KENDALL COUNTY
REGIONAL PLANNING COMMISSION

Kendall County Historic Court House
Court Room
110 W. Madison Street, Yorkville, Illinois

Approved - Meeting Minutes of January 22, 2025 - 7:00 p.m.

Chairman Bill Ashton called the meeting to order at 7:03 p.m.

ROLL CALL

Members Present: Bill Ashton, Eric Bernacki, Tom Casey, Dave Hamman, Keith Landovitz, Karin McCarthy-Lange, Ruben Rodriguez, Bob Stewart, Claire Wilson, and Seth Wormley
Members Absent: None
Staff Present: Matthew H. Asselmeier, Director, and Wanda A. Rolf, Office Assistant
Others Present: Steve Grebner, Steve Gengler, Tom Ryan, and Nick Standiford

APPROVAL OF AGENDA

Member Wilson made a motion, seconded by Member Landovitz, to approve the agenda. With a voice vote of ten (10) ayes, the motion carried.

APPROVAL OF MINUTES

Member Hamman made a motion, seconded by Member Bernacki, to approve the minutes of the December 11, 2024, meeting. With a voice vote of ten (10) ayes, the motion carried.

PETITIONS

Petition 24-30 Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner)

Mr. Asselmeier summarized the request.

The Petitioner is seeking a special use permit for a commercial solar energy facility and a variance to Section 36-282(17)a of the Kendall County Code to allow a commercial solar energy facility on land within one point five (1.5) miles of municipality without an annexation agreement.

The application materials, wetland delineation reports (including EcoCat information), NRI Report, property survey, amended site plan, vegetative management plan, decommissioning information, amended stormwater information, drain tile information, glare study, and property value study were provided.

On November 7, 2024, the property owner submitted a letter supporting the project. This letter was provided.

The property is located south of 9949 and 10021 Ament Road.

The total acreage of the two (2) parcels is approximately ninety-three point four (93.4) acres. The disturbed area is approximately forty-two point four (42.4) acres. The fenced area is approximately thirty-five point seven (35.7) acres.

The existing land use is Agricultural.

The County's Future Land Use Map calls for the property to be Rural Residential. Yorkville's Plan calls for the property to be Agricultural.

Ament Road is a Local Road maintained by Kendall Township.

The United City of Yorkville has a trail planned along Ament Road.

There are no floodplains on the property. There are two (2) farmed wetlands in the vicinity of the proposed use.

The adjacent land uses are Agricultural, Farmstead, Public Institutional (Cemetery), and Single-Family Residential.

The adjacent properties are zoned A-1, A-1SU and R-3.

The County's Plan calls for the area to be Rural Residential and Transportation Corridor.

Yorkville Plan calls for the area to be Agricultural.

Properties within one half (1/2) mile are zoned A-1, A-1SU, R-1, R-1 PUD, R-3, RPD-2, and M-1.

The A-1 special use permit to the north is for a cemetery. The A-1 special use permits to the east are for a church and school and for agricultural implement sales and service.

The Deere Crossing subdivision is located near the subject property. Approximately fourteen (14) homes are located within a half mile (0.5) miles of the subject property.

EcoCAT Report was submitted on July 10, 2023, for the eastern parcel and November 16, 2023, for the western parcel and consultation was terminated for both parcels.

A LESA Score was not generated for the property. The land evaluation was 96 out of 100 indicating the soils were well suited for agricultural. The NRI Report was provided.

Petition information was sent to Kendall Township on October 25, 2024. The Kendall Township Planning Commission met on November 18, 2024. The Kendall Township Planning Commission recommended approval of the proposal with the following conditions:

> "The entity will maintain and repair the subsurface drainage throughout the entirety of the lease to be repaired within the timeframe indicated in the special use permit (sup). The entity will commit to, as part of their maintenance schedule, perform a physical inspection of the property to include drain tile observation for damage and necessary repair. The surrounding property owners shall be provided a copy of the existing drain tile survey of subject property as well as any changes made as part of this project.
>
> We would request that there be a subsurface drainage repair bond to ensure there are sufficient funds available for any required repair of materials and labor at the time of agreement. All replacement tile shall equal to or greater than its current flow.

The planning and zoning committee also recommends as part of the comprehensive MONITORING AND MANAGEMENT PLAN AMENT ROAD SOLAR FARM – KENDALL COUNTY (section 1-6) specific attention to the noxious weeds including but not limited to water hemp, and Giant Ragweed."

The Kendall Township Board met on November 19, 2024, and requested that the County layover this proposal until the following items have been addressed to Kendall Township's satisfaction:

1. "That it appears specifically and in writing that any fiduciary instrument (i.e. Bond) be attached to the Title and or abstract of the Subject Property presently identified as *AMENT ROAD SOLAR FARM*. In so much as that responsibility will pass to any and all owners until the end of the deconstruction phase of the project.

2. That the concerns expressed above regarding the subsoil drainage issues be specifically addressed in any SUP, and failure to do so will result in a violation of the terms of the agreement and a monetary penalty will be applied.

3. That the concerns regarding the noxious weeds shall be specifically spelled out in the SUP and future agreements."

An email outlining Kendall Township's position was provided.

On December 3, 2024, the Petitioner submitted a letter responding to Kendall Township's requests and requesting that the proposal be continued to the January Kendall County Regional Planning Commission meeting and the January Zoning Board of Appeals hearing. This letter was provided.

On December 6, 2024, the Petitioner submitted an email to Kendall Township with the addresses of the abutting property owners for other solar projects in Kendall County. This email was provided.

On December 16, 2024, the Kendall Township Planning Commission met and reaffirmed their previous approval recommendation. An email to that effect was provided.

On January 21, 2025, the Kendall Township Board met and voted not to approve the proposal. An email to that effect was provided.

Petition information was sent to the United City of Yorkville on October 25, 2024. Prior to formal application submittal, the United City of Yorkville submitted a letter stating they would not pursue annexation at this time; this was provided. Yorkville also submitted an email requesting a forty foot (40') right-of-way dedication; Kendall Township was agreeable to this request. The emails related to the right-of-way dedication were provided.

The Yorkville Economic Development Committee reviewed the original proposal on January 7, 2025, and the Yorkville Planning and Zoning Committee reviewed the original proposal on January 8, 2025. Both boards recommended approval. An email from Yorkville was provided. The proposal goes to the Yorkville City Council on January 28, 2025.

Petition information was sent to the Bristol-Kendall Fire Protection District on October 25, 2024. No comments received.

ZPAC reviewed the original proposal at their meeting on November 5, 2024. ZPAC voted to forward the proposal to the Kendall County Regional Planning Commission by a vote of seven (7) in favor and zero (0) in opposition with three (3) members absent. The minutes of the meeting were provided.

The Kendall County Regional Planning Commission started their review of the proposal at their meeting on December 11, 2024. Discussion occurred regarding actionable items related to Kendall Township's concerns. Kendall Township's drainage concerns were centered on the impact of the proposal on neighboring property owners. Discussion occurred regarding Illinois Drainage Law and the need to have bonds of sufficient size to cover the complete cost of decommissioning and site cleanup. Discussion occurred regarding the ability of the County to place additional conditions on the special use permit. It was noted that Ament 1, LLC was created by New Leaf Energy. The Kendall County Regional Planning Commission voted to continue the Petition to the January 22, 2025, meeting at the Petitioner's request by a vote of nine (9) in favor and zero (0) in opposition with one (1) member absent. The minutes were provided.

The Kendall County Zoning Board of Appeals initiated a public hearing on this proposal on December 16, 2024, and voted to continue the Petition to the January 27, 2025, hearing by a vote of seven (7) in favor and zero (0) in opposition. The minutes were provided.

Per § 36-282(17) of the Kendall County Code, commercial solar energy facilities businesses can be special uses on A-1 zoned property subject to the following conditions:

a. All commercial solar energy facilities and test solar energy systems located within one point five (1.5) miles of a municipality shall either annex to the municipality or obtain an annexation agreement with the municipality requiring the municipality's regulations to flow through the property. Petitioner is requesting a variance.

b. The setbacks for commercial solar energy facilities shall be measured from the nearest edge of any component of the facility as follows:

   Occupied Community Buildings or Dwellings on Nonparticipating Properties-One hundred fifty feet (150') from the nearest point on the outside wall of the structure

   Boundary Lines of Participating Properties-None

   Boundary Lines of Nonparticipating Properties- Fifty feet (50') to the nearest point on the property line of the nonparticipating property

   Public Road Rights-Of-Way-Fifty feet (50') from the nearest edge

   The above setbacks do not exempt or excuse compliance with electric facility clearances approved or required by the National Electrical Code, the National Electrical Safety Code, Commerce Commission, Federal Energy Regulatory Commission, and their designees or successors. Per the site plan, the closet nonparticipating structure is approximately one thousand, thirty feet (1,030') to the southeast of the commercial solar energy facility. A church is located approximately one thousand, four hundred thirty-three feet (1,433') to the northeast of the commercial solar energy facility. The perimeter fence is setback fifty feet (50') from the adjoining property line. The commercial solar energy facility is approximately one thousand, four hundred forty-two feet (1,442') from the Ament Road. At their closest points, the panels are approximately forty-nine feet (49') south of the northern fence line, twenty-nine point five feet (29.5) west of the eastern fence line, just under nineteen feet (19') north of

the southern fence line, and twenty-one point five feet (21.5') east of the western fence line.

c. A commercial solar energy facility's perimeter shall be enclosed by fencing having a height of at least six feet (6') and no more than twenty-five feet (25'). This is true. Per the site plan, the fence is proposed to be seven feet (7') in height and will be chain link.

d. No component of a solar panel as part of a commercial solar energy facility shall have a height of more than twenty feet (20') above ground when the solar energy facility's arrays are at full tilt. This is true. Per the site plan, the maximum height will be nine feet (9'). The Petitioner does not want a restriction setting the maximum height at this level.

e. The above setback, fencing, and component height requirements may be waived subject to written consent of the owner of each affected nonparticipating property. This written consent shall be submitted at the time of application submittal. No such consent requested or needed.

f. Sound limitations for components in commercial solar energy facilities shall follow the sound limitations established by the Illinois Pollution Control Board. A noise study was provided.

g. The County shall not require standards for construction, decommissioning, or deconstruction of a commercial solar energy system or related financial assurances to be more restrictive than agricultural impact mitigation agreement set in State law. The amount of any decommissioning payment shall be limited to the cost identified in the decommissioning or deconstruction plan, as required by the agricultural impact mitigation agreement, minus the salvage value of the project. A copy of the agricultural impact mitigation agreement shall be submitted with the application materials. The decommissioning plan was provided and is outlined in the AIMA. As noted, the estimated cost of decommissioning is Four Hundred Twenty-Five Thousand, Eight Hundred Ninety-Seven Dollars and Thirty-Seven Cents ($425,897.37). This money will be provided to the County in the form of a bond as outlined in the AIMA.

h. A vegetative screening shall be placed around the commercial solar energy facility. The landscaping plan was provided with the site plan and more detailed landscaping information included in the vegetative management plan. The plan includes a cover crop seed mix, a native pollinator seed mix, and a native grazing seed mix. The performance standards and ground cover maintenance requirements were included in the vegetative management plan.

i. Commercial solar energy facility applicants shall provide the results and recommendations from consultations with the Illinois Department of Natural Resources obtained through the Ecological Compliance Assessment Tool (EcoCat) or a comparable successor tool. The commercial solar energy facility applicant shall adhere to the recommendations provided through this consultation. The EcoCat was submitted and consultation was terminated without any specific recommendations.

j. Commercial solar energy facility applicants shall provide the results of the United States Fish and Wildlife Service's Information for Planning and Consulting environmental review or a comparable successor toll that is consistent with the U.S. Fish and Wildlife Service's Land-Based Wind Energy Guidelines and any applicable United States Fish and Wildlife Service solar wildlife guidelines that have been subject to public review. This was provided in both wetland delineation reports. Six (6) threatened or endangered species were in the area, but no impacts were anticipated.

k. A facility owner shall demonstrate avoidance of protected lands as identified by the Illinois Department of Natural Resources and the Illinois Nature Preserve Commission or consider the recommendations of the Illinois Department of Natural Resources for setbacks from protected lands, including areas

identified by the Illinois Nature Preserve Commission. This is true. The site is designed around the farmed wetlands.

l. A facility owner shall provide evidence at the time of application submittal of consultation with the Illinois State Historic Preservation Office to assess potential impacts on State-registered historic sites under applicable State law. No potential impacts to State-registered historic sites exist.

m. A commercial solar energy facility owner shall plant, establish, and maintain for the life of the facility vegetative ground cover consistent with State law and the guidelines of the Illinois Department of Natural Resources' vegetative management plans. The vegetation management plan shall be required at the time of application submittal. The vegetation management plan, including timelines for planting and maintenance of the vegetation was provided.

n. The facility owner shall enter into a road use agreement with the jurisdiction having control over the applicable roads. The road use agreement shall follow applicable law. The facility owner shall supply the Kendall County Planning, Building and Zoning Department with a copy of the road use agreement. This provision shall be waived if the jurisdiction having control over the applicable roads does not wish to enter into an agreement. To date, the road use agreement negotiations are ongoing. No transportation or access plan was provided. The site plan shows one (1) twenty foot (20') wide gravel driveway approximately thirty feet (30') west of the eastern property line.

o. The facility owner shall repair or pay for the repair of all damage to the drainage system caused by the construction of the commercial solar energy system within a reasonable time after construction of the commercial solar energy facility is complete. The specific time shall be set in the special use permit. A tentative drain tile study was provided. The foundations for the racking will be placed in a manner that minimizes impacts on the drain tile.

No buildings are planned for the site. Any structures proposed for the site, including the solar arrays, shall obtain applicable permits.

The property is presently farmland. No wells, septic systems, or refuse collection points were identified.

The proposed area of disturbance is slightly less than one (1) acre. The County requested that the Petitioner submit an escrow payment so that WBK can evaluate the proposal; the Petitioner agreed to this request.

On November 15, 2024, WBK submitted a letter with several comments and questions. On December 23, 2024, the Petitioner submitted a response including a revised site plan and revised stormwater information. The cover letter outlining the changes was provided. On December 30, 2024, WBK submitted a response letter. On January 15, 2025, the Petitioner submitted an amendment site plan which incorporated the changes recommended by WBK and included two (2) basins requested by Kendall Township. The basins are shown on pages four (4) and five (5) of the site plan. The western basin has a depth of two point four feet (2.4') from the berm to the bottom of the basin. At the highest elevation, it has a surface area of forty-two thousand, five hundred thirty-five (42,535) square feet and will have a volume of forty-five thousand, three hundred nine (45,309) cubic feet. The eastern basin has a depth of one point eight (1.8') from the berm to the bottom of the basin. At the highest elevation, it has a surface area of thirty-nine thousand, seven hundred seventy-three (39,773) square feet and will have a volume of twenty-nine thousand, five hundred forty-six (29,546) cubic feet.

Per the site plan, the Petitioner propose one (1) twenty foot (20') wide access road.

There is one (1) forty foot (40') wide vehicular access gate and approximately ten (10) four foot (4') access gates proposed around the perimeter of the property. The locations of the smaller gates have not been determined. Knox box information will be provided to the County.

No permeant parking was proposed. There will be a staging area during construction; the specific location of the staging area was undetermined, but will likely be northwest of the vehicular access gate.

No lighting was proposed.

No specific signage was planned. The Petitioner was agreeable to installing one (1) sign at the vehicular access gate stating emergency contact information.

The Petitioner provided a glare study.

The Petitioner provided a general property values study. Mr. Asselmeier noted that the same company that provided the property value study for this project also prepared the property value study for the project on Simons Road. An email outlining the differences between the studies was available. The conclusion of both studies, that property values would not be negatively impacted, was the same.

No odors were foreseen.

The Petitioner provided noise information.

If approved, this would be the second special use permit for a commercial solar energy facility in unincorporated Kendall County.

The proposed Findings of Fact for the special use permit were as follows:

The establishment, maintenance, or operation of the special use will not be detrimental to or endanger the public health, safety, morals, comfort, or general welfare. The Project will generate clean, renewable electricity while producing no air, noise, or water pollution, or ground contamination. The front portion of the parcel closest to Ament Road will be retained for agricultural use as well as the surrounding land of the other parcel, which will create a natural screening during the growing season. The Petitioner submitted a vegetative management plan outlining the types of vegetation that will be planted, the timing of planting, and a maintenance plan for the vegetation.

The special use will not be substantially injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood. The Zoning classification of property within the general area of the property in question shall be considered in determining consistency with this standard. The proposed use makes adequate provisions for appropriate buffers, landscaping, fencing, lighting, building materials, open space and other improvements necessary to insure that the proposed use does not adversely impact adjacent uses and is compatible with the surrounding area and/or the County as a whole. The proposal will not interfere with the use and enjoyment of nearby properties. The surrounding properties are zoned primarily A-1 and will not be prevented from continuing any existing use or from pursuing future uses. The proposal's operations would be quiet and minimal traffic will occur after installation is completed. The solar panels are setback from Ament Road and neighboring houses to avoid negative visual impacts.

Adequate utilities, access roads and points of ingress and egress, drainage, and/or other necessary facilities have been or are being provided. The proposal will have adequate utility interconnections designed in collaboration with ComEd. The proposal does not require water, sewer, or any other public utility facilities to operate. The Petitioner will also build all roads and entrances at the facility and will enter into an agreement with Kendall Township regarding road use. After initial construction traffic, landscape maintenance and maintenance to the project components are anticipated to occur on an as-needed basis, consistent with the vegetative management plan. Existing traffic patterns will not be impacted in the post-construction operations phase. A drain tile survey will be completed prior to construction and foundation design will work around or reroute any identified drain tiles to ensure proper drainage.

The special use shall in all other respects conform to the applicable regulations of the district in which it is located, except as such regulations may in each instance be modified by the County Board pursuant to the recommendation of the Zoning Board of Appeals. If the requested variance is granted, the proposal meets all applicable regulations.

The special use is consistent with the purpose and objectives of the Land Resource Management Plan and other adopted County or municipal plans and policies. The proposal is also consistent with a goal and objective found on page 3-34 of the Land Resource Management Plan, "Support the public and private use of sustainable energy systems (examples include wind, solar, and geo-thermal)." However, the proposal is located on property classified as Rural Residential on the Future Land Use Map.

The proposed Findings of Fact for the variance:

The particular physical surroundings, shape, or topographical condition of the specific property involved would result in a particular hardship or practical difficulty upon the owner if the strict letter of the regulations were carried out. The subject property is located within one point five (1.5) miles of the United City of Yorkville. The Petitioner provided a letter from the United City of Yorkville stating that Yorkville did not wish to annex the property or enter into a pre-annexation agreement.

The conditions upon which the requested variation is based would not be applicable, generally, to other property within the same zoning classification. Other A-1 zoned properties within one point five (1.5) miles of a municipality could request a similar variance, if the municipality refuses to annex or enter into a pre-annexation agreement.

The alleged difficulty or hardship has not been created by any person presently having an interest in the property. The difficulty was created because the United City of Yorkville did not wish to enter into a pre-annexation agreement or annex the property.

The granting of the variation will not materially be detrimental to the public welfare or substantially injurious to other property or improvements in the neighborhood in which the property is located. Granting the variance would not be detrimental to the public or substantially injurious to other properties.

That the proposed variation will not impair an adequate supply of light and air to adjacent property, or substantially increase the congestion in the public streets or increase the danger of fire, or endanger the public safety or substantially diminish or impair property values within the neighborhood. The proposed variance would not impair light or air on adjacent property, cause congestion, increase the danger of fire, or negatively impact property values.

Staff will wait with issuing a recommendation on this proposal, pending comments from the Regional Planning Commission. The proposed conditions and restrictions are as follows:

1. The site shall be developed substantially in accordance with the submitted site plan, vegetative management plan, decommissioning plan, road access plan, and Agricultural Impact Mitigation Agreement.
2. A variance to section 36-282(17)(a) of the Kendall County Code is hereby granted allowing a commercial solar energy facility within one point five (1.5) miles of a municipality without an annexation or pre-annexation agreement. (**Added after ZPAC**).
3. Within ninety (90) days of the approval of the special use permit, the owners of the subject property shall dedicate a strip of land forty feet (40') in depth along the northern property line to Kendall Township. The Kendall County Planning, Building and Zoning Committee may grant an extension to this deadline.
4. None of the vehicles or equipment parked or stored on the subject property allowed by the special use permit shall be considered agricultural vehicles or agricultural equipment.
5. All of the vehicles and equipment stored on the subject property allowed by the special use permit shall be maintained in good condition with no deflated tires and shall be licensed if required by law.
6. Any structures, included solar arrays, constructed, installed, or used allowed by this special use permit shall not be considered for agricultural purposes and must secure applicable building permits.
7. One (1) warning sign shall be placed near or on the vehicular entrance gate. This sign shall include, at minimum, the address of the subject property and a twenty-four (24) hour emergency contact phone number. Additional signage may be installed, if required by applicable law.
8. KenCom and other applicable public safety agencies shall be supplied the access code to the Knox Box/security gate.
9. The operators of the use allowed by this special use permit acknowledge and agree to follow Kendall County's Right to Farm Clause.
10. The property owner and operator of the use allowed by this special use permit shall follow all applicable Federal, State, and Local laws related to the operation of this type of use.
11. Failure to comply with one or more of the above conditions or restrictions could result in the amendment or revocation of the special use permit.
12. If one or more of the above conditions is declared invalid by a court of competent jurisdiction, the remaining conditions shall remain valid.
13. This special use permit and variance shall be treated as a covenant running with the land and is binding on the successors, heirs, and assigns as to the same special use conducted on the property.

Chairman Ashton asked about the LESA Score. Mr. Asselmeier responded that the land evaluation score was 96 out of 100.

Member Wilson asked why the County Code required annexation or pre-annexation to a municipality if a proposal was within one point five (1.5) miles of a municipality. Mr. Asselmeier responded that the County did

not want commercial wind and solar projects to landlock municipalities. Member Wilson asked if the State law had similar annexation requirement. Mr. Asselmeier responded no.

Member Bernacki asked if WBK's comments had been resolved. Mr. Asselmeier responded that the Petitioner submitted revised stormwater information on January 15, 2025, and, to date, WBK has not provided a response to those comments.

Member Wilson asked if the bond information would be recorded. Mr. Asselmeier said the decommissioning bond would be kept on file at the County. The AIMA outlines when the County can review the bond. Member Wilson asked why the bond could not be recorded. Mr. Asselmeier said the County could require the bond to be recorded; the special use permit would be recorded. Member Wilson favored recording the bond.

Member Wilson noted that in the financial impact study, there was a comparable project in Colorado. She has a client near the site in Colorado and asked her client for comments on that project. The client said the project is a community solar garden for the houses within the development; they can purchase electrons to offset their electric bills. The client has no complaints about the project.

Member Landovitz asked if WBK was evaluating the stormwater management plan. Mr. Asselmeier responded that the stormwater management plan was still under evaluation. Member Landovitz asked about ground cover as a detention mechanism. Mr. Asselmeier responded that WBK was evaluating the impact of ground cover on stormwater runoff.

Member Landovitz asked about the basis for the costs in the decommissioning estimate. Mr. Asselmeier said the calculation of the bond is based on State law and the AIMA requires periodic review of the bond amount. He was concerned because no authority was provided regarding the figures in the estimate.

Member Wilson requested an independent evaluation of the decommissioning estimate at the Petitioner's expense.

Member Landovitz asked if any projects had been decommissioned. Mr. Asselmeier responded that he was not aware of any commercial solar projects that had been decommissioned.

Member Wilson shared Member Landovitz's concerns regarding decommissioning.

Steve Grebner, Kendall Township Clerk, said that Kendall Township was trying to attach the bond to the title of the property. He praised New Leaf's involvement in this project. He praised the work of the Kendall Township Planning Commission. The Kendall Township Board questioned if the proposal was the best use of land and in the best interest of the residents of Kendall Township. He expressed concerns about the unknowns related to decommissioning. He argued that it might be better to place solar panels on buildings instead of on farmland.

Member Landovitz asked if the objection was about a resolvable detail. Mr. Grebner said the objection steams from the best use of farmland. He provided a history of the detention basins.

Member Wormley asked if the Kendall Township Planning Commission voted on the proposal before the matter went to the Township Board. Mr. Grebner responded yes, pending final sign off of the County engineer.

Member Landovitz stated that he was more in favor of solar than other uses that could go on agricultural land because the solar panels could be removed and the land reverted back to productive agriculture. He also noted the need for landowners to have alternative revenue streams.

Member Landovitz asked about alternative uses that the Township Board would favor. Mr. Grebner responded that other uses were hypothetical and the Township Board evaluated the proposal that was before them. Mr. Grebner questioned if other areas were better suited for solar than quality farmland.

Member Wormley spoke about the land use. Kendall County is the fastest growing county in Illinois. He stated that farming is important, but many of the properties that are agriculture will not be agriculture in the future. Much of the land will become commercial. The solar farm will be detrimental to the County's tax revenue compared to having subdivisions and schools. Member Wormley would like to see the solar farms go to areas without development potential. Kendall County's future land use map is currently outdated and will be updated sometime this year.

Member Bernacki agreed with Member Wormley. He stated there will be positive growth over the next twenty (20) years.

Steve Gengler, Kendall Township Supervisor, stated that just south of the site of the solar farm is a PUD. There are plans for a school to be built. He feels that a solar farm may be harmful near a school.

Member Wilson asked Mr. Asselmeier if he was aware of the PUD that Mr. Gengler referenced. Mr. Asselmeier stated he was not aware of a PUD in the vicinity of the solar farm.

Member Stewart asked Mr. Asselmeier why New Leaf requested a variance to the zoning requirement regarding annexation into Yorkville. Mr. Asselmeier stated that New Leaf requested an annexation agreement into Yorkville, but Yorkville declined.

Member Landovitz was concerned that neither Yorkville nor Kendall Township had any comment as to an alternate vision for the solar farm. Yorkville did not want to annex the project, but they didn't seem to raise a concern about the future use of the land. He understood the reason for a farmer to lease part of their land.

Nick Standiford, Land Use Attorney with Schain Banks, stated that he worked with thirty (30) to fifty (50) community solar farms and has heard many of the same concerns as Kendall County.

Member Casey stated that the main question is land usage. The solar farm will be there for twenty (20) years and extend for five (5) more years.

Tom Ryan, Project Developer for New Leaf Energy, stated that one (1) of the main questions is the use of the land and taking farmland is an issue. Mr. Ryan stated that solar panels are a temporary use. They have a lease with the landowner for a period of twenty (20) years with the right to extend it five (5) years four (4) times. If

there is a lot of development in the area in (20) years, they will begin decommissioning and returning the site to its original state. There are many requirements needed for a solar farm. The correct interconnection is needed. Mr. Ryan stated that this area has a huge wave of solar projects. Mr. Ryan stated the solar farm industry will have to renounce some of their projects because of capacity issues. Mr. Ryan stated he received the interconnection and was placed in queue with ComEd three (3) years ago. He stated there was no more capacity in the substation. Until the substation gets upgraded which, will take millions of dollars, the building of solar farms will slow down.

Mr. Standiford stated the if the solar companies were able to find uneven, rocky land that was not good for farming, they would. Sites are limited because of the need for a substation.

Mr. Ryan stated that the landowner had some less favorable land with wetlands. This parcel falls into the best category for solar farms.

Member Wormley asked if they went to other counties to look for land. Mr. Ryan stated they have looked in other counties. They have approximately seventy (70) projects in Illinois. People within a certain radius will receive the community solar benefits.

Mr. Wormley stated that Kendall County is the fastest growing county in Illinois and people do not want to see solar farms. Mr. Ryan stated that the site of the project has been pushed back one thousand (1,000) feet from Ament Road and the same for Route 47. Member Wormley stated that, in the new future land use map, the guideline for solar farms will be one (1) mile from a state road or a county road from any direction.

Mr. Standiford explained the special use standards of approval and the variation standards. He discussed projects that New Leaf Energy has completed in Illinois. He discussed the adjoining land uses, as outlined in both the Kendall County Land Resource Management Plan and Yorkville's Comprehensive Plan. He discussed the pace of residential development in Yorkville. He discussed the proposed findings of fact contained in the Staff Report and the consistency with Land Resource Management Plan. He noted the classification of the property in Yorkville's plan. He noted the votes taken by Kendall Township. Discussion occurred regarding the amount tax dollars generated by the development; over twenty (20) years, the development will pay over Five Hundred Thousand Dollars ($500,000). Member Wormley said houses would generate comparable tax revenue and the property is generating food.

Member Wormley felt the area was not a good location because the area was going commercial or industrial. Those developments will generate more tax revenue.

Discussion occurred regarding updating the Land Resource Management Plan and the work with municipalities to update the Land Resource Management Plan.

Member Wormley discussed the need for the variance and explained the need for consistency in votes, which was why he was voting against the project. Mr. Standiford discussed State law related to the placement of commercial solar farms and the need for electricity.

Member Landovitz asked what the loss opportunity was, if the proposal does not occur at this time. Mr. Ryan responded that the interconnection could be lost.

The proposal goes to the Yorkville City Council on January 28, 2025.

Member Wilson asked why solar panels could not be placed on commercial properties like the former Caterpillar Plant in Montgomery. Mr. Ryan discussed distances to substations, a maximum distance of three (3) miles, and have proper feeder lines.

Member Wilson asked how many homes would be powered by this project. The response was about eight hundred (800).

There were no plans to expand at the site. Even if expansion was possible, New Leaf would an interconnection agreement with Comed.

Mr. Standiford was agreeable to recording the bond and having the Petitioner pay an independent consultant to prepare a decommissioning plan.

Member Hamman discussed the landowner perspective. A project like this could give a landowner additional income to keep their farm. He discussed a project on a property in Grundy County. He asked what happens if the County denies the project and gets sued. Mr. Asselmeier responded the County could get sued if the project is denied. Member Hamman noted that Grundy County denied a project on his property, was sued, and lost in court. Chairman Ashton noted that the Regional Planning Commission is purely advisory to the County Board. Member Hamman discussed predicted best uses on properties over twenty (20) years.

Member Bernacki discussed outstanding issues regarding stormwater and lack of comment from the Yorkville City Council. Mr. Asselmeier noted that the Kendall Township Planning Commission's recommendation was contingent on the resolution of stormwater issues. If those issues were not resolved to Kendall Township's satisfaction, their Planning Commission could recommend denial, which could trigger a supermajority vote at the County Board. Recommendations by the Yorkville City Council would be advisory. The Yorkville City Council could request an annexation agreement.

Member Wilson made a motion, seconded by Member Hamman, to recommend approval of the special use permit and variance with the conditions proposed by Staff, adding a condition that the decommissioning bond be attached to the decommissioning plan which would be recorded against the real estate, and adding a condition that an independent evaluation of the decommissioning cost occur at the Petitioner's expense.

The votes were as follows:
Ayes (2): Hamman and Wilson
Nays (8): Ashton, Bernacki, Casey, Landovitz, McCarthy-Lange, Rodriguez, Stewart, and Wormley
Absent (0): None
Abstain (0): None

The motion failed.

The proposal goes to the Kendall County Zoning Board of Appeals on January 27, 2025.

Member Landovitz voted no because of the potential land uses at the property. He gave deference to the voice of the elected officials, both the County and Kendall Township. He hoped that the updating of the Land Resource Management Plan will remove some of the differences. He felt bad for the landowners and the people that worked on the project.

Member Bernacki voted no because of the current classification of the land in the Land Resource Management Plan. He noted that Plainfield redid their plan recently and reclassified land to agricultural that had annexation agreements. He noted that Yorkville could redo their plan, which was completed in 2016. He felt working with Kendall Township was important. He also said that the Regional Planning Commission recommended denial of the solar project on Simons Road partially due to a lack of an annexation agreement with a municipality.

Member Wilson discussed balancing interests and unknowns. She noted that for farmers, their retirement is in their land. She understood the need to use farmland as a revenue source. She did not like the fact that farmer land is disappearing. In this case, she did not see an aesthetic issue and comparatively little farmland was being lost. She noted that solar panels have to be in certain locations related to substations and related infrastructure. She noted the project would comply with State law and she was unsure if the County's law related to annexation would hold in court. She favored the landowner and noted that the land could revert back to farm ground.

Member Hamman voted in favor of the proposal because the Petitioner presented a good case with the site setback from the roads. He favored being landowner's rights because selling the land may not be an option for tax reasons. He also had concerns regarding the legal aspects of denying this proposal.

Chairman Ashton voted no because of the high land evaluation score. He favored solar panels on ground that was not as productive for farming purposes.

Member Rodriguez discussed new developments and future land use in Kendall County. He voted no because of developments going on in Kendall County and future land uses in the County.

Member Casey favored commercial solar developments on commercial buildings.

Member McCarthy-Lange voted no because the proposal would look in the land use for twenty to forty (20-40) years. The County has changed drastically in the last forty (40) years. She did not want to lock in the land use that close to a municipality for such a long period of time. She would have liked the landowner to be present at the meeting; if the situation was dire, the landowner would appear at the meeting.

Petition 24-35 Kendall County Regional Planning Commission

Mr. Asselmeier summarized the request.

Section 36-1013 (f) (6) (a) (1) of the Kendall County Code contains the following regulations regarding parking in the front yard setbacks:

"No parking and drive aisles are permitted in a required front setback except the interior one-half (½) of the front yard in an M-1 Limited Manufacturing District or M-2 Heavy Industrial District."
During the review of the special use permit for a landscaping business between 3900 and 3716 Stewart, Staff was requested to investigate allowing parking in a portion of the required front yard

setbacks.

The front yard setbacks for properties zoned A-1 are one hundred fifty feet (150') from the centerline and one hundred feet (100') from the right-of-way line.

The consensus among the members of the Kendall County Regional Planning Commission was that this requirement was too large and prevented property owners from using their land effectively.

At their meeting on October 23, 2024, the Kendall County Regional Planning Commission decided to initiate a text amendment to the Kendall County Code allowing parking in the A-1 Zoning District in the interior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the interior fifty feet (50') from the right-of-way line where a right-of-way existed.

After review by the Kendall County Regional Planning Commission on December 11, 2024, the proposal was clarified to read as follows:

"No parking and drive aisles are permitted in a required front setback except the interior one-half (½) of the front yard in **A-1 Agricultural District,** M-1 Limited Manufacturing District**,** or M-2 Heavy Industrial District. **Specifically, in the A-1 Agricultural District, no parking is allowed in the exterior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the exterior fifty feet (50') from the right-of-way line where a right-of-way existed.**"

Information was sent to the Townships on October 25, 2024. No comments received.

ZPAC reviewed the original proposal at their meeting on November 5, 2024. Discussion occurred regarding the history of front yard setback regulations. ZPAC voted to recommend approval of the proposal by a vote of seven (7) in favor and zero in opposition (0) with three (3) members absent. The minutes of the meeting were provided.

The Kendall County Regional Planning Commission reviewed this proposal at their meeting on December 11, 2024. Discussion occurred regarding grandfathering and the applicability of the standards if a road is widened. The Commission wanted the setback distances of seventy-five feet (75') and fifty (50') emphasized in the regulation. Staff was requested to update the proposal to reflect this emphasis. The Kendall County Regional Planning Commission voted to continue this proposal by a vote of nine (9) in favor and zero (0) in opposition with one (1) member absent. The minutes of the meeting are provided. The minutes of the meeting were provided.

The Kendall County Zoning Board of Appeals initiated a public hearing on this proposal on December 16, 2024. The Kendall County Zoning Board of Appeals voted to continue to the proposal to the January 27, 2025, hearing by a vote of seven (7) in favor and zero (0) in opposition. The minutes of the hearing were provided.

Member Wormley made a motion, seconded by Member Landovitz, to recommend approval of the text amendment.

The votes were as follows:
Ayes (10): Ashton, Bernacki, Casey, Hamman, Landovitz, McCarthy-Lange, Rodriguez, Stewart, Wilson, and Wormley
Nays (0): None

Absent (0): None
Abstain (0): None

The motion carried.

The proposal goes to the Kendall County Zoning Board of Appeals on January 27, 2025.

CITIZENS TO BE HEARD/PUBLIC COMMENT
None

NEW BUSINESS
Election of Officers-Chairman, Vice Chairman, Treasurer, Secretary and Recording Secretary
Chairman Ashton declared that he no longer wanted to be Chairman. He wanted to spend additional time traveling.

Member Rodriguez made a motion, seconded by Member Hamman, to nominate and approve Keith Landovitz for Chairman, Eric Bernacki for Vice Chairman, and Karin McCarthy-Lange for Secretary.

The votes were as follows:
Ayes (10): Ashton, Bernacki, Casey, Hamman, Landovitz, McCarthy-Lange, Rodriguez, Stewart, Wilson, and Wormley
Nays (0): None
Absent (0): None
Abstain (0): None

The motion carried.

Commissioners thanked Chairman Ashton for his service.

Appointments to Comprehensive Land Plan and Ordinance Committee
Member Rodriguez left at this time (8:52 p.m.).

Discussion occurred regarding the current members of the Comprehensive Land Plan and Ordinance Committee. The current members are as follows: Chairman of the Kendall County Regional Planning Commission or Their Designee (Bill Ashton), Chairman of the Kendall County Zoning Board of Appeals or Their Designee (Randy Mohr), Chairman of the Kendall County Board or Their Designee (Matt Kellogg), Chairman of the Kendall County Planning, Building and Zoning Committee or Their Designee (Seth Wormley), Kendall County Soil and Water Conservation District Designee (Alyse Olson), Scott Gengler as Immediate Past Planning, Building and Zoning Committee Chairman, Jeff Wehrli, and Matthew Prochaska.

Discussion occurred regarding expanding the Committee for the Land Resource Management Plan update and the process of updating the Plan.

Chairman-Elect Landovitz will evaluate possible members.

Annual Meeting-February 1, 2025, at 9:00 a.m.
Commissioners reviewed the draft agenda for the meeting.

The appointments to the Comprehensive Land Plan and Ordinance Committee would occur at the Annual Meeting.

OLD BUSINESS
None

REVIEW OF PETITIONS THAT WENT TO COUNTY BOARD
Mr. Asselmeier reported that Petition 24-13 was withdrawn by the Petitioner.

Mr. Asselmeier reported that Petitions 24-31, 24-32, 24-33, and 24-34 were approved by the County Board. For Petition 24-34, the setback was set at twenty-five feet (25') from the edges of the permanent easement.

OTHER BUSINESS/ANNOUNCEMENTS
Mr. Asselmeier reported there were no petitions for the February 26th meeting.

ADJOURNMENT
Member Wilson made a motion, seconded by Member Hamman, to adjourn. With a voice vote of ten (10) ayes, the motion carried.

The Kendall County Regional Planning Commission meeting adjourned at 9:08 p.m.

Respectfully submitted by,
Matthew H. Asselmeier, AICP, CFM, Director

Encs.

KENDALL COUNTY
REGIONAL PLANNING COMMISSION
JANUARY 22, 2025

IF YOU WOULD LIKE TO BE CONTACTED ON FUTURE MEETINGS REGARDING THIS TOPIC, PLEASE PROVIDE YOUR ADDRESS OR EMAIL ADDRESS

NAME	ADDRESS (OPTIONAL)	EMAIL ADDRESS (OPTIONAL)
Steve Grebner		Sgrebsner@kendalltwp.com
Steve Grengler		SGrengler@kendall twp.com
Nicki Standeford		[redacted]
Tom Ryan		

STORMWATER/DRAINAGE MEMORANDUM

KENDALL COUNTY, IL

AMENT ROAD – COMMUNITY SOLAR

AMENT ROAD
KENDALL COUNTY, ILLINOIS

A 5 MW (AC) GROUND-MOUNTED SOLAR POWER GENERATING FACILITY

Prepared for

NEW LEAF ENERGY

[redacted]

Submitted by: Atwell, LLC

Atwell Project No.
23002398

Date: September 27, 2024
REVISED: January 14, 2025

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APPENDICES

1 PROJECT NARRATIVE

New Leaf Energy (NLE) is proposing a 5 MW (AC) ground-mounted solar generating facility to be constructed along Ament Road located in Kendall County, Illinois outside of the limits of the United City of Yorkville. The solar development proposes approximately 0.97 acres of new impervious area and will stabilize the ground within the fenced area and other limits of disturbance that will not be farmed with a native pollinator friendly prairie seed mix. The existing topography and flow patterns will remain the same throughout the project area. Per the Kendall County Stormwater Ordinance, the allowable release rate for proposed hydraulically disturbed areas (impervious areas) is 0.04 cfs/acre for a 24-hr 2-year storm and 0.15 cfs/acre for a 24-hr 100-year storm. Based on the nature of this project and the construction, it is assumed that the proposed impervious area is the only hydraulically disturbed area. The site runoff reduction was analyzed to demonstrate that the total projected post-development peak flow rate is below the allowable release rate, and this is expected to provide a net positive impact on the existing watershed.

2 EXISTING CONDITIONS

The existing 95.28-acre property consists of straight row crops with no existing structures. The only impervious area within the project limits of disturbance is a small portion of the eastbound lane of Ament Road and the existing site gravel entrance. The drainage areas contain additional impervious areas (the eastbound lane of Ament Road and some off-site structures). The project site consists of two parcels, of which “Parcel 1” will contain the proposed solar array field, and “Parcel 2” will contain only the proposed site access road and connection to Ament Road.

Existing Drainage Area #1 flows from a high point near the site entrance to the east property line of Parcel 2. Runoff then flows into Existing Drainage Area #2, which flows toward Parcel 1 through mostly off-site areas before transitioning onsite and out falling at an existing ditch along the Parcel 1 southern property line. Existing Drainage Area #3 flows from a high point at the middle of the east property line of Parcel 2 southward to the center of Parcel 1, which creates depressional storage before flowing into Existing Drainage Area #2. Existing Drainage Area #4 flows from a high point at the southern side of Parcel 2 across the Parcel 1 north property line and southward to an existing ditch along the Parcel 1 southern property line before flowing offsite.

Drainage Area #3 includes an existing depression that holds approximately 28,145 cubic feet of storage. There is no planned grading in this area and the storage within this depression will remain in the proposed condition.

Per the USDA NRCS Web Soil Survey included in **Appendix A**, the soil types and hydrologic soil groups consist of Lisbon silt loam (C/D), Drummer silty clay loam (B/D), Elpaso silty clay loam (B/D), and Graymont silt loam (C). The average existing hydrologic soil group rating for the project area is D. A pre-development drainage area map is included in **Appendix B**. On the next page, **Table 2.1** details the pre-development drainage area characteristics and **Table 2.2** details the pre-development curve number.

Table 2.1 – Pre-Development Drainage Area Characteristics

Drainage Area	Undisturbed		Disturbed		Total (ac)
	Impervious (ac)	Pervious (ac)	Impervious (ac)	Pervious (ac)	
Existing Drainage Area #1	0.09	5.49	0.01	-	**5.59**
Existing Drainage Area #2	0.31	62.20	-	-	**62.51**
Existing Drainage Area #3	-	20.76	-	-	**20.76**
Existing Drainage Area #4	-	11.54	-	-	**11.54**
				Total	**100.40**

Table 2.2 – Pre-Development Curve Numbers

Soil Rating	Cover Description	CN
C	Row Crops; Straight Row (SR) Good	85
D	Row Crops; Straight Row (SR) Good	89
-	Impervious Area	98
	Combined CN	**88**

3 PROPOSED CONDITIONS

The proposed development will consist of a solar generating facility and equipment pads enclosed within a minimum 7-foot-high perimeter fence, as well as a gravel access road connecting Ament Road to the project site. Proposed Drainage Areas #1 and #3 will be modified from existing conditions to reduce the amount of runoff onto the adjacent property to the east. Drainage Area #1 will contain a portion of the proposed site access road and connection to Ament Road within Parcel 2. Proposed Drainage Areas #2 and #4 will be modified from existing conditions to accommodate the proposed stormwater management basins which will reduce runoff flowing offsite to the south.

Appendix B includes the Post-Development Drainage Area Map and **Table 3.1** on the following page details the post-development drainage area characteristics. The post-development drainage area includes the undisturbed areas outside of the project limits of disturbance, the disturbed row crop ground cover which will be converted to pasture, and the hydrologic disturbed area (equipment pads and access road). The total project limits of disturbance is 42.4 acres, with 0.97 acres of proposed hydrologically disturbed area.

Table 3.1 – Post-Development Drainage Area Characteristics (disturbed and undisturbed)

Drainage Area	Undisturbed		Disturbed		Total (ac)
	Impervious (ac)	Pervious (ac)	Impervious (ac)	Pervious (ac)	
Proposed Drainage Area #1	0.09	3.72	0.32	-	**4.13**
Proposed Drainage Area #2	0.31	61.84	-	-	**62.15**
Proposed Drainage Area #3	-	21.57	0.65	-	**22.22**
Proposed Drainage Area #4	-	11.70	-	-	**11.70**
				Total	**100.20**

Runoff from the proposed drainage areas will flow offsite to their respective drainage area low points shown on the drainage area maps. The entire area within the project limits of disturbance is being converted from straight row crops to pasture by planting native pollinator friendly prairie seed. This is expected to result in a reduction in the total peak flow rate.

Table 3.2 - Post-Development Curve Numbers

Soil Rating	Cover Description	CN
C	Pasture; Good	74
D	Pasture; Good	80
-	Impervious Area	98
	Combined CN	**84**

For this report, the total runoff reduction was analyzed to demonstrate that the change in cover type decreases the total peak flow rate and is below the allowable release rate for the project (per Kendall County requirements). By decreasing the total runoff, there will be a net positive impact to the existing watershed. Rainfall depth frequency from the Illinois State Water Survey Bulletin 75 is provided in **Appendix C**. For the design of this report, the Huff Distribution Method in HydroCAD was used. Design was completed using the 2-year, 24-hour and 100-year, 24-hour storm events. Pre- and post-development stormwater calculations, as well as a graphical depiction of the models, are included with the HydroCAD reports in **Appendix D**.

4 CONCLUSION

A comparison of the peak flow rate (PFR) for each drainage area and the total hydrologic study area is provided in **Table 4.1** on the following page. **Appendix D-1** contains the HydroCAD report for the pre-development condition, and **Appendix D-2** includes the HydroCAD report for the post-development condition without the use of stormwater basins.

Table 4.1 – Pre- vs. Post-Development Storm Event Comparison without SWM Basins

	2-Year Storm Event			100-Year Storm Event		
	Pre-Developed Flow (cfs)	Post-Developed Flow (cfs)	% Change	Pre-Developed Flow (cfs)	Post-Developed Flow (cfs)	% Change
D.A. #1*	1.60	1.11	-30.6%	4.99	3.60	-27.9%
D.A. #2	17.97	16.64	-7.4%	54.18	52.41	-3.3%
D.A. #3	6.23	5.44	-12.7%	18.65	18.83	+1.0%
D.A. #4	3.44	2.58	-25.0%	10.32	9.54	-7.6%
Total	**28.55**	**24.99**	**-12.5%**	**86.46**	**82.12**	**-5.0%**

* Includes gravel road and pollinator seed mixes to stabilize the areas outside of the gravel road but within the limits of disturbance. Flow off site to adjacent property is negligent and not anticipated to create any off-site issues.

As shown, total flow rates for both storm events are decreased in the post-development condition without the use of the stormwater basins.

A comparison of the total allowable PFR and total post-development PFR for the 2-year and 100-year, 24-hour storm events is summarized in **Table 4.2**. The disturbed area flow rate was calculated by taking the disturbed area allowable release rate for each storm event and multiplying it by the total hydraulically disturbed area (impervious area). This value was then added to the pre-development PFR for the undisturbed areas (from HydroCAD) to calculate the total allowable post-development PFR for the project. This was compared to the total post-development PFR (from HydroCAD) to confirm that the proposed project decreases the total peak flow rate on site without the use of the stormwater basins.

Table 4.2 – Storm Frequency Flows (Total Allowable vs. Total Post-Development)

	Area (ac)	Peak Flow Rate (cfs)	
		2-Yr	100-Yr
Allowable Pre-Development PFR for Disturbed Area (per Kendall County requirements: **2-Yr:** 0.04 cfs/acre disturbed area **100-Yr:** 0.15 cfs/disturbed area)	0.97	0.04	0.15
Pre-Development PFR for Undisturbed Area (from HydroCAD)	99.23	29.24	88.13
Total Allowable Post-Development PFR (Allowable Pre-Development PFR for Disturbed Area + Pre-Development PFR for Undisturbed Area)	**100.20**	**29.28**	**88.28**
Total Post-Development PFR (from HydroCAD)	**100.20**	**24.99**	**82.12**

As shown in **Table 4.2**, the total post-development PFR for the project area is reduced for both storm events due to an increase in infiltration from the proposed native pollinator friendly prairie seed mix, which results in the use of a lower curve number. The proposed project utilizes a low-impact design by stabilizing the disturbed areas with a native pollinator friendly prairie seed mix. Therefore, the project will have a net positive impact on the watershed. The total post-development peak flow rates for both the 2-year and 100-year, 24-hour storm events are below the total allowable peak flow rate; thus, detention is not required.

A published study by the American Society of Civil Engineers (ASCE) is included in **Appendix E**. This report shows that the net increase in flow from a Solar Facility does not change so long as the ground cover does not change. In the case of this project, we do change the ground cover but to a cover that reduces the flow from the pre-development flows. So, in conjunction with this study and the revised ground cover, we feel that no detention or further stormwater management measures are required.

Per discussions with the local jurisdictions, it was requested to add stormwater management basins to the project to further reduce runoff to offsite areas south of the project area from Drainage Areas #2 and #4. Basin #1 receives stormwater runoff from Drainage Area #4, and Basin #2 receives stormwater runoff from Drainage Area #2. **Table 4.3** shows the storm event comparison with the stormwater basins included. The HydroCAD report for this analysis is provided in **Appendix D-3**.

Table 4.3 – Pre- vs. Post-Development Storm Event Comparison with SWM Basins

	2-Year Storm Event			100-Year Storm Event		
	Pre-Developed Flow (cfs)	Post-Developed Flow (cfs)	% Change	Pre-Developed Flow (cfs)	Post-Developed Flow (cfs)	% Change
D.A. #1*	1.60	1.11	-30.6%	4.99	3.60	-27.9%
D.A. #2	**17.97**	**16.59**	**-7.7%**	**54.18**	**52.26**	**-3.5%**
D.A. #3	6.23	5.44	-12.7%	18.65	18.83	+1.0%
D.A. #4	**3.44**	**2.10**	**-38.9%**	**10.32**	**9.40**	**-8.9%**
Total	**28.55**	**23.95**	**-16.1%**	**86.46**	**81.19**	**-6.1%**

* Includes gravel road and pollinator seed mixes to stabilize the areas outside of the gravel road but within the limits of disturbance. Flow off site to adjacent property is negligent and not anticipated to create any off-site issues.

As shown, the total post-development PFR for the project area is reduced further for Drainage Areas #2 and #4 (shown in bold) due to the use of the stormwater basins.

APPENDIX A

USDA NRCS SOILS REPORT

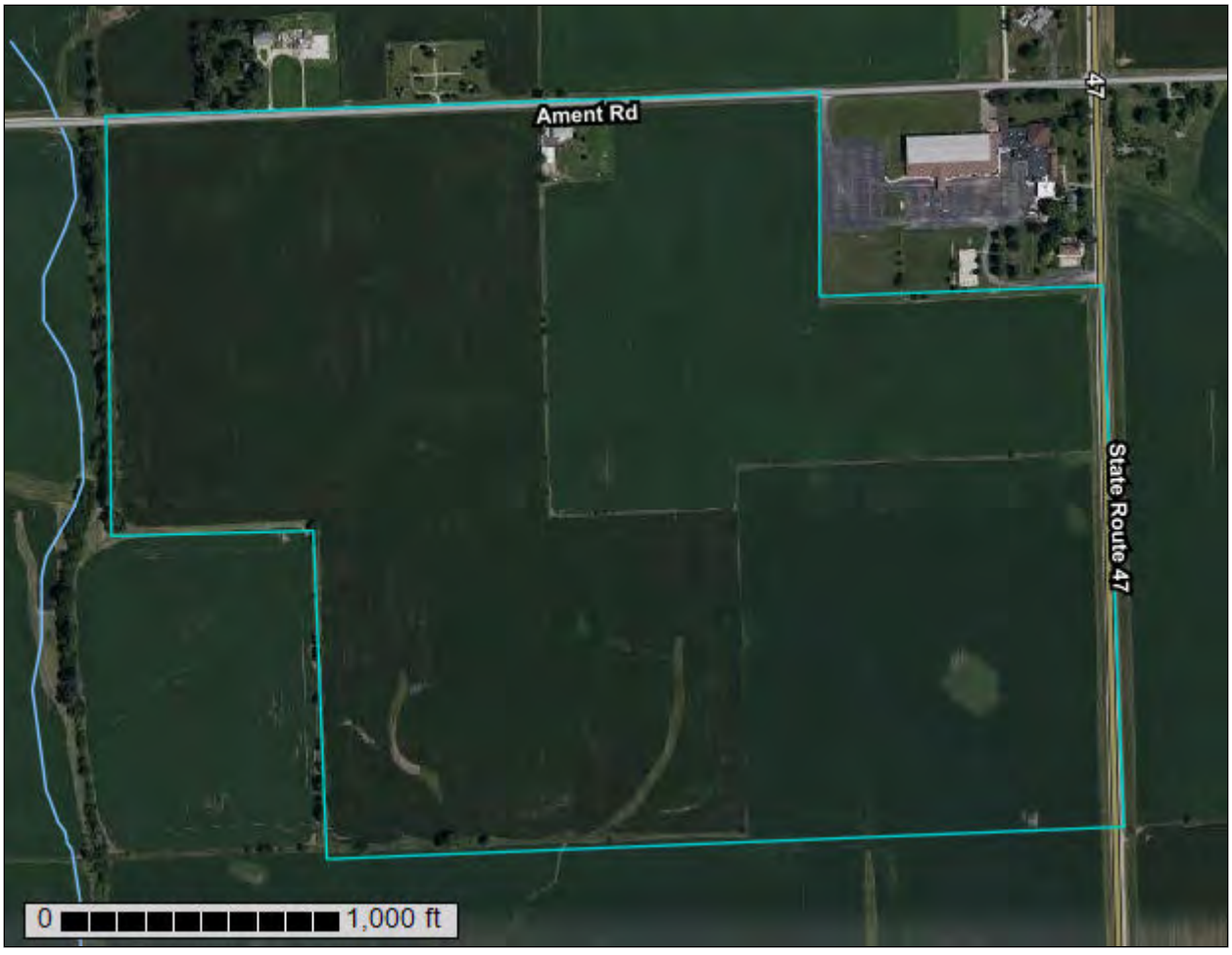
United States Department of Agriculture

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 Kendall County, Illinois



August 29, 2024

Preface

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

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

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

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

How Soil Surveys Are Made

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

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

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

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

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

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

Soil Survey Area: Kendall County, Illinois
Survey Area Data: Version 20, Aug 28, 2023

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

Date(s) aerial images were photographed: Aug 3, 2019—Oct 13, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
59A	Lisbon silt loam, 0 to 2 percent slopes	40.6	22.1%
60C2	La Rose silt loam, 5 to 10 percent slopes, eroded	2.9	1.6%
149A	Brenton silt loam, 0 to 2 percent slopes	2.7	1.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	49.1	26.7%
356A	Elpaso silty clay loam, 0 to 2 percent slopes	21.0	11.4%
541B	Graymont silt loam, 2 to 5 percent slopes	65.1	35.5%
541C2	Graymont silt loam, 5 to 10 percent slopes, eroded	2.2	1.2%
Totals for Area of Interest		**183.5**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit

descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Kendall County, Illinois

59A—Lisbon silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2ytd7
Elevation: 690 to 850 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 165 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Lisbon and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lisbon

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over till

Typical profile

Ap - 0 to 11 inches: silt loam
Bt - 11 to 36 inches: silty clay loam
2Bt - 36 to 39 inches: clay loam
2C - 39 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C/D
Ecological site: F095XB005WI - Moist Loamy or Clayey Lowland
Hydric soil rating: No

Minor Components

Elpaso, drained

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow
Hydric soil rating: Yes

Drummer, drained

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow
Hydric soil rating: Yes

Sable, drained

Percent of map unit: 2 percent
Landform: Swales, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB004WI - Wet Loamy or Clayey Lowland
Hydric soil rating: Yes

60C2—La Rose silt loam, 5 to 10 percent slopes, eroded

Map Unit Setting

National map unit symbol: pfmv
Elevation: 540 to 930 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

La rose and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of La Rose

Setting

Landform: Ground moraines, end moraines

Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 7 inches: silt loam
Bt - 7 to 19 inches: clay loam
C - 19 to 60 inches: loam

Properties and qualities

Slope: 5 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R108XA006IL - Loess Upland Prairie
Hydric soil rating: No

Minor Components

Elpaso

Percent of map unit:
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R108XA008IL - Ponded Loess Sedge Meadow, R108XA007IL - Wet Loess Upland Prairie
Hydric soil rating: Yes

149A—Brenton silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2sssp
Elevation: 490 to 1,010 feet
Mean annual precipitation: 35 to 43 inches
Mean annual air temperature: 46 to 54 degrees F

Frost-free period: 155 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Brenton

Setting

Landform: Stream terraces, outwash plains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over stratified loamy outwash

Typical profile

Ap - 0 to 14 inches: silt loam
Bt1 - 14 to 33 inches: silty clay loam
2Bt2 - 33 to 54 inches: loam
2Cg - 54 to 79 inches: stratified silt loam to loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly 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
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B/D
Ecological site: R108XA012IL - Outwash Prairie, R111XD020IN - Wet Outwash Mollisol
Hydric soil rating: No

Minor Components

Drummer, drained

Percent of map unit: 3 percent
Landform: Swales on till plains, swales on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow, R108XA013IL - Wet Outwash Prairie

Hydric soil rating: Yes

152A—Drummer silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2ssrz
Elevation: 490 to 1,020 feet
Mean annual precipitation: 33 to 43 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 160 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Drummer, drained, and similar soils: 94 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Drummer, Drained

Setting

Landform: Swales on till plains, swales on outwash plains, stream terraces on till plains, stream terraces on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Loess over stratified loamy outwash

Typical profile

Ap - 0 to 14 inches: silty clay loam
Btg - 14 to 41 inches: silty clay loam
2Btg - 41 to 47 inches: loam
2Cg - 47 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly 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 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow, R111XD020IN - Wet Outwash Mollisol, R108XA013IL - Wet Outwash Prairie
Hydric soil rating: Yes

Minor Components

Harpster, drained
Percent of map unit: 3 percent
Landform: Depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R110XY025IL - Ponded Calcareous Sedge Meadow
Hydric soil rating: Yes

Peotone, drained
Percent of map unit: 3 percent
Landform: Depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow
Hydric soil rating: Yes

356A—Elpaso silty clay loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2t6zs
Elevation: 580 to 1,020 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 155 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Elpaso, drained, and similar soils: 94 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elpaso, Drained

Setting
Landform: Till plains, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave

Parent material: Loess over till

Typical profile

Ap - 0 to 21 inches: silty clay loam
Btg1 - 21 to 44 inches: silty clay loam
2Btg2 - 44 to 69 inches: silty clay loam
2C - 69 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
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: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R108XA008IL - Ponded Loess Sedge Meadow, R110XY024IL - Ponded Depressional Sedge Meadow, R108XA007IL - Wet Loess Upland Prairie
Hydric soil rating: Yes

Minor Components

Harpster, drained

Percent of map unit: 4 percent
Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R110XY025IL - Ponded Calcareous Sedge Meadow
Hydric soil rating: Yes

Peotone, drained

Percent of map unit: 2 percent
Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow
Hydric soil rating: Yes

541B—Graymont silt loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2ww9q
Elevation: 550 to 850 feet
Mean annual precipitation: 36 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 140 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Graymont and similar soils: 94 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Graymont

Setting

Landform: Ground moraines, till plains
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over till

Typical profile

Ap - 0 to 12 inches: silt loam
Bt1 - 12 to 33 inches: silty clay loam
2Bt2 - 33 to 38 inches: silty clay loam
2C - 38 to 60 inches: silty clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Ecological site: R108XA006IL - Loess Upland Prairie, R110XY010IL - Moist Glacial Drift Upland Savanna
Hydric soil rating: No

Minor Components

Ashkum, drained
Percent of map unit: 5 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow
Hydric soil rating: Yes

Urban land
Percent of map unit: 1 percent
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

541C2—Graymont silt loam, 5 to 10 percent slopes, eroded

Map Unit Setting
National map unit symbol: 2t6zv
Elevation: 540 to 880 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 155 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Graymont, eroded, and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Graymont, Eroded

Setting
Landform: Till plains, ground moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess over till

Typical profile
Ap - 0 to 8 inches: silt loam
Bt1 - 8 to 30 inches: silty clay loam
2Bt2 - 30 to 38 inches: silty clay loam

2C - 38 to 60 inches: silty clay loam

Properties and qualities

Slope: 5 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R108XA006IL - Loess Upland Prairie, R110XY010IL - Moist Glacial Drift Upland Savanna
Hydric soil rating: No

Minor Components

Elpaso, drained

Percent of map unit: 3 percent
Landform: Till plains, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R108XA008IL - Ponded Loess Sedge Meadow, R110XY024IL - Ponded Depressional Sedge Meadow, R108XA007IL - Wet Loess Upland Prairie
Hydric soil rating: Yes

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Ament Road)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

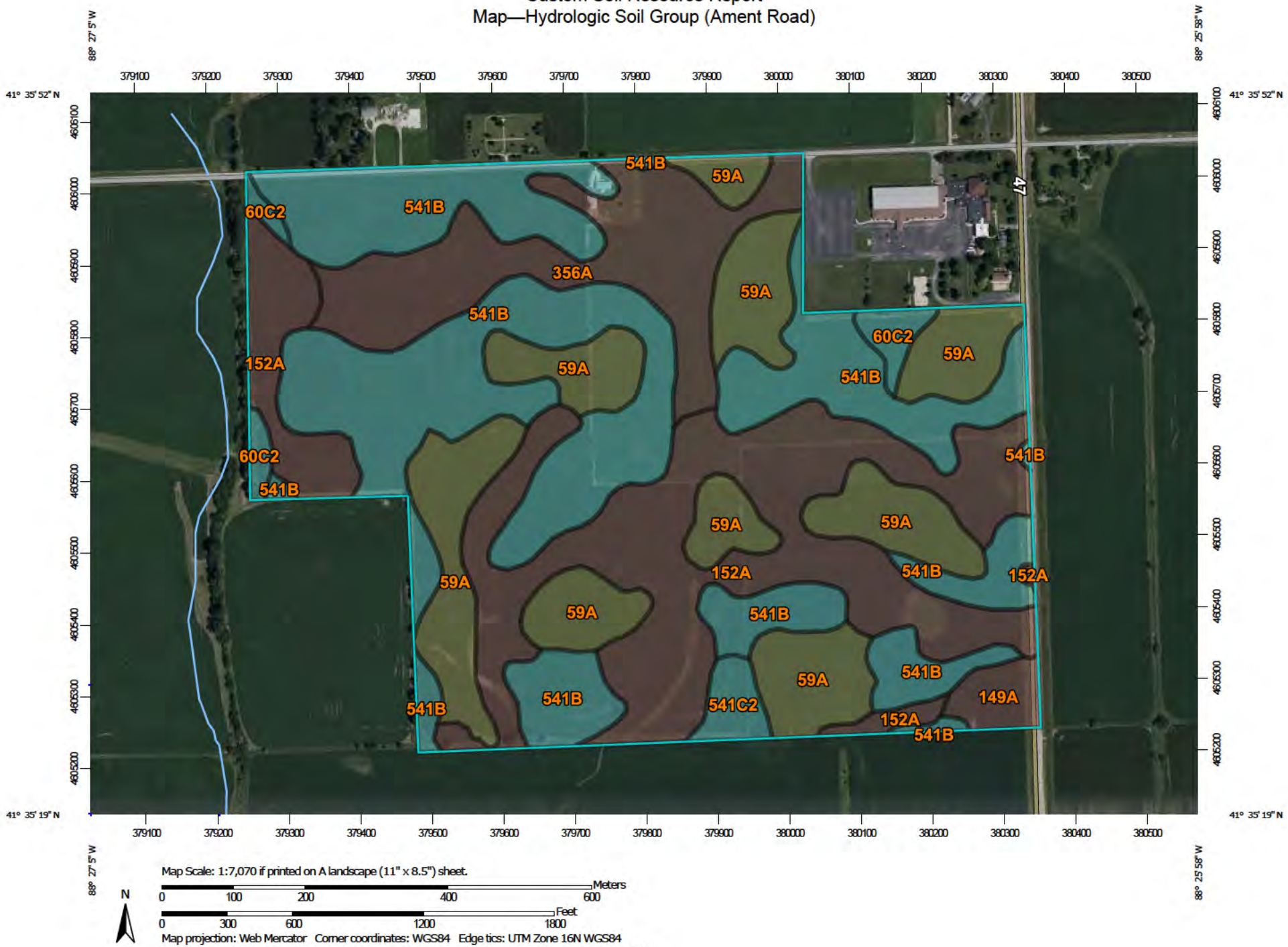
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group (Ament Road)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

Soil Survey Area: Kendall County, Illinois
Survey Area Data: Version 20, Aug 28, 2023

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

Date(s) aerial images were photographed: Aug 3, 2019—Oct 13, 2020

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.

Table—Hydrologic Soil Group (Ament Road)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
59A	Lisbon silt loam, 0 to 2 percent slopes	C/D	40.6	22.1%
60C2	La Rose silt loam, 5 to 10 percent slopes, eroded	C	2.9	1.6%
149A	Brenton silt loam, 0 to 2 percent slopes	B/D	2.7	1.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	B/D	49.1	26.7%
356A	Elpaso silty clay loam, 0 to 2 percent slopes	B/D	21.0	11.4%
541B	Graymont silt loam, 2 to 5 percent slopes	C	65.1	35.5%
541C2	Graymont silt loam, 5 to 10 percent slopes, eroded	C	2.2	1.2%
Totals for Area of Interest			**183.5**	**100.0%**

Rating Options—Hydrologic Soil Group (Ament Road)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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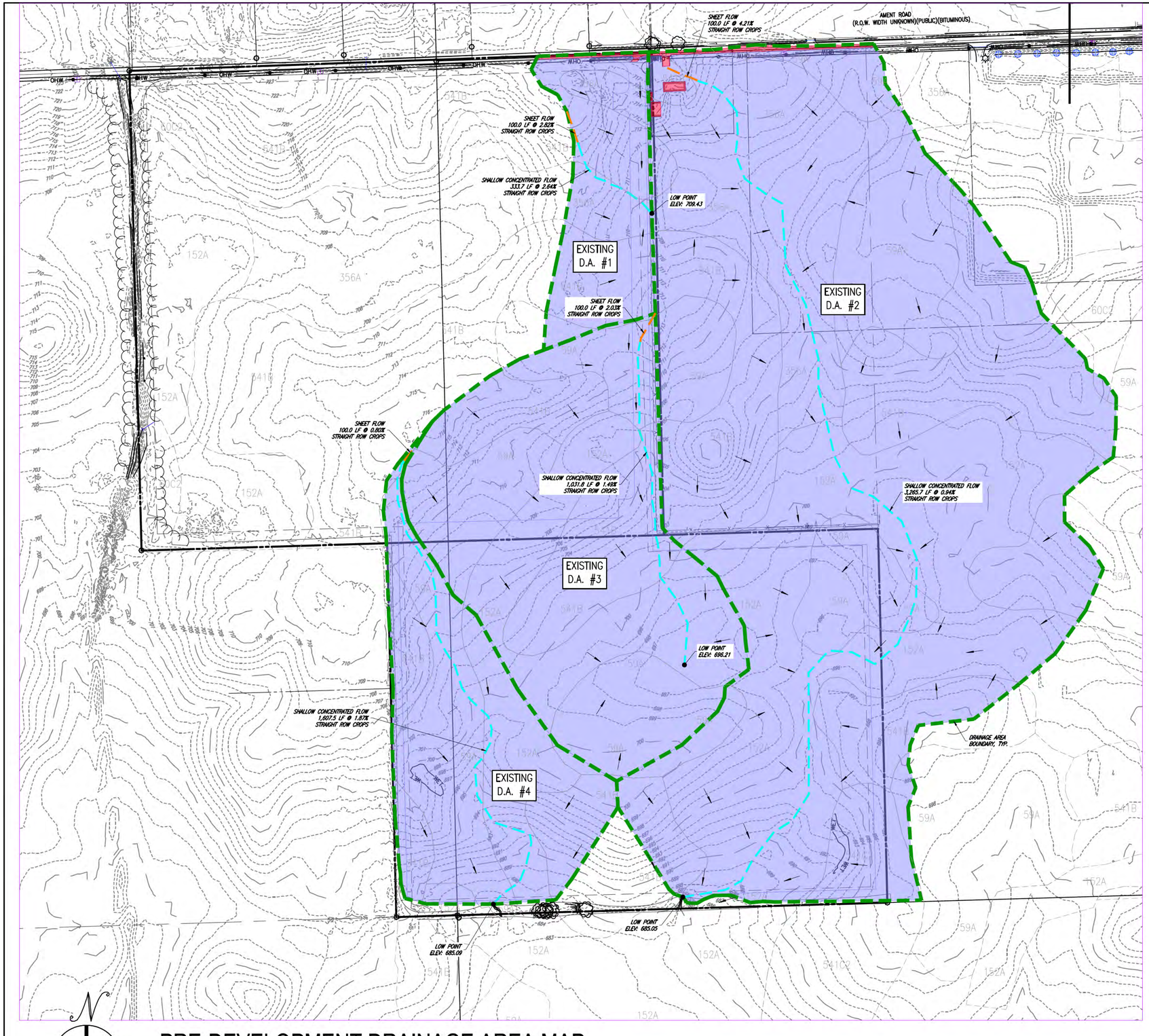
APPENDIX B

PRE- AND POST-DEVELOPMENT DRAINAGE AREA MAPS



PRE-DEVELOPMENT DRAINAGE AREA MAP

SCALE: 1" = 150'

0 150' 300'

LEGEND

- ROAD (GRAVEL)
- FENCE LINE
- PROPERTY LINE
- WETLAND LINE/FLAG
- (E) MAJOR CONTOUR
- (E) MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WETLAND BUFFER ZONE
- RIVERFRONT AREA
- 100-YEAR FLOOD HAZARD AREA
- TREELINE
- SILT FENCE
- SILT SOCK
- STORM PIPE
- ELECTRICAL TRENCH
- OVERHEAD ELECTRIC
- SEWER LINE
- WATER LINE
- GAS MAIN
- SIGN
- UTILITY POLE (WITH GUY ANCHOR)
- INDIVIDUAL TREE
- PROJECT LIMITS OF DISTURBANCE
- DRAINAGE AREA BOUNDARY
- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- ROW CROPS – GOOD CONDITION
- IMPERVIOUS AREA
- DRAINAGE FLOW ARROW

SOIL LEGEND

SOIL TYPE	SOIL RATING	SOIL NAME
59A	C/D	LISBON SILT LOAM, 0 TO 2 PERCENT SLOPES
60C2	C/D	LA ROSE SILT LOAM, 5 TO 10 PERCENT SLOPES, ERODED
152A	B/D	DRUMMER SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES
356A	B/D	ELPASO SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES
541B	C	GRAYMONT SILT LOAM, 2 TO 5 PERCENT SLOPES
541C2	C	GRAYMONT SILT LOAM, 5 TO 10 PERCENT SLOPES, ERODED

new leaf energy
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (800) 818-5249
FAX: (888) 678-8951
WWW.NEWLEAFENERGY.COM

ATWELL
866.850.4200 www.atwell-group.com
1250 EAST DIEHL ROAD, SUITE 300
NAPERVILLE, IL 60563
DESIGN FIRM #184-005876

NOT FOR CONSTRUCTION

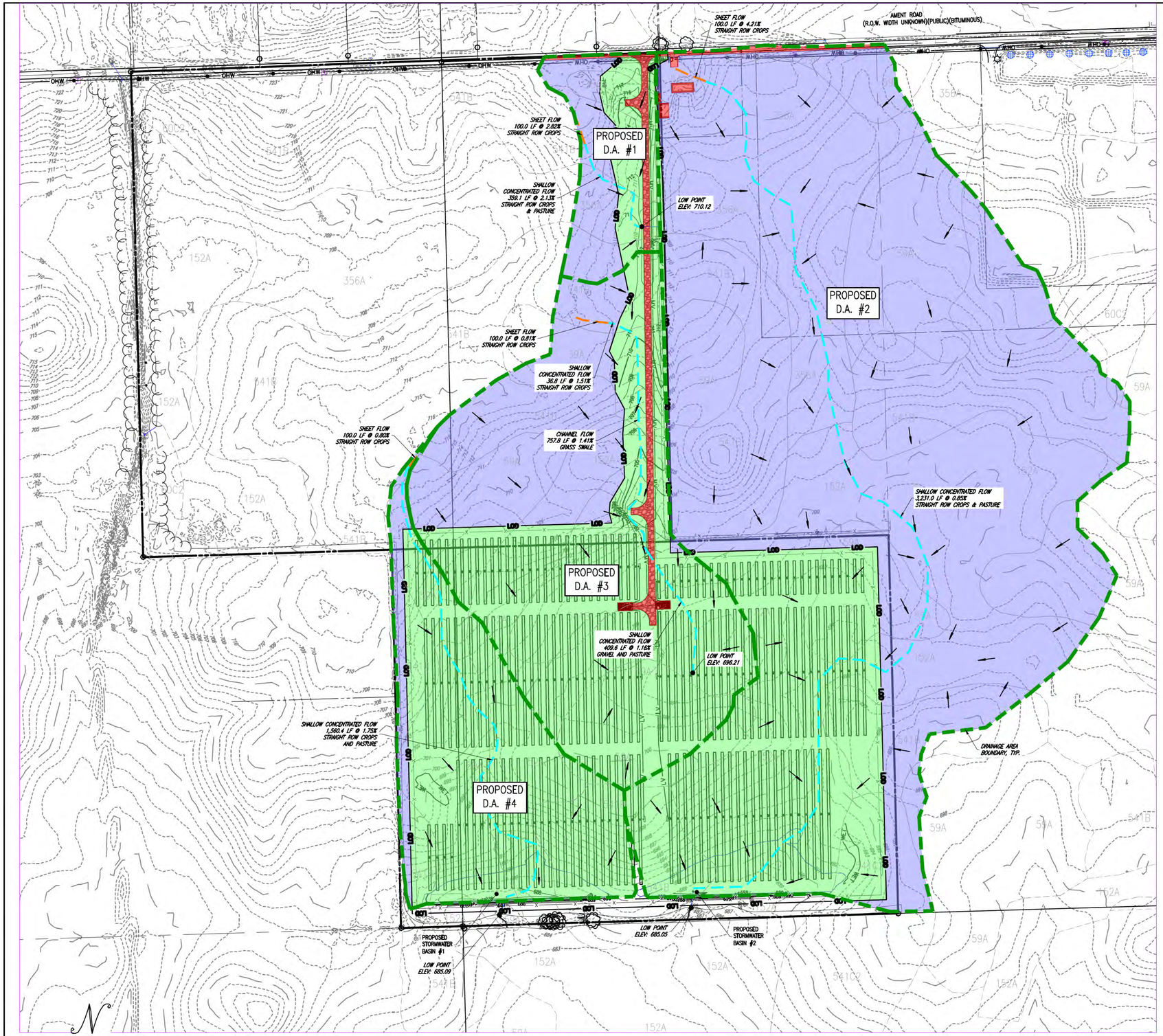
SPECIAL USE PERMIT SET
AMENT ROAD- KENDALL IL

PROJECT NUMBER:
22-4525

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	08/29/24	CMP	MBK	SPECIAL USE PERMIT SET
	09/13/24	CMP	MBK	SPECIAL USE PERMIT SET
1	10/17/24	CMP	MBK	SPECIAL USE PERMIT SET REV 1
	12/19/24	CMP	MBK	SUP SET - COUNTY COMMENTS
	01/14/25	CMP	MBK	SUP SET - COUNTY COMMENTS

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

SWM-1
PRE-DEVELOPMENT DRAINAGE AREA MAP



POST-DEVELOPMENT DRAINAGE AREA MAP

SCALE: 1" = 150'

0 150' 300'

LEGEND

- ROAD (GRAVEL)
- FENCE LINE
- PROPERTY LINE
- WETLAND LINE/FLAG
- (E) MAJOR CONTOUR
- (E) MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WETLAND BUFFER ZONE
- RIVERFRONT AREA
- 100-YEAR FLOOD HAZARD AREA
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- SILT FENCE
- SILT SOCK
- STORM PIPE
- ELECTRICAL TRENCH
- OVERHEAD ELECTRIC
- SEWER LINE
- WATER LINE
- GAS MAIN
- SIGN
- UTILITY POLE (WITH GUY ANCHOR)
- INDIVIDUAL TREE
- PROJECT LIMITS OF DISTURBANCE
- DRAINAGE AREA BOUNDARY
- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- ROW CROPS – GOOD CONDITION
- PASTURE
- IMPERVIOUS AREA
- DRAINAGE FLOW ARROW

SOIL LEGEND

SOIL TYPE	SOIL RATING	SOIL NAME
59A	C/D	LISBON SILT LOAM, 0 TO 2 PERCENT SLOPES
60C2	C/D	LA ROSE SILT LOAM, 5 TO 10 PERCENT SLOPES, ERODED
152A	B/D	DRUMMER SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES
356A	B/D	ELPASO SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES
541B	C	GRAYMONT SILT LOAM, 2 TO 5 PERCENT SLOPES
541C2	C	GRAYMONT SILT LOAM, 5 TO 10 PERCENT SLOPES, ERODED

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NOT FOR CONSTRUCTION

SPECIAL USE PERMIT SET
AMENT ROAD- KENDALL IL

PROJECT NUMBER:
22-4525

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	08/29/24	CMP	MBK	SPECIAL USE PERMIT SET
	09/13/24	CMP	MBK	SPECIAL USE PERMIT SET
	10/17/24	CMP	MBK	SPECIAL USE PERMIT SET REV 1
	12/19/24	CMP	MBK	SUP SET - COUNTY COMMENTS
	01/14/25	CMP	MBK	SUP SET - COUNTY COMMENTS

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

SWM-2

POST-DEVELOPMENT DRAINAGE AREA MAP

APPENDIX C

ISWS BULLETIN 75 PRECIPITATION DATA

Table 7. Rainfall (inches) for Given Recurrence Interval for Section 2 (Northeast)

Storm Duration	2-month	3-month	4-month	6-month	9-month	1-year	2-year	5-year	10-year	25-year	50-year	100-year	500-year
5 minutes	0.19	0.22	0.24	0.27	0.31	0.33	0.40	0.52	0.62	0.77	0.90	1.03	1.35
10 minutes	0.33	0.38	0.41	0.47	0.53	0.58	0.70	0.90	1.08	1.35	1.58	1.80	2.36
15 minutes	0.42	0.49	0.53	0.61	0.69	0.75	0.90	1.16	1.39	1.74	2.03	2.32	3.04
30 minutes	0.58	0.66	0.73	0.83	0.94	1.03	1.24	1.59	1.91	2.39	2.78	3.17	4.16
1 hour	0.74	0.84	0.93	1.05	1.20	1.30	1.57	2.02	2.42	3.03	3.53	4.03	5.28
2 hours	0.91	1.04	1.14	1.30	1.48	1.61	1.94	2.49	2.99	3.74	4.35	4.97	6.52
3 hours	1.00	1.15	1.26	1.44	1.63	1.77	2.14	2.75	3.30	4.13	4.80	5.49	7.20
6 hours	1.18	1.35	1.48	1.68	1.91	2.08	2.51	3.23	3.86	4.84	5.63	6.43	8.43
12 hours	1.37	1.56	1.71	1.95	2.21	2.41	2.91	3.74	4.48	5.61	6.53	7.46	9.78
18 hours	1.48	1.69	1.85	2.11	2.39	2.61	3.14	4.04	4.84	6.06	7.05	8.06	10.57
24 hours	1.57	1.80	1.97	2.24	2.55	2.77	3.34	4.30	5.15	6.45	7.50	8.57	11.24
48 hours	1.72	1.97	2.16	2.46	2.79	3.04	3.66	4.71	5.62	6.99	8.13	9.28	12.10
72 hours	1.87	2.14	2.34	2.67	3.03	3.30	3.97	5.08	6.05	7.49	8.64	9.85	12.81
120 hours	2.08	2.38	2.61	2.97	3.37	3.67	4.42	5.63	6.68	8.16	9.39	10.66	13.81
240 hours	2.63	3.01	3.30	3.76	4.27	4.65	5.60	7.09	8.25	9.90	11.26	12.65	16.00

APPENDIX D

HYDROCAD REPORT FOR
2-YEAR & 100-YEARSTORM EVENT

D-1 PRE-DEVELOPMENT CONDITION

D-2 POST-DEVELOPMENT CONDITION WITHOUT STORMWATER BASINS

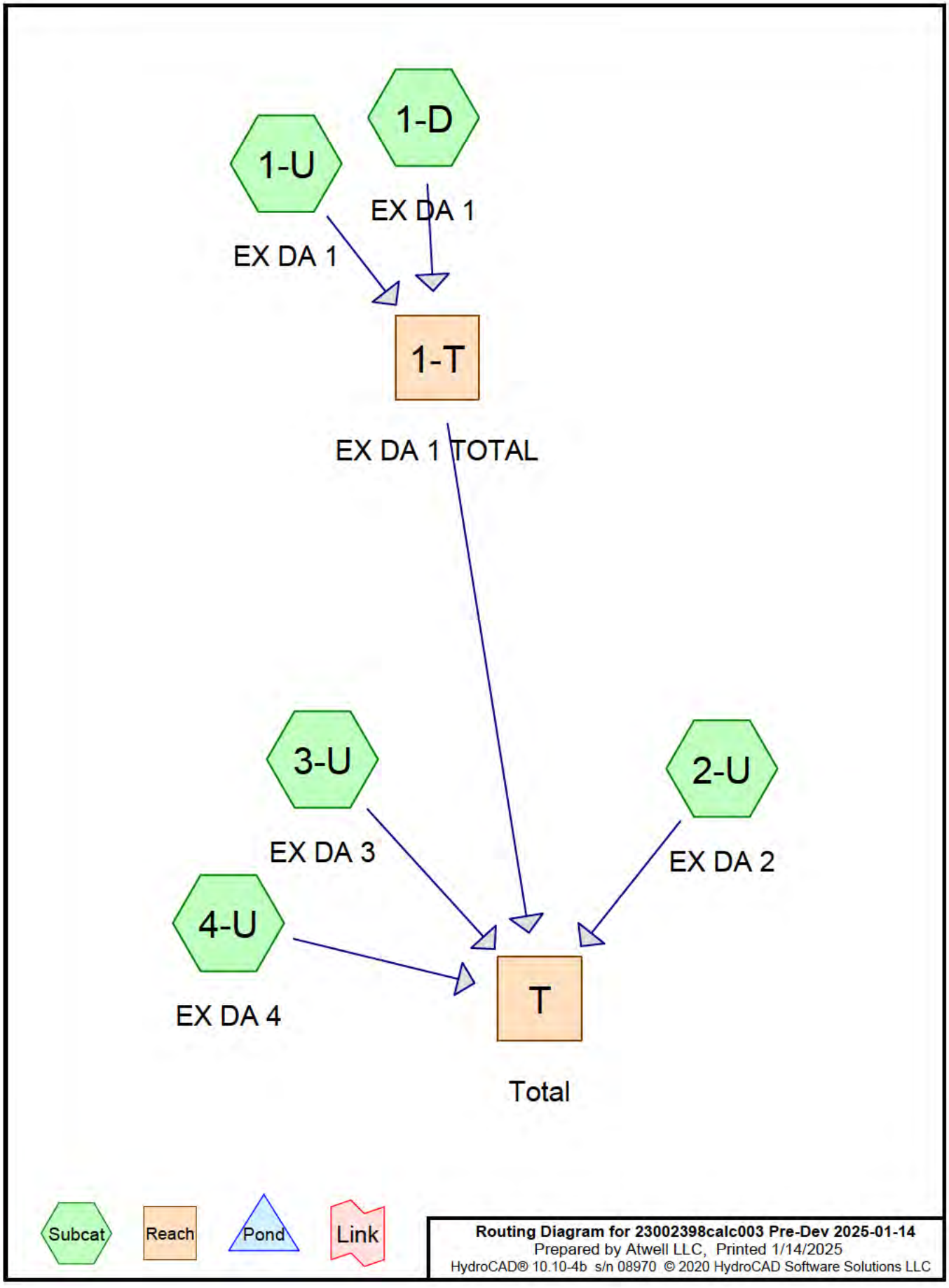
D-3 POST-DEVELOPMENT CONDITION WITH STORMWATER BASINS

APPENDIX D-1

HYDROCAD REPORT FOR
2-YEAR & 100-YEARSTORM EVENT

PRE-DEVELOPMENT CONDITION

TABLE OF CONTENTS



Routing Diagram for 23002398calc003 Pre-Dev 2025-01-14
Prepared by Atwell LLC, Printed 1/14/2025

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Huff 0-10sm	3Q	Scale	24.00	1	3.34	2
2	100-year	Huff 0-10sm	3Q	Scale	24.00	1	8.57	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.409	98	Impervious Area (1-D, 1-U, 2-U)
32.293	85	Row crops, straight row, Good, HSG C (1-U, 2-U, 3-U, 4-U)
67.691	89	Row crops, straight row, Good, HSG D (1-U, 2-U, 3-U, 4-U)
100.393	**88**	**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1-D: EX DA 1 Runoff Area=0.010 ac 100.00% Impervious Runoff Depth>3.10"
Flow Length=434' Tc=7.8 min CN=98 Runoff=0.00 cfs 0.003 af

Subcatchment1-U: EX DA 1 Runoff Area=5.582 ac 1.54% Impervious Runoff Depth>1.95"
Flow Length=434' Tc=7.8 min CN=86 Runoff=1.60 cfs 0.907 af

Subcatchment2-U: EX DA 2 Runoff Area=62.508 ac 0.50% Impervious Runoff Depth>2.06"
Flow Length=3,366' Tc=67.7 min CN=88 Runoff=17.97 cfs 10.713 af

Subcatchment3-U: EX DA 3 Runoff Area=20.755 ac 0.00% Impervious Runoff Depth>2.10"
Flow Length=1,132' Tc=20.3 min CN=88 Runoff=6.23 cfs 3.636 af

Subcatchment4-U: EX DA 4 Runoff Area=11.538 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=1,707' Tc=28.4 min CN=88 Runoff=3.44 cfs 2.013 af

Reach 1-T: EX DA 1 TOTAL Inflow=1.60 cfs 0.910 af
Outflow=1.60 cfs 0.910 af

Reach T: Total Inflow=28.55 cfs 17.272 af
Outflow=28.55 cfs 17.272 af

Total Runoff Area = 100.393 ac Runoff Volume = 17.272 af Average Runoff Depth = 2.06"
99.59% Pervious = 99.984 ac 0.41% Impervious = 0.409 ac

Summary for Subcatchment 1-D: EX DA 1

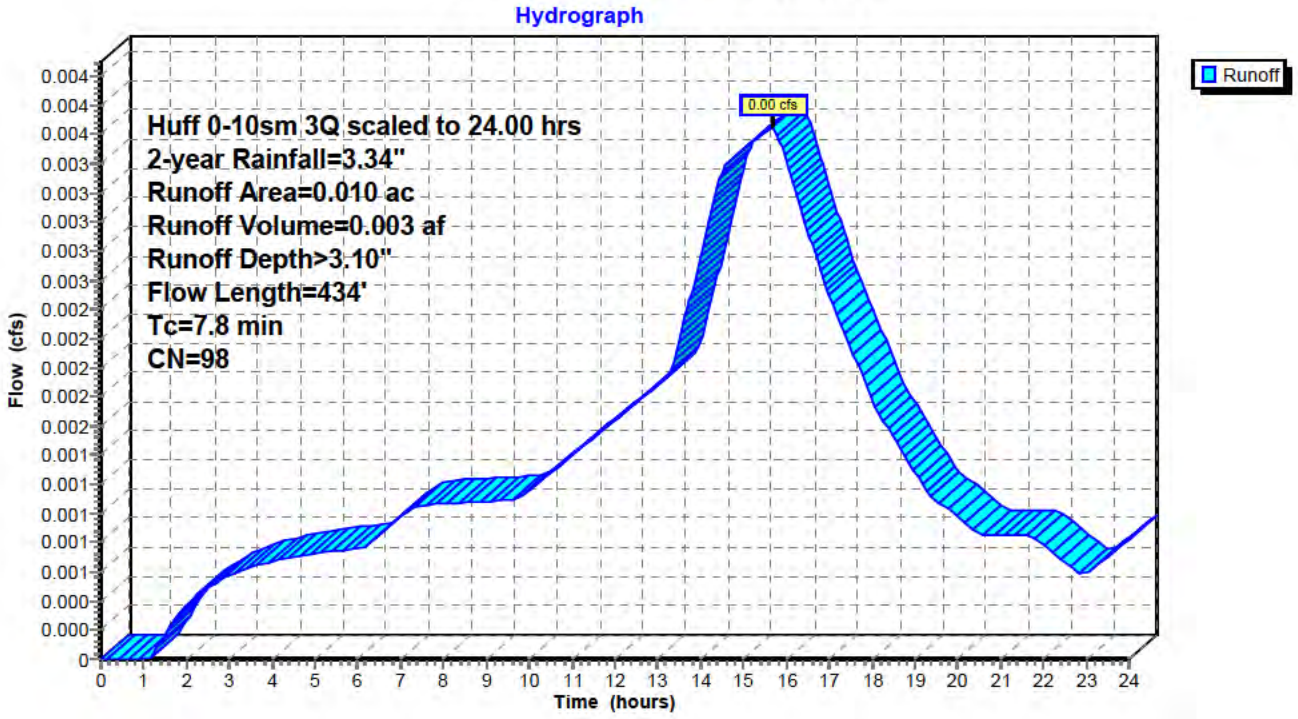
Runoff = 0.00 cfs @ 15.67 hrs, Volume= 0.003 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

	Area (ac)	CN	Description
*	0.010	98	Impervious Area
	0.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
3.8	334	0.0264	1.46		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
7.8	434	Total			

Subcatchment 1-D: EX DA 1



Hydrograph for Subcatchment 1-D: EX DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00
0.50	0.01	0.00	0.00
0.75	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.06	0.00	0.00
1.50	0.08	0.01	0.00
1.75	0.10	0.01	0.00
2.00	0.12	0.02	0.00
2.25	0.14	0.03	0.00
2.50	0.16	0.04	0.00
2.75	0.18	0.06	0.00
3.00	0.20	0.07	0.00
3.25	0.22	0.09	0.00
3.50	0.25	0.10	0.00
3.75	0.27	0.12	0.00
4.00	0.29	0.14	0.00
4.25	0.31	0.15	0.00
4.50	0.33	0.17	0.00
4.75	0.35	0.19	0.00
5.00	0.37	0.21	0.00
5.25	0.39	0.22	0.00
5.50	0.42	0.24	0.00
5.75	0.44	0.26	0.00
6.00	0.46	0.28	0.00
6.25	0.48	0.30	0.00
6.50	0.50	0.32	0.00
6.75	0.53	0.34	0.00
7.00	0.55	0.37	0.00
7.25	0.58	0.39	0.00
7.50	0.61	0.42	0.00
7.75	0.64	0.45	0.00
8.00	0.67	0.47	0.00
8.25	0.70	0.50	0.00
8.50	0.72	0.53	0.00
8.75	0.75	0.55	0.00
9.00	0.78	0.58	0.00
9.25	0.81	0.61	0.00
9.50	0.84	0.63	0.00
9.75	0.86	0.66	0.00
10.00	0.89	0.69	0.00
10.25	0.93	0.72	0.00
10.50	0.96	0.75	0.00
10.75	0.99	0.78	0.00
11.00	1.03	0.82	0.00
11.25	1.07	0.86	0.00
11.50	1.10	0.89	0.00
11.75	1.15	0.93	0.00
12.00	1.19	0.97	0.00
12.25	1.23	1.01	0.00
12.50	1.27	1.06	0.00
12.75	1.32	1.10	0.00
13.00	1.37	1.15	0.00
13.25	1.42	1.20	0.00
13.50	1.47	1.25	0.00
13.75	1.53	1.31	0.00
14.00	1.60	1.38	0.00
14.25	1.68	1.46	0.00
14.50	1.76	1.54	0.00
14.75	1.85	1.63	0.00
15.00	1.94	1.71	0.00
15.25	2.03	1.80	0.00
15.50	2.12	1.89	**0.00**
15.75	2.21	1.98	**0.00**
16.00	2.29	2.06	0.00
16.25	2.37	2.14	0.00
16.50	2.45	2.22	0.00
16.75	2.51	2.28	0.00
17.00	2.58	2.35	0.00
17.25	2.63	2.40	0.00
17.50	2.69	2.46	0.00
17.75	2.74	2.51	0.00
18.00	2.78	2.55	0.00
18.25	2.82	2.59	0.00
18.50	2.86	2.63	0.00
18.75	2.89	2.66	0.00
19.00	2.93	2.70	0.00
19.25	2.96	2.72	0.00
19.50	2.98	2.75	0.00
19.75	3.01	2.78	0.00
20.00	3.03	2.80	0.00
20.25	3.06	2.82	0.00
20.50	3.08	2.85	0.00
20.75	3.10	2.87	0.00
21.00	3.12	2.89	0.00
21.25	3.14	2.91	0.00
21.50	3.16	2.93	0.00
21.75	3.18	2.95	0.00
22.00	3.20	2.97	0.00
22.25	3.22	2.99	0.00
22.50	3.24	3.00	0.00
22.75	3.25	3.02	0.00
23.00	3.27	3.03	0.00
23.25	3.28	3.05	0.00
23.50	3.30	3.07	0.00
23.75	3.32	3.09	0.00
24.00	**3.34**	**3.11**	0.00

Summary for Subcatchment 1-U: EX DA 1

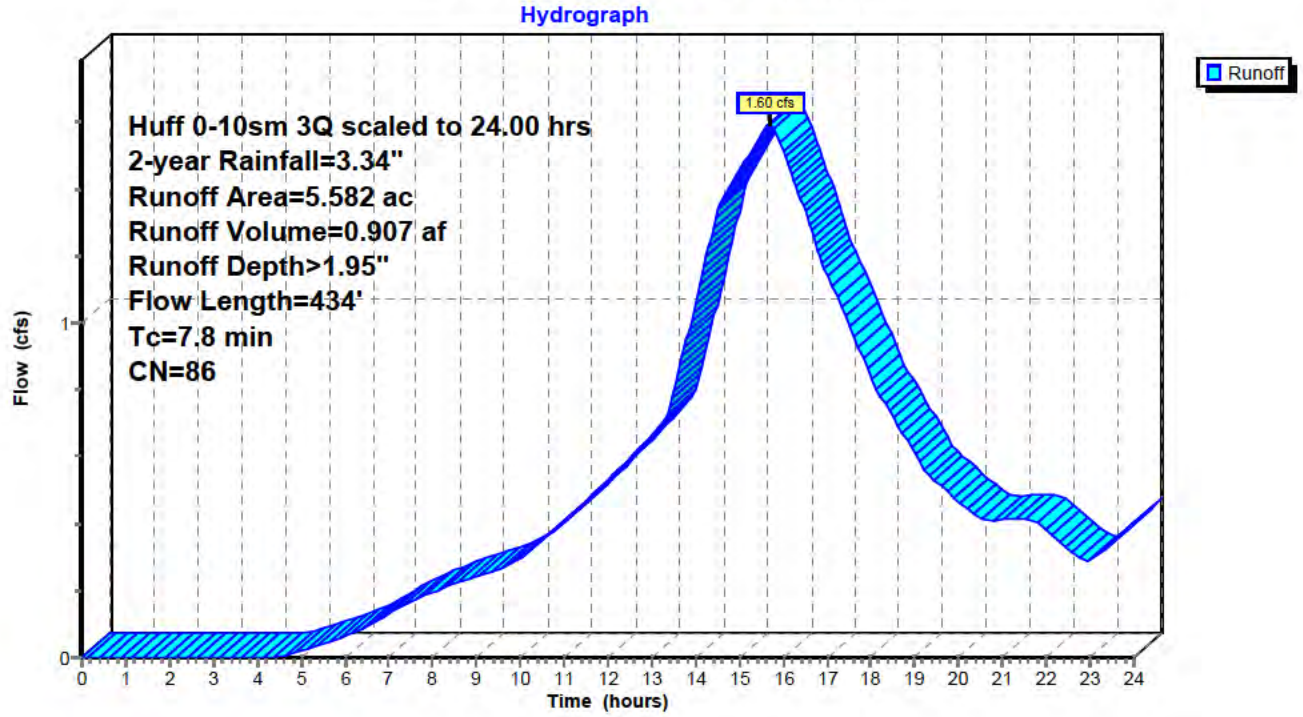
Runoff = 1.60 cfs @ 15.70 hrs, Volume= 0.907 af, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

	Area (ac)	CN	Description
	0.200	89	Row crops, straight row, Good, HSG D
	1.277	89	Row crops, straight row, Good, HSG D
	0.327	89	Row crops, straight row, Good, HSG D
	2.982	85	Row crops, straight row, Good, HSG C
	0.710	85	Row crops, straight row, Good, HSG C
*	0.086	98	Impervious Area
	5.582	86	Weighted Average
	5.496		98.46% Pervious Area
	0.086		1.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
3.8	334	0.0264	1.46		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
7.8	434	Total			

Subcatchment 1-U: EX DA 1



Hydrograph for Subcatchment 1-U: EX DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00
0.50	0.01	0.00	0.00
0.75	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.06	0.00	0.00
1.50	0.08	0.00	0.00
1.75	0.10	0.00	0.00
2.00	0.12	0.00	0.00
2.25	0.14	0.00	0.00
2.50	0.16	0.00	0.00
2.75	0.18	0.00	0.00
3.00	0.20	0.00	0.00
3.25	0.22	0.00	0.00
3.50	0.25	0.00	0.00
3.75	0.27	0.00	0.00
4.00	0.29	0.00	0.00
4.25	0.31	0.00	0.00
4.50	0.33	0.00	0.00
4.75	0.35	0.00	0.01
5.00	0.37	0.00	0.02
5.25	0.39	0.00	0.03
5.50	0.42	0.00	0.04
5.75	0.44	0.01	0.05
6.00	0.46	0.01	0.06
6.25	0.48	0.01	0.08
6.50	0.50	0.02	0.09
6.75	0.53	0.02	0.11
7.00	0.55	0.03	0.13
7.25	0.58	0.03	0.15
7.50	0.61	0.04	0.17
7.75	0.64	0.05	0.18
8.00	0.67	0.06	0.20
8.25	0.70	0.07	0.21
8.50	0.72	0.08	0.22
8.75	0.75	0.09	0.23
9.00	0.78	0.10	0.24
9.25	0.81	0.11	0.25
9.50	0.84	0.12	0.26
9.75	0.86	0.13	0.28
10.00	0.89	0.15	0.30
10.25	0.93	0.16	0.32
10.50	0.96	0.18	0.35
10.75	0.99	0.19	0.38
11.00	1.03	0.21	0.41
11.25	1.07	0.23	0.44
11.50	1.10	0.25	0.47
11.75	1.15	0.27	0.50
12.00	1.19	0.30	0.53
12.25	1.23	0.32	0.56
12.50	1.27	0.35	0.60
12.75	1.32	0.38	0.63
13.00	1.37	0.41	0.67
13.25	1.42	0.44	0.70
13.50	1.47	0.47	0.80
13.75	1.53	0.51	0.93
14.00	1.60	0.56	1.06
14.25	1.68	0.61	1.20
14.50	1.76	0.67	1.34
14.75	1.85	0.74	1.41
15.00	1.94	0.80	1.46
15.25	2.03	0.87	1.51
15.50	2.12	0.94	**1.56**
15.75	2.21	1.01	**1.59**
16.00	2.29	1.08	1.52
16.25	2.37	1.14	1.43
16.50	2.45	1.20	1.34
16.75	2.51	1.25	1.24
17.00	2.58	1.31	1.15
17.25	2.63	1.35	1.07
17.50	2.69	1.40	1.00
17.75	2.74	1.44	0.92
18.00	2.78	1.48	0.84
18.25	2.82	1.51	0.78
18.50	2.86	1.54	0.72
18.75	2.89	1.57	0.67
19.00	2.93	1.60	0.61
19.25	2.96	1.62	0.56
19.50	2.98	1.65	0.52
19.75	3.01	1.67	0.50
20.00	3.03	1.69	0.47
20.25	3.06	1.71	0.44
20.50	3.08	1.73	0.41
20.75	3.10	1.75	0.41
21.00	3.12	1.77	0.41
21.25	3.14	1.78	0.41
21.50	3.16	1.80	0.41
21.75	3.18	1.82	0.41
22.00	3.20	1.84	0.38
22.25	3.22	1.85	0.35
22.50	3.24	1.87	0.33
22.75	3.25	1.88	0.30
23.00	3.27	1.89	0.29
23.25	3.28	1.91	0.32
23.50	3.30	1.92	0.35
23.75	3.32	1.94	0.37
24.00	**3.34**	**1.96**	0.40

Summary for Subcatchment 2-U: EX DA 2

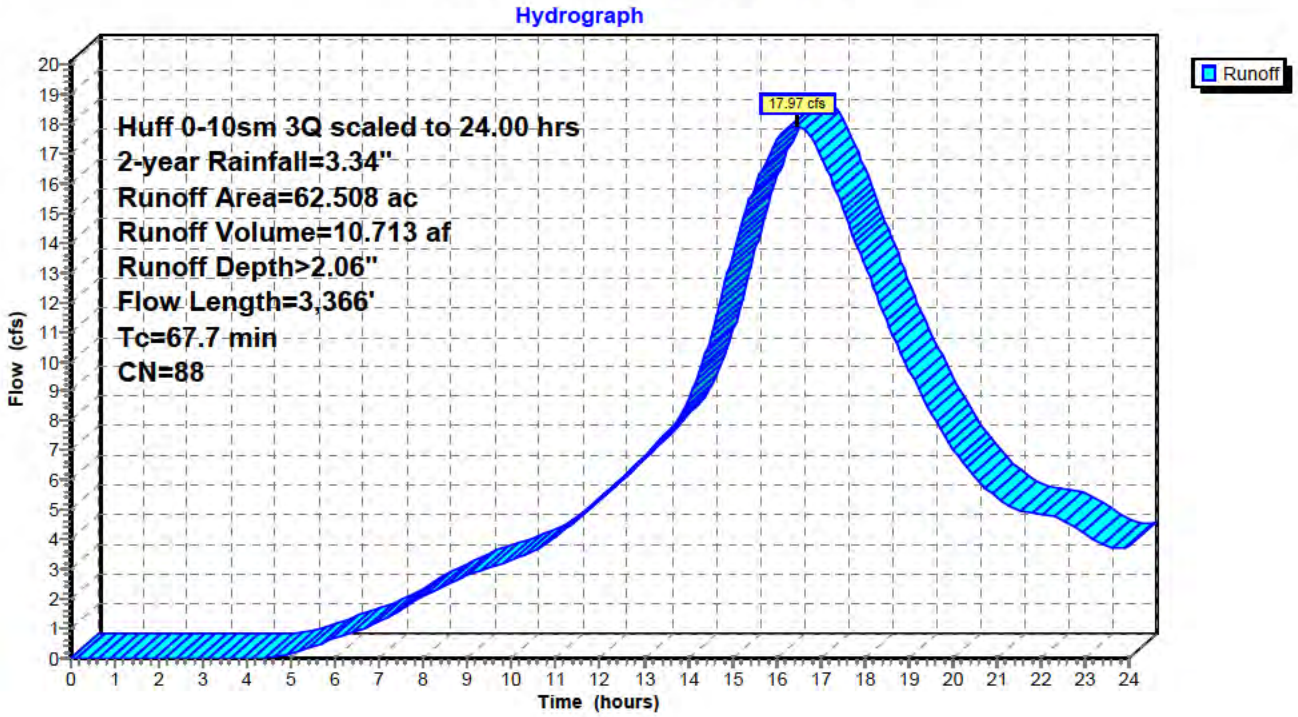
Runoff = 17.97 cfs @ 16.45 hrs, Volume= 10.713 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

	Area (ac)	CN	Description
	11.150	89	Row crops, straight row, Good, HSG D
	2.052	89	Row crops, straight row, Good, HSG D
	0.061	89	Row crops, straight row, Good, HSG D
	11.220	89	Row crops, straight row, Good, HSG D
	8.588	89	Row crops, straight row, Good, HSG D
	10.020	89	Row crops, straight row, Good, HSG D
	14.950	85	Row crops, straight row, Good, HSG C
	2.184	85	Row crops, straight row, Good, HSG C
	0.951	85	Row crops, straight row, Good, HSG C
	1.019	85	Row crops, straight row, Good, HSG C
*	0.313	98	Impervious Area
	62.508	88	Weighted Average
	62.195		99.50% Pervious Area
	0.313		0.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.0421	0.49		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.5	141	0.0306	1.57		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.8	3,125	0.0085	0.83		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
67.7	3,366	Total			

Subcatchment 2-U: EX DA 2



Hydrograph for Subcatchment 2-U: EX DA 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00
0.50	0.01	0.00	0.00
0.75	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.06	0.00	0.00
1.50	0.08	0.00	0.00
1.75	0.10	0.00	0.00
2.00	0.12	0.00	0.00
2.25	0.14	0.00	0.00
2.50	0.16	0.00	0.00
2.75	0.18	0.00	0.00
3.00	0.20	0.00	0.00
3.25	0.22	0.00	0.00
3.50	0.25	0.00	0.00
3.75	0.27	0.00	0.00
4.00	0.29	0.00	0.00
4.25	0.31	0.00	0.00
4.50	0.33	0.00	0.03
4.75	0.35	0.00	0.08
5.00	0.37	0.01	0.17
5.25	0.39	0.01	0.29
5.50	0.42	0.01	0.42
5.75	0.44	0.02	0.55
6.00	0.46	0.02	0.68
6.25	0.48	0.03	0.81
6.50	0.50	0.03	0.94
6.75	0.53	0.04	1.08
7.00	0.55	0.05	1.24
7.25	0.58	0.06	1.43
7.50	0.61	0.07	1.64
7.75	0.64	0.08	1.86
8.00	0.67	0.09	2.09
8.25	0.70	0.10	2.29
8.50	0.72	0.11	2.47
8.75	0.75	0.12	2.63
9.00	0.78	0.14	2.79
9.25	0.81	0.15	2.93
9.50	0.84	0.16	3.06
9.75	0.86	0.18	3.19
10.00	0.89	0.19	3.31
10.25	0.93	0.21	3.44
10.50	0.96	0.23	3.62
10.75	0.99	0.25	3.84
11.00	1.03	0.27	4.10
11.25	1.07	0.29	4.39
11.50	1.10	0.32	4.70
11.75	1.15	0.34	5.02
12.00	1.19	0.37	5.35
12.25	1.23	0.39	5.71
12.50	1.27	0.42	6.06
12.75	1.32	0.46	6.43
13.00	1.37	0.49	6.80
13.25	1.42	0.52	7.18
13.50	1.47	0.56	7.58
13.75	1.53	0.61	8.04
14.00	1.60	0.66	8.68
14.25	1.68	0.71	9.60
14.50	1.76	0.78	10.78
14.75	1.85	0.85	12.12
15.00	1.94	0.91	13.53
15.25	2.03	0.99	14.79
15.50	2.12	1.06	15.82
15.75	2.21	1.13	16.69
16.00	2.29	1.21	17.39
16.25	2.37	1.27	**17.84**
16.50	2.45	1.34	**17.95**
16.75	2.51	1.39	17.63
17.00	2.58	1.45	16.97
17.25	2.63	1.50	16.14
17.50	2.69	1.54	15.19
17.75	2.74	1.59	14.22
18.00	2.78	1.62	13.28
18.25	2.82	1.66	12.35
18.50	2.86	1.69	11.42
18.75	2.89	1.72	10.55
19.00	2.93	1.75	9.74
19.25	2.96	1.78	8.99
19.50	2.98	1.80	8.31
19.75	3.01	1.83	7.65
20.00	3.03	1.85	7.06
20.25	3.06	1.87	6.57
20.50	3.08	1.89	6.13
20.75	3.10	1.91	5.75
21.00	3.12	1.92	5.43
21.25	3.14	1.94	5.17
21.50	3.16	1.96	5.00
21.75	3.18	1.98	4.91
22.00	3.20	2.00	4.85
22.25	3.22	2.02	4.78
22.50	3.24	2.03	4.67
22.75	3.25	2.04	4.47
23.00	3.27	2.06	4.22
23.25	3.28	2.07	3.96
23.50	3.30	2.09	3.75
23.75	3.32	2.10	3.68
24.00	**3.34**	**2.12**	3.77

Summary for Subcatchment 3-U: EX DA 3

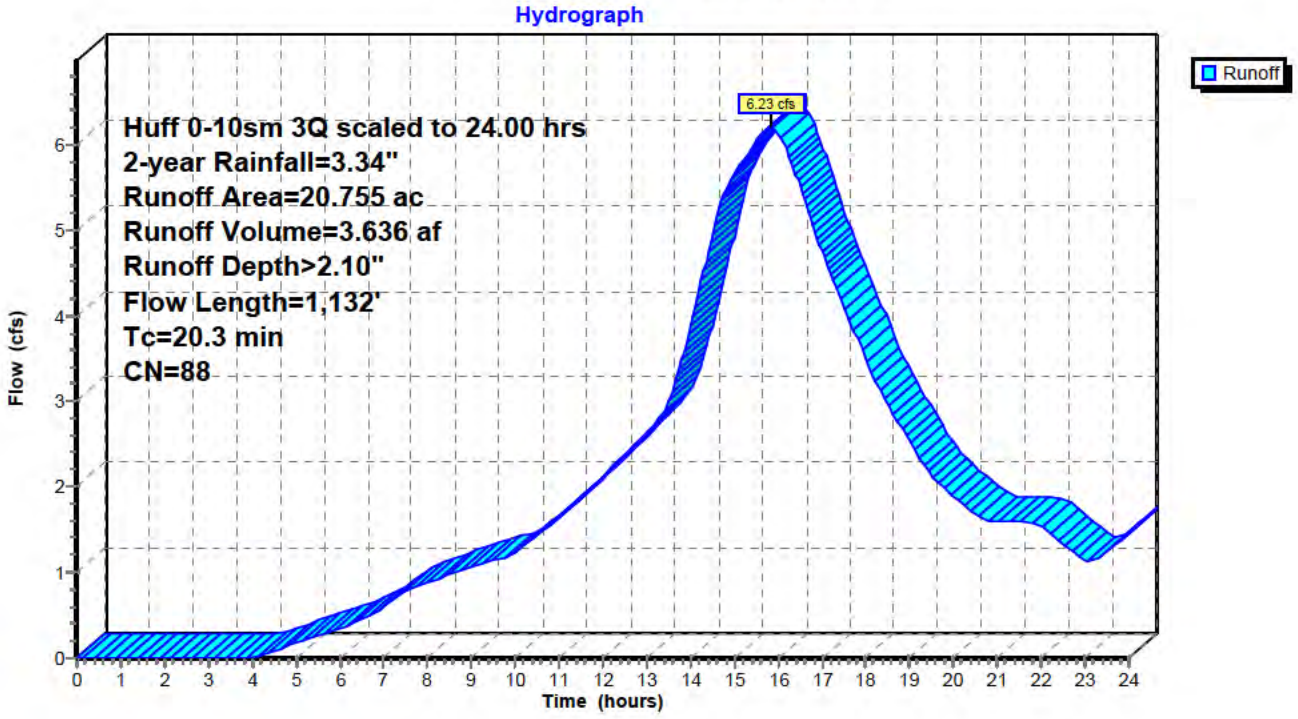
Runoff = 6.23 cfs @ 15.84 hrs, Volume= 3.636 af, Depth> 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

Area (ac)	CN	Description
3.643	89	Row crops, straight row, Good, HSG D
4.215	89	Row crops, straight row, Good, HSG D
1.296	89	Row crops, straight row, Good, HSG D
5.307	89	Row crops, straight row, Good, HSG D
3.064	85	Row crops, straight row, Good, HSG C
3.230	85	Row crops, straight row, Good, HSG C
20.755	88	Weighted Average
20.755		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.0203	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
15.7	1,032	0.0149	1.10		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.3	1,132	Total			

Subcatchment 3-U: EX DA 3



Hydrograph for Subcatchment 3-U: EX DA 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00
0.50	0.01	0.00	0.00
0.75	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.06	0.00	0.00
1.50	0.08	0.00	0.00
1.75	0.10	0.00	0.00
2.00	0.12	0.00	0.00
2.25	0.14	0.00	0.00
2.50	0.16	0.00	0.00
2.75	0.18	0.00	0.00
3.00	0.20	0.00	0.00
3.25	0.22	0.00	0.00
3.50	0.25	0.00	0.00
3.75	0.27	0.00	0.00
4.00	0.29	0.00	0.00
4.25	0.31	0.00	0.03
4.50	0.33	0.00	0.08
4.75	0.35	0.00	0.13
5.00	0.37	0.01	0.18
5.25	0.39	0.01	0.22
5.50	0.42	0.01	0.27
5.75	0.44	0.02	0.31
6.00	0.46	0.02	0.35
6.25	0.48	0.03	0.39
6.50	0.50	0.03	0.45
6.75	0.53	0.04	0.52
7.00	0.55	0.05	0.60
7.25	0.58	0.06	0.69
7.50	0.61	0.07	0.77
7.75	0.64	0.08	0.83
8.00	0.67	0.09	0.88
8.25	0.70	0.10	0.93
8.50	0.72	0.11	0.97
8.75	0.75	0.12	1.02
9.00	0.78	0.14	1.06
9.25	0.81	0.15	1.10
9.50	0.84	0.16	1.14
9.75	0.86	0.18	1.17
10.00	0.89	0.19	1.24
10.25	0.93	0.21	1.33
10.50	0.96	0.23	1.43
10.75	0.99	0.25	1.54
11.00	1.03	0.27	1.65
11.25	1.07	0.29	1.76
11.50	1.10	0.32	1.88
11.75	1.15	0.34	2.00
12.00	1.19	0.37	2.12
12.25	1.23	0.39	2.24
12.50	1.27	0.42	2.37
12.75	1.32	0.46	2.50
13.00	1.37	0.49	2.63
13.25	1.42	0.52	2.76
13.50	1.47	0.56	2.97
13.75	1.53	0.61	3.39
14.00	1.60	0.66	3.88
14.25	1.68	0.71	4.41
14.50	1.76	0.78	4.96
14.75	1.85	0.85	5.40
15.00	1.94	0.91	5.65
15.25	2.03	0.99	5.84
15.50	2.12	1.06	6.03
15.75	2.21	1.13	**6.20**
16.00	2.29	1.21	**6.15**
16.25	2.37	1.27	5.86
16.50	2.45	1.34	5.50
16.75	2.51	1.39	5.13
17.00	2.58	1.45	4.75
17.25	2.63	1.50	4.41
17.50	2.69	1.54	4.11
17.75	2.74	1.59	3.81
18.00	2.78	1.62	3.50
18.25	2.82	1.66	3.20
18.50	2.86	1.69	2.96
18.75	2.89	1.72	2.75
19.00	2.93	1.75	2.53
19.25	2.96	1.78	2.32
19.50	2.98	1.80	2.13
19.75	3.01	1.83	2.00
20.00	3.03	1.85	1.89
20.25	3.06	1.87	1.78
20.50	3.08	1.89	1.68
20.75	3.10	1.91	1.60
21.00	3.12	1.92	1.59
21.25	3.14	1.94	1.59
21.50	3.16	1.96	1.59
21.75	3.18	1.98	1.59
22.00	3.20	2.00	1.54
22.25	3.22	2.02	1.44
22.50	3.24	2.03	1.34
22.75	3.25	2.04	1.23
23.00	3.27	2.06	1.13
23.25	3.28	2.07	1.15
23.50	3.30	2.09	1.24
23.75	3.32	2.10	1.35
24.00	**3.34**	**2.12**	1.46

Summary for Subcatchment 4-U: EX DA 4

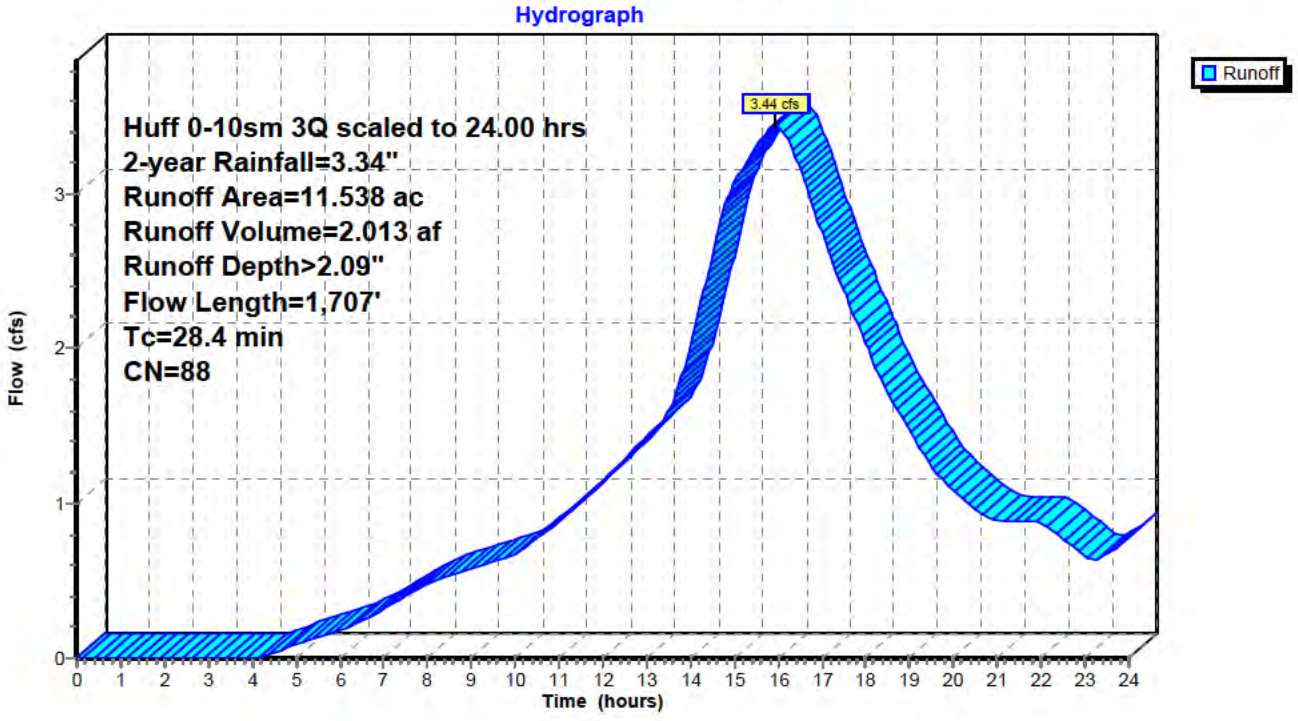
Runoff = 3.44 cfs @ 15.94 hrs, Volume= 2.013 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

Area (ac)	CN	Description
0.430	89	Row crops, straight row, Good, HSG D
4.644	89	Row crops, straight row, Good, HSG D
0.045	89	Row crops, straight row, Good, HSG D
3.216	89	Row crops, straight row, Good, HSG D
0.697	85	Row crops, straight row, Good, HSG C
2.506	85	Row crops, straight row, Good, HSG C
11.538	88	Weighted Average
11.538		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0080	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
21.8	1,607	0.0187	1.23		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
28.4	1,707	Total			

Subcatchment 4-U: EX DA 4



Hydrograph for Subcatchment 4-U: EX DA 4

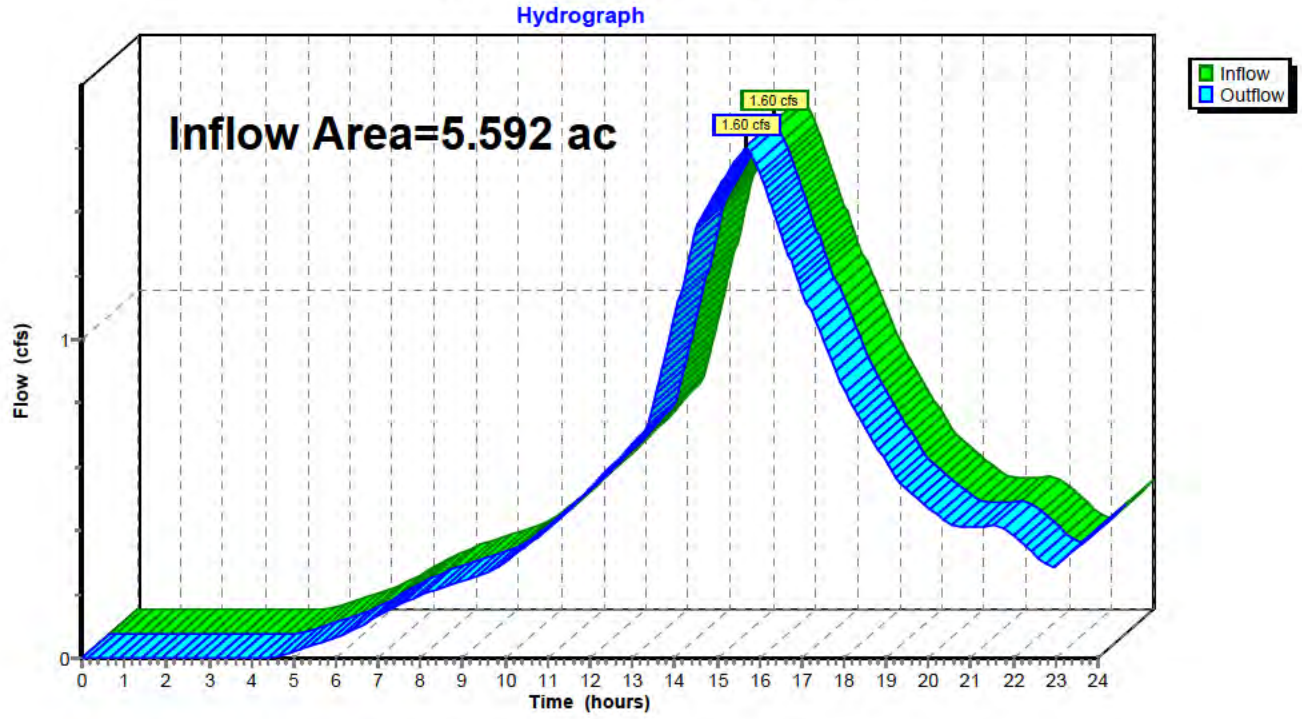
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00
0.50	0.01	0.00	0.00
0.75	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.06	0.00	0.00
1.50	0.08	0.00	0.00
1.75	0.10	0.00	0.00
2.00	0.12	0.00	0.00
2.25	0.14	0.00	0.00
2.50	0.16	0.00	0.00
2.75	0.18	0.00	0.00
3.00	0.20	0.00	0.00
3.25	0.22	0.00	0.00
3.50	0.25	0.00	0.00
3.75	0.27	0.00	0.00
4.00	0.29	0.00	0.00
4.25	0.31	0.00	0.01
4.50	0.33	0.00	0.03
4.75	0.35	0.00	0.06
5.00	0.37	0.01	0.08
5.25	0.39	0.01	0.11
5.50	0.42	0.01	0.14
5.75	0.44	0.02	0.16
6.00	0.46	0.02	0.18
6.25	0.48	0.03	0.21
6.50	0.50	0.03	0.23
6.75	0.53	0.04	0.27
7.00	0.55	0.05	0.31
7.25	0.58	0.06	0.36
7.50	0.61	0.07	0.41
7.75	0.64	0.08	0.44
8.00	0.67	0.09	0.48
8.25	0.70	0.10	0.50
8.50	0.72	0.11	0.53
8.75	0.75	0.12	0.55
9.00	0.78	0.14	0.58
9.25	0.81	0.15	0.60
9.50	0.84	0.16	0.62
9.75	0.86	0.18	0.64
10.00	0.89	0.19	0.67
10.25	0.93	0.21	0.71
10.50	0.96	0.23	0.77
10.75	0.99	0.25	0.83
11.00	1.03	0.27	0.89
11.25	1.07	0.29	0.95
11.50	1.10	0.32	1.01
11.75	1.15	0.34	1.08
12.00	1.19	0.37	1.14
12.25	1.23	0.39	1.21
12.50	1.27	0.42	1.28
12.75	1.32	0.46	1.35
13.00	1.37	0.49	1.43
13.25	1.42	0.52	1.50
13.50	1.47	0.56	1.59
13.75	1.53	0.61	1.77
14.00	1.60	0.66	2.03
14.25	1.68	0.71	2.31
14.50	1.76	0.78	2.60
14.75	1.85	0.85	2.88
15.00	1.94	0.91	3.06
15.25	2.03	0.99	3.19
15.50	2.12	1.06	3.30
15.75	2.21	1.13	**3.40**
16.00	2.29	1.21	**3.44**
16.25	2.37	1.27	3.33
16.50	2.45	1.34	3.15
16.75	2.51	1.39	2.95
17.00	2.58	1.45	2.75
17.25	2.63	1.50	2.55
17.50	2.69	1.54	2.37
17.75	2.74	1.59	2.20
18.00	2.78	1.62	2.03
18.25	2.82	1.66	1.86
18.50	2.86	1.69	1.71
18.75	2.89	1.72	1.59
19.00	2.93	1.75	1.47
19.25	2.96	1.78	1.35
19.50	2.98	1.80	1.24
19.75	3.01	1.83	1.15
20.00	3.03	1.85	1.08
20.25	3.06	1.87	1.02
20.50	3.08	1.89	0.96
20.75	3.10	1.91	0.91
21.00	3.12	1.92	0.89
21.25	3.14	1.94	0.88
21.50	3.16	1.96	0.88
21.75	3.18	1.98	0.88
22.00	3.20	2.00	0.87
22.25	3.22	2.02	0.83
22.50	3.24	2.03	0.77
22.75	3.25	2.04	0.71
23.00	3.27	2.06	0.65
23.25	3.28	2.07	0.63
23.50	3.30	2.09	0.67
23.75	3.32	2.10	0.72
24.00	**3.34**	**2.12**	0.78

Summary for Reach 1-T: EX DA 1 TOTAL

Inflow Area = 5.592 ac, 1.72% Impervious, Inflow Depth > 1.95" for 2-year event
Inflow = 1.60 cfs @ 15.70 hrs, Volume= 0.910 af
Outflow = 1.60 cfs @ 15.70 hrs, Volume= 0.910 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1-T: EX DA 1 TOTAL



Hydrograph for Reach 1-T: EX DA 1 TOTAL

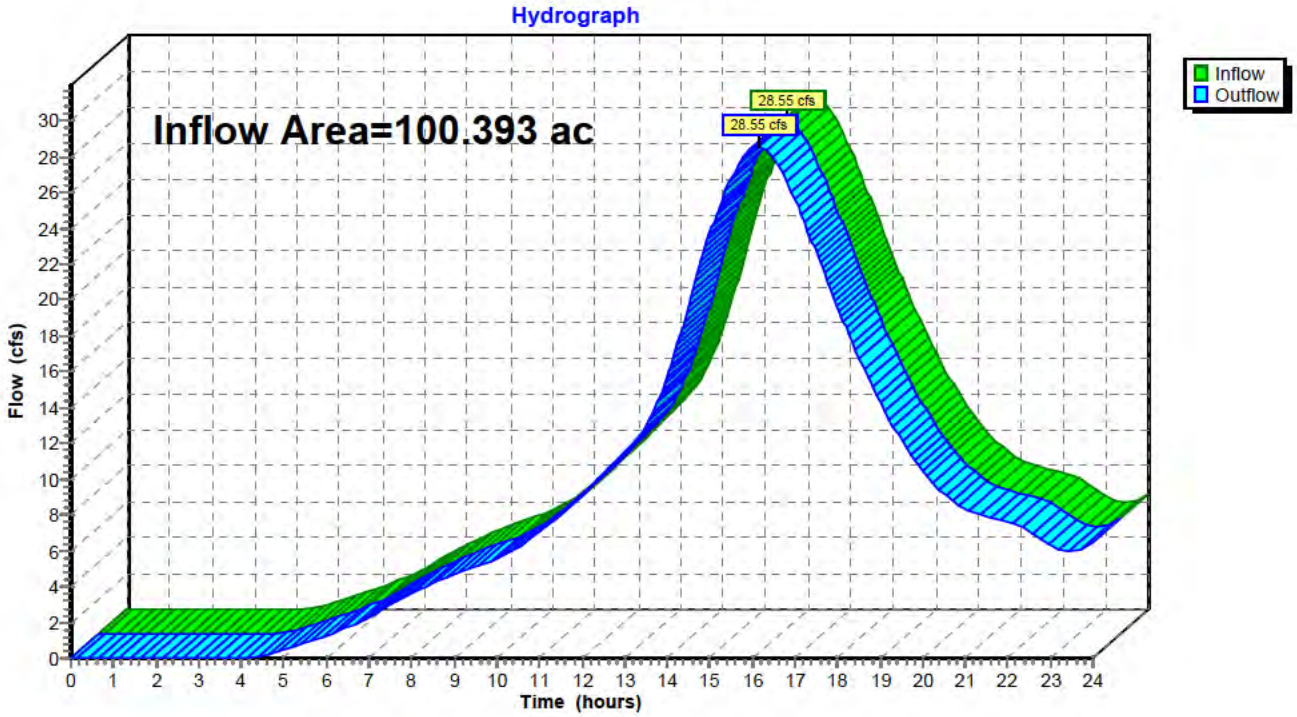
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	0.67		0.67
0.25	0.00		0.00	13.25	0.70		0.70
0.50	0.00		0.00	13.50	0.80		0.80
0.75	0.00		0.00	13.75	0.93		0.93
1.00	0.00		0.00	14.00	1.06		1.06
1.25	0.00		0.00	14.25	1.20		1.20
1.50	0.00		0.00	14.50	1.34		1.34
1.75	0.00		0.00	14.75	1.41		1.41
2.00	0.00		0.00	15.00	1.46		1.46
2.25	0.00		0.00	15.25	1.52		1.52
2.50	0.00		0.00	15.50	**1.57**		**1.57**
2.75	0.00		0.00	15.75	**1.60**		**1.60**
3.00	0.00		0.00	16.00	1.52		1.52
3.25	0.00		0.00	16.25	1.43		1.43
3.50	0.00		0.00	16.50	1.34		1.34
3.75	0.00		0.00	16.75	1.24		1.24
4.00	0.00		0.00	17.00	1.15		1.15
4.25	0.00		0.00	17.25	1.08		1.08
4.50	0.00		0.00	17.50	1.00		1.00
4.75	0.01		0.01	17.75	0.92		0.92
5.00	0.02		0.02	18.00	0.84		0.84
5.25	0.03		0.03	18.25	0.78		0.78
5.50	0.04		0.04	18.50	0.72		0.72
5.75	0.05		0.05	18.75	0.67		0.67
6.00	0.06		0.06	19.00	0.61		0.61
6.25	0.08		0.08	19.25	0.56		0.56
6.50	0.09		0.09	19.50	0.52		0.52
6.75	0.11		0.11	19.75	0.50		0.50
7.00	0.13		0.13	20.00	0.47		0.47
7.25	0.15		0.15	20.25	0.44		0.44
7.50	0.17		0.17	20.50	0.42		0.42
7.75	0.18		0.18	20.75	0.41		0.41
8.00	0.20		0.20	21.00	0.41		0.41
8.25	0.21		0.21	21.25	0.41		0.41
8.50	0.22		0.22	21.50	0.41		0.41
8.75	0.23		0.23	21.75	0.41		0.41
9.00	0.24		0.24	22.00	0.38		0.38
9.25	0.25		0.25	22.25	0.35		0.35
9.50	0.26		0.26	22.50	0.33		0.33
9.75	0.28		0.28	22.75	0.30		0.30
10.00	0.30		0.30	23.00	0.29		0.29
10.25	0.33		0.33	23.25	0.32		0.32
10.50	0.35		0.35	23.50	0.35		0.35
10.75	0.38		0.38	23.75	0.38		0.38
11.00	0.41		0.41	24.00	0.40		0.40
11.25	0.44		0.44				
11.50	0.47		0.47				
11.75	0.50		0.50				
12.00	0.53		0.53				
12.25	0.56		0.56				
12.50	0.60		0.60				
12.75	0.63		0.63				

Summary for Reach T: Total

Inflow Area = 100.393 ac, 0.41% Impervious, Inflow Depth > 2.06" for 2-year event
Inflow = 28.55 cfs @ 16.14 hrs, Volume= 17.272 af
Outflow = 28.55 cfs @ 16.14 hrs, Volume= 17.272 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach T: Total



Hydrograph for Reach T: Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	11.53		11.53
0.25	0.00		0.00	13.25	12.15		12.15
0.50	0.00		0.00	13.50	12.94		12.94
0.75	0.00		0.00	13.75	14.13		14.13
1.00	0.00		0.00	14.00	15.65		15.65
1.25	0.00		0.00	14.25	17.53		17.53
1.50	0.00		0.00	14.50	19.69		19.69
1.75	0.00		0.00	14.75	21.82		21.82
2.00	0.00		0.00	15.00	23.70		23.70
2.25	0.00		0.00	15.25	25.34		25.34
2.50	0.00		0.00	15.50	26.72		26.72
2.75	0.00		0.00	15.75	27.89		27.89
3.00	0.00		0.00	16.00	**28.49**		**28.49**
3.25	0.00		0.00	16.25	**28.46**		**28.46**
3.50	0.00		0.00	16.50	27.95		27.95
3.75	0.00		0.00	16.75	26.96		26.96
4.00	0.00		0.00	17.00	25.62		25.62
4.25	0.04		0.04	17.25	24.18		24.18
4.50	0.14		0.14	17.50	22.67		22.67
4.75	0.28		0.28	17.75	21.15		21.15
5.00	0.46		0.46	18.00	19.66		19.66
5.25	0.66		0.66	18.25	18.18		18.18
5.50	0.87		0.87	18.50	16.81		16.81
5.75	1.07		1.07	18.75	15.55		15.55
6.00	1.28		1.28	19.00	14.36		14.36
6.25	1.48		1.48	19.25	13.22		13.22
6.50	1.72		1.72	19.50	12.20		12.20
6.75	1.98		1.98	19.75	11.30		11.30
7.00	2.29		2.29	20.00	10.50		10.50
7.25	2.63		2.63	20.25	9.81		9.81
7.50	2.98		2.98	20.50	9.19		9.19
7.75	3.32		3.32	20.75	8.68		8.68
8.00	3.64		3.64	21.00	8.32		8.32
8.25	3.93		3.93	21.25	8.06		8.06
8.50	4.20		4.20	21.50	7.89		7.89
8.75	4.44		4.44	21.75	7.80		7.80
9.00	4.67		4.67	22.00	7.65		7.65
9.25	4.88		4.88	22.25	7.41		7.41
9.50	5.08		5.08	22.50	7.10		7.10
9.75	5.28		5.28	22.75	6.71		6.71
10.00	5.52		5.52	23.00	6.29		6.29
10.25	5.81		5.81	23.25	6.05		6.05
10.50	6.17		6.17	23.50	6.01		6.01
10.75	6.59		6.59	23.75	6.13		6.13
11.00	7.04		7.04	24.00	6.42		6.42
11.25	7.53		7.53				
11.50	8.06		8.06				
11.75	8.59		8.59				
12.00	9.15		9.15				
12.25	9.73		9.73				
12.50	10.31		10.31				
12.75	10.91		10.91				

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1-D: EX DA 1 Runoff Area=0.010 ac 100.00% Impervious Runoff Depth>8.31"
Flow Length=434' Tc=7.8 min CN=98 Runoff=0.01 cfs 0.007 af

Subcatchment1-U: EX DA 1 Runoff Area=5.582 ac 1.54% Impervious Runoff Depth>6.87"
Flow Length=434' Tc=7.8 min CN=86 Runoff=4.98 cfs 3.193 af

Subcatchment2-U: EX DA 2 Runoff Area=62.508 ac 0.50% Impervious Runoff Depth>6.94"
Flow Length=3,366' Tc=67.7 min CN=88 Runoff=54.18 cfs 36.153 af

Subcatchment3-U: EX DA 3 Runoff Area=20.755 ac 0.00% Impervious Runoff Depth>7.07"
Flow Length=1,132' Tc=20.3 min CN=88 Runoff=18.65 cfs 12.224 af

Subcatchment4-U: EX DA 4 Runoff Area=11.538 ac 0.00% Impervious Runoff Depth>7.04"
Flow Length=1,707' Tc=28.4 min CN=88 Runoff=10.32 cfs 6.773 af

Reach 1-T: EX DA 1 TOTAL Inflow=4.99 cfs 3.200 af
Outflow=4.99 cfs 3.200 af

Reach T: Total Inflow=86.46 cfs 58.350 af
Outflow=86.46 cfs 58.350 af

Total Runoff Area = 100.393 ac Runoff Volume = 58.350 af Average Runoff Depth = 6.97"
99.59% Pervious = 99.984 ac 0.41% Impervious = 0.409 ac

Summary for Subcatchment 1-D: EX DA 1

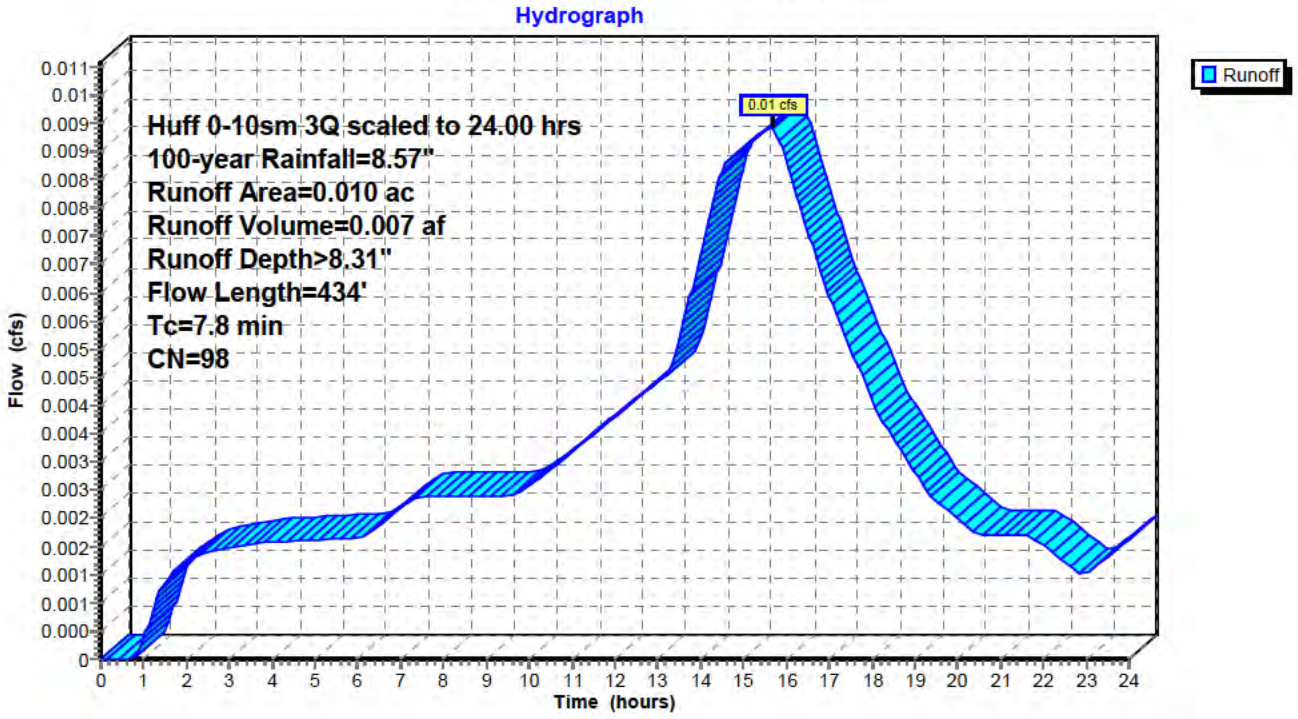
Runoff = 0.01 cfs @ 15.67 hrs, Volume= 0.007 af, Depth> 8.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

	Area (ac)	CN	Description
*	0.010	98	Impervious Area
	0.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
3.8	334	0.0264	1.46		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
7.8	434	Total			

Subcatchment 1-D: EX DA 1



Hydrograph for Subcatchment 1-D: EX DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.01	0.00
1.25	0.14	0.03	0.00
1.50	0.20	0.07	0.00
1.75	0.25	0.11	0.00
2.00	0.30	0.15	0.00
2.25	0.36	0.19	0.00
2.50	0.41	0.24	0.00
2.75	0.47	0.29	0.00
3.00	0.52	0.34	0.00
3.25	0.58	0.39	0.00
3.50	0.63	0.44	0.00
3.75	0.69	0.49	0.00
4.00	0.74	0.54	0.00
4.25	0.79	0.59	0.00
4.50	0.85	0.64	0.00
4.75	0.90	0.70	0.00
5.00	0.96	0.75	0.00
5.25	1.01	0.80	0.00
5.50	1.07	0.85	0.00
5.75	1.12	0.91	0.00
6.00	1.17	0.96	0.00
6.25	1.23	1.02	0.00
6.50	1.29	1.07	0.00
6.75	1.35	1.14	0.00
7.00	1.42	1.20	0.00
7.25	1.49	1.27	0.00
7.50	1.57	1.35	0.00
7.75	1.64	1.42	0.00
8.00	1.71	1.49	0.00
8.25	1.78	1.56	0.00
8.50	1.86	1.63	0.00
8.75	1.93	1.70	0.00
9.00	2.00	1.78	0.00
9.25	2.07	1.85	0.00
9.50	2.15	1.92	0.00
9.75	2.22	1.99	0.00
10.00	2.30	2.07	0.00
10.25	2.38	2.15	0.00
10.50	2.46	2.23	0.00
10.75	2.55	2.32	0.00
11.00	2.64	2.41	0.00
11.25	2.74	2.51	0.00
11.50	2.84	2.60	0.00
11.75	2.94	2.71	0.00
12.00	3.05	2.81	0.00
12.25	3.16	2.92	0.00
12.50	3.27	3.04	0.00
12.75	3.39	3.16	0.00
13.00	3.51	3.28	0.00
13.25	3.64	3.40	0.01
13.50	3.78	3.54	0.01
13.75	3.94	3.70	0.01
14.00	4.11	3.88	0.01
14.25	4.31	4.07	0.01
14.50	4.52	4.29	0.01
14.75	4.75	4.51	0.01
15.00	4.97	4.73	0.01
15.25	5.20	4.96	0.01
15.50	5.43	5.19	**0.01**
15.75	5.66	5.43	**0.01**
16.00	5.88	5.64	0.01
16.25	6.09	5.85	0.01
16.50	6.28	6.04	0.01
16.75	6.45	6.21	0.01
17.00	6.61	6.37	0.01
17.25	6.76	6.52	0.01
17.50	6.89	6.66	0.01
17.75	7.02	6.78	0.01
18.00	7.13	6.90	0.00
18.25	7.24	7.00	0.00
18.50	7.34	7.10	0.00
18.75	7.43	7.19	0.00
19.00	7.51	7.27	0.00
19.25	7.58	7.34	0.00
19.50	7.65	7.41	0.00
19.75	7.72	7.48	0.00
20.00	7.78	7.54	0.00
20.25	7.84	7.60	0.00
20.50	7.90	7.66	0.00
20.75	7.95	7.71	0.00
21.00	8.00	7.76	0.00
21.25	8.06	7.82	0.00
21.50	8.11	7.87	0.00
21.75	8.17	7.93	0.00
22.00	8.22	7.98	0.00
22.25	8.26	8.02	0.00
22.50	8.31	8.07	0.00
22.75	8.35	8.11	0.00
23.00	8.38	8.14	0.00
23.25	8.42	8.18	0.00
23.50	8.47	8.23	0.00
23.75	8.52	8.28	0.00
24.00	**8.57**	**8.33**	0.00

Summary for Subcatchment 1-U: EX DA 1

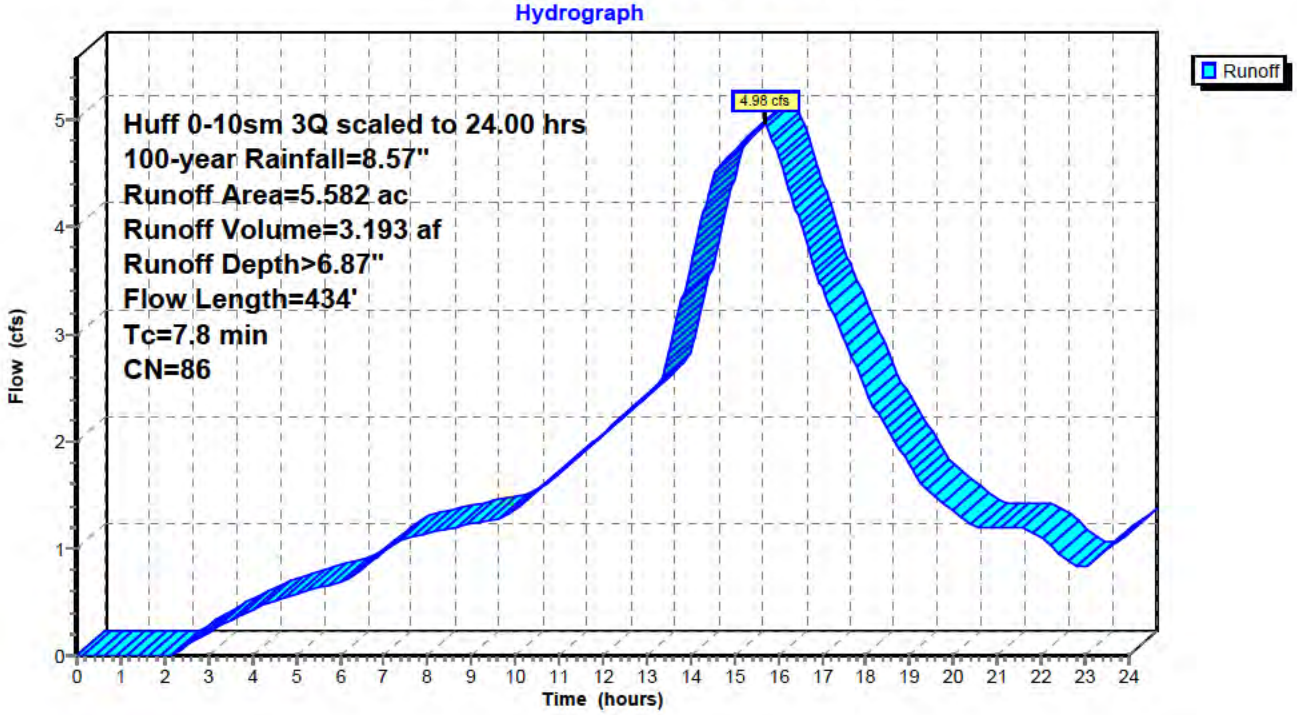
Runoff = 4.98 cfs @ 15.68 hrs, Volume= 3.193 af, Depth> 6.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

	Area (ac)	CN	Description
	0.200	89	Row crops, straight row, Good, HSG D
	1.277	89	Row crops, straight row, Good, HSG D
	0.327	89	Row crops, straight row, Good, HSG D
	2.982	85	Row crops, straight row, Good, HSG C
	0.710	85	Row crops, straight row, Good, HSG C
*	0.086	98	Impervious Area
	5.582	86	Weighted Average
	5.496		98.46% Pervious Area
	0.086		1.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
3.8	334	0.0264	1.46		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
7.8	434	Total			

Subcatchment 1-U: EX DA 1



Hydrograph for Subcatchment 1-U: EX DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.00	0.00
1.25	0.14	0.00	0.00
1.50	0.20	0.00	0.00
1.75	0.25	0.00	0.00
2.00	0.30	0.00	0.00
2.25	0.36	0.00	0.01
2.50	0.41	0.00	0.09
2.75	0.47	0.01	0.16
3.00	0.52	0.02	0.22
3.25	0.58	0.03	0.28
3.50	0.63	0.05	0.33
3.75	0.69	0.07	0.38
4.00	0.74	0.08	0.43
4.25	0.79	0.10	0.47
4.50	0.85	0.13	0.51
4.75	0.90	0.15	0.54
5.00	0.96	0.18	0.57
5.25	1.01	0.20	0.60
5.50	1.07	0.23	0.63
5.75	1.12	0.26	0.66
6.00	1.17	0.29	0.68
6.25	1.23	0.32	0.73
6.50	1.29	0.36	0.81
6.75	1.35	0.40	0.89
7.00	1.42	0.44	0.97
7.25	1.49	0.49	1.05
7.50	1.57	0.54	1.09
7.75	1.64	0.59	1.12
8.00	1.71	0.64	1.14
8.25	1.78	0.69	1.17
8.50	1.86	0.74	1.19
8.75	1.93	0.80	1.21
9.00	2.00	0.85	1.23
9.25	2.07	0.91	1.24
9.50	2.15	0.96	1.26
9.75	2.22	1.02	1.29
10.00	2.30	1.08	1.37
10.25	2.38	1.14	1.45
10.50	2.46	1.21	1.53
10.75	2.55	1.28	1.62
11.00	2.64	1.36	1.71
11.25	2.74	1.44	1.79
11.50	2.84	1.52	1.88
11.75	2.94	1.61	1.97
12.00	3.05	1.70	2.06
12.25	3.16	1.80	2.15
12.50	3.27	1.90	2.24
12.75	3.39	2.00	2.33
13.00	3.51	2.11	2.43
13.25	3.64	2.22	2.52
13.50	3.78	2.34	2.83
13.75	3.94	2.49	3.23
14.00	4.11	2.65	3.64
14.25	4.31	2.83	4.05
14.50	4.52	3.03	4.45
14.75	4.75	3.23	4.60
15.00	4.97	3.44	4.71
15.25	5.20	3.65	4.81
15.50	5.43	3.87	**4.91**
15.75	5.66	4.09	**4.95**
16.00	5.88	4.30	4.66
16.25	6.09	4.49	4.36
16.50	6.28	4.67	4.04
16.75	6.45	4.84	3.73
17.00	6.61	4.99	3.44
17.25	6.76	5.13	3.20
17.50	6.89	5.26	2.96
17.75	7.02	5.38	2.72
18.00	7.13	5.50	2.47
18.25	7.24	5.60	2.27
18.50	7.34	5.69	2.11
18.75	7.43	5.78	1.95
19.00	7.51	5.86	1.79
19.25	7.58	5.93	1.62
19.50	7.65	6.00	1.52
19.75	7.72	6.06	1.44
20.00	7.78	6.12	1.36
20.25	7.84	6.18	1.27
20.50	7.90	6.23	1.20
20.75	7.95	6.28	1.19
21.00	8.00	6.34	1.19
21.25	8.06	6.39	1.19
21.50	8.11	6.44	1.19
21.75	8.17	6.49	1.17
22.00	8.22	6.54	1.10
22.25	8.26	6.59	1.01
22.50	8.31	6.63	0.93
22.75	8.35	6.67	0.85
23.00	8.38	6.70	0.82
23.25	8.42	6.74	0.90
23.50	8.47	6.79	0.98
23.75	8.52	6.83	1.07
24.00	**8.57**	**6.88**	1.15

Summary for Subcatchment 2-U: EX DA 2

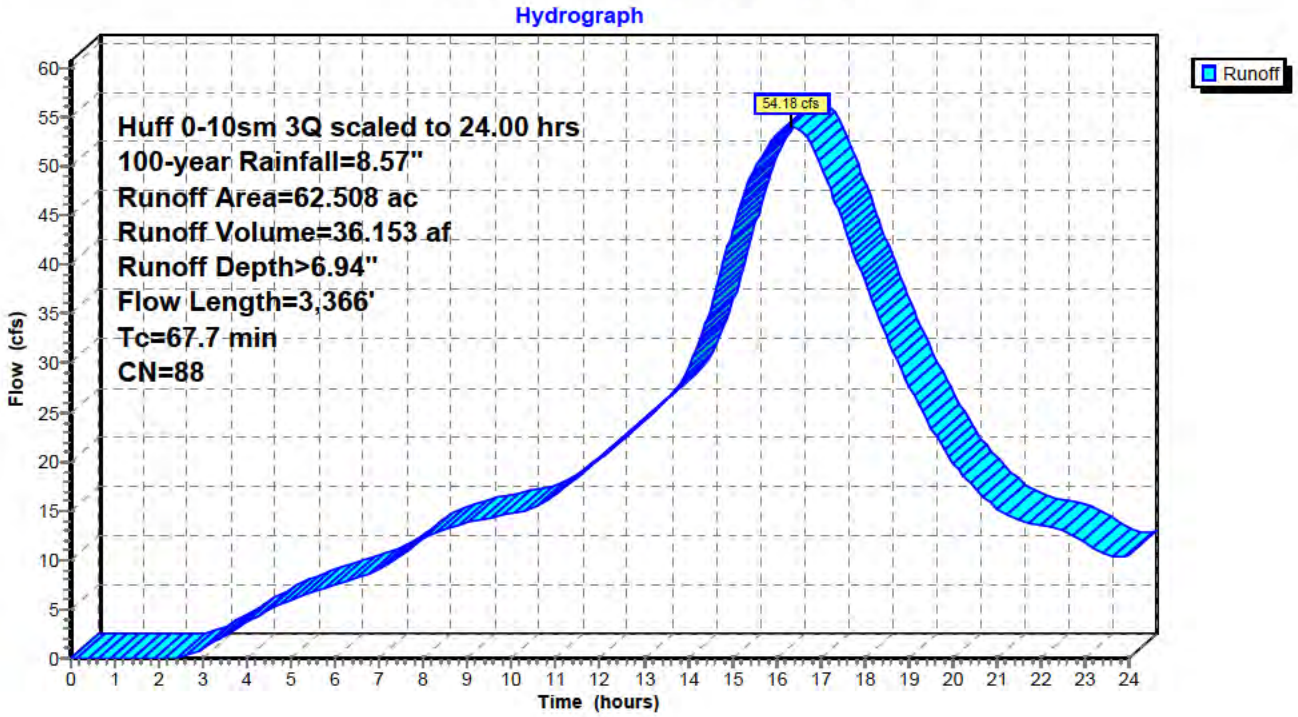
Runoff = 54.18 cfs @ 16.33 hrs, Volume= 36.153 af, Depth> 6.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

	Area (ac)	CN	Description
	11.150	89	Row crops, straight row, Good, HSG D
	2.052	89	Row crops, straight row, Good, HSG D
	0.061	89	Row crops, straight row, Good, HSG D
	11.220	89	Row crops, straight row, Good, HSG D
	8.588	89	Row crops, straight row, Good, HSG D
	10.020	89	Row crops, straight row, Good, HSG D
	14.950	85	Row crops, straight row, Good, HSG C
	2.184	85	Row crops, straight row, Good, HSG C
	0.951	85	Row crops, straight row, Good, HSG C
	1.019	85	Row crops, straight row, Good, HSG C
*	0.313	98	Impervious Area
	62.508	88	Weighted Average
	62.195		99.50% Pervious Area
	0.313		0.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.0421	0.49		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.5	141	0.0306	1.57		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.8	3,125	0.0085	0.83		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
67.7	3,366	Total			

Subcatchment 2-U: EX DA 2



Hydrograph for Subcatchment 2-U: EX DA 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.00	0.00
1.25	0.14	0.00	0.00
1.50	0.20	0.00	0.00
1.75	0.25	0.00	0.00
2.00	0.30	0.00	0.00
2.25	0.36	0.01	0.02
2.50	0.41	0.01	0.13
2.75	0.47	0.02	0.45
3.00	0.52	0.04	0.98
3.25	0.58	0.06	1.64
3.50	0.63	0.07	2.34
3.75	0.69	0.10	3.04
4.00	0.74	0.12	3.71
4.25	0.79	0.14	4.33
4.50	0.85	0.17	4.90
4.75	0.90	0.20	5.44
5.00	0.96	0.23	5.92
5.25	1.01	0.26	6.37
5.50	1.07	0.29	6.79
5.75	1.12	0.32	7.16
6.00	1.17	0.36	7.51
6.25	1.23	0.40	7.84
6.50	1.29	0.44	8.16
6.75	1.35	0.48	8.55
7.00	1.42	0.53	9.09
7.25	1.49	0.58	9.75
7.50	1.57	0.63	10.52
7.75	1.64	0.68	11.34
8.00	1.71	0.74	12.07
8.25	1.78	0.79	12.66
8.50	1.86	0.85	13.13
8.75	1.93	0.91	13.48
9.00	2.00	0.97	13.78
9.25	2.07	1.02	14.05
9.50	2.15	1.08	14.27
9.75	2.22	1.14	14.47
10.00	2.30	1.21	14.68
10.25	2.38	1.28	14.93
10.50	2.46	1.35	15.35
10.75	2.55	1.42	15.96
11.00	2.64	1.50	16.69
11.25	2.74	1.59	17.53
11.50	2.84	1.67	18.44
11.75	2.94	1.76	19.35
12.00	3.05	1.86	20.32
12.25	3.16	1.96	21.30
12.50	3.27	2.06	22.26
12.75	3.39	2.17	23.26
13.00	3.51	2.28	24.27
13.25	3.64	2.39	25.26
13.50	3.78	2.52	26.29
13.75	3.94	2.67	27.53
14.00	4.11	2.83	29.33
14.25	4.31	3.02	32.03
14.50	4.52	3.22	35.48
14.75	4.75	3.43	39.37
15.00	4.97	3.64	43.35
15.25	5.20	3.86	46.83
15.50	5.43	4.08	49.50
15.75	5.66	4.30	51.61
16.00	5.88	4.51	53.21
16.25	6.09	4.71	**54.07**
16.50	6.28	4.89	**53.91**
16.75	6.45	5.06	52.53
17.00	6.61	5.21	50.21
17.25	6.76	5.36	47.44
17.50	6.89	5.49	44.40
17.75	7.02	5.61	41.35
18.00	7.13	5.72	38.45
18.25	7.24	5.83	35.59
18.50	7.34	5.92	32.80
18.75	7.43	6.01	30.21
19.00	7.51	6.09	27.81
19.25	7.58	6.16	25.61
19.50	7.65	6.23	23.61
19.75	7.72	6.29	21.70
20.00	7.78	6.36	19.99
20.25	7.84	6.41	18.56
20.50	7.90	6.47	17.31
20.75	7.95	6.52	16.20
21.00	8.00	6.57	15.27
21.25	8.06	6.63	14.54
21.50	8.11	6.68	14.05
21.75	8.17	6.73	13.78
22.00	8.22	6.78	13.60
22.25	8.26	6.83	13.39
22.50	8.31	6.87	13.06
22.75	8.35	6.91	12.50
23.00	8.38	6.94	11.79
23.25	8.42	6.98	11.05
23.50	8.47	7.03	10.47
23.75	8.52	7.07	10.27
24.00	**8.57**	**7.13**	10.50

Summary for Subcatchment 3-U: EX DA 3

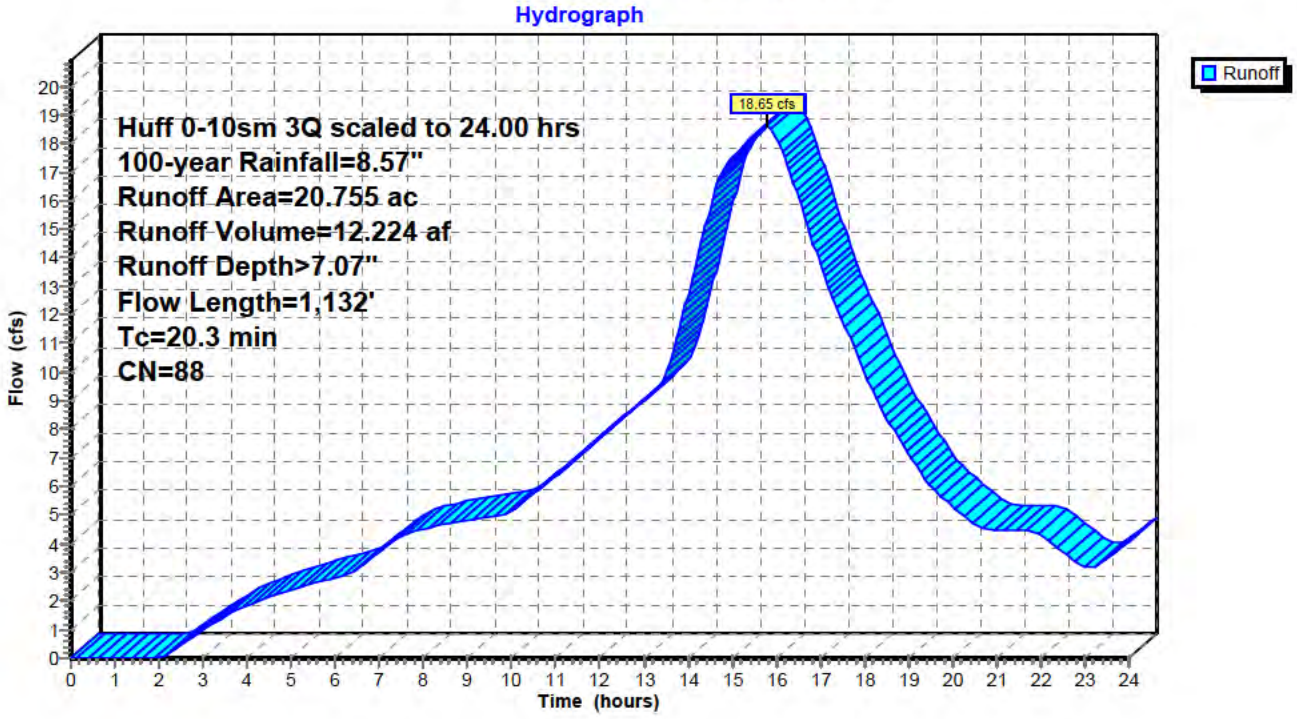
Runoff = 18.65 cfs @ 15.80 hrs, Volume= 12.224 af, Depth> 7.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

Area (ac)	CN	Description
3.643	89	Row crops, straight row, Good, HSG D
4.215	89	Row crops, straight row, Good, HSG D
1.296	89	Row crops, straight row, Good, HSG D
5.307	89	Row crops, straight row, Good, HSG D
3.064	85	Row crops, straight row, Good, HSG C
3.230	85	Row crops, straight row, Good, HSG C
20.755	88	Weighted Average
20.755		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.0203	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
15.7	1,032	0.0149	1.10		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.3	1,132	Total			

Subcatchment 3-U: EX DA 3



Hydrograph for Subcatchment 3-U: EX DA 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.00	0.00
1.25	0.14	0.00	0.00
1.50	0.20	0.00	0.00
1.75	0.25	0.00	0.00
2.00	0.30	0.00	0.00
2.25	0.36	0.01	0.16
2.50	0.41	0.01	0.45
2.75	0.47	0.02	0.74
3.00	0.52	0.04	1.00
3.25	0.58	0.06	1.24
3.50	0.63	0.07	1.45
3.75	0.69	0.10	1.65
4.00	0.74	0.12	1.82
4.25	0.79	0.14	1.98
4.50	0.85	0.17	2.13
4.75	0.90	0.20	2.27
5.00	0.96	0.23	2.39
5.25	1.01	0.26	2.50
5.50	1.07	0.29	2.61
5.75	1.12	0.32	2.71
6.00	1.17	0.36	2.80
6.25	1.23	0.40	2.90
6.50	1.29	0.44	3.13
6.75	1.35	0.48	3.41
7.00	1.42	0.53	3.71
7.25	1.49	0.58	4.02
7.50	1.57	0.63	4.30
7.75	1.64	0.68	4.44
8.00	1.71	0.74	4.53
8.25	1.78	0.79	4.61
8.50	1.86	0.85	4.68
8.75	1.93	0.91	4.75
9.00	2.00	0.97	4.82
9.25	2.07	1.02	4.87
9.50	2.15	1.08	4.93
9.75	2.22	1.14	4.98
10.00	2.30	1.21	5.15
10.25	2.38	1.28	5.43
10.50	2.46	1.35	5.75
10.75	2.55	1.42	6.06
11.00	2.64	1.50	6.39
11.25	2.74	1.59	6.71
11.50	2.84	1.67	7.04
11.75	2.94	1.76	7.37
12.00	3.05	1.86	7.70
12.25	3.16	1.96	8.03
12.50	3.27	2.06	8.36
12.75	3.39	2.17	8.70
13.00	3.51	2.28	9.04
13.25	3.64	2.39	9.37
13.50	3.78	2.52	9.94
13.75	3.94	2.67	11.20
14.00	4.11	2.83	12.68
14.25	4.31	3.02	14.21
14.50	4.52	3.22	15.76
14.75	4.75	3.43	16.95
15.00	4.97	3.64	17.50
15.25	5.20	3.86	17.91
15.50	5.43	4.08	18.28
15.75	5.66	4.30	**18.63**
16.00	5.88	4.51	**18.30**
16.25	6.09	4.71	17.30
16.50	6.28	4.89	16.14
16.75	6.45	5.06	14.96
17.00	6.61	5.21	13.77
17.25	6.76	5.36	12.75
17.50	6.89	5.49	11.82
17.75	7.02	5.61	10.91
18.00	7.13	5.72	10.00
18.25	7.24	5.83	9.12
18.50	7.34	5.92	8.42
18.75	7.43	6.01	7.79
19.00	7.51	6.09	7.18
19.25	7.58	6.16	6.57
19.50	7.65	6.23	6.01
19.75	7.72	6.29	5.64
20.00	7.78	6.36	5.32
20.25	7.84	6.41	5.02
20.50	7.90	6.47	4.71
20.75	7.95	6.52	4.50
21.00	8.00	6.57	4.46
21.25	8.06	6.63	4.45
21.50	8.11	6.68	4.45
21.75	8.17	6.73	4.45
22.00	8.22	6.78	4.31
22.25	8.26	6.83	4.03
22.50	8.31	6.87	3.73
22.75	8.35	6.91	3.42
23.00	8.38	6.94	3.14
23.25	8.42	6.98	3.19
23.50	8.47	7.03	3.46
23.75	8.52	7.07	3.76
24.00	**8.57**	**7.13**	4.07

Summary for Subcatchment 4-U: EX DA 4

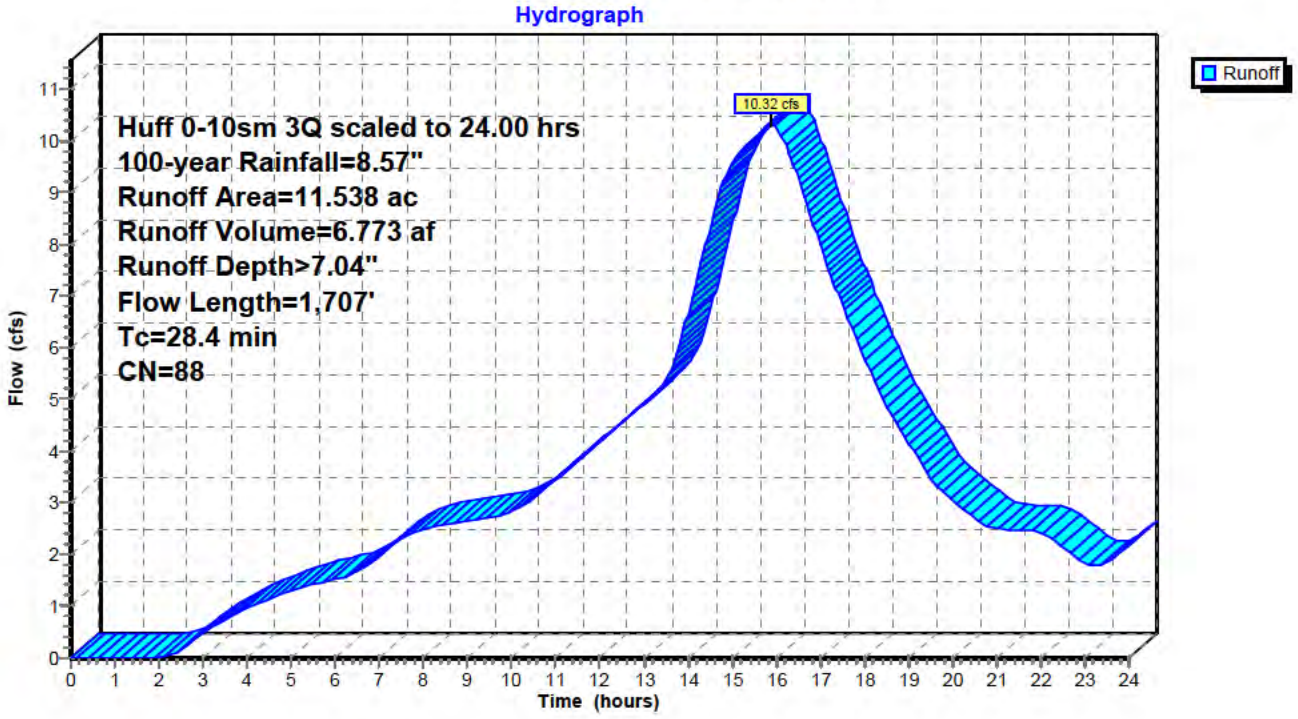
Runoff = 10.32 cfs @ 15.89 hrs, Volume= 6.773 af, Depth> 7.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

Area (ac)	CN	Description
0.430	89	Row crops, straight row, Good, HSG D
4.644	89	Row crops, straight row, Good, HSG D
0.045	89	Row crops, straight row, Good, HSG D
3.216	89	Row crops, straight row, Good, HSG D
0.697	85	Row crops, straight row, Good, HSG C
2.506	85	Row crops, straight row, Good, HSG C
11.538	88	Weighted Average
11.538		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0080	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
21.8	1,607	0.0187	1.23		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
28.4	1,707	Total			

Subcatchment 4-U: EX DA 4



Hydrograph for Subcatchment 4-U: EX DA 4

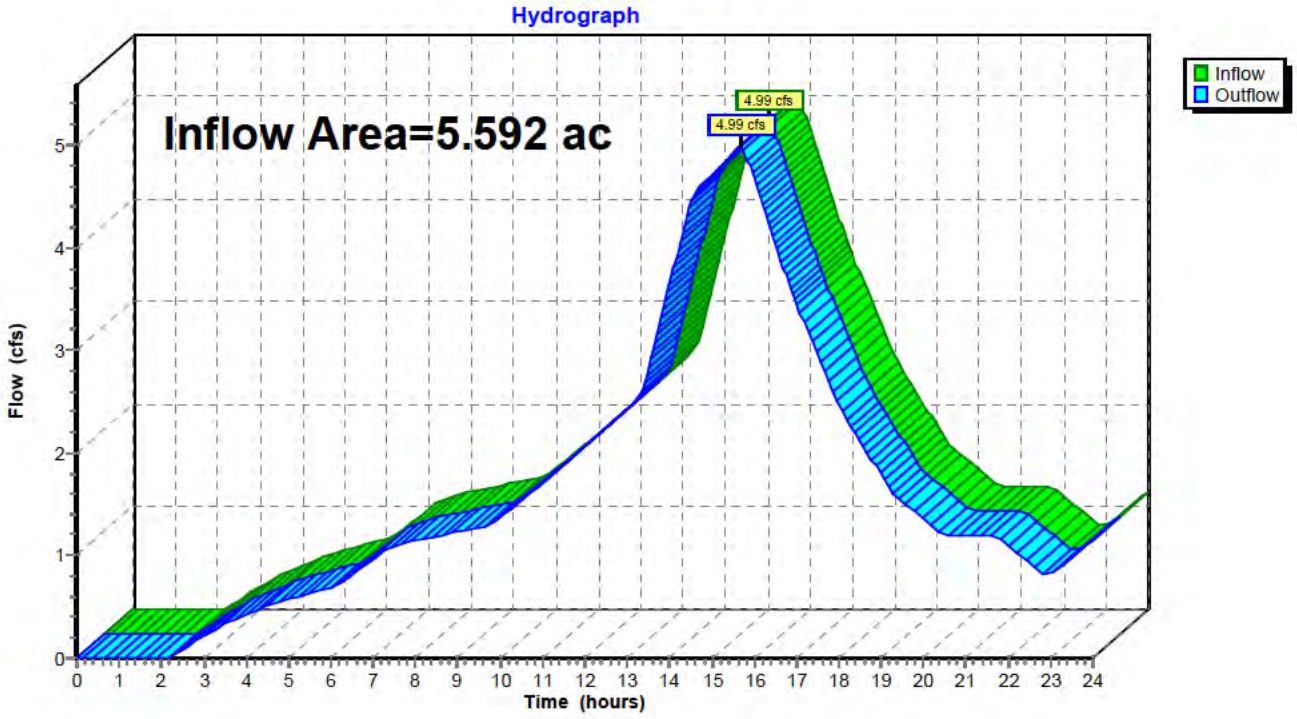
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.00	0.00
1.25	0.14	0.00	0.00
1.50	0.20	0.00	0.00
1.75	0.25	0.00	0.00
2.00	0.30	0.00	0.00
2.25	0.36	0.01	0.04
2.50	0.41	0.01	0.17
2.75	0.47	0.02	0.33
3.00	0.52	0.04	0.48
3.25	0.58	0.06	0.62
3.50	0.63	0.07	0.75
3.75	0.69	0.10	0.86
4.00	0.74	0.12	0.96
4.25	0.79	0.14	1.06
4.50	0.85	0.17	1.14
4.75	0.90	0.20	1.22
5.00	0.96	0.23	1.29
5.25	1.01	0.26	1.36
5.50	1.07	0.29	1.42
5.75	1.12	0.32	1.48
6.00	1.17	0.36	1.53
6.25	1.23	0.40	1.58
6.50	1.29	0.44	1.68
6.75	1.35	0.48	1.82
7.00	1.42	0.53	1.98
7.25	1.49	0.58	2.15
7.50	1.57	0.63	2.32
7.75	1.64	0.68	2.42
8.00	1.71	0.74	2.49
8.25	1.78	0.79	2.54
8.50	1.86	0.85	2.58
8.75	1.93	0.91	2.62
9.00	2.00	0.97	2.66
9.25	2.07	1.02	2.69
9.50	2.15	1.08	2.72
9.75	2.22	1.14	2.75
10.00	2.30	1.21	2.82
10.25	2.38	1.28	2.95
10.50	2.46	1.35	3.11
10.75	2.55	1.42	3.28
11.00	2.64	1.50	3.46
11.25	2.74	1.59	3.64
11.50	2.84	1.67	3.82
11.75	2.94	1.76	4.00
12.00	3.05	1.86	4.19
12.25	3.16	1.96	4.37
12.50	3.27	2.06	4.56
12.75	3.39	2.17	4.74
13.00	3.51	2.28	4.93
13.25	3.64	2.39	5.12
13.50	3.78	2.52	5.36
13.75	3.94	2.67	5.89
14.00	4.11	2.83	6.65
14.25	4.31	3.02	7.48
14.50	4.52	3.22	8.33
14.75	4.75	3.43	9.10
15.00	4.97	3.64	9.55
15.25	5.20	3.86	9.83
15.50	5.43	4.08	10.06
15.75	5.66	4.30	**10.26**
16.00	5.88	4.51	**10.27**
16.25	6.09	4.71	9.87
16.50	6.28	4.89	9.28
16.75	6.45	5.06	8.64
17.00	6.61	5.21	7.99
17.25	6.76	5.36	7.37
17.50	6.89	5.49	6.84
17.75	7.02	5.61	6.32
18.00	7.13	5.72	5.81
18.25	7.24	5.83	5.31
18.50	7.34	5.92	4.88
18.75	7.43	6.01	4.51
19.00	7.51	6.09	4.16
19.25	7.58	6.16	3.82
19.50	7.65	6.23	3.49
19.75	7.72	6.29	3.24
20.00	7.78	6.36	3.05
20.25	7.84	6.41	2.88
20.50	7.90	6.47	2.70
20.75	7.95	6.52	2.56
21.00	8.00	6.57	2.50
21.25	8.06	6.63	2.48
21.50	8.11	6.68	2.48
21.75	8.17	6.73	2.47
22.00	8.22	6.78	2.44
22.25	8.26	6.83	2.31
22.50	8.31	6.87	2.16
22.75	8.35	6.91	1.99
23.00	8.38	6.94	1.82
23.25	8.42	6.98	1.76
23.50	8.47	7.03	1.86
23.75	8.52	7.07	2.01
24.00	**8.57**	**7.13**	2.18

Summary for Reach 1-T: EX DA 1 TOTAL

Inflow Area = 5.592 ac, 1.72% Impervious, Inflow Depth > 6.87" for 100-year event
Inflow = 4.99 cfs @ 15.68 hrs, Volume= 3.200 af
Outflow = 4.99 cfs @ 15.68 hrs, Volume= 3.200 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1-T: EX DA 1 TOTAL



Hydrograph for Reach 1-T: EX DA 1 TOTAL

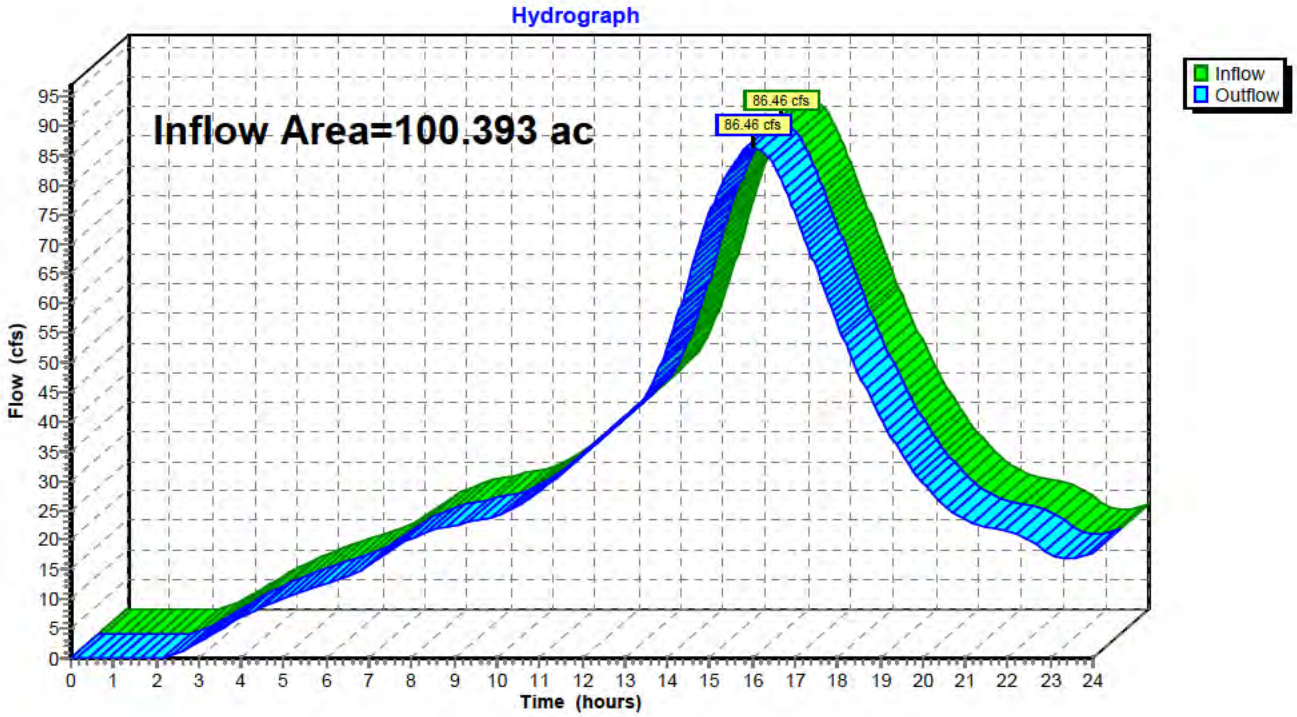
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00
0.25	0.00		0.00
0.50	0.00		0.00
0.75	0.00		0.00
1.00	0.00		0.00
1.25	0.00		0.00
1.50	0.00		0.00
1.75	0.00		0.00
2.00	0.00		0.00
2.25	0.02		0.02
2.50	0.09		0.09
2.75	0.16		0.16
3.00	0.22		0.22
3.25	0.28		0.28
3.50	0.33		0.33
3.75	0.38		0.38
4.00	0.43		0.43
4.25	0.47		0.47
4.50	0.51		0.51
4.75	0.54		0.54
5.00	0.58		0.58
5.25	0.61		0.61
5.50	0.63		0.63
5.75	0.66		0.66
6.00	0.69		0.69
6.25	0.74		0.74
6.50	0.81		0.81
6.75	0.89		0.89
7.00	0.97		0.97
7.25	1.05		1.05
7.50	1.10		1.10
7.75	1.12		1.12
8.00	1.15		1.15
8.25	1.17		1.17
8.50	1.19		1.19
8.75	1.21		1.21
9.00	1.23		1.23
9.25	1.25		1.25
9.50	1.26		1.26
9.75	1.29		1.29
10.00	1.37		1.37
10.25	1.45		1.45
10.50	1.54		1.54
10.75	1.62		1.62
11.00	1.71		1.71
11.25	1.80		1.80
11.50	1.89		1.89
11.75	1.98		1.98
12.00	2.07		2.07
12.25	2.16		2.16
12.50	2.25		2.25
12.75	2.34		2.34
13.00	2.43		2.43
13.25	2.52		2.52
13.50	2.83		2.83
13.75	3.24		3.24
14.00	3.64		3.64
14.25	4.06		4.06
14.50	4.46		4.46
14.75	4.61		4.61
15.00	4.72		4.72
15.25	4.82		4.82
15.50	**4.92**		**4.92**
15.75	**4.96**		**4.96**
16.00	4.67		4.67
16.25	4.36		4.36
16.50	4.05		4.05
16.75	3.74		3.74
17.00	3.44		3.44
17.25	3.20		3.20
17.50	2.96		2.96
17.75	2.72		2.72
18.00	2.48		2.48
18.25	2.28		2.28
18.50	2.12		2.12
18.75	1.95		1.95
19.00	1.79		1.79
19.25	1.63		1.63
19.50	1.52		1.52
19.75	1.44		1.44
20.00	1.36		1.36
20.25	1.28		1.28
20.50	1.20		1.20
20.75	1.19		1.19
21.00	1.19		1.19
21.25	1.19		1.19
21.50	1.19		1.19
21.75	1.18		1.18
22.00	1.10		1.10
22.25	1.02		1.02
22.50	0.93		0.93
22.75	0.85		0.85
23.00	0.82		0.82
23.25	0.90		0.90
23.50	0.99		0.99
23.75	1.07		1.07
24.00	1.15		1.15

Summary for Reach T: Total

Inflow Area = 100.393 ac, 0.41% Impervious, Inflow Depth > 6.97" for 100-year event
Inflow = 86.46 cfs @ 16.01 hrs, Volume= 58.350 af
Outflow = 86.46 cfs @ 16.01 hrs, Volume= 58.350 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach T: Total



Hydrograph for Reach T: Total

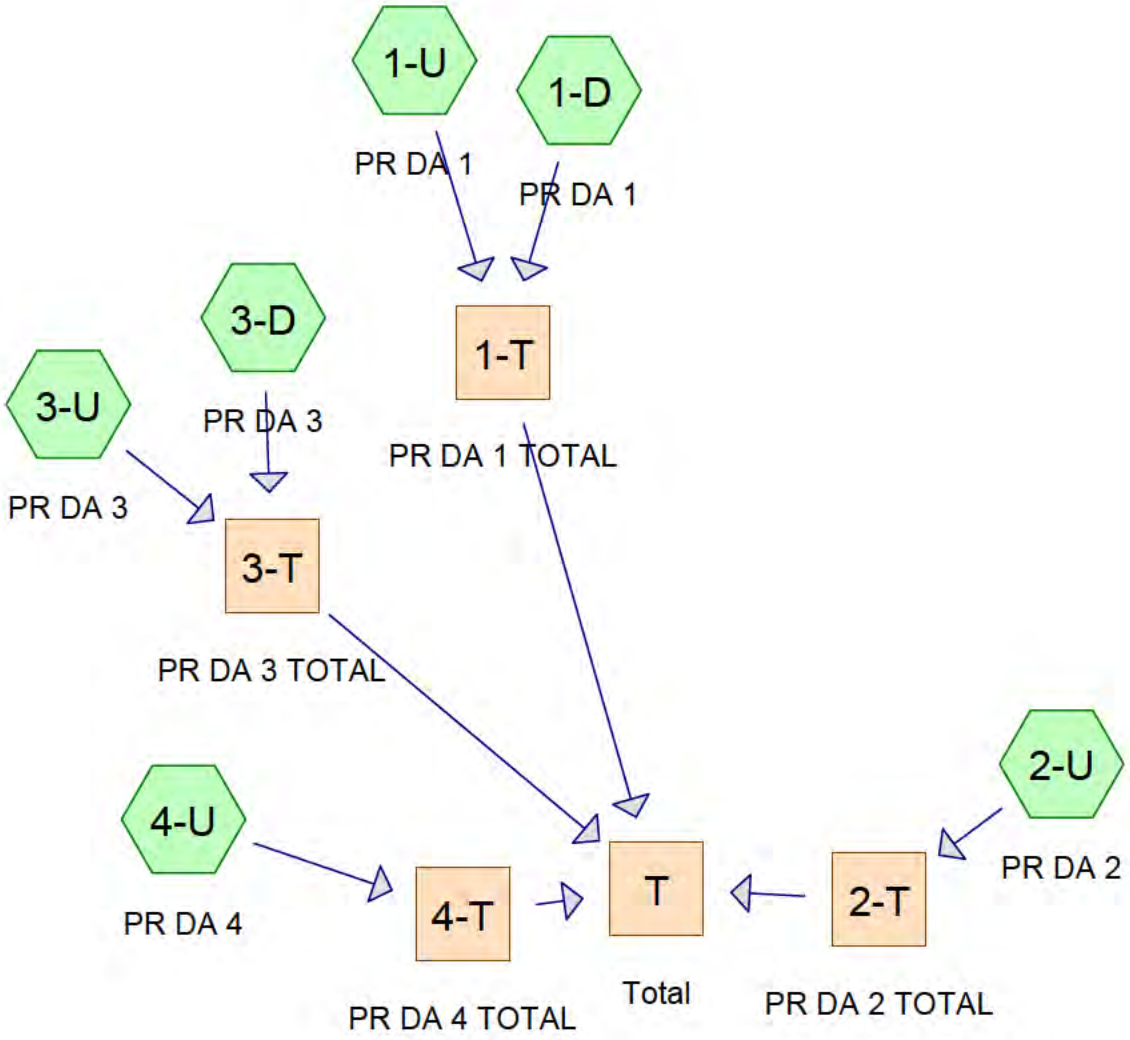
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	40.67		40.67
0.25	0.00		0.00	13.25	42.27		42.27
0.50	0.00		0.00	13.50	44.42		44.42
0.75	0.00		0.00	13.75	47.86		47.86
1.00	0.00		0.00	14.00	52.30		52.30
1.25	0.00		0.00	14.25	57.78		57.78
1.50	0.00		0.00	14.50	64.03		64.03
1.75	0.00		0.00	14.75	70.03		70.03
2.00	0.01		0.01	15.00	75.12		75.12
2.25	0.23		0.23	15.25	79.39		79.39
2.50	0.84		0.84	15.50	82.76		82.76
2.75	1.68		1.68	15.75	85.46		85.46
3.00	2.68		2.68	16.00	**86.46**		**86.46**
3.25	3.78		3.78	16.25	85.60		85.60
3.50	4.88		4.88	16.50	83.39		83.39
3.75	5.93		5.93	16.75	79.87		79.87
4.00	6.92		6.92	17.00	75.41		75.41
4.25	7.84		7.84	17.25	70.76		70.76
4.50	8.69		8.69	17.50	66.02		66.02
4.75	9.47		9.47	17.75	61.30		61.30
5.00	10.19		10.19	18.00	56.75		56.75
5.25	10.84		10.84	18.25	52.30		52.30
5.50	11.45		11.45	18.50	48.21		48.21
5.75	12.01		12.01	18.75	44.47		44.47
6.00	12.52		12.52	19.00	40.95		40.95
6.25	13.06		13.06	19.25	37.63		37.63
6.50	13.77		13.77	19.50	34.64		34.64
6.75	14.67		14.67	19.75	32.02		32.02
7.00	15.75		15.75	20.00	29.72		29.72
7.25	16.98		16.98	20.25	27.73		27.73
7.50	18.23		18.23	20.50	25.92		25.92
7.75	19.33		19.33	20.75	24.45		24.45
8.00	20.24		20.24	21.00	23.41		23.41
8.25	20.98		20.98	21.25	22.65		22.65
8.50	21.59		21.59	21.50	22.16		22.16
8.75	22.07		22.07	21.75	21.88		21.88
9.00	22.49		22.49	22.00	21.44		21.44
9.25	22.87		22.87	22.25	20.76		20.76
9.50	23.18		23.18	22.50	19.87		19.87
9.75	23.50		23.50	22.75	18.76		18.76
10.00	24.02		24.02	23.00	17.57		17.57
10.25	24.76		24.76	23.25	16.91		16.91
10.50	25.74		25.74	23.50	16.77		16.77
10.75	26.93		26.93	23.75	17.11		17.11
11.00	28.25		28.25	24.00	17.90		17.90
11.25	29.68		29.68				
11.50	31.18		31.18				
11.75	32.70		32.70				
12.00	34.27		34.27				
12.25	35.85		35.85				
12.50	37.43		37.43				
12.75	39.04		39.04				

APPENDIX D-2

HYDROCAD REPORT FOR
2-YEAR & 100-YEARSTORM EVENT

POST-DEVELOPMENT CONDITION
WITHOUT STORMWATER BASINS

TABLE OF CONTENTS



Subcat Reach Pond Link

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Huff 0-10sm	3Q	Scale	24.00	1	3.34	2
2	100-year	Huff 0-10sm	3Q	Scale	24.00	1	8.57	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.373	98	Impervious Area (1-D, 1-U, 2-U, 3-D)
11.437	74	Pasture/grassland/range, Good, HSG C (1-U, 2-U, 3-U, 4-U)
29.040	80	Pasture/grassland/range, Good, HSG D (1-U, 2-U, 3-U, 4-U)
20.897	85	Row crops, straight row, Good, HSG C (1-U, 2-U, 3-U, 4-U)
37.458	89	Row crops, straight row, Good, HSG D (1-U, 2-U, 3-U, 4-U)
100.205	**84**	**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1-D: PR DA 1 Runoff Area=0.323 ac 100.00% Impervious Runoff Depth>3.10"
Flow Length=459' Tc=9.8 min CN=98 Runoff=0.12 cfs 0.083 af

Subcatchment1-U: PR DA 1 Runoff Area=3.806 ac 2.26% Impervious Runoff Depth>1.72"
Flow Length=459' Tc=9.8 min CN=83 Runoff=0.99 cfs 0.544 af

Subcatchment2-U: PR DA 2 Runoff Area=62.154 ac 0.50% Impervious Runoff Depth>1.88"
Flow Length=3,331' Tc=78.0 min CN=86 Runoff=16.64 cfs 9.755 af

Subcatchment3-D: PR DA 3 Runoff Area=0.651 ac 100.00% Impervious Runoff Depth>3.09"
Flow Length=1,305' Tc=17.6 min CN=98 Runoff=0.24 cfs 0.167 af

Subcatchment3-U: PR DA 3 Runoff Area=21.569 ac 0.00% Impervious Runoff Depth>1.56"
Flow Length=1,305' Tc=17.6 min CN=81 Runoff=5.20 cfs 2.811 af

Subcatchment4-U: PR DA 4 Runoff Area=11.702 ac 0.00% Impervious Runoff Depth>1.41"
Flow Length=1,661' Tc=33.8 min CN=79 Runoff=2.58 cfs 1.378 af

Reach 1-T: PR DA 1 TOTAL Inflow=1.11 cfs 0.628 af
Outflow=1.11 cfs 0.628 af

Reach 2-T: PR DA 2 TOTAL Inflow=16.64 cfs 9.755 af
Outflow=16.64 cfs 9.755 af

Reach 3-T: PR DA 3 TOTAL Inflow=5.44 cfs 2.979 af
Outflow=5.44 cfs 2.979 af

Reach 4-T: PR DA 4 TOTAL Inflow=2.58 cfs 1.378 af
Outflow=2.58 cfs 1.378 af

Reach T: Total Inflow=24.99 cfs 14.740 af
Outflow=24.99 cfs 14.740 af

Total Runoff Area = 100.205 ac Runoff Volume = 14.740 af Average Runoff Depth = 1.77"
98.63% Pervious = 98.832 ac 1.37% Impervious = 1.373 ac

Summary for Subcatchment 1-D: PR DA 1

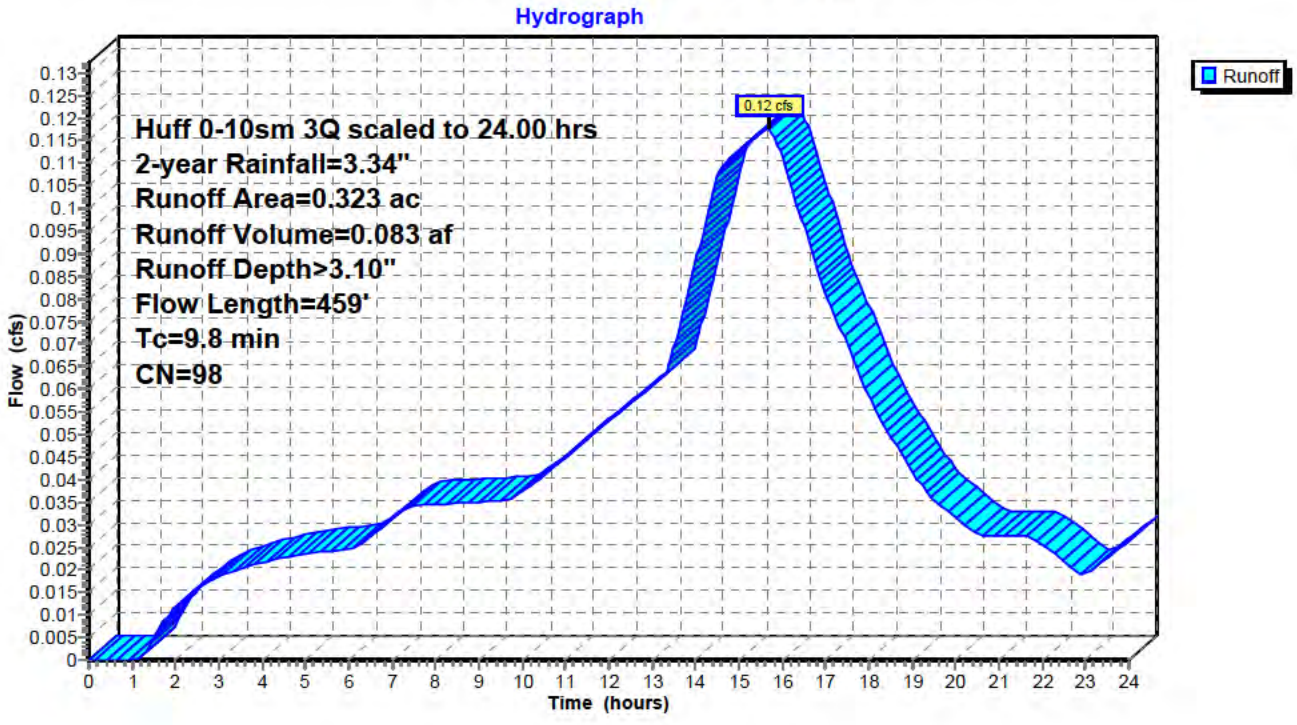
Runoff = 0.12 cfs @ 15.69 hrs, Volume= 0.083 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

	Area (ac)	CN	Description
*	0.323	98	Impervious Area
	0.323		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.9	171	0.0290	1.53		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.2	16	0.0380	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	172	0.0122	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.8	459	Total			

Subcatchment 1-D: PR DA 1



Hydrograph for Subcatchment 1-D: PR DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.37	1.15	0.06
0.25	0.00	0.00	0.00	13.25	1.42	1.20	0.06
0.50	0.01	0.00	0.00	13.50	1.47	1.25	0.07
0.75	0.02	0.00	0.00	13.75	1.53	1.31	0.08
1.00	0.04	0.00	0.00	14.00	1.60	1.38	0.09
1.25	0.06	0.00	0.00	14.25	1.68	1.46	0.10
1.50	0.08	0.01	0.01	14.50	1.76	1.54	0.11
1.75	0.10	0.01	0.01	14.75	1.85	1.63	0.11
2.00	0.12	0.02	0.01	15.00	1.94	1.71	0.11
2.25	0.14	0.03	0.01	15.25	2.03	1.80	0.11
2.50	0.16	0.04	0.02	15.50	2.12	1.89	**0.12**
2.75	0.18	0.06	0.02	15.75	2.21	1.98	**0.12**
3.00	0.20	0.07	0.02	16.00	2.29	2.06	0.11
3.25	0.22	0.09	0.02	16.25	2.37	2.14	0.10
3.50	0.25	0.10	0.02	16.50	2.45	2.22	0.10
3.75	0.27	0.12	0.02	16.75	2.51	2.28	0.09
4.00	0.29	0.14	0.02	17.00	2.58	2.35	0.08
4.25	0.31	0.15	0.02	17.25	2.63	2.40	0.08
4.50	0.33	0.17	0.02	17.50	2.69	2.46	0.07
4.75	0.35	0.19	0.02	17.75	2.74	2.51	0.06
5.00	0.37	0.21	0.02	18.00	2.78	2.55	0.06
5.25	0.39	0.22	0.02	18.25	2.82	2.59	0.05
5.50	0.42	0.24	0.02	18.50	2.86	2.63	0.05
5.75	0.44	0.26	0.02	18.75	2.89	2.66	0.05
6.00	0.46	0.28	0.02	19.00	2.93	2.70	0.04
6.25	0.48	0.30	0.03	19.25	2.96	2.72	0.04
6.50	0.50	0.32	0.03	19.50	2.98	2.75	0.04
6.75	0.53	0.34	0.03	19.75	3.01	2.78	0.03
7.00	0.55	0.37	0.03	20.00	3.03	2.80	0.03
7.25	0.58	0.39	0.03	20.25	3.06	2.82	0.03
7.50	0.61	0.42	0.03	20.50	3.08	2.85	0.03
7.75	0.64	0.45	0.03	20.75	3.10	2.87	0.03
8.00	0.67	0.47	0.03	21.00	3.12	2.89	0.03
8.25	0.70	0.50	0.03	21.25	3.14	2.91	0.03
8.50	0.72	0.53	0.03	21.50	3.16	2.93	0.03
8.75	0.75	0.55	0.03	21.75	3.18	2.95	0.03
9.00	0.78	0.58	0.04	22.00	3.20	2.97	0.03
9.25	0.81	0.61	0.04	22.25	3.22	2.99	0.02
9.50	0.84	0.63	0.04	22.50	3.24	3.00	0.02
9.75	0.86	0.66	0.04	22.75	3.25	3.02	0.02
10.00	0.89	0.69	0.04	23.00	3.27	3.03	0.02
10.25	0.93	0.72	0.04	23.25	3.28	3.05	0.02
10.50	0.96	0.75	0.04	23.50	3.30	3.07	0.02
10.75	0.99	0.78	0.04	23.75	3.32	3.09	0.02
11.00	1.03	0.82	0.04	24.00	**3.34**	**3.11**	0.03
11.25	1.07	0.86	0.05				
11.50	1.10	0.89	0.05				
11.75	1.15	0.93	0.05				
12.00	1.19	0.97	0.05				
12.25	1.23	1.01	0.05				
12.50	1.27	1.06	0.06				
12.75	1.32	1.10	0.06				

Summary for Subcatchment 1-U: PR DA 1

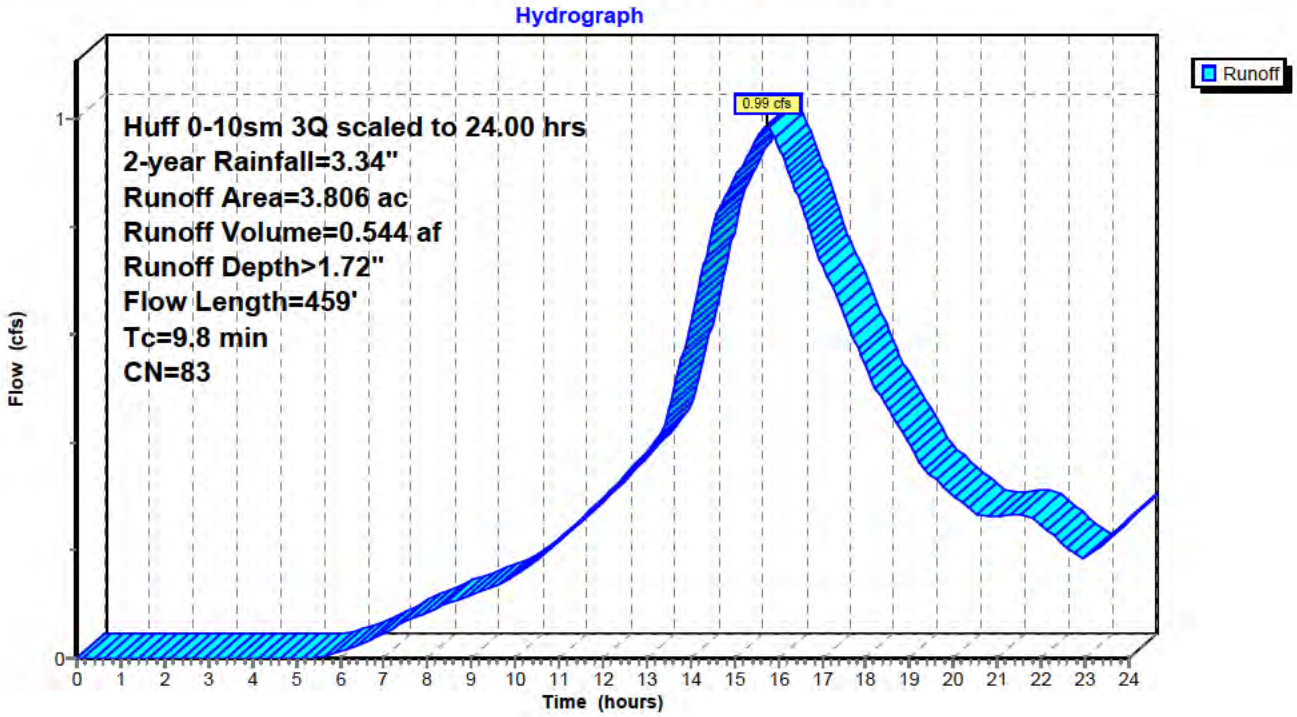
Runoff = 0.99 cfs @ 15.73 hrs, Volume= 0.544 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

	Area (ac)	CN	Description
	0.000	89	Row crops, straight row, Good, HSG D
	0.753	89	Row crops, straight row, Good, HSG D
	0.711	80	Pasture/grassland/range, Good, HSG D
	1.342	85	Row crops, straight row, Good, HSG C
	0.914	74	Pasture/grassland/range, Good, HSG C
*	0.086	98	Impervious Area
	3.806	83	Weighted Average
	3.720		97.74% Pervious Area
	0.086		2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.9	171	0.0290	1.53		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.2	16	0.0380	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	172	0.0122	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.8	459	Total			

Subcatchment 1-U: PR DA 1



Hydrograph for Subcatchment 1-U: PR DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.37	0.31	0.38
0.25	0.00	0.00	0.00	13.25	1.42	0.33	0.41
0.50	0.01	0.00	0.00	13.50	1.47	0.36	0.46
0.75	0.02	0.00	0.00	13.75	1.53	0.40	0.54
1.00	0.04	0.00	0.00	14.00	1.60	0.44	0.62
1.25	0.06	0.00	0.00	14.25	1.68	0.49	0.71
1.50	0.08	0.00	0.00	14.50	1.76	0.54	0.80
1.75	0.10	0.00	0.00	14.75	1.85	0.59	0.85
2.00	0.12	0.00	0.00	15.00	1.94	0.65	0.89
2.25	0.14	0.00	0.00	15.25	2.03	0.71	0.93
2.50	0.16	0.00	0.00	15.50	2.12	0.78	0.96
2.75	0.18	0.00	0.00	15.75	2.21	0.84	**0.99**
3.00	0.20	0.00	0.00	16.00	2.29	0.90	0.95
3.25	0.22	0.00	0.00	16.25	2.37	0.96	0.90
3.50	0.25	0.00	0.00	16.50	2.45	1.01	0.85
3.75	0.27	0.00	0.00	16.75	2.51	1.07	0.79
4.00	0.29	0.00	0.00	17.00	2.58	1.11	0.73
4.25	0.31	0.00	0.00	17.25	2.63	1.16	0.69
4.50	0.33	0.00	0.00	17.50	2.69	1.20	0.64
4.75	0.35	0.00	0.00	17.75	2.74	1.24	0.59
5.00	0.37	0.00	0.00	18.00	2.78	1.27	0.54
5.25	0.39	0.00	0.00	18.25	2.82	1.30	0.50
5.50	0.42	0.00	0.00	18.50	2.86	1.33	0.46
5.75	0.44	0.00	0.00	18.75	2.89	1.36	0.43
6.00	0.46	0.00	0.01	19.00	2.93	1.39	0.40
6.25	0.48	0.00	0.02	19.25	2.96	1.41	0.36
6.50	0.50	0.00	0.03	19.50	2.98	1.43	0.34
6.75	0.53	0.01	0.04	19.75	3.01	1.45	0.32
7.00	0.55	0.01	0.05	20.00	3.03	1.47	0.30
7.25	0.58	0.01	0.06	20.25	3.06	1.49	0.29
7.50	0.61	0.02	0.07	20.50	3.08	1.51	0.27
7.75	0.64	0.02	0.08	20.75	3.10	1.53	0.26
8.00	0.67	0.03	0.09	21.00	3.12	1.54	0.26
8.25	0.70	0.03	0.09	21.25	3.14	1.56	0.27
8.50	0.72	0.04	0.10	21.50	3.16	1.58	0.27
8.75	0.75	0.05	0.11	21.75	3.18	1.60	0.26
9.00	0.78	0.06	0.12	22.00	3.20	1.61	0.25
9.25	0.81	0.06	0.13	22.25	3.22	1.63	0.23
9.50	0.84	0.07	0.13	22.50	3.24	1.64	0.21
9.75	0.86	0.08	0.14	22.75	3.25	1.65	0.19
10.00	0.89	0.09	0.15	23.00	3.27	1.66	0.18
10.25	0.93	0.10	0.17	23.25	3.28	1.68	0.20
10.50	0.96	0.12	0.18	23.50	3.30	1.69	0.22
10.75	0.99	0.13	0.20	23.75	3.32	1.71	0.24
11.00	1.03	0.14	0.22	24.00	**3.34**	**1.72**	0.26
11.25	1.07	0.16	0.24				
11.50	1.10	0.18	0.26				
11.75	1.15	0.19	0.28				
12.00	1.19	0.21	0.30				
12.25	1.23	0.23	0.32				
12.50	1.27	0.26	0.34				
12.75	1.32	0.28	0.36				

Summary for Subcatchment 2-U: PR DA 2

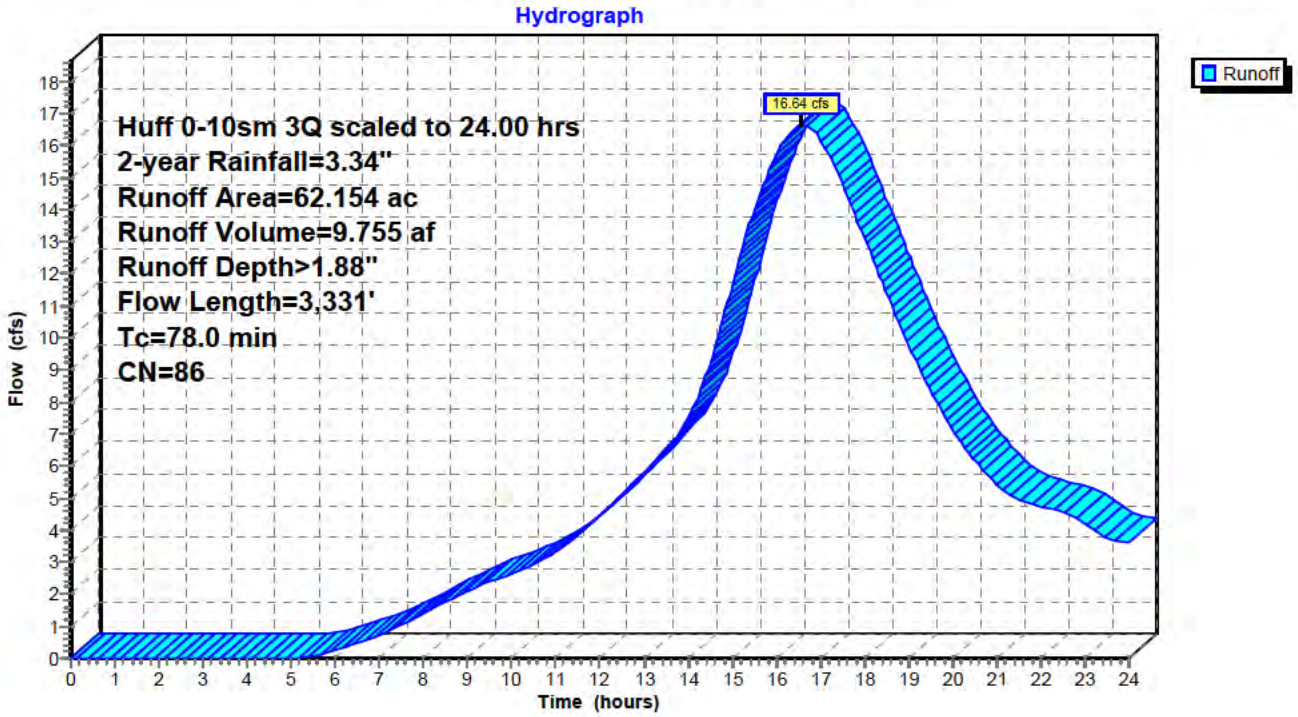
Runoff = 16.64 cfs @ 16.57 hrs, Volume= 9.755 af, Depth> 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

	Area (ac)	CN	Description
	11.052	89	Row crops, straight row, Good, HSG D
	2.151	80	Pasture/grassland/range, Good, HSG D
	0.061	89	Row crops, straight row, Good, HSG D
	10.906	89	Row crops, straight row, Good, HSG D
	8.457	80	Pasture/grassland/range, Good, HSG D
	9.982	89	Row crops, straight row, Good, HSG D
	0.038	80	Pasture/grassland/range, Good, HSG D
	14.843	85	Row crops, straight row, Good, HSG C
	2.519	74	Pasture/grassland/range, Good, HSG C
	0.830	85	Row crops, straight row, Good, HSG C
	1.002	74	Pasture/grassland/range, Good, HSG C
*	0.313	98	Impervious Area
	62.154	86	Weighted Average
	61.841		99.50% Pervious Area
	0.313		0.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.0421	0.49		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.5	141	0.0306	1.57		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
42.0	1,988	0.0077	0.79		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
31.1	1,102	0.0071	0.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
78.0	3,331	Total			

Subcatchment 2-U: PR DA 2



Hydrograph for Subcatchment 2-U: PR DA 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00
0.50	0.01	0.00	0.00
0.75	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.06	0.00	0.00
1.50	0.08	0.00	0.00
1.75	0.10	0.00	0.00
2.00	0.12	0.00	0.00
2.25	0.14	0.00	0.00
2.50	0.16	0.00	0.00
2.75	0.18	0.00	0.00
3.00	0.20	0.00	0.00
3.25	0.22	0.00	0.00
3.50	0.25	0.00	0.00
3.75	0.27	0.00	0.00
4.00	0.29	0.00	0.00
4.25	0.31	0.00	0.00
4.50	0.33	0.00	0.00
4.75	0.35	0.00	0.00
5.00	0.37	0.00	0.01
5.25	0.39	0.00	0.03
5.50	0.42	0.00	0.08
5.75	0.44	0.01	0.15
6.00	0.46	0.01	0.24
6.25	0.48	0.01	0.35
6.50	0.50	0.02	0.46
6.75	0.53	0.02	0.57
7.00	0.55	0.03	0.71
7.25	0.58	0.03	0.86
7.50	0.61	0.04	1.03
7.75	0.64	0.05	1.22
8.00	0.67	0.06	1.41
8.25	0.70	0.07	1.60
8.50	0.72	0.08	1.78
8.75	0.75	0.09	1.94
9.00	0.78	0.10	2.10
9.25	0.81	0.11	2.24
9.50	0.84	0.12	2.38
9.75	0.86	0.13	2.51
10.00	0.89	0.15	2.64
10.25	0.93	0.16	2.77
10.50	0.96	0.18	2.93
10.75	0.99	0.19	3.11
11.00	1.03	0.21	3.34
11.25	1.07	0.23	3.59
11.50	1.10	0.25	3.86
11.75	1.15	0.27	4.15
12.00	1.19	0.30	4.46
12.25	1.23	0.32	4.78
12.50	1.27	0.35	5.11
12.75	1.32	0.38	5.46
13.00	1.37	0.41	5.80
13.25	1.42	0.44	6.17
13.50	1.47	0.47	6.54
13.75	1.53	0.51	6.96
14.00	1.60	0.56	7.49
14.25	1.68	0.61	8.24
14.50	1.76	0.67	9.21
14.75	1.85	0.74	10.37
15.00	1.94	0.80	11.64
15.25	2.03	0.87	12.86
15.50	2.12	0.94	13.97
15.75	2.21	1.01	14.89
16.00	2.29	1.08	15.69
16.25	2.37	1.14	16.29
16.50	2.45	1.20	**16.60**
16.75	2.51	1.25	**16.58**
17.00	2.58	1.31	16.19
17.25	2.63	1.35	15.59
17.50	2.69	1.40	14.81
17.75	2.74	1.44	13.99
18.00	2.78	1.48	13.13
18.25	2.82	1.51	12.27
18.50	2.86	1.54	11.42
18.75	2.89	1.57	10.58
19.00	2.93	1.60	9.80
19.25	2.96	1.62	9.06
19.50	2.98	1.65	8.38
19.75	3.01	1.67	7.73
20.00	3.03	1.69	7.15
20.25	3.06	1.71	6.62
20.50	3.08	1.73	6.17
20.75	3.10	1.75	5.78
21.00	3.12	1.77	5.43
21.25	3.14	1.78	5.15
21.50	3.16	1.80	4.94
21.75	3.18	1.82	4.81
22.00	3.20	1.84	4.72
22.25	3.22	1.85	4.65
22.50	3.24	1.87	4.55
22.75	3.25	1.88	4.40
23.00	3.27	1.89	4.19
23.25	3.28	1.91	3.95
23.50	3.30	1.92	3.74
23.75	3.32	1.94	3.62
24.00	**3.34**	**1.96**	3.63

Summary for Subcatchment 3-D: PR DA 3

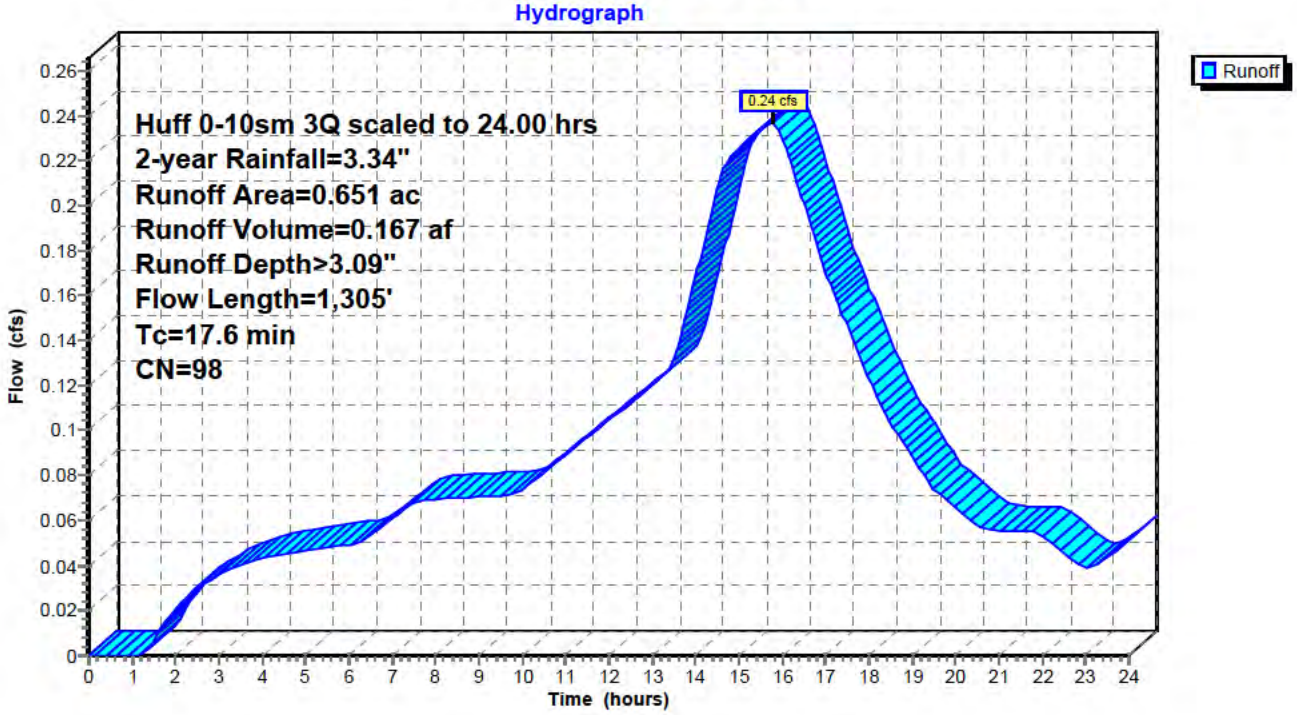
Runoff = 0.24 cfs @ 15.77 hrs, Volume= 0.167 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

	Area (ac)	CN	Description
*	0.651	98	Impervious Area
	0.651		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0081	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
0.6	37	0.0151	1.11		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.8	758	0.0141	7.10	71.03	**Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.3	38	0.0146	2.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.3	372	0.0113	0.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.6	1,305	Total			

Subcatchment 3-D: PR DA 3



Hydrograph for Subcatchment 3-D: PR DA 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00
0.50	0.01	0.00	0.00
0.75	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.06	0.00	0.00
1.50	0.08	0.01	0.01
1.75	0.10	0.01	0.01
2.00	0.12	0.02	0.02
2.25	0.14	0.03	0.03
2.50	0.16	0.04	0.03
2.75	0.18	0.06	0.03
3.00	0.20	0.07	0.04
3.25	0.22	0.09	0.04
3.50	0.25	0.10	0.04
3.75	0.27	0.12	0.04
4.00	0.29	0.14	0.04
4.25	0.31	0.15	0.04
4.50	0.33	0.17	0.05
4.75	0.35	0.19	0.05
5.00	0.37	0.21	0.05
5.25	0.39	0.22	0.05
5.50	0.42	0.24	0.05
5.75	0.44	0.26	0.05
6.00	0.46	0.28	0.05
6.25	0.48	0.30	0.05
6.50	0.50	0.32	0.05
6.75	0.53	0.34	0.06
7.00	0.55	0.37	0.06
7.25	0.58	0.39	0.06
7.50	0.61	0.42	0.07
7.75	0.64	0.45	0.07
8.00	0.67	0.47	0.07
8.25	0.70	0.50	0.07
8.50	0.72	0.53	0.07
8.75	0.75	0.55	0.07
9.00	0.78	0.58	0.07
9.25	0.81	0.61	0.07
9.50	0.84	0.63	0.07
9.75	0.86	0.66	0.07
10.00	0.89	0.69	0.07
10.25	0.93	0.72	0.08
10.50	0.96	0.75	0.08
10.75	0.99	0.78	0.08
11.00	1.03	0.82	0.09
11.25	1.07	0.86	0.09
11.50	1.10	0.89	0.10
11.75	1.15	0.93	0.10
12.00	1.19	0.97	0.10
12.25	1.23	1.01	0.11
12.50	1.27	1.06	0.11
12.75	1.32	1.10	0.12
13.00	1.37	1.15	0.12
13.25	1.42	1.20	0.12
13.50	1.47	1.25	0.13
13.75	1.53	1.31	0.15
14.00	1.60	1.38	0.17
14.25	1.68	1.46	0.19
14.50	1.76	1.54	0.21
14.75	1.85	1.63	0.22
15.00	1.94	1.71	0.23
15.25	2.03	1.80	0.23
15.50	2.12	1.89	0.23
15.75	2.21	1.98	**0.24**
16.00	2.29	2.06	0.23
16.25	2.37	2.14	0.22
16.50	2.45	2.22	0.20
16.75	2.51	2.28	0.19
17.00	2.58	2.35	0.17
17.25	2.63	2.40	0.16
17.50	2.69	2.46	0.15
17.75	2.74	2.51	0.13
18.00	2.78	2.55	0.12
18.25	2.82	2.59	0.11
18.50	2.86	2.63	0.10
18.75	2.89	2.66	0.10
19.00	2.93	2.70	0.09
19.25	2.96	2.72	0.08
19.50	2.98	2.75	0.07
19.75	3.01	2.78	0.07
20.00	3.03	2.80	0.07
20.25	3.06	2.82	0.06
20.50	3.08	2.85	0.06
20.75	3.10	2.87	0.06
21.00	3.12	2.89	0.06
21.25	3.14	2.91	0.06
21.50	3.16	2.93	0.06
21.75	3.18	2.95	0.06
22.00	3.20	2.97	0.05
22.25	3.22	2.99	0.05
22.50	3.24	3.00	0.05
22.75	3.25	3.02	0.04
23.00	3.27	3.03	0.04
23.25	3.28	3.05	0.04
23.50	3.30	3.07	0.04
23.75	3.32	3.09	0.05
24.00	**3.34**	**3.11**	0.05

Summary for Subcatchment 3-U: PR DA 3

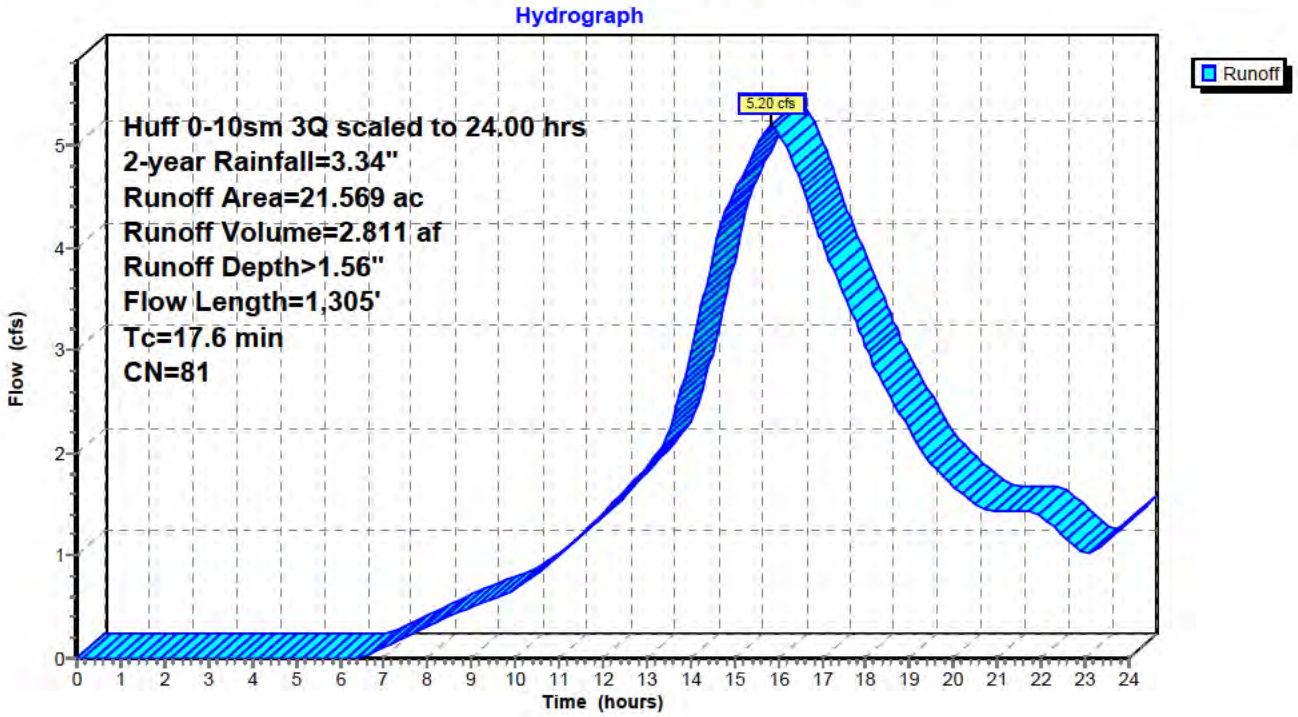
Runoff = 5.20 cfs @ 15.84 hrs, Volume= 2.811 af, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

Area (ac)	CN	Description
3.171	89	Row crops, straight row, Good, HSG D
4.736	80	Pasture/grassland/range, Good, HSG D
1.134	89	Row crops, straight row, Good, HSG D
5.352	80	Pasture/grassland/range, Good, HSG D
3.187	85	Row crops, straight row, Good, HSG C
3.989	74	Pasture/grassland/range, Good, HSG C
21.569	81	Weighted Average
21.569		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0081	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
0.6	37	0.0151	1.11		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.8	758	0.0141	7.10	71.03	**Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.3	38	0.0146	2.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.3	372	0.0113	0.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.6	1,305	Total			

Subcatchment 3-U: PR DA 3



Hydrograph for Subcatchment 3-U: PR DA 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00
0.50	0.01	0.00	0.00
0.75	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.06	0.00	0.00
1.50	0.08	0.00	0.00
1.75	0.10	0.00	0.00
2.00	0.12	0.00	0.00
2.25	0.14	0.00	0.00
2.50	0.16	0.00	0.00
2.75	0.18	0.00	0.00
3.00	0.20	0.00	0.00
3.25	0.22	0.00	0.00
3.50	0.25	0.00	0.00
3.75	0.27	0.00	0.00
4.00	0.29	0.00	0.00
4.25	0.31	0.00	0.00
4.50	0.33	0.00	0.00
4.75	0.35	0.00	0.00
5.00	0.37	0.00	0.00
5.25	0.39	0.00	0.00
5.50	0.42	0.00	0.00
5.75	0.44	0.00	0.00
6.00	0.46	0.00	0.00
6.25	0.48	0.00	0.00
6.50	0.50	0.00	0.02
6.75	0.53	0.00	0.06
7.00	0.55	0.00	0.10
7.25	0.58	0.01	0.16
7.50	0.61	0.01	0.21
7.75	0.64	0.01	0.27
8.00	0.67	0.02	0.32
8.25	0.70	0.02	0.36
8.50	0.72	0.02	0.41
8.75	0.75	0.03	0.45
9.00	0.78	0.04	0.50
9.25	0.81	0.04	0.54
9.50	0.84	0.05	0.58
9.75	0.86	0.06	0.62
10.00	0.89	0.07	0.68
10.25	0.93	0.07	0.75
10.50	0.96	0.08	0.83
10.75	0.99	0.10	0.91
11.00	1.03	0.11	1.00
11.25	1.07	0.12	1.10
11.50	1.10	0.14	1.20
11.75	1.15	0.15	1.30
12.00	1.19	0.17	1.41
12.25	1.23	0.19	1.52
12.50	1.27	0.21	1.63
12.75	1.32	0.23	1.75
13.00	1.37	0.25	1.87
13.25	1.42	0.27	1.99
13.50	1.47	0.30	2.19
13.75	1.53	0.33	2.55
14.00	1.60	0.37	2.97
14.25	1.68	0.41	3.43
14.50	1.76	0.46	3.91
14.75	1.85	0.51	4.29
15.00	1.94	0.57	4.54
15.25	2.03	0.62	4.76
15.50	2.12	0.68	4.97
15.75	2.21	0.74	**5.17**
16.00	2.29	0.80	**5.14**
16.25	2.37	0.85	4.92
16.50	2.45	0.90	4.65
16.75	2.51	0.95	4.36
17.00	2.58	1.00	4.06
17.25	2.63	1.04	3.80
17.50	2.69	1.08	3.55
17.75	2.74	1.11	3.30
18.00	2.78	1.15	3.04
18.25	2.82	1.18	2.79
18.50	2.86	1.21	2.59
18.75	2.89	1.23	2.41
19.00	2.93	1.26	2.23
19.25	2.96	1.28	2.04
19.50	2.98	1.30	1.88
19.75	3.01	1.32	1.78
20.00	3.03	1.34	1.68
20.25	3.06	1.36	1.59
20.50	3.08	1.37	1.49
20.75	3.10	1.39	1.44
21.00	3.12	1.41	1.43
21.25	3.14	1.42	1.44
21.50	3.16	1.44	1.44
21.75	3.18	1.46	1.44
22.00	3.20	1.47	1.39
22.25	3.22	1.49	1.30
22.50	3.24	1.50	1.20
22.75	3.25	1.51	1.10
23.00	3.27	1.52	1.01
23.25	3.28	1.53	1.05
23.50	3.30	1.55	1.15
23.75	3.32	1.56	1.25
24.00	**3.34**	**1.58**	1.36

Summary for Subcatchment 4-U: PR DA 4

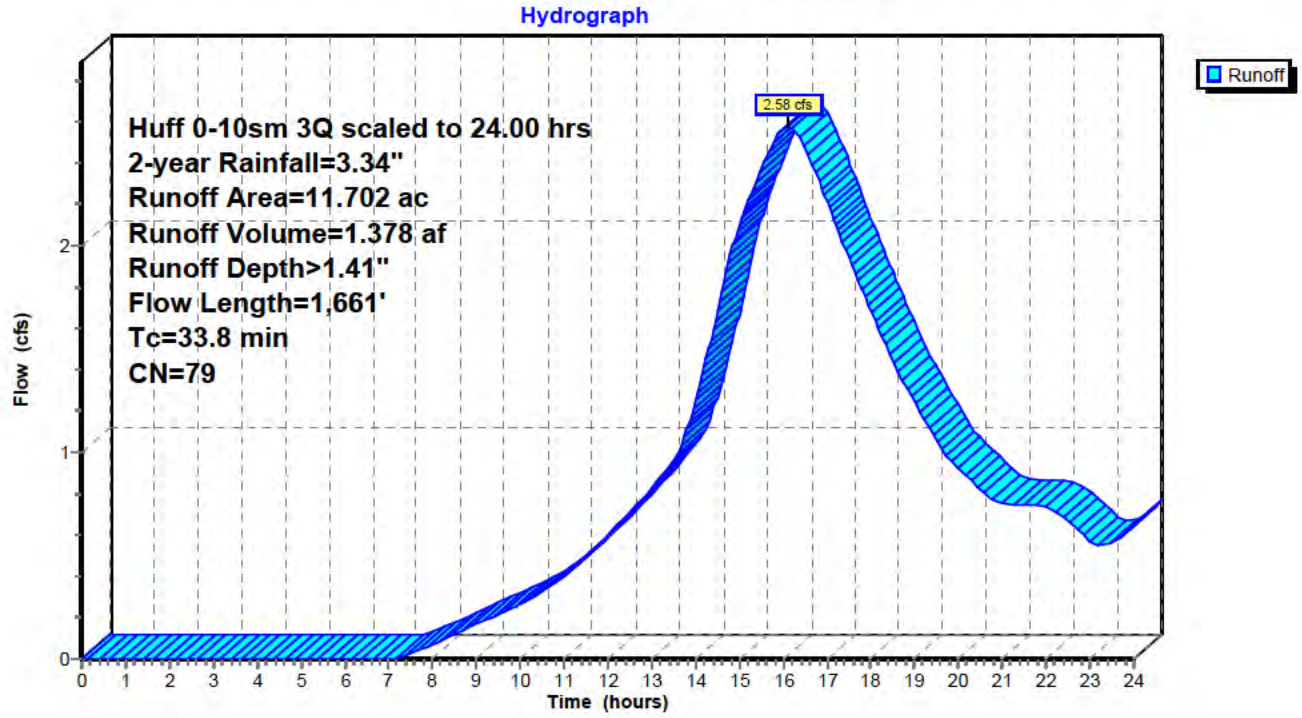
Runoff = 2.58 cfs @ 16.08 hrs, Volume= 1.378 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

Area (ac)	CN	Description
0.399	89	Row crops, straight row, Good, HSG D
4.560	80	Pasture/grassland/range, Good, HSG D
0.000	89	Row crops, straight row, Good, HSG D
3.035	80	Pasture/grassland/range, Good, HSG D
0.695	85	Row crops, straight row, Good, HSG C
3.013	74	Pasture/grassland/range, Good, HSG C
11.702	79	Weighted Average
11.702		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0080	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
2.7	198	0.0180	1.21		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
24.5	1,363	0.0175	0.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
33.8	1,661	Total			

Subcatchment 4-U: PR DA 4



Hydrograph for Subcatchment 4-U: PR DA 4

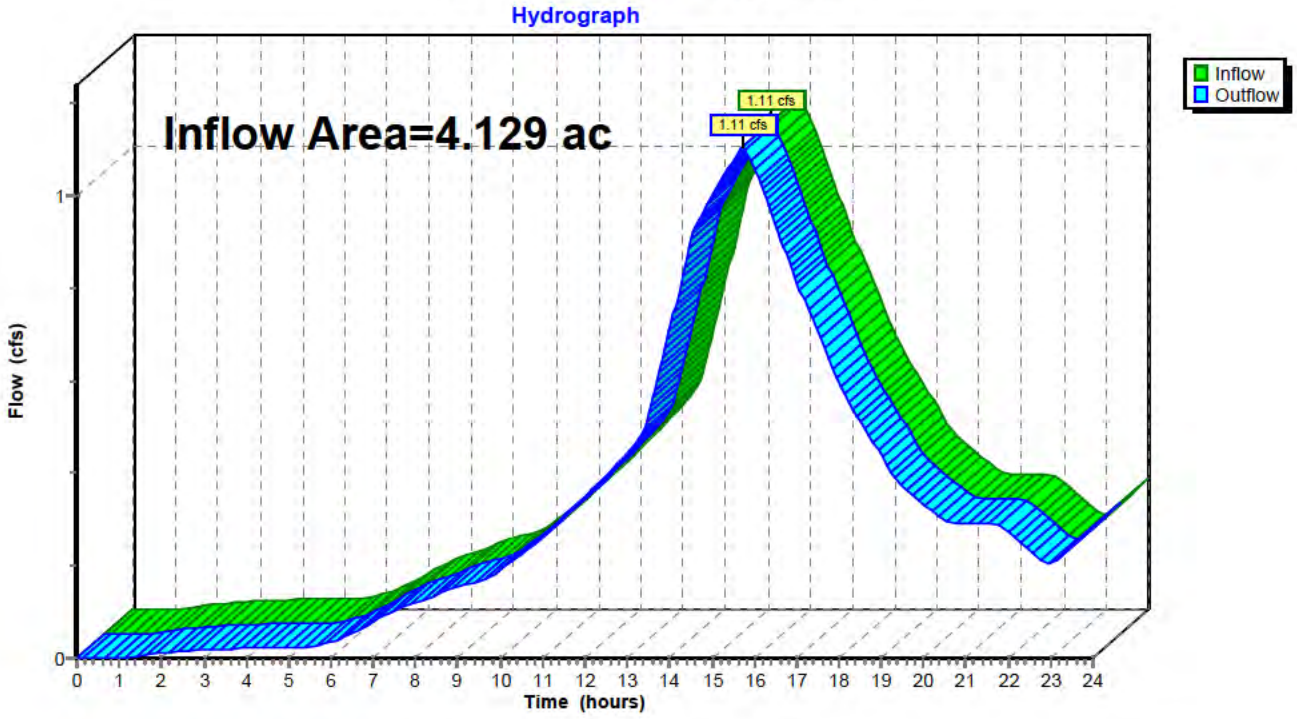
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00
0.50	0.01	0.00	0.00
0.75	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.06	0.00	0.00
1.50	0.08	0.00	0.00
1.75	0.10	0.00	0.00
2.00	0.12	0.00	0.00
2.25	0.14	0.00	0.00
2.50	0.16	0.00	0.00
2.75	0.18	0.00	0.00
3.00	0.20	0.00	0.00
3.25	0.22	0.00	0.00
3.50	0.25	0.00	0.00
3.75	0.27	0.00	0.00
4.00	0.29	0.00	0.00
4.25	0.31	0.00	0.00
4.50	0.33	0.00	0.00
4.75	0.35	0.00	0.00
5.00	0.37	0.00	0.00
5.25	0.39	0.00	0.00
5.50	0.42	0.00	0.00
5.75	0.44	0.00	0.00
6.00	0.46	0.00	0.00
6.25	0.48	0.00	0.00
6.50	0.50	0.00	0.00
6.75	0.53	0.00	0.00
7.00	0.55	0.00	0.00
7.25	0.58	0.00	0.01
7.50	0.61	0.00	0.02
7.75	0.64	0.00	0.05
8.00	0.67	0.01	0.07
8.25	0.70	0.01	0.10
8.50	0.72	0.01	0.12
8.75	0.75	0.02	0.15
9.00	0.78	0.02	0.17
9.25	0.81	0.03	0.19
9.50	0.84	0.03	0.22
9.75	0.86	0.04	0.24
10.00	0.89	0.04	0.26
10.25	0.93	0.05	0.29
10.50	0.96	0.06	0.33
10.75	0.99	0.07	0.36
11.00	1.03	0.08	0.41
11.25	1.07	0.09	0.45
11.50	1.10	0.10	0.50
11.75	1.15	0.12	0.55
12.00	1.19	0.13	0.60
12.25	1.23	0.15	0.65
12.50	1.27	0.16	0.71
12.75	1.32	0.18	0.77
13.00	1.37	0.20	0.83
13.25	1.42	0.22	0.89
13.50	1.47	0.25	0.96
13.75	1.53	0.27	1.08
14.00	1.60	0.31	1.25
14.25	1.68	0.35	1.46
14.50	1.76	0.39	1.68
14.75	1.85	0.44	1.92
15.00	1.94	0.49	2.10
15.25	2.03	0.54	2.24
15.50	2.12	0.59	2.37
15.75	2.21	0.65	2.49
16.00	2.29	0.70	**2.57**
16.25	2.37	0.75	**2.56**
16.50	2.45	0.80	2.47
16.75	2.51	0.85	2.35
17.00	2.58	0.89	2.21
17.25	2.63	0.93	2.07
17.50	2.69	0.97	1.94
17.75	2.74	1.00	1.82
18.00	2.78	1.03	1.69
18.25	2.82	1.06	1.56
18.50	2.86	1.09	1.44
18.75	2.89	1.11	1.34
19.00	2.93	1.14	1.24
19.25	2.96	1.16	1.15
19.50	2.98	1.18	1.06
19.75	3.01	1.19	0.98
20.00	3.03	1.21	0.92
20.25	3.06	1.23	0.87
20.50	3.08	1.25	0.82
20.75	3.10	1.26	0.78
21.00	3.12	1.28	0.75
21.25	3.14	1.29	0.75
21.50	3.16	1.31	0.74
21.75	3.18	1.32	0.75
22.00	3.20	1.34	0.74
22.25	3.22	1.35	0.71
22.50	3.24	1.36	0.67
22.75	3.25	1.38	0.62
23.00	3.27	1.39	0.57
23.25	3.28	1.40	0.54
23.50	3.30	1.41	0.56
23.75	3.32	1.43	0.60
24.00	**3.34**	**1.44**	0.65

Summary for Reach 1-T: PR DA 1 TOTAL

Inflow Area = 4.129 ac, 9.91% Impervious, Inflow Depth > 1.82" for 2-year event
Inflow = 1.11 cfs @ 15.73 hrs, Volume= 0.628 af
Outflow = 1.11 cfs @ 15.73 hrs, Volume= 0.628 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1-T: PR DA 1 TOTAL



Hydrograph for Reach 1-T: PR DA 1 TOTAL

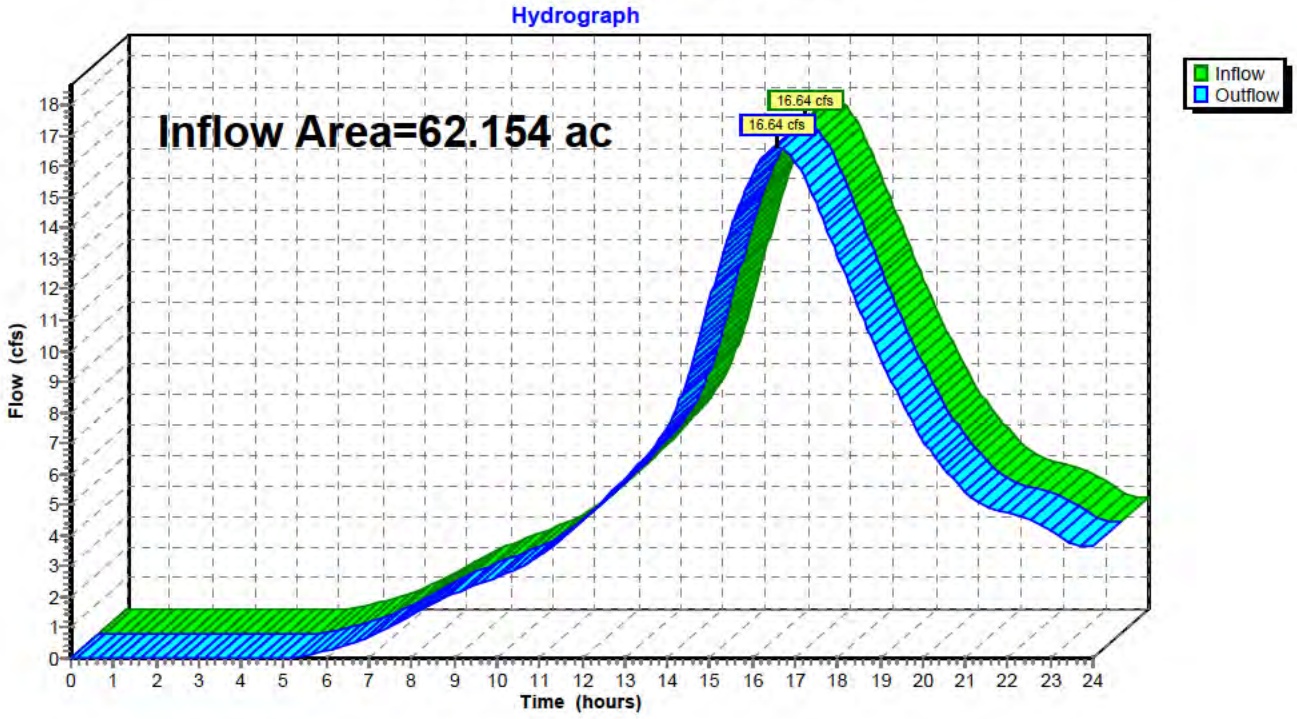
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	0.44		0.44
0.25	0.00		0.00	13.25	0.47		0.47
0.50	0.00		0.00	13.50	0.53		0.53
0.75	0.00		0.00	13.75	0.62		0.62
1.00	0.00		0.00	14.00	0.71		0.71
1.25	0.00		0.00	14.25	0.81		0.81
1.50	0.01		0.01	14.50	0.91		0.91
1.75	0.01		0.01	14.75	0.96		0.96
2.00	0.01		0.01	15.00	1.00		1.00
2.25	0.01		0.01	15.25	1.04		1.04
2.50	0.02		0.02	15.50	1.08		1.08
2.75	0.02		0.02	15.75	**1.11**		**1.11**
3.00	0.02		0.02	16.00	1.06		1.06
3.25	0.02		0.02	16.25	1.00		1.00
3.50	0.02		0.02	16.50	0.94		0.94
3.75	0.02		0.02	16.75	0.88		0.88
4.00	0.02		0.02	17.00	0.81		0.81
4.25	0.02		0.02	17.25	0.76		0.76
4.50	0.02		0.02	17.50	0.71		0.71
4.75	0.02		0.02	17.75	0.65		0.65
5.00	0.02		0.02	18.00	0.60		0.60
5.25	0.02		0.02	18.25	0.55		0.55
5.50	0.02		0.02	18.50	0.51		0.51
5.75	0.03		0.03	18.75	0.48		0.48
6.00	0.04		0.04	19.00	0.44		0.44
6.25	0.04		0.04	19.25	0.40		0.40
6.50	0.05		0.05	19.50	0.37		0.37
6.75	0.06		0.06	19.75	0.35		0.35
7.00	0.08		0.08	20.00	0.33		0.33
7.25	0.09		0.09	20.25	0.31		0.31
7.50	0.10		0.10	20.50	0.30		0.30
7.75	0.11		0.11	20.75	0.29		0.29
8.00	0.12		0.12	21.00	0.29		0.29
8.25	0.13		0.13	21.25	0.29		0.29
8.50	0.14		0.14	21.50	0.29		0.29
8.75	0.15		0.15	21.75	0.29		0.29
9.00	0.15		0.15	22.00	0.27		0.27
9.25	0.16		0.16	22.25	0.25		0.25
9.50	0.17		0.17	22.50	0.23		0.23
9.75	0.18		0.18	22.75	0.21		0.21
10.00	0.19		0.19	23.00	0.20		0.20
10.25	0.21		0.21	23.25	0.22		0.22
10.50	0.23		0.23	23.50	0.24		0.24
10.75	0.24		0.24	23.75	0.26		0.26
11.00	0.26		0.26	24.00	0.28		0.28
11.25	0.28		0.28				
11.50	0.31		0.31				
11.75	0.33		0.33				
12.00	0.35		0.35				
12.25	0.37		0.37				
12.50	0.40		0.40				
12.75	0.42		0.42				

Summary for Reach 2-T: PR DA 2 TOTAL

Inflow Area = 62.154 ac, 0.50% Impervious, Inflow Depth > 1.88" for 2-year event
Inflow = 16.64 cfs @ 16.57 hrs, Volume= 9.755 af
Outflow = 16.64 cfs @ 16.57 hrs, Volume= 9.755 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 2-T: PR DA 2 TOTAL



Hydrograph for Reach 2-T: PR DA 2 TOTAL

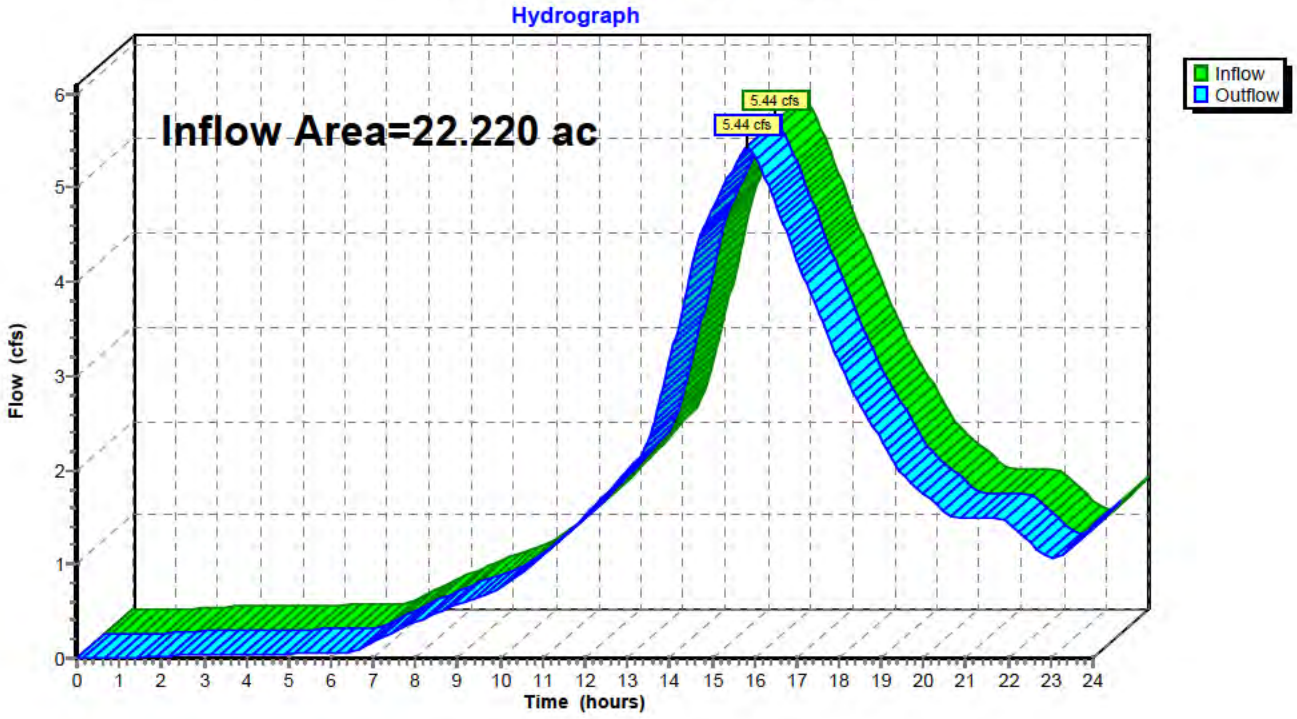
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	5.80		5.80
0.25	0.00		0.00	13.25	6.17		6.17
0.50	0.00		0.00	13.50	6.54		6.54
0.75	0.00		0.00	13.75	6.96		6.96
1.00	0.00		0.00	14.00	7.49		7.49
1.25	0.00		0.00	14.25	8.24		8.24
1.50	0.00		0.00	14.50	9.21		9.21
1.75	0.00		0.00	14.75	10.37		10.37
2.00	0.00		0.00	15.00	11.64		11.64
2.25	0.00		0.00	15.25	12.86		12.86
2.50	0.00		0.00	15.50	13.97		13.97
2.75	0.00		0.00	15.75	14.89		14.89
3.00	0.00		0.00	16.00	15.69		15.69
3.25	0.00		0.00	16.25	16.29		16.29
3.50	0.00		0.00	16.50	**16.60**		**16.60**
3.75	0.00		0.00	16.75	**16.58**		**16.58**
4.00	0.00		0.00	17.00	16.19		16.19
4.25	0.00		0.00	17.25	15.59		15.59
4.50	0.00		0.00	17.50	14.81		14.81
4.75	0.00		0.00	17.75	13.99		13.99
5.00	0.01		0.01	18.00	13.13		13.13
5.25	0.03		0.03	18.25	12.27		12.27
5.50	0.08		0.08	18.50	11.42		11.42
5.75	0.15		0.15	18.75	10.58		10.58
6.00	0.24		0.24	19.00	9.80		9.80
6.25	0.35		0.35	19.25	9.06		9.06
6.50	0.46		0.46	19.50	8.38		8.38
6.75	0.57		0.57	19.75	7.73		7.73
7.00	0.71		0.71	20.00	7.15		7.15
7.25	0.86		0.86	20.25	6.62		6.62
7.50	1.03		1.03	20.50	6.17		6.17
7.75	1.22		1.22	20.75	5.78		5.78
8.00	1.41		1.41	21.00	5.43		5.43
8.25	1.60		1.60	21.25	5.15		5.15
8.50	1.78		1.78	21.50	4.94		4.94
8.75	1.94		1.94	21.75	4.81		4.81
9.00	2.10		2.10	22.00	4.72		4.72
9.25	2.24		2.24	22.25	4.65		4.65
9.50	2.38		2.38	22.50	4.55		4.55
9.75	2.51		2.51	22.75	4.40		4.40
10.00	2.64		2.64	23.00	4.19		4.19
10.25	2.77		2.77	23.25	3.95		3.95
10.50	2.93		2.93	23.50	3.74		3.74
10.75	3.11		3.11	23.75	3.62		3.62
11.00	3.34		3.34	24.00	3.63		3.63
11.25	3.59		3.59				
11.50	3.86		3.86				
11.75	4.15		4.15				
12.00	4.46		4.46				
12.25	4.78		4.78				
12.50	5.11		5.11				
12.75	5.46		5.46				

Summary for Reach 3-T: PR DA 3 TOTAL

Inflow Area = 22.220 ac, 2.93% Impervious, Inflow Depth > 1.61" for 2-year event
Inflow = 5.44 cfs @ 15.84 hrs, Volume= 2.979 af
Outflow = 5.44 cfs @ 15.84 hrs, Volume= 2.979 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3-T: PR DA 3 TOTAL



Hydrograph for Reach 3-T: PR DA 3 TOTAL

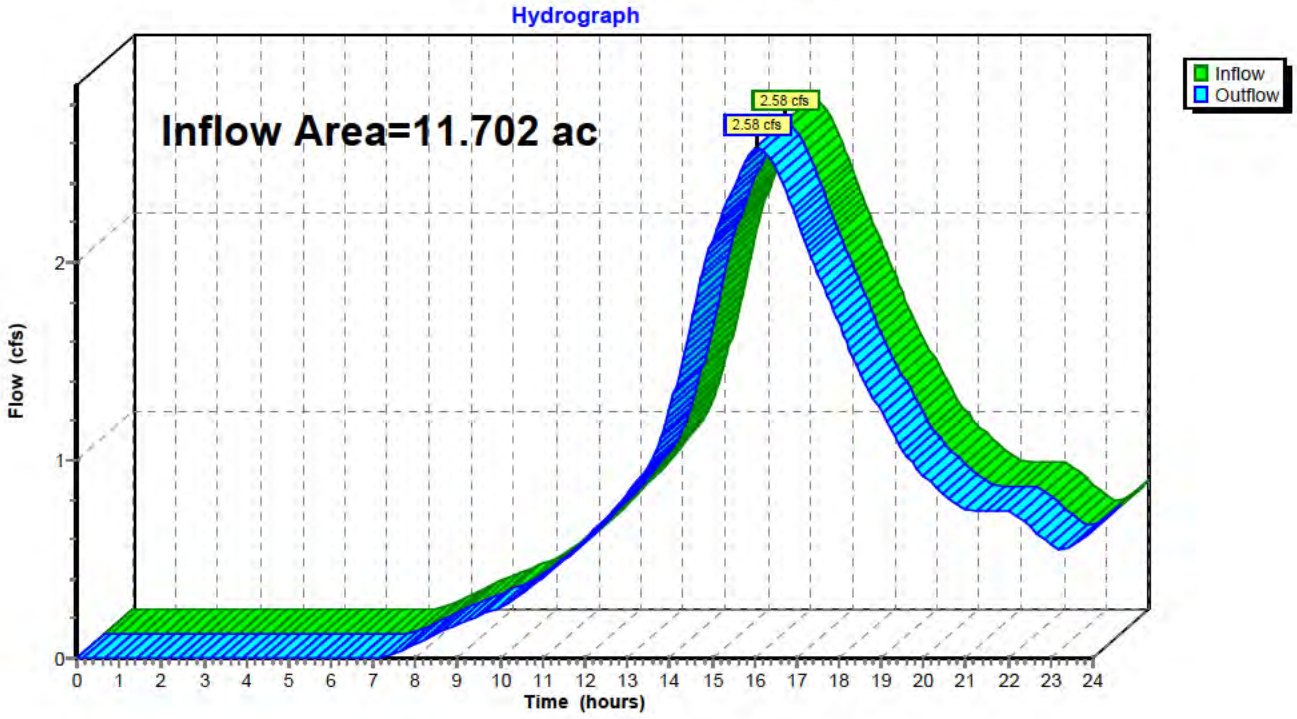
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	1.99		1.99
0.25	0.00		0.00	13.25	2.12		2.12
0.50	0.00		0.00	13.50	2.32		2.32
0.75	0.00		0.00	13.75	2.70		2.70
1.00	0.00		0.00	14.00	3.14		3.14
1.25	0.00		0.00	14.25	3.61		3.61
1.50	0.01		0.01	14.50	4.11		4.11
1.75	0.01		0.01	14.75	4.51		4.51
2.00	0.02		0.02	15.00	4.76		4.76
2.25	0.03		0.03	15.25	4.99		4.99
2.50	0.03		0.03	15.50	5.20		5.20
2.75	0.03		0.03	15.75	**5.41**		**5.41**
3.00	0.04		0.04	16.00	**5.37**		**5.37**
3.25	0.04		0.04	16.25	5.13		5.13
3.50	0.04		0.04	16.50	4.85		4.85
3.75	0.04		0.04	16.75	4.55		4.55
4.00	0.04		0.04	17.00	4.23		4.23
4.25	0.04		0.04	17.25	3.96		3.96
4.50	0.05		0.05	17.50	3.70		3.70
4.75	0.05		0.05	17.75	3.43		3.43
5.00	0.05		0.05	18.00	3.16		3.16
5.25	0.05		0.05	18.25	2.90		2.90
5.50	0.05		0.05	18.50	2.70		2.70
5.75	0.05		0.05	18.75	2.51		2.51
6.00	0.05		0.05	19.00	2.32		2.32
6.25	0.05		0.05	19.25	2.12		2.12
6.50	0.07		0.07	19.50	1.96		1.96
6.75	0.11		0.11	19.75	1.85		1.85
7.00	0.17		0.17	20.00	1.75		1.75
7.25	0.22		0.22	20.25	1.65		1.65
7.50	0.28		0.28	20.50	1.55		1.55
7.75	0.34		0.34	20.75	1.50		1.50
8.00	0.38		0.38	21.00	1.49		1.49
8.25	0.43		0.43	21.25	1.49		1.49
8.50	0.48		0.48	21.50	1.50		1.50
8.75	0.52		0.52	21.75	1.50		1.50
9.00	0.57		0.57	22.00	1.44		1.44
9.25	0.61		0.61	22.25	1.35		1.35
9.50	0.65		0.65	22.50	1.25		1.25
9.75	0.69		0.69	22.75	1.14		1.14
10.00	0.75		0.75	23.00	1.05		1.05
10.25	0.83		0.83	23.25	1.09		1.09
10.50	0.91		0.91	23.50	1.19		1.19
10.75	1.00		1.00	23.75	1.30		1.30
11.00	1.09		1.09	24.00	1.41		1.41
11.25	1.19		1.19				
11.50	1.29		1.29				
11.75	1.40		1.40				
12.00	1.51		1.51				
12.25	1.62		1.62				
12.50	1.74		1.74				
12.75	1.86		1.86				

Summary for Reach 4-T: PR DA 4 TOTAL

Inflow Area = 11.702 ac, 0.00% Impervious, Inflow Depth > 1.41" for 2-year event
Inflow = 2.58 cfs @ 16.08 hrs, Volume= 1.378 af
Outflow = 2.58 cfs @ 16.08 hrs, Volume= 1.378 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4-T: PR DA 4 TOTAL



Hydrograph for Reach 4-T: PR DA 4 TOTAL

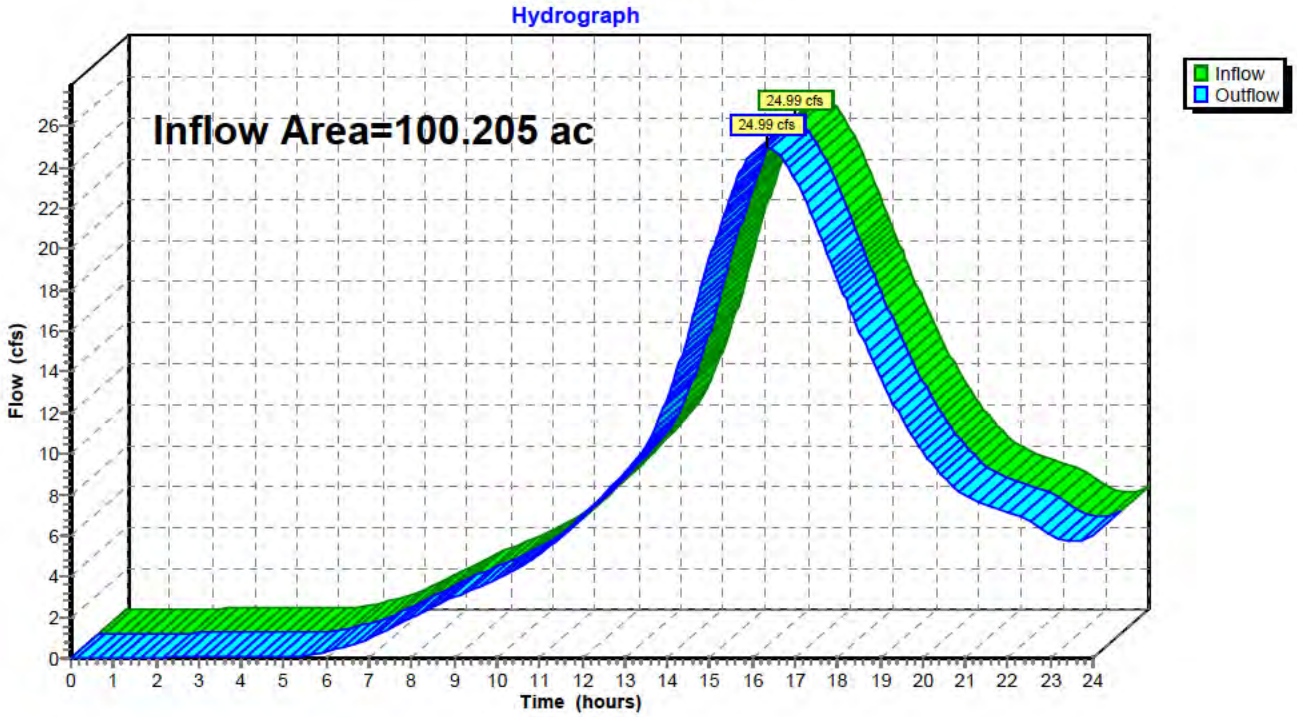
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00
0.25	0.00		0.00
0.50	0.00		0.00
0.75	0.00		0.00
1.00	0.00		0.00
1.25	0.00		0.00
1.50	0.00		0.00
1.75	0.00		0.00
2.00	0.00		0.00
2.25	0.00		0.00
2.50	0.00		0.00
2.75	0.00		0.00
3.00	0.00		0.00
3.25	0.00		0.00
3.50	0.00		0.00
3.75	0.00		0.00
4.00	0.00		0.00
4.25	0.00		0.00
4.50	0.00		0.00
4.75	0.00		0.00
5.00	0.00		0.00
5.25	0.00		0.00
5.50	0.00		0.00
5.75	0.00		0.00
6.00	0.00		0.00
6.25	0.00		0.00
6.50	0.00		0.00
6.75	0.00		0.00
7.00	0.00		0.00
7.25	0.01		0.01
7.50	0.02		0.02
7.75	0.05		0.05
8.00	0.07		0.07
8.25	0.10		0.10
8.50	0.12		0.12
8.75	0.15		0.15
9.00	0.17		0.17
9.25	0.19		0.19
9.50	0.22		0.22
9.75	0.24		0.24
10.00	0.26		0.26
10.25	0.29		0.29
10.50	0.33		0.33
10.75	0.36		0.36
11.00	0.41		0.41
11.25	0.45		0.45
11.50	0.50		0.50
11.75	0.55		0.55
12.00	0.60		0.60
12.25	0.65		0.65
12.50	0.71		0.71
12.75	0.77		0.77
13.00	0.83		0.83
13.25	0.89		0.89
13.50	0.96		0.96
13.75	1.08		1.08
14.00	1.25		1.25
14.25	1.46		1.46
14.50	1.68		1.68
14.75	1.92		1.92
15.00	2.10		2.10
15.25	2.24		2.24
15.50	2.37		2.37
15.75	2.49		2.49
16.00	**2.57**		**2.57**
16.25	**2.56**		**2.56**
16.50	2.47		2.47
16.75	2.35		2.35
17.00	2.21		2.21
17.25	2.07		2.07
17.50	1.94		1.94
17.75	1.82		1.82
18.00	1.69		1.69
18.25	1.56		1.56
18.50	1.44		1.44
18.75	1.34		1.34
19.00	1.24		1.24
19.25	1.15		1.15
19.50	1.06		1.06
19.75	0.98		0.98
20.00	0.92		0.92
20.25	0.87		0.87
20.50	0.82		0.82
20.75	0.78		0.78
21.00	0.75		0.75
21.25	0.75		0.75
21.50	0.74		0.74
21.75	0.75		0.75
22.00	0.74		0.74
22.25	0.71		0.71
22.50	0.67		0.67
22.75	0.62		0.62
23.00	0.57		0.57
23.25	0.54		0.54
23.50	0.56		0.56
23.75	0.60		0.60
24.00	0.65		0.65

Summary for Reach T: Total

Inflow Area = 100.205 ac, 1.37% Impervious, Inflow Depth > 1.77" for 2-year event
Inflow = 24.99 cfs @ 16.34 hrs, Volume= 14.740 af
Outflow = 24.99 cfs @ 16.34 hrs, Volume= 14.740 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach T: Total



Hydrograph for Reach T: Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	9.07		9.07
0.25	0.00		0.00	13.25	9.65		9.65
0.50	0.00		0.00	13.50	10.35		10.35
0.75	0.00		0.00	13.75	11.36		11.36
1.00	0.00		0.00	14.00	12.60		12.60
1.25	0.00		0.00	14.25	14.11		14.11
1.50	0.01		0.01	14.50	15.91		15.91
1.75	0.02		0.02	14.75	17.76		17.76
2.00	0.03		0.03	15.00	19.51		19.51
2.25	0.04		0.04	15.25	21.13		21.13
2.50	0.05		0.05	15.50	22.63		22.63
2.75	0.05		0.05	15.75	23.90		23.90
3.00	0.05		0.05	16.00	24.69		24.69
3.25	0.06		0.06	16.25	**24.98**		**24.98**
3.50	0.06		0.06	16.50	**24.87**		**24.87**
3.75	0.06		0.06	16.75	24.35		24.35
4.00	0.06		0.06	17.00	23.45		23.45
4.25	0.07		0.07	17.25	22.38		22.38
4.50	0.07		0.07	17.50	21.16		21.16
4.75	0.07		0.07	17.75	19.90		19.90
5.00	0.08		0.08	18.00	18.58		18.58
5.25	0.10		0.10	18.25	17.29		17.29
5.50	0.15		0.15	18.50	16.07		16.07
5.75	0.23		0.23	18.75	14.90		14.90
6.00	0.33		0.33	19.00	13.80		13.80
6.25	0.44		0.44	19.25	12.73		12.73
6.50	0.58		0.58	19.50	11.77		11.77
6.75	0.75		0.75	19.75	10.91		10.91
7.00	0.95		0.95	20.00	10.15		10.15
7.25	1.18		1.18	20.25	9.46		9.46
7.50	1.44		1.44	20.50	8.84		8.84
7.75	1.71		1.71	20.75	8.34		8.34
8.00	1.99		1.99	21.00	7.96		7.96
8.25	2.26		2.26	21.25	7.68		7.68
8.50	2.52		2.52	21.50	7.47		7.47
8.75	2.76		2.76	21.75	7.34		7.34
9.00	2.99		2.99	22.00	7.17		7.17
9.25	3.21		3.21	22.25	6.97		6.97
9.50	3.41		3.41	22.50	6.70		6.70
9.75	3.62		3.62	22.75	6.37		6.37
10.00	3.84		3.84	23.00	6.02		6.02
10.25	4.10		4.10	23.25	5.81		5.81
10.50	4.39		4.39	23.50	5.74		5.74
10.75	4.72		4.72	23.75	5.78		5.78
11.00	5.10		5.10	24.00	5.97		5.97
11.25	5.51		5.51				
11.50	5.96		5.96				
11.75	6.43		6.43				
12.00	6.92		6.92				
12.25	7.43		7.43				
12.50	7.96		7.96				
12.75	8.51		8.51				

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1-D: PR DA 1 Runoff Area=0.323 ac 100.00% Impervious Runoff Depth>8.30"
Flow Length=459' Tc=9.8 min CN=98 Runoff=0.30 cfs 0.223 af

Subcatchment1-U: PR DA 1 Runoff Area=3.806 ac 2.26% Impervious Runoff Depth>6.50"
Flow Length=459' Tc=9.8 min CN=83 Runoff=3.30 cfs 2.061 af

Subcatchment2-U: PR DA 2 Runoff Area=62.154 ac 0.50% Impervious Runoff Depth>6.67"
Flow Length=3,331' Tc=78.0 min CN=86 Runoff=52.41 cfs 34.569 af

Subcatchment3-D: PR DA 3 Runoff Area=0.651 ac 100.00% Impervious Runoff Depth>8.28"
Flow Length=1,305' Tc=17.6 min CN=98 Runoff=0.61 cfs 0.449 af

Subcatchment3-U: PR DA 3 Runoff Area=21.569 ac 0.00% Impervious Runoff Depth>6.23"
Flow Length=1,305' Tc=17.6 min CN=81 Runoff=18.22 cfs 11.204 af

Subcatchment4-U: PR DA 4 Runoff Area=11.702 ac 0.00% Impervious Runoff Depth>5.95"
Flow Length=1,661' Tc=33.8 min CN=79 Runoff=9.54 cfs 5.800 af

Reach 1-T: PR DA 1 TOTAL Inflow=3.60 cfs 2.284 af
Outflow=3.60 cfs 2.284 af

Reach 2-T: PR DA 2 TOTAL Inflow=52.41 cfs 34.569 af
Outflow=52.41 cfs 34.569 af

Reach 3-T: PR DA 3 TOTAL Inflow=18.83 cfs 11.653 af
Outflow=18.83 cfs 11.653 af

Reach 4-T: PR DA 4 TOTAL Inflow=9.54 cfs 5.800 af
Outflow=9.54 cfs 5.800 af

Reach T: Total Inflow=82.12 cfs 54.306 af
Outflow=82.12 cfs 54.306 af

Total Runoff Area = 100.205 ac Runoff Volume = 54.306 af Average Runoff Depth = 6.50"
98.63% Pervious = 98.832 ac 1.37% Impervious = 1.373 ac

Summary for Subcatchment 1-D: PR DA 1

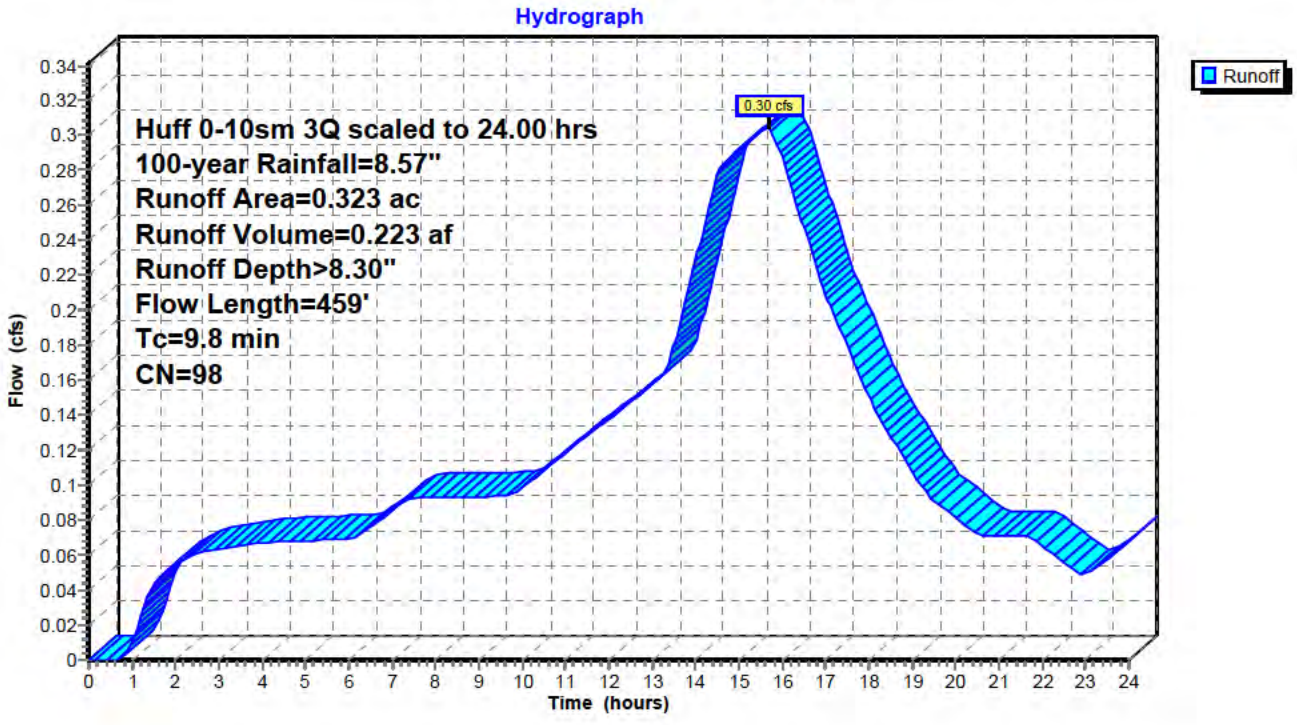
Runoff = 0.30 cfs @ 15.69 hrs, Volume= 0.223 af, Depth> 8.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

	Area (ac)	CN	Description
*	0.323	98	Impervious Area
	0.323		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.9	171	0.0290	1.53		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.2	16	0.0380	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	172	0.0122	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.8	459	Total			

Subcatchment 1-D: PR DA 1



Hydrograph for Subcatchment 1-D: PR DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.01	0.01
1.25	0.14	0.03	0.03
1.50	0.20	0.07	0.04
1.75	0.25	0.11	0.05
2.00	0.30	0.15	0.06
2.25	0.36	0.19	0.06
2.50	0.41	0.24	0.06
2.75	0.47	0.29	0.06
3.00	0.52	0.34	0.06
3.25	0.58	0.39	0.06
3.50	0.63	0.44	0.07
3.75	0.69	0.49	0.07
4.00	0.74	0.54	0.07
4.25	0.79	0.59	0.07
4.50	0.85	0.64	0.07
4.75	0.90	0.70	0.07
5.00	0.96	0.75	0.07
5.25	1.01	0.80	0.07
5.50	1.07	0.85	0.07
5.75	1.12	0.91	0.07
6.00	1.17	0.96	0.07
6.25	1.23	1.02	0.07
6.50	1.29	1.07	0.08
6.75	1.35	1.14	0.08
7.00	1.42	1.20	0.09
7.25	1.49	1.27	0.09
7.50	1.57	1.35	0.09
7.75	1.64	1.42	0.09
8.00	1.71	1.49	0.09
8.25	1.78	1.56	0.09
8.50	1.86	1.63	0.09
8.75	1.93	1.70	0.09
9.00	2.00	1.78	0.09
9.25	2.07	1.85	0.09
9.50	2.15	1.92	0.09
9.75	2.22	1.99	0.09
10.00	2.30	2.07	0.10
10.25	2.38	2.15	0.10
10.50	2.46	2.23	0.11
10.75	2.55	2.32	0.11
11.00	2.64	2.41	0.12
11.25	2.74	2.51	0.12
11.50	2.84	2.60	0.13
11.75	2.94	2.71	0.13
12.00	3.05	2.81	0.14
12.25	3.16	2.92	0.14
12.50	3.27	3.04	0.15
12.75	3.39	3.16	0.15
13.00	3.51	3.28	0.16
13.25	3.64	3.40	0.16
13.50	3.78	3.54	0.18
13.75	3.94	3.70	0.20
14.00	4.11	3.88	0.23
14.25	4.31	4.07	0.25
14.50	4.52	4.29	0.28
14.75	4.75	4.51	0.29
15.00	4.97	4.73	0.29
15.25	5.20	4.96	0.30
15.50	5.43	5.19	**0.30**
15.75	5.66	5.43	**0.30**
16.00	5.88	5.64	0.29
16.25	6.09	5.85	0.27
16.50	6.28	6.04	0.25
16.75	6.45	6.21	0.23
17.00	6.61	6.37	0.21
17.25	6.76	6.52	0.19
17.50	6.89	6.66	0.18
17.75	7.02	6.78	0.17
18.00	7.13	6.90	0.15
18.25	7.24	7.00	0.14
18.50	7.34	7.10	0.13
18.75	7.43	7.19	0.12
19.00	7.51	7.27	0.11
19.25	7.58	7.34	0.10
19.50	7.65	7.41	0.09
19.75	7.72	7.48	0.09
20.00	7.78	7.54	0.08
20.25	7.84	7.60	0.08
20.50	7.90	7.66	0.07
20.75	7.95	7.71	0.07
21.00	8.00	7.76	0.07
21.25	8.06	7.82	0.07
21.50	8.11	7.87	0.07
21.75	8.17	7.93	0.07
22.00	8.22	7.98	0.07
22.25	8.26	8.02	0.06
22.50	8.31	8.07	0.06
22.75	8.35	8.11	0.05
23.00	8.38	8.14	0.05
23.25	8.42	8.18	0.05
23.50	8.47	8.23	0.06
23.75	8.52	8.28	0.06
24.00	**8.57**	**8.33**	0.07

Summary for Subcatchment 1-U: PR DA 1

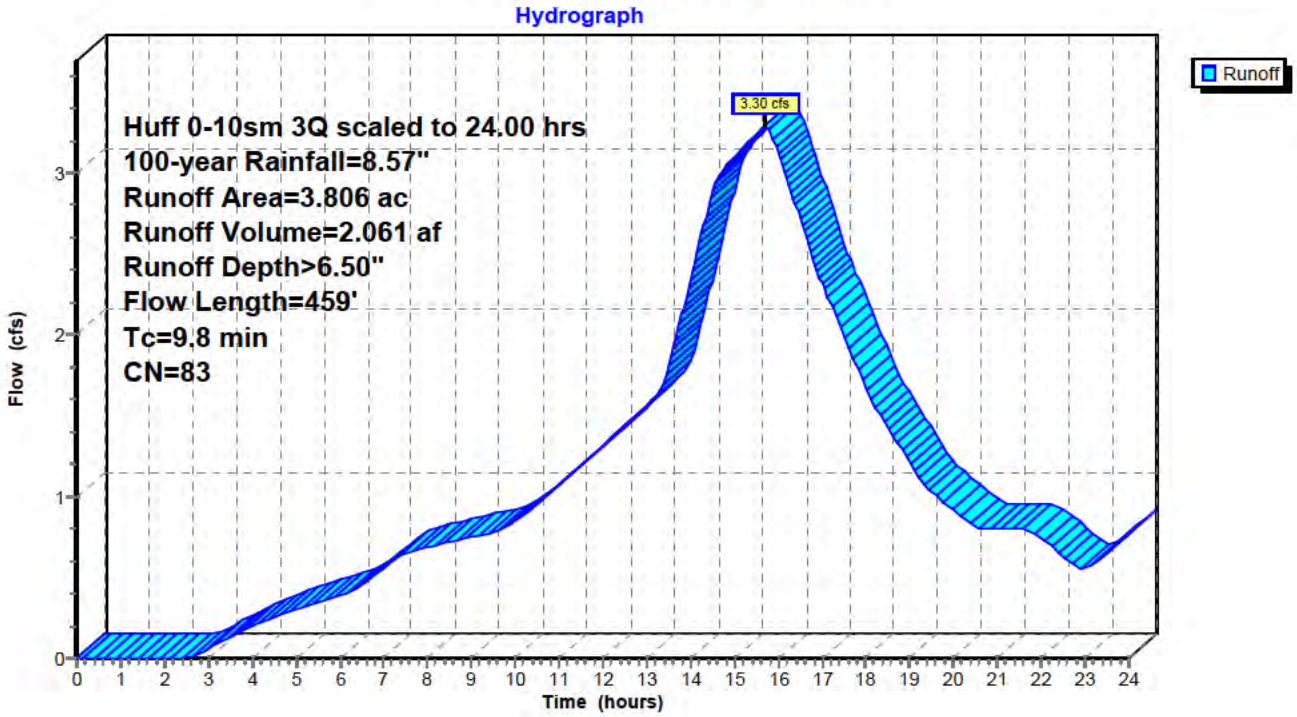
Runoff = 3.30 cfs @ 15.70 hrs, Volume= 2.061 af, Depth> 6.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

	Area (ac)	CN	Description
	0.000	89	Row crops, straight row, Good, HSG D
	0.753	89	Row crops, straight row, Good, HSG D
	0.711	80	Pasture/grassland/range, Good, HSG D
	1.342	85	Row crops, straight row, Good, HSG C
	0.914	74	Pasture/grassland/range, Good, HSG C
*	0.086	98	Impervious Area
	3.806	83	Weighted Average
	3.720		97.74% Pervious Area
	0.086		2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.9	171	0.0290	1.53		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.2	16	0.0380	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	172	0.0122	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.8	459	Total			

Subcatchment 1-U: PR DA 1



Hydrograph for Subcatchment 1-U: PR DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.00	0.00
1.25	0.14	0.00	0.00
1.50	0.20	0.00	0.00
1.75	0.25	0.00	0.00
2.00	0.30	0.00	0.00
2.25	0.36	0.00	0.00
2.50	0.41	0.00	0.00
2.75	0.47	0.00	0.02
3.00	0.52	0.01	0.06
3.25	0.58	0.01	0.10
3.50	0.63	0.02	0.13
3.75	0.69	0.03	0.17
4.00	0.74	0.05	0.20
4.25	0.79	0.06	0.23
4.50	0.85	0.08	0.25
4.75	0.90	0.10	0.28
5.00	0.96	0.12	0.30
5.25	1.01	0.14	0.32
5.50	1.07	0.16	0.34
5.75	1.12	0.18	0.36
6.00	1.17	0.21	0.38
6.25	1.23	0.24	0.41
6.50	1.29	0.27	0.46
6.75	1.35	0.30	0.51
7.00	1.42	0.34	0.56
7.25	1.49	0.38	0.61
7.50	1.57	0.42	0.65
7.75	1.64	0.46	0.67
8.00	1.71	0.51	0.69
8.25	1.78	0.55	0.70
8.50	1.86	0.60	0.72
8.75	1.93	0.65	0.74
9.00	2.00	0.70	0.75
9.25	2.07	0.75	0.77
9.50	2.15	0.80	0.78
9.75	2.22	0.85	0.80
10.00	2.30	0.90	0.85
10.25	2.38	0.96	0.90
10.50	2.46	1.03	0.96
10.75	2.55	1.09	1.01
11.00	2.64	1.16	1.07
11.25	2.74	1.24	1.13
11.50	2.84	1.32	1.19
11.75	2.94	1.40	1.25
12.00	3.05	1.48	1.31
12.25	3.16	1.57	1.37
12.50	3.27	1.67	1.44
12.75	3.39	1.77	1.50
13.00	3.51	1.87	1.56
13.25	3.64	1.97	1.63
13.50	3.78	2.09	1.81
13.75	3.94	2.23	2.07
14.00	4.11	2.38	2.34
14.25	4.31	2.56	2.62
14.50	4.52	2.75	2.90
14.75	4.75	2.94	3.02
15.00	4.97	3.15	3.10
15.25	5.20	3.35	3.17
15.50	5.43	3.57	**3.25**
15.75	5.66	3.78	**3.29**
16.00	5.88	3.98	3.13
16.25	6.09	4.17	2.93
16.50	6.28	4.35	2.72
16.75	6.45	4.51	2.51
17.00	6.61	4.66	2.32
17.25	6.76	4.80	2.16
17.50	6.89	4.93	2.00
17.75	7.02	5.05	1.84
18.00	7.13	5.15	1.68
18.25	7.24	5.25	1.54
18.50	7.34	5.35	1.43
18.75	7.43	5.43	1.32
19.00	7.51	5.51	1.21
19.25	7.58	5.58	1.10
19.50	7.65	5.65	1.03
19.75	7.72	5.71	0.97
20.00	7.78	5.77	0.92
20.25	7.84	5.83	0.86
20.50	7.90	5.88	0.81
20.75	7.95	5.93	0.80
21.00	8.00	5.98	0.80
21.25	8.06	6.03	0.80
21.50	8.11	6.09	0.80
21.75	8.17	6.14	0.79
22.00	8.22	6.18	0.74
22.25	8.26	6.23	0.69
22.50	8.31	6.27	0.63
22.75	8.35	6.31	0.58
23.00	8.38	6.34	0.55
23.25	8.42	6.38	0.60
23.50	8.47	6.43	0.66
23.75	8.52	6.47	0.71
24.00	**8.57**	**6.52**	0.77

Summary for Subcatchment 2-U: PR DA 2

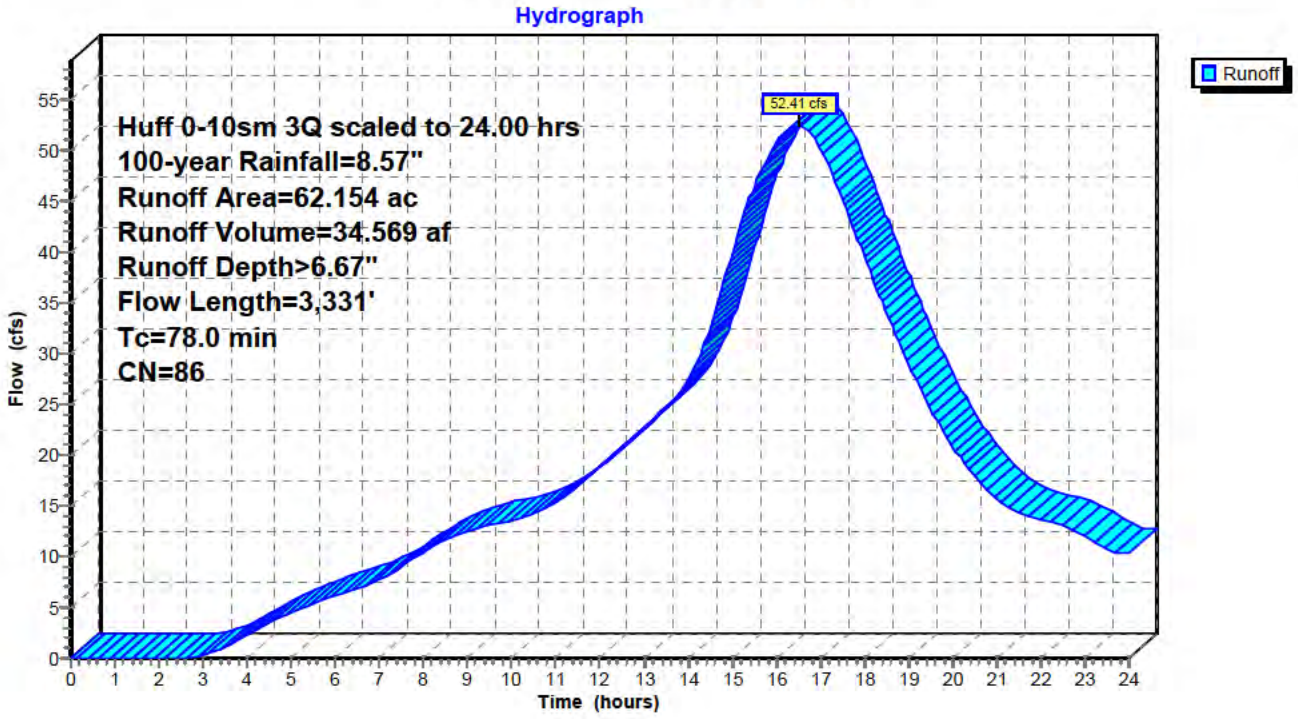
Runoff = 52.41 cfs @ 16.53 hrs, Volume= 34.569 af, Depth> 6.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

	Area (ac)	CN	Description
	11.052	89	Row crops, straight row, Good, HSG D
	2.151	80	Pasture/grassland/range, Good, HSG D
	0.061	89	Row crops, straight row, Good, HSG D
	10.906	89	Row crops, straight row, Good, HSG D
	8.457	80	Pasture/grassland/range, Good, HSG D
	9.982	89	Row crops, straight row, Good, HSG D
	0.038	80	Pasture/grassland/range, Good, HSG D
	14.843	85	Row crops, straight row, Good, HSG C
	2.519	74	Pasture/grassland/range, Good, HSG C
	0.830	85	Row crops, straight row, Good, HSG C
	1.002	74	Pasture/grassland/range, Good, HSG C
*	0.313	98	Impervious Area
	62.154	86	Weighted Average
	61.841		99.50% Pervious Area
	0.313		0.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.0421	0.49		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.5	141	0.0306	1.57		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
42.0	1,988	0.0077	0.79		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
31.1	1,102	0.0071	0.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
78.0	3,331	Total			

Subcatchment 2-U: PR DA 2



Hydrograph for Subcatchment 2-U: PR DA 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.00	0.00
1.25	0.14	0.00	0.00
1.50	0.20	0.00	0.00
1.75	0.25	0.00	0.00
2.00	0.30	0.00	0.00
2.25	0.36	0.00	0.00
2.50	0.41	0.00	0.01
2.75	0.47	0.01	0.08
3.00	0.52	0.02	0.27
3.25	0.58	0.03	0.63
3.50	0.63	0.05	1.12
3.75	0.69	0.07	1.69
4.00	0.74	0.08	2.28
4.25	0.79	0.10	2.87
4.50	0.85	0.13	3.43
4.75	0.90	0.15	3.97
5.00	0.96	0.18	4.48
5.25	1.01	0.20	4.95
5.50	1.07	0.23	5.39
5.75	1.12	0.26	5.80
6.00	1.17	0.29	6.19
6.25	1.23	0.32	6.54
6.50	1.29	0.36	6.89
6.75	1.35	0.40	7.26
7.00	1.42	0.44	7.74
7.25	1.49	0.49	8.32
7.50	1.57	0.54	9.01
7.75	1.64	0.59	9.75
8.00	1.71	0.64	10.48
8.25	1.78	0.69	11.13
8.50	1.86	0.74	11.66
8.75	1.93	0.80	12.11
9.00	2.00	0.85	12.46
9.25	2.07	0.91	12.79
9.50	2.15	0.96	13.06
9.75	2.22	1.02	13.31
10.00	2.30	1.08	13.55
10.25	2.38	1.14	13.81
10.50	2.46	1.21	14.19
10.75	2.55	1.28	14.68
11.00	2.64	1.36	15.36
11.25	2.74	1.44	16.11
11.50	2.84	1.52	16.96
11.75	2.94	1.61	17.84
12.00	3.05	1.70	18.76
12.25	3.16	1.80	19.71
12.50	3.27	1.90	20.67
12.75	3.39	2.00	21.66
13.00	3.51	2.11	22.63
13.25	3.64	2.22	23.65
13.50	3.78	2.34	24.64
13.75	3.94	2.49	25.81
14.00	4.11	2.65	27.34
14.25	4.31	2.83	29.57
14.50	4.52	3.03	32.52
14.75	4.75	3.23	36.02
15.00	4.97	3.44	39.82
15.25	5.20	3.65	43.33
15.50	5.43	3.87	46.39
15.75	5.66	4.09	48.76
16.00	5.88	4.30	50.68
16.25	6.09	4.49	51.98
16.50	6.28	4.67	**52.39**
16.75	6.45	4.84	**51.78**
17.00	6.61	4.99	50.13
17.25	6.76	5.13	47.87
17.50	6.89	5.26	45.13
17.75	7.02	5.38	42.35
18.00	7.13	5.50	39.50
18.25	7.24	5.60	36.73
18.50	7.34	5.69	34.01
18.75	7.43	5.78	31.37
19.00	7.51	5.86	28.95
19.25	7.58	5.93	26.67
19.50	7.65	6.00	24.61
19.75	7.72	6.06	22.63
20.00	7.78	6.12	20.87
20.25	7.84	6.18	19.29
20.50	7.90	6.23	17.94
20.75	7.95	6.28	16.76
21.00	8.00	6.34	15.72
21.25	8.06	6.39	14.89
21.50	8.11	6.44	14.26
21.75	8.17	6.49	13.87
22.00	8.22	6.54	13.60
22.25	8.26	6.59	13.39
22.50	8.31	6.63	13.08
22.75	8.35	6.67	12.62
23.00	8.38	6.70	12.02
23.25	8.42	6.74	11.32
23.50	8.47	6.79	10.71
23.75	8.52	6.83	10.34
24.00	**8.57**	**6.88**	10.36

Summary for Subcatchment 3-D: PR DA 3

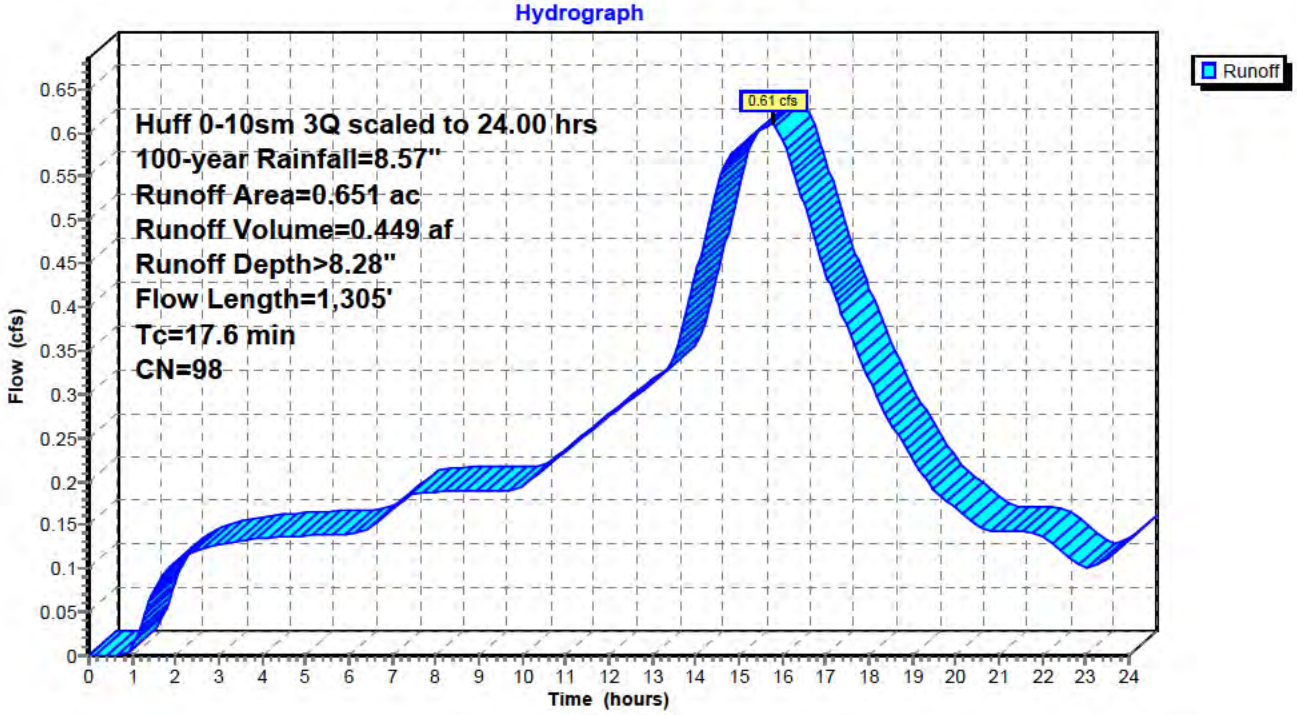
Runoff = 0.61 cfs @ 15.77 hrs, Volume= 0.449 af, Depth> 8.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

	Area (ac)	CN	Description
*	0.651	98	Impervious Area
	0.651		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0081	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
0.6	37	0.0151	1.11		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.8	758	0.0141	7.10	71.03	**Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.3	38	0.0146	2.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.3	372	0.0113	0.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.6	1,305	Total			

Subcatchment 3-D: PR DA 3



Hydrograph for Subcatchment 3-D: PR DA 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.01	0.01
1.25	0.14	0.03	0.04
1.50	0.20	0.07	0.07
1.75	0.25	0.11	0.09
2.00	0.30	0.15	0.11
2.25	0.36	0.19	0.11
2.50	0.41	0.24	0.12
2.75	0.47	0.29	0.12
3.00	0.52	0.34	0.13
3.25	0.58	0.39	0.13
3.50	0.63	0.44	0.13
3.75	0.69	0.49	0.13
4.00	0.74	0.54	0.13
4.25	0.79	0.59	0.14
4.50	0.85	0.64	0.14
4.75	0.90	0.70	0.14
5.00	0.96	0.75	0.14
5.25	1.01	0.80	0.14
5.50	1.07	0.85	0.14
5.75	1.12	0.91	0.14
6.00	1.17	0.96	0.14
6.25	1.23	1.02	0.14
6.50	1.29	1.07	0.15
6.75	1.35	1.14	0.16
7.00	1.42	1.20	0.17
7.25	1.49	1.27	0.18
7.50	1.57	1.35	0.19
7.75	1.64	1.42	0.19
8.00	1.71	1.49	0.19
8.25	1.78	1.56	0.19
8.50	1.86	1.63	0.19
8.75	1.93	1.70	0.19
9.00	2.00	1.78	0.19
9.25	2.07	1.85	0.19
9.50	2.15	1.92	0.19
9.75	2.22	1.99	0.19
10.00	2.30	2.07	0.19
10.25	2.38	2.15	0.20
10.50	2.46	2.23	0.21
10.75	2.55	2.32	0.22
11.00	2.64	2.41	0.23
11.25	2.74	2.51	0.24
11.50	2.84	2.60	0.25
11.75	2.94	2.71	0.26
12.00	3.05	2.81	0.27
12.25	3.16	2.92	0.28
12.50	3.27	3.04	0.29
12.75	3.39	3.16	0.30
13.00	3.51	3.28	0.31
13.25	3.64	3.40	0.32
13.50	3.78	3.54	0.34
13.75	3.94	3.70	0.39
14.00	4.11	3.88	0.44
14.25	4.31	4.07	0.49
14.50	4.52	4.29	0.54
14.75	4.75	4.51	0.57
15.00	4.97	4.73	0.58
15.25	5.20	4.96	0.59
15.50	5.43	5.19	0.60
15.75	5.66	5.43	**0.61**
16.00	5.88	5.64	0.59
16.25	6.09	5.85	0.56
16.50	6.28	6.04	0.52
16.75	6.45	6.21	0.48
17.00	6.61	6.37	0.44
17.25	6.76	6.52	0.41
17.50	6.89	6.66	0.38
17.75	7.02	6.78	0.35
18.00	7.13	6.90	0.32
18.25	7.24	7.00	0.29
18.50	7.34	7.10	0.27
18.75	7.43	7.19	0.25
19.00	7.51	7.27	0.23
19.25	7.58	7.34	0.21
19.50	7.65	7.41	0.19
19.75	7.72	7.48	0.18
20.00	7.78	7.54	0.17
20.25	7.84	7.60	0.16
20.50	7.90	7.66	0.15
20.75	7.95	7.71	0.14
21.00	8.00	7.76	0.14
21.25	8.06	7.82	0.14
21.50	8.11	7.87	0.14
21.75	8.17	7.93	0.14
22.00	8.22	7.98	0.14
22.25	8.26	8.02	0.13
22.50	8.31	8.07	0.12
22.75	8.35	8.11	0.11
23.00	8.38	8.14	0.10
23.25	8.42	8.18	0.10
23.50	8.47	8.23	0.11
23.75	8.52	8.28	0.12
24.00	**8.57**	**8.33**	0.13

Summary for Subcatchment 3-U: PR DA 3

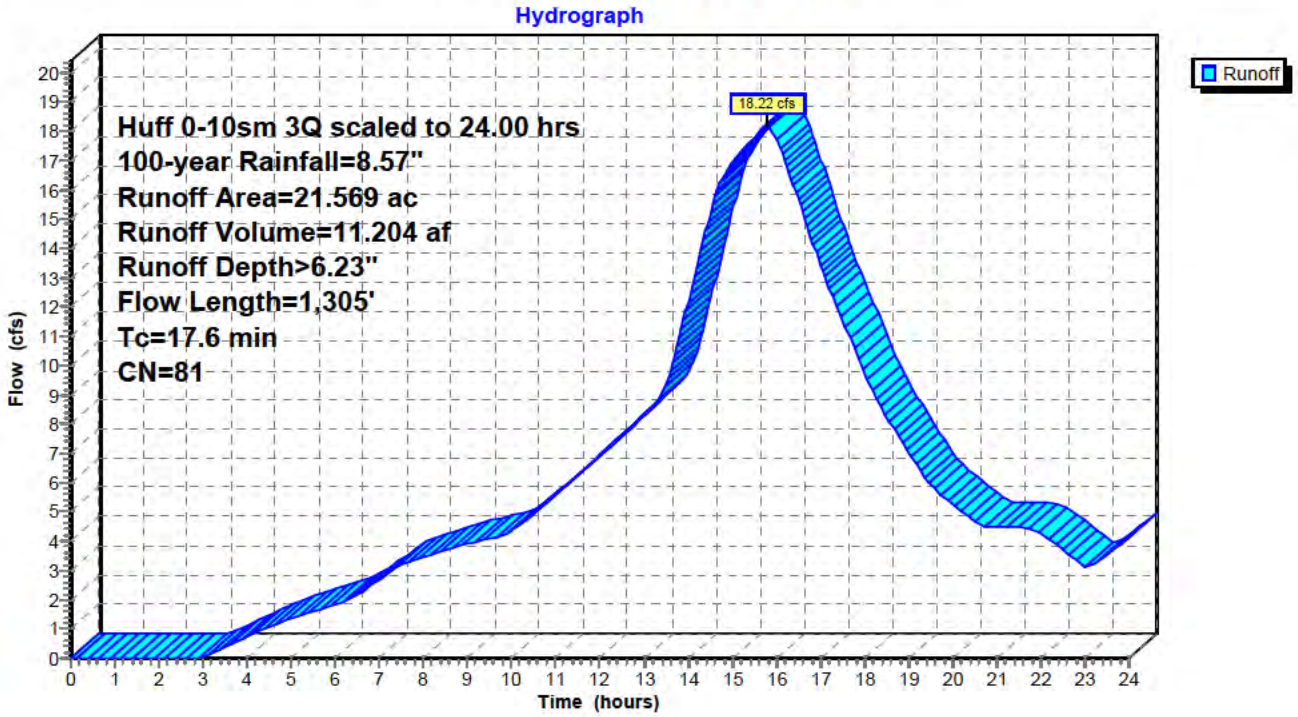
Runoff = 18.22 cfs @ 15.79 hrs, Volume= 11.204 af, Depth> 6.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

Area (ac)	CN	Description
3.171	89	Row crops, straight row, Good, HSG D
4.736	80	Pasture/grassland/range, Good, HSG D
1.134	89	Row crops, straight row, Good, HSG D
5.352	80	Pasture/grassland/range, Good, HSG D
3.187	85	Row crops, straight row, Good, HSG C
3.989	74	Pasture/grassland/range, Good, HSG C
21.569	81	Weighted Average
21.569		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0081	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
0.6	37	0.0151	1.11		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.8	758	0.0141	7.10	71.03	**Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.3	38	0.0146	2.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.3	372	0.0113	0.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.6	1,305	Total			

Subcatchment 3-U: PR DA 3



Hydrograph for Subcatchment 3-U: PR DA 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.00	0.00
1.25	0.14	0.00	0.00
1.50	0.20	0.00	0.00
1.75	0.25	0.00	0.00
2.00	0.30	0.00	0.00
2.25	0.36	0.00	0.00
2.50	0.41	0.00	0.00
2.75	0.47	0.00	0.00
3.00	0.52	0.00	0.03
3.25	0.58	0.00	0.19
3.50	0.63	0.01	0.39
3.75	0.69	0.02	0.57
4.00	0.74	0.03	0.75
4.25	0.79	0.04	0.91
4.50	0.85	0.05	1.07
4.75	0.90	0.07	1.21
5.00	0.96	0.08	1.35
5.25	1.01	0.10	1.48
5.50	1.07	0.12	1.60
5.75	1.12	0.14	1.71
6.00	1.17	0.16	1.82
6.25	1.23	0.19	1.95
6.50	1.29	0.21	2.16
6.75	1.35	0.24	2.41
7.00	1.42	0.28	2.68
7.25	1.49	0.31	2.96
7.50	1.57	0.35	3.21
7.75	1.64	0.39	3.36
8.00	1.71	0.43	3.49
8.25	1.78	0.47	3.60
8.50	1.86	0.52	3.71
8.75	1.93	0.56	3.81
9.00	2.00	0.61	3.90
9.25	2.07	0.65	3.99
9.50	2.15	0.70	4.08
9.75	2.22	0.75	4.16
10.00	2.30	0.80	4.36
10.25	2.38	0.86	4.65
10.50	2.46	0.91	4.96
10.75	2.55	0.98	5.27
11.00	2.64	1.04	5.59
11.25	2.74	1.11	5.92
11.50	2.84	1.19	6.26
11.75	2.94	1.27	6.59
12.00	3.05	1.35	6.94
12.25	3.16	1.43	7.28
12.50	3.27	1.52	7.63
12.75	3.39	1.62	7.99
13.00	3.51	1.72	8.34
13.25	3.64	1.82	8.70
13.50	3.78	1.94	9.35
13.75	3.94	2.07	10.66
14.00	4.11	2.22	12.14
14.25	4.31	2.38	13.66
14.50	4.52	2.57	15.22
14.75	4.75	2.76	16.34
15.00	4.97	2.96	16.90
15.25	5.20	3.16	17.36
15.50	5.43	3.37	17.80
15.75	5.66	3.58	**18.20**
16.00	5.88	3.78	**17.80**
16.25	6.09	3.96	16.80
16.50	6.28	4.14	15.70
16.75	6.45	4.30	14.56
17.00	6.61	4.44	13.43
17.25	6.76	4.58	12.47
17.50	6.89	4.71	11.58
17.75	7.02	4.82	10.69
18.00	7.13	4.93	9.80
18.25	7.24	5.03	8.94
18.50	7.34	5.12	8.28
18.75	7.43	5.20	7.67
19.00	7.51	5.28	7.07
19.25	7.58	5.35	6.46
19.50	7.65	5.42	5.93
19.75	7.72	5.48	5.59
20.00	7.78	5.54	5.28
20.25	7.84	5.59	4.97
20.50	7.90	5.64	4.67
20.75	7.95	5.70	4.49
21.00	8.00	5.75	4.46
21.25	8.06	5.80	4.46
21.50	8.11	5.85	4.47
21.75	8.17	5.90	4.46
22.00	8.22	5.95	4.29
22.25	8.26	5.99	4.00
22.50	8.31	6.03	3.70
22.75	8.35	6.07	3.39
23.00	8.38	6.10	3.12
23.25	8.42	6.14	3.24
23.50	8.47	6.19	3.53
23.75	8.52	6.23	3.84
24.00	**8.57**	**6.28**	4.15

Summary for Subcatchment 4-U: PR DA 4

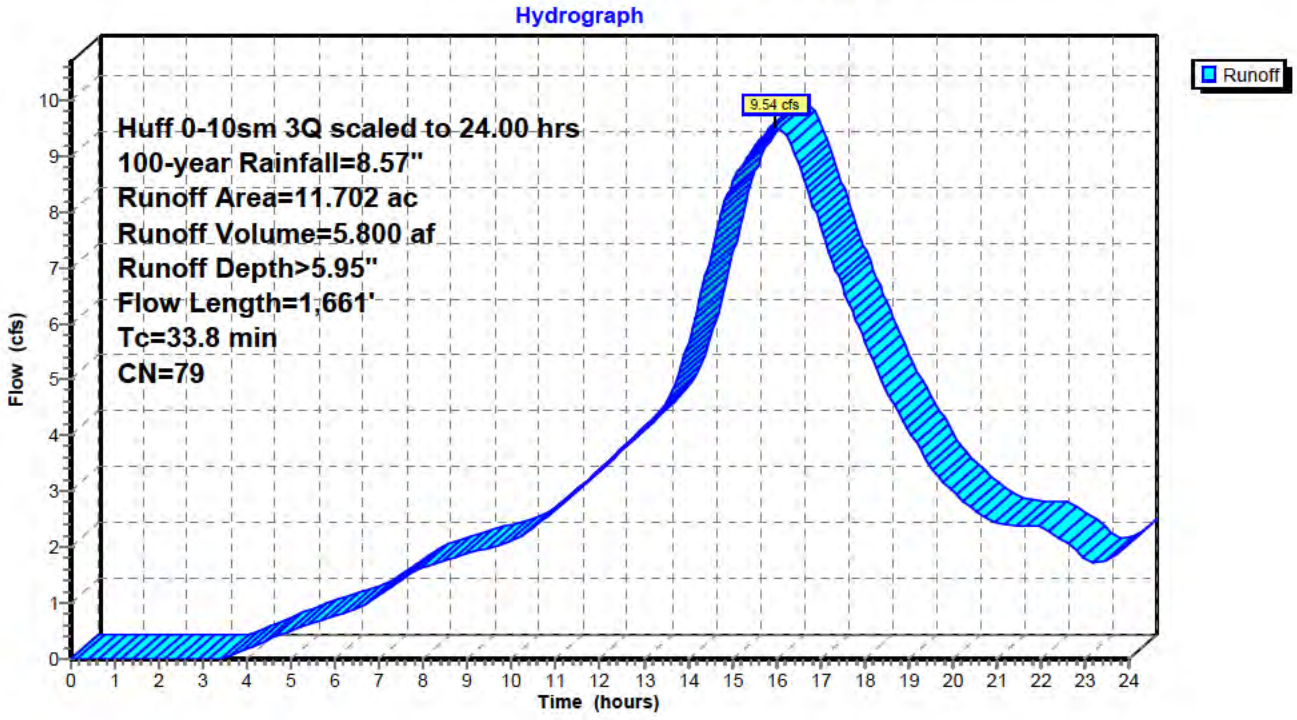
Runoff = 9.54 cfs @ 15.97 hrs, Volume= 5.800 af, Depth> 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

Area (ac)	CN	Description
0.399	89	Row crops, straight row, Good, HSG D
4.560	80	Pasture/grassland/range, Good, HSG D
0.000	89	Row crops, straight row, Good, HSG D
3.035	80	Pasture/grassland/range, Good, HSG D
0.695	85	Row crops, straight row, Good, HSG C
3.013	74	Pasture/grassland/range, Good, HSG C
11.702	79	Weighted Average
11.702		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0080	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
2.7	198	0.0180	1.21		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
24.5	1,363	0.0175	0.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
33.8	1,661	Total			

Subcatchment 4-U: PR DA 4



Hydrograph for Subcatchment 4-U: PR DA 4

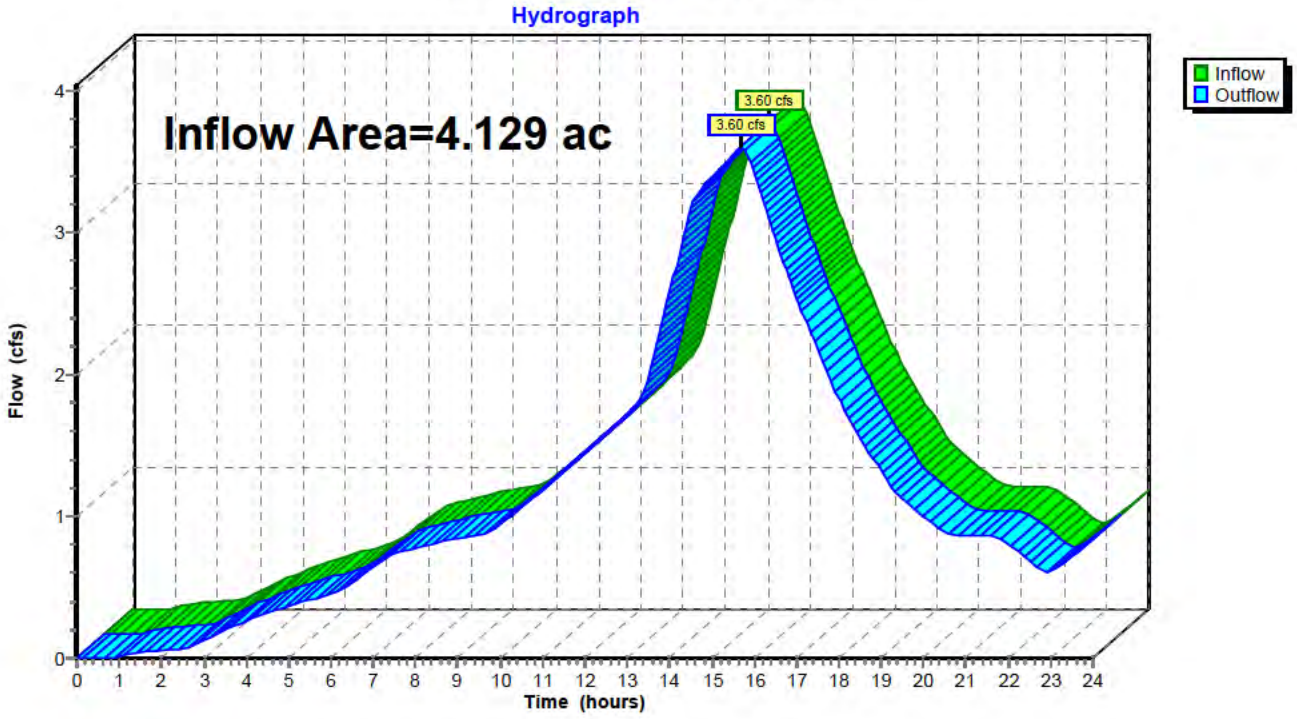
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	3.51	1.57	4.14
0.25	0.01	0.00	0.00	13.25	3.64	1.67	4.34
0.50	0.02	0.00	0.00	13.50	3.78	1.78	4.56
0.75	0.05	0.00	0.00	13.75	3.94	1.91	4.98
1.00	0.09	0.00	0.00	14.00	4.11	2.06	5.63
1.25	0.14	0.00	0.00	14.25	4.31	2.22	6.38
1.50	0.20	0.00	0.00	14.50	4.52	2.40	7.18
1.75	0.25	0.00	0.00	14.75	4.75	2.58	7.95
2.00	0.30	0.00	0.00	15.00	4.97	2.78	8.51
2.25	0.36	0.00	0.00	15.25	5.20	2.97	8.86
2.50	0.41	0.00	0.00	15.50	5.43	3.18	9.16
2.75	0.47	0.00	0.00	15.75	5.66	3.38	**9.41**
3.00	0.52	0.00	0.00	16.00	5.88	3.57	**9.54**
3.25	0.58	0.00	0.00	16.25	6.09	3.76	9.32
3.50	0.63	0.00	0.02	16.50	6.28	3.93	8.87
3.75	0.69	0.01	0.09	16.75	6.45	4.08	8.32
4.00	0.74	0.02	0.18	17.00	6.61	4.23	7.74
4.25	0.79	0.02	0.26	17.25	6.76	4.36	7.18
4.50	0.85	0.03	0.35	17.50	6.89	4.49	6.66
4.75	0.90	0.05	0.43	17.75	7.02	4.60	6.18
5.00	0.96	0.06	0.51	18.00	7.13	4.71	5.71
5.25	1.01	0.07	0.58	18.25	7.24	4.80	5.23
5.50	1.07	0.09	0.65	18.50	7.34	4.89	4.81
5.75	1.12	0.11	0.72	18.75	7.43	4.98	4.44
6.00	1.17	0.13	0.78	19.00	7.51	5.05	4.11
6.25	1.23	0.15	0.84	19.25	7.58	5.12	3.78
6.50	1.29	0.17	0.92	19.50	7.65	5.19	3.46
6.75	1.35	0.19	1.02	19.75	7.72	5.25	3.20
7.00	1.42	0.22	1.15	20.00	7.78	5.31	3.00
7.25	1.49	0.26	1.29	20.25	7.84	5.36	2.83
7.50	1.57	0.29	1.43	20.50	7.90	5.41	2.66
7.75	1.64	0.33	1.54	20.75	7.95	5.46	2.51
8.00	1.71	0.36	1.63	21.00	8.00	5.51	2.43
8.25	1.78	0.40	1.71	21.25	8.06	5.56	2.40
8.50	1.86	0.44	1.77	21.50	8.11	5.61	2.39
8.75	1.93	0.48	1.83	21.75	8.17	5.66	2.39
9.00	2.00	0.52	1.89	22.00	8.22	5.71	2.37
9.25	2.07	0.57	1.95	22.25	8.26	5.75	2.27
9.50	2.15	0.61	2.00	22.50	8.31	5.79	2.13
9.75	2.22	0.66	2.05	22.75	8.35	5.83	1.98
10.00	2.30	0.70	2.11	23.00	8.38	5.87	1.82
10.25	2.38	0.76	2.22	23.25	8.42	5.90	1.73
10.50	2.46	0.81	2.36	23.50	8.47	5.95	1.78
10.75	2.55	0.87	2.52	23.75	8.52	5.99	1.91
11.00	2.64	0.93	2.69	24.00	**8.57**	**6.04**	2.06
11.25	2.74	1.00	2.86				
11.50	2.84	1.07	3.03				
11.75	2.94	1.14	3.21				
12.00	3.05	1.22	3.39				
12.25	3.16	1.30	3.57				
12.50	3.27	1.39	3.76				
12.75	3.39	1.48	3.95				

Summary for Reach 1-T: PR DA 1 TOTAL

Inflow Area = 4.129 ac, 9.91% Impervious, Inflow Depth > 6.64" for 100-year event
Inflow = 3.60 cfs @ 15.70 hrs, Volume= 2.284 af
Outflow = 3.60 cfs @ 15.70 hrs, Volume= 2.284 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1-T: PR DA 1 TOTAL



Hydrograph for Reach 1-T: PR DA 1 TOTAL

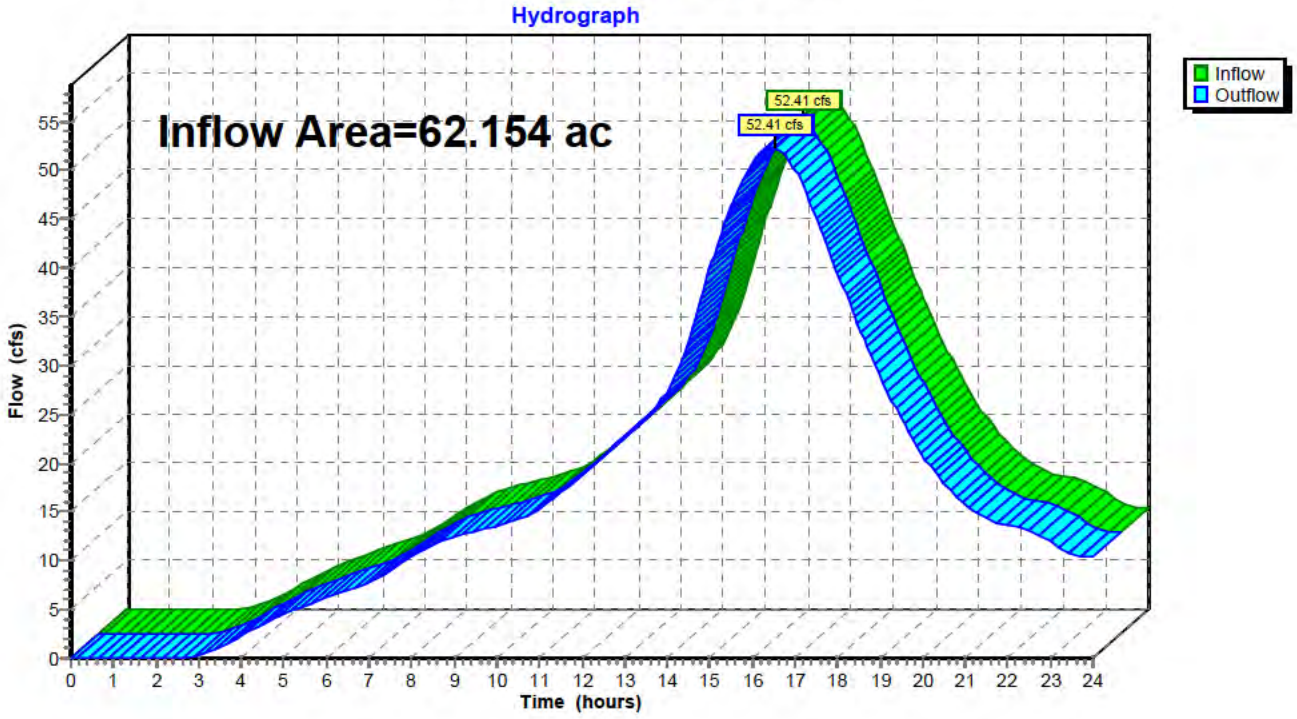
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	1.72		1.72
0.25	0.00		0.00	13.25	1.79		1.79
0.50	0.00		0.00	13.50	1.99		1.99
0.75	0.00		0.00	13.75	2.28		2.28
1.00	0.01		0.01	14.00	2.57		2.57
1.25	0.03		0.03	14.25	2.87		2.87
1.50	0.04		0.04	14.50	3.17		3.17
1.75	0.05		0.05	14.75	3.31		3.31
2.00	0.06		0.06	15.00	3.39		3.39
2.25	0.06		0.06	15.25	3.47		3.47
2.50	0.06		0.06	15.50	**3.55**		**3.55**
2.75	0.08		0.08	15.75	**3.60**		**3.60**
3.00	0.12		0.12	16.00	3.41		3.41
3.25	0.16		0.16	16.25	3.19		3.19
3.50	0.20		0.20	16.50	2.97		2.97
3.75	0.23		0.23	16.75	2.74		2.74
4.00	0.26		0.26	17.00	2.53		2.53
4.25	0.29		0.29	17.25	2.35		2.35
4.50	0.32		0.32	17.50	2.18		2.18
4.75	0.35		0.35	17.75	2.00		2.00
5.00	0.37		0.37	18.00	1.83		1.83
5.25	0.39		0.39	18.25	1.68		1.68
5.50	0.41		0.41	18.50	1.56		1.56
5.75	0.43		0.43	18.75	1.44		1.44
6.00	0.45		0.45	19.00	1.32		1.32
6.25	0.48		0.48	19.25	1.20		1.20
6.50	0.53		0.53	19.50	1.12		1.12
6.75	0.59		0.59	19.75	1.06		1.06
7.00	0.64		0.64	20.00	1.00		1.00
7.25	0.70		0.70	20.25	0.94		0.94
7.50	0.74		0.74	20.50	0.88		0.88
7.75	0.76		0.76	20.75	0.87		0.87
8.00	0.78		0.78	21.00	0.87		0.87
8.25	0.80		0.80	21.25	0.87		0.87
8.50	0.81		0.81	21.50	0.87		0.87
8.75	0.83		0.83	21.75	0.86		0.86
9.00	0.85		0.85	22.00	0.81		0.81
9.25	0.86		0.86	22.25	0.75		0.75
9.50	0.87		0.87	22.50	0.69		0.69
9.75	0.89		0.89	22.75	0.63		0.63
10.00	0.94		0.94	23.00	0.60		0.60
10.25	1.00		1.00	23.25	0.65		0.65
10.50	1.07		1.07	23.50	0.71		0.71
10.75	1.13		1.13	23.75	0.77		0.77
11.00	1.19		1.19	24.00	0.83		0.83
11.25	1.26		1.26				
11.50	1.32		1.32				
11.75	1.39		1.39				
12.00	1.45		1.45				
12.25	1.52		1.52				
12.50	1.58		1.58				
12.75	1.65		1.65				

Summary for Reach 2-T: PR DA 2 TOTAL

Inflow Area = 62.154 ac, 0.50% Impervious, Inflow Depth > 6.67" for 100-year event
Inflow = 52.41 cfs @ 16.53 hrs, Volume= 34.569 af
Outflow = 52.41 cfs @ 16.53 hrs, Volume= 34.569 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 2-T: PR DA 2 TOTAL



Hydrograph for Reach 2-T: PR DA 2 TOTAL

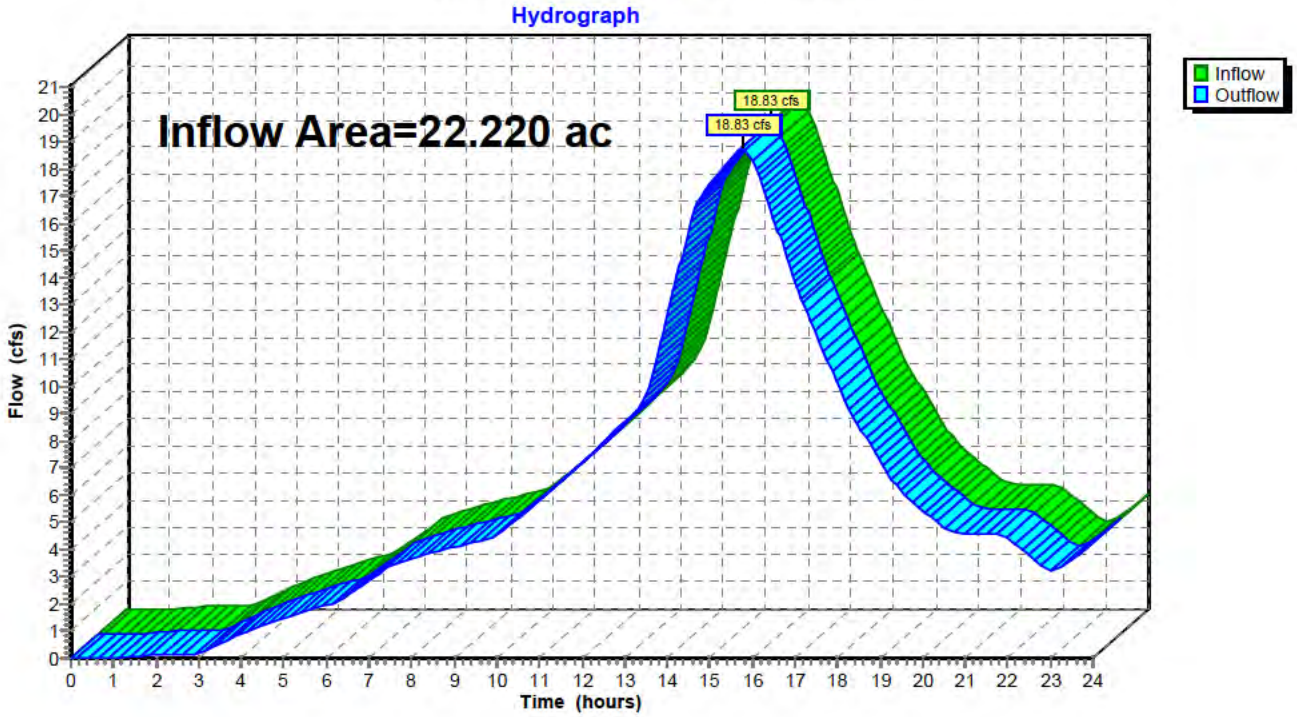
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	22.63		22.63
0.25	0.00		0.00	13.25	23.65		23.65
0.50	0.00		0.00	13.50	24.64		24.64
0.75	0.00		0.00	13.75	25.81		25.81
1.00	0.00		0.00	14.00	27.34		27.34
1.25	0.00		0.00	14.25	29.57		29.57
1.50	0.00		0.00	14.50	32.52		32.52
1.75	0.00		0.00	14.75	36.02		36.02
2.00	0.00		0.00	15.00	39.82		39.82
2.25	0.00		0.00	15.25	43.33		43.33
2.50	0.01		0.01	15.50	46.39		46.39
2.75	0.08		0.08	15.75	48.76		48.76
3.00	0.27		0.27	16.00	50.68		50.68
3.25	0.63		0.63	16.25	51.98		51.98
3.50	1.12		1.12	16.50	**52.39**		**52.39**
3.75	1.69		1.69	16.75	**51.78**		**51.78**
4.00	2.28		2.28	17.00	50.13		50.13
4.25	2.87		2.87	17.25	47.87		47.87
4.50	3.43		3.43	17.50	45.13		45.13
4.75	3.97		3.97	17.75	42.35		42.35
5.00	4.48		4.48	18.00	39.50		39.50
5.25	4.95		4.95	18.25	36.73		36.73
5.50	5.39		5.39	18.50	34.01		34.01
5.75	5.80		5.80	18.75	31.37		31.37
6.00	6.19		6.19	19.00	28.95		28.95
6.25	6.54		6.54	19.25	26.67		26.67
6.50	6.89		6.89	19.50	24.61		24.61
6.75	7.26		7.26	19.75	22.63		22.63
7.00	7.74		7.74	20.00	20.87		20.87
7.25	8.32		8.32	20.25	19.29		19.29
7.50	9.01		9.01	20.50	17.94		17.94
7.75	9.75		9.75	20.75	16.76		16.76
8.00	10.48		10.48	21.00	15.72		15.72
8.25	11.13		11.13	21.25	14.89		14.89
8.50	11.66		11.66	21.50	14.26		14.26
8.75	12.11		12.11	21.75	13.87		13.87
9.00	12.46		12.46	22.00	13.60		13.60
9.25	12.79		12.79	22.25	13.39		13.39
9.50	13.06		13.06	22.50	13.08		13.08
9.75	13.31		13.31	22.75	12.62		12.62
10.00	13.55		13.55	23.00	12.02		12.02
10.25	13.81		13.81	23.25	11.32		11.32
10.50	14.19		14.19	23.50	10.71		10.71
10.75	14.68		14.68	23.75	10.34		10.34
11.00	15.36		15.36	24.00	10.36		10.36
11.25	16.11		16.11				
11.50	16.96		16.96				
11.75	17.84		17.84				
12.00	18.76		18.76				
12.25	19.71		19.71				
12.50	20.67		20.67				
12.75	21.66		21.66				

Summary for Reach 3-T: PR DA 3 TOTAL

Inflow Area = 22.220 ac, 2.93% Impervious, Inflow Depth > 6.29" for 100-year event
Inflow = 18.83 cfs @ 15.79 hrs, Volume= 11.653 af
Outflow = 18.83 cfs @ 15.79 hrs, Volume= 11.653 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3-T: PR DA 3 TOTAL



Hydrograph for Reach 3-T: PR DA 3 TOTAL

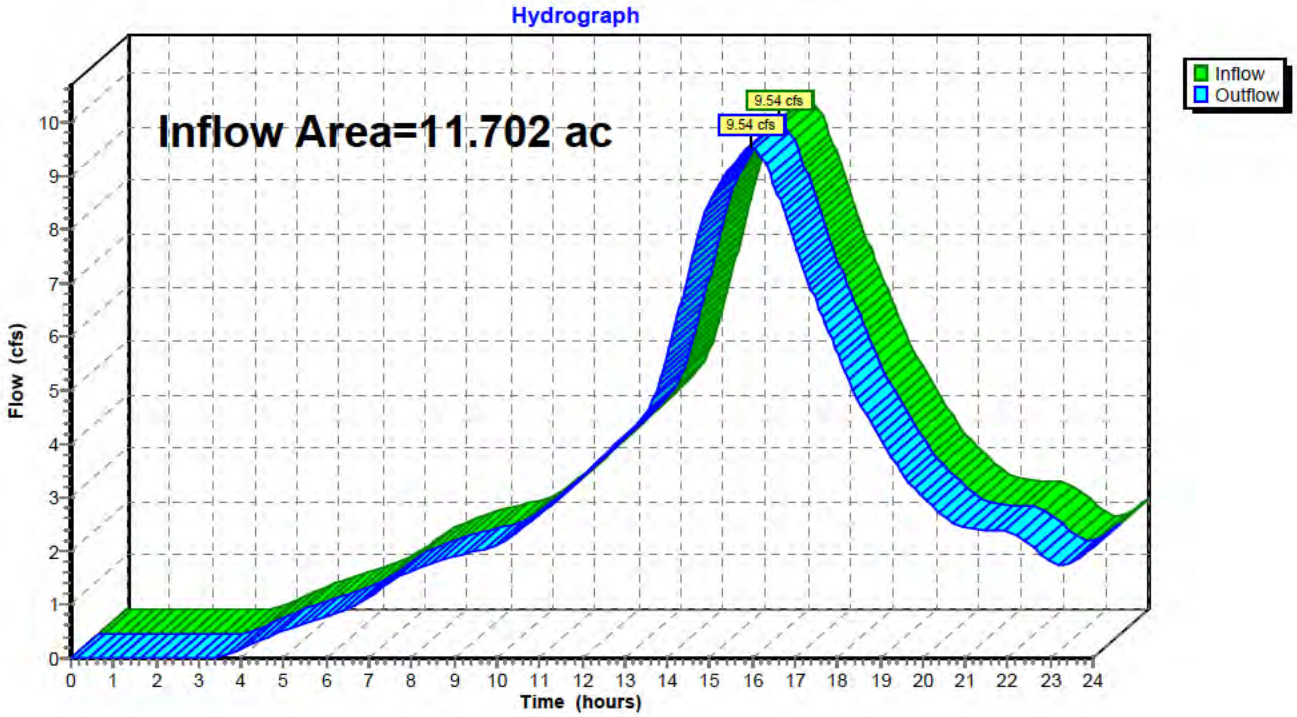
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	8.65		8.65
0.25	0.00		0.00	13.25	9.02		9.02
0.50	0.00		0.00	13.50	9.70		9.70
0.75	0.00		0.00	13.75	11.05		11.05
1.00	0.01		0.01	14.00	12.58		12.58
1.25	0.04		0.04	14.25	14.15		14.15
1.50	0.07		0.07	14.50	15.75		15.75
1.75	0.09		0.09	14.75	16.91		16.91
2.00	0.11		0.11	15.00	17.48		17.48
2.25	0.11		0.11	15.25	17.95		17.95
2.50	0.12		0.12	15.50	18.40		18.40
2.75	0.12		0.12	15.75	**18.81**		**18.81**
3.00	0.16		0.16	16.00	**18.39**		**18.39**
3.25	0.32		0.32	16.25	17.35		17.35
3.50	0.52		0.52	16.50	16.22		16.22
3.75	0.71		0.71	16.75	15.04		15.04
4.00	0.88		0.88	17.00	13.87		13.87
4.25	1.05		1.05	17.25	12.88		12.88
4.50	1.20		1.20	17.50	11.95		11.95
4.75	1.35		1.35	17.75	11.04		11.04
5.00	1.49		1.49	18.00	10.12		10.12
5.25	1.61		1.61	18.25	9.23		9.23
5.50	1.74		1.74	18.50	8.55		8.55
5.75	1.85		1.85	18.75	7.92		7.92
6.00	1.96		1.96	19.00	7.29		7.29
6.25	2.09		2.09	19.25	6.67		6.67
6.50	2.31		2.31	19.50	6.12		6.12
6.75	2.57		2.57	19.75	5.77		5.77
7.00	2.85		2.85	20.00	5.45		5.45
7.25	3.14		3.14	20.25	5.13		5.13
7.50	3.40		3.40	20.50	4.82		4.82
7.75	3.55		3.55	20.75	4.63		4.63
8.00	3.67		3.67	21.00	4.61		4.61
8.25	3.79		3.79	21.25	4.61		4.61
8.50	3.90		3.90	21.50	4.61		4.61
8.75	4.00		4.00	21.75	4.61		4.61
9.00	4.09		4.09	22.00	4.43		4.43
9.25	4.18		4.18	22.25	4.13		4.13
9.50	4.26		4.26	22.50	3.81		3.81
9.75	4.35		4.35	22.75	3.49		3.49
10.00	4.55		4.55	23.00	3.22		3.22
10.25	4.85		4.85	23.25	3.34		3.34
10.50	5.17		5.17	23.50	3.64		3.64
10.75	5.50		5.50	23.75	3.96		3.96
11.00	5.83		5.83	24.00	4.28		4.28
11.25	6.16		6.16				
11.50	6.51		6.51				
11.75	6.86		6.86				
12.00	7.21		7.21				
12.25	7.57		7.57				
12.50	7.92		7.92				
12.75	8.29		8.29				

Summary for Reach 4-T: PR DA 4 TOTAL

Inflow Area = 11.702 ac, 0.00% Impervious, Inflow Depth > 5.95" for 100-year event
Inflow = 9.54 cfs @ 15.97 hrs, Volume= 5.800 af
Outflow = 9.54 cfs @ 15.97 hrs, Volume= 5.800 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4-T: PR DA 4 TOTAL



Hydrograph for Reach 4-T: PR DA 4 TOTAL

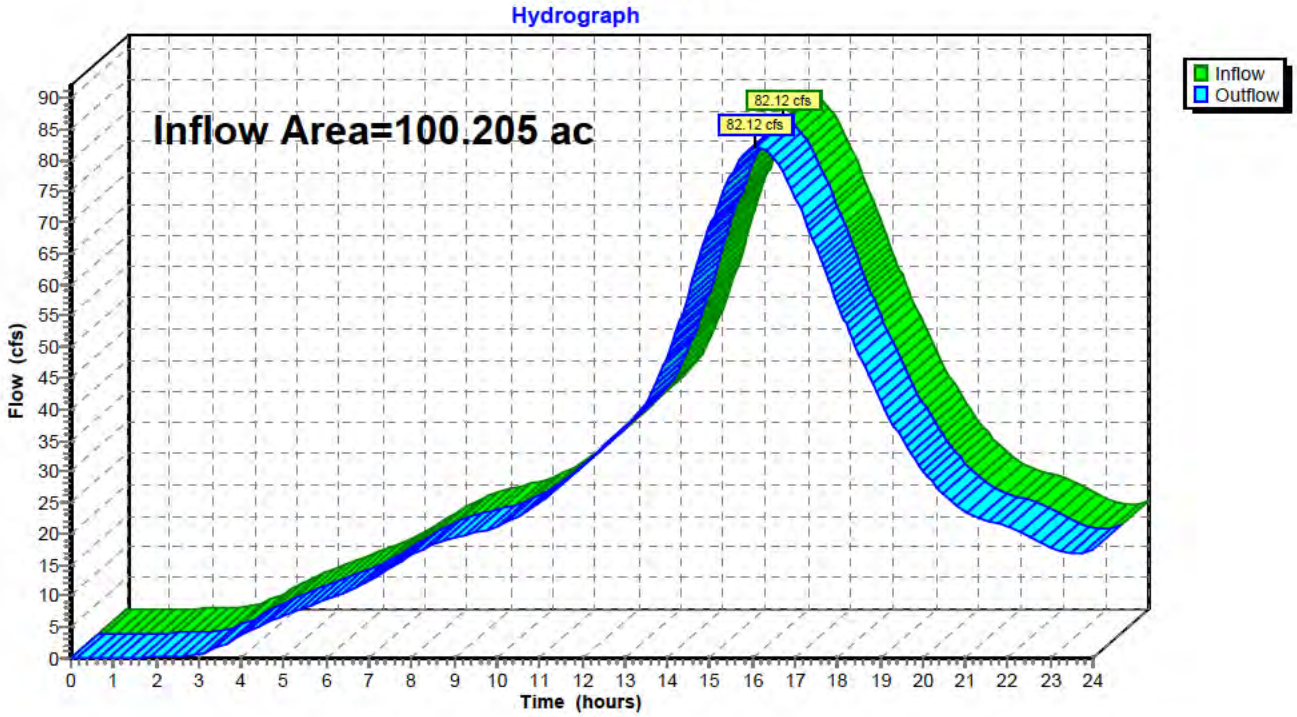
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	4.14		4.14
0.25	0.00		0.00	13.25	4.34		4.34
0.50	0.00		0.00	13.50	4.56		4.56
0.75	0.00		0.00	13.75	4.98		4.98
1.00	0.00		0.00	14.00	5.63		5.63
1.25	0.00		0.00	14.25	6.38		6.38
1.50	0.00		0.00	14.50	7.18		7.18
1.75	0.00		0.00	14.75	7.95		7.95
2.00	0.00		0.00	15.00	8.51		8.51
2.25	0.00		0.00	15.25	8.86		8.86
2.50	0.00		0.00	15.50	9.16		9.16
2.75	0.00		0.00	15.75	**9.41**		**9.41**
3.00	0.00		0.00	16.00	**9.54**		**9.54**
3.25	0.00		0.00	16.25	9.32		9.32
3.50	0.02		0.02	16.50	8.87		8.87
3.75	0.09		0.09	16.75	8.32		8.32
4.00	0.18		0.18	17.00	7.74		7.74
4.25	0.26		0.26	17.25	7.18		7.18
4.50	0.35		0.35	17.50	6.66		6.66
4.75	0.43		0.43	17.75	6.18		6.18
5.00	0.51		0.51	18.00	5.71		5.71
5.25	0.58		0.58	18.25	5.23		5.23
5.50	0.65		0.65	18.50	4.81		4.81
5.75	0.72		0.72	18.75	4.44		4.44
6.00	0.78		0.78	19.00	4.11		4.11
6.25	0.84		0.84	19.25	3.78		3.78
6.50	0.92		0.92	19.50	3.46		3.46
6.75	1.02		1.02	19.75	3.20		3.20
7.00	1.15		1.15	20.00	3.00		3.00
7.25	1.29		1.29	20.25	2.83		2.83
7.50	1.43		1.43	20.50	2.66		2.66
7.75	1.54		1.54	20.75	2.51		2.51
8.00	1.63		1.63	21.00	2.43		2.43
8.25	1.71		1.71	21.25	2.40		2.40
8.50	1.77		1.77	21.50	2.39		2.39
8.75	1.83		1.83	21.75	2.39		2.39
9.00	1.89		1.89	22.00	2.37		2.37
9.25	1.95		1.95	22.25	2.27		2.27
9.50	2.00		2.00	22.50	2.13		2.13
9.75	2.05		2.05	22.75	1.98		1.98
10.00	2.11		2.11	23.00	1.82		1.82
10.25	2.22		2.22	23.25	1.73		1.73
10.50	2.36		2.36	23.50	1.78		1.78
10.75	2.52		2.52	23.75	1.91		1.91
11.00	2.69		2.69	24.00	2.06		2.06
11.25	2.86		2.86				
11.50	3.03		3.03				
11.75	3.21		3.21				
12.00	3.39		3.39				
12.25	3.57		3.57				
12.50	3.76		3.76				
12.75	3.95		3.95				

Summary for Reach T: Total

Inflow Area = 100.205 ac, 1.37% Impervious, Inflow Depth > 6.50" for 100-year event
Inflow = 82.12 cfs @ 16.06 hrs, Volume= 54.306 af
Outflow = 82.12 cfs @ 16.06 hrs, Volume= 54.306 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach T: Total



Hydrograph for Reach T: Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	37.14		37.14
0.25	0.00		0.00	13.25	38.80		38.80
0.50	0.00		0.00	13.50	40.89		40.89
0.75	0.00		0.00	13.75	44.11		44.11
1.00	0.02		0.02	14.00	48.12		48.12
1.25	0.07		0.07	14.25	52.97		52.97
1.50	0.12		0.12	14.50	58.63		58.63
1.75	0.14		0.14	14.75	64.20		64.20
2.00	0.16		0.16	15.00	69.20		69.20
2.25	0.17		0.17	15.25	73.62		73.62
2.50	0.19		0.19	15.50	77.49		77.49
2.75	0.28		0.28	15.75	80.58		80.58
3.00	0.55		0.55	16.00	**82.03**		**82.03**
3.25	1.11		1.11	16.25	**81.85**		**81.85**
3.50	1.86		1.86	16.50	80.45		80.45
3.75	2.72		2.72	16.75	77.89		77.89
4.00	3.60		3.60	17.00	74.27		74.27
4.25	4.47		4.47	17.25	70.28		70.28
4.50	5.31		5.31	17.50	65.92		65.92
4.75	6.10		6.10	17.75	61.58		61.58
5.00	6.84		6.84	18.00	57.15		57.15
5.25	7.54		7.54	18.25	52.87		52.87
5.50	8.20		8.20	18.50	48.92		48.92
5.75	8.81		8.81	18.75	45.17		45.17
6.00	9.38		9.38	19.00	41.67		41.67
6.25	9.95		9.95	19.25	38.32		38.32
6.50	10.65		10.65	19.50	35.31		35.31
6.75	11.45		11.45	19.75	32.65		32.65
7.00	12.38		12.38	20.00	30.32		30.32
7.25	13.45		13.45	20.25	28.19		28.19
7.50	14.57		14.57	20.50	26.30		26.30
7.75	15.61		15.61	20.75	24.78		24.78
8.00	16.57		16.57	21.00	23.63		23.63
8.25	17.43		17.43	21.25	22.77		22.77
8.50	18.14		18.14	21.50	22.13		22.13
8.75	18.77		18.77	21.75	21.73		21.73
9.00	19.29		19.29	22.00	21.20		21.20
9.25	19.77		19.77	22.25	20.54		20.54
9.50	20.19		20.19	22.50	19.72		19.72
9.75	20.60		20.60	22.75	18.72		18.72
10.00	21.16		21.16	23.00	17.65		17.65
10.25	21.89		21.89	23.25	17.03		17.03
10.50	22.78		22.78	23.50	16.83		16.83
10.75	23.83		23.83	23.75	16.98		16.98
11.00	25.06		25.06	24.00	17.54		17.54
11.25	26.39		26.39				
11.50	27.82		27.82				
11.75	29.29		29.29				
12.00	30.81		30.81				
12.25	32.37		32.37				
12.50	33.94		33.94				
12.75	35.56		35.56				

APPENDIX D-3

HYDROCAD REPORT FOR
2-YEAR & 100-YEARSTORM EVENT

POST-DEVELOPMENT CONDITION
WITH STORMWATER BASINS

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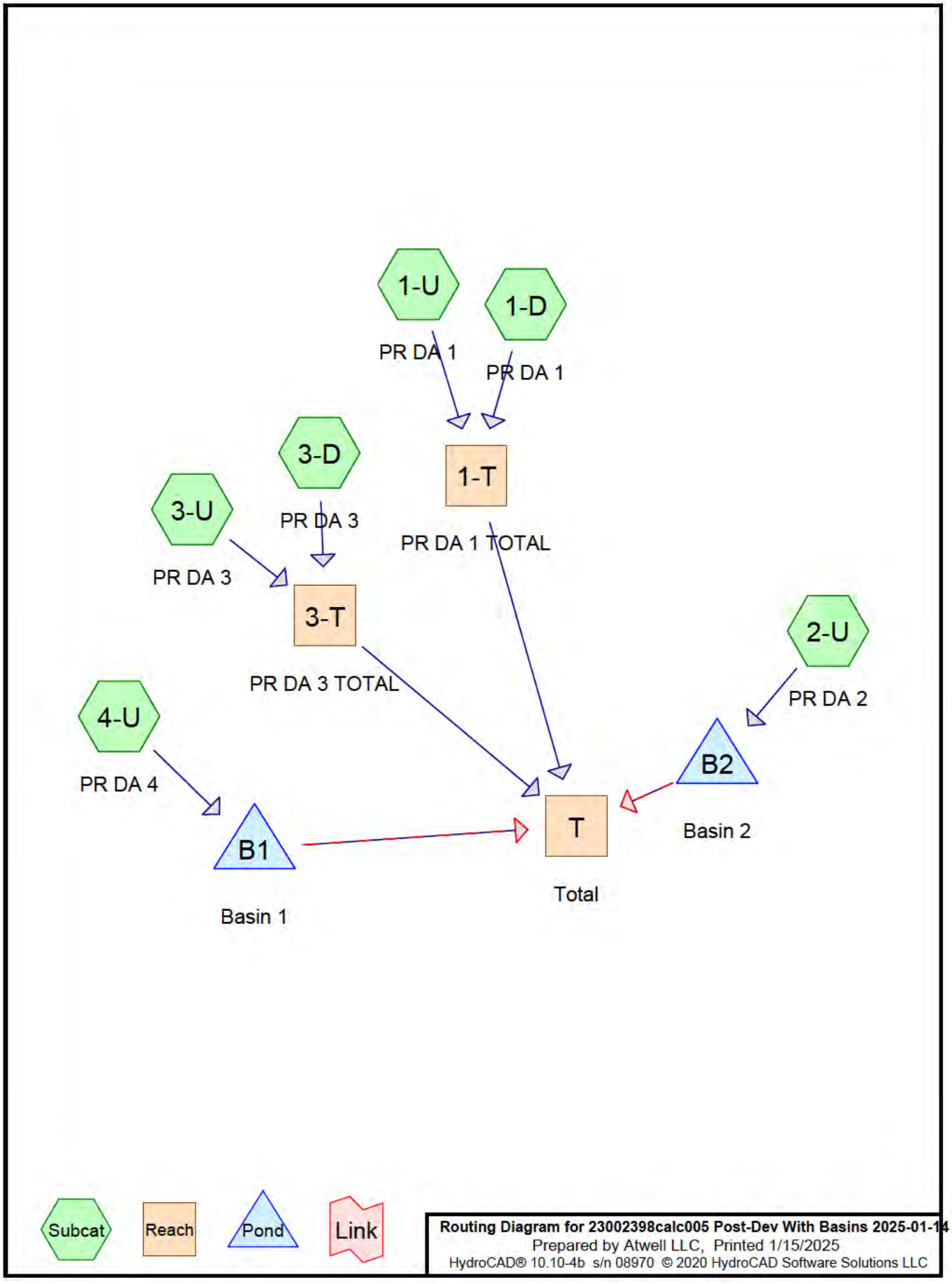


Routing Diagram for 23002398calc005 Post-Dev With Basins 2025-01-14

Prepared by Atwell LLC, Printed 1/15/2025

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Huff 0-10sm	3Q	Scale	24.00	1	3.34	2
2	100-year	Huff 0-10sm	3Q	Scale	24.00	1	8.57	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.373	98	Impervious Area (1-D, 1-U, 2-U, 3-D)
11.437	74	Pasture/grassland/range, Good, HSG C (1-U, 2-U, 3-U, 4-U)
29.040	80	Pasture/grassland/range, Good, HSG D (1-U, 2-U, 3-U, 4-U)
20.897	85	Row crops, straight row, Good, HSG C (1-U, 2-U, 3-U, 4-U)
37.458	89	Row crops, straight row, Good, HSG D (1-U, 2-U, 3-U, 4-U)
100.205	**84**	**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1-D: PR DA 1 Runoff Area=0.323 ac 100.00% Impervious Runoff Depth>3.10"
Flow Length=459' Tc=9.8 min CN=98 Runoff=0.12 cfs 0.083 af

Subcatchment1-U: PR DA 1 Runoff Area=3.806 ac 2.26% Impervious Runoff Depth>1.72"
Flow Length=459' Tc=9.8 min CN=83 Runoff=0.99 cfs 0.544 af

Subcatchment2-U: PR DA 2 Runoff Area=62.154 ac 0.50% Impervious Runoff Depth>1.88"
Flow Length=3,331' Tc=78.0 min CN=86 Runoff=16.64 cfs 9.755 af

Subcatchment3-D: PR DA 3 Runoff Area=0.651 ac 100.00% Impervious Runoff Depth>3.09"
Flow Length=1,305' Tc=17.6 min CN=98 Runoff=0.24 cfs 0.167 af

Subcatchment3-U: PR DA 3 Runoff Area=21.569 ac 0.00% Impervious Runoff Depth>1.56"
Flow Length=1,305' Tc=17.6 min CN=81 Runoff=5.20 cfs 2.811 af

Subcatchment4-U: PR DA 4 Runoff Area=11.702 ac 0.00% Impervious Runoff Depth>1.41"
Flow Length=1,661' Tc=33.8 min CN=79 Runoff=2.58 cfs 1.378 af

Reach 1-T: PR DA 1 TOTAL Inflow=1.11 cfs 0.628 af
Outflow=1.11 cfs 0.628 af

Reach 3-T: PR DA 3 TOTAL Inflow=5.44 cfs 2.979 af
Outflow=5.44 cfs 2.979 af

Reach T: Total Inflow=23.95 cfs 14.287 af
Outflow=23.95 cfs 14.287 af

Pond B1: Basin 1 Peak Elev=689.13' Storage=17,821 cf Inflow=2.58 cfs 1.378 af
Primary=0.84 cfs 0.786 af Secondary=1.25 cfs 0.277 af Outflow=2.10 cfs 1.063 af

Pond B2: Basin 2 Peak Elev=689.48' Storage=12,232 cf Inflow=16.64 cfs 9.755 af
Primary=0.70 cfs 0.840 af Secondary=15.90 cfs 8.778 af Outflow=16.59 cfs 9.618 af

Total Runoff Area = 100.205 ac Runoff Volume = 14.740 af Average Runoff Depth = 1.77"
98.63% Pervious = 98.832 ac 1.37% Impervious = 1.373 ac

Summary for Subcatchment 1-D: PR DA 1

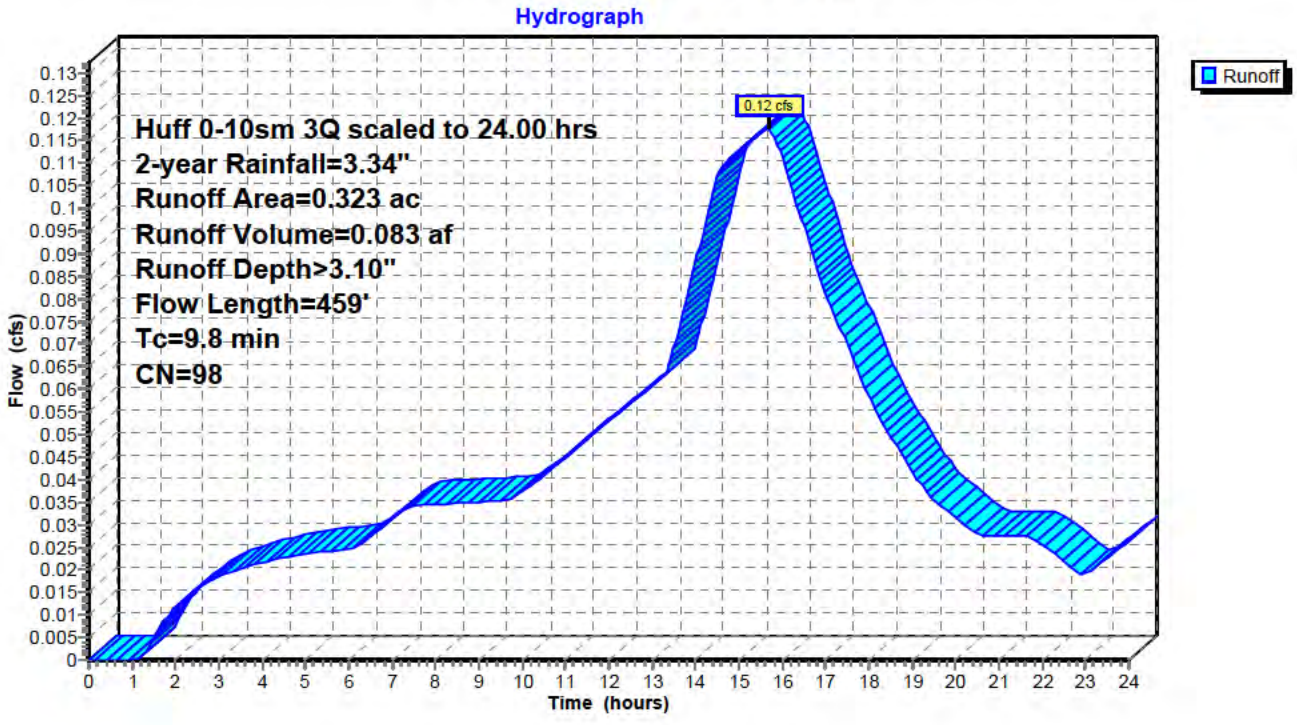
Runoff = 0.12 cfs @ 15.69 hrs, Volume= 0.083 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

	Area (ac)	CN	Description
*	0.323	98	Impervious Area
	0.323		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.9	171	0.0290	1.53		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.2	16	0.0380	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	172	0.0122	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.8	459	Total			

Subcatchment 1-D: PR DA 1



Hydrograph for Subcatchment 1-D: PR DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.37	1.15	0.06
0.25	0.00	0.00	0.00	13.25	1.42	1.20	0.06
0.50	0.01	0.00	0.00	13.50	1.47	1.25	0.07
0.75	0.02	0.00	0.00	13.75	1.53	1.31	0.08
1.00	0.04	0.00	0.00	14.00	1.60	1.38	0.09
1.25	0.06	0.00	0.00	14.25	1.68	1.46	0.10
1.50	0.08	0.01	0.01	14.50	1.76	1.54	0.11
1.75	0.10	0.01	0.01	14.75	1.85	1.63	0.11
2.00	0.12	0.02	0.01	15.00	1.94	1.71	0.11
2.25	0.14	0.03	0.01	15.25	2.03	1.80	0.11
2.50	0.16	0.04	0.02	15.50	2.12	1.89	**0.12**
2.75	0.18	0.06	0.02	15.75	2.21	1.98	**0.12**
3.00	0.20	0.07	0.02	16.00	2.29	2.06	0.11
3.25	0.22	0.09	0.02	16.25	2.37	2.14	0.10
3.50	0.25	0.10	0.02	16.50	2.45	2.22	0.10
3.75	0.27	0.12	0.02	16.75	2.51	2.28	0.09
4.00	0.29	0.14	0.02	17.00	2.58	2.35	0.08
4.25	0.31	0.15	0.02	17.25	2.63	2.40	0.08
4.50	0.33	0.17	0.02	17.50	2.69	2.46	0.07
4.75	0.35	0.19	0.02	17.75	2.74	2.51	0.06
5.00	0.37	0.21	0.02	18.00	2.78	2.55	0.06
5.25	0.39	0.22	0.02	18.25	2.82	2.59	0.05
5.50	0.42	0.24	0.02	18.50	2.86	2.63	0.05
5.75	0.44	0.26	0.02	18.75	2.89	2.66	0.05
6.00	0.46	0.28	0.02	19.00	2.93	2.70	0.04
6.25	0.48	0.30	0.03	19.25	2.96	2.72	0.04
6.50	0.50	0.32	0.03	19.50	2.98	2.75	0.04
6.75	0.53	0.34	0.03	19.75	3.01	2.78	0.03
7.00	0.55	0.37	0.03	20.00	3.03	2.80	0.03
7.25	0.58	0.39	0.03	20.25	3.06	2.82	0.03
7.50	0.61	0.42	0.03	20.50	3.08	2.85	0.03
7.75	0.64	0.45	0.03	20.75	3.10	2.87	0.03
8.00	0.67	0.47	0.03	21.00	3.12	2.89	0.03
8.25	0.70	0.50	0.03	21.25	3.14	2.91	0.03
8.50	0.72	0.53	0.03	21.50	3.16	2.93	0.03
8.75	0.75	0.55	0.03	21.75	3.18	2.95	0.03
9.00	0.78	0.58	0.04	22.00	3.20	2.97	0.03
9.25	0.81	0.61	0.04	22.25	3.22	2.99	0.02
9.50	0.84	0.63	0.04	22.50	3.24	3.00	0.02
9.75	0.86	0.66	0.04	22.75	3.25	3.02	0.02
10.00	0.89	0.69	0.04	23.00	3.27	3.03	0.02
10.25	0.93	0.72	0.04	23.25	3.28	3.05	0.02
10.50	0.96	0.75	0.04	23.50	3.30	3.07	0.02
10.75	0.99	0.78	0.04	23.75	3.32	3.09	0.02
11.00	1.03	0.82	0.04	24.00	**3.34**	**3.11**	0.03
11.25	1.07	0.86	0.05				
11.50	1.10	0.89	0.05				
11.75	1.15	0.93	0.05				
12.00	1.19	0.97	0.05				
12.25	1.23	1.01	0.05				
12.50	1.27	1.06	0.06				
12.75	1.32	1.10	0.06				

Summary for Subcatchment 1-U: PR DA 1

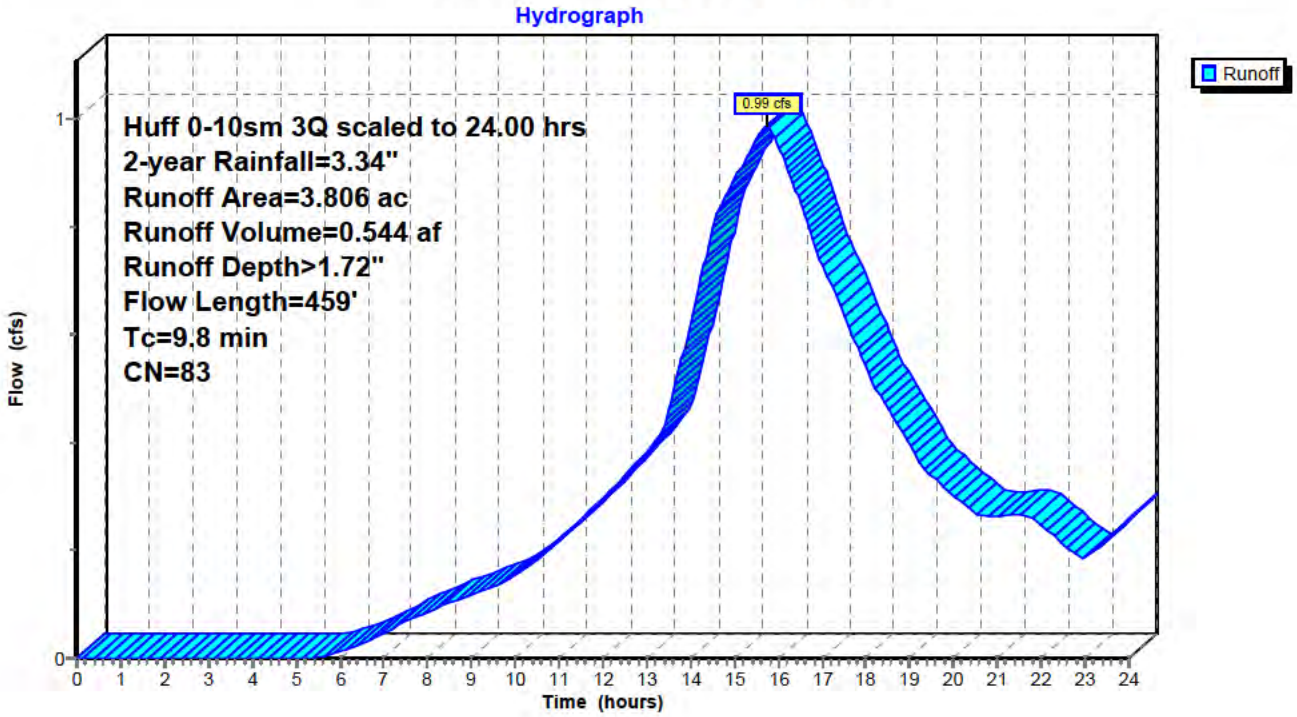
Runoff = 0.99 cfs @ 15.73 hrs, Volume= 0.544 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

	Area (ac)	CN	Description
	0.000	89	Row crops, straight row, Good, HSG D
	0.753	89	Row crops, straight row, Good, HSG D
	0.711	80	Pasture/grassland/range, Good, HSG D
	1.342	85	Row crops, straight row, Good, HSG C
	0.914	74	Pasture/grassland/range, Good, HSG C
*	0.086	98	Impervious Area
	3.806	83	Weighted Average
	3.720		97.74% Pervious Area
	0.086		2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.9	171	0.0290	1.53		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.2	16	0.0380	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	172	0.0122	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.8	459	Total			

Subcatchment 1-U: PR DA 1



Hydrograph for Subcatchment 1-U: PR DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.37	0.31	0.38
0.25	0.00	0.00	0.00	13.25	1.42	0.33	0.41
0.50	0.01	0.00	0.00	13.50	1.47	0.36	0.46
0.75	0.02	0.00	0.00	13.75	1.53	0.40	0.54
1.00	0.04	0.00	0.00	14.00	1.60	0.44	0.62
1.25	0.06	0.00	0.00	14.25	1.68	0.49	0.71
1.50	0.08	0.00	0.00	14.50	1.76	0.54	0.80
1.75	0.10	0.00	0.00	14.75	1.85	0.59	0.85
2.00	0.12	0.00	0.00	15.00	1.94	0.65	0.89
2.25	0.14	0.00	0.00	15.25	2.03	0.71	0.93
2.50	0.16	0.00	0.00	15.50	2.12	0.78	0.96
2.75	0.18	0.00	0.00	15.75	2.21	0.84	**0.99**
3.00	0.20	0.00	0.00	16.00	2.29	0.90	0.95
3.25	0.22	0.00	0.00	16.25	2.37	0.96	0.90
3.50	0.25	0.00	0.00	16.50	2.45	1.01	0.85
3.75	0.27	0.00	0.00	16.75	2.51	1.07	0.79
4.00	0.29	0.00	0.00	17.00	2.58	1.11	0.73
4.25	0.31	0.00	0.00	17.25	2.63	1.16	0.69
4.50	0.33	0.00	0.00	17.50	2.69	1.20	0.64
4.75	0.35	0.00	0.00	17.75	2.74	1.24	0.59
5.00	0.37	0.00	0.00	18.00	2.78	1.27	0.54
5.25	0.39	0.00	0.00	18.25	2.82	1.30	0.50
5.50	0.42	0.00	0.00	18.50	2.86	1.33	0.46
5.75	0.44	0.00	0.00	18.75	2.89	1.36	0.43
6.00	0.46	0.00	0.01	19.00	2.93	1.39	0.40
6.25	0.48	0.00	0.02	19.25	2.96	1.41	0.36
6.50	0.50	0.00	0.03	19.50	2.98	1.43	0.34
6.75	0.53	0.01	0.04	19.75	3.01	1.45	0.32
7.00	0.55	0.01	0.05	20.00	3.03	1.47	0.30
7.25	0.58	0.01	0.06	20.25	3.06	1.49	0.29
7.50	0.61	0.02	0.07	20.50	3.08	1.51	0.27
7.75	0.64	0.02	0.08	20.75	3.10	1.53	0.26
8.00	0.67	0.03	0.09	21.00	3.12	1.54	0.26
8.25	0.70	0.03	0.09	21.25	3.14	1.56	0.27
8.50	0.72	0.04	0.10	21.50	3.16	1.58	0.27
8.75	0.75	0.05	0.11	21.75	3.18	1.60	0.26
9.00	0.78	0.06	0.12	22.00	3.20	1.61	0.25
9.25	0.81	0.06	0.13	22.25	3.22	1.63	0.23
9.50	0.84	0.07	0.13	22.50	3.24	1.64	0.21
9.75	0.86	0.08	0.14	22.75	3.25	1.65	0.19
10.00	0.89	0.09	0.15	23.00	3.27	1.66	0.18
10.25	0.93	0.10	0.17	23.25	3.28	1.68	0.20
10.50	0.96	0.12	0.18	23.50	3.30	1.69	0.22
10.75	0.99	0.13	0.20	23.75	3.32	1.71	0.24
11.00	1.03	0.14	0.22	24.00	**3.34**	**1.72**	0.26
11.25	1.07	0.16	0.24				
11.50	1.10	0.18	0.26				
11.75	1.15	0.19	0.28				
12.00	1.19	0.21	0.30				
12.25	1.23	0.23	0.32				
12.50	1.27	0.26	0.34				
12.75	1.32	0.28	0.36				

Summary for Subcatchment 2-U: PR DA 2

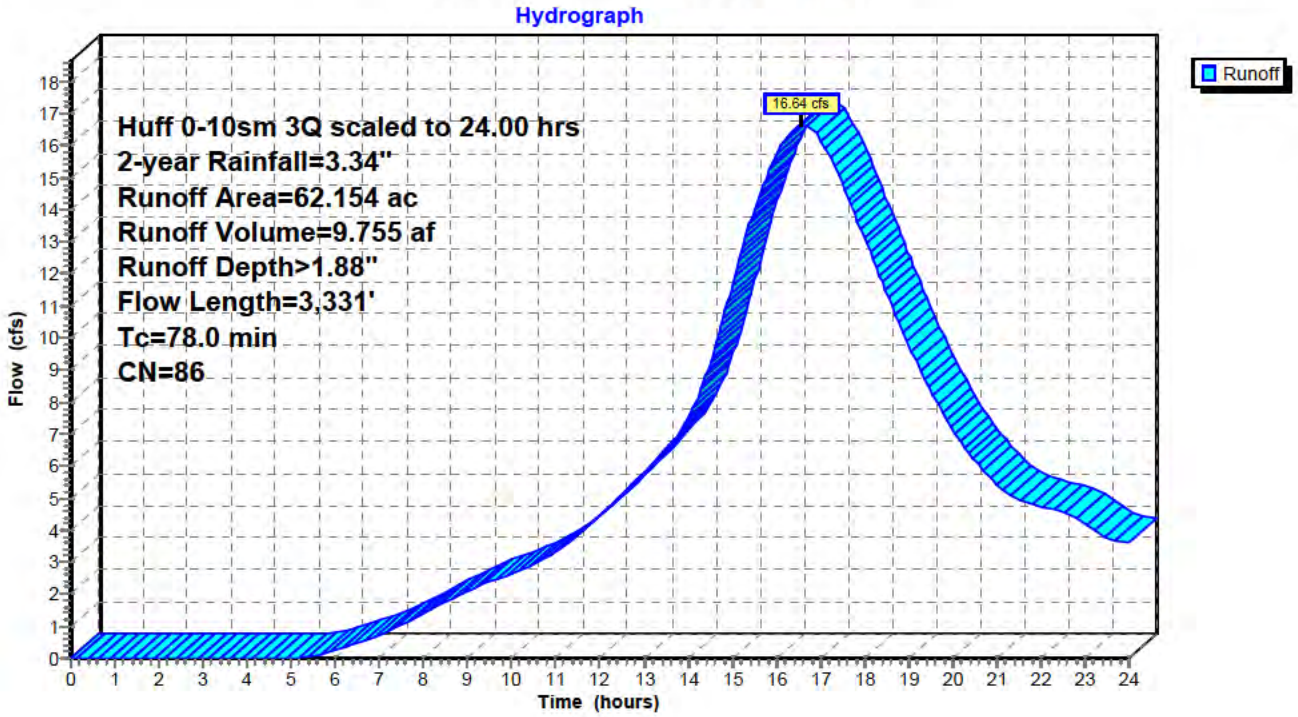
Runoff = 16.64 cfs @ 16.57 hrs, Volume= 9.755 af, Depth> 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

	Area (ac)	CN	Description
	11.052	89	Row crops, straight row, Good, HSG D
	2.151	80	Pasture/grassland/range, Good, HSG D
	0.061	89	Row crops, straight row, Good, HSG D
	10.906	89	Row crops, straight row, Good, HSG D
	8.457	80	Pasture/grassland/range, Good, HSG D
	9.982	89	Row crops, straight row, Good, HSG D
	0.038	80	Pasture/grassland/range, Good, HSG D
	14.843	85	Row crops, straight row, Good, HSG C
	2.519	74	Pasture/grassland/range, Good, HSG C
	0.830	85	Row crops, straight row, Good, HSG C
	1.002	74	Pasture/grassland/range, Good, HSG C
*	0.313	98	Impervious Area
	62.154	86	Weighted Average
	61.841		99.50% Pervious Area
	0.313		0.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.0421	0.49		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.5	141	0.0306	1.57		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
42.0	1,988	0.0077	0.79		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
31.1	1,102	0.0071	0.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
78.0	3,331	Total			

Subcatchment 2-U: PR DA 2



Hydrograph for Subcatchment 2-U: PR DA 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.37	0.41	5.80
0.25	0.00	0.00	0.00	13.25	1.42	0.44	6.17
0.50	0.01	0.00	0.00	13.50	1.47	0.47	6.54
0.75	0.02	0.00	0.00	13.75	1.53	0.51	6.96
1.00	0.04	0.00	0.00	14.00	1.60	0.56	7.49
1.25	0.06	0.00	0.00	14.25	1.68	0.61	8.24
1.50	0.08	0.00	0.00	14.50	1.76	0.67	9.21
1.75	0.10	0.00	0.00	14.75	1.85	0.74	10.37
2.00	0.12	0.00	0.00	15.00	1.94	0.80	11.64
2.25	0.14	0.00	0.00	15.25	2.03	0.87	12.86
2.50	0.16	0.00	0.00	15.50	2.12	0.94	13.97
2.75	0.18	0.00	0.00	15.75	2.21	1.01	14.89
3.00	0.20	0.00	0.00	16.00	2.29	1.08	15.69
3.25	0.22	0.00	0.00	16.25	2.37	1.14	16.29
3.50	0.25	0.00	0.00	16.50	2.45	1.20	**16.60**
3.75	0.27	0.00	0.00	16.75	2.51	1.25	**16.58**
4.00	0.29	0.00	0.00	17.00	2.58	1.31	16.19
4.25	0.31	0.00	0.00	17.25	2.63	1.35	15.59
4.50	0.33	0.00	0.00	17.50	2.69	1.40	14.81
4.75	0.35	0.00	0.00	17.75	2.74	1.44	13.99
5.00	0.37	0.00	0.01	18.00	2.78	1.48	13.13
5.25	0.39	0.00	0.03	18.25	2.82	1.51	12.27
5.50	0.42	0.00	0.08	18.50	2.86	1.54	11.42
5.75	0.44	0.01	0.15	18.75	2.89	1.57	10.58
6.00	0.46	0.01	0.24	19.00	2.93	1.60	9.80
6.25	0.48	0.01	0.35	19.25	2.96	1.62	9.06
6.50	0.50	0.02	0.46	19.50	2.98	1.65	8.38
6.75	0.53	0.02	0.57	19.75	3.01	1.67	7.73
7.00	0.55	0.03	0.71	20.00	3.03	1.69	7.15
7.25	0.58	0.03	0.86	20.25	3.06	1.71	6.62
7.50	0.61	0.04	1.03	20.50	3.08	1.73	6.17
7.75	0.64	0.05	1.22	20.75	3.10	1.75	5.78
8.00	0.67	0.06	1.41	21.00	3.12	1.77	5.43
8.25	0.70	0.07	1.60	21.25	3.14	1.78	5.15
8.50	0.72	0.08	1.78	21.50	3.16	1.80	4.94
8.75	0.75	0.09	1.94	21.75	3.18	1.82	4.81
9.00	0.78	0.10	2.10	22.00	3.20	1.84	4.72
9.25	0.81	0.11	2.24	22.25	3.22	1.85	4.65
9.50	0.84	0.12	2.38	22.50	3.24	1.87	4.55
9.75	0.86	0.13	2.51	22.75	3.25	1.88	4.40
10.00	0.89	0.15	2.64	23.00	3.27	1.89	4.19
10.25	0.93	0.16	2.77	23.25	3.28	1.91	3.95
10.50	0.96	0.18	2.93	23.50	3.30	1.92	3.74
10.75	0.99	0.19	3.11	23.75	3.32	1.94	3.62
11.00	1.03	0.21	3.34	24.00	**3.34**	**1.96**	3.63
11.25	1.07	0.23	3.59				
11.50	1.10	0.25	3.86				
11.75	1.15	0.27	4.15				
12.00	1.19	0.30	4.46				
12.25	1.23	0.32	4.78				
12.50	1.27	0.35	5.11				
12.75	1.32	0.38	5.46				

Summary for Subcatchment 3-D: PR DA 3

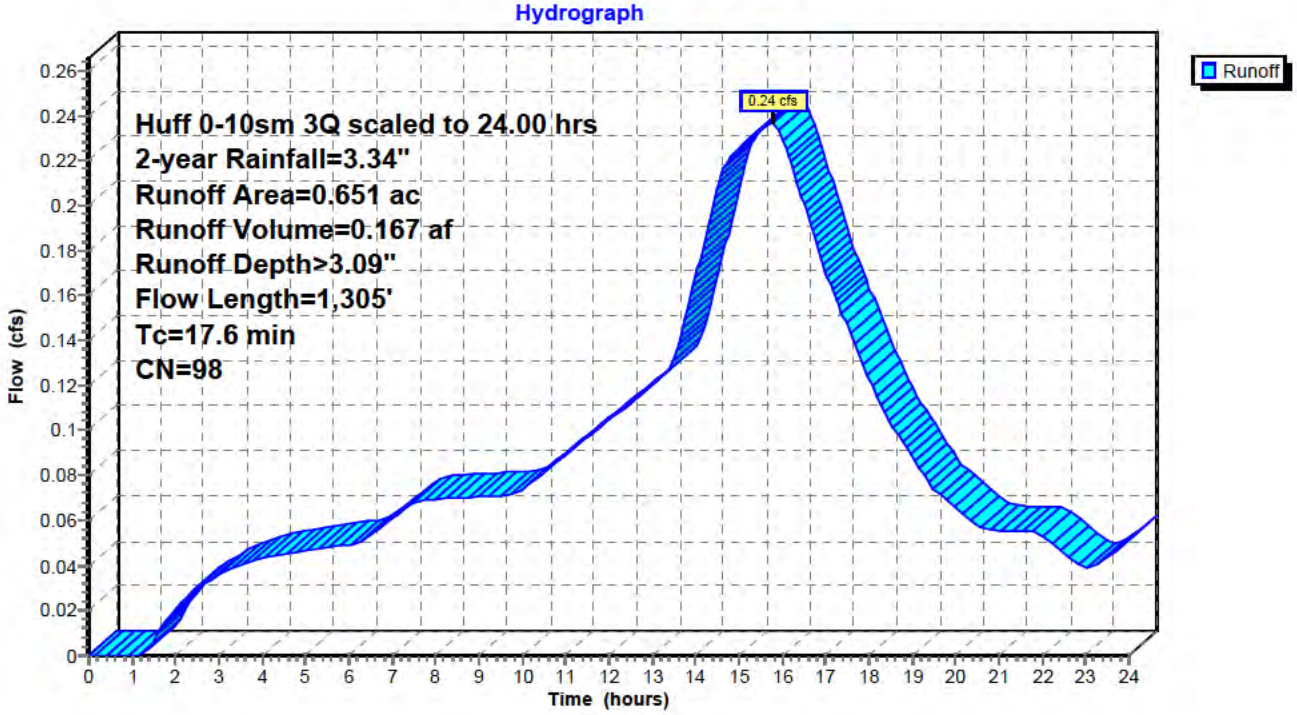
Runoff = 0.24 cfs @ 15.77 hrs, Volume= 0.167 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

	Area (ac)	CN	Description
*	0.651	98	Impervious Area
	0.651		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0081	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
0.6	37	0.0151	1.11		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.8	758	0.0141	7.10	71.03	**Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.3	38	0.0146	2.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.3	372	0.0113	0.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.6	1,305	Total			

Subcatchment 3-D: PR DA 3



Hydrograph for Subcatchment 3-D: PR DA 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.37	1.15	0.12
0.25	0.00	0.00	0.00	13.25	1.42	1.20	0.12
0.50	0.01	0.00	0.00	13.50	1.47	1.25	0.13
0.75	0.02	0.00	0.00	13.75	1.53	1.31	0.15
1.00	0.04	0.00	0.00	14.00	1.60	1.38	0.17
1.25	0.06	0.00	0.00	14.25	1.68	1.46	0.19
1.50	0.08	0.01	0.01	14.50	1.76	1.54	0.21
1.75	0.10	0.01	0.01	14.75	1.85	1.63	0.22
2.00	0.12	0.02	0.02	15.00	1.94	1.71	0.23
2.25	0.14	0.03	0.03	15.25	2.03	1.80	0.23
2.50	0.16	0.04	0.03	15.50	2.12	1.89	0.23
2.75	0.18	0.06	0.03	15.75	2.21	1.98	**0.24**
3.00	0.20	0.07	0.04	16.00	2.29	2.06	0.23
3.25	0.22	0.09	0.04	16.25	2.37	2.14	0.22
3.50	0.25	0.10	0.04	16.50	2.45	2.22	0.20
3.75	0.27	0.12	0.04	16.75	2.51	2.28	0.19
4.00	0.29	0.14	0.04	17.00	2.58	2.35	0.17
4.25	0.31	0.15	0.04	17.25	2.63	2.40	0.16
4.50	0.33	0.17	0.05	17.50	2.69	2.46	0.15
4.75	0.35	0.19	0.05	17.75	2.74	2.51	0.13
5.00	0.37	0.21	0.05	18.00	2.78	2.55	0.12
5.25	0.39	0.22	0.05	18.25	2.82	2.59	0.11
5.50	0.42	0.24	0.05	18.50	2.86	2.63	0.10
5.75	0.44	0.26	0.05	18.75	2.89	2.66	0.10
6.00	0.46	0.28	0.05	19.00	2.93	2.70	0.09
6.25	0.48	0.30	0.05	19.25	2.96	2.72	0.08
6.50	0.50	0.32	0.05	19.50	2.98	2.75	0.07
6.75	0.53	0.34	0.06	19.75	3.01	2.78	0.07
7.00	0.55	0.37	0.06	20.00	3.03	2.80	0.07
7.25	0.58	0.39	0.06	20.25	3.06	2.82	0.06
7.50	0.61	0.42	0.07	20.50	3.08	2.85	0.06
7.75	0.64	0.45	0.07	20.75	3.10	2.87	0.06
8.00	0.67	0.47	0.07	21.00	3.12	2.89	0.06
8.25	0.70	0.50	0.07	21.25	3.14	2.91	0.06
8.50	0.72	0.53	0.07	21.50	3.16	2.93	0.06
8.75	0.75	0.55	0.07	21.75	3.18	2.95	0.06
9.00	0.78	0.58	0.07	22.00	3.20	2.97	0.05
9.25	0.81	0.61	0.07	22.25	3.22	2.99	0.05
9.50	0.84	0.63	0.07	22.50	3.24	3.00	0.05
9.75	0.86	0.66	0.07	22.75	3.25	3.02	0.04
10.00	0.89	0.69	0.07	23.00	3.27	3.03	0.04
10.25	0.93	0.72	0.08	23.25	3.28	3.05	0.04
10.50	0.96	0.75	0.08	23.50	3.30	3.07	0.04
10.75	0.99	0.78	0.08	23.75	3.32	3.09	0.05
11.00	1.03	0.82	0.09	24.00	**3.34**	**3.11**	0.05
11.25	1.07	0.86	0.09				
11.50	1.10	0.89	0.10				
11.75	1.15	0.93	0.10				
12.00	1.19	0.97	0.10				
12.25	1.23	1.01	0.11				
12.50	1.27	1.06	0.11				
12.75	1.32	1.10	0.12				

Summary for Subcatchment 3-U: PR DA 3

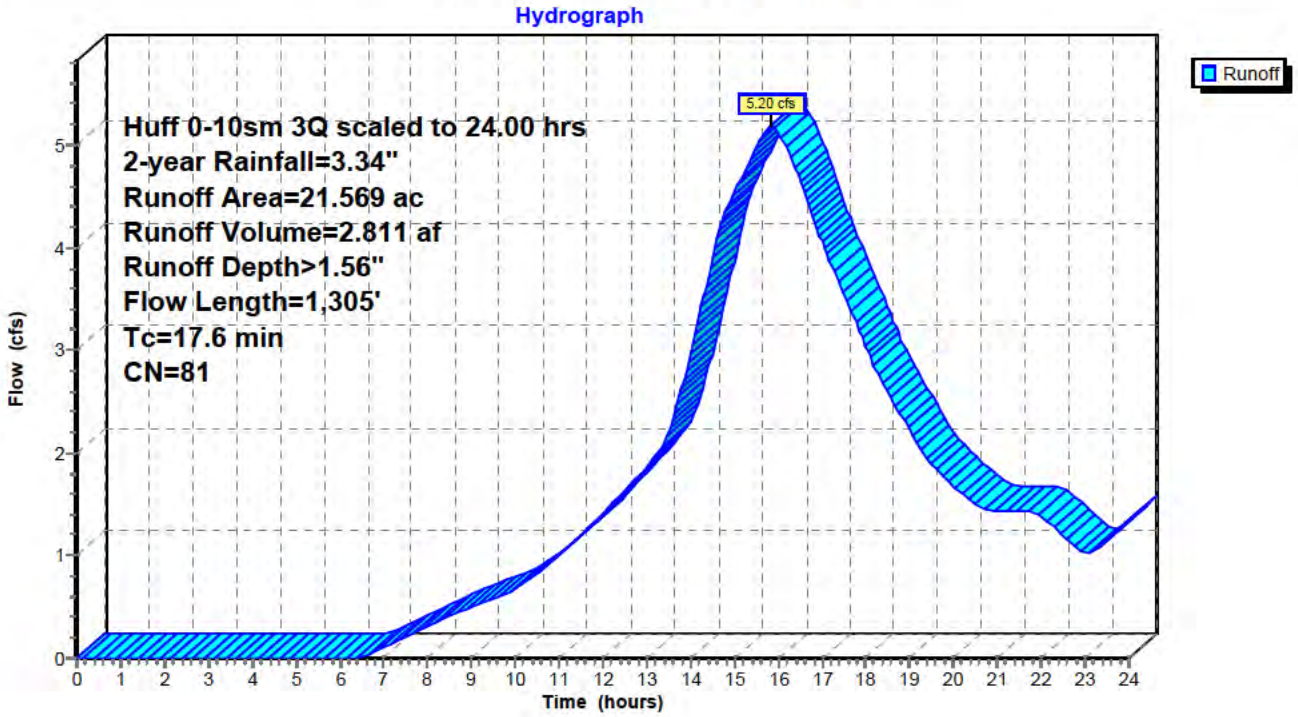
Runoff = 5.20 cfs @ 15.84 hrs, Volume= 2.811 af, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

Area (ac)	CN	Description
3.171	89	Row crops, straight row, Good, HSG D
4.736	80	Pasture/grassland/range, Good, HSG D
1.134	89	Row crops, straight row, Good, HSG D
5.352	80	Pasture/grassland/range, Good, HSG D
3.187	85	Row crops, straight row, Good, HSG C
3.989	74	Pasture/grassland/range, Good, HSG C
21.569	81	Weighted Average
21.569		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0081	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
0.6	37	0.0151	1.11		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.8	758	0.0141	7.10	71.03	**Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.3	38	0.0146	2.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.3	372	0.0113	0.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.6	1,305	Total			

Subcatchment 3-U: PR DA 3



Hydrograph for Subcatchment 3-U: PR DA 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.37	0.25	1.87
0.25	0.00	0.00	0.00	13.25	1.42	0.27	1.99
0.50	0.01	0.00	0.00	13.50	1.47	0.30	2.19
0.75	0.02	0.00	0.00	13.75	1.53	0.33	2.55
1.00	0.04	0.00	0.00	14.00	1.60	0.37	2.97
1.25	0.06	0.00	0.00	14.25	1.68	0.41	3.43
1.50	0.08	0.00	0.00	14.50	1.76	0.46	3.91
1.75	0.10	0.00	0.00	14.75	1.85	0.51	4.29
2.00	0.12	0.00	0.00	15.00	1.94	0.57	4.54
2.25	0.14	0.00	0.00	15.25	2.03	0.62	4.76
2.50	0.16	0.00	0.00	15.50	2.12	0.68	4.97
2.75	0.18	0.00	0.00	15.75	2.21	0.74	**5.17**
3.00	0.20	0.00	0.00	16.00	2.29	0.80	**5.14**
3.25	0.22	0.00	0.00	16.25	2.37	0.85	4.92
3.50	0.25	0.00	0.00	16.50	2.45	0.90	4.65
3.75	0.27	0.00	0.00	16.75	2.51	0.95	4.36
4.00	0.29	0.00	0.00	17.00	2.58	1.00	4.06
4.25	0.31	0.00	0.00	17.25	2.63	1.04	3.80
4.50	0.33	0.00	0.00	17.50	2.69	1.08	3.55
4.75	0.35	0.00	0.00	17.75	2.74	1.11	3.30
5.00	0.37	0.00	0.00	18.00	2.78	1.15	3.04
5.25	0.39	0.00	0.00	18.25	2.82	1.18	2.79
5.50	0.42	0.00	0.00	18.50	2.86	1.21	2.59
5.75	0.44	0.00	0.00	18.75	2.89	1.23	2.41
6.00	0.46	0.00	0.00	19.00	2.93	1.26	2.23
6.25	0.48	0.00	0.00	19.25	2.96	1.28	2.04
6.50	0.50	0.00	0.02	19.50	2.98	1.30	1.88
6.75	0.53	0.00	0.06	19.75	3.01	1.32	1.78
7.00	0.55	0.00	0.10	20.00	3.03	1.34	1.68
7.25	0.58	0.01	0.16	20.25	3.06	1.36	1.59
7.50	0.61	0.01	0.21	20.50	3.08	1.37	1.49
7.75	0.64	0.01	0.27	20.75	3.10	1.39	1.44
8.00	0.67	0.02	0.32	21.00	3.12	1.41	1.43
8.25	0.70	0.02	0.36	21.25	3.14	1.42	1.44
8.50	0.72	0.02	0.41	21.50	3.16	1.44	1.44
8.75	0.75	0.03	0.45	21.75	3.18	1.46	1.44
9.00	0.78	0.04	0.50	22.00	3.20	1.47	1.39
9.25	0.81	0.04	0.54	22.25	3.22	1.49	1.30
9.50	0.84	0.05	0.58	22.50	3.24	1.50	1.20
9.75	0.86	0.06	0.62	22.75	3.25	1.51	1.10
10.00	0.89	0.07	0.68	23.00	3.27	1.52	1.01
10.25	0.93	0.07	0.75	23.25	3.28	1.53	1.05
10.50	0.96	0.08	0.83	23.50	3.30	1.55	1.15
10.75	0.99	0.10	0.91	23.75	3.32	1.56	1.25
11.00	1.03	0.11	1.00	24.00	**3.34**	**1.58**	1.36
11.25	1.07	0.12	1.10				
11.50	1.10	0.14	1.20				
11.75	1.15	0.15	1.30				
12.00	1.19	0.17	1.41				
12.25	1.23	0.19	1.52				
12.50	1.27	0.21	1.63				
12.75	1.32	0.23	1.75				

Summary for Subcatchment 4-U: PR DA 4

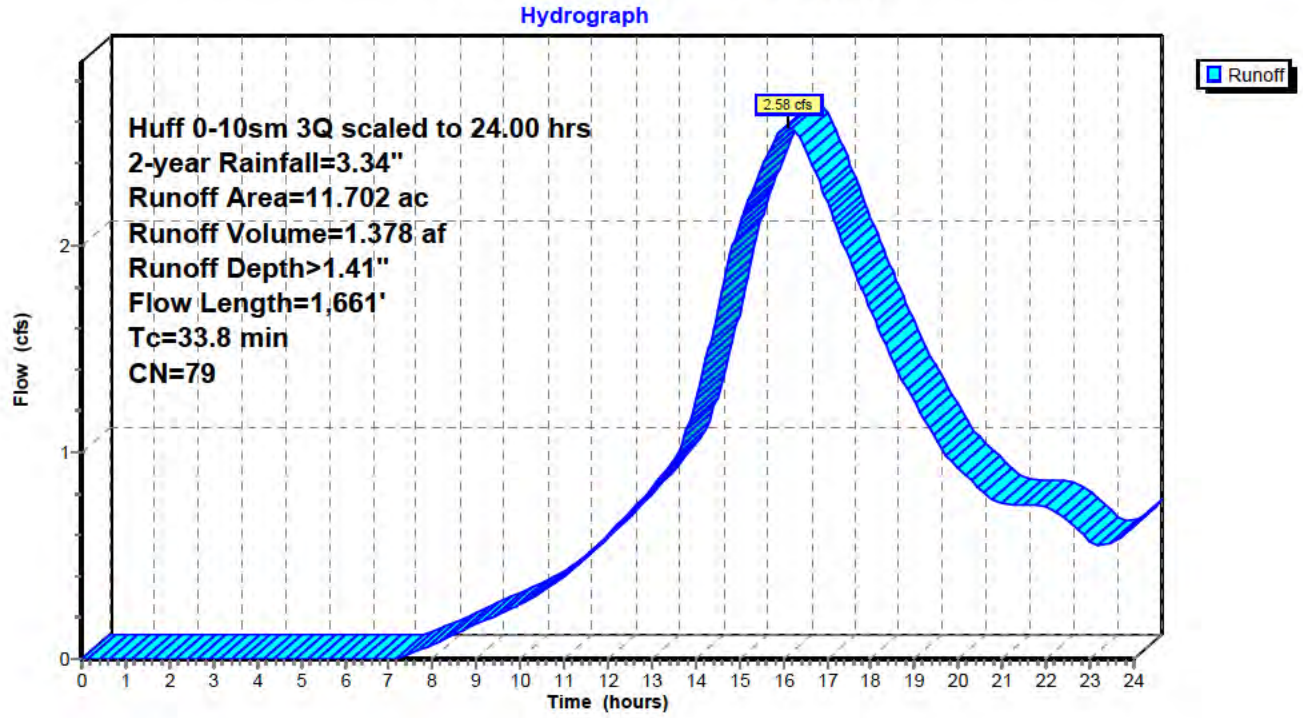
Runoff = 2.58 cfs @ 16.08 hrs, Volume= 1.378 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

Area (ac)	CN	Description
0.399	89	Row crops, straight row, Good, HSG D
4.560	80	Pasture/grassland/range, Good, HSG D
0.000	89	Row crops, straight row, Good, HSG D
3.035	80	Pasture/grassland/range, Good, HSG D
0.695	85	Row crops, straight row, Good, HSG C
3.013	74	Pasture/grassland/range, Good, HSG C
11.702	79	Weighted Average
11.702		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0080	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
2.7	198	0.0180	1.21		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
24.5	1,363	0.0175	0.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
33.8	1,661	Total			

Subcatchment 4-U: PR DA 4



Hydrograph for Subcatchment 4-U: PR DA 4

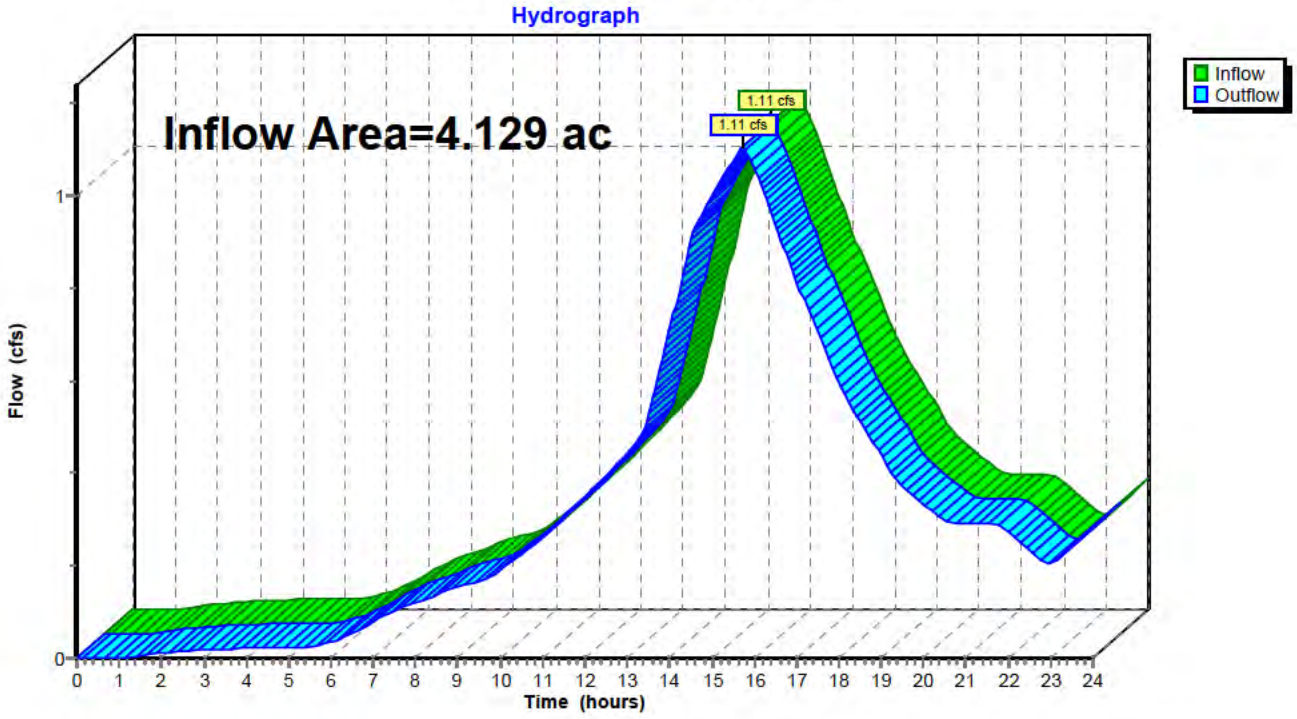
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.37	0.20	0.83
0.25	0.00	0.00	0.00	13.25	1.42	0.22	0.89
0.50	0.01	0.00	0.00	13.50	1.47	0.25	0.96
0.75	0.02	0.00	0.00	13.75	1.53	0.27	1.08
1.00	0.04	0.00	0.00	14.00	1.60	0.31	1.25
1.25	0.06	0.00	0.00	14.25	1.68	0.35	1.46
1.50	0.08	0.00	0.00	14.50	1.76	0.39	1.68
1.75	0.10	0.00	0.00	14.75	1.85	0.44	1.92
2.00	0.12	0.00	0.00	15.00	1.94	0.49	2.10
2.25	0.14	0.00	0.00	15.25	2.03	0.54	2.24
2.50	0.16	0.00	0.00	15.50	2.12	0.59	2.37
2.75	0.18	0.00	0.00	15.75	2.21	0.65	2.49
3.00	0.20	0.00	0.00	16.00	2.29	0.70	**2.57**
3.25	0.22	0.00	0.00	16.25	2.37	0.75	**2.56**
3.50	0.25	0.00	0.00	16.50	2.45	0.80	2.47
3.75	0.27	0.00	0.00	16.75	2.51	0.85	2.35
4.00	0.29	0.00	0.00	17.00	2.58	0.89	2.21
4.25	0.31	0.00	0.00	17.25	2.63	0.93	2.07
4.50	0.33	0.00	0.00	17.50	2.69	0.97	1.94
4.75	0.35	0.00	0.00	17.75	2.74	1.00	1.82
5.00	0.37	0.00	0.00	18.00	2.78	1.03	1.69
5.25	0.39	0.00	0.00	18.25	2.82	1.06	1.56
5.50	0.42	0.00	0.00	18.50	2.86	1.09	1.44
5.75	0.44	0.00	0.00	18.75	2.89	1.11	1.34
6.00	0.46	0.00	0.00	19.00	2.93	1.14	1.24
6.25	0.48	0.00	0.00	19.25	2.96	1.16	1.15
6.50	0.50	0.00	0.00	19.50	2.98	1.18	1.06
6.75	0.53	0.00	0.00	19.75	3.01	1.19	0.98
7.00	0.55	0.00	0.00	20.00	3.03	1.21	0.92
7.25	0.58	0.00	0.01	20.25	3.06	1.23	0.87
7.50	0.61	0.00	0.02	20.50	3.08	1.25	0.82
7.75	0.64	0.00	0.05	20.75	3.10	1.26	0.78
8.00	0.67	0.01	0.07	21.00	3.12	1.28	0.75
8.25	0.70	0.01	0.10	21.25	3.14	1.29	0.75
8.50	0.72	0.01	0.12	21.50	3.16	1.31	0.74
8.75	0.75	0.02	0.15	21.75	3.18	1.32	0.75
9.00	0.78	0.02	0.17	22.00	3.20	1.34	0.74
9.25	0.81	0.03	0.19	22.25	3.22	1.35	0.71
9.50	0.84	0.03	0.22	22.50	3.24	1.36	0.67
9.75	0.86	0.04	0.24	22.75	3.25	1.38	0.62
10.00	0.89	0.04	0.26	23.00	3.27	1.39	0.57
10.25	0.93	0.05	0.29	23.25	3.28	1.40	0.54
10.50	0.96	0.06	0.33	23.50	3.30	1.41	0.56
10.75	0.99	0.07	0.36	23.75	3.32	1.43	0.60
11.00	1.03	0.08	0.41	24.00	**3.34**	**1.44**	0.65
11.25	1.07	0.09	0.45				
11.50	1.10	0.10	0.50				
11.75	1.15	0.12	0.55				
12.00	1.19	0.13	0.60				
12.25	1.23	0.15	0.65				
12.50	1.27	0.16	0.71				
12.75	1.32	0.18	0.77				

Summary for Reach 1-T: PR DA 1 TOTAL

Inflow Area = 4.129 ac, 9.91% Impervious, Inflow Depth > 1.82" for 2-year event
Inflow = 1.11 cfs @ 15.73 hrs, Volume= 0.628 af
Outflow = 1.11 cfs @ 15.73 hrs, Volume= 0.628 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1-T: PR DA 1 TOTAL



Hydrograph for Reach 1-T: PR DA 1 TOTAL

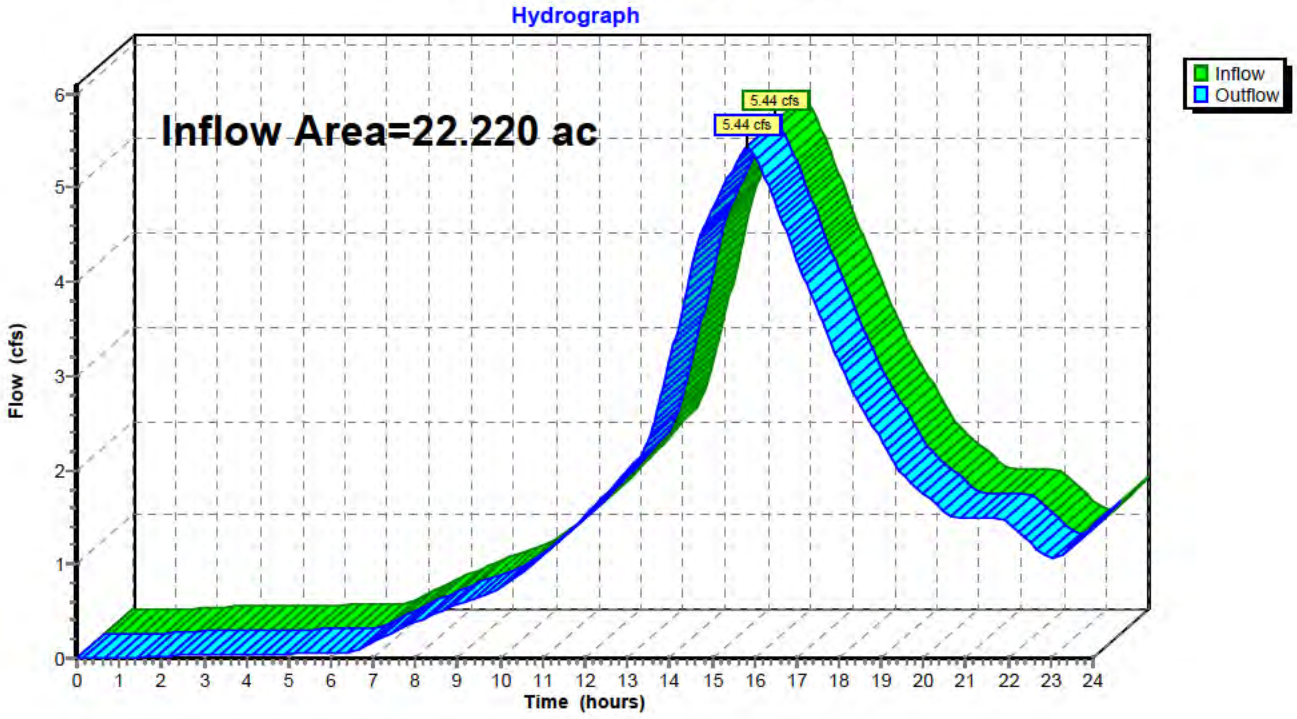
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	0.44		0.44
0.25	0.00		0.00	13.25	0.47		0.47
0.50	0.00		0.00	13.50	0.53		0.53
0.75	0.00		0.00	13.75	0.62		0.62
1.00	0.00		0.00	14.00	0.71		0.71
1.25	0.00		0.00	14.25	0.81		0.81
1.50	0.01		0.01	14.50	0.91		0.91
1.75	0.01		0.01	14.75	0.96		0.96
2.00	0.01		0.01	15.00	1.00		1.00
2.25	0.01		0.01	15.25	1.04		1.04
2.50	0.02		0.02	15.50	1.08		1.08
2.75	0.02		0.02	15.75	**1.11**		**1.11**
3.00	0.02		0.02	16.00	1.06		1.06
3.25	0.02		0.02	16.25	1.00		1.00
3.50	0.02		0.02	16.50	0.94		0.94
3.75	0.02		0.02	16.75	0.88		0.88
4.00	0.02		0.02	17.00	0.81		0.81
4.25	0.02		0.02	17.25	0.76		0.76
4.50	0.02		0.02	17.50	0.71		0.71
4.75	0.02		0.02	17.75	0.65		0.65
5.00	0.02		0.02	18.00	0.60		0.60
5.25	0.02		0.02	18.25	0.55		0.55
5.50	0.02		0.02	18.50	0.51		0.51
5.75	0.03		0.03	18.75	0.48		0.48
6.00	0.04		0.04	19.00	0.44		0.44
6.25	0.04		0.04	19.25	0.40		0.40
6.50	0.05		0.05	19.50	0.37		0.37
6.75	0.06		0.06	19.75	0.35		0.35
7.00	0.08		0.08	20.00	0.33		0.33
7.25	0.09		0.09	20.25	0.31		0.31
7.50	0.10		0.10	20.50	0.30		0.30
7.75	0.11		0.11	20.75	0.29		0.29
8.00	0.12		0.12	21.00	0.29		0.29
8.25	0.13		0.13	21.25	0.29		0.29
8.50	0.14		0.14	21.50	0.29		0.29
8.75	0.15		0.15	21.75	0.29		0.29
9.00	0.15		0.15	22.00	0.27		0.27
9.25	0.16		0.16	22.25	0.25		0.25
9.50	0.17		0.17	22.50	0.23		0.23
9.75	0.18		0.18	22.75	0.21		0.21
10.00	0.19		0.19	23.00	0.20		0.20
10.25	0.21		0.21	23.25	0.22		0.22
10.50	0.23		0.23	23.50	0.24		0.24
10.75	0.24		0.24	23.75	0.26		0.26
11.00	0.26		0.26	24.00	0.28		0.28
11.25	0.28		0.28				
11.50	0.31		0.31				
11.75	0.33		0.33				
12.00	0.35		0.35				
12.25	0.37		0.37				
12.50	0.40		0.40				
12.75	0.42		0.42				

Summary for Reach 3-T: PR DA 3 TOTAL

Inflow Area = 22.220 ac, 2.93% Impervious, Inflow Depth > 1.61" for 2-year event
Inflow = 5.44 cfs @ 15.84 hrs, Volume= 2.979 af
Outflow = 5.44 cfs @ 15.84 hrs, Volume= 2.979 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3-T: PR DA 3 TOTAL



Hydrograph for Reach 3-T: PR DA 3 TOTAL

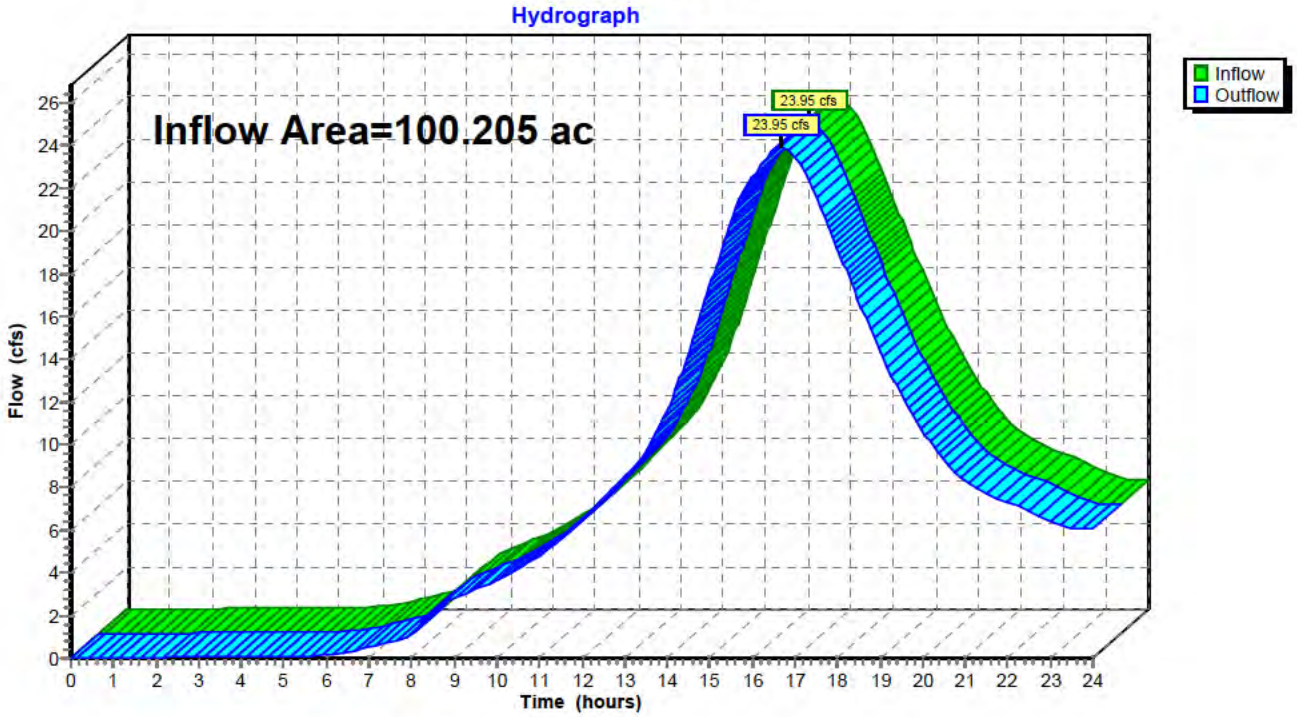
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	1.99		1.99
0.25	0.00		0.00	13.25	2.12		2.12
0.50	0.00		0.00	13.50	2.32		2.32
0.75	0.00		0.00	13.75	2.70		2.70
1.00	0.00		0.00	14.00	3.14		3.14
1.25	0.00		0.00	14.25	3.61		3.61
1.50	0.01		0.01	14.50	4.11		4.11
1.75	0.01		0.01	14.75	4.51		4.51
2.00	0.02		0.02	15.00	4.76		4.76
2.25	0.03		0.03	15.25	4.99		4.99
2.50	0.03		0.03	15.50	5.20		5.20
2.75	0.03		0.03	15.75	**5.41**		**5.41**
3.00	0.04		0.04	16.00	**5.37**		**5.37**
3.25	0.04		0.04	16.25	5.13		5.13
3.50	0.04		0.04	16.50	4.85		4.85
3.75	0.04		0.04	16.75	4.55		4.55
4.00	0.04		0.04	17.00	4.23		4.23
4.25	0.04		0.04	17.25	3.96		3.96
4.50	0.05		0.05	17.50	3.70		3.70
4.75	0.05		0.05	17.75	3.43		3.43
5.00	0.05		0.05	18.00	3.16		3.16
5.25	0.05		0.05	18.25	2.90		2.90
5.50	0.05		0.05	18.50	2.70		2.70
5.75	0.05		0.05	18.75	2.51		2.51
6.00	0.05		0.05	19.00	2.32		2.32
6.25	0.05		0.05	19.25	2.12		2.12
6.50	0.07		0.07	19.50	1.96		1.96
6.75	0.11		0.11	19.75	1.85		1.85
7.00	0.17		0.17	20.00	1.75		1.75
7.25	0.22		0.22	20.25	1.65		1.65
7.50	0.28		0.28	20.50	1.55		1.55
7.75	0.34		0.34	20.75	1.50		1.50
8.00	0.38		0.38	21.00	1.49		1.49
8.25	0.43		0.43	21.25	1.49		1.49
8.50	0.48		0.48	21.50	1.50		1.50
8.75	0.52		0.52	21.75	1.50		1.50
9.00	0.57		0.57	22.00	1.44		1.44
9.25	0.61		0.61	22.25	1.35		1.35
9.50	0.65		0.65	22.50	1.25		1.25
9.75	0.69		0.69	22.75	1.14		1.14
10.00	0.75		0.75	23.00	1.05		1.05
10.25	0.83		0.83	23.25	1.09		1.09
10.50	0.91		0.91	23.50	1.19		1.19
10.75	1.00		1.00	23.75	1.30		1.30
11.00	1.09		1.09	24.00	1.41		1.41
11.25	1.19		1.19				
11.50	1.29		1.29				
11.75	1.40		1.40				
12.00	1.51		1.51				
12.25	1.62		1.62				
12.50	1.74		1.74				
12.75	1.86		1.86				

Summary for Reach T: Total

Inflow Area = 100.205 ac, 1.37% Impervious, Inflow Depth > 1.71" for 2-year event
Inflow = 23.95 cfs @ 16.67 hrs, Volume= 14.287 af
Outflow = 23.95 cfs @ 16.67 hrs, Volume= 14.287 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach T: Total



Hydrograph for Reach T: Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	8.49		8.49
0.25	0.00		0.00	13.25	9.03		9.03
0.50	0.00		0.00	13.50	9.68		9.68
0.75	0.00		0.00	13.75	10.56		10.56
1.00	0.00		0.00	14.00	11.59		11.59
1.25	0.00		0.00	14.25	12.83		12.83
1.50	0.01		0.01	14.50	14.31		14.31
1.75	0.02		0.02	14.75	15.86		15.86
2.00	0.03		0.03	15.00	17.41		17.41
2.25	0.04		0.04	15.25	18.96		18.96
2.50	0.05		0.05	15.50	20.43		20.43
2.75	0.05		0.05	15.75	21.71		21.71
3.00	0.05		0.05	16.00	22.52		22.52
3.25	0.06		0.06	16.25	23.18		23.18
3.50	0.06		0.06	16.50	**23.81**		**23.81**
3.75	0.06		0.06	16.75	**23.92**		**23.92**
4.00	0.06		0.06	17.00	23.49		23.49
4.25	0.07		0.07	17.25	22.70		22.70
4.50	0.07		0.07	17.50	21.65		21.65
4.75	0.07		0.07	17.75	20.46		20.46
5.00	0.07		0.07	18.00	19.20		19.20
5.25	0.07		0.07	18.25	17.93		17.93
5.50	0.09		0.09	18.50	16.73		16.73
5.75	0.11		0.11	18.75	15.55		15.55
6.00	0.15		0.15	19.00	14.42		14.42
6.25	0.20		0.20	19.25	13.34		13.34
6.50	0.28		0.28	19.50	12.34		12.34
6.75	0.39		0.39	19.75	11.47		11.47
7.00	0.51		0.51	20.00	10.66		10.66
7.25	0.64		0.64	20.25	9.92		9.92
7.50	0.77		0.77	20.50	9.26		9.26
7.75	0.88		0.88	20.75	8.73		8.73
8.00	1.02		1.02	21.00	8.30		8.30
8.25	1.71		1.71	21.25	7.96		7.96
8.50	2.21		2.21	21.50	7.69		7.69
8.75	2.53		2.53	21.75	7.50		7.50
9.00	2.79		2.79	22.00	7.31		7.31
9.25	3.02		3.02	22.25	7.10		7.10
9.50	3.23		3.23	22.50	6.89		6.89
9.75	3.44		3.44	22.75	6.64		6.64
10.00	3.66		3.66	23.00	6.36		6.36
10.25	3.91		3.91	23.25	6.20		6.20
10.50	4.18		4.18	23.50	6.09		6.09
10.75	4.48		4.48	23.75	6.04		6.04
11.00	4.81		4.81	24.00	6.10		6.10
11.25	5.20		5.20				
11.50	5.61		5.61				
11.75	6.04		6.04				
12.00	6.50		6.50				
12.25	6.97		6.97				
12.50	7.46		7.46				
12.75	7.97		7.97				

Summary for Pond B1: Basin 1

Inflow Area = 11.702 ac, 0.00% Impervious, Inflow Depth > 1.41" for 2-year event
Inflow = 2.58 cfs @ 16.08 hrs, Volume= 1.378 af
Outflow = 2.10 cfs @ 17.21 hrs, Volume= 1.063 af, Atten= 19%, Lag= 67.4 min
Primary = 0.84 cfs @ 17.21 hrs, Volume= 0.786 af
Secondary = 1.25 cfs @ 17.21 hrs, Volume= 0.277 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 689.13' @ 17.21 hrs Surf.Area= 24,369 sf Storage= 17,821 cf

Plug-Flow detention time= 149.7 min calculated for 1.060 af (77% of inflow)
Center-of-Mass det. time= 70.3 min (1,076.6 - 1,006.3)

Volume	Invert	Avail.Storage	Storage Description
#1	687.60'	47,069 cf	**Storage (Prismatic)**Listed below (Recalc)

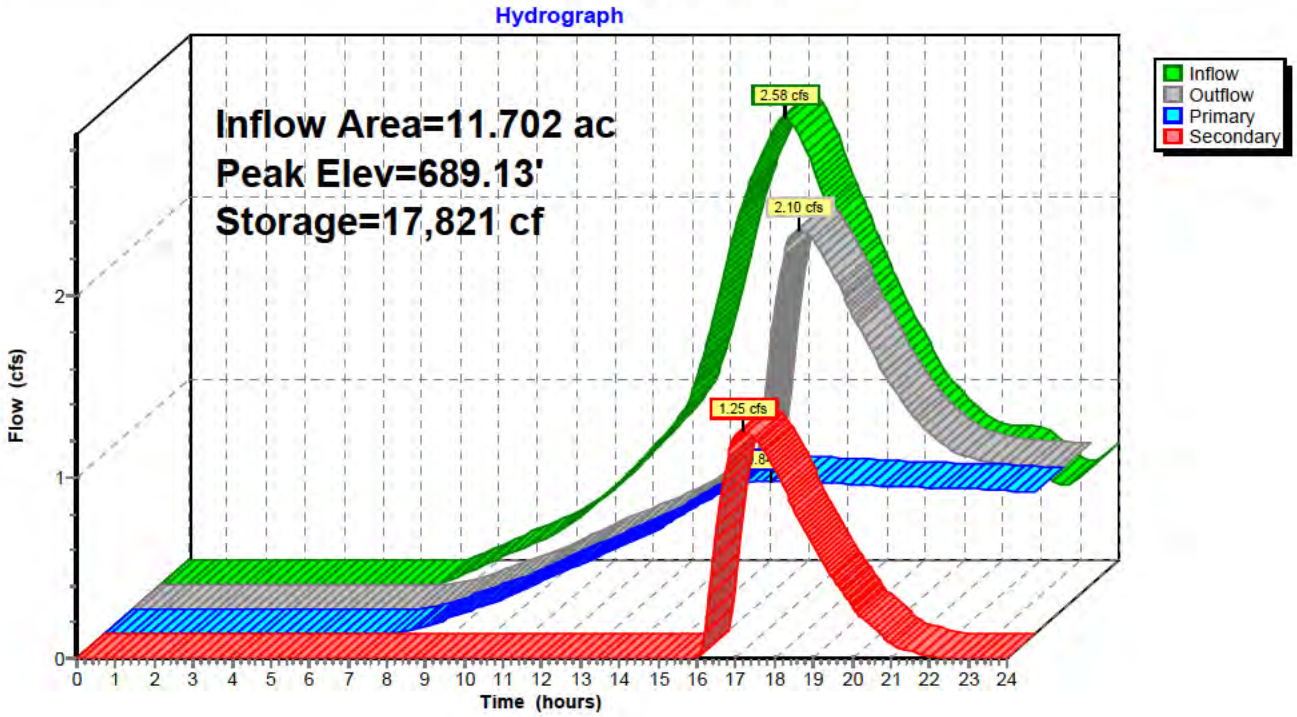
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
687.60	29	0	0
688.00	5,769	1,160	1,160
689.00	21,757	13,763	14,923
690.00	42,536	32,147	47,069

Device	Routing	Invert	Outlet Devices
#1	Primary	687.60'	**6.0" Round 6" PVC Pipe** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 687.60' / 685.09' S= 0.0418 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	689.00'	**11.0' long x 11.5' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.55 2.60 2.70 2.67 2.67 2.67 2.66 2.64

Primary OutFlow Max=0.84 cfs @ 17.21 hrs HW=689.13' (Free Discharge)
↑—**1=6" PVC Pipe** (Inlet Controls 0.84 cfs @ 4.29 fps)

Secondary OutFlow Max=1.25 cfs @ 17.21 hrs HW=689.13' (Free Discharge)
↑—**2=Emergency Overflow** (Weir Controls 1.25 cfs @ 0.90 fps)

Pond B1: Basin 1



Hydrograph for Pond B1: Basin 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	687.60	0.00	0.00	0.00
0.50	0.00	0	687.60	0.00	0.00	0.00
1.00	0.00	0	687.60	0.00	0.00	0.00
1.50	0.00	0	687.60	0.00	0.00	0.00
2.00	0.00	0	687.60	0.00	0.00	0.00
2.50	0.00	0	687.60	0.00	0.00	0.00
3.00	0.00	0	687.60	0.00	0.00	0.00
3.50	0.00	0	687.60	0.00	0.00	0.00
4.00	0.00	0	687.60	0.00	0.00	0.00
4.50	0.00	0	687.60	0.00	0.00	0.00
5.00	0.00	0	687.60	0.00	0.00	0.00
5.50	0.00	0	687.60	0.00	0.00	0.00
6.00	0.00	0	687.60	0.00	0.00	0.00
6.50	0.00	0	687.60	0.00	0.00	0.00
7.00	0.00	0	687.60	0.00	0.00	0.00
7.50	0.02	13	687.64	0.00	0.00	0.00
8.00	0.07	77	687.70	0.02	0.02	0.00
8.50	0.12	182	687.76	0.06	0.06	0.00
9.00	0.17	313	687.81	0.09	0.09	0.00
9.50	0.22	458	687.85	0.13	0.13	0.00
10.00	0.26	612	687.89	0.17	0.17	0.00
10.50	0.33	792	687.93	0.21	0.21	0.00
11.00	0.41	1,023	687.98	0.26	0.26	0.00
11.50	0.50	1,318	688.03	0.31	0.31	0.00
12.00	0.60	1,694	688.08	0.36	0.36	0.00
12.50	0.71	2,178	688.15	0.41	0.41	0.00
13.00	0.83	2,787	688.22	0.45	0.45	0.00
13.50	0.96	3,538	688.29	0.50	0.50	0.00
14.00	1.25	4,560	688.38	0.55	0.55	0.00
14.50	1.68	6,153	688.51	0.61	0.61	0.00
15.00	2.10	8,436	688.66	0.67	0.67	0.00
15.50	2.37	11,205	688.82	0.73	0.73	0.00
16.00	**2.57**	14,302	688.97	0.79	0.79	0.00
16.50	**2.47**	16,919	689.09	1.56	0.83	0.73
17.00	2.21	**17,771**	**689.12**	**2.07**	**0.84**	**1.22**
17.50	1.94	**17,756**	**689.12**	**2.06**	**0.84**	**1.21**
18.00	1.69	17,473	689.11	1.88	0.84	1.04
18.50	1.44	17,091	689.10	1.66	0.83	0.83
19.00	1.24	16,704	689.08	1.45	0.83	0.63
19.50	1.06	16,328	689.06	1.26	0.82	0.44
20.00	0.92	15,966	689.05	1.11	0.82	0.29
20.50	0.82	15,656	689.03	0.99	0.81	0.18
21.00	0.75	15,369	689.02	0.89	0.81	0.09
21.50	0.74	15,160	689.01	0.84	0.80	0.04
22.00	0.74	15,008	689.00	0.82	0.80	0.01
22.50	0.67	14,836	689.00	0.80	0.80	0.00
23.00	0.57	14,519	688.98	0.79	0.79	0.00
23.50	0.56	14,088	688.96	0.79	0.79	0.00
24.00	0.65	13,763	688.95	0.78	0.78	0.00

Summary for Pond B2: Basin 2

Inflow Area = 62.154 ac, 0.50% Impervious, Inflow Depth > 1.88" for 2-year event
Inflow = 16.64 cfs @ 16.57 hrs, Volume= 9.755 af
Outflow = 16.59 cfs @ 16.73 hrs, Volume= 9.618 af, Atten= 0%, Lag= 9.6 min
Primary = 0.70 cfs @ 16.73 hrs, Volume= 0.840 af
Secondary = 15.90 cfs @ 16.73 hrs, Volume= 8.778 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 689.48' @ 16.73 hrs Surf.Area= 23,712 sf Storage= 12,232 cf

Plug-Flow detention time= 18.0 min calculated for 9.598 af (98% of inflow)
Center-of-Mass det. time= 11.9 min (1,007.8 - 995.9)

Volume	Invert	Avail.Storage	Storage Description
#1	688.36'	77,771 cf	**Storage (Prismatic)**Listed below (Recalc)

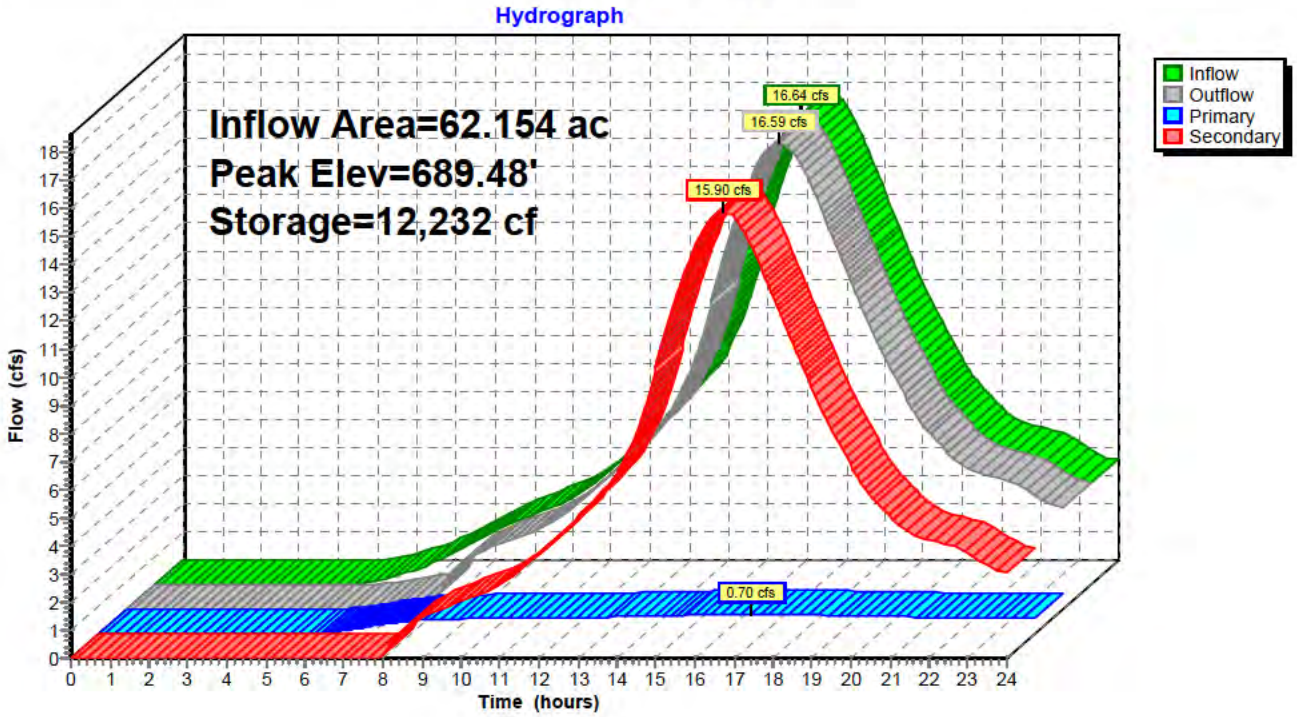
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
688.36	42	0	0
689.00	11,522	3,700	3,700
690.00	36,691	24,107	27,807
691.00	63,237	49,964	77,771

Device	Routing	Invert	Outlet Devices
#1	Primary	688.36'	**6.0" Round 6" PVC Pipe** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 688.36' / 685.05' S= 0.0662 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.20 sf
#2	Secondary	689.00'	**18.0' long x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.70 cfs @ 16.73 hrs HW=689.48' (Free Discharge)
↑**1=6" PVC Pipe** (Inlet Controls 0.70 cfs @ 3.55 fps)

Secondary OutFlow Max=15.89 cfs @ 16.73 hrs HW=689.48' (Free Discharge)
↑**2=Emergency Spillway** (Weir Controls 15.89 cfs @ 1.82 fps)

Pond B2: Basin 2



Hydrograph for Pond B2: Basin 2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	688.36	0.00	0.00	0.00
0.50	0.00	0	688.36	0.00	0.00	0.00
1.00	0.00	0	688.36	0.00	0.00	0.00
1.50	0.00	0	688.36	0.00	0.00	0.00
2.00	0.00	0	688.36	0.00	0.00	0.00
2.50	0.00	0	688.36	0.00	0.00	0.00
3.00	0.00	0	688.36	0.00	0.00	0.00
3.50	0.00	0	688.36	0.00	0.00	0.00
4.00	0.00	0	688.36	0.00	0.00	0.00
4.50	0.00	0	688.36	0.00	0.00	0.00
5.00	0.01	2	688.37	0.00	0.00	0.00
5.50	0.08	52	688.43	0.01	0.01	0.00
6.00	0.24	264	688.53	0.06	0.06	0.00
6.50	0.46	694	688.64	0.16	0.16	0.00
7.00	0.71	1,349	688.75	0.27	0.27	0.00
7.50	1.03	2,311	688.87	0.38	0.38	0.00
8.00	1.41	3,740	689.00	0.49	0.47	0.02
8.50	1.78	4,705	689.08	1.53	0.51	1.02
9.00	2.10	5,000	689.10	1.98	0.52	1.45
9.50	2.38	5,193	689.11	2.28	0.53	1.75
10.00	2.64	5,359	689.13	2.55	0.54	2.02
10.50	2.93	5,521	689.14	2.83	0.54	2.29
11.00	3.34	5,737	689.15	3.20	0.55	2.65
11.50	3.86	6,018	689.17	3.69	0.56	3.14
12.00	4.46	6,340	689.19	4.28	0.57	3.71
12.50	5.11	6,685	689.21	4.92	0.58	4.34
13.00	5.80	7,043	689.23	5.60	0.59	5.02
13.50	6.54	7,413	689.25	6.33	0.60	5.73
14.00	7.49	7,848	689.28	7.20	0.61	6.59
14.50	9.21	8,582	689.32	8.69	0.63	8.06
15.00	11.64	9,683	689.37	10.97	0.65	10.32
15.50	13.97	10,817	689.42	13.41	0.67	12.74
16.00	15.69	11,660	689.46	15.29	0.69	14.61
16.50	**16.60**	**12,173**	**689.48**	**16.45**	**0.70**	**15.76**
17.00	**16.19**	**12,141**	**689.48**	**16.38**	**0.70**	**15.68**
17.50	14.81	11,615	689.46	15.19	0.69	14.51
18.00	13.13	10,882	689.43	13.56	0.67	12.88
18.50	11.42	10,102	689.39	11.85	0.66	11.20
19.00	9.80	9,319	689.35	10.21	0.64	9.57
19.50	8.38	8,612	689.32	8.75	0.63	8.12
20.00	7.15	7,983	689.28	7.47	0.61	6.85
20.50	6.17	7,461	689.26	6.42	0.60	5.82
21.00	5.43	7,054	689.23	5.63	0.59	5.04
21.50	4.94	6,760	689.21	5.06	0.58	4.48
22.00	4.72	6,610	689.21	4.77	0.58	4.20
22.50	4.55	6,522	689.20	4.61	0.57	4.04
23.00	4.19	6,359	689.19	4.31	0.57	3.74
23.50	3.74	6,115	689.18	3.87	0.56	3.31
24.00	3.63	5,981	689.17	3.63	0.56	3.07

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1-D: PR DA 1 Runoff Area=0.323 ac 100.00% Impervious Runoff Depth>8.30"
Flow Length=459' Tc=9.8 min CN=98 Runoff=0.30 cfs 0.223 af

Subcatchment1-U: PR DA 1 Runoff Area=3.806 ac 2.26% Impervious Runoff Depth>6.50"
Flow Length=459' Tc=9.8 min CN=83 Runoff=3.30 cfs 2.061 af

Subcatchment2-U: PR DA 2 Runoff Area=62.154 ac 0.50% Impervious Runoff Depth>6.67"
Flow Length=3,331' Tc=78.0 min CN=86 Runoff=52.41 cfs 34.569 af

Subcatchment3-D: PR DA 3 Runoff Area=0.651 ac 100.00% Impervious Runoff Depth>8.28"
Flow Length=1,305' Tc=17.6 min CN=98 Runoff=0.61 cfs 0.449 af

Subcatchment3-U: PR DA 3 Runoff Area=21.569 ac 0.00% Impervious Runoff Depth>6.23"
Flow Length=1,305' Tc=17.6 min CN=81 Runoff=18.22 cfs 11.204 af

Subcatchment4-U: PR DA 4 Runoff Area=11.702 ac 0.00% Impervious Runoff Depth>5.95"
Flow Length=1,661' Tc=33.8 min CN=79 Runoff=9.54 cfs 5.800 af

Reach 1-T: PR DA 1 TOTAL Inflow=3.60 cfs 2.284 af
Outflow=3.60 cfs 2.284 af

Reach 3-T: PR DA 3 TOTAL Inflow=18.83 cfs 11.653 af
Outflow=18.83 cfs 11.653 af

Reach T: Total Inflow=81.19 cfs 53.688 af
Outflow=81.19 cfs 53.688 af

Pond B1: Basin 1 Peak Elev=689.44' Storage=26,555 cf Inflow=9.54 cfs 5.800 af
Primary=0.94 cfs 1.261 af Secondary=8.46 cfs 4.137 af Outflow=9.40 cfs 5.398 af

Pond B2: Basin 2 Peak Elev=690.04' Storage=29,378 cf Inflow=52.41 cfs 34.569 af
Primary=0.89 cfs 1.196 af Secondary=51.37 cfs 33.157 af Outflow=52.26 cfs 34.353 af

Total Runoff Area = 100.205 ac Runoff Volume = 54.306 af Average Runoff Depth = 6.50"
98.63% Pervious = 98.832 ac 1.37% Impervious = 1.373 ac

Summary for Subcatchment 1-D: PR DA 1

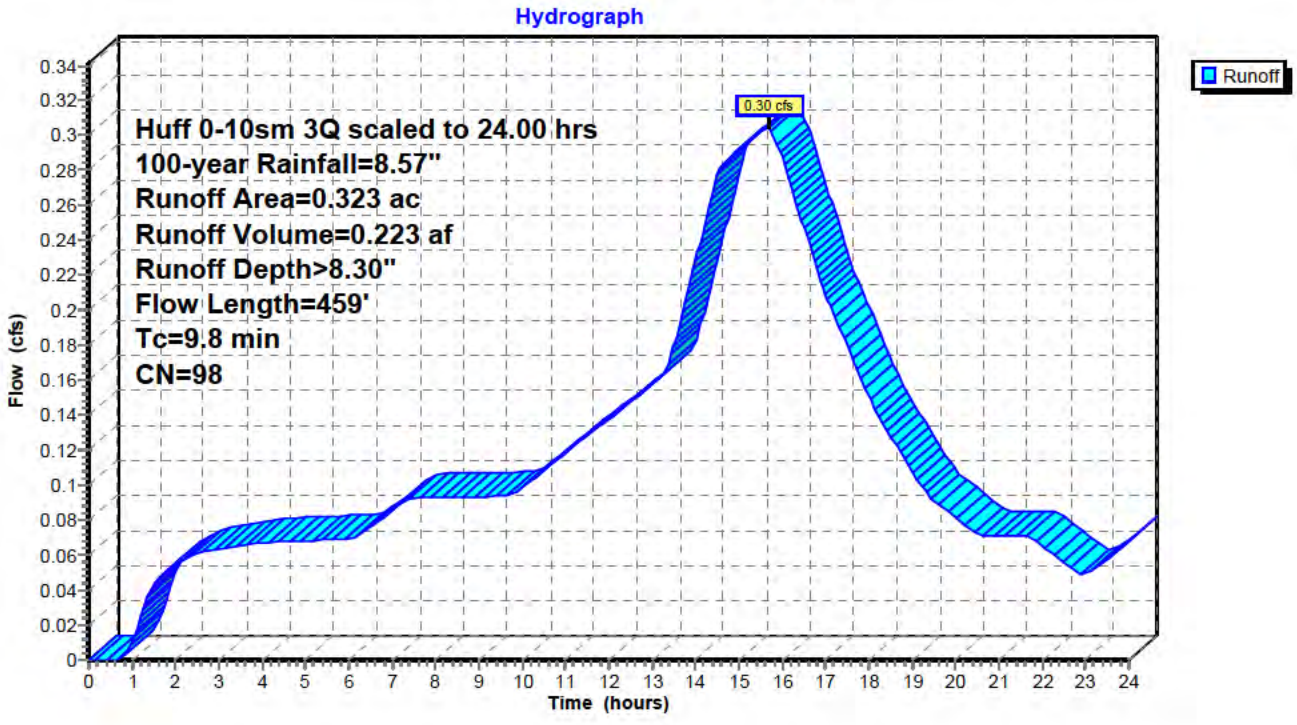
Runoff = 0.30 cfs @ 15.69 hrs, Volume= 0.223 af, Depth> 8.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

	Area (ac)	CN	Description
*	0.323	98	Impervious Area
	0.323		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.9	171	0.0290	1.53		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.2	16	0.0380	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	172	0.0122	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.8	459	Total			

Subcatchment 1-D: PR DA 1



Hydrograph for Subcatchment 1-D: PR DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.01	0.01
1.25	0.14	0.03	0.03
1.50	0.20	0.07	0.04
1.75	0.25	0.11	0.05
2.00	0.30	0.15	0.06
2.25	0.36	0.19	0.06
2.50	0.41	0.24	0.06
2.75	0.47	0.29	0.06
3.00	0.52	0.34	0.06
3.25	0.58	0.39	0.06
3.50	0.63	0.44	0.07
3.75	0.69	0.49	0.07
4.00	0.74	0.54	0.07
4.25	0.79	0.59	0.07
4.50	0.85	0.64	0.07
4.75	0.90	0.70	0.07
5.00	0.96	0.75	0.07
5.25	1.01	0.80	0.07
5.50	1.07	0.85	0.07
5.75	1.12	0.91	0.07
6.00	1.17	0.96	0.07
6.25	1.23	1.02	0.07
6.50	1.29	1.07	0.08
6.75	1.35	1.14	0.08
7.00	1.42	1.20	0.09
7.25	1.49	1.27	0.09
7.50	1.57	1.35	0.09
7.75	1.64	1.42	0.09
8.00	1.71	1.49	0.09
8.25	1.78	1.56	0.09
8.50	1.86	1.63	0.09
8.75	1.93	1.70	0.09
9.00	2.00	1.78	0.09
9.25	2.07	1.85	0.09
9.50	2.15	1.92	0.09
9.75	2.22	1.99	0.09
10.00	2.30	2.07	0.10
10.25	2.38	2.15	0.10
10.50	2.46	2.23	0.11
10.75	2.55	2.32	0.11
11.00	2.64	2.41	0.12
11.25	2.74	2.51	0.12
11.50	2.84	2.60	0.13
11.75	2.94	2.71	0.13
12.00	3.05	2.81	0.14
12.25	3.16	2.92	0.14
12.50	3.27	3.04	0.15
12.75	3.39	3.16	0.15
13.00	3.51	3.28	0.16
13.25	3.64	3.40	0.16
13.50	3.78	3.54	0.18
13.75	3.94	3.70	0.20
14.00	4.11	3.88	0.23
14.25	4.31	4.07	0.25
14.50	4.52	4.29	0.28
14.75	4.75	4.51	0.29
15.00	4.97	4.73	0.29
15.25	5.20	4.96	0.30
15.50	5.43	5.19	**0.30**
15.75	5.66	5.43	**0.30**
16.00	5.88	5.64	0.29
16.25	6.09	5.85	0.27
16.50	6.28	6.04	0.25
16.75	6.45	6.21	0.23
17.00	6.61	6.37	0.21
17.25	6.76	6.52	0.19
17.50	6.89	6.66	0.18
17.75	7.02	6.78	0.17
18.00	7.13	6.90	0.15
18.25	7.24	7.00	0.14
18.50	7.34	7.10	0.13
18.75	7.43	7.19	0.12
19.00	7.51	7.27	0.11
19.25	7.58	7.34	0.10
19.50	7.65	7.41	0.09
19.75	7.72	7.48	0.09
20.00	7.78	7.54	0.08
20.25	7.84	7.60	0.08
20.50	7.90	7.66	0.07
20.75	7.95	7.71	0.07
21.00	8.00	7.76	0.07
21.25	8.06	7.82	0.07
21.50	8.11	7.87	0.07
21.75	8.17	7.93	0.07
22.00	8.22	7.98	0.07
22.25	8.26	8.02	0.06
22.50	8.31	8.07	0.06
22.75	8.35	8.11	0.05
23.00	8.38	8.14	0.05
23.25	8.42	8.18	0.05
23.50	8.47	8.23	0.06
23.75	8.52	8.28	0.06
24.00	**8.57**	**8.33**	0.07

Summary for Subcatchment 1-U: PR DA 1

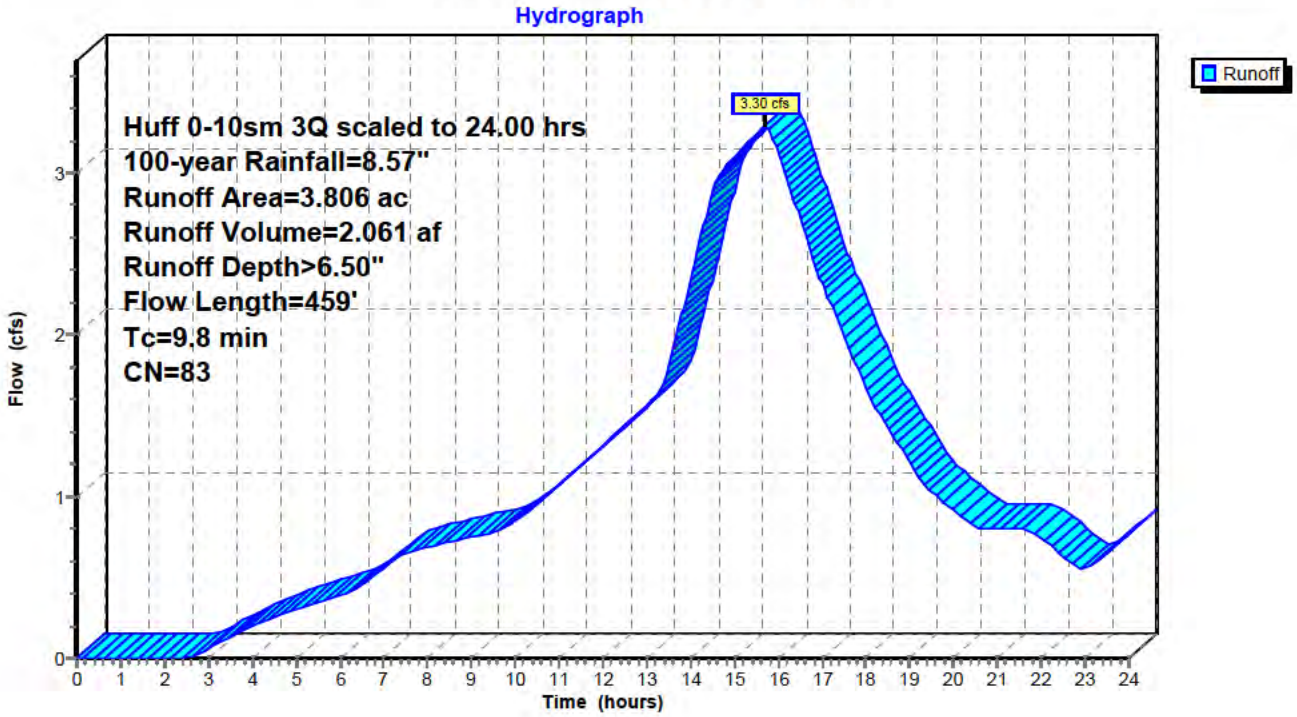
Runoff = 3.30 cfs @ 15.70 hrs, Volume= 2.061 af, Depth> 6.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

	Area (ac)	CN	Description
	0.000	89	Row crops, straight row, Good, HSG D
	0.753	89	Row crops, straight row, Good, HSG D
	0.711	80	Pasture/grassland/range, Good, HSG D
	1.342	85	Row crops, straight row, Good, HSG C
	0.914	74	Pasture/grassland/range, Good, HSG C
*	0.086	98	Impervious Area
	3.806	83	Weighted Average
	3.720		97.74% Pervious Area
	0.086		2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0282	0.42		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.9	171	0.0290	1.53		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
0.2	16	0.0380	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	172	0.0122	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.8	459	Total			

Subcatchment 1-U: PR DA 1



Hydrograph for Subcatchment 1-U: PR DA 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.00	0.00
1.25	0.14	0.00	0.00
1.50	0.20	0.00	0.00
1.75	0.25	0.00	0.00
2.00	0.30	0.00	0.00
2.25	0.36	0.00	0.00
2.50	0.41	0.00	0.00
2.75	0.47	0.00	0.02
3.00	0.52	0.01	0.06
3.25	0.58	0.01	0.10
3.50	0.63	0.02	0.13
3.75	0.69	0.03	0.17
4.00	0.74	0.05	0.20
4.25	0.79	0.06	0.23
4.50	0.85	0.08	0.25
4.75	0.90	0.10	0.28
5.00	0.96	0.12	0.30
5.25	1.01	0.14	0.32
5.50	1.07	0.16	0.34
5.75	1.12	0.18	0.36
6.00	1.17	0.21	0.38
6.25	1.23	0.24	0.41
6.50	1.29	0.27	0.46
6.75	1.35	0.30	0.51
7.00	1.42	0.34	0.56
7.25	1.49	0.38	0.61
7.50	1.57	0.42	0.65
7.75	1.64	0.46	0.67
8.00	1.71	0.51	0.69
8.25	1.78	0.55	0.70
8.50	1.86	0.60	0.72
8.75	1.93	0.65	0.74
9.00	2.00	0.70	0.75
9.25	2.07	0.75	0.77
9.50	2.15	0.80	0.78
9.75	2.22	0.85	0.80
10.00	2.30	0.90	0.85
10.25	2.38	0.96	0.90
10.50	2.46	1.03	0.96
10.75	2.55	1.09	1.01
11.00	2.64	1.16	1.07
11.25	2.74	1.24	1.13
11.50	2.84	1.32	1.19
11.75	2.94	1.40	1.25
12.00	3.05	1.48	1.31
12.25	3.16	1.57	1.37
12.50	3.27	1.67	1.44
12.75	3.39	1.77	1.50
13.00	3.51	1.87	1.56
13.25	3.64	1.97	1.63
13.50	3.78	2.09	1.81
13.75	3.94	2.23	2.07
14.00	4.11	2.38	2.34
14.25	4.31	2.56	2.62
14.50	4.52	2.75	2.90
14.75	4.75	2.94	3.02
15.00	4.97	3.15	3.10
15.25	5.20	3.35	3.17
15.50	5.43	3.57	**3.25**
15.75	5.66	3.78	**3.29**
16.00	5.88	3.98	3.13
16.25	6.09	4.17	2.93
16.50	6.28	4.35	2.72
16.75	6.45	4.51	2.51
17.00	6.61	4.66	2.32
17.25	6.76	4.80	2.16
17.50	6.89	4.93	2.00
17.75	7.02	5.05	1.84
18.00	7.13	5.15	1.68
18.25	7.24	5.25	1.54
18.50	7.34	5.35	1.43
18.75	7.43	5.43	1.32
19.00	7.51	5.51	1.21
19.25	7.58	5.58	1.10
19.50	7.65	5.65	1.03
19.75	7.72	5.71	0.97
20.00	7.78	5.77	0.92
20.25	7.84	5.83	0.86
20.50	7.90	5.88	0.81
20.75	7.95	5.93	0.80
21.00	8.00	5.98	0.80
21.25	8.06	6.03	0.80
21.50	8.11	6.09	0.80
21.75	8.17	6.14	0.79
22.00	8.22	6.18	0.74
22.25	8.26	6.23	0.69
22.50	8.31	6.27	0.63
22.75	8.35	6.31	0.58
23.00	8.38	6.34	0.55
23.25	8.42	6.38	0.60
23.50	8.47	6.43	0.66
23.75	8.52	6.47	0.71
24.00	**8.57**	**6.52**	0.77

Summary for Subcatchment 2-U: PR DA 2

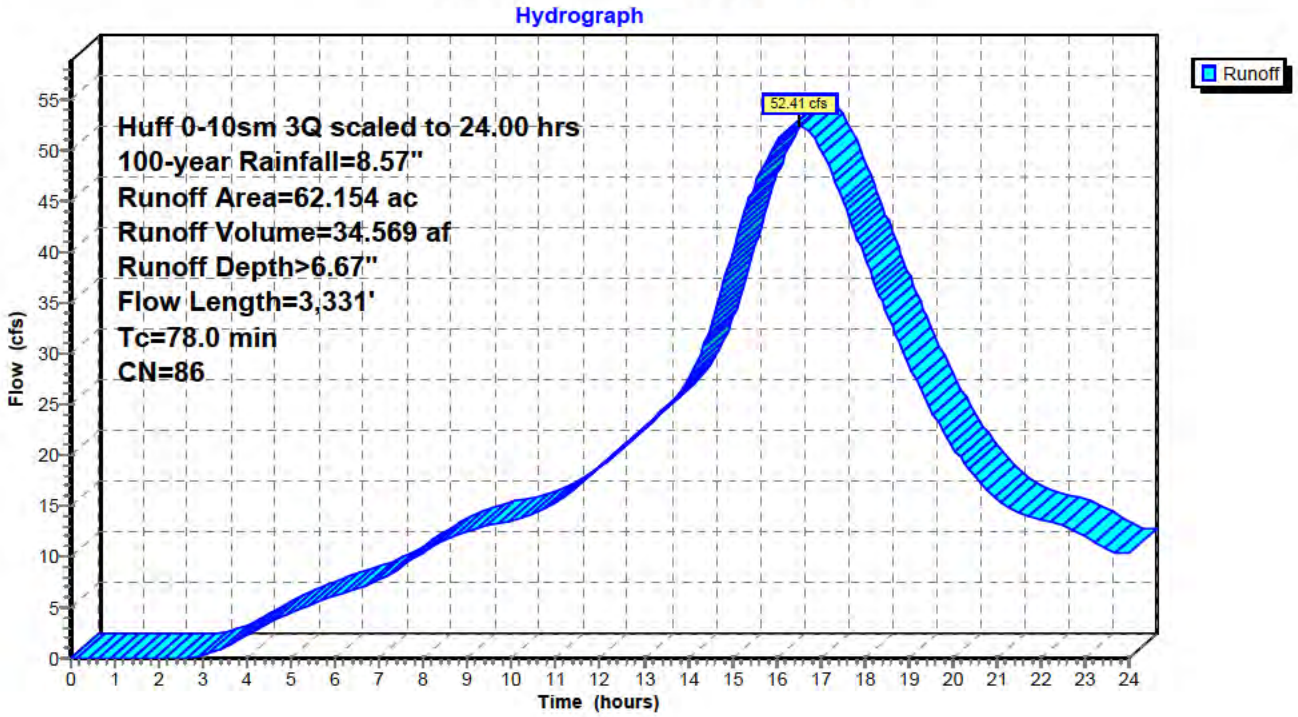
Runoff = 52.41 cfs @ 16.53 hrs, Volume= 34.569 af, Depth> 6.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

	Area (ac)	CN	Description
	11.052	89	Row crops, straight row, Good, HSG D
	2.151	80	Pasture/grassland/range, Good, HSG D
	0.061	89	Row crops, straight row, Good, HSG D
	10.906	89	Row crops, straight row, Good, HSG D
	8.457	80	Pasture/grassland/range, Good, HSG D
	9.982	89	Row crops, straight row, Good, HSG D
	0.038	80	Pasture/grassland/range, Good, HSG D
	14.843	85	Row crops, straight row, Good, HSG C
	2.519	74	Pasture/grassland/range, Good, HSG C
	0.830	85	Row crops, straight row, Good, HSG C
	1.002	74	Pasture/grassland/range, Good, HSG C
*	0.313	98	Impervious Area
	62.154	86	Weighted Average
	61.841		99.50% Pervious Area
	0.313		0.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.0421	0.49		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
1.5	141	0.0306	1.57		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
42.0	1,988	0.0077	0.79		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
31.1	1,102	0.0071	0.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
78.0	3,331	Total			

Subcatchment 2-U: PR DA 2



Hydrograph for Subcatchment 2-U: PR DA 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.00	0.00
1.25	0.14	0.00	0.00
1.50	0.20	0.00	0.00
1.75	0.25	0.00	0.00
2.00	0.30	0.00	0.00
2.25	0.36	0.00	0.00
2.50	0.41	0.00	0.01
2.75	0.47	0.01	0.08
3.00	0.52	0.02	0.27
3.25	0.58	0.03	0.63
3.50	0.63	0.05	1.12
3.75	0.69	0.07	1.69
4.00	0.74	0.08	2.28
4.25	0.79	0.10	2.87
4.50	0.85	0.13	3.43
4.75	0.90	0.15	3.97
5.00	0.96	0.18	4.48
5.25	1.01	0.20	4.95
5.50	1.07	0.23	5.39
5.75	1.12	0.26	5.80
6.00	1.17	0.29	6.19
6.25	1.23	0.32	6.54
6.50	1.29	0.36	6.89
6.75	1.35	0.40	7.26
7.00	1.42	0.44	7.74
7.25	1.49	0.49	8.32
7.50	1.57	0.54	9.01
7.75	1.64	0.59	9.75
8.00	1.71	0.64	10.48
8.25	1.78	0.69	11.13
8.50	1.86	0.74	11.66
8.75	1.93	0.80	12.11
9.00	2.00	0.85	12.46
9.25	2.07	0.91	12.79
9.50	2.15	0.96	13.06
9.75	2.22	1.02	13.31
10.00	2.30	1.08	13.55
10.25	2.38	1.14	13.81
10.50	2.46	1.21	14.19
10.75	2.55	1.28	14.68
11.00	2.64	1.36	15.36
11.25	2.74	1.44	16.11
11.50	2.84	1.52	16.96
11.75	2.94	1.61	17.84
12.00	3.05	1.70	18.76
12.25	3.16	1.80	19.71
12.50	3.27	1.90	20.67
12.75	3.39	2.00	21.66
13.00	3.51	2.11	22.63
13.25	3.64	2.22	23.65
13.50	3.78	2.34	24.64
13.75	3.94	2.49	25.81
14.00	4.11	2.65	27.34
14.25	4.31	2.83	29.57
14.50	4.52	3.03	32.52
14.75	4.75	3.23	36.02
15.00	4.97	3.44	39.82
15.25	5.20	3.65	43.33
15.50	5.43	3.87	46.39
15.75	5.66	4.09	48.76
16.00	5.88	4.30	50.68
16.25	6.09	4.49	51.98
16.50	6.28	4.67	**52.39**
16.75	6.45	4.84	**51.78**
17.00	6.61	4.99	50.13
17.25	6.76	5.13	47.87
17.50	6.89	5.26	45.13
17.75	7.02	5.38	42.35
18.00	7.13	5.50	39.50
18.25	7.24	5.60	36.73
18.50	7.34	5.69	34.01
18.75	7.43	5.78	31.37
19.00	7.51	5.86	28.95
19.25	7.58	5.93	26.67
19.50	7.65	6.00	24.61
19.75	7.72	6.06	22.63
20.00	7.78	6.12	20.87
20.25	7.84	6.18	19.29
20.50	7.90	6.23	17.94
20.75	7.95	6.28	16.76
21.00	8.00	6.34	15.72
21.25	8.06	6.39	14.89
21.50	8.11	6.44	14.26
21.75	8.17	6.49	13.87
22.00	8.22	6.54	13.60
22.25	8.26	6.59	13.39
22.50	8.31	6.63	13.08
22.75	8.35	6.67	12.62
23.00	8.38	6.70	12.02
23.25	8.42	6.74	11.32
23.50	8.47	6.79	10.71
23.75	8.52	6.83	10.34
24.00	**8.57**	**6.88**	10.36

Summary for Subcatchment 3-D: PR DA 3

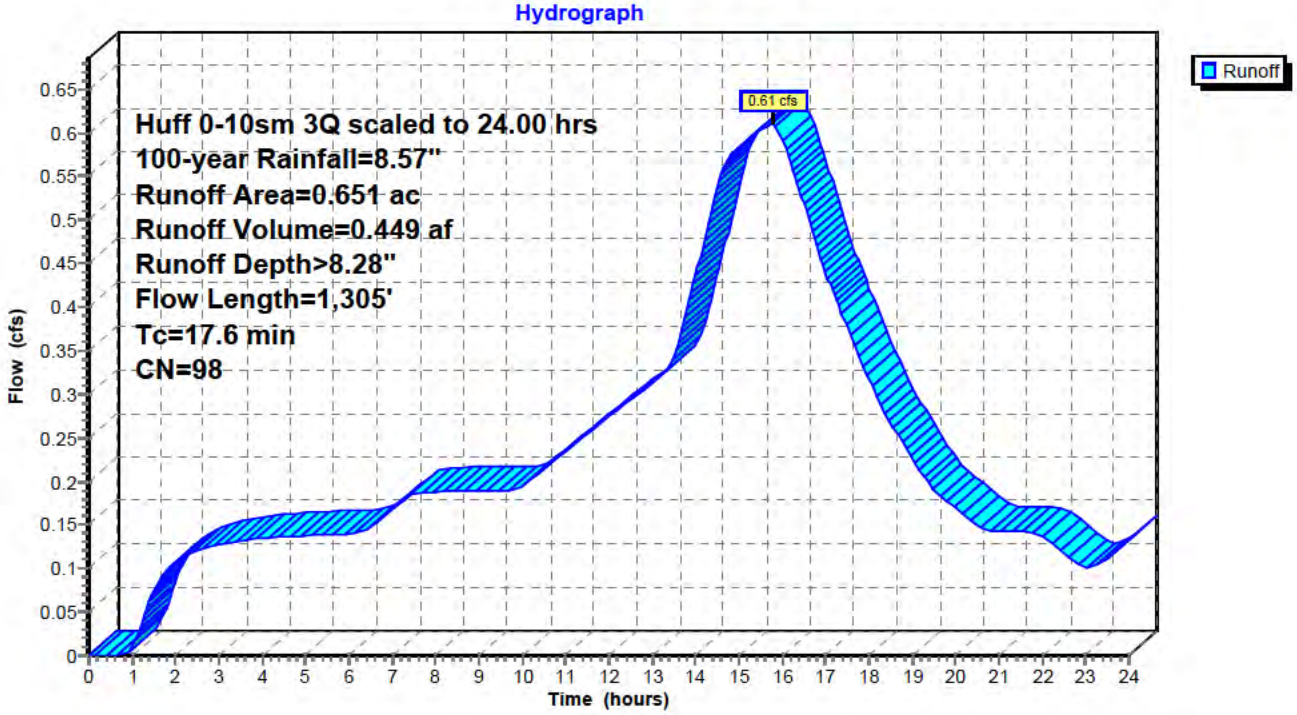
Runoff = 0.61 cfs @ 15.77 hrs, Volume= 0.449 af, Depth> 8.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

	Area (ac)	CN	Description
*	0.651	98	Impervious Area
	0.651		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0081	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
0.6	37	0.0151	1.11		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.8	758	0.0141	7.10	71.03	**Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.3	38	0.0146	2.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.3	372	0.0113	0.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.6	1,305	Total			

Subcatchment 3-D: PR DA 3



Hydrograph for Subcatchment 3-D: PR DA 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.01	0.01
1.25	0.14	0.03	0.04
1.50	0.20	0.07	0.07
1.75	0.25	0.11	0.09
2.00	0.30	0.15	0.11
2.25	0.36	0.19	0.11
2.50	0.41	0.24	0.12
2.75	0.47	0.29	0.12
3.00	0.52	0.34	0.13
3.25	0.58	0.39	0.13
3.50	0.63	0.44	0.13
3.75	0.69	0.49	0.13
4.00	0.74	0.54	0.13
4.25	0.79	0.59	0.14
4.50	0.85	0.64	0.14
4.75	0.90	0.70	0.14
5.00	0.96	0.75	0.14
5.25	1.01	0.80	0.14
5.50	1.07	0.85	0.14
5.75	1.12	0.91	0.14
6.00	1.17	0.96	0.14
6.25	1.23	1.02	0.14
6.50	1.29	1.07	0.15
6.75	1.35	1.14	0.16
7.00	1.42	1.20	0.17
7.25	1.49	1.27	0.18
7.50	1.57	1.35	0.19
7.75	1.64	1.42	0.19
8.00	1.71	1.49	0.19
8.25	1.78	1.56	0.19
8.50	1.86	1.63	0.19
8.75	1.93	1.70	0.19
9.00	2.00	1.78	0.19
9.25	2.07	1.85	0.19
9.50	2.15	1.92	0.19
9.75	2.22	1.99	0.19
10.00	2.30	2.07	0.19
10.25	2.38	2.15	0.20
10.50	2.46	2.23	0.21
10.75	2.55	2.32	0.22
11.00	2.64	2.41	0.23
11.25	2.74	2.51	0.24
11.50	2.84	2.60	0.25
11.75	2.94	2.71	0.26
12.00	3.05	2.81	0.27
12.25	3.16	2.92	0.28
12.50	3.27	3.04	0.29
12.75	3.39	3.16	0.30
13.00	3.51	3.28	0.31
13.25	3.64	3.40	0.32
13.50	3.78	3.54	0.34
13.75	3.94	3.70	0.39
14.00	4.11	3.88	0.44
14.25	4.31	4.07	0.49
14.50	4.52	4.29	0.54
14.75	4.75	4.51	0.57
15.00	4.97	4.73	0.58
15.25	5.20	4.96	0.59
15.50	5.43	5.19	0.60
15.75	5.66	5.43	**0.61**
16.00	5.88	5.64	0.59
16.25	6.09	5.85	0.56
16.50	6.28	6.04	0.52
16.75	6.45	6.21	0.48
17.00	6.61	6.37	0.44
17.25	6.76	6.52	0.41
17.50	6.89	6.66	0.38
17.75	7.02	6.78	0.35
18.00	7.13	6.90	0.32
18.25	7.24	7.00	0.29
18.50	7.34	7.10	0.27
18.75	7.43	7.19	0.25
19.00	7.51	7.27	0.23
19.25	7.58	7.34	0.21
19.50	7.65	7.41	0.19
19.75	7.72	7.48	0.18
20.00	7.78	7.54	0.17
20.25	7.84	7.60	0.16
20.50	7.90	7.66	0.15
20.75	7.95	7.71	0.14
21.00	8.00	7.76	0.14
21.25	8.06	7.82	0.14
21.50	8.11	7.87	0.14
21.75	8.17	7.93	0.14
22.00	8.22	7.98	0.14
22.25	8.26	8.02	0.13
22.50	8.31	8.07	0.12
22.75	8.35	8.11	0.11
23.00	8.38	8.14	0.10
23.25	8.42	8.18	0.10
23.50	8.47	8.23	0.11
23.75	8.52	8.28	0.12
24.00	**8.57**	**8.33**	0.13

Summary for Subcatchment 3-U: PR DA 3

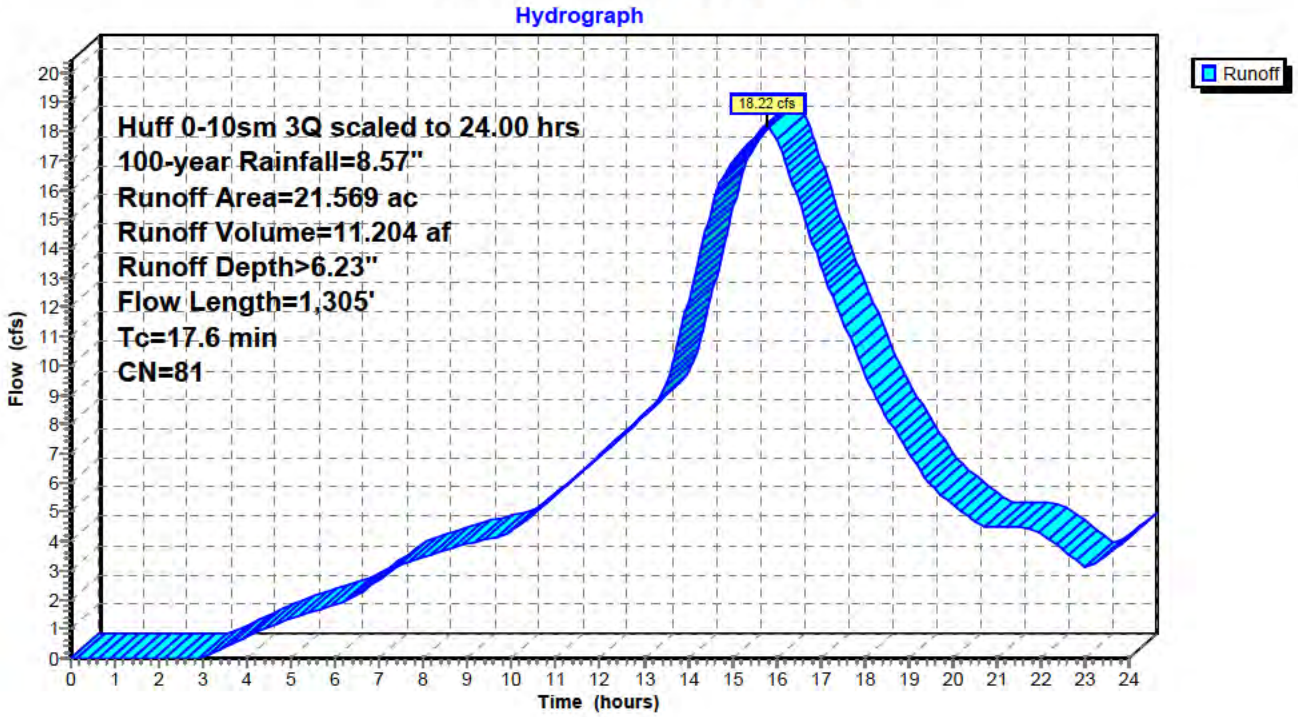
Runoff = 18.22 cfs @ 15.79 hrs, Volume= 11.204 af, Depth> 6.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

Area (ac)	CN	Description
3.171	89	Row crops, straight row, Good, HSG D
4.736	80	Pasture/grassland/range, Good, HSG D
1.134	89	Row crops, straight row, Good, HSG D
5.352	80	Pasture/grassland/range, Good, HSG D
3.187	85	Row crops, straight row, Good, HSG C
3.989	74	Pasture/grassland/range, Good, HSG C
21.569	81	Weighted Average
21.569		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0081	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
0.6	37	0.0151	1.11		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.8	758	0.0141	7.10	71.03	**Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.3	38	0.0146	2.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.3	372	0.0113	0.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.6	1,305	Total			

Subcatchment 3-U: PR DA 3



Hydrograph for Subcatchment 3-U: PR DA 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.00	0.00
1.25	0.14	0.00	0.00
1.50	0.20	0.00	0.00
1.75	0.25	0.00	0.00
2.00	0.30	0.00	0.00
2.25	0.36	0.00	0.00
2.50	0.41	0.00	0.00
2.75	0.47	0.00	0.00
3.00	0.52	0.00	0.03
3.25	0.58	0.00	0.19
3.50	0.63	0.01	0.39
3.75	0.69	0.02	0.57
4.00	0.74	0.03	0.75
4.25	0.79	0.04	0.91
4.50	0.85	0.05	1.07
4.75	0.90	0.07	1.21
5.00	0.96	0.08	1.35
5.25	1.01	0.10	1.48
5.50	1.07	0.12	1.60
5.75	1.12	0.14	1.71
6.00	1.17	0.16	1.82
6.25	1.23	0.19	1.95
6.50	1.29	0.21	2.16
6.75	1.35	0.24	2.41
7.00	1.42	0.28	2.68
7.25	1.49	0.31	2.96
7.50	1.57	0.35	3.21
7.75	1.64	0.39	3.36
8.00	1.71	0.43	3.49
8.25	1.78	0.47	3.60
8.50	1.86	0.52	3.71
8.75	1.93	0.56	3.81
9.00	2.00	0.61	3.90
9.25	2.07	0.65	3.99
9.50	2.15	0.70	4.08
9.75	2.22	0.75	4.16
10.00	2.30	0.80	4.36
10.25	2.38	0.86	4.65
10.50	2.46	0.91	4.96
10.75	2.55	0.98	5.27
11.00	2.64	1.04	5.59
11.25	2.74	1.11	5.92
11.50	2.84	1.19	6.26
11.75	2.94	1.27	6.59
12.00	3.05	1.35	6.94
12.25	3.16	1.43	7.28
12.50	3.27	1.52	7.63
12.75	3.39	1.62	7.99
13.00	3.51	1.72	8.34
13.25	3.64	1.82	8.70
13.50	3.78	1.94	9.35
13.75	3.94	2.07	10.66
14.00	4.11	2.22	12.14
14.25	4.31	2.38	13.66
14.50	4.52	2.57	15.22
14.75	4.75	2.76	16.34
15.00	4.97	2.96	16.90
15.25	5.20	3.16	17.36
15.50	5.43	3.37	17.80
15.75	5.66	3.58	**18.20**
16.00	5.88	3.78	**17.80**
16.25	6.09	3.96	16.80
16.50	6.28	4.14	15.70
16.75	6.45	4.30	14.56
17.00	6.61	4.44	13.43
17.25	6.76	4.58	12.47
17.50	6.89	4.71	11.58
17.75	7.02	4.82	10.69
18.00	7.13	4.93	9.80
18.25	7.24	5.03	8.94
18.50	7.34	5.12	8.28
18.75	7.43	5.20	7.67
19.00	7.51	5.28	7.07
19.25	7.58	5.35	6.46
19.50	7.65	5.42	5.93
19.75	7.72	5.48	5.59
20.00	7.78	5.54	5.28
20.25	7.84	5.59	4.97
20.50	7.90	5.64	4.67
20.75	7.95	5.70	4.49
21.00	8.00	5.75	4.46
21.25	8.06	5.80	4.46
21.50	8.11	5.85	4.47
21.75	8.17	5.90	4.46
22.00	8.22	5.95	4.29
22.25	8.26	5.99	4.00
22.50	8.31	6.03	3.70
22.75	8.35	6.07	3.39
23.00	8.38	6.10	3.12
23.25	8.42	6.14	3.24
23.50	8.47	6.19	3.53
23.75	8.52	6.23	3.84
24.00	**8.57**	**6.28**	4.15

Summary for Subcatchment 4-U: PR DA 4

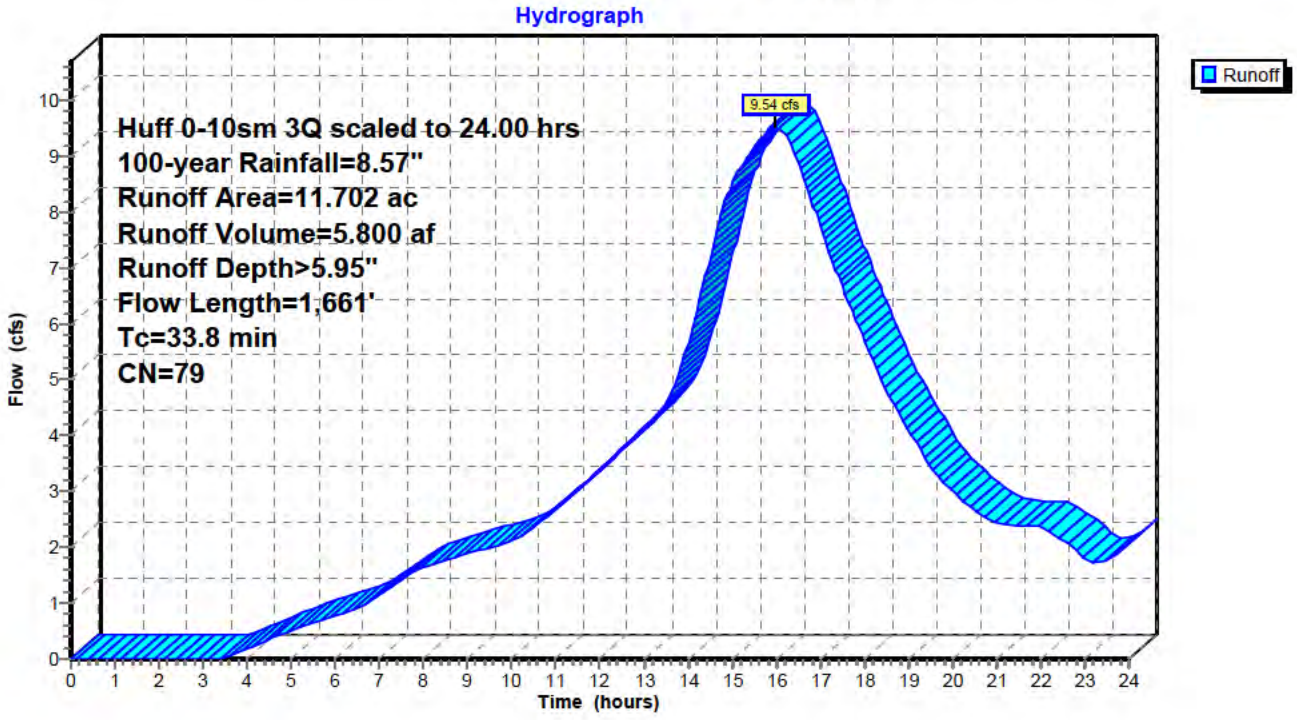
Runoff = 9.54 cfs @ 15.97 hrs, Volume= 5.800 af, Depth> 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

Area (ac)	CN	Description
0.399	89	Row crops, straight row, Good, HSG D
4.560	80	Pasture/grassland/range, Good, HSG D
0.000	89	Row crops, straight row, Good, HSG D
3.035	80	Pasture/grassland/range, Good, HSG D
0.695	85	Row crops, straight row, Good, HSG C
3.013	74	Pasture/grassland/range, Good, HSG C
11.702	79	Weighted Average
11.702		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0080	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34"
2.7	198	0.0180	1.21		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
24.5	1,363	0.0175	0.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
33.8	1,661	Total			

Subcatchment 4-U: PR DA 4



Hydrograph for Subcatchment 4-U: PR DA 4

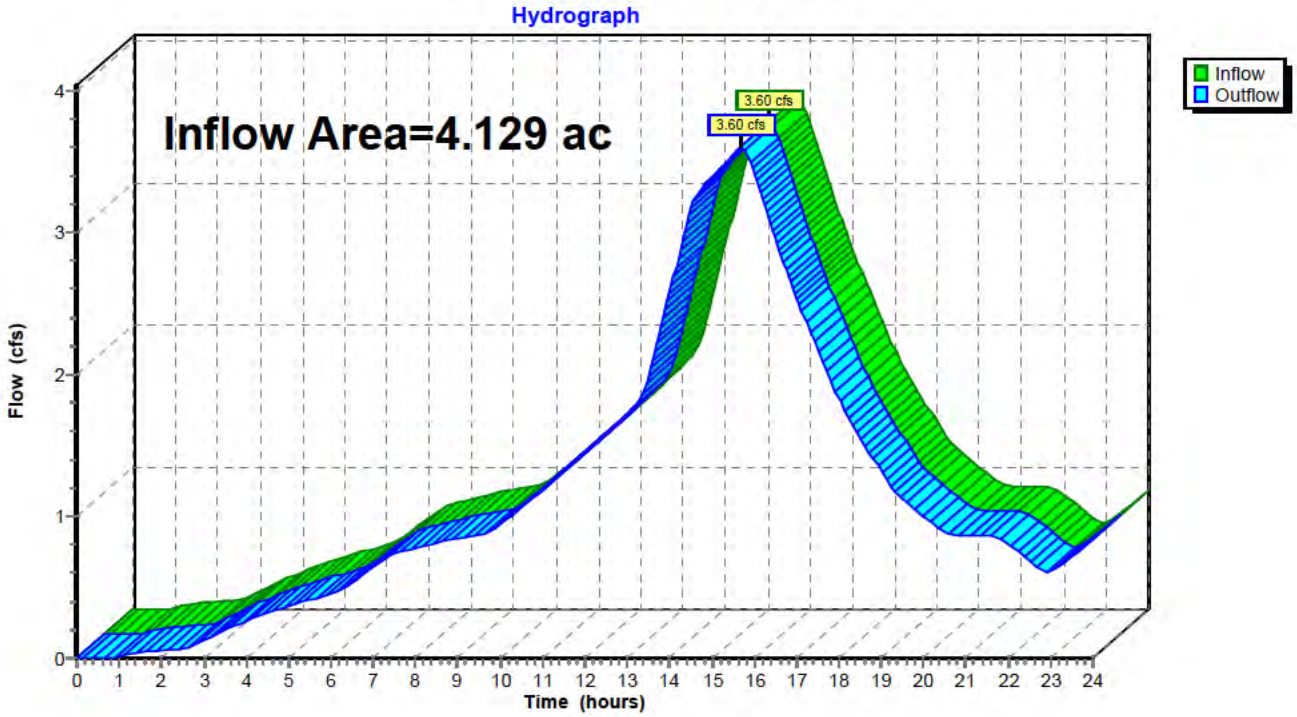
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.09	0.00	0.00
1.25	0.14	0.00	0.00
1.50	0.20	0.00	0.00
1.75	0.25	0.00	0.00
2.00	0.30	0.00	0.00
2.25	0.36	0.00	0.00
2.50	0.41	0.00	0.00
2.75	0.47	0.00	0.00
3.00	0.52	0.00	0.00
3.25	0.58	0.00	0.00
3.50	0.63	0.00	0.02
3.75	0.69	0.01	0.09
4.00	0.74	0.02	0.18
4.25	0.79	0.02	0.26
4.50	0.85	0.03	0.35
4.75	0.90	0.05	0.43
5.00	0.96	0.06	0.51
5.25	1.01	0.07	0.58
5.50	1.07	0.09	0.65
5.75	1.12	0.11	0.72
6.00	1.17	0.13	0.78
6.25	1.23	0.15	0.84
6.50	1.29	0.17	0.92
6.75	1.35	0.19	1.02
7.00	1.42	0.22	1.15
7.25	1.49	0.26	1.29
7.50	1.57	0.29	1.43
7.75	1.64	0.33	1.54
8.00	1.71	0.36	1.63
8.25	1.78	0.40	1.71
8.50	1.86	0.44	1.77
8.75	1.93	0.48	1.83
9.00	2.00	0.52	1.89
9.25	2.07	0.57	1.95
9.50	2.15	0.61	2.00
9.75	2.22	0.66	2.05
10.00	2.30	0.70	2.11
10.25	2.38	0.76	2.22
10.50	2.46	0.81	2.36
10.75	2.55	0.87	2.52
11.00	2.64	0.93	2.69
11.25	2.74	1.00	2.86
11.50	2.84	1.07	3.03
11.75	2.94	1.14	3.21
12.00	3.05	1.22	3.39
12.25	3.16	1.30	3.57
12.50	3.27	1.39	3.76
12.75	3.39	1.48	3.95
13.00	3.51	1.57	4.14
13.25	3.64	1.67	4.34
13.50	3.78	1.78	4.56
13.75	3.94	1.91	4.98
14.00	4.11	2.06	5.63
14.25	4.31	2.22	6.38
14.50	4.52	2.40	7.18
14.75	4.75	2.58	7.95
15.00	4.97	2.78	8.51
15.25	5.20	2.97	8.86
15.50	5.43	3.18	9.16
15.75	5.66	3.38	**9.41**
16.00	5.88	3.57	**9.54**
16.25	6.09	3.76	9.32
16.50	6.28	3.93	8.87
16.75	6.45	4.08	8.32
17.00	6.61	4.23	7.74
17.25	6.76	4.36	7.18
17.50	6.89	4.49	6.66
17.75	7.02	4.60	6.18
18.00	7.13	4.71	5.71
18.25	7.24	4.80	5.23
18.50	7.34	4.89	4.81
18.75	7.43	4.98	4.44
19.00	7.51	5.05	4.11
19.25	7.58	5.12	3.78
19.50	7.65	5.19	3.46
19.75	7.72	5.25	3.20
20.00	7.78	5.31	3.00
20.25	7.84	5.36	2.83
20.50	7.90	5.41	2.66
20.75	7.95	5.46	2.51
21.00	8.00	5.51	2.43
21.25	8.06	5.56	2.40
21.50	8.11	5.61	2.39
21.75	8.17	5.66	2.39
22.00	8.22	5.71	2.37
22.25	8.26	5.75	2.27
22.50	8.31	5.79	2.13
22.75	8.35	5.83	1.98
23.00	8.38	5.87	1.82
23.25	8.42	5.90	1.73
23.50	8.47	5.95	1.78
23.75	8.52	5.99	1.91
24.00	**8.57**	**6.04**	2.06

Summary for Reach 1-T: PR DA 1 TOTAL

Inflow Area = 4.129 ac, 9.91% Impervious, Inflow Depth > 6.64" for 100-year event
Inflow = 3.60 cfs @ 15.70 hrs, Volume= 2.284 af
Outflow = 3.60 cfs @ 15.70 hrs, Volume= 2.284 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1-T: PR DA 1 TOTAL



Hydrograph for Reach 1-T: PR DA 1 TOTAL

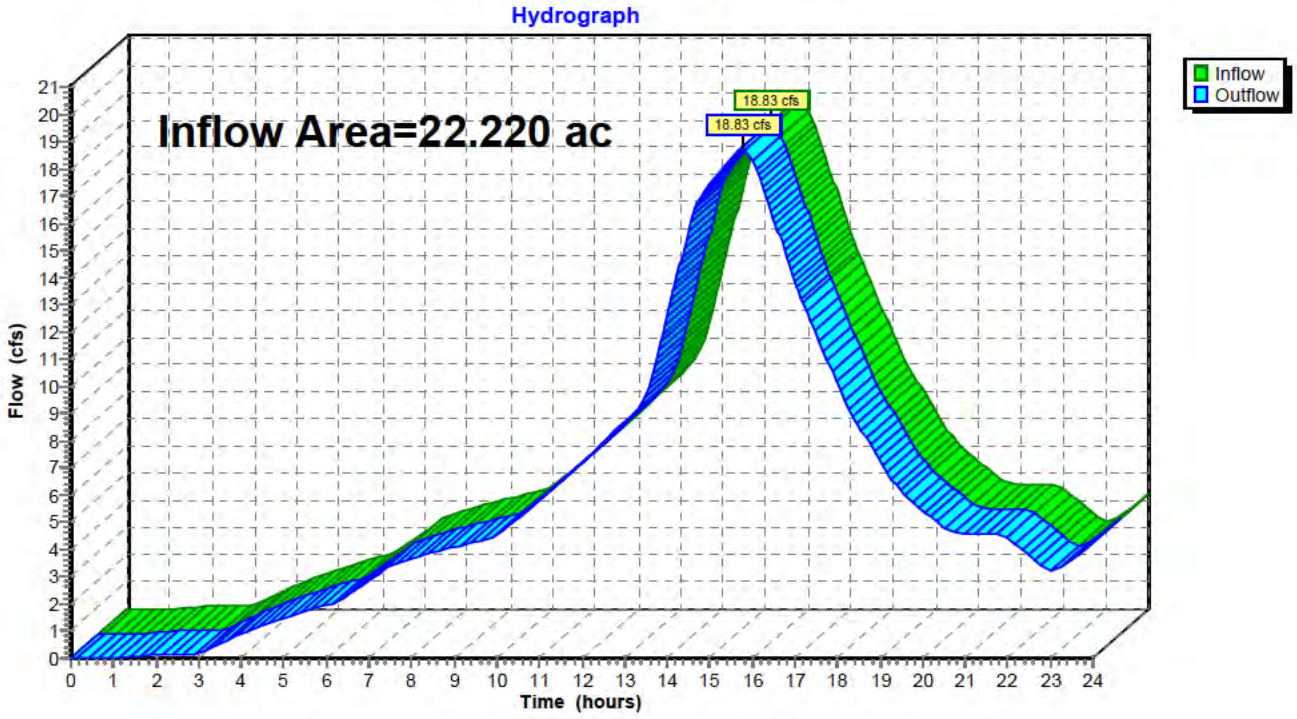
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	1.72		1.72
0.25	0.00		0.00	13.25	1.79		1.79
0.50	0.00		0.00	13.50	1.99		1.99
0.75	0.00		0.00	13.75	2.28		2.28
1.00	0.01		0.01	14.00	2.57		2.57
1.25	0.03		0.03	14.25	2.87		2.87
1.50	0.04		0.04	14.50	3.17		3.17
1.75	0.05		0.05	14.75	3.31		3.31
2.00	0.06		0.06	15.00	3.39		3.39
2.25	0.06		0.06	15.25	3.47		3.47
2.50	0.06		0.06	15.50	**3.55**		**3.55**
2.75	0.08		0.08	15.75	**3.60**		**3.60**
3.00	0.12		0.12	16.00	3.41		3.41
3.25	0.16		0.16	16.25	3.19		3.19
3.50	0.20		0.20	16.50	2.97		2.97
3.75	0.23		0.23	16.75	2.74		2.74
4.00	0.26		0.26	17.00	2.53		2.53
4.25	0.29		0.29	17.25	2.35		2.35
4.50	0.32		0.32	17.50	2.18		2.18
4.75	0.35		0.35	17.75	2.00		2.00
5.00	0.37		0.37	18.00	1.83		1.83
5.25	0.39		0.39	18.25	1.68		1.68
5.50	0.41		0.41	18.50	1.56		1.56
5.75	0.43		0.43	18.75	1.44		1.44
6.00	0.45		0.45	19.00	1.32		1.32
6.25	0.48		0.48	19.25	1.20		1.20
6.50	0.53		0.53	19.50	1.12		1.12
6.75	0.59		0.59	19.75	1.06		1.06
7.00	0.64		0.64	20.00	1.00		1.00
7.25	0.70		0.70	20.25	0.94		0.94
7.50	0.74		0.74	20.50	0.88		0.88
7.75	0.76		0.76	20.75	0.87		0.87
8.00	0.78		0.78	21.00	0.87		0.87
8.25	0.80		0.80	21.25	0.87		0.87
8.50	0.81		0.81	21.50	0.87		0.87
8.75	0.83		0.83	21.75	0.86		0.86
9.00	0.85		0.85	22.00	0.81		0.81
9.25	0.86		0.86	22.25	0.75		0.75
9.50	0.87		0.87	22.50	0.69		0.69
9.75	0.89		0.89	22.75	0.63		0.63
10.00	0.94		0.94	23.00	0.60		0.60
10.25	1.00		1.00	23.25	0.65		0.65
10.50	1.07		1.07	23.50	0.71		0.71
10.75	1.13		1.13	23.75	0.77		0.77
11.00	1.19		1.19	24.00	0.83		0.83
11.25	1.26		1.26				
11.50	1.32		1.32				
11.75	1.39		1.39				
12.00	1.45		1.45				
12.25	1.52		1.52				
12.50	1.58		1.58				
12.75	1.65		1.65				

Summary for Reach 3-T: PR DA 3 TOTAL

Inflow Area = 22.220 ac, 2.93% Impervious, Inflow Depth > 6.29" for 100-year event
Inflow = 18.83 cfs @ 15.79 hrs, Volume= 11.653 af
Outflow = 18.83 cfs @ 15.79 hrs, Volume= 11.653 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3-T: PR DA 3 TOTAL



Hydrograph for Reach 3-T: PR DA 3 TOTAL

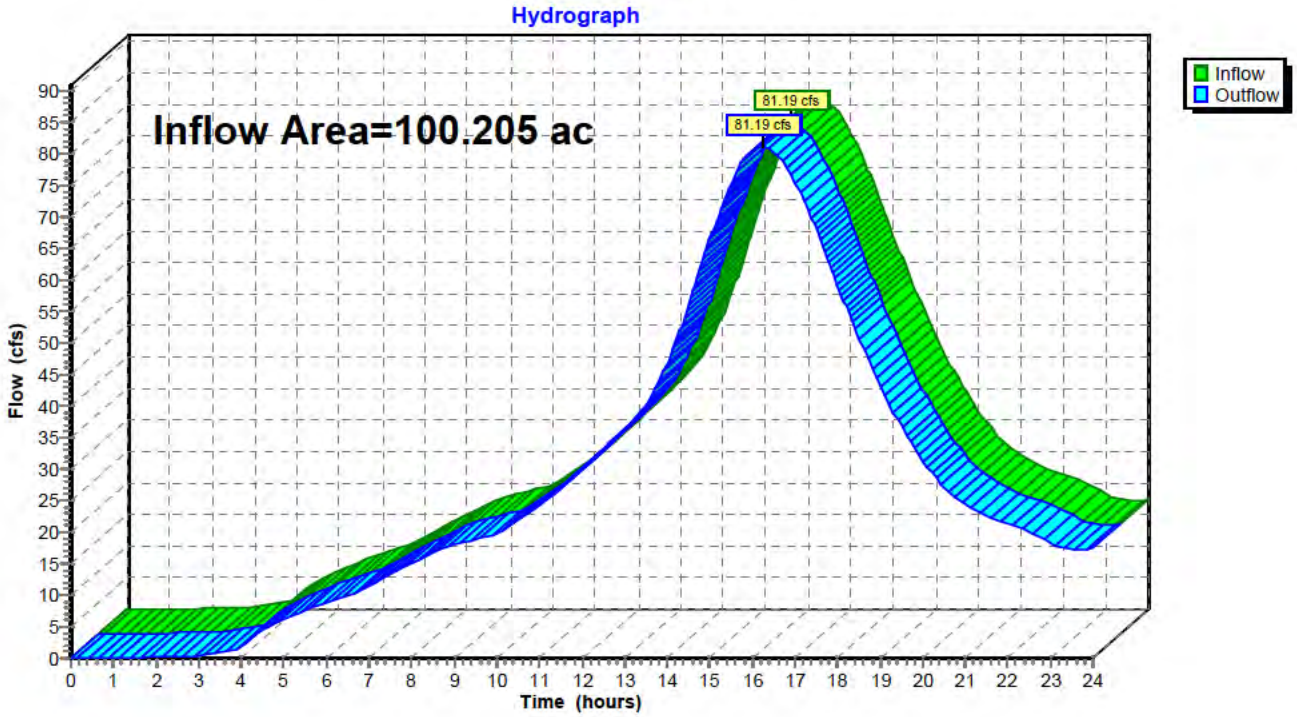
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00
0.25	0.00		0.00
0.50	0.00		0.00
0.75	0.00		0.00
1.00	0.01		0.01
1.25	0.04		0.04
1.50	0.07		0.07
1.75	0.09		0.09
2.00	0.11		0.11
2.25	0.11		0.11
2.50	0.12		0.12
2.75	0.12		0.12
3.00	0.16		0.16
3.25	0.32		0.32
3.50	0.52		0.52
3.75	0.71		0.71
4.00	0.88		0.88
4.25	1.05		1.05
4.50	1.20		1.20
4.75	1.35		1.35
5.00	1.49		1.49
5.25	1.61		1.61
5.50	1.74		1.74
5.75	1.85		1.85
6.00	1.96		1.96
6.25	2.09		2.09
6.50	2.31		2.31
6.75	2.57		2.57
7.00	2.85		2.85
7.25	3.14		3.14
7.50	3.40		3.40
7.75	3.55		3.55
8.00	3.67		3.67
8.25	3.79		3.79
8.50	3.90		3.90
8.75	4.00		4.00
9.00	4.09		4.09
9.25	4.18		4.18
9.50	4.26		4.26
9.75	4.35		4.35
10.00	4.55		4.55
10.25	4.85		4.85
10.50	5.17		5.17
10.75	5.50		5.50
11.00	5.83		5.83
11.25	6.16		6.16
11.50	6.51		6.51
11.75	6.86		6.86
12.00	7.21		7.21
12.25	7.57		7.57
12.50	7.92		7.92
12.75	8.29		8.29
13.00	8.65		8.65
13.25	9.02		9.02
13.50	9.70		9.70
13.75	11.05		11.05
14.00	12.58		12.58
14.25	14.15		14.15
14.50	15.75		15.75
14.75	16.91		16.91
15.00	17.48		17.48
15.25	17.95		17.95
15.50	18.40		18.40
15.75	**18.81**		**18.81**
16.00	**18.39**		**18.39**
16.25	17.35		17.35
16.50	16.22		16.22
16.75	15.04		15.04
17.00	13.87		13.87
17.25	12.88		12.88
17.50	11.95		11.95
17.75	11.04		11.04
18.00	10.12		10.12
18.25	9.23		9.23
18.50	8.55		8.55
18.75	7.92		7.92
19.00	7.29		7.29
19.25	6.67		6.67
19.50	6.12		6.12
19.75	5.77		5.77
20.00	5.45		5.45
20.25	5.13		5.13
20.50	4.82		4.82
20.75	4.63		4.63
21.00	4.61		4.61
21.25	4.61		4.61
21.50	4.61		4.61
21.75	4.61		4.61
22.00	4.43		4.43
22.25	4.13		4.13
22.50	3.81		3.81
22.75	3.49		3.49
23.00	3.22		3.22
23.25	3.34		3.34
23.50	3.64		3.64
23.75	3.96		3.96
24.00	4.28		4.28

Summary for Reach T: Total

Inflow Area = 100.205 ac, 1.37% Impervious, Inflow Depth > 6.43" for 100-year event
Inflow = 81.19 cfs @ 16.23 hrs, Volume= 53.688 af
Outflow = 81.19 cfs @ 16.23 hrs, Volume= 53.688 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach T: Total



Hydrograph for Reach T: Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	13.00	36.41		36.41
0.25	0.00		0.00	13.25	38.04		38.04
0.50	0.00		0.00	13.50	40.08		40.08
0.75	0.00		0.00	13.75	43.04		43.04
1.00	0.02		0.02	14.00	46.62		46.62
1.25	0.07		0.07	14.25	50.94		50.94
1.50	0.12		0.12	14.50	56.12		56.12
1.75	0.14		0.14	14.75	61.38		61.38
2.00	0.16		0.16	15.00	66.37		66.37
2.25	0.17		0.17	15.25	71.13		71.13
2.50	0.18		0.18	15.50	75.35		75.35
2.75	0.22		0.22	15.75	78.87		78.87
3.00	0.32		0.32	16.00	80.72		80.72
3.25	0.60		0.60	16.25	**81.19**		**81.19**
3.50	0.95		0.95	16.50	80.54		80.54
3.75	1.32		1.32	16.75	78.71		78.71
4.00	1.65		1.65	17.00	75.75		75.75
4.25	3.24		3.24	17.25	72.13		72.13
4.50	4.56		4.56	17.50	68.07		68.07
4.75	5.47		5.47	17.75	63.73		63.73
5.00	6.25		6.25	18.00	59.33		59.33
5.25	6.95		6.95	18.25	55.00		55.00
5.50	7.61		7.61	18.50	50.98		50.98
5.75	8.22		8.22	18.75	47.12		47.12
6.00	8.78		8.78	19.00	43.46		43.46
6.25	9.33		9.33	19.25	40.00		40.00
6.50	9.99		9.99	19.50	36.86		36.86
6.75	10.70		10.70	19.75	34.11		34.11
7.00	11.48		11.48	20.00	31.52		31.52
7.25	12.39		12.39	20.25	29.25		29.25
7.50	13.34		13.34	20.50	27.24		27.24
7.75	14.27		14.27	20.75	25.61		25.61
8.00	15.18		15.18	21.00	24.33		24.33
8.25	16.03		16.03	21.25	23.31		23.31
8.50	16.77		16.77	21.50	22.52		22.52
8.75	17.40		17.40	21.75	21.97		21.97
9.00	17.94		17.94	22.00	21.39		21.39
9.25	18.40		18.40	22.25	20.75		20.75
9.50	18.82		18.82	22.50	20.03		20.03
9.75	19.21		19.21	22.75	19.17		19.17
10.00	19.78		19.78	23.00	18.20		18.20
10.25	20.75		20.75	23.25	17.60		17.60
10.50	21.84		21.84	23.50	17.22		17.22
10.75	23.01		23.01	23.75	17.12		17.12
11.00	24.28		24.28	24.00	17.38		17.38
11.25	25.64		25.64				
11.50	27.07		27.07				
11.75	28.55		28.55				
12.00	30.07		30.07				
12.25	31.62		31.62				
12.50	33.19		33.19				
12.75	34.80		34.80				

Summary for Pond B1: Basin 1

Inflow Area = 11.702 ac, 0.00% Impervious, Inflow Depth > 5.95" for 100-year event
Inflow = 9.54 cfs @ 15.97 hrs, Volume= 5.800 af
Outflow = 9.40 cfs @ 16.19 hrs, Volume= 5.398 af, Atten= 1%, Lag= 13.5 min
Primary = 0.94 cfs @ 16.19 hrs, Volume= 1.261 af
Secondary = 8.46 cfs @ 16.19 hrs, Volume= 4.137 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 689.44' @ 16.19 hrs Surf.Area= 30,932 sf Storage= 26,555 cf

Plug-Flow detention time= 76.8 min calculated for 5.387 af (93% of inflow)
Center-of-Mass det. time= 44.6 min (976.1 - 931.5)

Volume	Invert	Avail.Storage	Storage Description
#1	687.60'	47,069 cf	**Storage (Prismatic)**Listed below (Recalc)

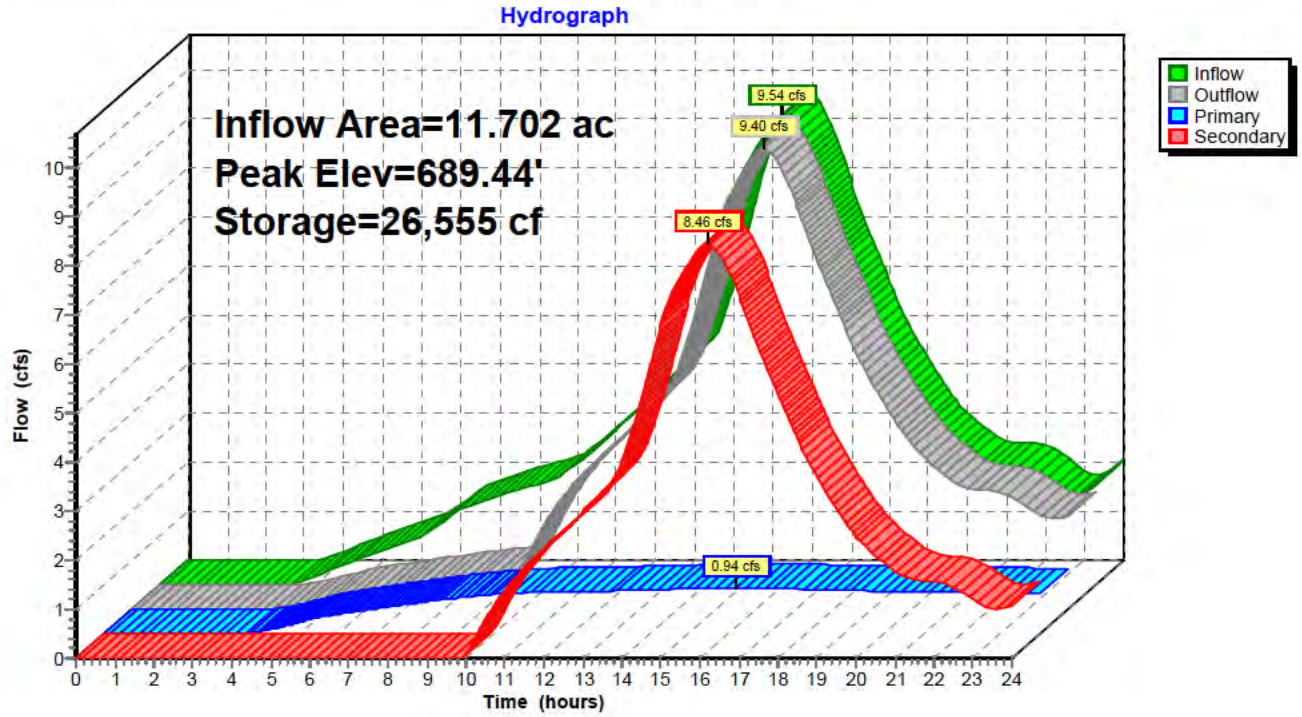
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
687.60	29	0	0
688.00	5,769	1,160	1,160
689.00	21,757	13,763	14,923
690.00	42,536	32,147	47,069

Device	Routing	Invert	Outlet Devices
#1	Primary	687.60'	**6.0" Round 6" PVC Pipe** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 687.60' / 685.09' S= 0.0418 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	689.00'	**11.0' long x 11.5' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.55 2.60 2.70 2.67 2.67 2.67 2.66 2.64

Primary OutFlow Max=0.94 cfs @ 16.19 hrs HW=689.44' (Free Discharge)
↑—**1=6" PVC Pipe** (Inlet Controls 0.94 cfs @ 4.80 fps)

Secondary OutFlow Max=8.46 cfs @ 16.19 hrs HW=689.44' (Free Discharge)
↑—**2=Emergency Overflow** (Weir Controls 8.46 cfs @ 1.74 fps)

Pond B1: Basin 1



Hydrograph for Pond B1: Basin 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	687.60	0.00	0.00	0.00
0.50	0.00	0	687.60	0.00	0.00	0.00
1.00	0.00	0	687.60	0.00	0.00	0.00
1.50	0.00	0	687.60	0.00	0.00	0.00
2.00	0.00	0	687.60	0.00	0.00	0.00
2.50	0.00	0	687.60	0.00	0.00	0.00
3.00	0.00	0	687.60	0.00	0.00	0.00
3.50	0.02	8	687.63	0.00	0.00	0.00
4.00	0.18	143	687.74	0.04	0.04	0.00
4.50	0.35	461	687.85	0.13	0.13	0.00
5.00	0.51	903	687.95	0.24	0.24	0.00
5.50	0.65	1,436	688.04	0.33	0.33	0.00
6.00	0.78	2,068	688.13	0.40	0.40	0.00
6.50	0.92	2,820	688.22	0.45	0.45	0.00
7.00	1.15	3,802	688.32	0.51	0.51	0.00
7.50	1.43	5,145	688.43	0.57	0.57	0.00
8.00	1.63	6,838	688.56	0.63	0.63	0.00
8.50	1.77	8,730	688.68	0.68	0.68	0.00
9.00	1.89	10,765	688.79	0.72	0.72	0.00
9.50	2.00	12,923	688.90	0.77	0.77	0.00
10.00	2.11	15,191	689.01	0.85	0.80	0.04
10.50	2.36	17,002	689.09	1.61	0.83	0.78
11.00	2.69	18,044	689.13	2.24	0.85	1.39
11.50	3.03	18,734	689.16	2.69	0.86	1.84
12.00	3.39	19,299	689.18	3.09	0.86	2.23
12.50	3.76	19,821	689.21	3.48	0.87	2.61
13.00	4.14	20,326	689.22	3.86	0.87	2.99
13.50	4.56	20,827	689.24	4.26	0.88	3.38
14.00	5.63	21,667	689.27	4.95	0.89	4.06
14.50	7.18	23,168	689.33	6.23	0.91	5.33
15.00	8.51	24,816	689.38	7.73	0.92	6.80
15.50	**9.16**	25,867	689.42	8.73	0.93	7.79
16.00	**9.54**	**26,478**	**689.44**	**9.33**	**0.94**	**8.38**
16.50	8.87	**26,358**	**689.44**	**9.21**	**0.94**	**8.27**
17.00	7.74	25,473	689.41	8.34	0.93	7.41
17.50	6.66	24,340	689.37	7.29	0.92	6.37
18.00	5.71	23,245	689.33	6.30	0.91	5.40
18.50	4.81	22,177	689.29	5.38	0.90	4.48
19.00	4.11	21,235	689.26	4.59	0.89	3.70
19.50	3.46	20,394	689.23	3.92	0.88	3.04
20.00	3.00	19,658	689.20	3.36	0.87	2.49
20.50	2.66	19,095	689.18	2.95	0.86	2.09
21.00	2.43	18,638	689.16	2.63	0.85	1.77
21.50	2.39	18,401	689.15	2.47	0.85	1.62
22.00	2.37	18,313	689.15	2.41	0.85	1.56
22.50	2.13	18,135	689.14	2.29	0.85	1.45
23.00	1.82	17,762	689.12	2.06	0.84	1.22
23.50	1.78	17,424	689.11	1.85	0.84	1.01
24.00	2.06	17,517	689.11	1.91	0.84	1.07

Summary for Pond B2: Basin 2

Inflow Area = 62.154 ac, 0.50% Impervious, Inflow Depth > 6.67" for 100-year event
Inflow = 52.41 cfs @ 16.53 hrs, Volume= 34.569 af
Outflow = 52.26 cfs @ 16.61 hrs, Volume= 34.353 af, Atten= 0%, Lag= 4.8 min
Primary = 0.89 cfs @ 16.61 hrs, Volume= 1.196 af
Secondary = 51.37 cfs @ 16.61 hrs, Volume= 33.157 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 690.04' @ 16.61 hrs Surf.Area= 37,810 sf Storage= 29,378 cf

Plug-Flow detention time= 11.3 min calculated for 34.282 af (99% of inflow)
Center-of-Mass det. time= 8.2 min (940.6 - 932.4)

Volume	Invert	Avail.Storage	Storage Description
#1	688.36'	77,771 cf	**Storage (Prismatic)**Listed below (Recalc)

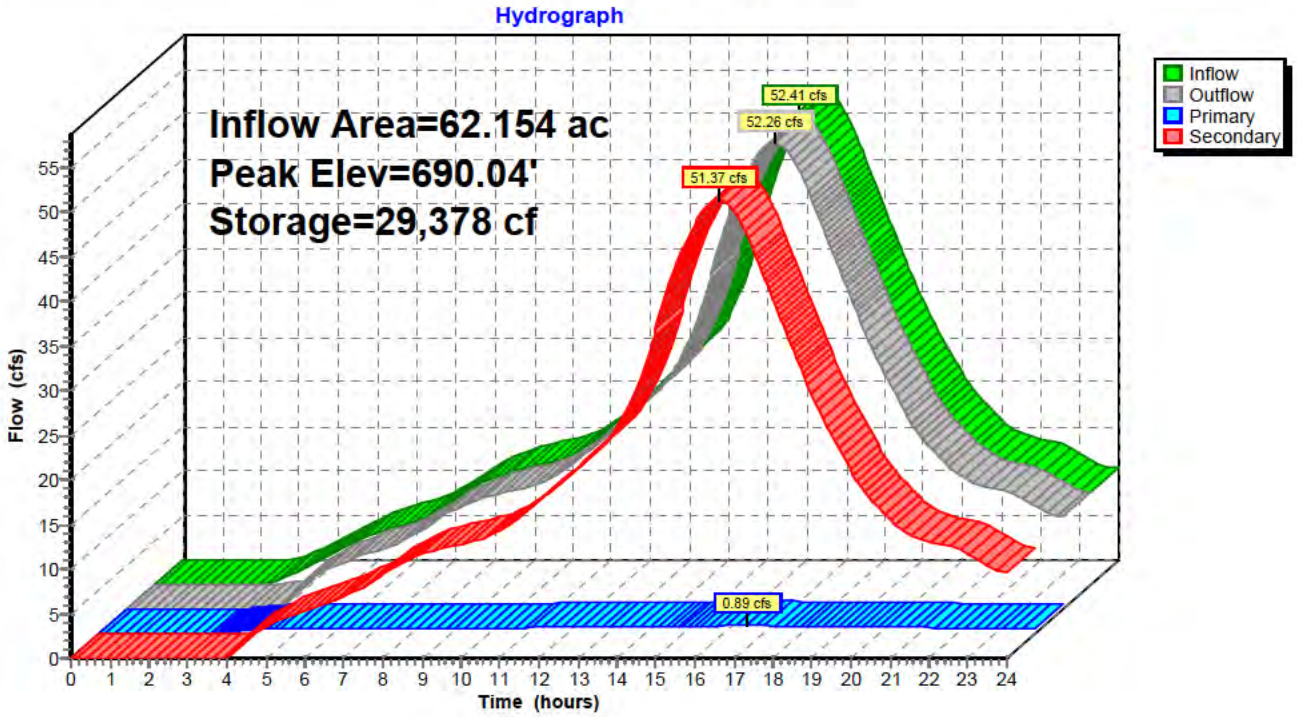
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
688.36	42	0	0
689.00	11,522	3,700	3,700
690.00	36,691	24,107	27,807
691.00	63,237	49,964	77,771

Device	Routing	Invert	Outlet Devices
#1	Primary	688.36'	**6.0" Round 6" PVC Pipe** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 688.36' / 685.05' S= 0.0662 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.20 sf
#2	Secondary	689.00'	**18.0' long x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.89 cfs @ 16.61 hrs HW=690.04' (Free Discharge)
↑**1=6" PVC Pipe** (Inlet Controls 0.89 cfs @ 4.55 fps)

Secondary OutFlow Max=51.36 cfs @ 16.61 hrs HW=690.04' (Free Discharge)
↑**2=Emergency Spillway** (Weir Controls 51.36 cfs @ 2.74 fps)

Pond B2: Basin 2



Hydrograph for Pond B2: Basin 2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	688.36	0.00	0.00	0.00
0.50	0.00	0	688.36	0.00	0.00	0.00
1.00	0.00	0	688.36	0.00	0.00	0.00
1.50	0.00	0	688.36	0.00	0.00	0.00
2.00	0.00	0	688.36	0.00	0.00	0.00
2.50	0.01	3	688.37	0.00	0.00	0.00
3.00	0.27	156	688.49	0.04	0.04	0.00
3.50	1.12	1,105	688.71	0.23	0.23	0.00
4.00	2.28	3,510	688.98	0.46	0.46	0.00
4.50	3.43	5,564	689.14	2.90	0.54	2.36
5.00	4.48	6,275	689.19	4.16	0.57	3.59
5.50	5.39	6,797	689.22	5.13	0.58	4.55
6.00	6.19	7,229	689.24	5.97	0.59	5.37
6.50	6.89	7,597	689.26	6.69	0.60	6.09
7.00	7.74	7,988	689.28	7.48	0.61	6.86
7.50	9.01	8,558	689.31	8.64	0.63	8.01
8.00	10.48	9,263	689.35	10.10	0.64	9.45
8.50	11.66	9,876	689.38	11.38	0.65	10.72
9.00	12.46	10,297	689.40	12.28	0.66	11.61
9.50	13.06	10,593	689.41	12.92	0.67	12.25
10.00	13.55	10,825	689.42	13.43	0.67	12.76
10.50	14.19	11,079	689.43	13.99	0.68	13.32
11.00	15.36	11,540	689.45	15.02	0.69	14.34
11.50	16.96	12,213	689.48	16.54	0.70	15.85
12.00	18.76	12,988	689.52	18.31	0.71	17.60
12.50	20.67	13,809	689.55	20.21	0.72	19.49
13.00	22.63	14,650	689.58	22.17	0.74	21.43
13.50	24.64	15,523	689.61	24.13	0.75	23.38
14.00	27.34	16,658	689.66	26.52	0.76	25.76
14.50	32.52	18,783	689.73	30.96	0.79	30.17
15.00	39.82	22,110	689.84	37.78	0.83	36.95
15.50	46.39	25,553	689.94	44.68	0.86	43.82
16.00	50.68	28,041	690.01	49.59	0.88	48.71
16.50	**52.39**	**29,325**	**690.04**	**52.15**	**0.89**	**51.26**
17.00	**50.13**	**28,752**	**690.03**	**51.01**	**0.89**	**50.12**
17.50	45.13	26,547	689.97	46.64	0.87	45.78
18.00	39.50	23,748	689.88	41.08	0.84	40.24
18.50	34.01	20,990	689.80	35.50	0.81	34.68
19.00	28.95	18,444	689.72	30.25	0.79	29.47
19.50	24.61	16,269	689.64	25.70	0.76	24.95
20.00	20.87	14,456	689.57	21.72	0.73	20.98
20.50	17.94	13,108	689.52	18.59	0.71	17.88
21.00	15.72	12,074	689.48	16.23	0.70	15.53
21.50	14.26	11,340	689.45	14.57	0.68	13.89
22.00	13.60	10,964	689.43	13.74	0.68	13.06
22.50	13.08	10,739	689.42	13.24	0.67	12.57
23.00	12.02	10,320	689.40	12.33	0.66	11.66
23.50	10.71	9,706	689.37	11.02	0.65	10.37
24.00	10.36	9,389	689.36	10.36	0.64	9.71

APPENDIX E

ASCE STUDY ON FLOWS FROM SOLAR FARMS

Hydrologic Response of Solar Farms

Lauren M. Cook, S.M.ASCE[1]; and Richard H. McCuen, M.ASCE[2]

Abstract: Because of the benefits of solar energy, the number of solar farms is increasing; however, their hydrologic impacts have not been studied. The goal of this study was to determine the hydrologic effects of solar farms and examine whether or not storm-water management is needed to control runoff volumes and rates. A model of a solar farm was used to simulate runoff for two conditions: the pre- and postpaneled conditions. Using sensitivity analyses, modeling showed that the solar panels themselves did not have a significant effect on the runoff volumes, peaks, or times to peak. However, if the ground cover under the panels is gravel or bare ground, owing to design decisions or lack of maintenance, the peak discharge may increase significantly with storm-water management needed. In addition, the kinetic energy of the flow that drains from the panels was found to be greater than that of the rainfall, which could cause erosion at the base of the panels. Thus, it is recommended that the grass beneath the panels be well maintained or that a buffer strip be placed after the most downgradient row of panels. This study, along with design recommendations, can be used as a guide for the future design of solar farms. **DOI: 10.1061/(ASCE)HE.1943-5584.0000530.**

CE Database subject headings: Hydrology; Land use; Solar power; Floods; Surface water; Runoff; Stormwater management.

Author keywords: Hydrology; Land use change; Solar energy; Flooding; Surface water runoff; Storm-water management.

Introduction

Storm-water management practices are generally implemented to reverse the effects of land-cover changes that cause increases in volumes and rates of runoff. This is a concern posed for new types of land-cover change such as the solar farm. Solar energy is a renewable energy source that is expected to increase in importance in the near future. Because solar farms require considerable land, it is necessary to understand the design of solar farms and their potential effect on erosion rates and storm runoff, especially the impact on offsite properties and receiving streams. These farms can vary in size from 8 ha (20 acres) in residential areas to 250 ha (600 acres) in areas where land is abundant.

The solar panels are impervious to rain water; however, they are mounted on metal rods and placed over pervious land. In some cases, the area below the panel is paved or covered with gravel. Service roads are generally located between rows of panels. Although some panels are stationary, others are designed to move so that the angle of the panel varies with the angle of the sun. The angle can range, depending on the latitude, from 22° during the summer months to 74° during the winter months. In addition, the angle and direction can also change throughout the day. The issue posed is whether or not these rows of impervious panels will change the runoff characteristics of the site, specifically increase runoff volumes or peak discharge rates. If the increases are hydrologically significant, storm-water management facilities may be needed. Additionally, it is possible that the velocity of water draining from the edge of the panels is sufficient to cause erosion of the soil below the panels, especially where the maintenance roadways are bare ground.

The outcome of this study provides guidance for assessing the hydrologic effects of solar farms, which is important to those who plan, design, and install arrays of solar panels. Those who design solar farms may need to provide for storm-water management. This study investigated the hydrologic effects of solar farms, assessed whether or not storm-water management might be needed, and if the velocity of the runoff from the panels could be sufficient to cause erosion of the soil below the panels.

Model Development

Solar farms are generally designed to maximize the amount of energy produced per unit of land area, while still allowing space for maintenance. The hydrologic response of solar farms is not usually considered in design. Typically, the panels will be arrayed in long rows with separations between the rows to allow for maintenance vehicles. To model a typical layout, a unit width of one panel was assumed, with the length of the downgradient strip depending on the size of the farm. For example, a solar farm with 30 rows of 200 panels each could be modeled as a strip of 30 panels with space between the panels for maintenance vehicles. Rainwater that drains from the upper panel onto the ground will flow over the land under the 29 panels on the downgradient strip. Depending on the land cover, infiltration losses would be expected as the runoff flows to the bottom of the slope.

To determine the effects that the solar panels have on runoff characteristics, a model of a solar farm was developed. Runoff in the form of sheet flow without the addition of the solar panels served as the prepaneled condition. The paneled condition assumed a downgradient series of cells with one solar panel per ground cell. Each cell was separated into three sections: wet, dry, and spacer.

The dry section is that portion directly underneath the solar panel, unexposed directly to the rainfall. As the angle of the panel from the horizontal increases, more of the rain will fall directly onto

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the ground; this section of the cell is referred to as the wet section. The spacer section is the area between the rows of panels used by maintenance vehicles. Fig. 1 is an image of two solar panels and the spacer section allotted for maintenance vehicles. Fig. 2 is a schematic of the wet, dry, and spacer sections with their respective dimensions. In Fig. 1, tracks from the vehicles are visible on what is modeled within as the spacer section. When the solar panel is horizontal, then the length longitudinal to the direction that runoff will occur is the length of the dry and wet sections combined. Runoff from a dry section drains onto the downgradient spacer section. Runoff from the spacer section flows to the wet section of the next downgradient cell. Water that drains from a solar panel falls directly onto the spacer section of that cell.

The length of the spacer section is constant. During a storm event, the loss rate was assumed constant for the 24-h storm because a wet antecedent condition was assumed. The lengths of the wet and dry sections changed depending on the angle of the solar panel. The total length of the wet and dry sections was set equal to the length of one horizontal solar panel, which was assumed to be 3.5 m. When a solar panel is horizontal, the dry section length would equal 3.5 m and the wet section length would be zero. In the paneled condition, the dry section does not receive direct rainfall because the rain first falls onto the solar panel then drains onto the spacer section. However, the dry section does infiltrate some of the runoff that comes from the upgradient wet section. The wet section was modeled similar to the spacer section with rain falling directly onto the section and assuming a constant loss rate.

For the presolar panel condition, the spacer and wet sections are modeled the same as in the paneled condition; however, the cell does not include a dry section. In the prepaneled condition, rain falls directly onto the entire cell. When modeling the prepaneled condition, all cells receive rainfall at the same rate and are subject to losses. All other conditions were assumed to remain the same such that the prepaneled and paneled conditions can be compared.

Rainfall was modeled after an natural resources conservation service (NRCS) Type II Storm (McCuen 2005) because it is an accurate representation of actual storms of varying characteristics that are imbedded in intensity-duration-frequency (IDF) curves. For each duration of interest, a dimensionless hyetograph was developed using a time increment of 12 s over the duration of the storm (see Fig. 3). The depth of rainfall that corresponds to each storm magnitude was then multiplied by the dimensionless hyetograph. For a 2-h storm duration, depths of 40.6, 76.2, and 101.6 mm were used for the 2-, 25-, and 100-year events. The 2- and 6-h duration hyetographs were developed using the center portion of the 24-h storm, with the rainfall depths established with the Baltimore IDF curve. The corresponding depths for a 6-h duration were 53.3, 106.7, and 132.1 mm, respectively. These magnitudes were chosen to give a range of storm conditions.

During each time increment, the depth of rain is multiplied by the cell area to determine the volume of rain added to each section of each cell. This volume becomes the storage in each cell. Depending on the soil group, a constant volume of losses was subtracted from the storage. The runoff velocity from a solar panel was calculated using Manning's equation, with the hydraulic radius for sheet flow assumed to equal the depth of the storage on the panel (Bedient and Huber 2002). Similar assumptions were made to compute the velocities in each section of the surface sections.

Fig. 1. Maintenance or "spacer" section between two rows of solar panels (photo by John E. Showler, reprinted with permission)

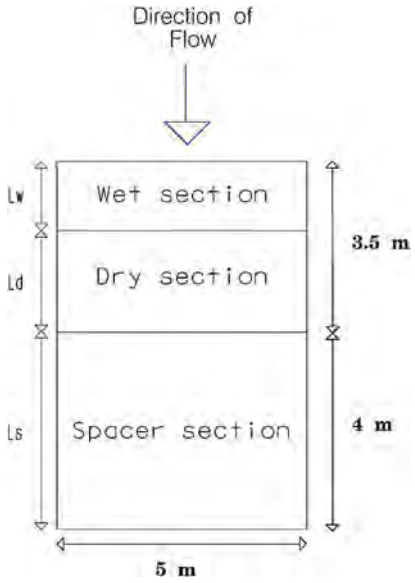

Fig. 2. Wet, dry, and spacer sections of a single cell with lengths *Lw*, *Ls*, and *Ld* with the solar panel covering the dry section

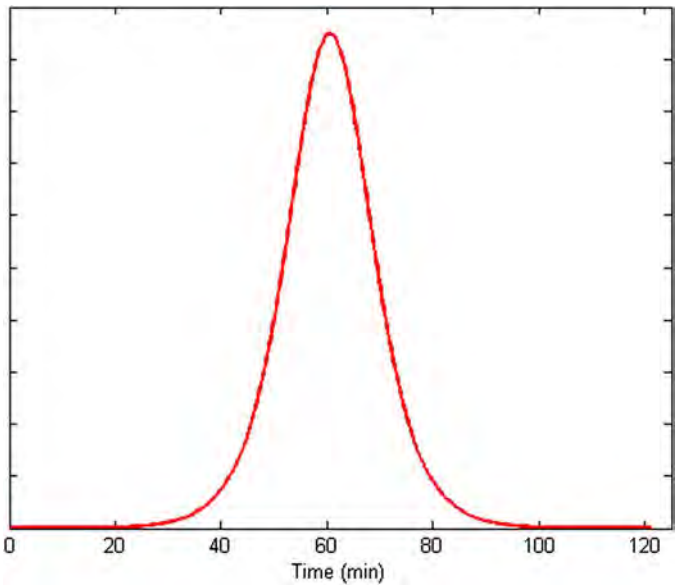

Fig. 3. Dimensionless hyetograph of 2-h Type II storm

Runoff from one section to the next and then to the next downgradient cell was routed using the continuity of mass. The routing coefficient depended on the depth of flow in storage and the velocity of runoff. Flow was routed from the wet section to the dry section to the spacer section, with flow from the spacer section draining to the wet section of the next cell. Flow from the most downgradient cell was assumed to be the outflow. Discharge rates and volumes from the most downgradient cell were used for comparisons between the prepaneled and paneled conditions.

Alternative Model Scenarios

To assess the effects of the different variables, a section of 30 cells, each with a solar panel, was assumed for the base model. Each cell was separated individually into wet, dry, and spacer sections. The area had a total ground length of 225 m with a ground slope of 1% and width of 5 m, which was the width of an average solar panel. The roughness coefficient (Engman 1986) for the silicon solar panel was assumed to be that of glass, 0.01. Roughness coefficients of 0.15 for grass and 0.02 for bare ground were also assumed. Loss rates of 0.5715 cm/h (0.225 in./h) and 0.254 cm/h (0.1 in./h) for B and C soils, respectively, were assumed.

The prepaneled condition using the 2-h, 25-year rainfall was assumed for the base condition, with each cell assumed to have a good grass cover condition. All other analyses were made assuming a paneled condition. For most scenarios, the runoff volumes and peak discharge rates from the paneled model were not significantly greater than those for the prepaneled condition. Over a total length of 225 m with 30 solar panels, the runoff increased by 0.26 m^3, which was a difference of only 0.35%. The slight increase in runoff volume reflects the slightly higher velocities for the paneled condition. The peak discharge increased by 0.0013 m^3, a change of only 0.31%. The time to peak was delayed by one time increment, i.e., 12 s. Inclusion of the panels did not have a significant hydrologic impact.

Storm Magnitude

The effect of storm magnitude was investigated by changing the magnitude from a 25-year storm to a 2-year storm. For the 2-year storm, the rainfall and runoff volumes decreased by approximately 50%. However, the runoff from the paneled watershed condition increased compared to the prepaneled condition by approximately the same volume as for the 25-year analysis, 0.26 m^3. This increase represents only a 0.78% increase in volume. The peak discharge and the time to peak did not change significantly. These results reflect runoff from a good grass cover condition and indicated that the general conclusion of very minimal impacts was the same for different storm magnitudes.

Ground Slope

The effect of the downgradient ground slope of the solar farm was also examined. The angle of the solar panels would influence the velocity of flows from the panels. As the ground slope was increased, the velocity of flow over the ground surface would be closer to that on the panels. This could cause an overall increase in discharge rates. The ground slope was changed from 1 to 5%, with all other conditions remaining the same as the base conditions.

With the steeper incline, the volume of losses decreased from that for the 1% slope, which is to be expected because the faster velocity of the runoff would provide less opportunity for infiltration. However, between the prepaneled and paneled conditions, the increase in runoff volume was less than 1%. The peak discharge and the time to peak did not change. Therefore, the greater ground slope did not significantly influence the response of the solar farm.

Soil Type

The effect of soil type on the runoff was also examined. The soil group was changed from B soil to C soil by varying the loss rate. As expected, owing to the higher loss rate for the C soil, the depths of runoff increased by approximately 7.5% with the C soil when compared with the volume for B soils. However, the runoff volume for the C soil condition only increased by 0.17% from the prepaneled condition to the paneled condition. In comparison with the B soil, a difference of 0.35% in volume resulted between the two conditions. Therefore, the soil group influenced the actual volumes and rates, but not the relative effect of the paneled condition when compared to the prepaneled condition.

Panel Angle

Because runoff velocities increase with slope, the effect of the angle of the solar panel on the hydrologic response was examined. Analyses were made for angles of 30° and 70° to test an average range from winter to summer. The hydrologic response for these angles was compared to that of the base condition angle of 45°. The other site conditions remained the same. The analyses showed that the angle of the panel had only a slight effect on runoff volumes and discharge rates. The lower angle of 30° was associated with an increased runoff volume, whereas the runoff volume decreased for the steeper angle of 70° when compared with the base condition of 45°. However, the differences (~0.5%) were very slight. Nevertheless, these results indicate that, when the solar panel was closer to horizontal, i.e., at a lower angle, a larger difference in runoff volume occurred between the prepaneled and paneled conditions. These differences in the response result are from differences in loss rates.

The peak discharge was also lower at the lower angle. At an angle of 30°, the peak discharge was slightly lower than at the higher angle of 70°. For the 2-h storm duration, the time to peak of the 30° angle was 2 min delayed from the time to peak of when the panel was positioned at a 70° angle, which reflects the longer travel times across the solar panels.

Storm Duration

To assess the effect of storm duration, analyses were made for 6-h storms, testing magnitudes for 2-, 25-, and 100-year return periods, with the results compared with those for the 2-h rainfall events. The longer storm duration was tested to determine whether a longer duration storm would produce a different ratio of increase in runoff between the prepaneled and paneled conditions. When compared to runoff volumes from the 2-h storm, those for the 6-h storm were 34% greater in both the paneled and prepaneled cases. However, when comparing the prepaneled to the paneled condition, the increase in the runoff volume with the 6-h storm was less than 1% regardless of the return period. The peak discharge and the time-to-peak did not differ significantly between the two conditions. The trends in the hydrologic response of the solar farm did not vary with storm duration.

Ground Cover

The ground cover under the panels was assumed to be a native grass that received little maintenance. For some solar farms, the area beneath the panel is covered in gravel or partially paved because the panels prevent the grass from receiving sunlight. Depending on the

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volume of traffic, the spacer cell could be grass, patches of grass, or bare ground. Thus, it was necessary to determine whether or not these alternative ground-cover conditions would affect the runoff characteristics. This was accomplished by changing the Manning's n for the ground beneath the panels. The value of n under the panels, i.e., the dry section, was set to 0.015 for gravel, with the value for the spacer or maintenance section set to 0.02, i.e., bare ground. These can be compared to the base condition of a native grass ($n = 0.15$). A good cover should promote losses and delay the runoff.

For the smoother surfaces, the velocity of the runoff increased and the losses decreased, which resulted in increasing runoff volumes. This occurred both when the ground cover under the panels was changed to gravel and when the cover in the spacer section was changed to bare ground. Owing to the higher velocities of the flow, runoff rates from the cells increased significantly such that it was necessary to reduce the computational time increment. Fig. 4(a) shows the hydrograph from a 30-panel area with a time increment of 12 s. With a time increment of 12 s, the water in each cell is discharged at the end of every time increment, which results in no attenuation of the flow; thus, the undulations shown in Fig. 4(a) result. The time increment was reduced to 3 s for the 2-h storm, which resulted in watershed smoothing and a rational hydrograph shape [Fig. 4(b)]. The results showed that the storm runoff

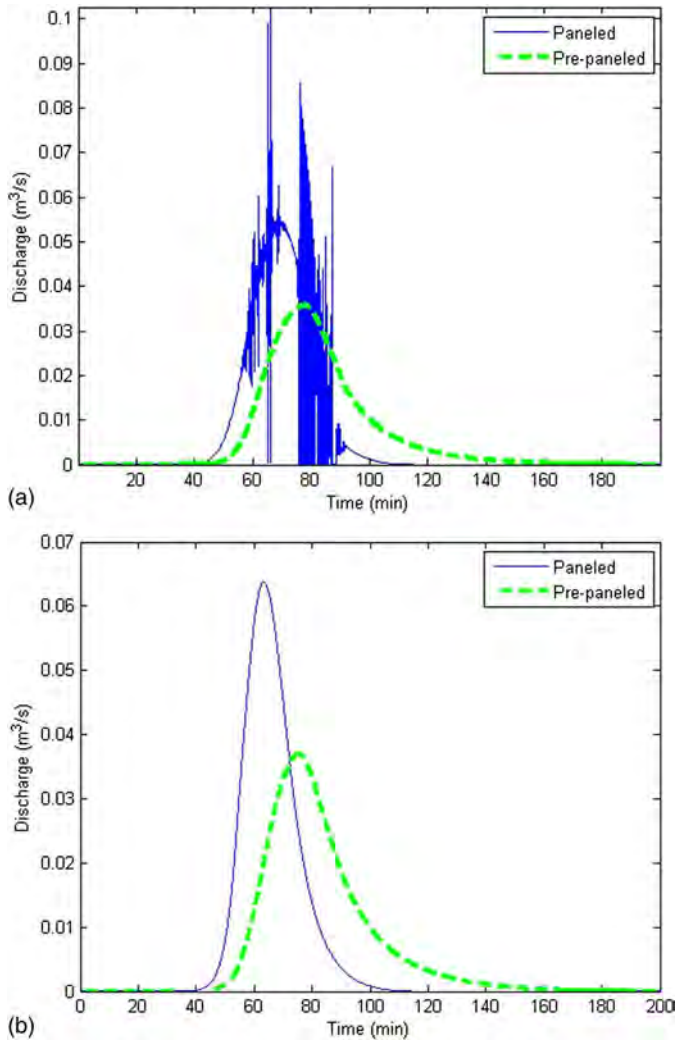

Fig. 4. Hydrograph with time increment of (a) 12 s; (b) 3 s with Manning's n for bare ground

increased by 7% from the grass-covered scenario to the scenario with gravel under the panel. The peak discharge increased by 73% for the gravel ground cover when compared with the grass cover without the panels. The time to peak was 10 min less with the gravel than with the grass, which reflects the effect of differences in surface roughness and the resulting velocities.

If maintenance vehicles used the spacer section regularly and the grass cover was not adequately maintained, the soil in the spacer section would be compacted and potentially the runoff volumes and rates would increase. Grass that is not maintained has the potential to become patchy and turn to bare ground. The grass under the panel may not get enough sunlight and die. Fig. 1 shows the result of the maintenance trucks frequently driving in the spacer section, which diminished the grass cover.

The effect of the lack of solar farm maintenance on runoff characteristics was modeled by changing the Manning's n to a value of 0.02 for bare ground. In this scenario, the roughness coefficient for the ground under the panels, i.e., the dry section, as well as in the spacer cell was changed from grass covered to bare ground ($n = 0.02$).The effects were nearly identical to that of the gravel. The runoff volume increased by 7% from the grass-covered to the bare-ground condition. The peak discharge increased by 72% when compared with the grass-covered condition. The runoff for the bare-ground condition also resulted in an earlier time to peak by approximately 10 min. Two other conditions were also modeled, showing similar results. In the first scenario, gravel was placed directly under the panel, and healthy grass was placed in the spacer section, which mimics a possible design decision. Under these conditions, the peak discharge increased by 42%, and the volume of runoff increased by 4%, which suggests that storm-water management would be necessary if gravel is placed anywhere.

Fig. 5 shows two solar panels from a solar farm in New Jersey. The bare ground between the panels can cause increased runoff rates and reductions in time of concentration, both of which could necessitate storm-water management. The final condition modeled involved the assumption of healthy grass beneath the panels and bare ground in the spacer section, which would simulate the condition of unmaintained grass resulting from vehicles that drive over the spacer section. Because the spacer section is 53% of the cell, the change in land cover to bare ground would reduce losses and decrease runoff travel times, which would cause runoff to amass as it

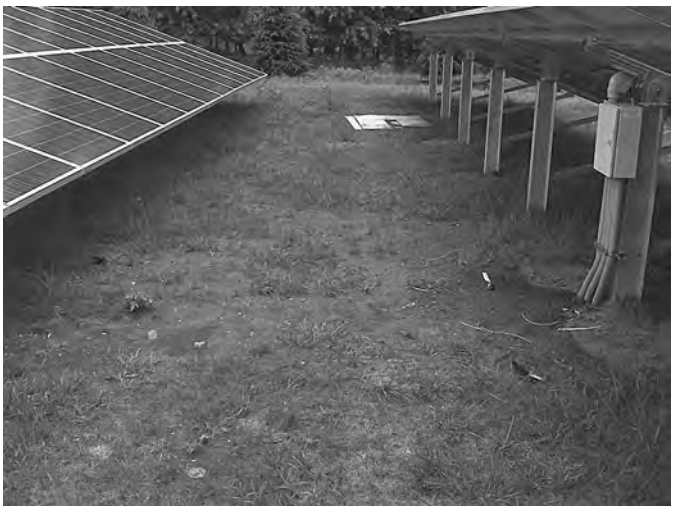

Fig. 5. Site showing the initiation of bare ground below the panels, which increases the potential for erosion (photo by John Showler, reprinted with permission)

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moves downgradient. With the spacer section as bare ground, the peak discharge increased by 100%, which reflected the increases in volume and decrease in timing. These results illustrate the need for maintenance of the grass below and between the panels.

Design Suggestions

With well-maintained grass underneath the panels, the solar panels themselves do not have much effect on total volumes of the runoff or peak discharge rates. Although the panels are impervious, the rainwater that drains from the panels appears as runoff over the downgradient cells. Some of the runoff infiltrates. If the grass cover of a solar farm is not maintained, it can deteriorate either because of a lack of sunlight or maintenance vehicle traffic. In this case, the runoff characteristics can change significantly with both runoff rates and volumes increasing by significant amounts. In addition, if gravel or pavement is placed underneath the panels, this can also contribute to a significant increase in the hydrologic response.

If bare ground is foreseen to be a problem or gravel is to be placed under the panels to prevent erosion, it is necessary to counteract the excess runoff using some form of storm-water management. A simple practice that can be implemented is a buffer strip (Dabney et al. 2006) at the downgradient end of the solar farm. The buffer strip length must be sufficient to return the runoff characteristics with the panels to those of runoff experienced before the gravel and panels were installed. Alternatively, a detention basin can be installed.

A buffer strip was modeled along with the panels. For approximately every 200 m of panels, or 29 cells, the buffer must be 5 cells long (or 35 m) to reduce the runoff volume to that which occurred before the panels were added. Even if a gravel base is not placed under the panels, the inclusion of a buffer strip may be a good practice when grass maintenance is not a top funding priority. Fig. 6 shows the peak discharge from the graveled surface versus the length of the buffer needed to keep the discharge to prepaneled peak rate.

Water draining from a solar panel can increase the potential for erosion of the spacer section. If the spacer section is bare ground, the high kinetic energy of water draining from the panel can cause soil detachment and transport (Garde and Raju 1977; Beuselinck et al. 2002). The amount and risk of erosion was modeled using the velocity of water coming off a solar panel compared with the velocity and intensity of the rainwater. The velocity of panel runoff was calculated using Manning's equation, and the velocity of falling rainwater was calculated using the following:

$$V_t = 120\, d_r^{0.35} \tag{1}$$

where d_r = diameter of a raindrop, assumed to be 1 mm. The relationship between kinetic energy and rainfall intensity is

$$K_e = 916 + 330 \log_{10} i \tag{2}$$

where i = rainfall intensity (in./h) and K_e = kinetic energy (ft-tons per ac-in. of rain) of rain falling onto the wet section and the panel, as well as the water flowing off of the end of the panel (Wischmeier and Smith 1978). The kinetic energy (Salles et al. 2002) of the rainfall was greater than that coming off the panel, but the area under the panel (i.e., the product of the length, width, and cosine of the panel angle) is greater than the area under the edge of the panel where the water drains from the panel onto the ground. Thus, dividing the kinetic energy by the respective areas gives a more accurate representation of the kinetic energy experienced by the soil. The energy of the water draining from the panel onto the ground can be nearly 10 times greater than the rain itself falling onto the ground area. If the solar panel runoff falls onto an unsealed soil, considerable detachment can result (Motha et al. 2004). Thus, because of the increased kinetic energy, it is possible that the soil is much more prone to erosion with the panels than without. Where panels are installed, methods of erosion control should be included in the design.

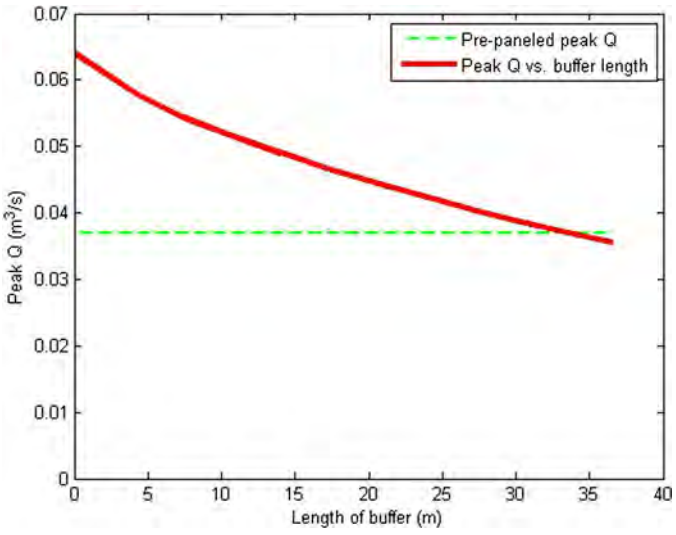

Fig. 6. Peak discharge over gravel compared with buffer length

Conclusions

Solar farms are the energy generators of the future; thus, it is important to determine the environmental and hydrologic effects of these farms, both existing and proposed. A model was created to simulate storm-water runoff over a land surface without panels and then with solar panels added. Various sensitivity analyses were conducted including changing the storm duration and volume, soil type, ground slope, panel angle, and ground cover to determine the effect that each of these factors would have on the volumes and peak discharge rates of the runoff.

The addition of solar panels over a grassy field does not have much of an effect on the volume of runoff, the peak discharge, nor the time to peak. With each analysis, the runoff volume increased slightly but not enough to require storm-water management facilities. However, when the land-cover type was changed under the panels, the hydrologic response changed significantly. When gravel or pavement was placed under the panels, with the spacer section left as patchy grass or bare ground, the volume of the runoff increased significantly and the peak discharge increased by approximately 100%. This was also the result when the entire cell was assumed to be bare ground.

The potential for erosion of the soil at the base of the solar panels was also studied. It was determined that the kinetic energy of the water draining from the solar panel could be as much as 10 times greater than that of rainfall. Thus, because the energy of the water draining from the panels is much higher, it is very possible that soil below the base of the solar panel could erode owing to the concentrated flow of water off the panel, especially if there is bare ground in the spacer section of the cell. If necessary, erosion control methods should be used.

Bare ground beneath the panels and in the spacer section is a realistic possibility (see Figs. 1 and 5). Thus, a good, well-maintained grass cover beneath the panels and in the spacer section is highly recommended. If gravel, pavement, or bare ground is

deemed unavoidable below the panels or in the spacer section, it may necessary to add a buffer section to control the excess runoff volume and ensure adequate losses. If these simple measures are taken, solar farms will not have an adverse hydrologic impact from excess runoff or contribute eroded soil particles to receiving streams and waterways.

Acknowledgments

The authors appreciate the photographs (Figs. 1 and 5) of Ortho Clinical Diagnostics, 1001 Route 202, North Raritan, New Jersey, 08869, provided by John E. Showler, Environmental Scientist, New Jersey Department of Agriculture. The extensive comments of reviewers resulted in an improved paper.

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Matt Asselmeier

From: Steve Grebner <sgrebner@kendalltwp.com>
Sent: Tuesday, January 21, 2025 10:38 PM
To: Matt Asselmeier
Cc: Steve Gengler
Subject: [External]Petition 24-30 Kendall Township Full Board vote on Petition 24-30

Matt;
At our Monthly meeting on 1/21/2025 the Kendall Township Board of Trustees voted NOT to approve the Petition 24-30. While the township Planning Commission recommended the approval PENDING the approval of the plan by the County Engineer, the Full board was NOT willing to approve the Petition.

So the official position of Kendall Township at this time is NOT to approve the project known as Ament Solar 1 LLC.

Petition 24 – 30 – Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner) Special Use Permit for a Commercial Solar Energy Facility and Variance to Section 36 282(17)(a) of the Kendall County Code to Allow a Commercial Solar Energy Facility on Land within One Point Five (1.5) Miles of Municipality without an Annexation Agreement 05-16-300-006 and 05-17-400-005 South of 9949 and 10021 Ament Road, Yorkville in Kendall Township Petitioner Would Like to Install a Commercial Solar Energy Facility; Property is Zoned A 1

Steve Grebner, Clerk Kendall Township
Check out our New Township website by clicking the QR code

Ament Road

Kendall County, IL

Kendall County

Zoning Board of Appeals

new leaf energy

Agenda

- New Leaf Energy: Company Overview
- Property and Site Overview
- Solar Project Overview
- Drainage
- Project Benefits
- Decommissioning
- Questions

Project Team

- Tom Ryan - New Leaf - Project Developer
- Nick Bellone - New Leaf - Civil Project Engineer
- Mike Keith - Atwell LLC - Civil Project Engineer
- Nick Standiford - Schain Banks - Counsel

New Leaf Energy: Company Overview

About Us

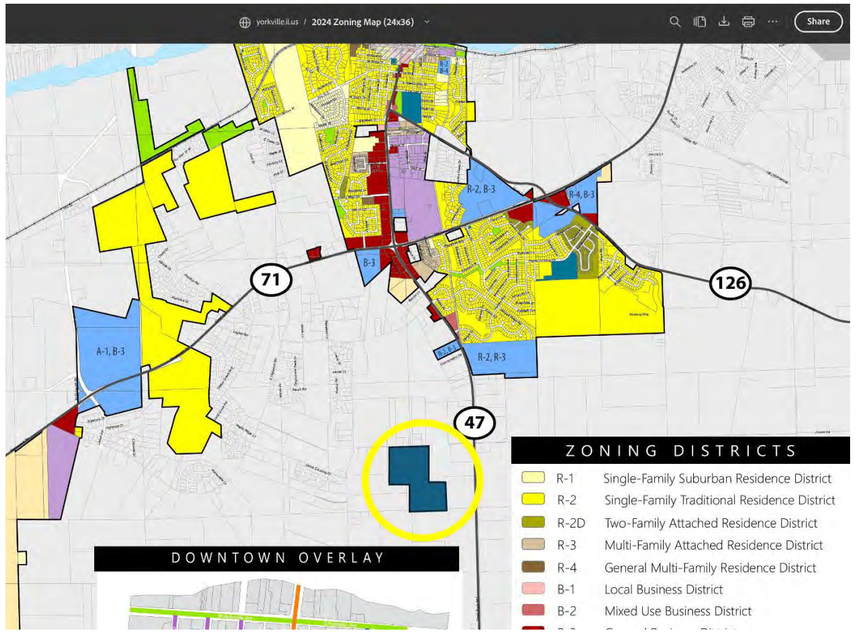
- Formerly known as Borrego Solar, we have been business since the 1980s and developing community solar projects since 2002
- Midwest Development team located in Illinois; company is headquartered in Massachusetts

Our Success in Illinois

- Permitted over 70 community solar projects throughout Illinois
- 25 projects have been built in Illinois over the past 6 years
- 6 projects currently under construction; 14 projects expected to construct in 2025
- Worked with over 40 counties and municipalities in Illinois

Project Site Overview

- Site Address: **Ament Rd - Kendall County**
- Landowner: **Janet Dhuse**
- Coordinates: **(41.597060, -88.443146)**
- Parcel ID**: 05-16-300-006 & 05-17-400-005**
- County: **Kendall County**
- Acres of Parcels: **94 acres**
- Targeted usable Acres: **40 acres**



Project Site Overview

Power Capacity - 5MWac

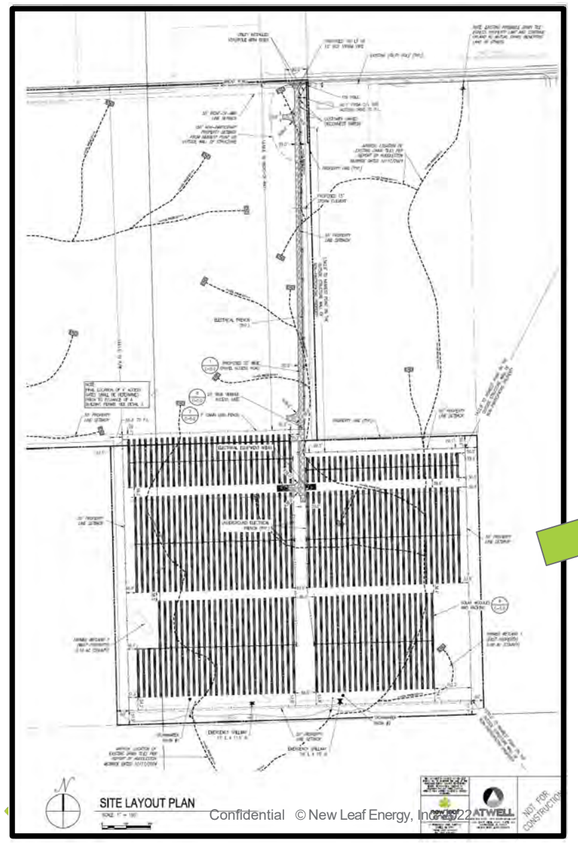
Access - Ament Rd

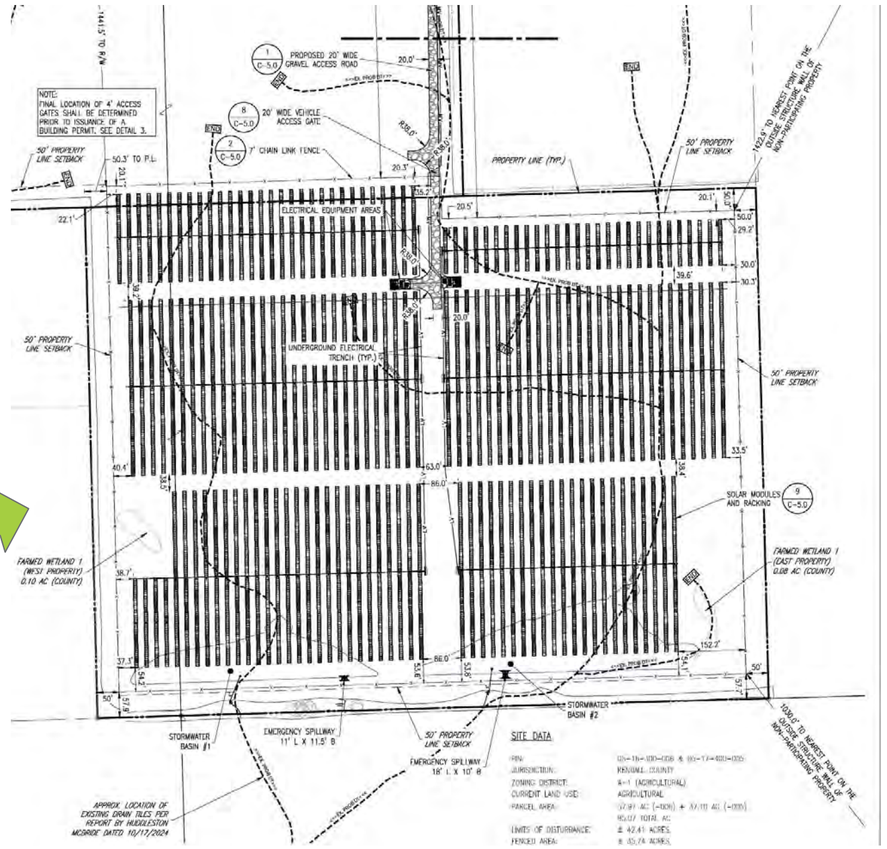
Racking Type - Single Axis Tracker

Interconnection Status - ComEd

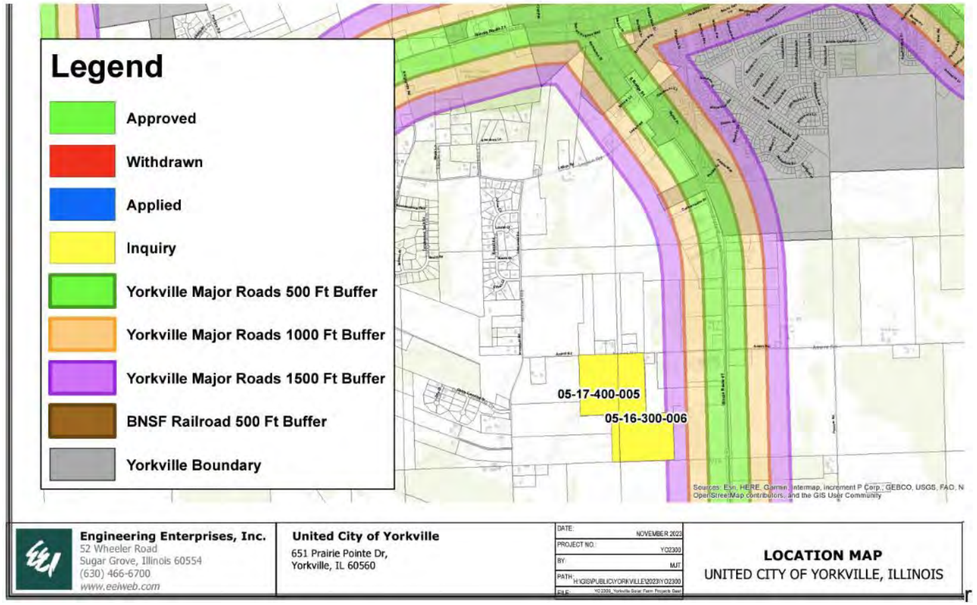
Storage - None

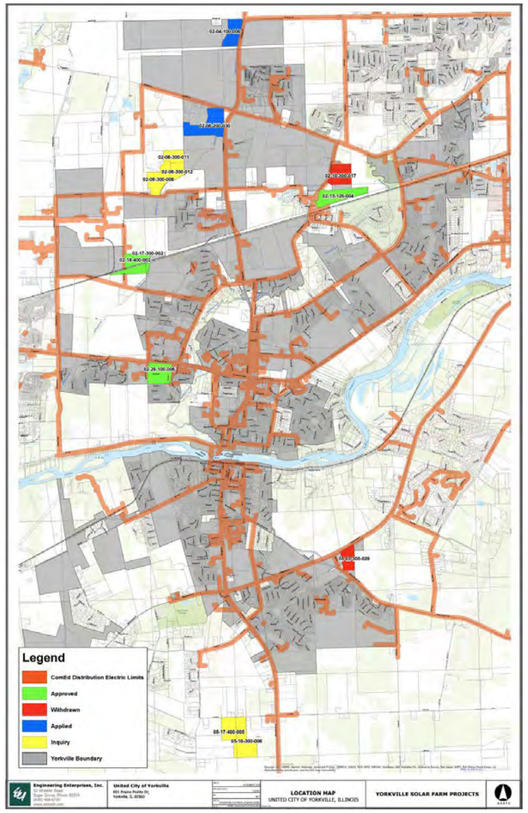
Site Layout





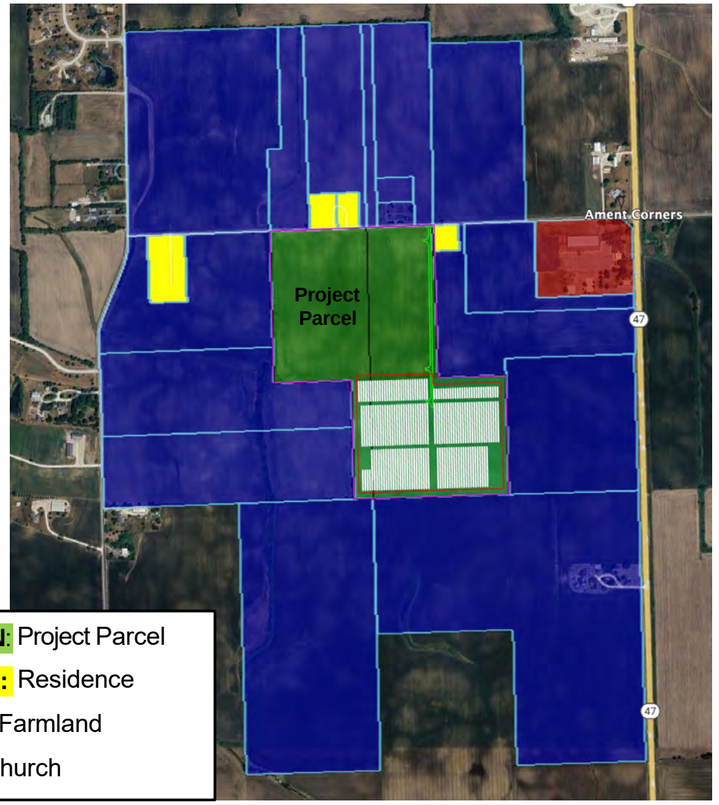
Yorkville Ordinance Update





Outreach Overview

- Notifications were sent to all surrounding property owners as well as Kendall Townships and The United City of Yorkville
- New Leaf representatives will conduct door to door outreach to all adjacent residences prior to KCRPC hearing.
- Closest residence is 1,378 feet to the north



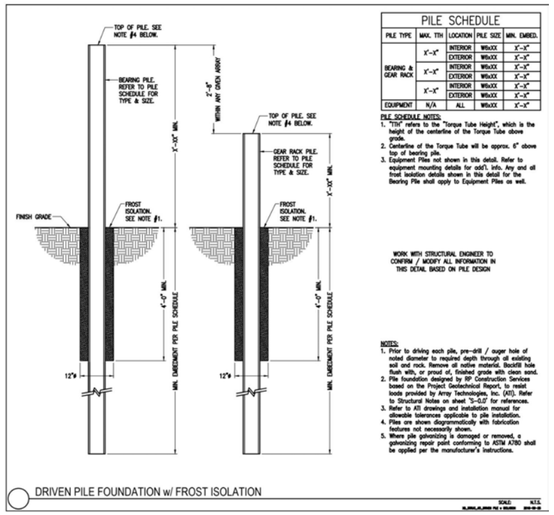
GREEN: Project Parcel
Yellow: Residence
BLUE: Farmland
Red: Church

Select Project Attributes

New Leaf Energy site in Will County

- Solar panel arrays consisting of trackers and racking
- Concrete limited to equipment pad for electrical equipment
- Security fence at 7’ height
- Underground trenching/cabling
- Gravel access road
- Limited access road grading and retention basins to maintain drainage patterns
- Planted with native pollinator mix
- Layout designed to accommodate agrivoltaics

Racking Foundations



Driven Pile:
Most Common in Illinois

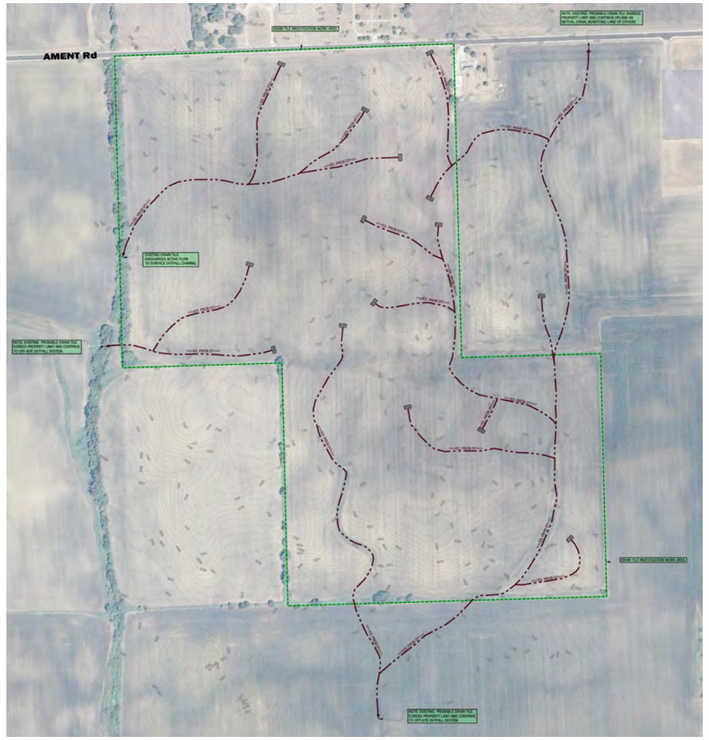
Ground Screw:
Typically only used when bedrock present (rare in Illinois)

No concrete or cast foundations are used

Project Site Overview: Drainage

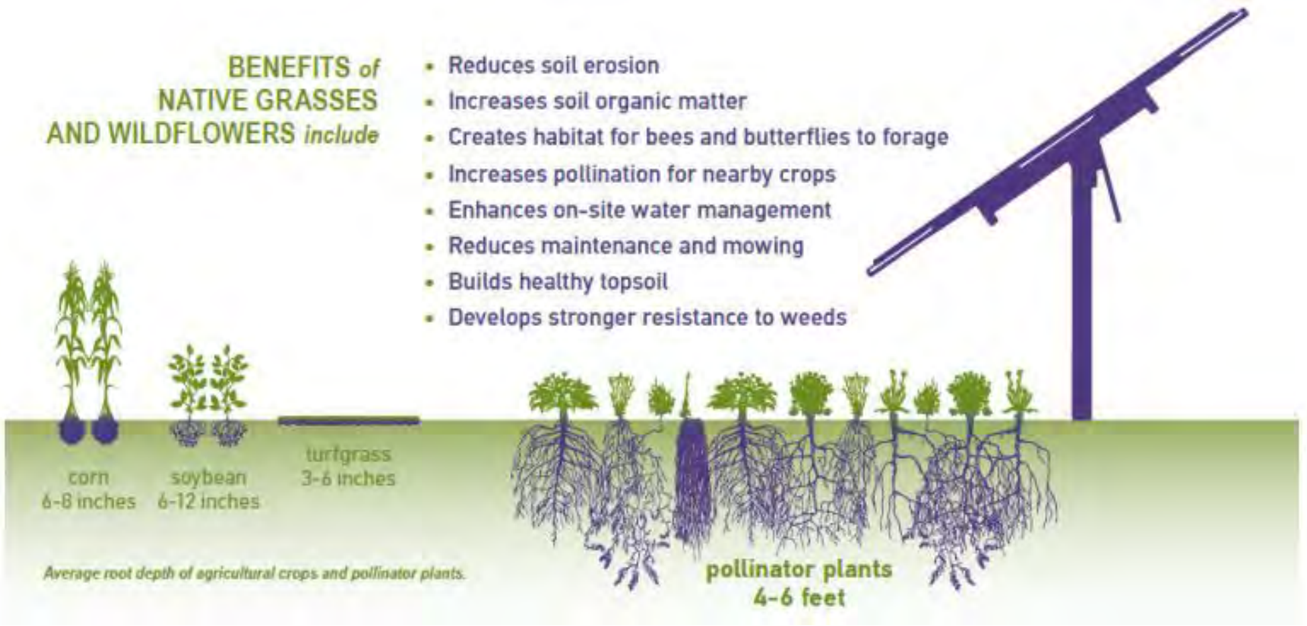
After construction, the field will drain the same way that it did prior to the solar installation:

- Drain tile is considered in final layout design and avoided when practical
- During construction, tile locations are flagged to facilitate avoidance
- Broken tile is repaired or replaced in-kind
- Construction crews regularly monitor the site for any tile or drainage issues

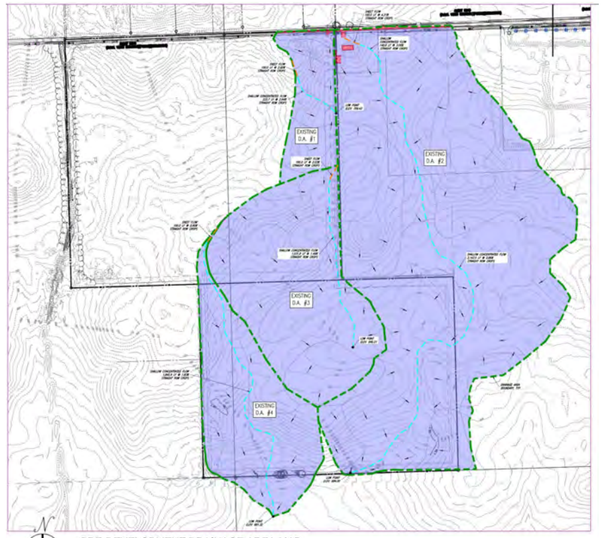


Drain Tile Probability Map prepared by Tom Huddleston of Huddleston McBride

Pollinators

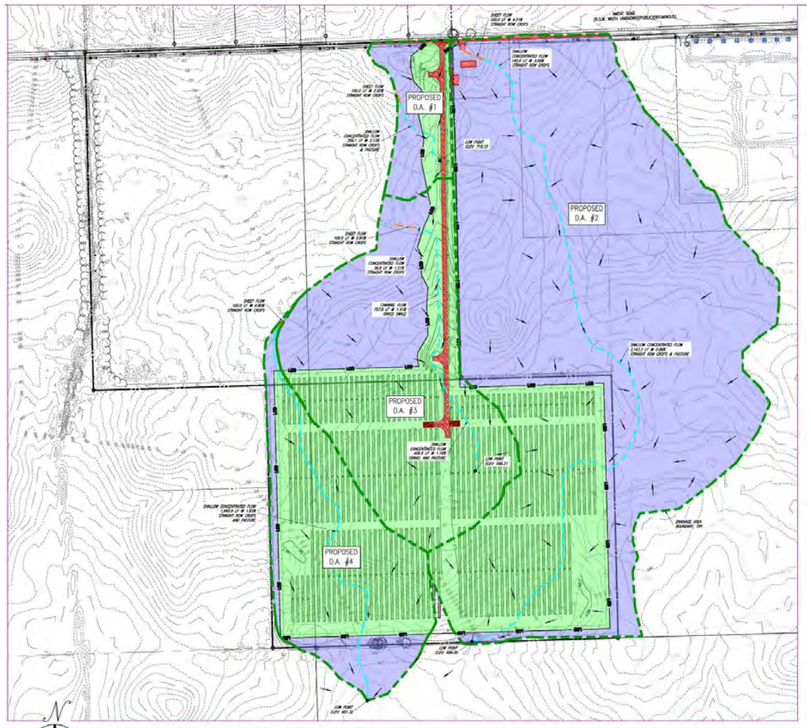


Stormwater Study



PRE-DEVELOPMENT DRAINAGE AREA MAP

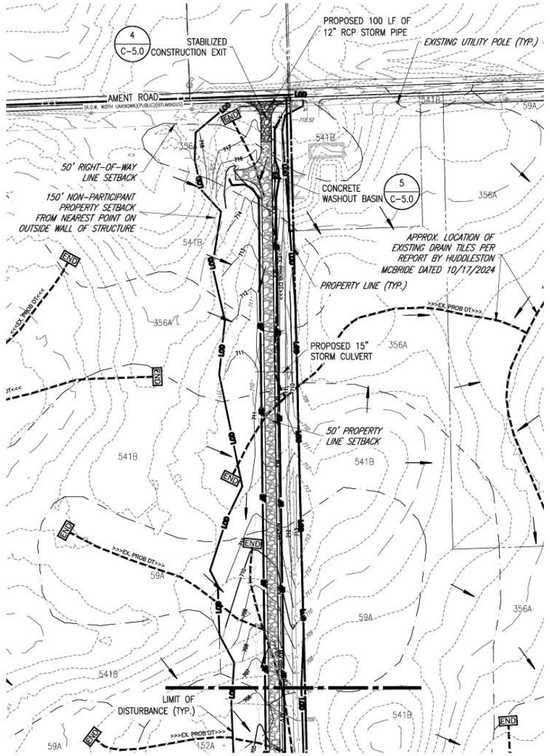
PROJECT LIMITS OF DISTURBANCE
DRAINAGE AREA BOUNDARY
SHEET FLOW
SHALLOW CONCENTRATED FLOW
ROW CROPS – GOOD CONDITION
PASTURE
IMPERVIOUS AREA
DRAINAGE FLOW ARROW

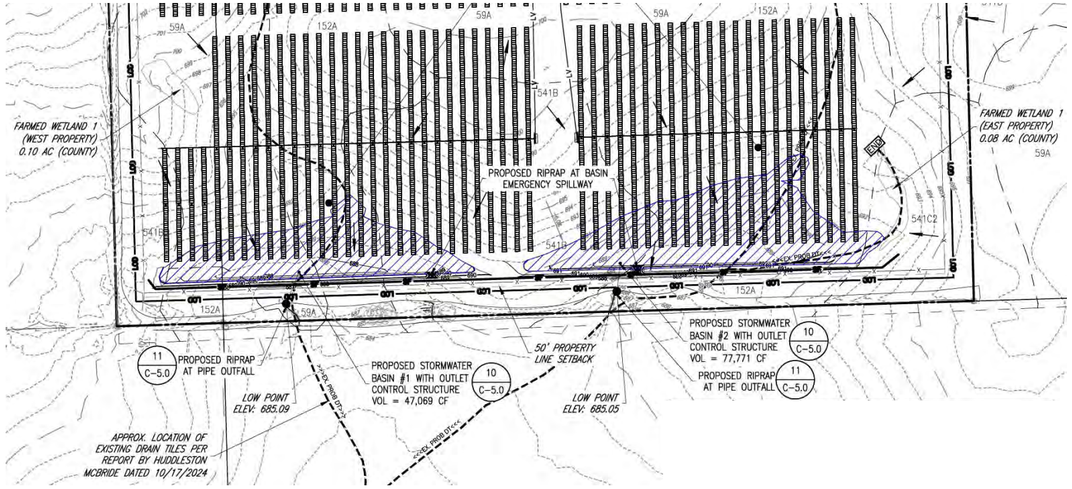


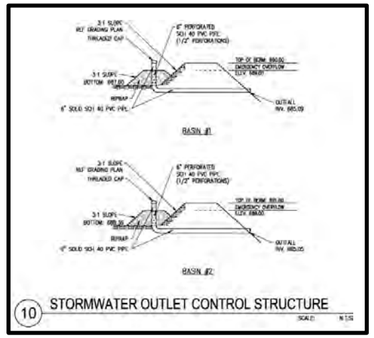
POST-DEVELOPMENT DRAINAGE AREA MAP

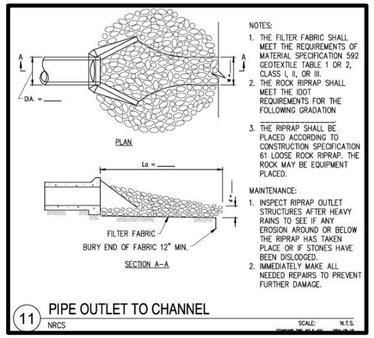
Prepared by Atwell, LLC on January 12, 2025

Stormwater Study - Kendall Township Requests









Decommissioning Plan

Line Item	Task	Cost
1	Module Removal	$ 7,810.83
2	Rack Wiring Removal	$ 1,952.71
3	Rack Dismantling	$ 5,858.18
4	Electrical Equipment Loading and Removal	$ 2,680.20
5	Break Up Concrete Pads	$ 1,221.77
6	Load Racks	$ 23,120.99
7	Electrical Wiring Removal	$ 4,064.97
8	Foundation Pile Removal	$ 26,505.02
9	Fence Removal	$ 23,464.96
10	Power Pole Removal	$ 7,500.00
11	Gravel Road Reclamation	$ 55,253.21
12	Seed Disturbed Areas	$ 4,985.06
13	Trucking to Transfer Station	$ 2,093.44
	Total =	**$166,511.35**

25 Year Projection

# of Years = 25
Inflation Rate = 2.0%
Total * (1+ Inflation Rate)^ # of Years + Grand Total

Decommissioning Bond Total: $425,897.37

Project Benefits

- **Will pay $575,858 in property taxes over 20 years**
  - Diversifies local economy without burdening infrastructure and services
- Maintains existing drainage; has minimal impervious areas
- Compatible with agrivoltaic uses like livestock grazing
- Native seed mix allows for reduced runoff and erosion and creates a habitat for pollinators
- Temporary use of the space – allows the soil to rest for 40 years and remain productive when returned to farming

Tax Rate

This project will pay approximately $575,858 in property tax over its first 20 years of operations.

- The first year of operations will pay $38,994 in property tax.
- Current 2024 property tax at this site area is $2,200.

20 Years

District	%	20 Years
SCHOOL DISTRICT CU-115	75%	$431,893.50
BRISTOL-KENDALL FPD	8%	$46,068.64
KENDALL COUNTY	7%	$40,310.06
JR COLLEGE #516	5%	$28,792.90
KENDALL ROAD DISTRICT	2%	$11,517.16
FOREST PRESERVE	2%	$11,517.16
KENDALL TOWNSHIP	1%	$5,758.58
TOTAL		$575,858.00

Thank you

new leaf energy

Appendix

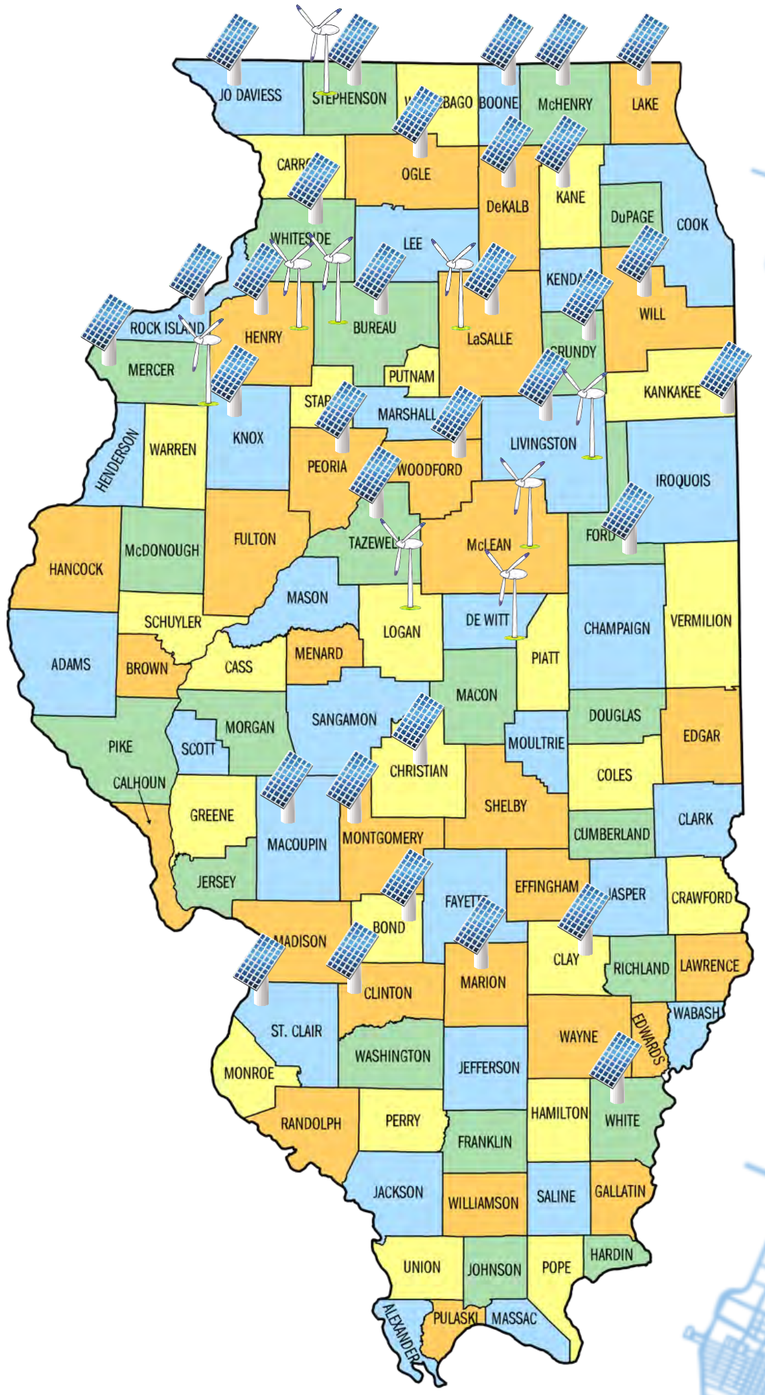
LAND USE ANALYSIS

AMENT SOLAR 1

new leaf energy

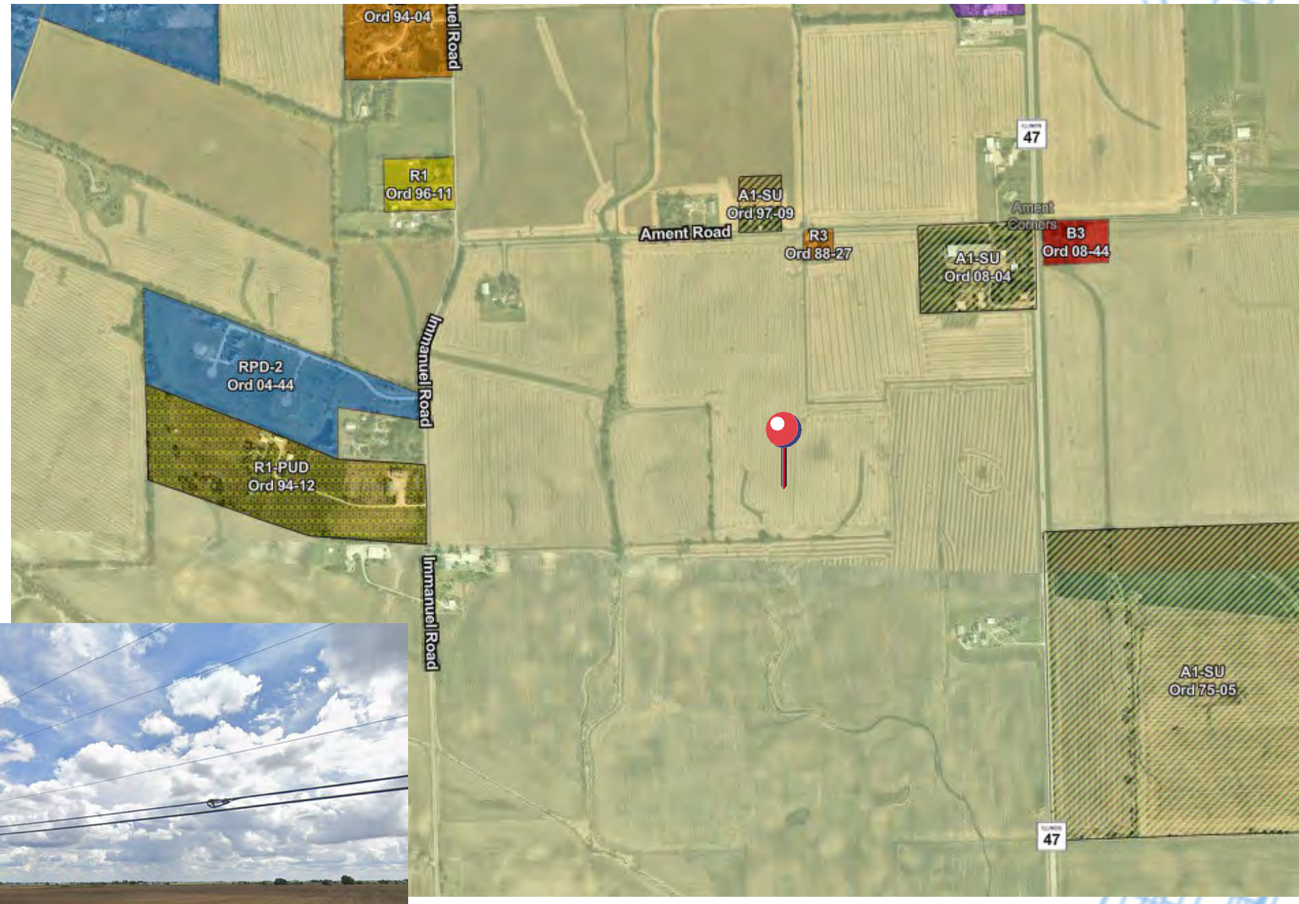
SCHAIN BANKS ENERGY APPROVALS

- Obtained siting approvals and special use permits for utility and community scale projects throughout Illinois (as well as Michigan and Indiana)



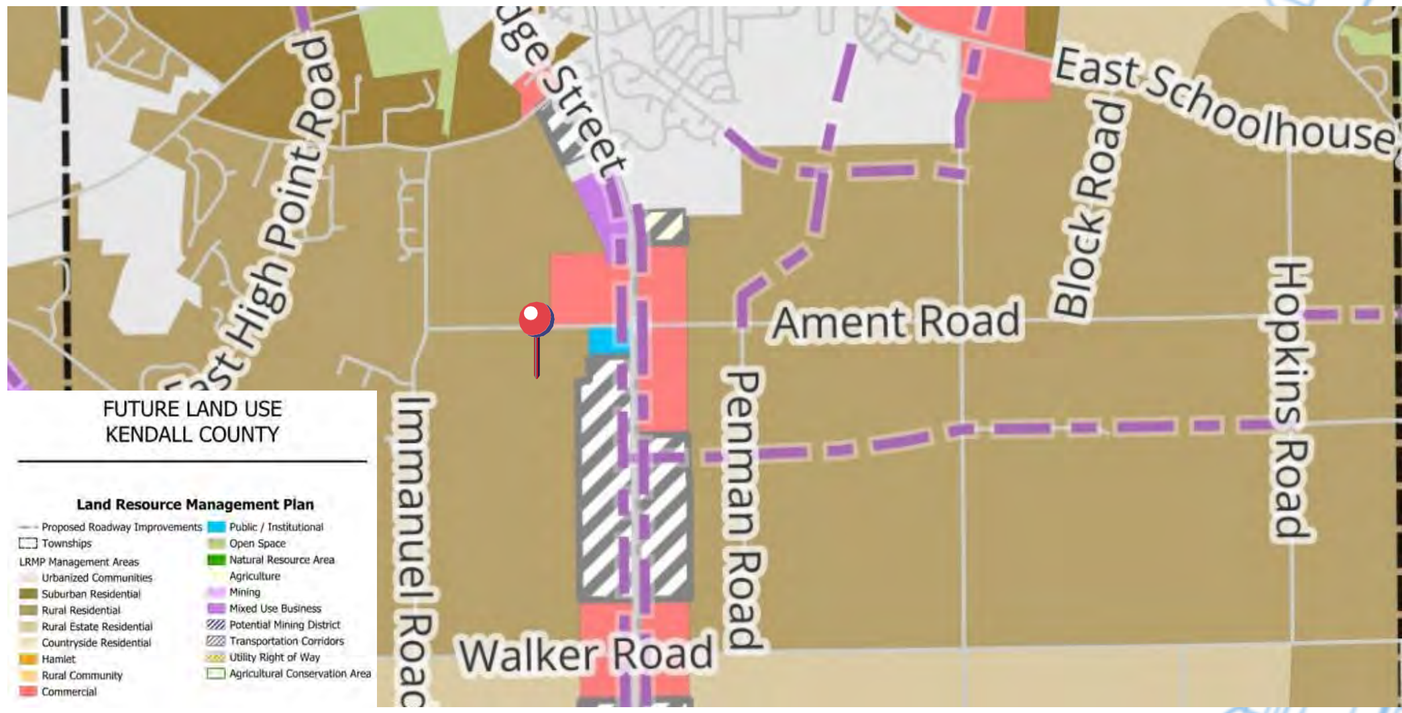
COUNTY'S ZONING MAP

- **Zoned A1**
  - Commercial Solar Energy Facilities permitted by special use
- **Surrounded by A1 zoned parcels**
- **North**
  - R3 (Rancho Hernandez)
  - A1- Special Use (Cemetery)
- **South**
  - A1
- **Northeast**
  - A1- Special Use (Cross Lutheran Church)
- **West**
  - PUDs



COUNTY'S FUTURE LAND USE PLAN

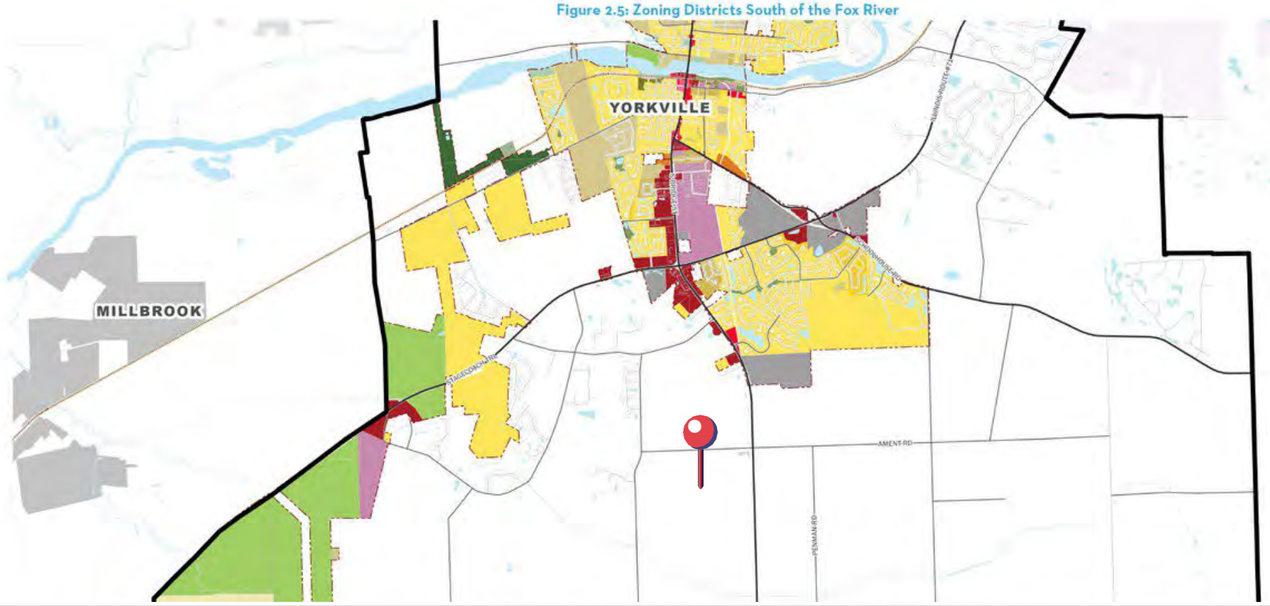
- Rural Residential
- Surrounded by Rural Residential
- Commercial to NE
- Transportation Corridor to E



YORKVILLE'S ZONING MAP

- **Located in "Planning Area"**
  - Yorkville did not require Annexation Agreement
- R-2 to NE
- PUD to NE
- "Due to 2008 recession, recently **planned residential subdivisions have yet to be fully built-out**." (2016 Yorkville Comp. Plan, 8)

Figure 2.5: Zoning Districts South of the Fox River



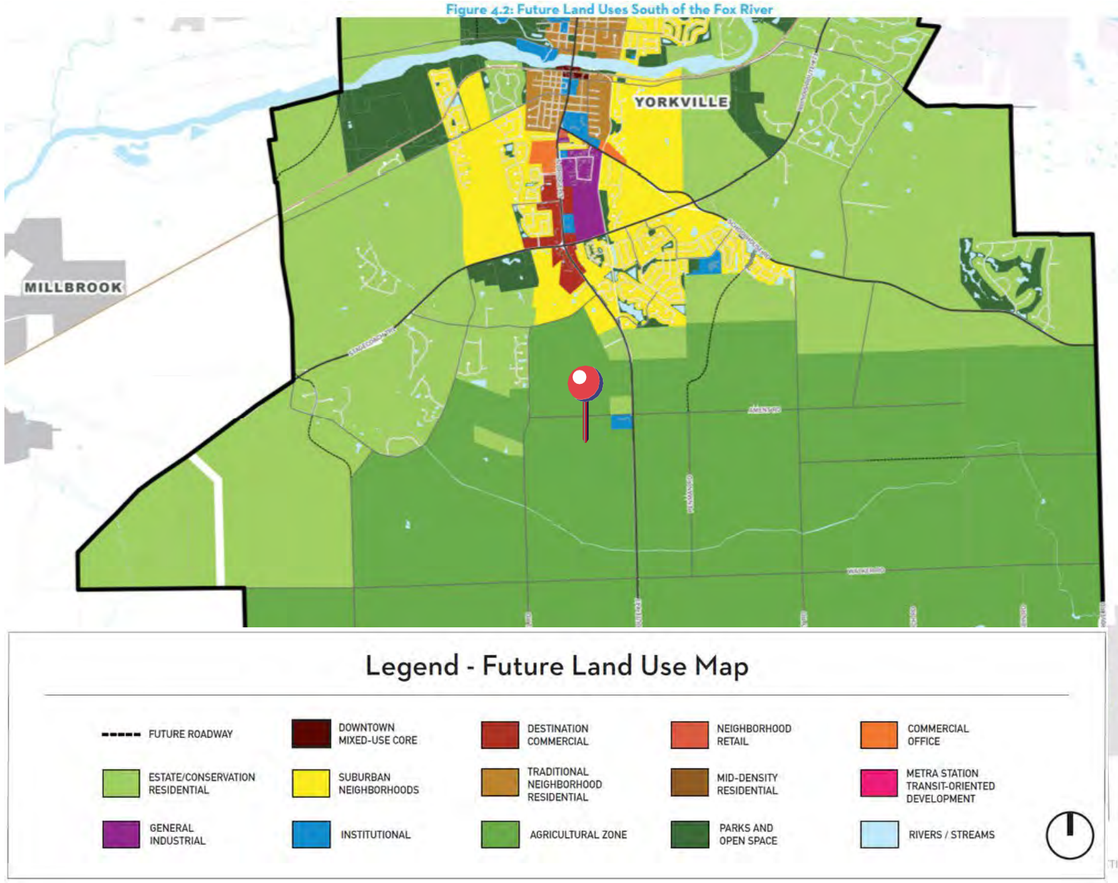
Legend - Zoning Districts

YORKVILLE BOUNDARY	E-1 - ESTATE RESIDENCE	R-3 - Multifamily ATTACHED RESIDENCE	B-1 - LOCAL BUSINESS	M-1 - LIMITED MANUFACTURING
PLANNING AREA	R-1 - SINGLE-FAMLY SUBURBAN RESIDENCE	R-4 - GENERAL MULTI-FAMILY RESIDENCE	B-2 - RETAIL COMMERCE BUSINESS	M-2 - GENERAL MANUFACTURING
FOREST PRESERVE	R-2 - SINGLE-FAMILY TRADITIONAL RESIDENCE	PUD - PLANNED UNIT DEVELOPMENT	B-3 - GENERAL BUSINESS	OS-1 - OPEN SPACE (PASSIVE)
A-1 - AGRICULTURAL	R-2D - TWO-FAMILY ATTACHED RESIDENCE	O - OFFICE	B-4 - SERVICE	OS-2 - OPEN SPACE (RECREATIONAL)

YORKVILLE'S FUTURE LAND USE PLAN

- Agricultural Zone
- Institutional to E (Church)
- No Commercial to NE
- No Transportation Corridor to E
- "The land use framework proposed in these past plans were based on the assumption of **continued, fast-paced residential and commercial growth, which did not materialize after the 2008 economic recession**." (2016 Yorkville Comp. Plan, 14)

Figure 4.2: Future Land Uses South of the Fox River



STATEWIDE SITING ACT

- Agricultural Impact Mitigation Agreement
- Setbacks
- 6-foot fence
- No component more than 20 feet in height
- Vegetative screening
- EcoCat consultation
- U.S. Fish and Wildlife consultation
- Illinois Department of Natural Resources recommendations (IDNR)
- Avoid/setback protected lands identified by IDNR and Illinois Nature Preserve Commission
- Illinois State Historic Preservation Office (SHPO) consultation
- Pollinator-Friendly Solar Site Act vegetative ground cover
- Other requirements not more restrictive than the Act

SPECIAL USE 1

- The establishment, maintenance, or operation of the special use will not be detrimental to or endanger the public health, safety, morals, comfort, or general welfare.

- **Finding – The Project will generate clean, renewable electricity while producing no air, noise, or water pollution, or ground contamination. The front portion of the parcel closest Ament Road will be retained for agricultural use as well as the surrounding land of the other parcel, which will create a natural screening during the growing season. The Petitioner submitted a vegetative management plan outlining the types of vegetation that will be planted, the timing of planting, and a maintenance plan for the vegetation.**

SPECIAL USE 2

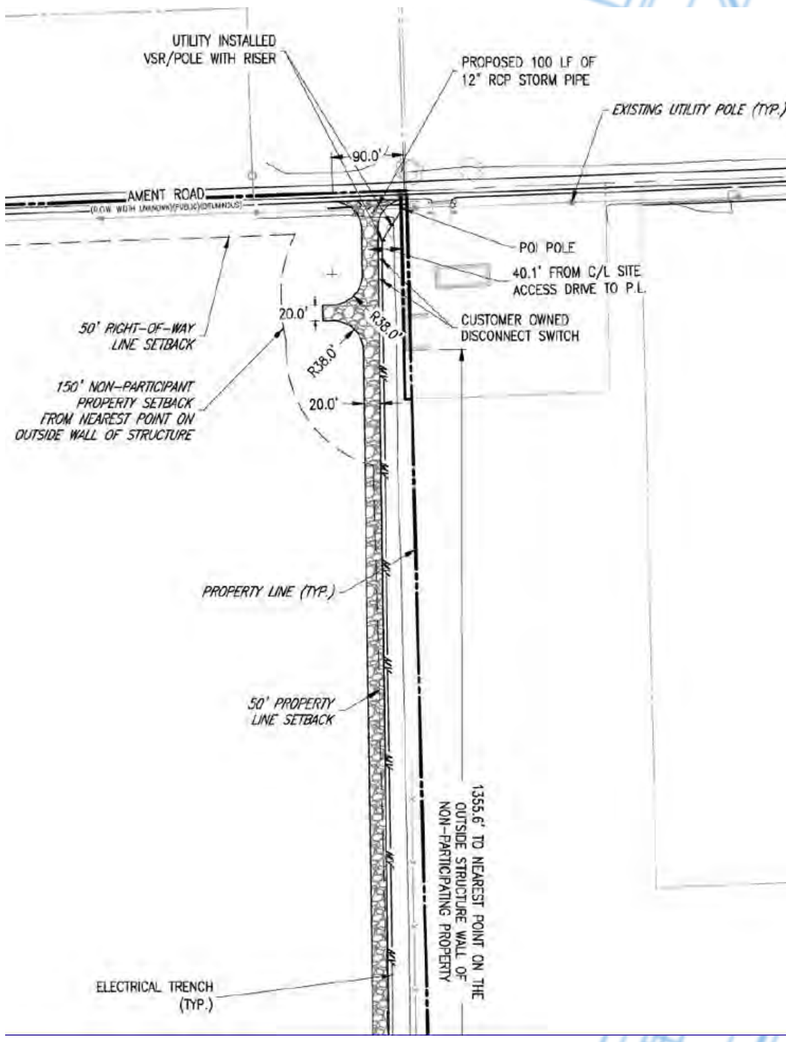
- The special use will not be substantially injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood. The zoning classification of property within the general area of the property in question shall be considered in determining consistency with this standard. The proposed use shall make adequate provisions for appropriate buffers, landscaping, fencing, lighting, building materials, open space and other improvements necessary to ensure that the proposed use does not adversely impact adjacent uses and is compatible with the surrounding area and/or the County as a whole.

- **Finding – The Proposal will not interfere with the use and enjoyment of nearby properties. The surrounding properties are zoned primarily A-1 and will not be prevented from continuing any existing use or from pursuing future uses. The proposal's operations would be quiet and minimal traffic will occur after installation is completed. The solar panels are setback from Ament Road and neighboring houses to avoid negative visual impacts.**

SPECIAL USE 3

- Adequate utilities, access roads and points of ingress and egress, drainage, and/or other necessary facilities have been or are being provided.

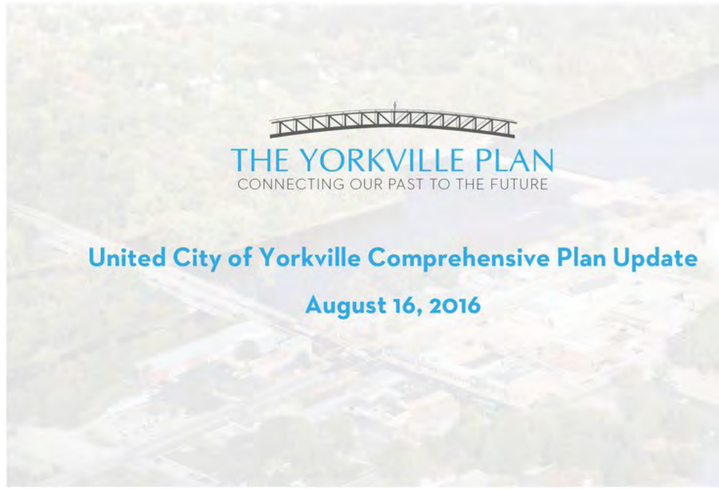
- **Finding – The Proposal will have adequate utility interconnections designed in collaboration with ComEd. The proposal does not require water, sewer, or any other public utility facilities to operate. The Petitioner will also build all roads and entrances at the facility and will enter into an agreement with Kendall Township regarding road use. After initial construction traffic, landscape maintenance and maintenance to the project components are anticipated to occur on an as-needed basis, consistent with the vegetative management plane. Existing traffic patterns will not be impacted in post-construction operations phase. A drain tile survey will be completed prior to construction and foundation design will work around or reroute any identified drain tiles to ensure proper drainage.**

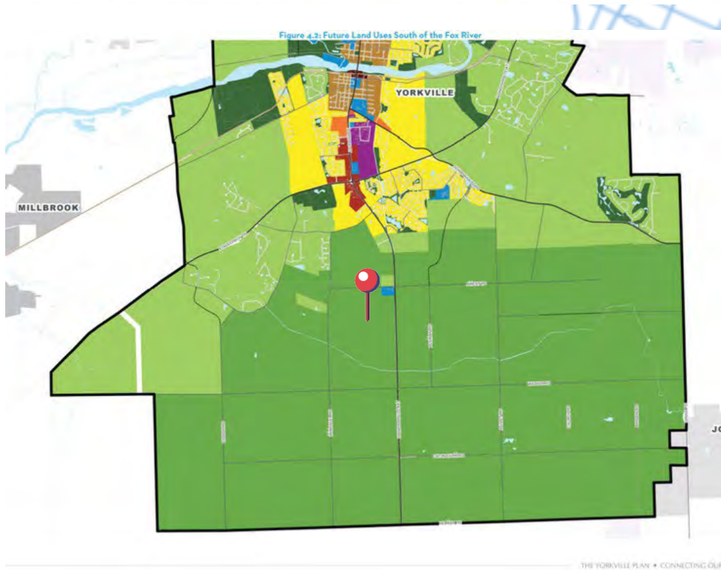


SPECIAL USE 4

- The special use shall in all other respects conform to the applicable regulations of the district in which it is located, except as such regulations may in each instance be modified by the County Board pursuant to the recommendation of the Zoning Board of Appeals.

- **Finding – If the requested variance is granted, the proposal meets all applicable regulations.**

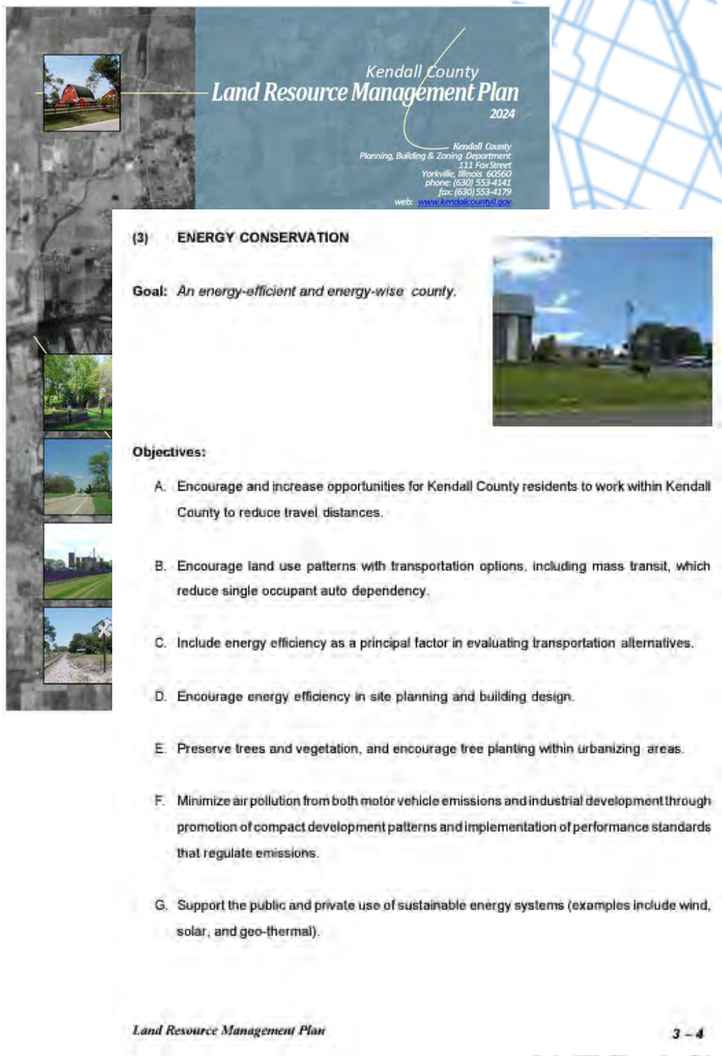




SPECIAL USE 5

- The special use is consistent with the purpose and objectives of the Land Resource Management Plan and other adopted County or municipal plans and policies.

- **Finding – The Proposal is also consistent with a goal and objective found on page 3 - 4 of the Land Resource Management Plan, " Support the public and private use of sustainable energy systems (examples include wind, solar, and geo-thermal)." ~~However,~~ The proposal is located on property classified as Rural Residential on the Future Land Use Map; however, the proposal is located on property classified as "Agricultural" on the City of Yorkville's Future Land Use Map. Yorkville's Economic Development Committee (EDC) and Planning and Zoning Commission (PZC) recommended to permit the solar farm and variance. The Kendall Township Planning Commission also recommend approval.**



Kendall County
Land Resource Management Plan
2024

Kendall County
Planning, Building & Zoning Department
111 Fox Street
Yorkville, Illinois 60560
phone: (630) 553-4141
fax: (630) 553-4179
web: www.kendallcountyil.gov

(3) ENERGY CONSERVATION

Goal: *An energy-efficient and energy-wise county.*

Objectives:

A. Encourage and increase opportunities for Kendall County residents to work within Kendall County to reduce travel distances.

B. Encourage land use patterns with transportation options, including mass transit, which reduce single occupant auto dependency.

C. Include energy efficiency as a principal factor in evaluating transportation alternatives.

D. Encourage energy efficiency in site planning and building design.

E. Preserve trees and vegetation, and encourage tree planting within urbanizing areas.

F. Minimize air pollution from both motor vehicle emissions and industrial development through promotion of compact development patterns and implementation of performance standards that regulate emissions.

G. Support the public and private use of sustainable energy systems (examples include wind, solar, and geo-thermal).

Land Resource Management Plan 3 – 4

VARIANCE 1

- That the particular physical surroundings, shape, or topographical condition of the specific property involved would result in a particular hardship or practical difficulty upon the owner if the strict letter of the regulations were carried out.

- **Finding – The subject property is located within one point five (1.5) miles of the Unified City of Yorkville. The Petitioner provided a letter from the City of Yorkville stating that Yorkville did not wish to annex the property or enter into a pre-annexation agreement.**

United City of Yorkville
651 Prairie Pointe Drive
Yorkville, Illinois 60560
Telephone: 630-553-4350
www.yorkville.il.us

August 27, 2024

Matthew H. Asselmeier, AICP, CFM (VIA E-MAIL: masselmeier@kendallcountyil.gov)
Kendall County
Planning, Building & Zoning
111 West Fox Street
Yorkville, Illinois 60560

RE: Ament Road Solar // PINS: 05-16-300-006 & 05-17-400-005

Dear Mr. Asselmeier,

Section 7:01(D)(17)(a) of the Kendall County Zoning Ordinance states as follows:

> 17. Commercial Solar Energy Facility and Test Solar Energy Systems subject to the following conditions (Amended 5/16/23): a. All commercial solar energy facilities and test solar energy systems located within one point five (1.5) miles of a municipality shall either annex to the municipality or obtain an annexation agreement with the municipality requiring the municipality's regulations to flow through the property.

Please let this letter serve as the City of Yorkville's ("City") notice to Kendall County that the City does not currently seek to annex the above-referenced property or to enter into a pre-annexation agreement with the landowner and developer of this property.

Sincerely,

Krysti Barksdale-Noble

Krysti J. Barksdale-Noble, AICP
Community Development Director

Cc: Kathleen F. Orr, City Attorney kfo@ottosenlaw.com
Bart Olson, City Administrator BOlson@yorkville.il.us
Tom Ryan tryan@newleafenergy.com
Nicholas Sandiford nstandiford@schainbanks.com

VARIANCE 2

- That the conditions upon which the requested variation is based would not be applicable, generally, to other property within the same zoning classification.

- **Finding - Other A-1 zoned properties within the one point five (1.5) miles of a municipality could request a similar variance, if the municipality refuses to annex or enter into a pre-annexation agreement.**

Memorandum

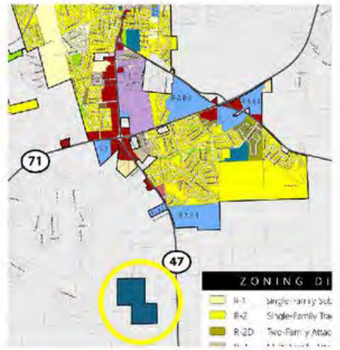
To: City Council
From: Krysti J. Barksdale-Noble, Community Development Director
CC: Bart Olson, City Administrator
Sara Mendez, Planner I
Date: August 14, 2024
Subject: **Ament Road Solar Farm – Pre-Annexation Agreement Inquiry**

Summary

New Leaf Energy has submitted a proposal to develop a solar farm on a site located on Ament Road, west of IL 47. The site in question is currently unincorporated, not contiguous to the City of Yorkville, but falls within the City's 1.5-mile planning jurisdiction. As a result, they are seeking guidance on whether the City of Yorkville is interested in pursuing a pre-annexation agreement.

Key Considerations

New Leaf Energy, the developer of the recently annexed and approved community solar project located north of the BNSF railroad and east of Beecher Road, is proposing to develop a 5-megawatt commercial solar energy facility on approximately 40-acres of land located south of Ament Road and west of IL 47. The property is within unincorporated Kendall County and approximately 3,500 feet from Yorkville's corporate boundary. While not contiguous to the city, the property does fall within Yorkville's 1.5-mile planning jurisdiction.



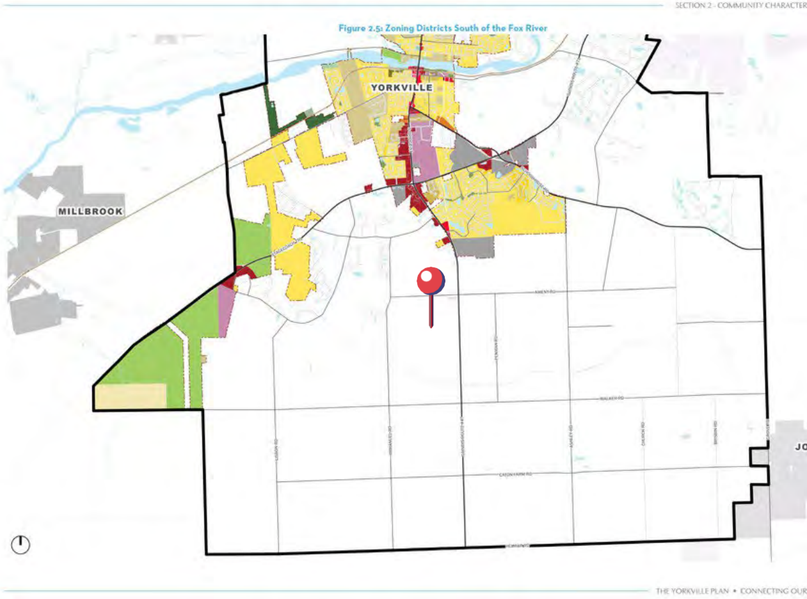
Below is a brief analysis of the approval process, considerations for and against pre-annexation and important proposal details.

1. **Approval Process:**
   - New Leaf Energy is pursuing special use approval through Kendall County.
   - They have the option to seek a pre-annexation agreement with Yorkville, which would require them to undergo the City's site review and building permitting processes.

VARIANCE 3

- That the alleged difficulty or hardship has not been created by any person presently having an interest in the property

- **Finding - The difficulty was created because the United City of Yorkville did not wish to enter into a pre-annexation agreement or annex the property**



VARIANCE 4

- That the granting of the variation will not materially be detrimental to the public welfareor substantially injurious to other property or improvements in the neighborhood in which the property is located.

- **Finding – Granting the variance would not be detrimental to the public or substantially injurious to other properties.**

VARIANCE 5

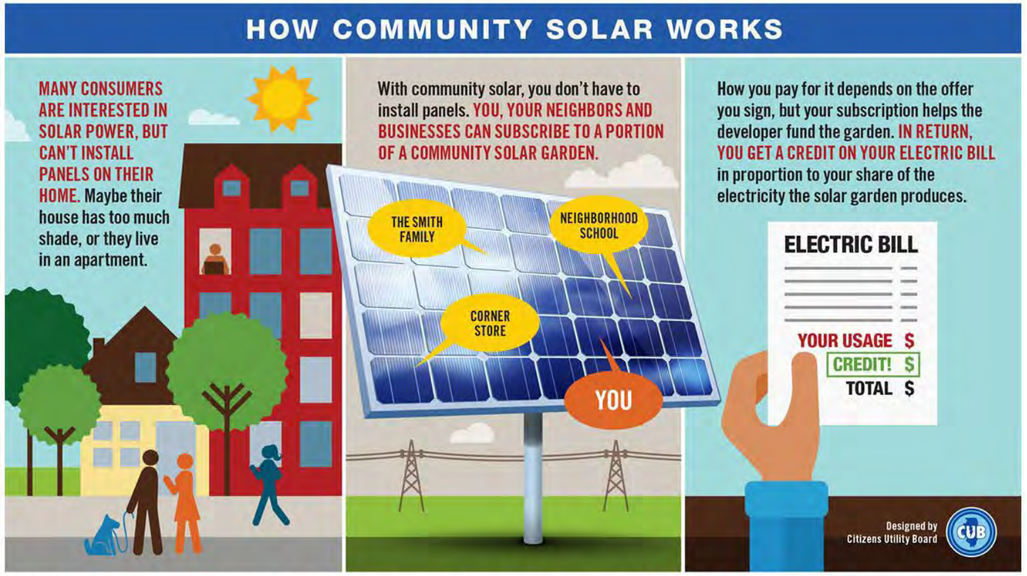
- That the proposed variation will not impair an adequate supply of light and air to adjacent property, or substantially increase the congestion in the public streets or increasethe danger of fire or endanger the public safety or substantially diminish or impair property values within the neighborhood.

- **Finding – The proposed variance would not impair light or air on adjacent property, cause congestion, increase the danger of fire, or negatively impact property values.**

Community Solar Primer

Community solar allows electricity consumers to realize the benefits of solar energy without having to place panels on their home or business.

Through community solar, consumers subscribe to a portion of the electricity produced by a solar project and in return receive credits on their electricity bill.



Note: Community solar projects have a maximum size of 5 Megawatts (MW) of electricity output—roughly 25,000 standard (2 x 1 meter) panels. Also, the utility is required to buy the energy output that hasn't been subscribed out in a solar garden.

Citizens Utility Board

Community Solar Primer: Differences with Utility-Scale

Community Solar: 25-35 Acres

- Interconnected directly to distribution grid; supplies nearby surrounding communities
- Provides discounted electricity to retail consumers
- 2-3 year development timeline

Utility-Scale Solar: >500 Acres

- Interconnected to high-voltage transmission; typically exports to demand elsewhere
- Power is sold on a wholesale basis to utilities and large commercial and industrial offtakers
- 5-7 year development timeline

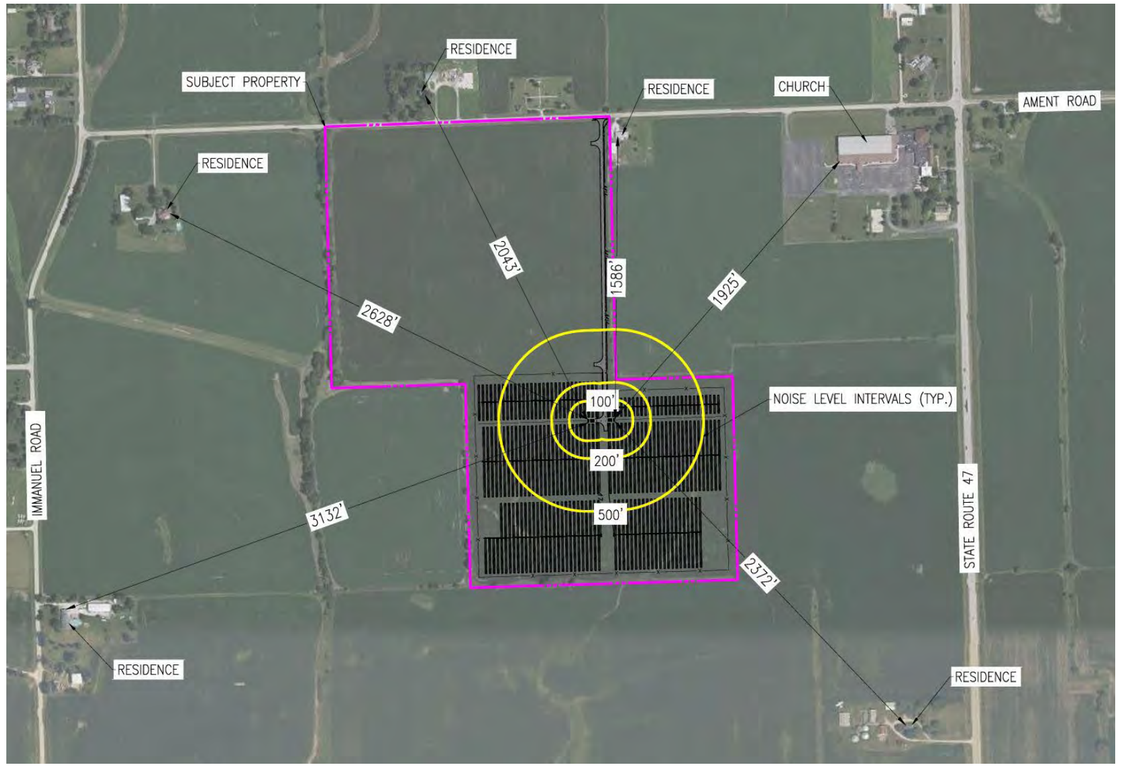
Noise Study Results

Noise Levels at 100’ Intervals:

100’ = 57 Decibels
(Similar to a air conditioner unit)

200’ = 51 Decibels

500’ = 43 Decibels
(Below Background Noise)

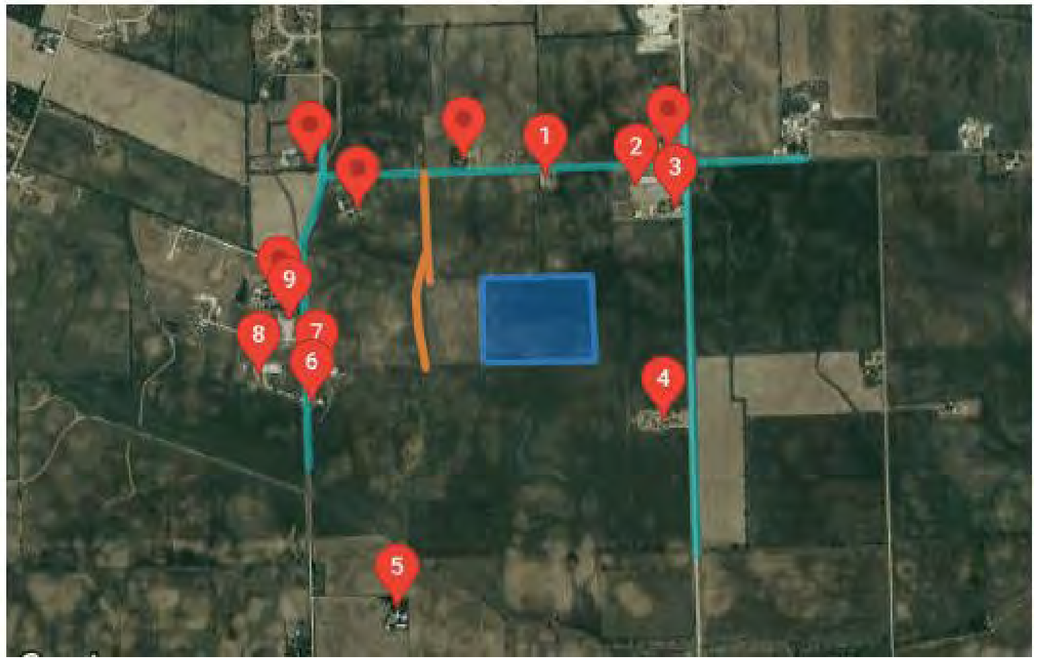


Prepared by New Leaf Energy, Inc

Glare Study

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Ament Road	0	0.0	0	0.0
Illinois Route 47	0	0.0	0	0.0
Immanuel Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

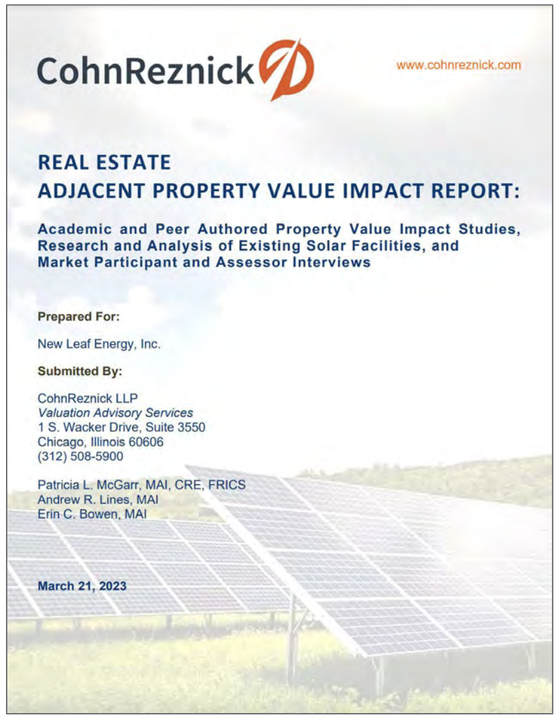
No glare was found at any of the receptors



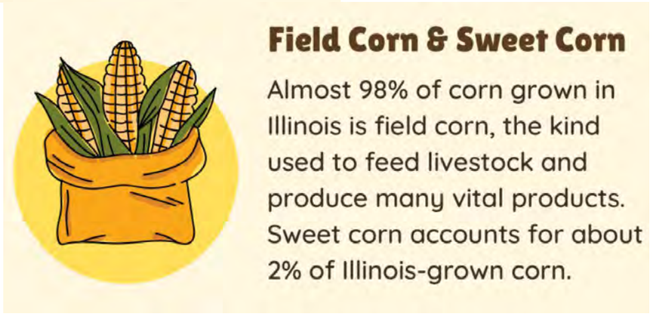
Prepared by Forge Solar, LLC on July 9, 2024

CohnReznick Property Value Impact Study Results for Solar

- CohnReznick performed a Property Value Impact Study for New Leaf Energy to assess the impact of solar projects on nearby real estate.
- Study included interviews with Market Participants, County and Township Assessors in Illinois as to how the market evaluates:
  - Farmland with views to solar farms - No impact
  - Single-family homes with views to solar farms - No impact
- **Conclusion: no measurable impact to adjacent properties in:**
  - **Range of sales price**
  - **Conditions of sale**
  - **Overall marketability**



Fun Facts



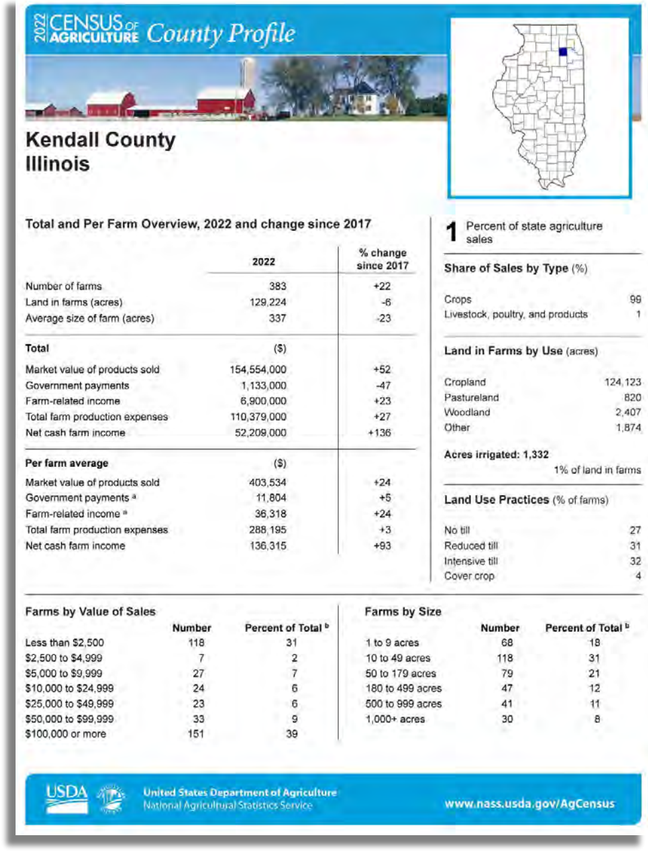
Field corn, or dent corn, is the most common type of corn. 98% of the corn grown in Illinois is field corn. Field corn has a hard outer-shell and is full of starch. The kernels on this type of corn are mature and dry before harvest occurs in the fall. Field corn is used in everything from livestock feed to ethanol production and can even be found in cereal, wallpaper, skateboards, cosmetics, and plastic!

Soil Conditions

Cropland
124,123 acres

Community Solar Site
40 acres

Percent of Farmland
.00032%



2022 CENSUS OF AGRICULTURE *County Profile*

Kendall County
Illinois

Total and Per Farm Overview, 2022 and change since 2017

	2022	% change since 2017
Number of farms	383	+22
Land in farms (acres)	129,224	-6
Average size of farm (acres)	337	-23
Total	($)	
Market value of products sold	154,554,000	+52
Government payments	1,133,000	-47
Farm-related income	6,900,000	+23
Total farm production expenses	110,379,000	+27
Net cash farm income	52,209,000	+136
Per farm average	($)	
Market value of products sold	403,534	+24
Government payments [a]	11,804	+5
Farm-related income [a]	36,318	+24
Total farm production expenses	288,195	+3
Net cash farm income	136,315	+93

1 Percent of state agriculture sales

Share of Sales by Type (%)

Crops	99
Livestock, poultry, and products	1

Land in Farms by Use (acres)

Cropland	124,123
Pastureland	820
Woodland	2,407
Other	1,874

Acres irrigated: 1,332
1% of land in farms

Land Use Practices (% of farms)

No till	27
Reduced till	31
Intensive till	32
Cover crop	4

Farms by Value of Sales

	Number	Percent of Total [b]
Less than $2,500	118	31
$2,500 to $4,999	7	2
$5,000 to $9,999	27	7
$10,000 to $24,999	24	6
$25,000 to $49,999	23	6
$50,000 to $99,999	33	9
$100,000 or more	151	39

Farms by Size

	Number	Percent of Total [b]
1 to 9 acres	68	18
10 to 49 acres	118	31
50 to 179 acres	79	21
180 to 499 acres	47	12
500 to 999 acres	41	11
1,000+ acres	30	8

USDA United States Department of Agriculture
National Agricultural Statistics Service
www.nass.usda.gov/AgCensus

US Army Corps of Engineers

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, CHICAGO DISTRICT
231 SOUTH LA SALLE STREET, SUITE 1500
CHICAGO IL 60604-1437

January 13, 2025

Regulatory Branch (LRC-2024-00481)

SUBJECT: No Permit Required (NPR) Letter for the Ament Road Solar Project in Yorkville, Kendall County, Illinois (Latitude 41.593804°N, Longitude -88.444237°W)

Janel Dhuse
3743 North Kenmore Avenue, #3
Chicago, Illinois 60613

Dear Ms. Dhuse:

The U.S. Army Corps of Engineers, Chicago District, has completed its review of your August 13, 2024 request that the U.S. Army Corps of Engineers issue a No Permit Required (NPR) letter with a Jurisdictional Determination (JD) for the above-referenced activity. The subject project has been assigned number LRC-2024-00481. Please reference this number in all future correspondence concerning this project.

Following a review of the Water Resources Delineation Report dated June 18, 2024, prepared by EnCAP, Inc., and a verification of the information submitted in the report, this office has determined that the subject property contains "waters of the United States" under the jurisdiction of this office and therefore, subject to regulation under Section 404 of the Clean Water Act, specifically: Wetland 1/Intermittent Creek. In addition, Farmed Wetand 1W & Farmed Wetland 1E have been determined to be non-jurisdictional. An Approved Jurisdictional Determination (AJD) is enclosed.

Following a review of the information you furnished to this office and assuming your project is conducted only as set forth in the plans titled “Site Use Permit Set, Ament Road – Kendall, IL” prepared by New Leaf Energy, this office has determined that a Department of the Army (DA) permit is not required to complete the proposed work as your request for a NPR letter states that you are not proposing to discharge dredged or fill material into any aquatic resource situated on the Subject Property. As a result, this office is issuing a NPR letter for the above-referenced activity. Please be aware that any unpermitted discharge into an area within the jurisdiction of this office may result in civil or criminal enforcement under the Clean Water Act, 33 U.S.C. 1319.

This letter is considered an approved jurisdictional determination for your subject site. If you object to this determination, you may appeal, according to 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and a Request for Appeal (RFA) form. If you request to appeal the above determination, you must submit a completed RFA form to the Great Lakes/Ohio River Division Office at the following address:

Stormwater Management Permit Application

STORMWATER MANAGEMENT PERMIT

PERMIT APPLICATION #_____

Conformance with all Federal, State, and County Regulations is required. Applicants are encouraged to read the Stormwater Management Division of the Kendall County Code and consider a pre-application meeting with Department staff prior to submittal. See attached highlights of regulations.

Property: Name AMENT ROAD SOLAR 1, LLC

Owner Address 55 TECHNOLOGY DRIVE, SUITE 102 / LOWELL, MA 01851

Phone 800-818-5249

Agent: Name ATWELL, LLC

Address 1250 E. DIEHL ROAD, SUITE 300 / NAPERVILLE, IL 60563

Phone 630-281-8424

Site: Address or Location AMENT ROAD, KENDALL COUNTY, ILLINOIS

Tax Parcel # 05-16-300-006 & 05-17-400-005

Zoning/Land Use/Acres A-1 / AGRICULTURAL / 95.07 TOTAL

Proposed Development:
A 4.99 MW (AC) ground mounted solar power generating facility

Attachments: Plat_____ Construction Plans_____
Soils_____ Landscaping_____
Grading_____ Phasing_____
Other_____

Fees
$_____ Processing Fee ($50.00)
$_____ Engineering Review Deposit ($2,500.00 *or* 2% of estimated cost of the proposed improvements, whichever is greater. A $3,500.00 Construction Inspection Services Fee and General Consultation Fee Might Be Required as the Project Progresses)

TOTAL $ _____ One check is acceptable made out to the Kendall County Treasurer

Staff will contact Applicant regarding schedule and reviews.

I hereby certify that the information on this application, on the documents attached, and on other submittals made during the review process is true and correct; that I am authorized to file this application; and that I agree to conform to all requirements set forth by the County and all conditions of the Kendall County Code related to stormwater management. I understand that by signing this form, that the property in question may be visited by County Staff and County Engineers throughout the permit and construction process. I also understand that I am responsible for all costs associated with this application. The applicant attests that they are free of debt or current on all debts owed to Kendall County as of the application date.

Owner's Signature (Including Middle Initial)_____ Date_____

Agent's Signature (Including Middle Initial) Nichole Beller Date 1/15/2025

Kendall County Planning, Building, & Zoning Department
111 West Fox Street, Room 203
Yorkville, Illinois 60560
Phone: (630) 553-4139, Fax (630) 553-4179
www.kendallcountyil.gov

Materials in a Solar Panel

COMPONENT	MATERIAL	TOTAL SHARE	REMARK
FRAME	Aluminum	10 % – 20 %	not hazardous
	Silicone	<1 %	not hazardous, see section 8
LAMINATE	Glass	60 % – 75 %	not hazardous
	Plastics (EVA, PET, PE, PPE, PC)	10 % – 15 %	no hazards known
	Silicon	2 % – 4 %	not hazardous
	Metals (Aluminum, Copper, Tin)	1 % – 3 %	not hazardous
	Lead	<0,1 %	hazardous
	Silver	<0,05 %	not hazardous

As of 2023, solar module manufacturers have removed lead solder from their panels altogether

Decommissioning: Recycling

Solar panels recycling is not a massive market at present, but it is expected to grow as solar projects begin reaching end of life in the next two decades in Illinois.

- Currently there is one solar PV recycling facility in Illinois, Interco, which is located in Madison, IL (metro St. Louis).
  - Interco operates a 400,000 square-foot facility and processes over 250,000 salvage solar panels each year.
- It is expected that the State of Illinois will require panels to be recycled in the near future

Establishing Meadows

- **Year 1:**
  - Cover Crop / Nurse Crop planting for site stabilization
    - By the end of the first growing season, planted areas will have 90% vegetative cover
  - First mowing for weed management and to encourage native growth
- **Year 2:**
  - 3x mowings to disrupt annual weeds from going to seed while encouraging native wildflowers to put energy into rooting deeply
    - By the end of year two, 50% of the vegetation will be native vs. non-invasive
- **Year 3:**
  - 1 complete site mowing
  - Integrated Vegetation Management (IVM) - Spot mowing, wicking, hand weeding and other methods are used to control invasive species and weeds.
  - Plug Plantings - Mature versions of the plants specified in the seed mix are installed to accelerate the establishment of the pollinator plants.
    - End of year three, 60% native with no non-native/invasive species being among the three most dominant species found on the site.
- **Year 4:**
  - IVM and Plug Planting
  - 2 complete site visits
    - Project monitoring and annual reporting
- **Year 5:**
  - By year five, a self-sustaining field of native pollinators will have been established
    - Project monitoring and reporting will continue

Native Pollinators

NATIVE PLANT SEED MIX: 28.8 LBS/AC

GENUS/SPECIES	COMMON NAME	SEEDS/OZ	OZ/AC
ALLIUM CERNUUM	NODDING ONION	7,600	6.0
ASTER OOLENTANGIENSE	SKY BLUE ASTER	80,000	4.0
ASTRAGALUS CANADENSIS	CANADA MILK VETCH	17,000	2.0
ECHINACEA PALLIDA	PALE PURPLE CONEFLOWER	5,200	32.0
RUDBECKIA HIRTA	BLACK-EYED SUSAN	92,000	16.0
TRADESCANTIA OHIENSIS	OHIO SPIDERWORT	8,000	16.0
ZIZIA AUREA	GOLDEN ALEXANDERS	11,000	16.0
BOUTELOUA CURTIPENDULA	SIDE-OATS GRAMA	6,000	320.0
BROMUS KALMII	PRAIRIE BROME		4.0
CAREX BREVIOR	PLAINS OVAL SEDGE		8.0
CAREX VULPINOIDEA	BROWN FOX SEDGE	100,000	32.0
SPOROBOLUS HETEROLEPIS	PRAIRIE DROPSEED	16,000	6.0
	12 SPECIES		462 (28.8 LBS/AC)