

Winsome Subdivision
17480 Meridian Road North
Colorado Springs, Colorado 80924

Preliminary Drainage Report

JANUARY 11, 2019

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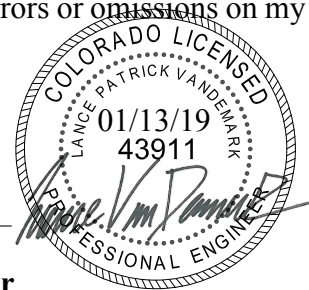
VERTEX Project: 49388
PCD File No. SP-18-006

Benjamin Jenkins, P.E.
Project Engineer

Lance VanDemark, P.E.
Project Manager

Engineer's Certification

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.



Lance VanDemark, P.E.
Registered Professional Engineer
State of Colorado No. 43911

Owner's Certification

I, the owner/developer have read and will comply with all of the requirements specified in this drainage report and plan.

PT McCune, LLC
Name of Developer

Authorized Signature

El Paso County

Filed in accordance with the requirements of the Colorado Springs Drainage Criteria Manual Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

Gilbert LaForce
County Engineer

Date

Revise to
 Jennifer Irvine, P.E.
 County Engineer/ECM Administrator

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1.0 GENERAL LOCATION AND DESCRIPTION

The following report provides detailed drainage information for existing and proposed conditions for the Winsome Subdivision project. The intent of this report is to show the routing of minor and major storms through the proposed site in accordance with El Paso County Standards. For this site, a minor flow is defined as the 5-year frequency storm and a major flow as the 100-year frequency storm. The information given in this report is intended to provide an adequately detailed analysis of on-site drainage areas and receiving facilities. This development will consist of large-lot single family residential lots, access roads, and the required infrastructure to serve them.

GENERAL LOCATION

The site is located at 17480 Meridian Road North or, more generally, at the northwest corner of Hodgen Road and Meridian Road North in unincorporated El Paso County, latitude 39°04'38" N and longitude 104°36'47" W. The subject property is undeveloped and situated in Sections 13 and 24, Township 11 South, Range 65 West of the 6th P.M., County of El Paso, State of Colorado.

The site is bounded to the south by Hodgen Road, to the east by Meridian Road North, and to the north and west by several parcels zoned primarily as Agricultural and Residential use with some Forest Land. On the east side of Median Road is Forest Green Subdivision, a low-density single-family development. On the south side of Hodgen Road is Bison Meadows Subdivision which is also a low-density single family residential subdivision. The remainder of properties surrounding the site have not yet been formally platted. The site has not been included in any previous drainage study. West Kiowa Creek flows approximately through the center of the property from the southwest corner to the northeast corner, upstream to the west and southwest of the property lie 3 Kiowa Creek Watershed Reservoirs notated as 1-N-10, 1-P-10, and 1-P-20. There are no irrigation ditches on the property.

DESCRIPTION OF PROPERTY

The existing site contains 767 acres of agricultural grazing land and dry farm land. Ground cover consists mainly of native grasses, shrubs, and several stands of evergreen trees along its northern and southern boundary. Existing wetlands are present along West Kiowa Creek and its tributaries, wetland boundaries are located roughly 50 feet to either side of the thalweg of West Kiowa Creek and the drainageway way to the south of the creek on the property. There are no existing irrigation canals or ditches on the project site nor are there any major geologic features. The property generally slopes in a northeasterly direction with slopes ranging between 1-16%. Soils consist of Alamosa loam, Brussett loam, Cruckton sandy loam, Elbeth sandy loam, Holderness loam, Kettle gravelly loamy sands, Peyton sandy loam, Peyton-Pring complex, Pring course sandy loam, Tomah-Crowford loamy sands and Tomah-Crowfoot complex. Most of the site has soils classified in Hydrologic Soil Group B; however, the property also contains a small mixture of soils from Hydrologic Soils Groups C and D located in the areas in and adjacent to West Kiowa Creek and its tributaries. A soils map prepared by Natural Resources Conservation Service is included in the Appendix.

The development of this property will consist of 143 2.5 to 10-acre single family residential lots and the requisite public roads and stormwater infrastructure to serve them. The project will have a phased development plan. Anticipated construction activities include earthwork and paving associated with the public road development, as well as the installation of culverts and stormwater detention ponds to convey and treat stormwater on the site. As previously discussed, West Kiowa Creek bisects the property, flowing from southwest to northeast. In addition, a major tributary of West Kiowa Creek flows north from a point halfway along the southern property boundary and intersects West Kiowa Creek in the middle of the property. The primary access for the site will be from 3 points along Hodgen Road and 1 entry point along Meridian Road.

2.0 DRAINAGE BASINS AND SUB-BASINS

MAJOR BASIN DESCRIPTION

The site resides within the West Kiowa Creek Drainage Basin (KIKI0200) which is located near the northern boundary of El Paso County, approximately 14.5 miles east of downtown Monument, CO. This watershed begins approximately 5 miles southwest of the Winsome property and continues another 10 miles to the northeast where it outfalls into Kiowa Creek which eventually discharges into the South Platte River near Fort Morgan, CO.

DRAINAGE STUDIES, OUTFALL SYSTEM PLANS, & SITE CONSTRAINTS

There are no major drainage studies (DBPS or MDDP) for this area on record and no base flood elevations for this reach of West Kiowa Creek that have been established. In conjunction with the development of this site, a floodplain study has been performed on the section of West Kiowa Creek located within the property. A Conditional Letter of Map Revision (CLOMR) has been submitted to FEMA to establish the floodplain boundary on-site. A plan showing the new proposed 100-year floodplain line is included in the appendix along with supporting documentation. The site is shown on FEMA flood map 08041C0350F which indicates that the site is in Zone X – an area outside of the 0.2% annual chance of flood (see the accompanying exhibits in the Appendix). The areas immediately adjacent to West Kiowa Creek are designated as Zone A, which is a 100-year Flood Hazard Area in which no base flood elevations have been determined. There are no known irrigation facilities located on the property at the current time.

EXISTING SUB-BASIN DESCRIPTION

Historically, the runoff from the property flows into West Kiowa Creek, which bisects the site flowing from the southwest corner of the property to the northeast corner. There are 10 on-site sub-basins and 6 off-site sub-basin that contribute flows to West Kiowa Creek. The 10 on-site sub-basins correspond to the largest defined natural drainage channels that occur on site, while the 6 off-site basins are defined by the entire West Kiowa Creek watershed that is upstream from the subject property.

Update to the latest
FIRM Map with an
effective date of
12/7/2018

As previously discussed, the site is currently undeveloped, containing mainly native grasses and shrubs, with limited forested areas along the northern and southern boundary of the site. The existing topography of the site slopes generally in a northerly direction with grades varying from 1-16%. There are no existing irrigation canals or ditches on the project site nor are there any major geologic features. The existing site can be described as 12 sub-basins as follows:

Sub-Basin A is the 915.4-acre watershed of the western tributary to West Kiowa Creek. This sub-basin contains the West Kiowa Creek 1-N-10 Reservoir which is located about a quarter-mile upstream of the property to the west. The sub-basin generates peak runoff of 83.48cfs in the 5-year event and peak runoff of 569.4cfs in the 100-year event. Stormwater generated within the basin flows east from Southwood Drive to the subject property and discharges into West Kiowa Creek immediately to the east of the western property boundary.

Consisting of the entire West Kiowa Creek watershed that is south of Hodgen Road, Sub-Basin Ba encompasses 3836.7 acres and generates peak runoff of 199.93cfs in the 5-year event and peak runoff of 1456.9cfs in the 100-year event. This sub-basin contains 2 Kiowa Creek Watershed Reservoirs noted as 1-P-10 and 1-P-20 located upstream of the property to the southwest. The largest of these reservoirs is evaluated later in the report for risk hazard. Sub-Basin Ba begins approximately 5 miles to the southwest of the Winsome property near Black Forest, CO. Stormwater generated within the basin flows from southwest to northeast passing under a bridge on Hogden Roan into sub-basin Bb.

Stormwater generated within the 100.6-acre sub-basin Bb has a peak runoff of 31.83cfs in the 5-year event and peak runoff of 122.7cfs in the 100-year event. Sub-Basin Bb is located at the southwest corner of the property and consists of the land immediately tributary to West Kiowa Creek on the north side of Hodgen Road. Flows from this sub-basin travel to the northeast discharging into the Creek.

Sub-Basin Ca consists of an off-site area located near the southwest corner of the property. This sub-basin has an area of 162.7-acres and generates peak runoff of 12.89cfs in the 5-year event and peak runoff of 113.2cfs in the 100-year event. This sub-basin discharges into a 30" CMP culvert under Hodgen Road flowing into sub-basin Cb.

Sub-Basin Cb located in the southwest corner of the property. This sub-basin has an area of 70-acres and generates peak runoff of 20.86cfs in the 5-year event and peak runoff of 85.5cfs in the 100-year event. This sub-basin consists of the land tributary to a minor drainage channel that discharges into sub-basin H.

Sub-Basin Da is the 161.3-acre watershed of the southern tributary to West Kiowa Creek. This sub-basin contains offsite flows that overtop Hodgen Road along this drainageway. The sub-basin generates peak runoff of 12.81cfs in the 5-year event and peak runoff of 112.6cfs in the 100-year event. Stormwater generated within the basin flows north from Pole Pine Point to the subject property and discharges into a 72" CMP culvert under Hodgen Road into sub-basin Dc.

Clarify. The first and last sentence seems to contradict. Is the existing 72" CMP under capacity during 100yr which results in additional overtopping? How could a 72" CMP not have the capacity for 113 cfs?

Sub-Basin Db is the 49.9-acre watershed of the southern tributary to West Kiowa Creek. The sub-basin generates peak runoff of 3.61cfs in the 5-year event and peak runoff of 30.8cfs in the 100-year event. Stormwater generated within the basin flows north from Pole Pine Point to the subject property and discharges into a 30" CMP culvert under Hodgen Road into sub-basin Dc.

Sub-Basin Dc is the 209.5-acre watershed of the southern tributary to West Kiowa Creek. This sub-basin contains a significant fraction of the southern half of the Winsome property. The sub-basin generates peak runoff of 51.66cfs in the 5-year event and peak runoff of 225.2cfs in the 100-year event. Stormwater generated within the basin flows north discharges into West Kiowa Creek immediately near the center of the project site.

Sub-Basin Ea consists of an off-site area located near the southeast corner of the property. This sub-basin has an area of 37.9-acres and generates peak runoff of 3.39cfs in the 5-year event and

peak runoff of 30.5cfs in the 100-year event. This sub-basin discharges into a 30" RCP culvert under Hodgen Road flowing into sub-basin Eb.

Sub-Basin Eb located in the southeast corner of the property and consists of an on-site watershed that discharges into West Kiowa Creek at the eastern property line. This sub-basin has an area of 114.8-acres and generates peak runoff of 27.72cfs in the 5-year event and peak runoff of 124.6cfs in the 100-year event. This sub-basin consists of the land tributary to a minor drainage channel that is north of Hodgen Road on the eastern side of the site.

Sub-Basin F located in the southeast corner of the property and consists of an on-site watershed that discharges into West Kiowa Creek to the east of the property. This sub-basin has an area of 44.5-acres and generates peak runoff of 13.62cfs in the 5-year event and peak runoff of 54.8cfs in the 100-year event. This sub-basin consists of the land tributary to a minor drainage channel that is north of Hodgen Road on the eastern side of the site.

Sub-Basin G located on the western side of the property and consists of an on-site watershed of a minor natural drainage channel that flows from west to east and discharges into West Kiowa Creek near the west of the property. This sub-basin has an area of 107.6 acres and generates peak runoff of 58.82cfs in the 5-year event and peak runoff of 181.6cfs in the 100-year event.

Sub-Basin H located in the northern side corner of the property and consists of an on-site watershed that discharges into West Kiowa Creek on the north side of the property. This sub-basin has an area of 121.8 acres and generates peak runoff of 52.59cfs in the 5-year event and peak runoff of 183cfs in the 100-year event. This sub-basin consists of the land tributary to a minor drainage channel that is north of West Kiowa Creek on the western side of the site.

Sub-Basin I located in the northeast corner of the property and consists of an on-site watershed that discharges into West Kiowa Creek to the east of the property. This sub-basin has an area of 37.5-acres and generates peak runoff of 29.73cfs in the 5-year event and peak runoff of 79cfs in

the 100-year event. This sub-basin consists of the land tributary to a minor drainage channel that is north of West Kiowa Creek on the eastern side of the site.

Sub-Basin J located in the northeast corner of the property and consists of an on-site watershed that discharges to the north of the property in existing natural drainage channels. This sub-basin has an area of 10.1-acres and generates peak runoff of 3.85cfs in the 5-year event and peak runoff of 14.9cfs in the 100-year event. This sub-basin consists of the land tributary to a minor drainage channel that is north of Hodgen Road on the eastern side of the site.

Sub-Basin K located in the northeast corner of the property and consists of an on-site watershed that discharges to the north of the property in existing natural drainage channels. This sub-basin has an area of 17.8-acres and generates peak runoff of 10.81cfs in the 5-year event and peak runoff of 31.5cfs in the 100-year event. This sub-basin consists of the land tributary to a minor drainage channel that is north of Hodgen Road on the eastern side of the site.

Flow rate numbers were generated using NRCS Curve Number Methodology with AutoCAD Storm and Sanitary 2018 modeling software. Colorado Springs Stormwater Manual criteria was used for identifying curve numbers of the type B, C, and D NRCS Hydrologic Soil Groups as they applied to the various sub-basins. A Spreadsheet summarizing the results of calculations for the existing conditions can be found in the Appendix.

PROPOSED SUB-BASIN DESCRIPTION

In the proposed condition, stormwater runoff will generally flow from southwest to northeast as it does in the existing condition. The main difference between the existing and proposed conditions is the flow paths of West Kiowa Creek and the various tributary drainageways will intersect the proposed public roads that access the residential lots. All existing drainage patterns will be maintained throughout the site to the extent possible. To calculate the design flows for each of the proposed culverts that will convey runoff across the proposed roads, the existing basins were

subdivided to create design points at each of the proposed crossing locations. As a result, there are 35 on-site sub-basins and 8 off-site sub-basins in the proposed condition.

In accordance with the above-mentioned drainage patterns, the proposed project will be divided into 43 sub-basins that are described as follows:

Sub-Basin A1 is an off-site sub-basin to the west of the property that consists mostly of agricultural land and has an area of 865.9 acres. Sub-Basin A1 also contains West Kiowa Creek 10-N-1 Reservoir. The curve number for Sub-Basin A1 is 60.36. The basin will generate runoff of 57.80cfs and 454.61cfs in the minor and major storms, respectively. Flows from this sub-basin will be conveyed by a natural drainage channel through Sub-Basin A3 to West Kiowa Creek, which will convey flows off the site to the northeast.

Sub-Basin A2 is a small off-site sub-basin to the west of the property consisting of mostly of native grasslands and has an area of 37.0 acres. The curve number for Sub-Basin A2 is 66.00. The basin will generate runoff of 7.91cfs and 38.75cfs in the minor and major storms, respectively. Flows from this sub-basin will also be conveyed by a natural drainage channel through Sub-Basin A3 to West Kiowa Creek, which will convey flows off the site to the northeast.

Sub-Basin A3 consists of 3 large residential lots to the west of Alamar Way on the western boundary of the site and has an area of 41.5 acres. The curve number for Sub-Basin A3 is 76.50. The basin will generate runoff of 26.68cfs and 76.62cfs in the minor and major storms, respectively. Flows from this sub-basin will be conveyed by natural drainageways and along the side of Alamar Way from the northwest to the southeast end of the basin into Sub-basin G2.

Sub-Basin B1 consists of the West Kiowa Creek watershed to the south of Hodgen Road. This sub-basin has an area of 3836.70 acres. The curve number for Sub-Basin B1 is 60.34. The basin will generate runoff of 207.15cfs and 1528.85cfs in the minor and major storms, respectively. Flows from this sub-basin will pass under Hodgen Road and then conveyed by a natural drainage

channel through Sub-Basin B3 via West Kiowa Creek, which will convey flows off the site to the northeast.

Sub-Basin B2 consists of 4 large residential lots at the southwest corner of the project. This sub-basin has an area of 13.10 acres. The curve number for Sub-Basin B2 is 64.00. The basin will generate runoff of 2.80cfs and 15.93cfs in the minor and major storms, respectively. Flows from this basin will travel across the lots from south to north where they will be intercepted by a culvert in Clove Hitch Ct. From the culvert flows will be conveyed by a natural drainage channel through Sub-Basin B4 to West Kiowa Creek, which will convey flows off the site to the northeast.

Sub-Basin B3 is an off-site sub-basin to the west of the site near the southwest corner of the property. This sub-basin has an area of 54.90 acres. The curve number for Sub-Basin B3 is 65.10. The basin will generate runoff of 10.16cfs and 53.05cfs in the minor and major storms, respectively. Flows from this sub-basin will be conveyed by a natural drainage channel through Sub-Basin B4 to West Kiowa Creek, which will convey flows off the site to the northeast.

Sub-Basin B4 consists of 6 large residential lots and West Kiowa Creek at the southwest corner of the property. This sub-basin has an area of 41.48 acres. The curve number for Sub-Basin B4 is 47.99. The basin will generate runoff of 11.58cfs and 47.99cfs in the minor and major storms, respectively. Flows from this basin will flow north to northeast and will be conveyed by a natural drainage channel through Sub-Basin B4 to West Kiowa Creek, which will convey flows off the site to the northeast.

Sub-Basin C1 is an off-site sub-basin to the south of Hodgen Road. This sub-basin has an area of 162.70 acres. The curve number for Sub-Basin C1 is 60.00. The basin will generate runoff of 12.89cfs and 113.24cfs in the minor and major storms, respectively. Flows from this sub-basin will be conveyed north by a natural drainage channel to Hodgen Road or through an existing 30" CMP culvert that will convey flows under Hodgen Road into Sub-Basin C2.

Sub-Basin C2 consists of 7 large residential lots along the southern boundary of the property. This sub-basin has an area of 22.40 acres. The curve number for Sub-Basin C2 is 64.00. The basin will generate runoff of 4.04cfs and 23.14cfs in the minor and major storms, respectively. Stormwater from this basin will flow north across the lots to a culvert under Mosey Trail. The culvert flows will be conveyed across Sub-Basin C3 and ultimately will discharge into West Kiowa Creek.

Sub-Basin C3 consists of 5 large residential lots in southern half of the property, just south of Winding Way Circle. This sub-basin has an area of 16.10 acres. The curve number for Sub-Basin C3 is 64.00. The basin will generate runoff of 3.13cfs and 17.91cfs in the minor and major storms, respectively. Runoff from this basin will flow to the northwest across the lots to a culvert under Winsome Way. From the culvert runoff will convey across Sub-Basin B4 and will be discharged into West Kiowa Creek.

Sub-Basin C4 consists of only two residential lots and a portion of West Kiowa Creek north of the southern loop of Alamar Way. This sub-basin has an area of 23.80 acres. The curve number for Sub-Basin C4 is 65.00. The basin will generate runoff of 4.18cfs and 21.99cfs in the minor and major storms, respectively. Stormwater from this sub-basin will flow north across the residential lots to West Kiowa Creek.

Sub-Basin D1.1 is an off-site sub-basin to the south of Hodgen Road consisting of agricultural land and large residential lots. This sub-basin has an area of 161.30 acres. The curve number for Sub-Basin D1 is 60.00. The basin will generate runoff of 12.81cfs and 112.62cfs in the minor and major storms, respectively. Flows from this sub-basin will be conveyed north by a natural drainage channel to an existing 72" CMP culvert that will convey flows under Hodgen Road into Sub-Basin D2.

Sub-Basin D1.2 is an off-site sub-basin to the south of Hodgen Road consisting of agricultural land and large residential lots. This sub-basin has an area of 49.90 acres. The curve number for Sub-Basin D1 is 60.00. The basin will generate runoff of 3.61cfs and 30.80cfs in the minor and

major storms, respectively. Flows from this sub-basin will be conveyed north by a natural drainage channel to a 30" CMP culvert that will convey flows under Hodgen Road into Sub-Basin D3.

Sub-Basin D2 consists of 17 large residential lots and the southern tributary to West Kiowa Creek. This sub-basin has an area of 68.70 acres. The curve number for Sub-Basin D2 is 65.50. The basin will generate runoff of 12.98cfs and 69.94cfs in the minor and major storms, respectively. A culvert will convey flows across Alamar Way into Sub-Basin D5.

Sub-Basin D3 consists of 12 large residential lots at the southeast corner of the property. This sub-basin has an area of 41.20 acres. The curve number for Sub-Basin D3 is 64.00. The basin will generate runoff of 6.44cfs and 36.85cfs in the minor and major storms, respectively. Stormwater from this sub-basin will flow west across the residential lots to a natural channel that will convey flows to the north to a culvert under Asteria Lane. From the culvert runoff will continue to flow north through Sub-Basin D4 in a natural drainageway.

Sub-Basin D4 consists of 12 large residential lots to the south of the southern loop of Alamar Way. This sub-basin has an area of 34.30 acres. The curve number for Sub-Basin D4 is 64.00. The basin will generate runoff of 6.36cfs and 36.45cfs in the minor and major storms, respectively. Stormwater from this sub-basin will flow across the residential lots to a natural drainage channel that will convey flows north to a culvert under Alamar Way. From the culvert, runoff will continue north through Sub-Basin D6 to the 5.946 ac-ft stormwater detention pond, Pond 3 and then discharge to a natural drainage channel flowing to West Kiowa Creek.

Sub-Basin D5 consists of a portion of the southern tributary to West Kiowa Creek immediately to the north of the southern loop of Alamar Way. This sub-basin has an area of 12.80 acres. The curve number for Sub-Basin D5 is 67.20. The basin will generate runoff of 3.67cfs and 16.37cfs in the minor and major storms, respectively. Stormwater from this sub-basin generally flows south to north along the southern tributary streambed.

Sub-Basin D6 consists of 5 large residential lots and the portion of West Kiowa Creek on the northwest corner of Twinkling Star Lane and Alamar Way. This sub-basin has an area of 41.80 acres. The curve number for Sub-Basin D6 is 64.80. The basin will generate runoff of 4.42cfs and 31.67cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows northwest across the residential lots to the 5.946 ac-ft stormwater detention pond, Pond 3, which will discharge to West Kiowa Creek. Flows in the creek pass under Alamar Way through a double box culvert.

Sub-Basin E0 off-site sub-basin is located south of the southeast corner of the property. This sub-basin has an area of 37.9 acres. The curve number for Sub-Basin E0 is 60.00. The basin will generate runoff of 3.01cfs and 26.42cfs in the minor and major storms, respectively. Stormwater from this sub-basin will flow north across the residential lots to a 30" RCP culvert under Hodgen Road. From the culvert flows proceed north through Sub-Basin E1.1 to be treated in the 3.220 ac-ft stormwater pond, Pond P6.

Sub-Basin E1.1 consists of one commercial lot in the southeast corner of the property. The commercial lot will have its own full spectrum 3.220 ac-ft stormwater detention pond, Pond 6 in place and outlet to the road side ditch still ultimately flowing to the culvert at the north end of the basin. This sub-basin has an area of 7.9 acres. Half of this lot is forested and will remain undeveloped. The curve number for Sub-Basin E1.1 is 76.00. The basin will generate runoff of 1.67cfs and 4.93cfs in the minor and major storms, respectively.

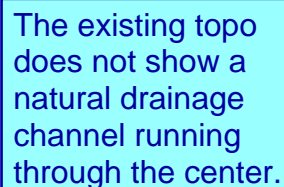
Sub-Basin E1.2 consists of 3 large lots towards the southeast corner of the property. This sub-basin has an area of 16.30 acres. The curve number for Sub-Basin E1.2 is 64.00. The basin will generate runoff of 1.94cfs and 3.30cfs in the minor and major storms, respectively. Stormwater from this sub-basin will flow north across the residential lots through a culvert under Woodridge Terrace to Sub-basin F1.

Sub-Basin E2 consists of a portion of a large residential lot at the southwest corner of Flapjack Lane and Early Light Drive. This sub-basin has an area of 2.60 acres. The curve number for Sub-Basin E2 is 64.00. The basin will generate runoff of 0.58cfs and 3.30cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows north to a culvert under Flapjack Lane. From the culvert, runoff flows in a natural drainage channel to Sub-Basin E3.

Sub-Basin E3 consists of 6 large residential lots on the south side of Asteria Lane. This sub-basin has an area of 19.80 acres. The curve number for Sub-Basin E3 is 64.00. The sub-basin will generate runoff of 3.94cfs and 22.50cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows east across the lots to a natural drainage channel which conveys flows north to the culvert under Asteria Lane. From the culvert, runoff continues down the proposed swale through Sub-Basins E4.

Sub-Basin E4 consists of 5 large residential lots to the north of Asteria Lane in the southeast corner of the property. This sub-basin has an area of 18.20 acres. The curve number for Sub-Basin E4 is 64.00. The basin will generate runoff of 3.55cfs and 20.34cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows to the proposed swale running through the center of the sub-basin and are conveyed north to the culvert under Alamar Way. From the culvert, the flows continue north through the proposed swale that runs through Sub-Basin E7.

Sub-Basin E5 consists of portions of 7 large residential lots south of Alamar Way near the southern terminus of Clove Hitch Ct. This sub-basin has an area of 13.50 acres. The curve number for Sub-Basin E5 is 64.00. The basin will generate runoff of 2.70cfs and 15.43cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed north to the culvert under Alamar Way. From the culvert the flows continue north through Sub-Basin E6 in a natural drainage channel.



The existing topo does not show a natural drainage channel running through the center.

Sub-Basin E6 consists of 6 large residential lots along the eastern boundary of the property north of Alamar Way. This sub-basin has an area of 28.90 acres. The curve number for Sub-Basin E6 is 61.70. The basin will generate runoff of 4.32cfs and 28.98cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed north to the 5.447 ac-ft stormwater detention pond, Pond 5. From the pond flows continue north in a natural drainage channel and are discharged to the property to the north as they were in the existing condition.

Sub-Basin E7 consists of a portion of 5 large residential lots on the eastern side of the property north of Alamar Way. This sub-basin has an area of 9.80 acres. The curve number for Sub-Basin E7 is 62.00. The basin will generate runoff of 1.50cfs and 10.46cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the proposed swale running through the center of the sub-basin and discharges to the proposed swale to the north that flows through to Sub-basin E6 into the 5.447 ac-ft stormwater detention pond, Pond 5.

Sub-Basin F1 consists of portions of 8 large residential lots along the eastern boundary of the project, on the east side of Twinkling Star Lane. This sub-basin has an area of 42.90 acres. The curve number for Sub-Basin F2 is 60.40. The basin will generate runoff of 3.79cfs and 31.68cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the existing drainage channel through the center of the sub-basin and are discharged from the property to the north to a proposed swale that runs along the north property line.

If this ultimately drain to Pond 5 state as such.

Sub-Basin G1 consists of a portion of 3 large residential lots and off-site grassland along the western boundary of the project, on the west side of Alamar Way. This sub-basin has an area of 25.20 acres. The curve number for Sub-Basin G1 is 66.00. The basin will generate runoff of 6.77cfs and 32.61cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed east to a culvert under Alamar Way. From the culvert the flows continue east through Sub-Basin G2.

Sub-Basin G2 consists of a portion of 5 large residential lots on the east side of the western loop of Alamar Way. This sub-basin has an area of 21.20 acres. The curve number for Sub-Basin G2 is 73.40. The basin will generate runoff of 9.89cfs and 32.95cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the proposed swale running through the center of the sub-basin and are conveyed east to the 6.336 ac-ft stormwater detention pond, Pond 1. From the pond flows continue east and are discharged to West Kiowa Creek.

Sub-Basin H1 consists portions of 3 large residential lots along the western boundary of the project, on the north side of Alamar Way. This sub-basin has an area of 13.90 acres. The curve number for Sub-Basin H1 is 60.00. The basin will generate runoff of 6.40cfs and 23.02cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed southeast to the culvert under Alamar Way. From the culvert, the flows continue southeast through Sub-Basin H4.

Sub-Basin H2 consists portions of 6 large residential lots along the northern boundary of the project, on the north side of Alamar Way. This sub-basin has an area of 39.10 acres. The curve number for Sub-Basin H2 is 67.20. The basin will generate runoff of 10.58cfs and 47.54cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed southeast to the culvert under Alamar Way. From the culvert the flows continue southeast through Sub-Basin H6.

Sub-Basin H3 consists of portions of 2 large residential lots along the northern boundary of the project. This sub-basin has an area of 5.80 acres. The curve number for Sub-Basin H2 is 66.00. The basin will generate runoff of 1.67cfs and 8.03 cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed southeast to the culvert under Alamar Way. From the culvert the flows continue southeast through Sub-Basin H7.

and offsite residential lot

Sub-Basin H4 consists of a portion of 4 large residential lots on the east side of the western loop of Alamar Way. This sub-basin has an area of 27.10 acres. The curve number for Sub-Basin H4 is 73.75. The basin will generate runoff of 14.06cfs and 44.75cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed southeast to the 6.336 ac-ft stormwater detention pond, Pond 1. From the pond, flows continue southeast and are discharged to West Kiowa Creek.

Sub-Basin H5 consists of a portion of 3 large residential lots on the east side of the western loop of Alamar Way. This sub-basin has an area of 20.20 acres. The curve number for Sub-Basin H5 is 74.10. The basin will generate runoff of 11.71 cfs and 35.73cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the proposed swale running through the center of the sub-basin and are conveyed southeast to the 6.342 ac-ft stormwater detention pond, Pond 2. From the pond, flows continue southeast and are discharged to West Kiowa Creek.

Sub-Basin H6 consists of a portion of 2 large residential lots on the east side of the western loop of Alamar Way. This sub-basin has an area of 31.60 acres. The curve number for Sub-Basin H6 is 66.60. The basin will generate runoff of 7.57cfs and 35.44cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the proposed swale running through the center of the sub-basin and are conveyed southeast to the 6.342 ac-ft stormwater detention pond, Pond 2. From the pond flows continue southeast and are discharged to West Kiowa Creek.

Sub-Basin H7 consists of a portion of 3 large residential lots on the east side of the western loop of Alamar Way. This sub-basin has an area of 25.80 acres. The curve number for Sub-Basin H7 is 70.50. The basin will generate runoff of 10.49cfs and 38.72cfs in the minor and major storms,

Topography does not show a natural drainage channel running through the center of the subbasins H8 & I1.

respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are discharged to West Kiowa Creek.

Sub-Basin H8 consists of a portion of 2 large residential lots on the east side of Clove Hitch Ct. This sub-basin has an area of 8.50 acres. The curve number for Sub-Basin H8 is 74.55. The basin will generate runoff of 5.62cfs and 17.12cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed southeast to the eastern boundary of the project and discharged onto the neighboring property as they were in the existing condition.

Sub-Basin H9 consists of a portion of 2 large residential lots on the east side of Clove Hitch Ct. This sub-basin has an area of 6.90 acres. The curve number for Sub-Basin H9 is 60.00. The basin will generate runoff of 3.41cfs and 12.20cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed southeast to the proposed swale and into the 1.452 ac-ft stormwater detention pond, Pond 4. From the pond flows continue southeast and are discharged from the property to the east as they were in the existing condition.

Sub-Basin I1 consists of a portion of 2 large residential lots at the northwest corner of the intersection of Twinkling Star Lane and Alamar Way. This sub-basin has an area of 6.80 acres. The curve number for Sub-Basin H2 is 72.00. The basin will generate runoff of 3.79cfs and 12.75cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed southeast to the culvert under Twinkling Star Lane. From the culvert the flows continue southeast through Sub-Basin I2.

Sub-Basin I2 consists of a portion of 3 large residential lots on the east side of Clove Hitch Ct, north of Sub-Basin H9. This sub-basin has an area of 14.80 acres. The curve number for Sub-Basin I2 is 72.00. The basin will generate runoff of 8.28cfs and 28.00cfs in the minor and major storms,

Update the narrative. Based on the drainage map and pond calculation, I2 is diverted to pond 4.

respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are discharged from the property to the east as they were in the existing condition.

Sub-Basin J1 consists of portions of 2 large residential lots along the northern boundary of the project. This sub-basin has an area of 10.10 acres. The curve number for Sub-Basin J1 is 68.50. The basin will generate runoff of 1.07cfs and 9.68cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows north across the lots from the property to the north as it did in the existing condition.

Sub-Basin K1 consists of portions of 4 large residential lots along the northern boundary of the project. This sub-basin has an area of 17.80 acres. The curve number for Sub-Basin J1 is 69.60. The basin will generate runoff of 7.82cfs and 29.72cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows north across the lots from the property to the north as it did in the existing condition.

3.0 DRAINAGE DESIGN CRITERIA

REGULATIONS

The hydrologic calculations in this report comply with the El Paso County Drainage Criteria Manuals. There are no previous drainage studies that cover this property.

HYDROLOGICAL CRITERIA

Since this project contains both sub-basins over 100 acres and sub-basins less than 100 acres, times of concentration and peak runoff values were calculated for the 5-year and 100-year storm events using the NRCS Curve Number Method as required by the City of Colorado Springs/El Paso County Drainage Criteria Manuals. The model utilizes the NRCS Type II 24-hr rainfall distribution, the cumulative depth for the 5-year storm is 2.7 inches and cumulative depth of the 100-year storm is 4.6 inches. Per the Drainage Criteria Manual, both Frontal Storms and Thunder

Storms were evaluated to determine the higher design flow. The comparative analysis of these storms show that the Frontal Storm produces significantly higher flow rates, so this storm type was used for drainage design. The table below outlines the rain gage data used for the comparison.

Frontal Storm Rainfall Depths

	1 H	24 H
5 Year	1.5	2.7
100 Year	2.52	4.6

Thunder Storm 2H Rainfall Depths

Minutes	Fraction of 1 H	5Y	100Y
5	0.01	0.02	0.04
10	0.05	0.07	0.12
15	0.08	0.12	0.20
20	0.12	0.18	0.30
25	0.18	0.27	0.45
30	0.26	0.39	0.65
35	0.42	0.63	1.06
40	0.71	1.07	1.79
45	0.82	1.24	2.08
50	0.89	1.34	2.25
55	0.94	1.40	2.36
60	0.97	1.46	2.45
65	1.00	1.51	2.53
70	1.02	1.53	2.57
75	1.03	1.55	2.60
80	1.04	1.56	2.62
85	1.05	1.58	2.65
90	1.06	1.59	2.68
95	1.07	1.61	2.70
100	1.08	1.62	2.73
105	1.09	1.64	2.75
110	1.10	1.65	2.77
115	1.11	1.66	2.79
120	1.12	1.68	2.82

The comparative peak outfall results for each storm type are shown below, and the full output for all the storm types is included in the appendix.



Peak Flow At Outfall		
Existing Condition Model	Frontal Storm	Thunder Storm
5 Year	349.5 cfs	95.4 cfs
100 Year	2355.0 cfs	1099.2 cfs

The frontal storm rain gage values that were used for the analysis are contained in the appendix.

NRCS

TR-55 CURVE NUMBER SELECTION

Basin runoff curve numbers were generated using the runoff curve tables and methods presented in the Colorado Springs/El Paso County Stormwater Criteria Manual.

With curve values for a developed condition only listed up to a 2-acre lot size, some conservative interpolation was necessary. Taking into account that the curve numbers are not linear as the lot sizes increase, the following table was extrapolated for this study.

LOT SIZE	IMPERVIOUS	SOIL GROUP	SOIL GROUP	SOIL GROUP	SOIL GROUP
2 ½ ACRE	11%	NA	64	76	81
5 ACRE LOTS	7%	NA	60	72	77

Impervious areas were referenced from the county Engineering Criteria Manual (Appendix L Table 3-1) in the table shown below.

Are these HSG A, B, C & D?
Update headers accordingly.

**Table 3-1
Typical Values of Percent Impervious**

Type of Development	Percent Impervious
Commercial	95%
Industrial	85%
Multi-Family	65%
Single Family - 0.1377 acre lots (6,000 SF)	53%
Single-Family – 0.20 acre lots	43%
Single-Family – 0.25 acre lots	40%
Single-Family – 0.33 acre lots	30%
Single-Family – 0.5 acre lots	25%
Single-Family – 1.0 acre lots	20%
Single-Family – 2.5 acre lots	11%
Single-Family – 5 acre lots	7%

FLOODPLAIN STUDY

A formal floodplain study has not been done for this site in the past. A CLOMR submittal has been assembled for this project and was submitted to FEMA in November 2018. The proposed 100-year floodplain line has been calculated and is shown on the plans.

HYDRAULIC CRITERIA

Routing of stormwater runoff and modelling of drainageways on the site, was done using the NRCS Curve Number Method as required by the City of Colorado Springs. However, ultimate culvert and full spectrum detention pond sizing shall be based on Rational Method peak flows and will utilize Urban Drainage UD-Culvert & UD-Detention calculations. Culvert sizing will be included in the final drainage report and has not been completed at this time. Preliminary detention pond sizing has been completed and details are included in the appendix. Ownership and maintenance of the ponds will be by a subdivision metro district. An overview of the pond characteristics is shown in the table below.

Since the report noted over-detention, place a column identifying the ratio of Peak Outflow to predeveloped flowrate.

Preliminary Drainage Report Winsome Subdivision

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	Required Volume Designed)	Q100 Flow Entering Pond (Developed)	Flow Exiting Pond (Developed)	Outlet Size
Pond 1	6.0 ac-ft	174.1 cfs	70.5 cfs	36 in
Pond 2	6.3 ac-ft	184.5 cfs	53.7 cfs	30 in
Pond 3	5.8 ac-ft	154.1 cfs	79.0 cfs	36 in
Pond 4	1.3 ac-ft	56.1 cfs	30.4 cfs	24 in
Pond 5	5.4 ac-ft	109.3 cfs	35.4 cfs	24 in
Pond 6	3.0 ac-ft	79.5 cfs	30.7 cfs	24 in

No changes in geometry or rerouting of natural drainageways is proposed as a part of this project. The natural drainage channels were modelled as trapezoidal channels using a bottom width of 20 feet and 4:1 side slopes for efficiency. However, a full HEC-RAS analysis was completed that modeled the accurate shape of the drainage way. A copy of the hydrology model and hydraulic analysis results are included in the appendix.

The basins for the site flow to the 150-acre dedicated open space area containing the onsite reach of West Kiowa Creek. The open space roughly bisects the site from the southwest corner of the property to the northeast corner of the property. In addition to the creek itself, this tract contains preservation areas for wetlands and wildlife. To accommodate these areas, the tract will be further restricted as a natural corridor by the county requiring submittal to the US Fish & Wildlife for habitat preservation, and then also being submitted to FEMA for floodplain preservation. The proposed post development flows will all be at or below historic levels. To maintain this natural environment, and likely required by US Fish and Wildlife, we propose not making any channel improvements to this area.

PRUDENT LINE ANALYSIS

A Prudent Line analysis has been performed on the West Kiowa Creek reach for the site, and the resulting prudent line and maintenance line are included on the Drainage Plan. The Prudent Line method decision tree would direct use of the simplified approach based on: developed density < 1 unit per acre, channel capacity > 10-year storm event requirements, dedicated open space determination, and < 15% impervious criteria. The analysis showed the larger setback being 110.8 feet offset from the 10-year floodplain line. The prudent line that was developed crossed a small

portion of two proposed lots. Easements have been placed at these locations to prevent any building. A summary of the prudent line calculations follows below.

Storm Return Period (Years)	Stream Flowrate (cfs)	Carrying Capacity (cubic feet)	Sediment Deficit (cubic feet)
2	76.0	10944.0	2736.0
5	320.0	46080.0	11520.0
10	660.0	95040.0	23760.0
25	1208.0	173952.0	43488.0
50	1647.0	237168.0	59292.0
100	2133.0	307152.0	76788.0

Bank Slope (X:1 (H:V))
10

Average Annual Sediment (cubic feet)	9079.9
30-Year Sediment Deficit (cubic feet)	272397.6
30-Year Average Prudent Line Setback (feet)	104.4
100-Year Prudent Line Setback (feet)	110.8

The table below shows the HEC-RAS data at each of our sections through the reach of the drainageway on this project. This data is based on a channel flow Mannings of 0.04 to match our hydrology model.

Reach	River Station	Profile	Min. Channel Elev. (ft)	Water Surface Elev. (ft)	Top Width (ft)	Velocity in Channel (fps)	Froude # Chl
West Kiowa	7258.36	100-yr	7333.54	7338.71	68.62	9.14	0.76
West Kiowa	6993.16	100-yr	7330.84	7336.04	77.21	10.01	0.84
West Kiowa	6787.05	100-yr	7328.00	7334.00	90.87	9.99	0.83
West Kiowa	6565.94	100-yr	7326.00	7332.20	94.08	7.75	0.62
West Kiowa	6325.83	100-yr	7324.16	7332.11	200.37	4.46	0.31
West Kiowa	6156.77	100-yr	7323.97	7332.18	372.01	2.17	0.14
West Kiowa	5833.82	100-yr	7321.68	7332.18	475.99	0.94	0.06
West Kiowa	5442.15	100-yr	7317.99	7332.18	565.00	0.77	0.04

West Kiowa	5431.65	100-yr	7318.03	7331.87	540.04	4.10	0.32
West Kiowa	5376.00	Upstream Crossing					
West Kiowa	5321.65	100-yr	7317.99	7322.14	90.65	9.66	0.91
West Kiowa	5300.65	100-yr	7317.99	7321.76	79.24	10.02	0.95
West Kiowa	4866.08	100-yr	7313.47	7317.32	172.09	7.16	0.68
West Kiowa	4720.61	100-yr	7312.00	7317.27	149.09	3.94	0.34
West Kiowa	4486.00	100-yr	7312.00	7316.29	127.01	6.25	0.55
West Kiowa	4331.01	100-yr	7311.43	7314.42	115.21	8.61	1.00
West Kiowa	4076.71	100-yr	7307.48	7311.51	107.38	7.13	0.67
West Kiowa	3774.36	100-yr	7304.64	7309.29	101.57	7.53	0.68
West Kiowa	3689.36	100-yr	7303.99	7308.76	146.26	7.14	0.67
West Kiowa	3338.18	100-yr	7300.28	7304.83	137.79	9.51	0.92
West Kiowa	3071.30	100-yr	7296.87	7302.13	223.55	9.14	0.76
West Kiowa	2934.46	100-yr	7296.00	7301.12	105.76	9.01	0.72
West Kiowa	2576.35	100-yr	7293.68	7297.46	122.77	9.27	0.94
West Kiowa	2373.76	100-yr	7291.32	7295.77	96.87	7.79	0.68
West Kiowa	2132.45	100-yr	7289.16	7292.80	100.91	9.59	0.99
West Kiowa	1842.45	100-yr	7284.08	7291.50	140.12	6.11	0.46
West Kiowa	1634.19	100-yr	7284.00	7291.70	379.07	2.15	0.15
West Kiowa	1530.98	100-yr	7282.00	7291.70	435.63	1.61	0.10
West Kiowa	1250.13	100-yr	7280.00	7291.67	286.62	1.37	0.08
West Kiowa	1240.12	100-yr	7280.00	7290.58	266.50	7.45	0.41
West Kiowa	1185.00	Downstream Crossing					
West Kiowa	1131.75	100-yr	7280.00	7284.06	132.70	11.00	0.98
West Kiowa	1105.72	100-yr	7279.98	7283.65	117.74	7.50	0.73
West Kiowa	909.01	100-yr	7277.98	7281.99	242.92	7.77	0.76
West Kiowa	679.18	100-yr	7275.60	7278.93	269.44	4.26	0.48
West Kiowa	441.15	100-yr	7273.98	7277.04	152.61	7.07	0.74

4.0 DRAINAGE FACILITY DESIGN

GENERAL CONCEPT

This project is a low density residential development with lots varying between 2.5 acres and 5 acres in size. Adjoining properties and drainage facilities downstream from the site will not be affected. In order to maintain historic runoff levels for this site, a series of 6 full spectrum detention ponds are being proposed that will capture and control the flows from roads and residential lots.

The information provided with the Prelim Drainage Report was for the full developed condition. Summarize the general process needed with each final drainage report to ensure that interim condition release develop flow at or less than historic rates.

Staffs is assuming the developed condition SCS modeling will be updated with each phase/filing so that only the sub-basin that is being constructed reflects the developed condition CN while the undeveloped elements matches the historic condition.

to West Kiowa Creek or on to the
5 ponds are sized to over-detect

SPECIFIC DETAILS

In the existing condition, the subject property is undeveloped land consisting mostly of grassland with a few forested areas near the northern and southern boundaries. Runoff from the site is collected by natural swales and channels that convey flows to West Kiowa Creek, which carries water from the site. The proposed development does not aim to change these natural drainage patterns, but rather to preserve them to the extent possible. With this philosophy in mind, culverts were added to the design to convey water under proposed roads as it flows through the site. Culverts will be sized using the Rational Method and the Urban Drainage UD-Culvert spreadsheets. These sizing results will be presented in the Final Drainage Report.

Results of the hydrologic model show that in the existing condition 100-year storm event, 2355cfs leaves the site at the northeast corner of the property and in the proposed condition 2345cfs leaves the site. This development will not adversely impact the drainageways and related facilities

Lot Release Exhibit is missing in the appendix.

Provide information for which ponds are anticipated to be constructed with each phase. Update the Preliminary Plan phasing plan accordingly. You may want to include a note that it is subject to change and will be determined with each subsequent FDR.

into phases that will be built

one at a time. There are currently 4 phased land releases planned as shown on the Lot Release Exhibit in the Appendix. Culverts and stormwater detention ponds will be installed according to these releases. Stormwater will flow through historic conveyances in areas of the project where construction has not started or impacted the area.

RISK ASSESSMENT

The site has been further evaluated for future flooding risk with respect to three documented reservoirs upstream from the project. The reservoirs are listed as 1-N-10, 1-P-10, and 1-P-20 in

the Kiowa Creek Watershed. The reservoirs were installed as jurisdictional flood control and are documented by the state. The Colorado State Dam Safety Engineering office has been contacted. With input criteria from John Hunyadi who oversees jurisdictional dams in this area, the largest of the 3 dams in question have been modeled and results have been provided back to the state. A breaching “sunny day” flow rate of 9500cfs is the largest of the 3 dams and results in a small portion of two proposed lots being affected. Easements have been added so that no building will occur in these areas and the current low risk level associated with the dams will remain unchanged.



identify the two lots.

DRAINAGE BASIN FEE

At this time the West Kiowa Creek Drainage Basin is not part of the El Paso County Drainage Basin Fee Program.

CONCLUSIONS

This report has been prepared in accordance with El Paso County stormwater criteria. It outlines the routing of the 5-Year and 100-year storm events through the project’s drainage system. The proposed drainage facilities were designed to convey and treat stormwater flows in accordance with the requirements presented by El Paso County and the Colorado Springs Drainage Criteria Manual. These proposed improvements provide adequate protection to this site without adverse impacts on adjoining upstream and downstream properties.

Consideration has been given to the Four-Step Process outlined in the El Paso County Engineering Criteria Manual for BMP selection as noted below:

Step 1: Employ Runoff Reduction Practices

This project is a low density residential development with lots varying between 2.5 acres and 5 acres in size. The development is designed to have a minimal impact and maintain the rural nature of the existing area. Relative to the size of the site, a small amount of paving is proposed as residential roadways. Roadside ditches and swales will be placed to

slow down the velocity and effectively reduce runoff peaks. Full Spectrum Detention Basins will be used to capture stormwater and maintain flows off the site at below historic levels.

Step 2: Stabilize Drainageways

Stabilizing the flow paths with in the development will be addressed by roadside ditch designs, flow controls, and swales. Roadside ditch slopes will be designed to control flow rates, and check dams will be used in areas of steeper slopes to slow storm runoff. Low sloping swales are proposed to direct water from adjacent basins to the full spectrum detention ponds. The swales will be graded to reduce the velocity of the water before it enters the ponds. By controlling stormwater along the flow paths we anticipate minimal erosion.

Step 3: Provide Water Quality Capture Volumes (WQCV)

The development proposes 6 full spectrum detention basins to capture stormwater runoff. These ponds have all been sized using UD-Detention and will provide full spectrum detention. Per ECM Appendix I Section 1.7.1.B in development areas of low density housing, water quality is not required across all areas, but full spectrum detention ponds are required when stormwater detention is employed.

Step 4: Consider Need for Industrial and Commercial BMP's

There is one proposed lot on the site with an intended commercial use. At this time, the specific type of use for this area has not been determined. The only proposed development for this area currently is a dedicated full spectrum detention pond. When the commercial area is developed, Covering of Storage/Handling Areas and Spill Containment & Control can be addressed if appropriate.

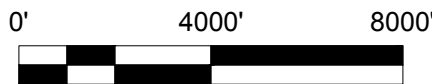
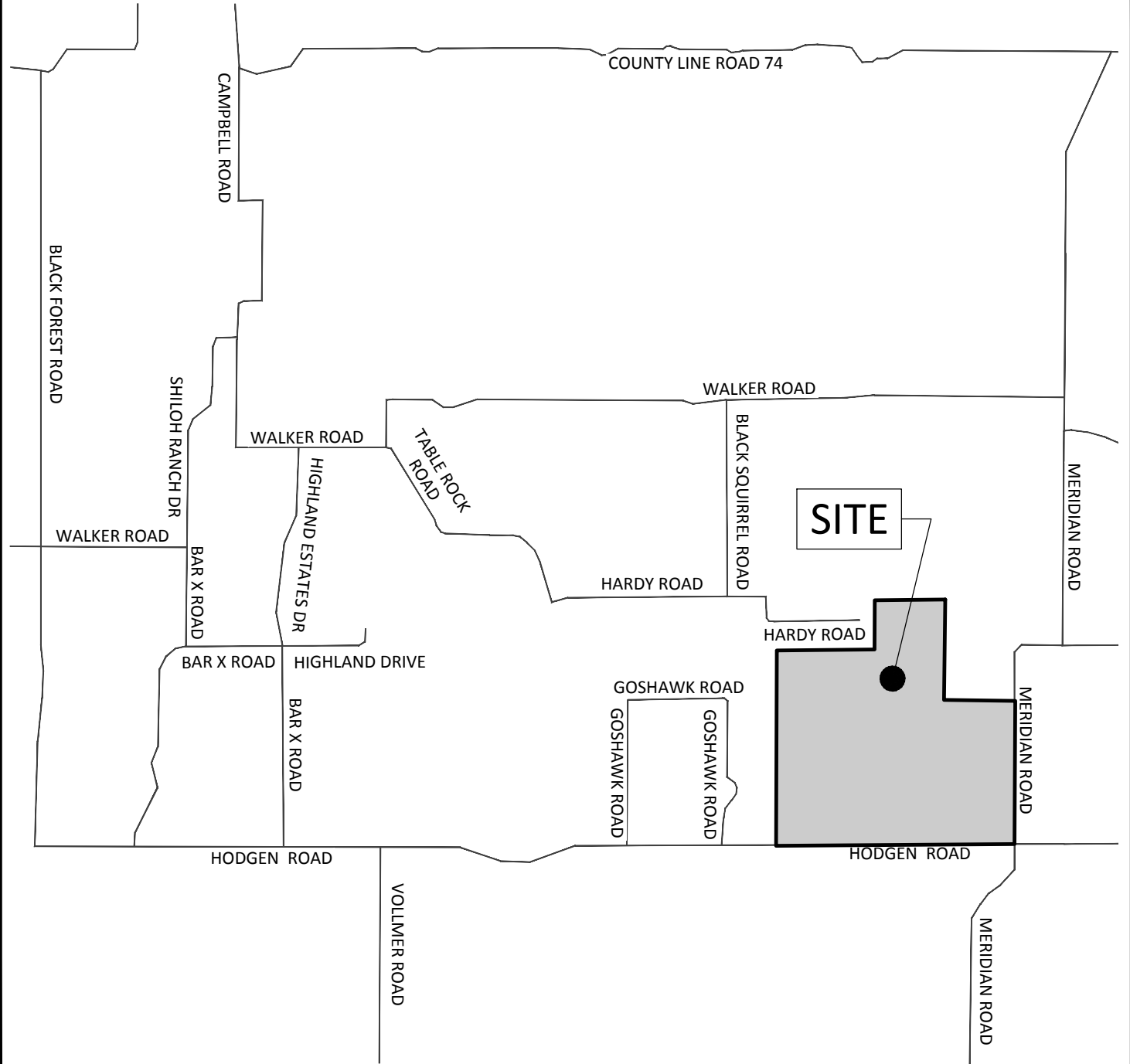
5.0 REFERENCES

1. Urban Storm Drainage Criteria Manuals (Volumes 1, 2, and 3) Urban Drainage & Flood Control District.
2. City of Colorado Springs Drainage Criteria Manual, Volumes 1 & 2, Stormwater Quality Policies, Procedures and Best Management Practices (BMPs), Dates May 2014.
3. Federal Emergency Management Agency, Flood Insurance Rate Map Index 08041C0507F and 08041C0530F, dated March 17, 1997.
4. Natural Resources Conservation Service, Web Soil Survey, dated October 10, 2017.
5. Entech Engineering Geotechnical Report, Dated October 2, 2018
6. El Paso County Planning Website, Tri-Lakes Drainage and Flood Control Vision:
<http://dev.adm2.elpasoco.com/Planning/Tri-Lakes/Tri-Drainage.asp>

El Paso County

1. VICINITY MAP

VICINITY MAP



VICINITY MAP

MCCUNE RANCH SUBDIVISION

17480 MERIDIAN ROAD
ELBERT, COLORADO

File No.:	
Date:	10/04/2018
Drawn:	JCP
Checked:	LPV
Job No.:	49388

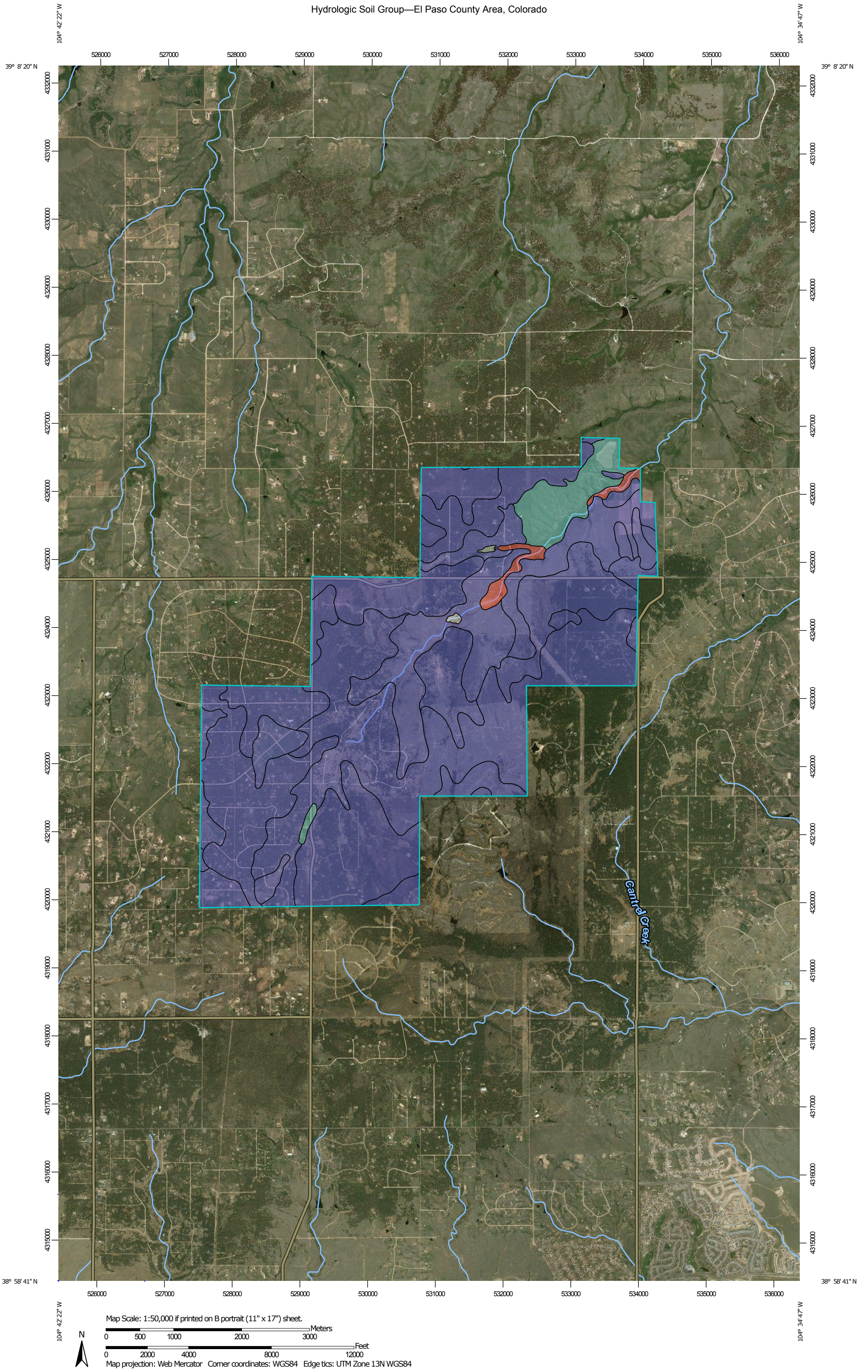
FIGURE

1

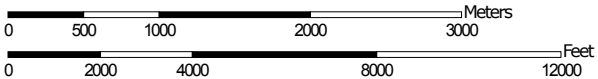
VERTEX[®]

2. HYDROLOGIC SOILS MAP

Hydrologic Soil Group—El Paso County Area, Colorado




Map Scale: 1:50,000 if printed on B portrait (11" x 17") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

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

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: El Paso County Area, Colorado
 Survey Area Data: Version 15, Oct 10, 2017

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

Date(s) aerial images were photographed: May 22, 2016—Mar 9, 2017

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Alamosa loam, 1 to 3 percent slopes	D	80.6	1.2%
15	Brussett loam, 3 to 5 percent slopes	B	6.0	0.1%
21	Cruckton sandy loam, 1 to 9 percent slopes	B	4.7	0.1%
25	Elbeth sandy loam, 3 to 8 percent slopes	B	2,081.3	31.8%
26	Elbeth sandy loam, 8 to 15 percent slopes	B	2,075.9	31.7%
34	Holderness loam, 1 to 5 percent slopes	C	15.5	0.2%
36	Holderness loam, 8 to 15 percent slopes	C	278.7	4.3%
40	Kettle gravelly loamy sand, 3 to 8 percent slopes	B	400.4	6.1%
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	B	265.1	4.0%
67	Peyton sandy loam, 5 to 9 percent slopes	B	36.3	0.6%
68	Peyton-Pring complex, 3 to 8 percent slopes	B	38.1	0.6%
71	Pring coarse sandy loam, 3 to 8 percent slopes	B	26.0	0.4%
92	Tomah-Crowfoot loamy sands, 3 to 8 percent slopes	B	661.6	10.1%
93	Tomah-Crowfoot complex, 8 to 15 percent slopes	B	574.4	8.8%
111	Water		10.0	0.2%
Totals for Area of Interest			6,554.4	100.0%

Description

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.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

3. THUNDER STORM COMPARISON OUTPUTS

Project Description

File Name WinsomeSubdivisionExistingCondition (24).SPF
 Description McCune Ranch Basins

Project Options

Flow Units CFS
 Elevation Type Depth
 Hydrology Method SCS TR-55
 Time of Concentration (TOC) Method SCS TR-55
 Link Routing Method Kinematic Wave
 Enable Overflow Ponding at Nodes YES
 Skip Steady State Analysis Time Periods NO

Analysis Options

Start Analysis On Mar 09, 2018 00:00:00
 End Analysis On Mar 10, 2018 00:00:00
 Start Reporting On Mar 09, 2018 00:00:00
 Antecedent Dry Days 0 days
 Runoff (Dry Weather) Time Step 0 01:00:00 days hh:mm:ss
 Runoff (Wet Weather) Time Step 0 00:05:00 days hh:mm:ss
 Reporting Time Step 0 00:05:00 days hh:mm:ss
 Routing Time Step 30 seconds

Number of Elements

	Qty
Rain Gages	1
Subbasins.....	16
Nodes.....	17
<i>Junctions</i>	12
<i>Outfalls</i>	1
<i>Flow Diversions</i>	4
<i>Inlets</i>	0
<i>Storage Nodes</i>	0
Links.....	18
<i>Channels</i>	14
<i>Pipes</i>	4
<i>Pumps</i>	0
<i>Orifices</i>	0
<i>Weirs</i>	0
<i>Outlets</i>	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1		Time Series	TS-100	Thunder Cumulative	inches					User Defined

Subbasin Summary

SN	Subbasin ID	Area	Weighted Curve Number	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
		(ac)	(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)	
1	A	915.40	61.83	2.82	0.32	296.59	262.33	0 00:52:35
2	Ba	3836.70	60.34	2.82	0.28	1078.11	662.59	0 01:28:25
3	Bb	100.60	69.79	2.82	0.61	61.16	68.70	0 00:39:51
4	Ca	162.70	60.00	2.82	0.27	44.09	46.96	0 00:37:06
5	Cb	70.00	68.70	2.82	0.56	39.48	46.11	0 00:36:41
6	Da	161.30	60.00	2.82	0.27	43.71	46.66	0 00:36:57
7	Db	49.90	60.00	2.82	0.27	13.52	13.16	0 00:43:48
8	Dc	209.50	67.70	2.82	0.53	109.99	119.85	0 00:40:49
9	Ea	37.90	60.00	2.82	0.27	10.27	12.08	0 00:30:07
10	Eb	114.80	67.20	2.82	0.51	58.09	65.10	0 00:38:39
11	F	44.50	69.00	2.82	0.58	25.63	29.82	0 00:37:04
12	G	107.60	74.50	2.82	0.82	88.23	113.28	0 00:33:54
13	H	121.80	71.76	2.82	0.69	84.29	106.39	0 00:33:38
14	I	37.50	79.00	2.82	1.06	39.71	54.62	0 00:31:46
15	J	10.10	69.50	2.82	0.60	6.02	8.08	0 00:29:14
16	K	17.80	76.00	2.82	0.90	15.95	20.40	0 00:34:33

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft ²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	ABC	Junction	7318.50	7328.50	7318.50	7328.50	0.00	893.19	7322.62	0.00	5.88	0 00:00	0.00	0.00
2	B1	Junction	7385.00	7395.00	7385.00	7395.00	0.00	662.36	7388.16	0.00	6.84	0 00:00	0.00	0.00
3	B2	Junction	7380.00	7390.00	7380.00	7390.00	0.00	662.01	7383.16	0.00	6.84	0 00:00	0.00	0.00
4	Cc1	Junction	7379.00	7389.00	7379.00	7389.00	0.00	47.12	7381.50	0.00	7.50	0 00:00	0.00	0.00
5	Da2	Junction	7385.00	7395.00	7385.00	7395.00	0.00	46.35	7386.41	0.00	8.59	0 00:00	0.00	0.00
6	Db2	Junction	7412.00	7422.00	7412.00	7422.00	0.00	13.05	7412.95	0.00	9.05	0 00:00	0.00	0.00
7	Ee1	Junction	7417.00	7427.00	7417.00	7427.00	0.00	11.93	7417.70	0.00	9.30	0 00:00	0.00	0.00
8	EF1	Junction	7276.00	7286.00	7276.00	7286.00	0.00	1099.15	7281.33	0.00	4.67	0 00:00	0.00	0.00
9	GHD	Junction	7300.00	7310.00	7300.00	7310.00	0.00	1043.94	7304.12	0.00	5.88	0 00:00	0.00	0.00
10	NUL	Junction	7280.00	7290.00	7280.00	7290.00	0.00	1043.21	7285.33	0.00	4.67	0 00:00	0.00	0.00
11	OS-J	Junction	7410.00	7420.00	7410.00	7420.00	0.00	7.93	7410.00	0.00	10.00	0 00:00	0.00	0.00
12	OS-K	Junction	7349.00	7359.00	7349.00	7359.00	0.00	20.35	7349.00	0.00	10.00	0 00:00	0.00	0.00
13	Out-01	Outfall	7260.00					1099.16	7261.81					
14	C1	Flow Diversions	7382.00	7392.00	7382.00		0.00	46.71	7384.50				0.00	0.00
15	Da1	Flow Diversions	7388.00	7398.00	7388.00		0.00	46.37	7389.42				0.00	0.00
16	Db1	Flow Diversions	7416.00	7426.00	7416.00		0.00	13.06	7416.95				0.00	0.00
17	E1	Flow Diversions	7420.00	7430.00	7420.00		0.00	11.94	7420.71				0.00	0.00

Link Summary

SN Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope (%)	Diameter or Height (ft)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Reported (min)	Surcharged Condition
1	ExCulv1	Pipe	C1 Cc1	100.00	7382.00	7379.00	3.0000	2.500	0.0250	39.62	36.94	1.07	8.69	2.50	1.00	20.00	SURCHARGED
2	ExCulv2	Pipe	Da1 Da2	100.00	7388.00	7385.00	3.0000	6.000	0.0250	46.35	381.44	0.12	9.10	1.42	0.24	0.00	Calculated
3	ExCulv3	Pipe	Db1 Db2	100.00	7416.00	7412.00	4.0000	2.500	0.0250	13.05	42.66	0.31	7.63	0.95	0.38	0.00	Calculated
4	ExCulv4	Pipe	E1 Ee1	125.00	7420.00	7417.00	2.4000	2.500	0.0120	11.93	68.84	0.17	10.50	0.70	0.28	0.00	Calculated
5	1	Channel	B2 ABC	2473.30	7380.00	7318.50	2.4900	10.000	0.0400	661.46	11419.17	0.06	8.84	2.50	0.25	0.00	
6	2	Channel	ABC GHD	2839.57	7318.50	7300.00	0.6500	10.000	0.0400	891.54	5845.14	0.15	5.97	4.11	0.41	0.00	
7	3	Channel	GHD NUL	1717.53	7300.00	7280.00	1.1600	10.000	0.0400	1043.21	7814.45	0.13	7.66	3.85	0.39	0.00	
8	4	Channel	NUL EFI	1277.36	7280.00	7276.00	0.3100	10.000	0.0400	1042.76	4052.37	0.26	4.75	5.33	0.53	0.00	
9	5	Channel	EF1 Out-01	70.66	7276.00	7260.00	22.6400	10.000	0.0400	1099.16	34459.47	0.03	22.26	1.81	0.18	0.00	
10	6	Channel	Cc1 ABC	2431.12	7379.00	7318.50	2.4900	10.000	0.0400	46.40	11423.78	0.00	3.95	0.55	0.06	0.00	
11	7a	Channel	Da2 GHD	3754.63	7385.00	7300.00	2.2600	10.000	0.0400	42.74	10895.85	0.00	3.73	0.54	0.05	0.00	
12	7b	Channel	Db2 GHD	4064.87	7412.00	7300.00	2.7600	10.000	0.0400	11.06	12020.46	0.00	2.45	0.23	0.02	0.00	
13	8	Channel	Ee1 EFI	5201.60	7417.00	7276.00	2.7100	10.000	0.0400	8.77	11922.75	0.00	2.34	0.20	0.02	0.00	
14	BR1	Channel	B1 B2	492.55	7385.00	7380.00	1.0200	10.000	0.0400	662.01	7296.17	0.09	6.41	3.16	0.32	0.00	
15	OverTop-Ca	Channel	C1 Cc1	462.70	7382.00	7379.00	0.6500	0.500	0.0320	8.73	118.95	0.07	1.55	0.10	0.21	0.00	
16	OverTop-Da	Channel	Da1 Da2	381.56	7388.00	7385.00	0.7900	0.500	0.0320	0.00	131.98	0.00	0.00	0.00	0.00	0.00	
17	OverTop-Db	Channel	Db1 Db2	227.21	7416.00	7412.00	1.7600	0.500	0.0320	0.00	197.50	0.00	0.00	0.00	0.00	0.00	
18	OverTop-Ea	Channel	E1 Ee1	427.06	7420.00	7417.00	0.7000	0.500	0.0320	0.00	124.75	0.00	0.00	0.00	0.00	0.00	

Provide a schematic diagram for the modeling.

Unresolved. Modeling will be reviewed once a schematic diagram is provided for all the modeling provided.

Subbasin Hydrology

Subbasin : A

Input Data

Area (ac) 915.40
 Weighted Curve Number 61.83
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	823.86	B	60.00
Pasture, grassland, or range, Fair	9.15	D	84.00
Pasture, grassland, or range, Fair	64.08	C	79.00
Pasture, grassland, or range, Fair	9.15	B	69.00
5 Acre Lots, 7% Impervious	9.15	D	77.00
Composite Area & Weighted CN	915.39		61.83

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

$$T_c = (0.007 * ((n * L_f)^{0.8})) / ((P^{0.5}) * (S_f^{0.4}))$$

Where :

T_c = Time of Concentration (hr)
 n = Manning's roughness
 L_f = Flow Length (ft)
 P = 2 yr, 24 hr Rainfall (inches)
 S_f = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (S_f^{0.5}) (unpaved surface)
 V = 20.3282 * (S_f^{0.5}) (paved surface)
 V = 15.0 * (S_f^{0.5}) (grassed waterway surface)
 V = 10.0 * (S_f^{0.5}) (nearly bare & untilled surface)
 V = 9.0 * (S_f^{0.5}) (cultivated straight rows surface)
 V = 7.0 * (S_f^{0.5}) (short grass pasture surface)
 V = 5.0 * (S_f^{0.5}) (woodland surface)
 V = 2.5 * (S_f^{0.5}) (forest w/heavy litter surface)
 T_c = (L_f / V) / (3600 sec/hr)

Where:

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)

Channel Flow Equation :

$$V = (1.49 * (R^{2/3}) * (S_f^{0.5})) / n$$

R = A_q / W_p
 T_c = (L_f / V) / (3600 sec/hr)

Where :

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 R = Hydraulic Radius (ft)
 A_q = Flow Area (ft²)
 W_p = Wetted Perimeter (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)
 n = Manning's roughness

	Flowpath A	Flowpath B	Flowpath C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

	Flowpath A	Flowpath B	Flowpath C
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.57	0.00	0.00
Computed Flow Time (min) :	10.62	0.00	0.00

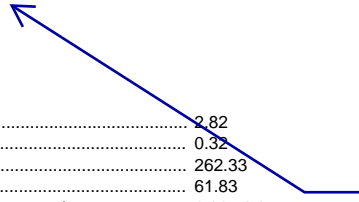
	Flowpath A	Flowpath B	Flowpath C
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	10494	0.00	0.00
Channel Slope (%) :	2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.36	0.00	0.00
Computed Flow Time (min) :	20.92	0.00	0.00
Total TOC (min)			52.59

Subbasin Runoff Results

Total Rainfall (in)	2.82
Total Runoff (in)	0.32
Peak Runoff (cfs)	262.33
Weighted Curve Number	61.83
Time of Concentration (days hh:mm:ss)	0 00:52:35

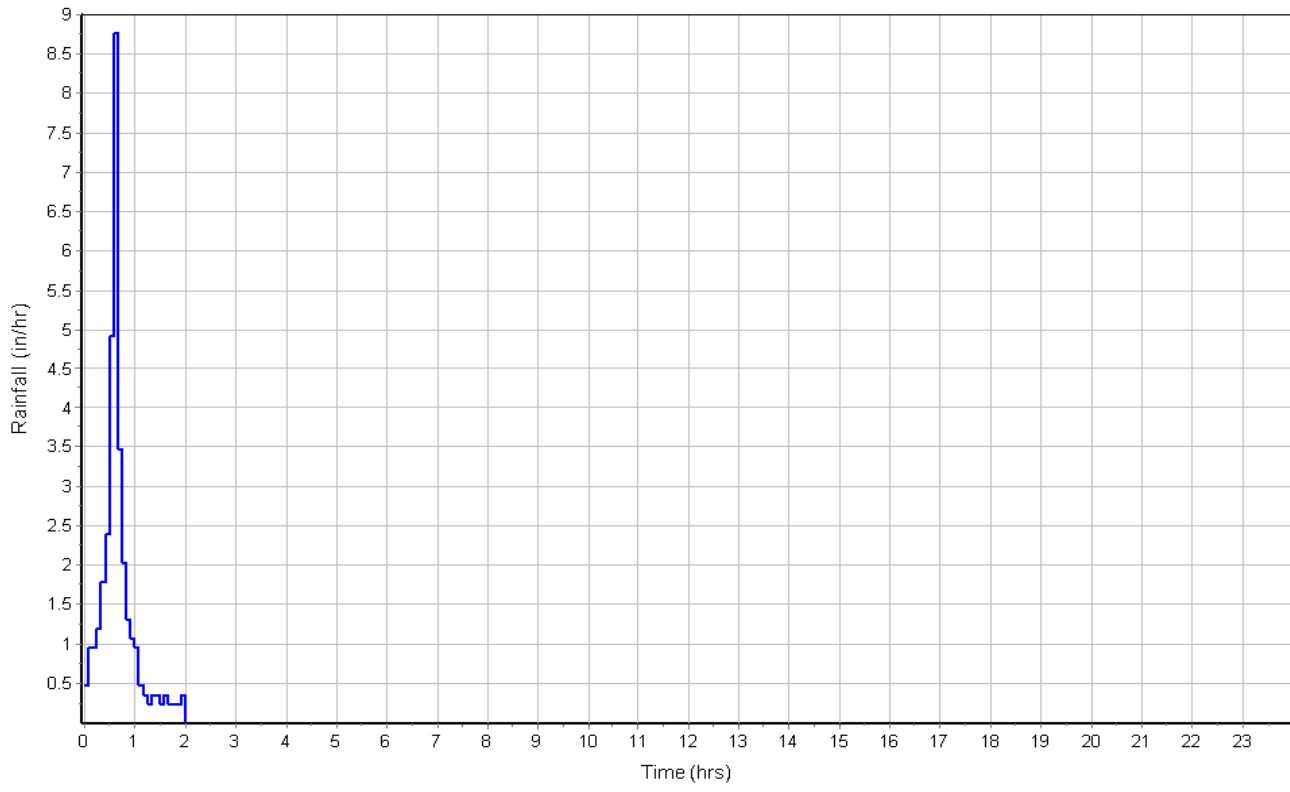
How does AutoCAD Storm and Sanitary modeling software handle the lag time? I don't see this variable in the input/output provided. On HEC-HMS you input the Lag Time. What's being presented in the appendix appears to only be the time of concentration.

Also, where is the initial abstraction accounted for?

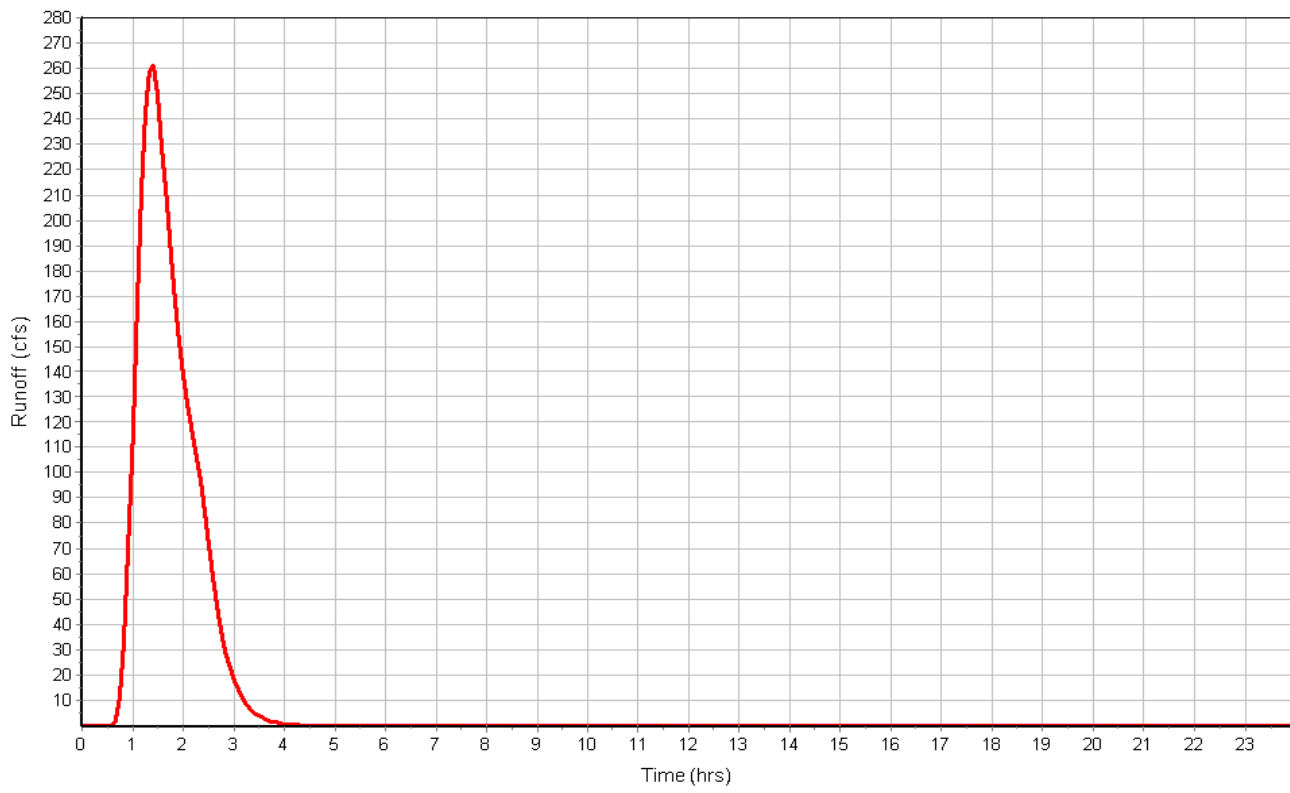


Subbasin : A

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Ba

Input Data

Area (ac) 3836.70
 Weighted Curve Number 60.34
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	3759.97	B	60.00
5 Acre Lots, 7% Impervious	76.73	D	77.00
Composite Area & Weighted CN	3836.70		60.34

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.40	0.00	0.00
Computed Flow Time (min) :	11.90	0.00	0.00

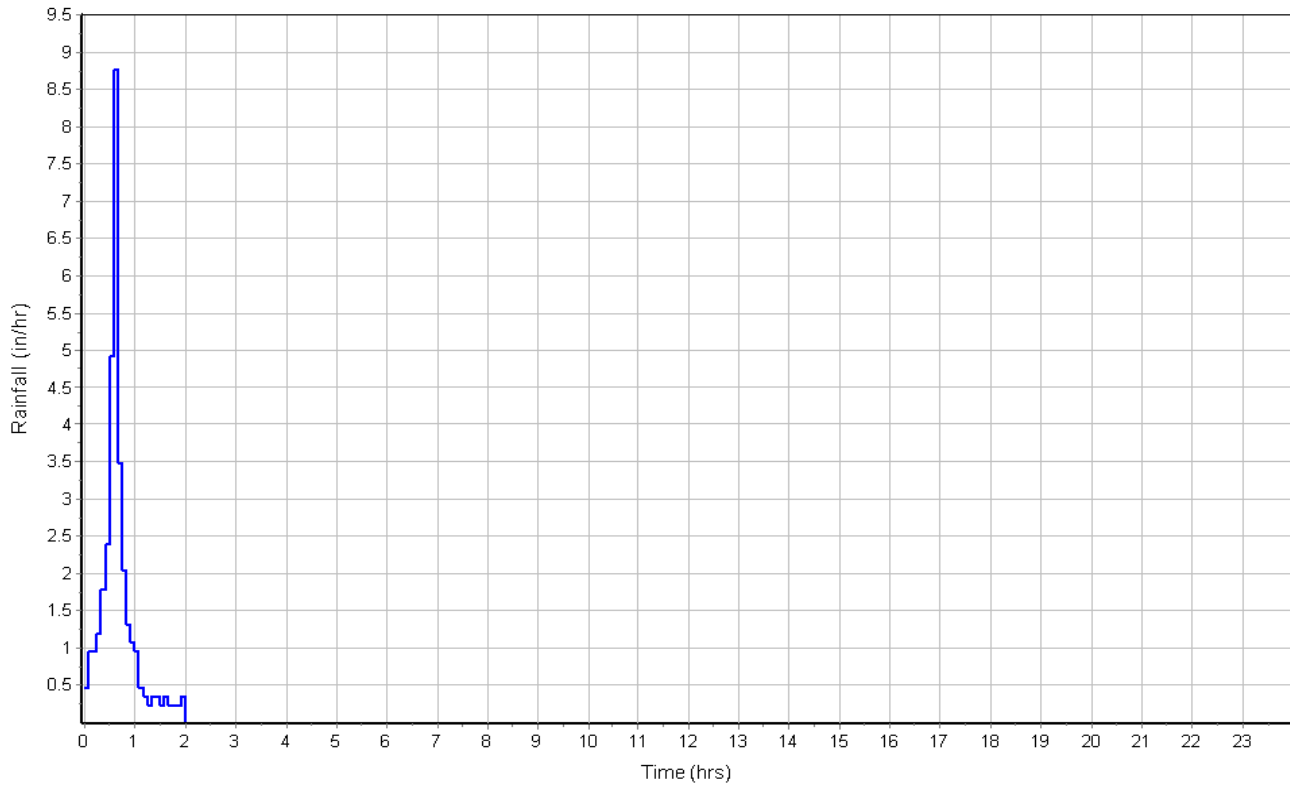
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	23284	0.00	0.00
Channel Slope (%) :	1.4	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	7.00	0.00	0.00
Computed Flow Time (min) :	55.47	0.00	0.00
Total TOC (min)	88.43		

Subbasin Runoff Results

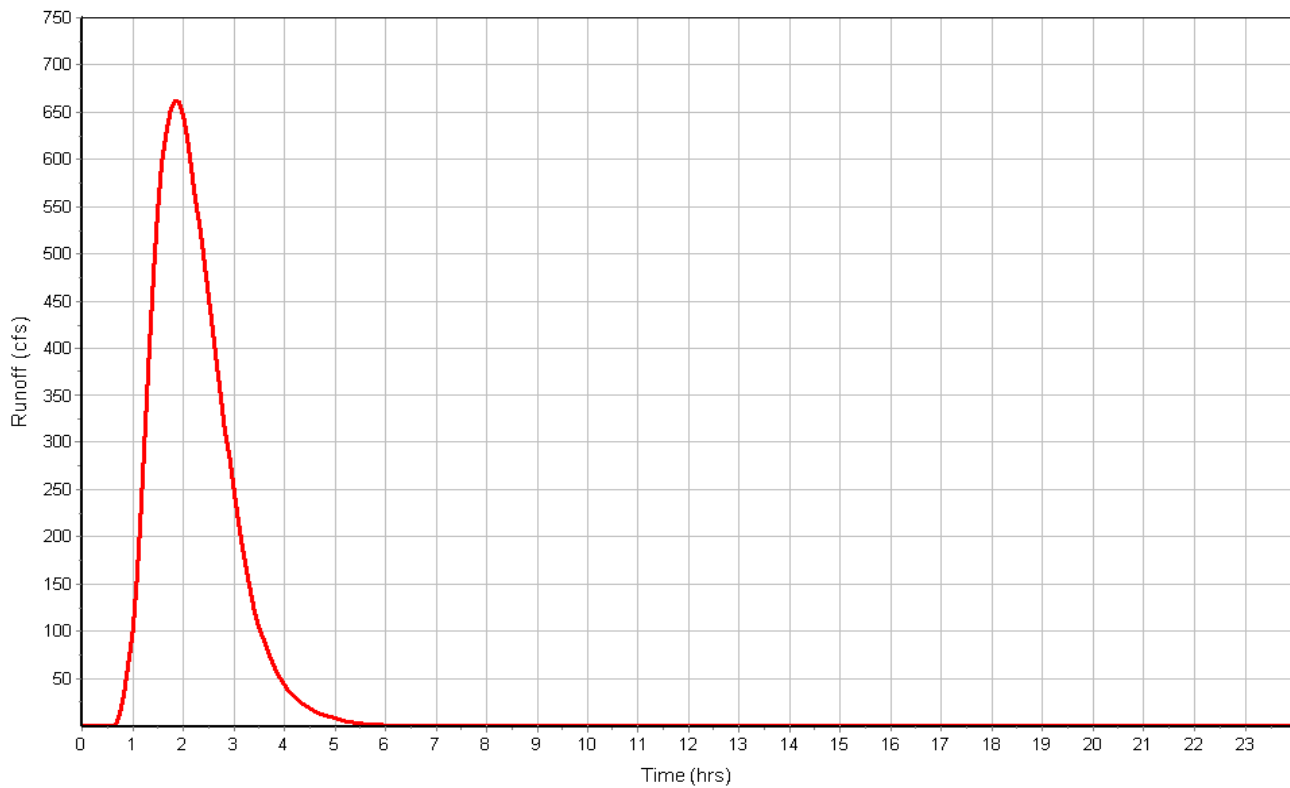
Total Rainfall (in) 2.82
 Total Runoff (in) 0.28
 Peak Runoff (cfs) 662.59
 Weighted Curve Number 60.34
 Time of Concentration (days hh:mm:ss) 0 01:28:26

Subbasin : Ba

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Bb

Input Data

Area (ac) 100.60
 Weighted Curve Number 69.79
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	90.54	B	69.00
Pasture, grassland, or range, Fair	5.03	D	84.00
Composite Area & Weighted CN	95.57		69.79

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.48	0.00	0.00
Computed Flow Time (min) :	11.26	0.00	0.00

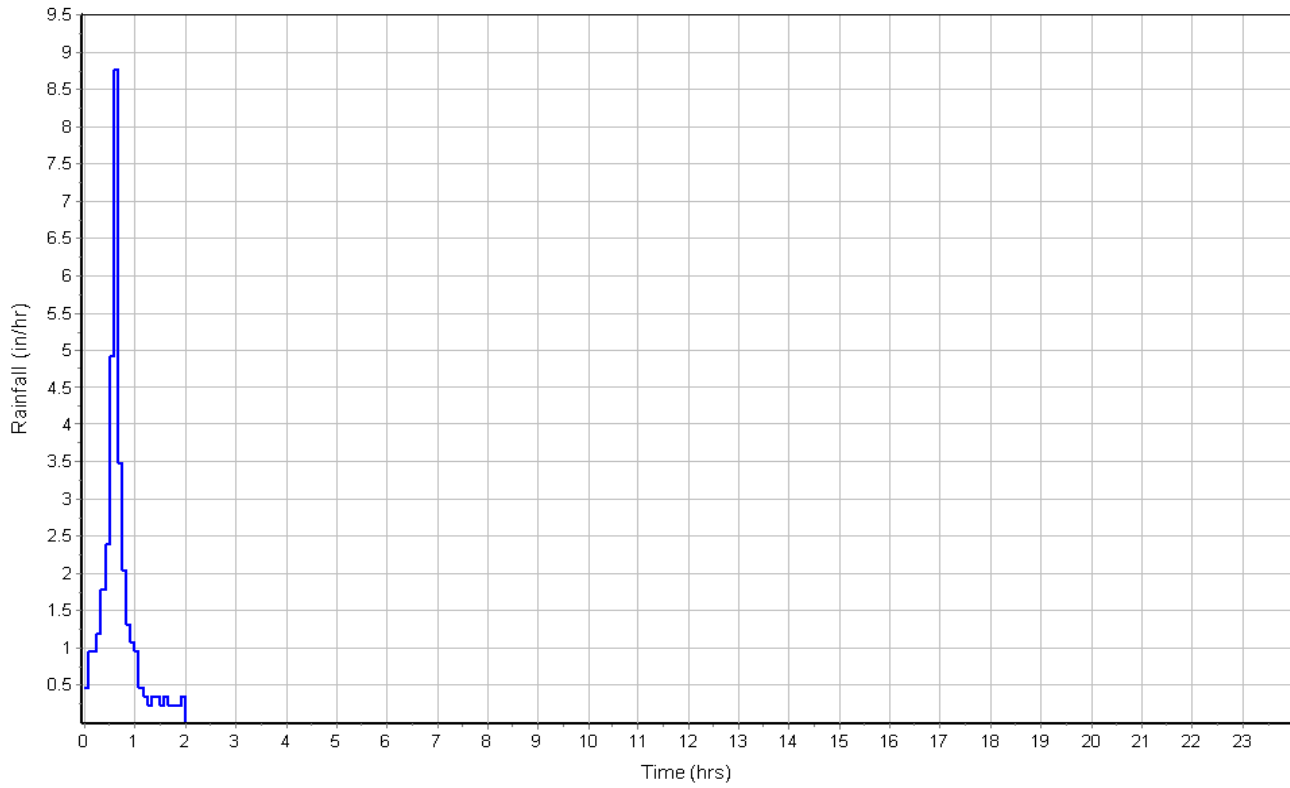
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	4140	0.00	0.00
Channel Slope (%) :	2.4	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	9.16	0.00	0.00
Computed Flow Time (min) :	7.53	0.00	0.00
Total TOC (min)	39.85		

Subbasin Runoff Results

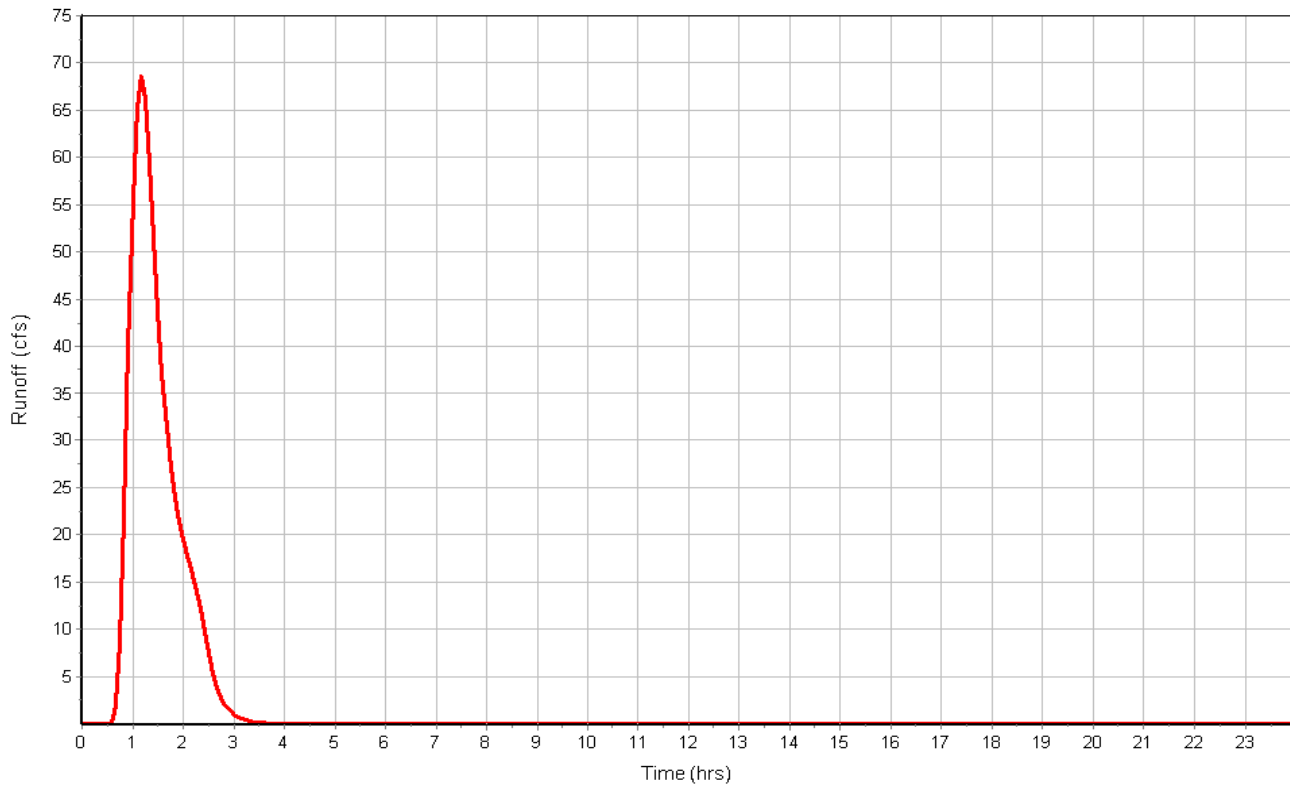
Total Rainfall (in) 2.82
 Total Runoff (in) 0.61
 Peak Runoff (cfs) 68.70
 Weighted Curve Number 69.79
 Time of Concentration (days hh:mm:ss) 0 00:39:51

Subbasin : Bb

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Ca

Input Data

Area (ac) 162.70
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	162.70	B	60.00
Composite Area & Weighted CN	162.70		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.42	0.00	0.00
Computed Flow Time (min) :	11.74	0.00	0.00

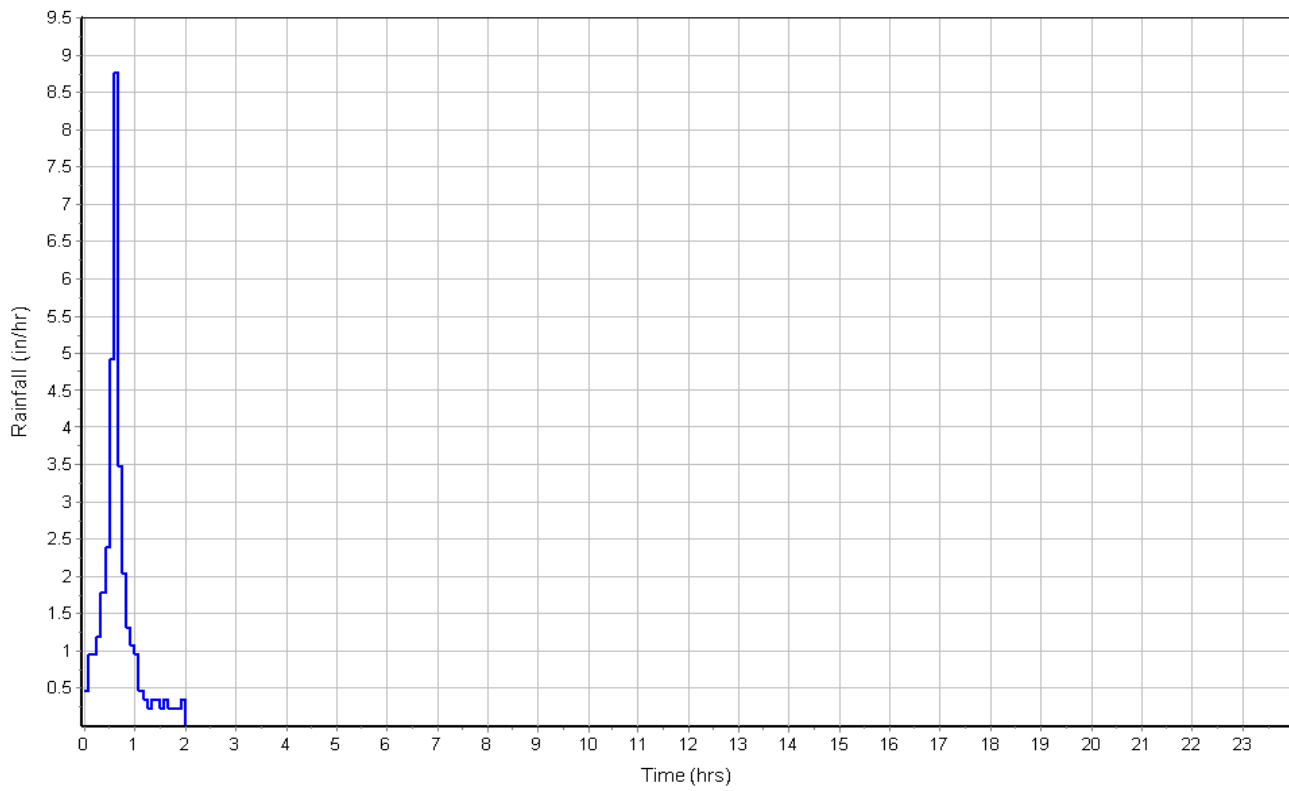
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	3099	0.00	0.00
Channel Slope (%) :	4.1	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.97	0.00	0.00
Computed Flow Time (min) :	4.31	0.00	0.00
Total TOC (min)	37.11		

Subbasin Runoff Results

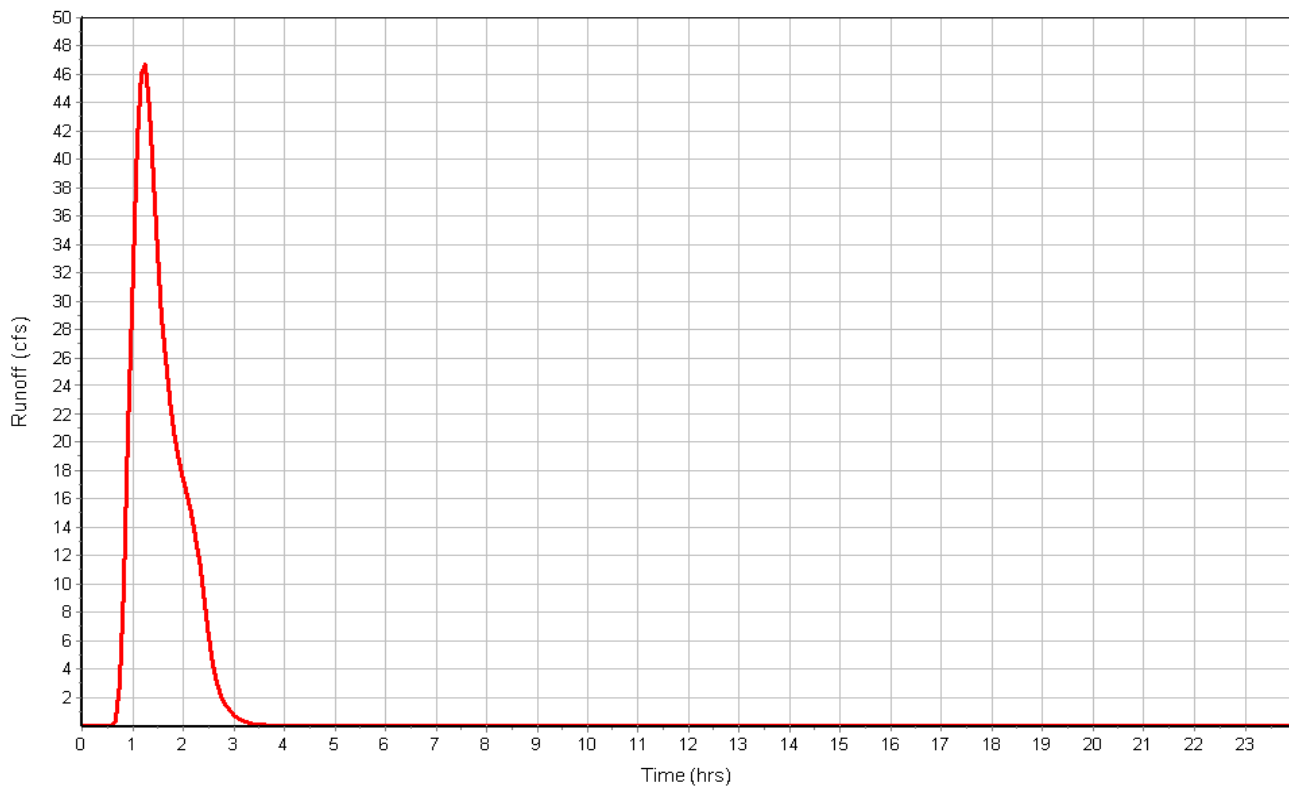
Total Rainfall (in) 2.82
 Total Runoff (in) 0.27
 Peak Runoff (cfs) 46.96
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:37:07

Subbasin : Ca

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Cb

Input Data

Area (ac) 70.00
 Weighted Curve Number 68.70
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods & grass combination, Fair	10.50	B	65.00
Pasture, grassland, or range, Fair	2.10	C	79.00
Pasture, grassland, or range, Fair	57.40	B	69.00
Composite Area & Weighted CN	70.00		68.70

Time of Concentration

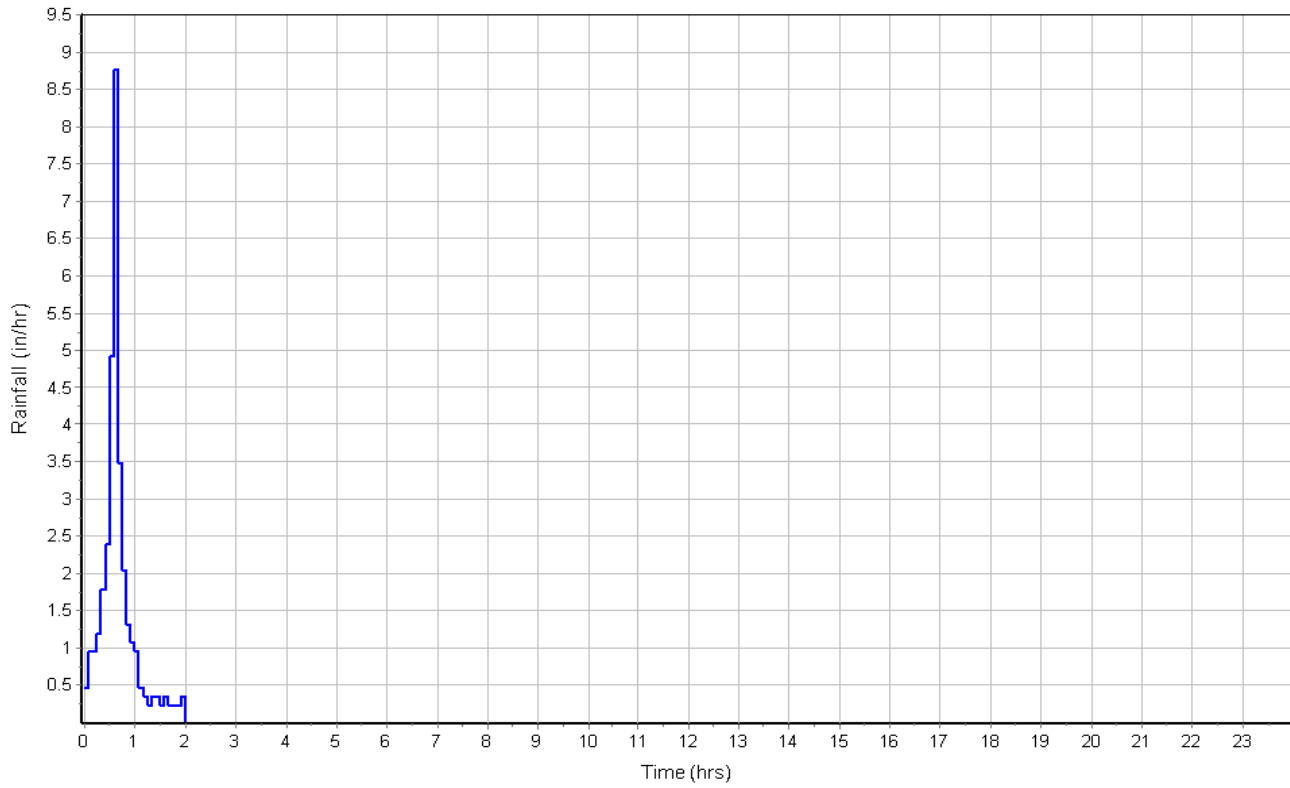
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.6	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.33	0.00	0.00
Computed Flow Time (min) :	12.53	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	2084	0.00	0.00
Channel Slope (%) :	3.6	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.22	0.00	0.00
Computed Flow Time (min) :	3.10	0.00	0.00
Total TOC (min)	36.69		

Subbasin Runoff Results

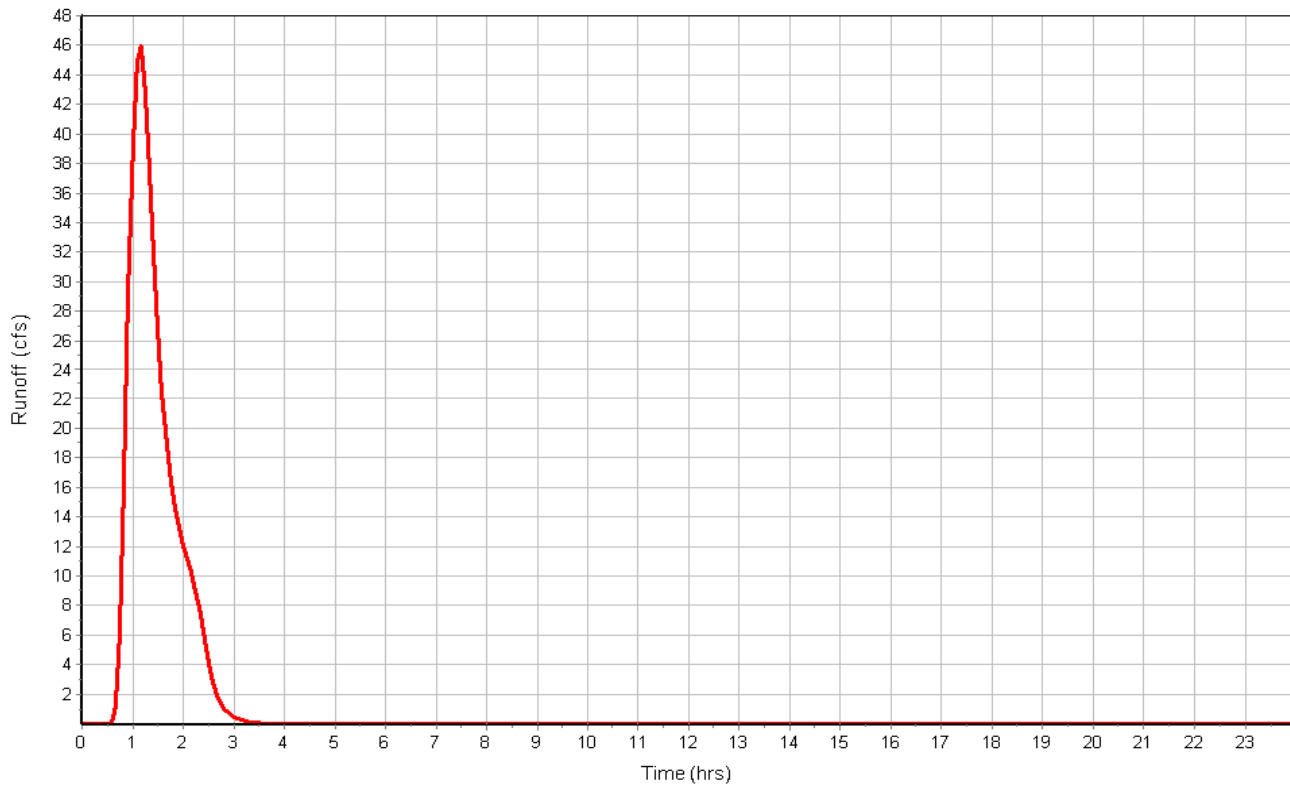
Total Rainfall (in) 2.82
 Total Runoff (in) 0.56
 Peak Runoff (cfs) 46.11
 Weighted Curve Number 68.70
 Time of Concentration (days hh:mm:ss) 0 00:36:41

Subbasin : Cb

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Da

Input Data

Area (ac) 161.30
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	161.30	B	60.00
Composite Area & Weighted CN	161.30		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5.7	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.19	0.00	0.00
Computed Flow Time (min) :	14.01	0.00	0.00

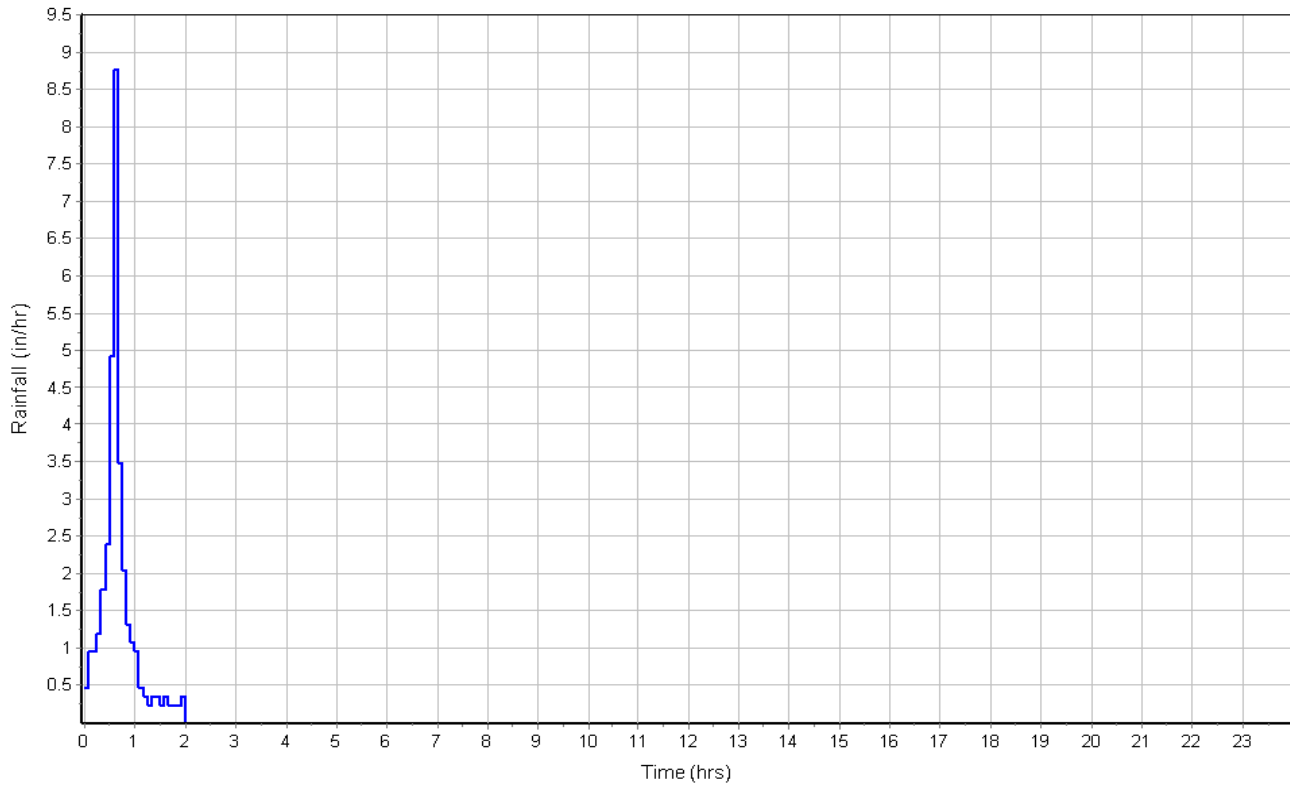
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1601	0.00	0.00
Channel Slope (%) :	5.7	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	14.12	0.00	0.00
Computed Flow Time (min) :	1.89	0.00	0.00
Total TOC (min)	36.95		

Subbasin Runoff Results

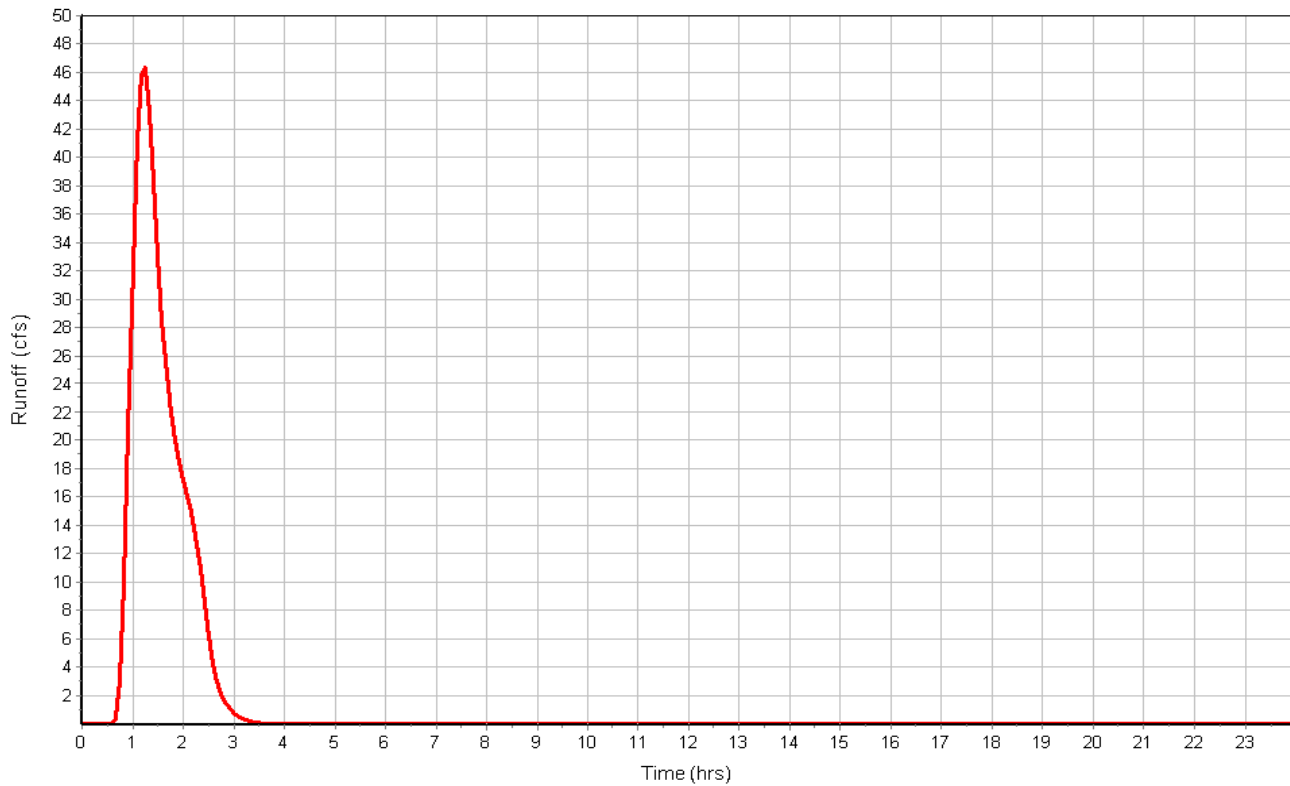
Total Rainfall (in) 2.82
 Total Runoff (in) 0.27
 Peak Runoff (cfs) 46.66
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:36:57

Subbasin : Da

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Db

Input Data

Area (ac) 49.90
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	49.90	B	60.00
Composite Area & Weighted CN	49.90		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.48	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	0.79	0.00	0.00
Computed Flow Time (min) :	21.10	0.00	0.00

Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	922	0.00	0.00
Channel Slope (%) :	2.48	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	9.31	0.00	0.00
Computed Flow Time (min) :	1.65	0.00	0.00
Total TOC (min)	43.81		

Subbasin Runoff Results

Total Rainfall (in) 2.82
 Total Runoff (in) 0.27
 Peak Runoff (cfs) 13.16
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:43:49

Subbasin : Dc

Input Data

Area (ac) 209.50
 Weighted Curve Number 67.70
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods & grass combination, Fair	83.80	B	65.00
Pasture, grassland, or range, Fair	4.19	D	84.00
Pasture, grassland, or range, Fair	121.51	B	69.00
Composite Area & Weighted CN	209.50		67.70

Time of Concentration

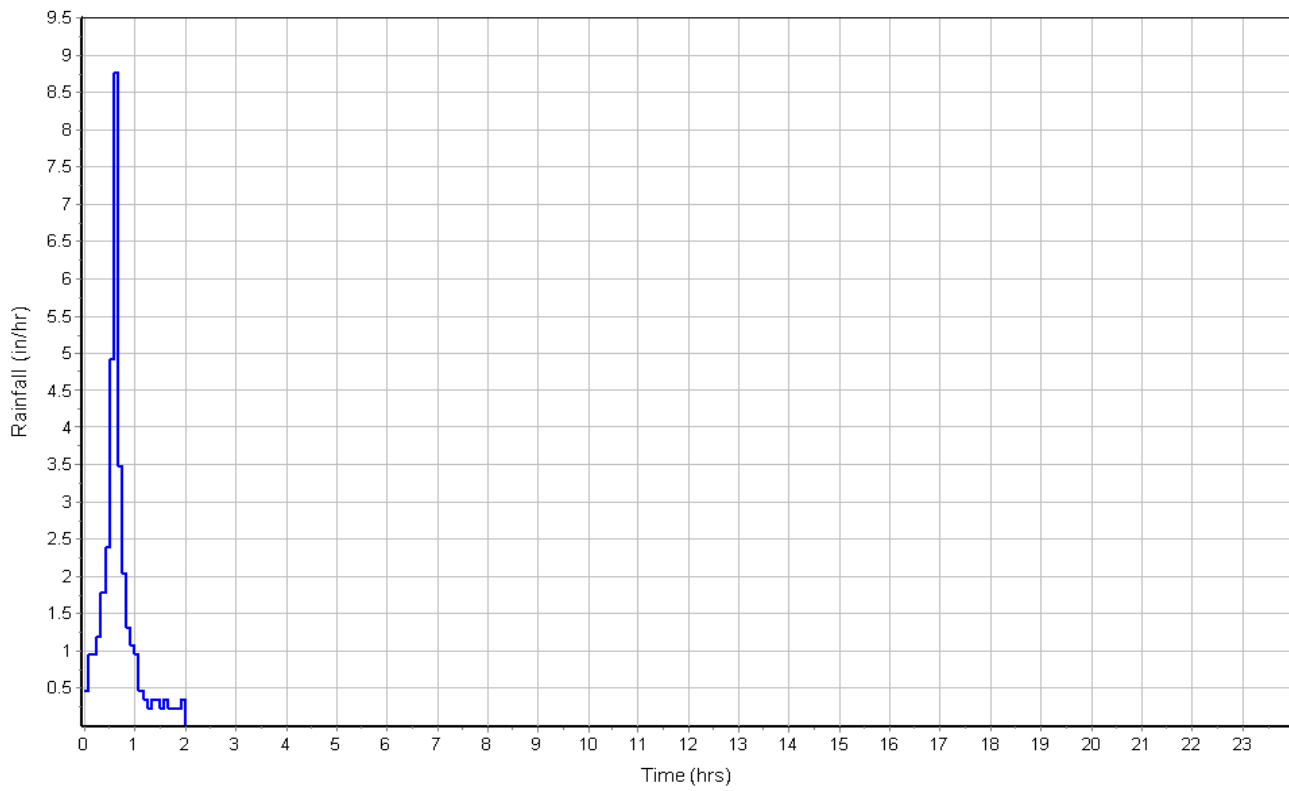
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.21	0.00	0.00
Computed Flow Time (min) :	13.77	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	3678	0.00	0.00
Channel Slope (%) :	3	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.24	0.00	0.00
Computed Flow Time (min) :	5.99	0.00	0.00
Total TOC (min)	40.82		

Subbasin Runoff Results

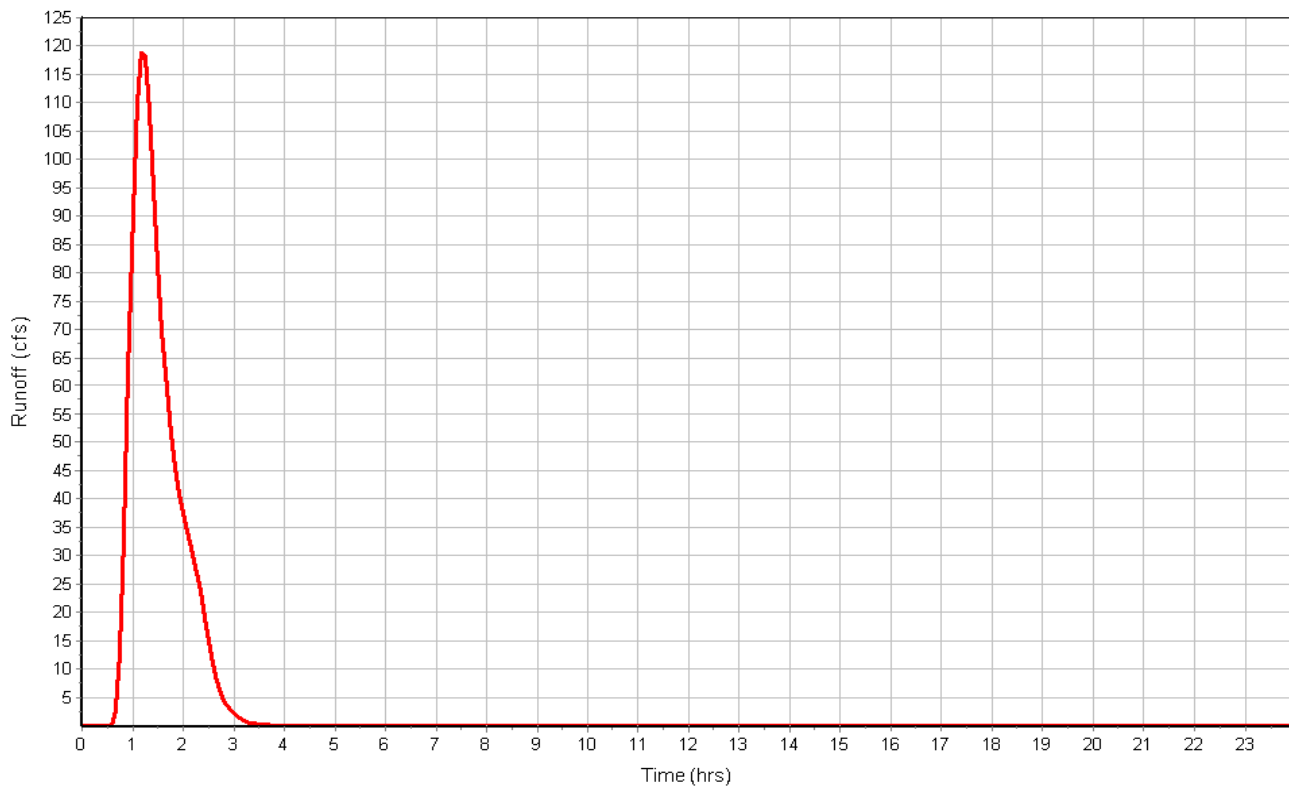
Total Rainfall (in) 2.82
 Total Runoff (in) 0.53
 Peak Runoff (cfs) 119.85
 Weighted Curve Number 67.70
 Time of Concentration (days hh:mm:ss) 0 00:40:49

Subbasin : Dc

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Ea

Input Data

Area (ac) 37.90
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	37.90	B	60.00
Composite Area & Weighted CN	37.90		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.9	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.11	0.00	0.00
Computed Flow Time (min) :	7.51	0.00	0.00

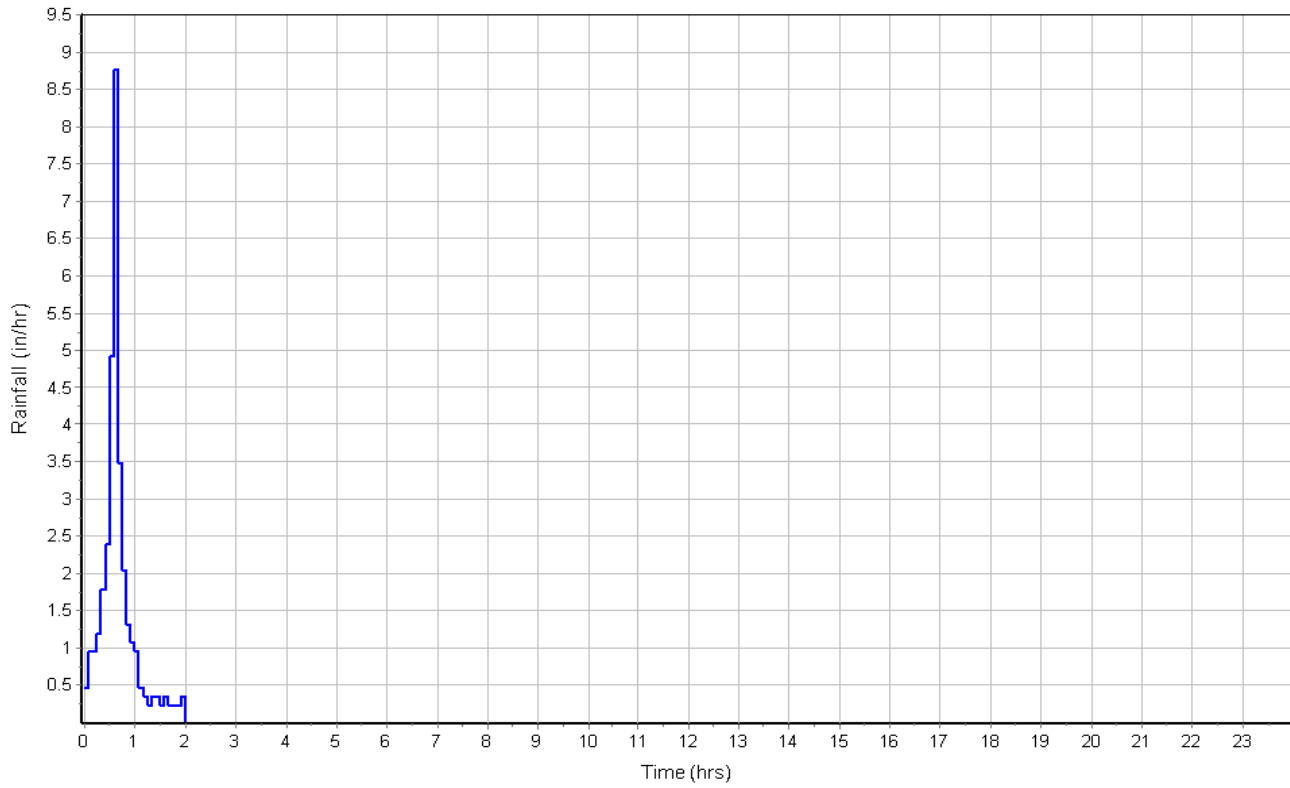
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1227	0.00	0.00
Channel Slope (%) :	4.9	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.09	0.00	0.00
Computed Flow Time (min) :	1.56	0.00	0.00
Total TOC (min)	30.13		

Subbasin Runoff Results

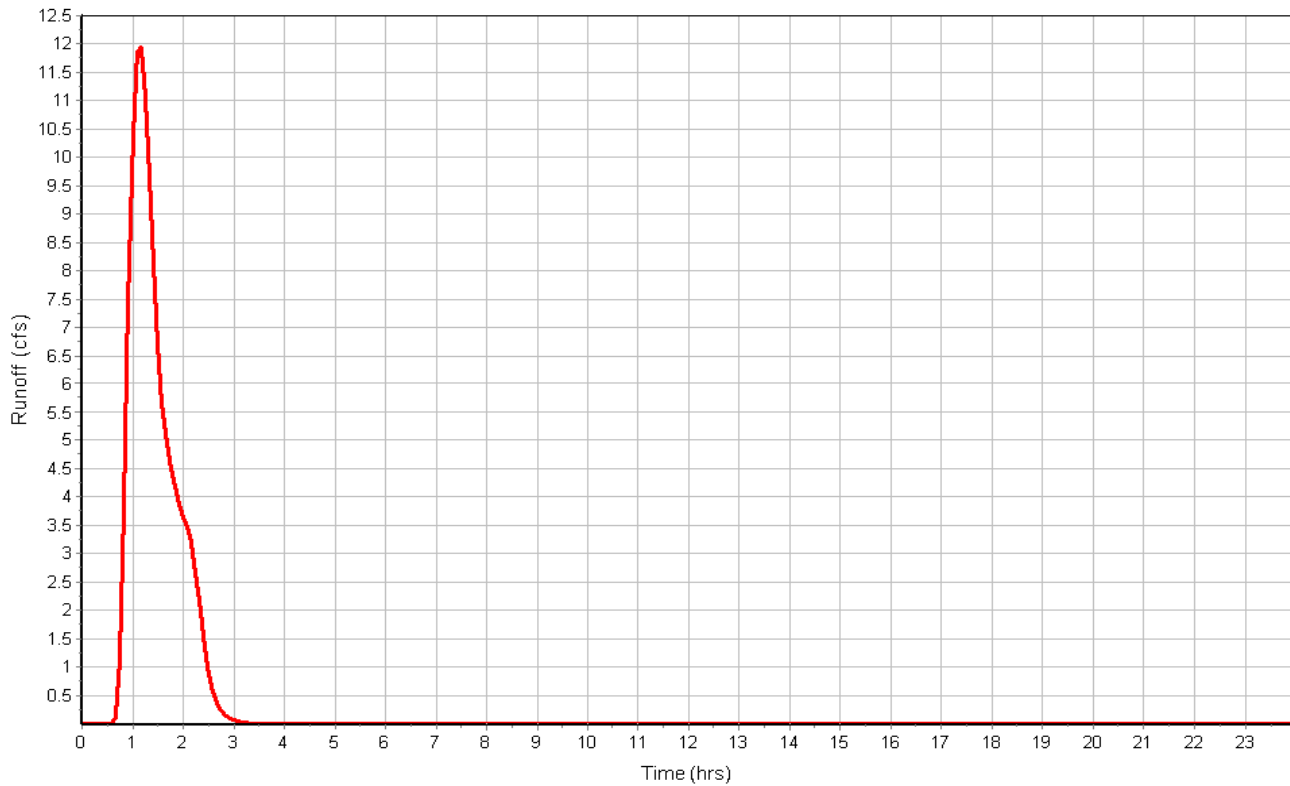
Total Rainfall (in) 2.82
 Total Runoff (in) 0.27
 Peak Runoff (cfs) 12.08
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:30:08

Subbasin : Ea

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Eb

Input Data

Area (ac) 114.80
 Weighted Curve Number 67.20
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	91.84	B	69.00
5 Acre Lots, 7% Impervious	22.96	B	60.00
Composite Area & Weighted CN	114.80		67.20

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	12.25	0.00	0.00

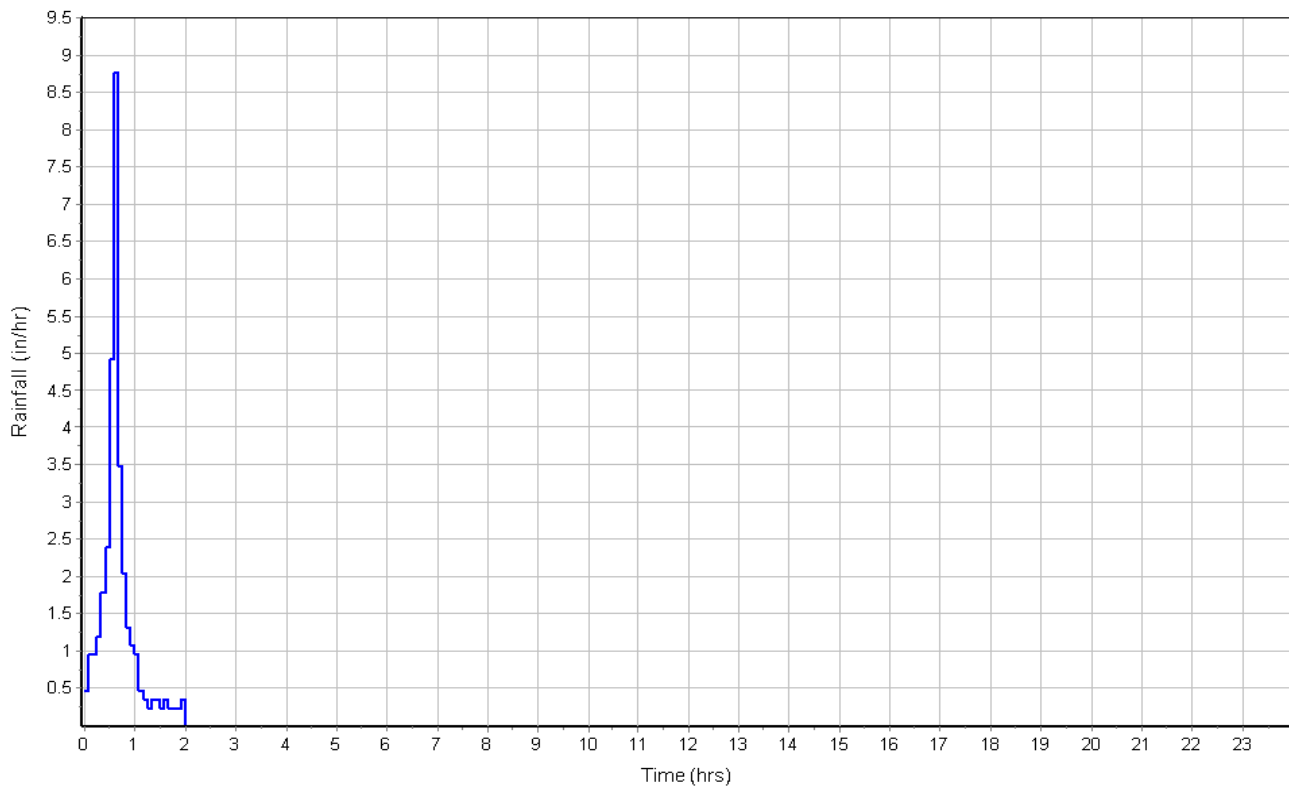
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	3696	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.53	0.00	0.00
Computed Flow Time (min) :	5.34	0.00	0.00
Total TOC (min)	38.66		

Subbasin Runoff Results

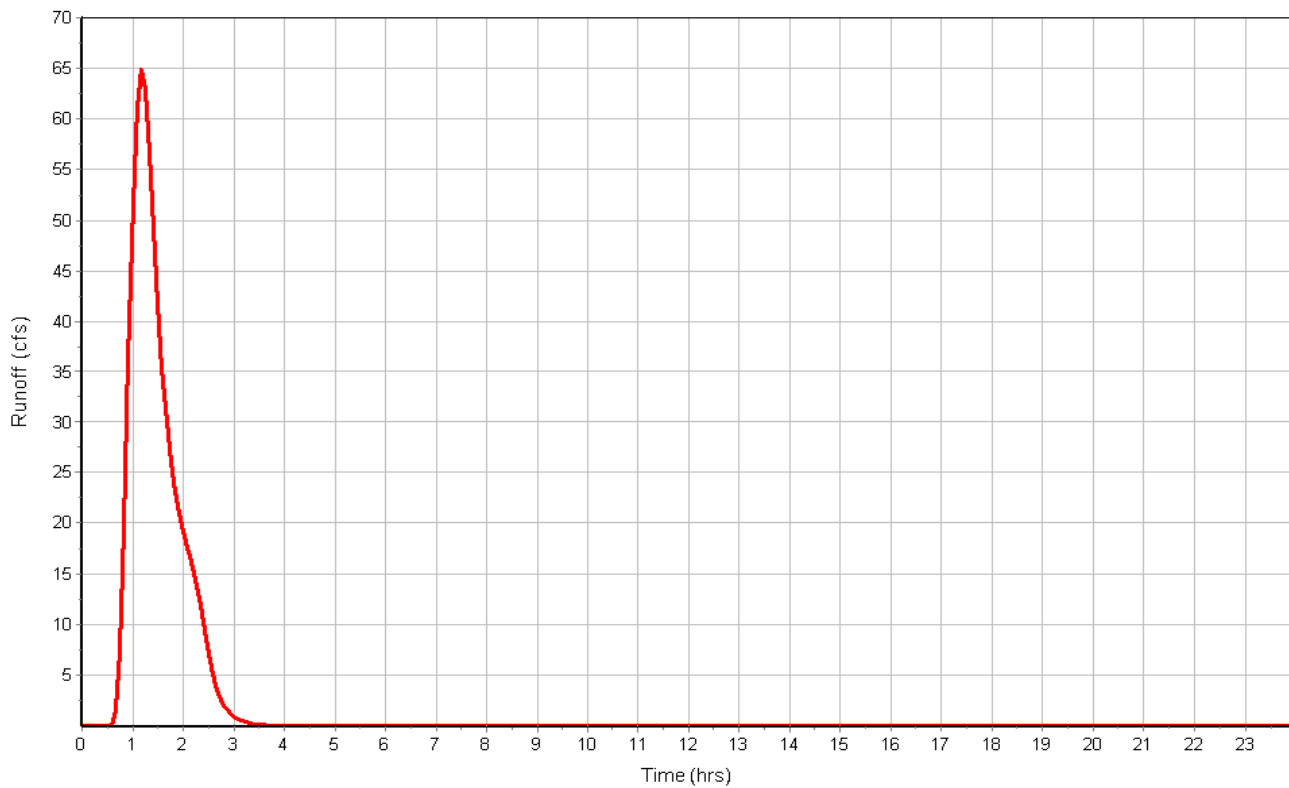
Total Rainfall (in) 2.82
 Total Runoff (in) 0.51
 Peak Runoff (cfs) 65.10
 Weighted Curve Number 67.20
 Time of Concentration (days hh:mm:ss) 0 00:38:40

Subbasin : Eb

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : F

Input Data

Area (ac) 44.50
 Weighted Curve Number 69.00
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	44.50	B	69.00
Composite Area & Weighted CN	44.50		69.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0.00	0.00
Computed Flow Time (min) :	13.33	0.00	0.00

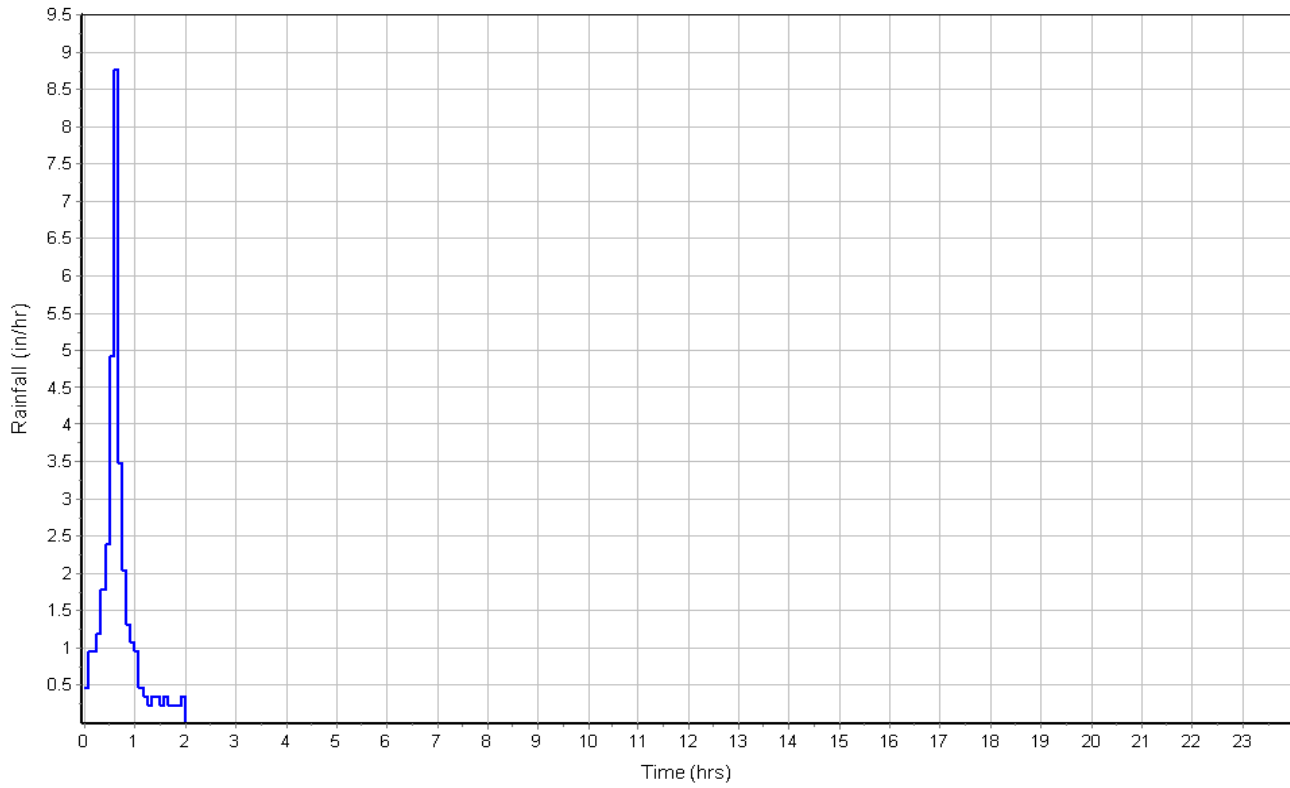
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1707	0.00	0.00
Channel Slope (%) :	3.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.58	0.00	0.00
Computed Flow Time (min) :	2.69	0.00	0.00
Total TOC (min)	37.08		

Subbasin Runoff Results

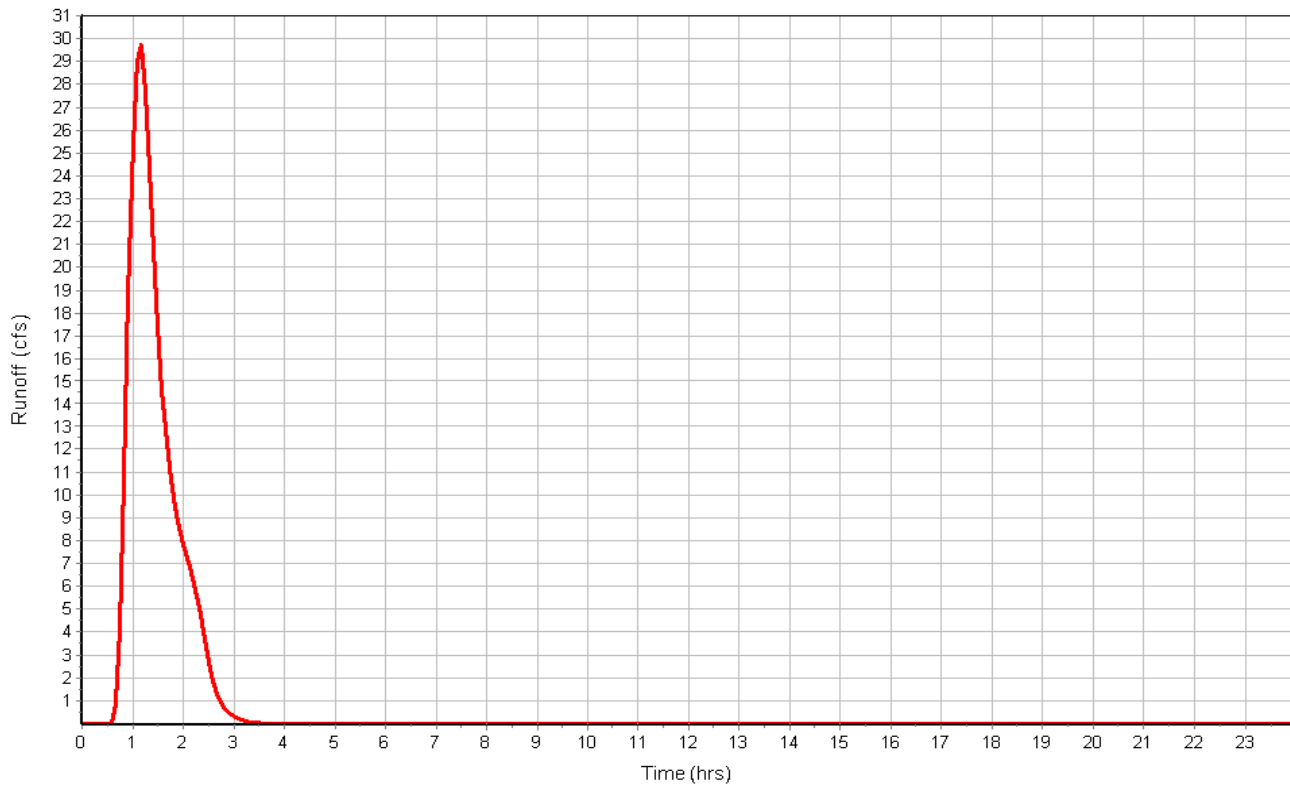
Total Rainfall (in) 2.82
 Total Runoff (in) 0.58
 Peak Runoff (cfs) 29.82
 Weighted Curve Number 69.00
 Time of Concentration (days hh:mm:ss) 0 00:37:05

Subbasin : F

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : G

Input Data

Area (ac) 107.60
 Weighted Curve Number 74.50
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	59.18	C	79.00
Pasture, grassland, or range, Fair	48.42	B	69.00
Composite Area & Weighted CN	107.60		74.50

Time of Concentration

	Flowpath A	Flowpath B	Flowpath C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

	Flowpath A	Flowpath B	Flowpath C
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.7	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.52	0.00	0.00
Computed Flow Time (min) :	10.96	0.00	0.00

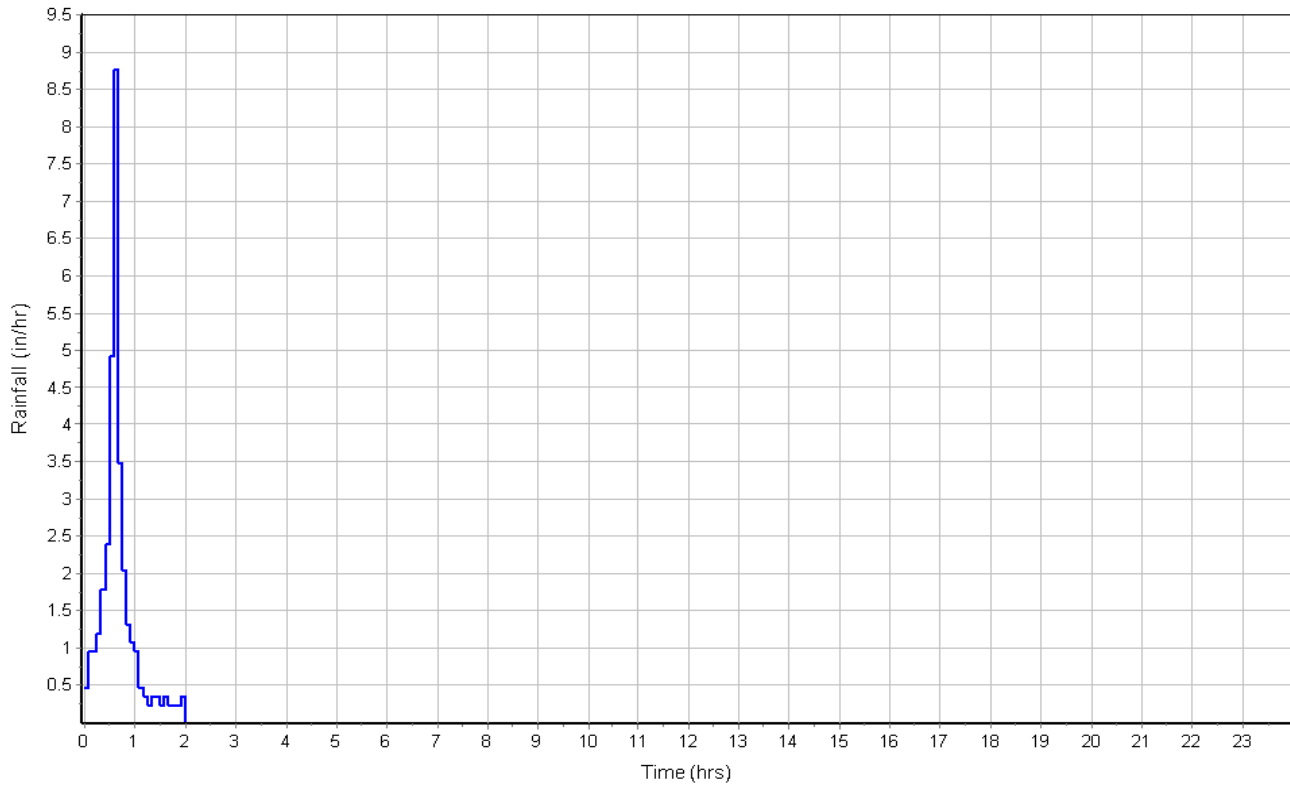
	Flowpath A	Flowpath B	Flowpath C
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1441	0.00	0.00
Channel Slope (%) :	4.7	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.82	0.00	0.00
Computed Flow Time (min) :	1.87	0.00	0.00
Total TOC (min)	33.90		

Subbasin Runoff Results

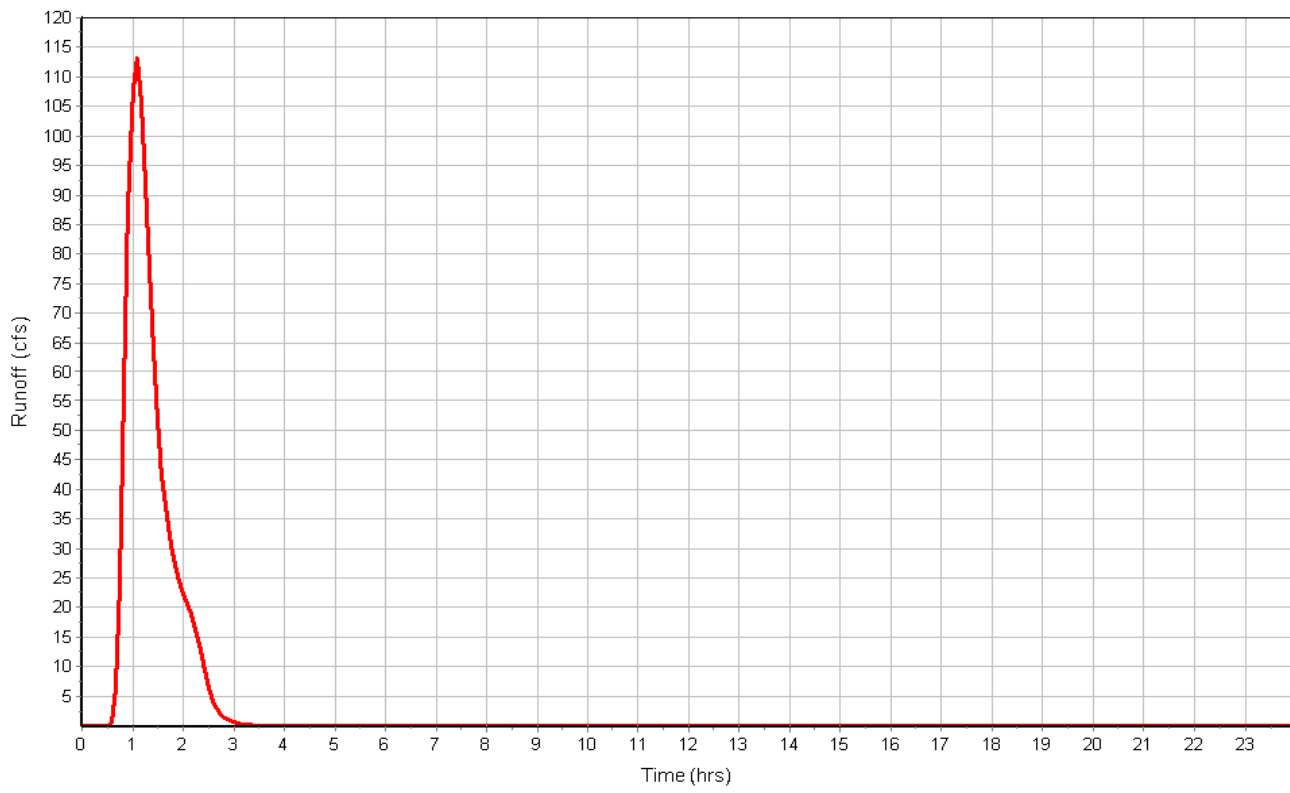
Total Rainfall (in) 2.82
 Total Runoff (in) 0.82
 Peak Runoff (cfs) 113.28
 Weighted Curve Number 74.50
 Time of Concentration (days hh:mm:ss) 0 00:33:54

Subbasin : G

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H

Input Data

Area (ac) 121.80
 Weighted Curve Number 71.76
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	54.81	C	79.00
Woods, Fair	31.67	B	60.00
Pasture, grassland, or range, Fair	30.45	B	69.00
Pasture, grassland, or range, Fair	4.87	D	84.00
Composite Area & Weighted CN	121.80		71.76

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.43	0.00	0.00
Computed Flow Time (min) :	11.66	0.00	0.00

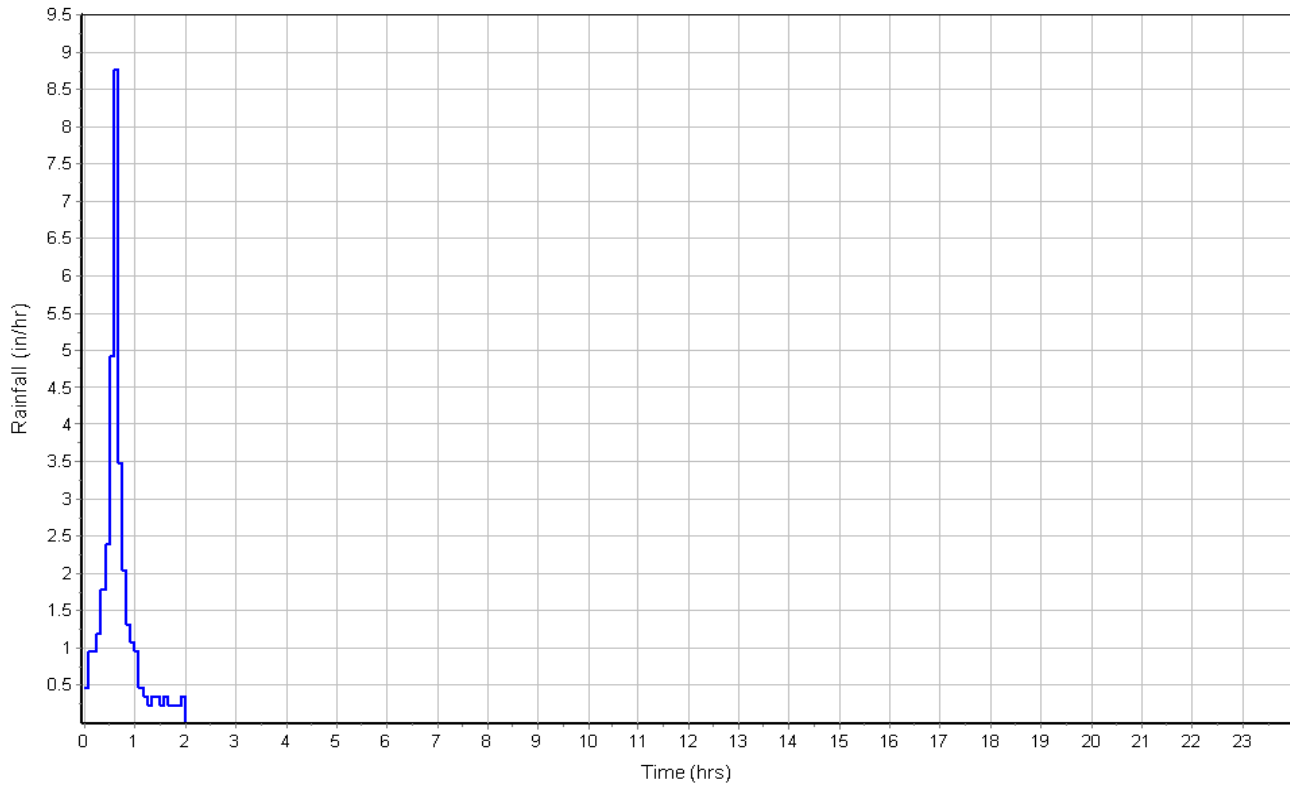
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	676	0.00	0.00
Channel Slope (%) :	4.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.12	0.00	0.00
Computed Flow Time (min) :	0.93	0.00	0.00
Total TOC (min)	33.64		

Subbasin Runoff Results

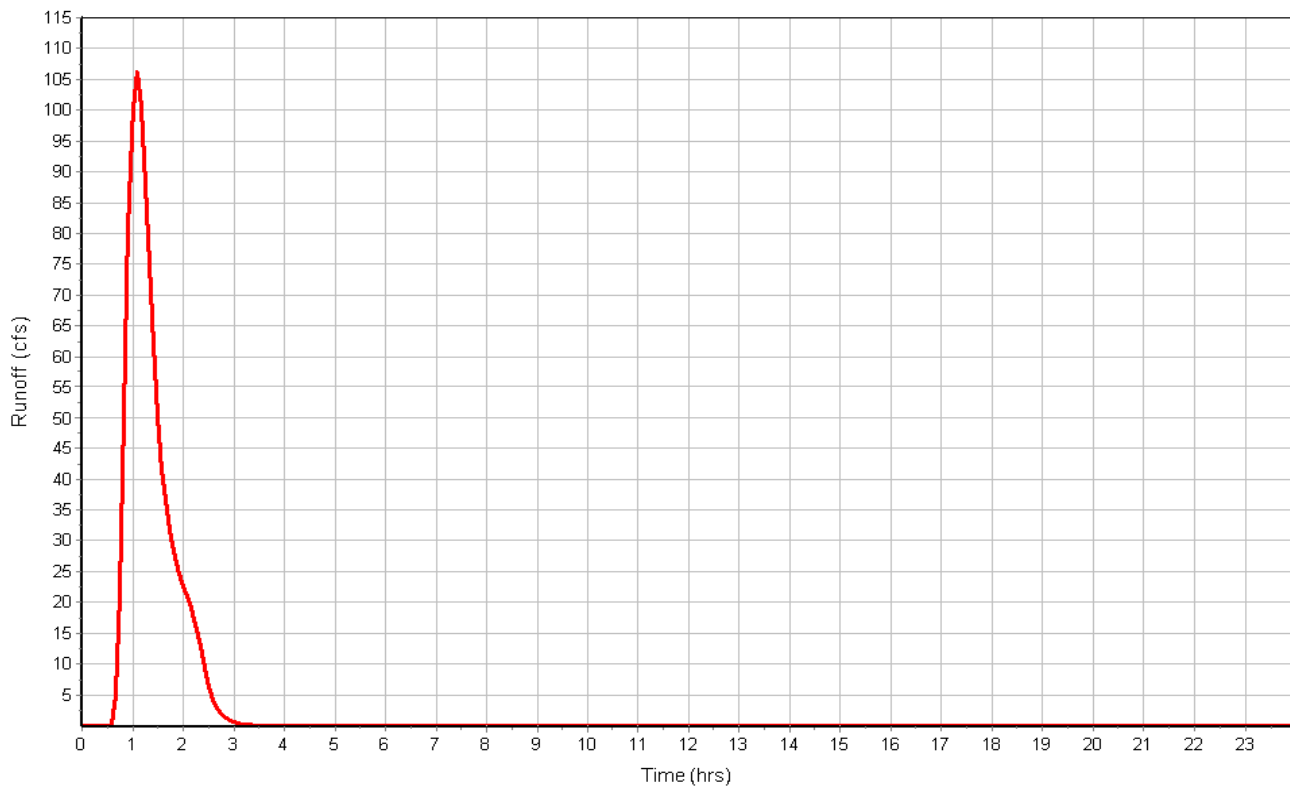
Total Rainfall (in) 2.82
 Total Runoff (in) 0.69
 Peak Runoff (cfs) 106.39
 Weighted Curve Number 71.76
 Time of Concentration (days hh:mm:ss) 0 00:33:38

Subbasin : H

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : I

Input Data

Area (ac) 37.50
 Weighted Curve Number 79.00
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	37.50	C	79.00
Composite Area & Weighted CN	37.50		79.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.58	0.00	0.00
Computed Flow Time (min) :	10.55	0.00	0.00

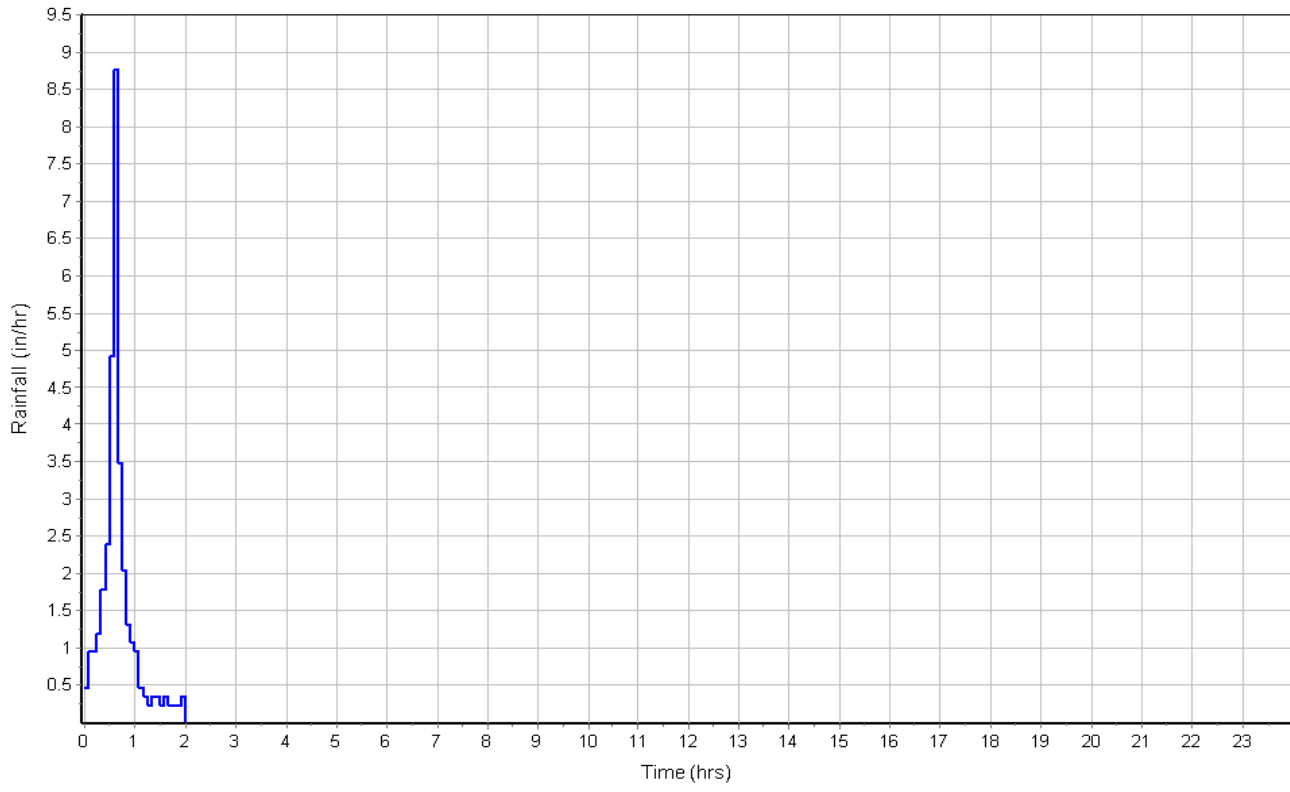
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	134	0.00	0.00
Channel Slope (%) :	5.1	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.35	0.00	0.00
Computed Flow Time (min) :	0.17	0.00	0.00
Total TOC (min)	31.77		

Subbasin Runoff Results

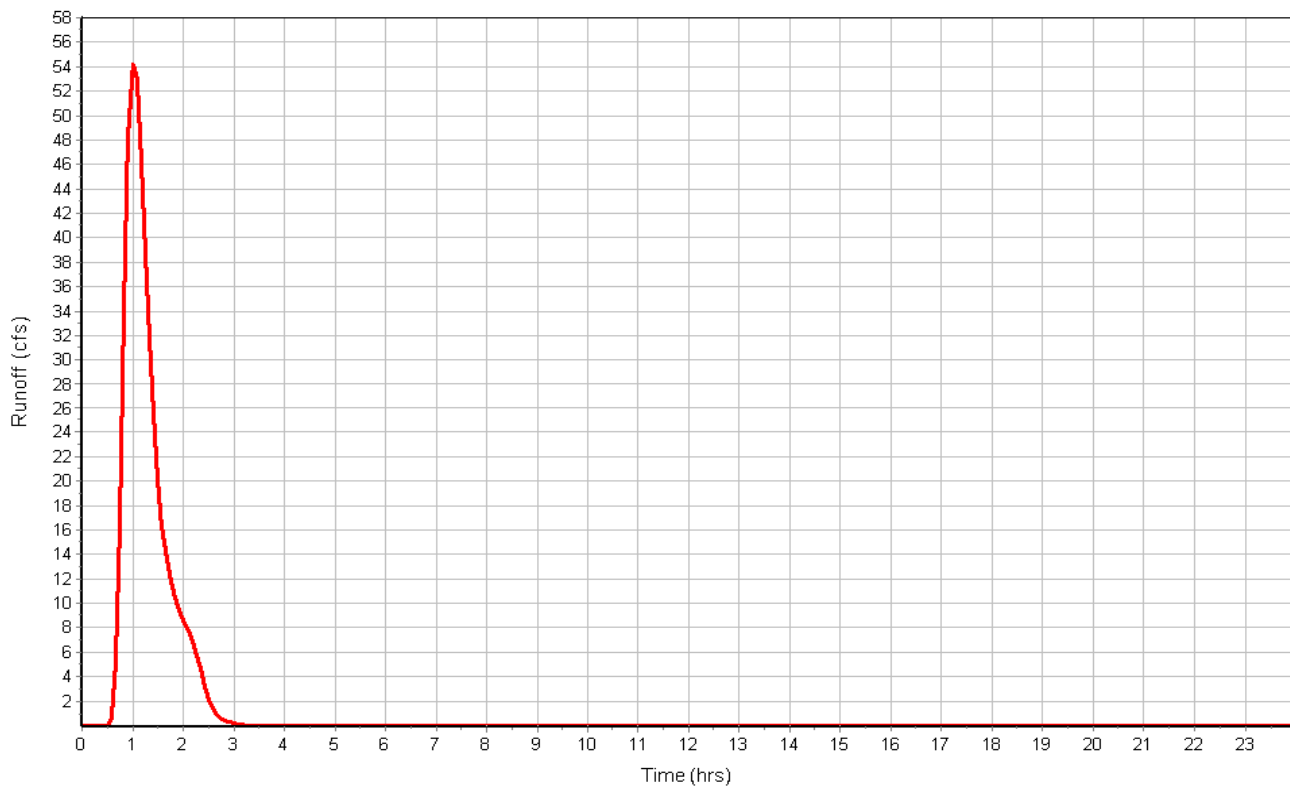
Total Rainfall (in) 2.82
 Total Runoff (in) 1.06
 Peak Runoff (cfs) 54.62
 Weighted Curve Number 79.00
 Time of Concentration (days hh:mm:ss) 0 00:31:46

Subbasin : I

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : J

Input Data

Area (ac) 10.10
 Weighted Curve Number 69.50
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	5.05	B	60.00
Woods, Fair	5.05	D	79.00
Composite Area & Weighted CN	10.10		69.50

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	8.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	2.08	0.00	0.00
Computed Flow Time (min) :	8.01	0.00	0.00

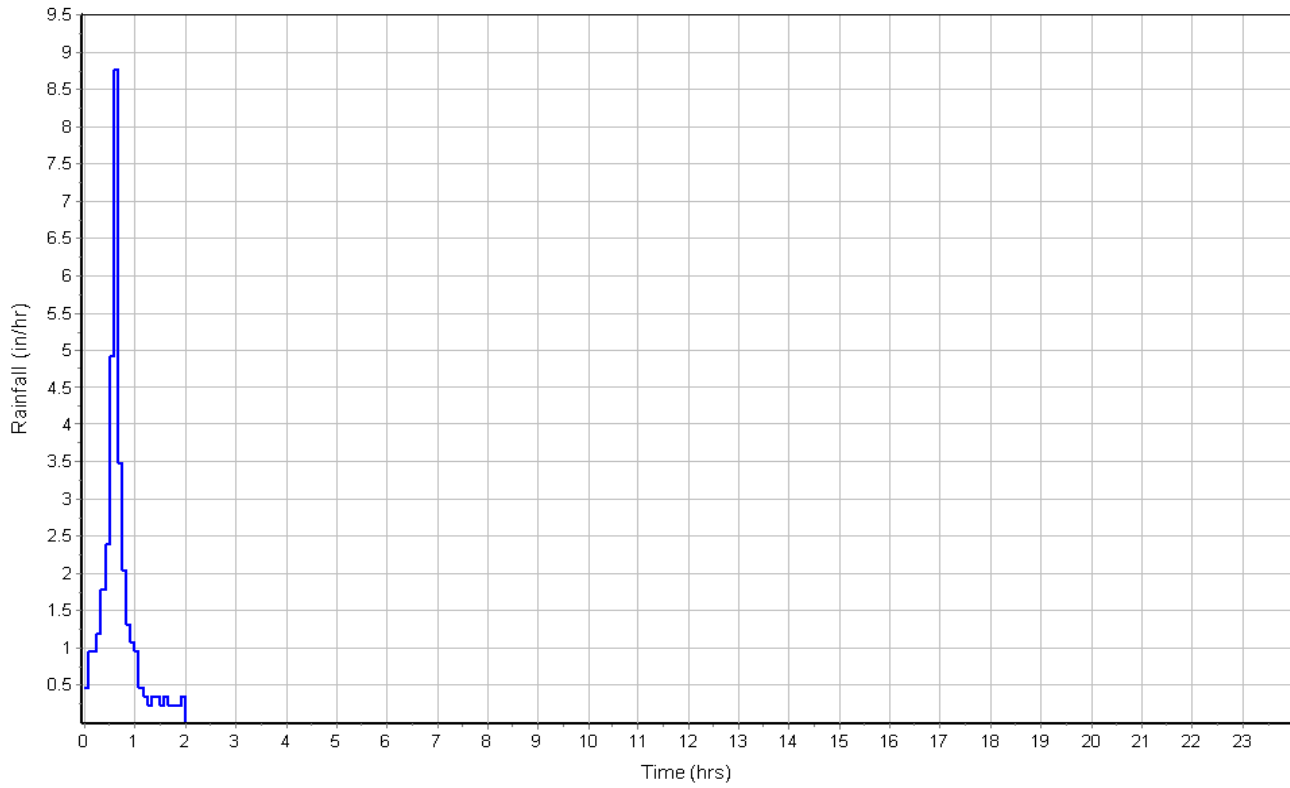
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	134	0.00	0.00
Channel Slope (%) :	5.1	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.35	0.00	0.00
Computed Flow Time (min) :	0.17	0.00	0.00
Total TOC (min)	29.24		

Subbasin Runoff Results

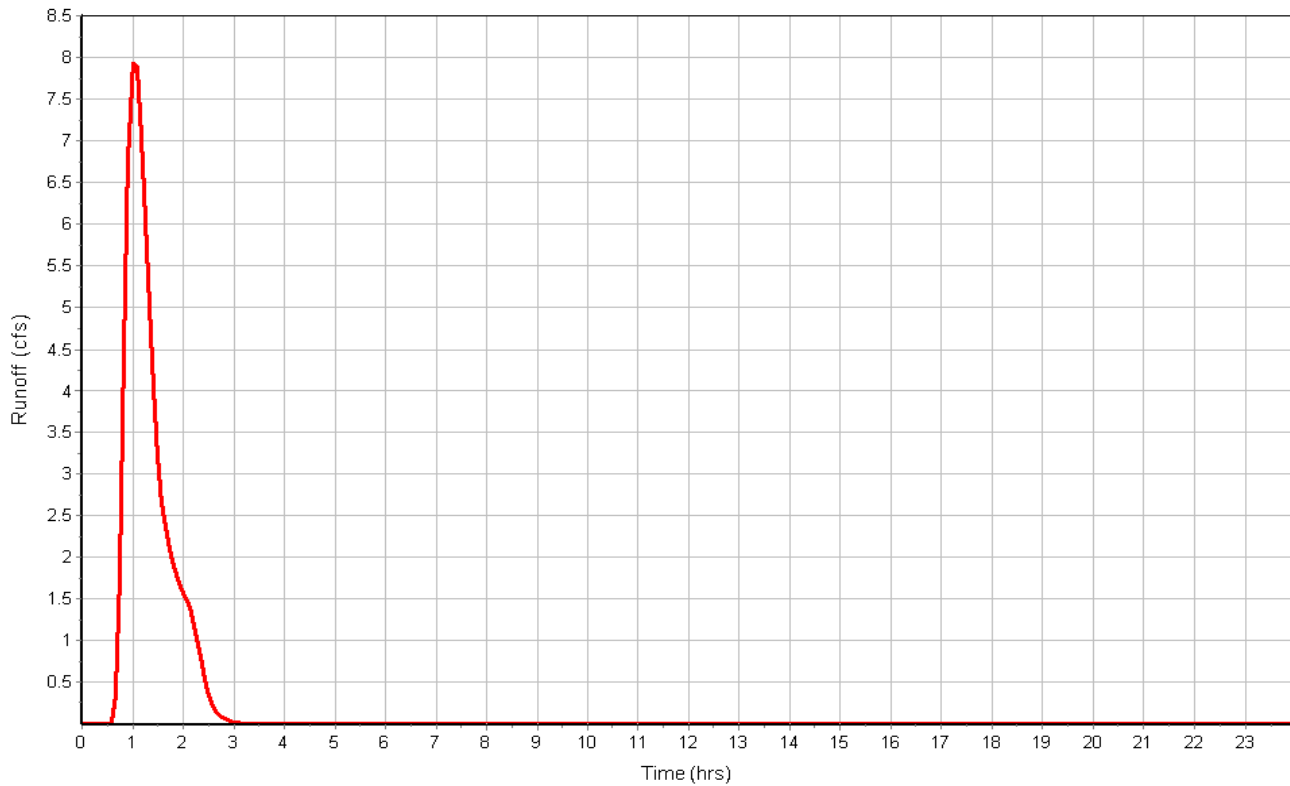
Total Rainfall (in) 2.82
 Total Runoff (in) 0.60
 Peak Runoff (cfs) 8.08
 Weighted Curve Number 69.50
 Time of Concentration (days hh:mm:ss) 0 00:29:14

Subbasin : J

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : K

Input Data

Area (ac) 17.80
 Weighted Curve Number 76.00
 Rain Gage ID Rain Gage-Thunder

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods & grass combination, Fair	17.80	C	76.00
Composite Area & Weighted CN	17.80		76.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.38	0.00	0.00
Computed Flow Time (min) :	12.08	0.00	0.00

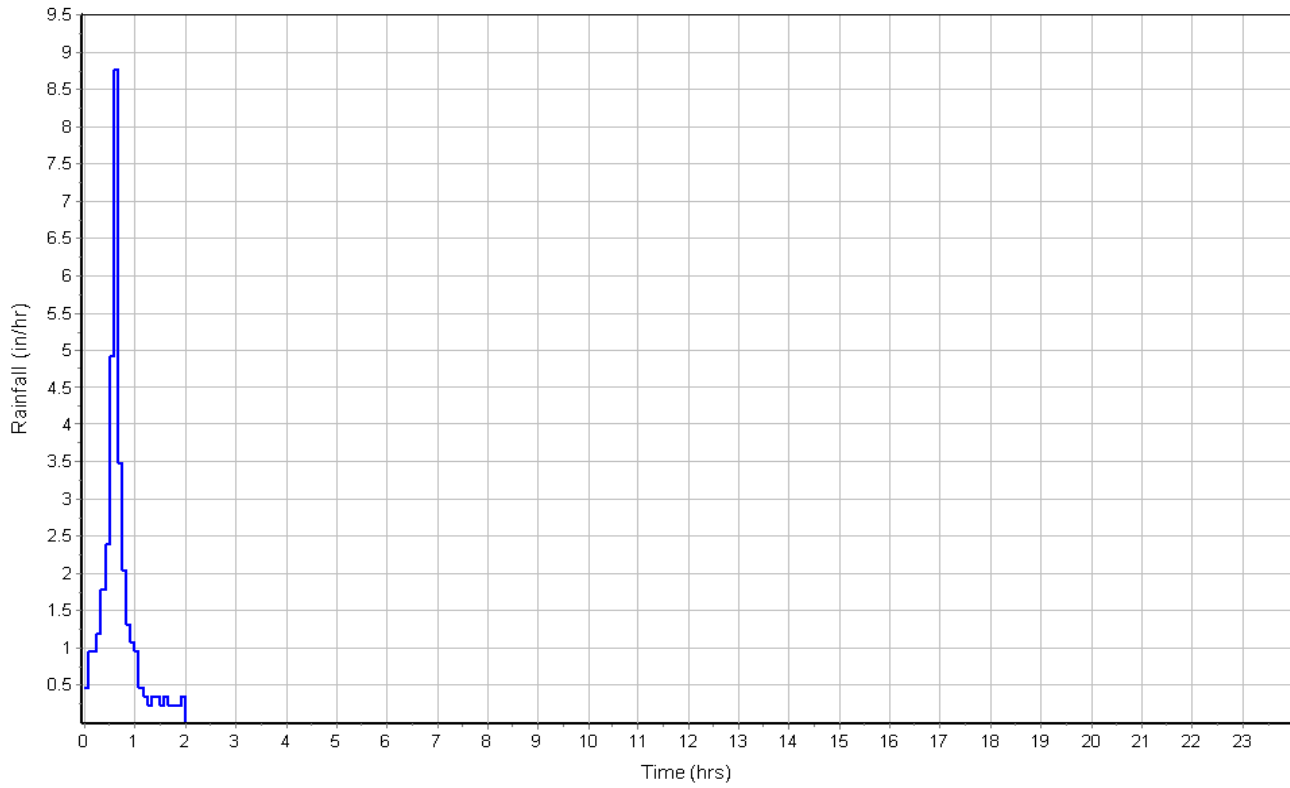
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1000	0.00	0.00
Channel Slope (%) :	3.9	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.68	0.00	0.00
Computed Flow Time (min) :	1.43	0.00	0.00
Total TOC (min)	34.56		

Subbasin Runoff Results

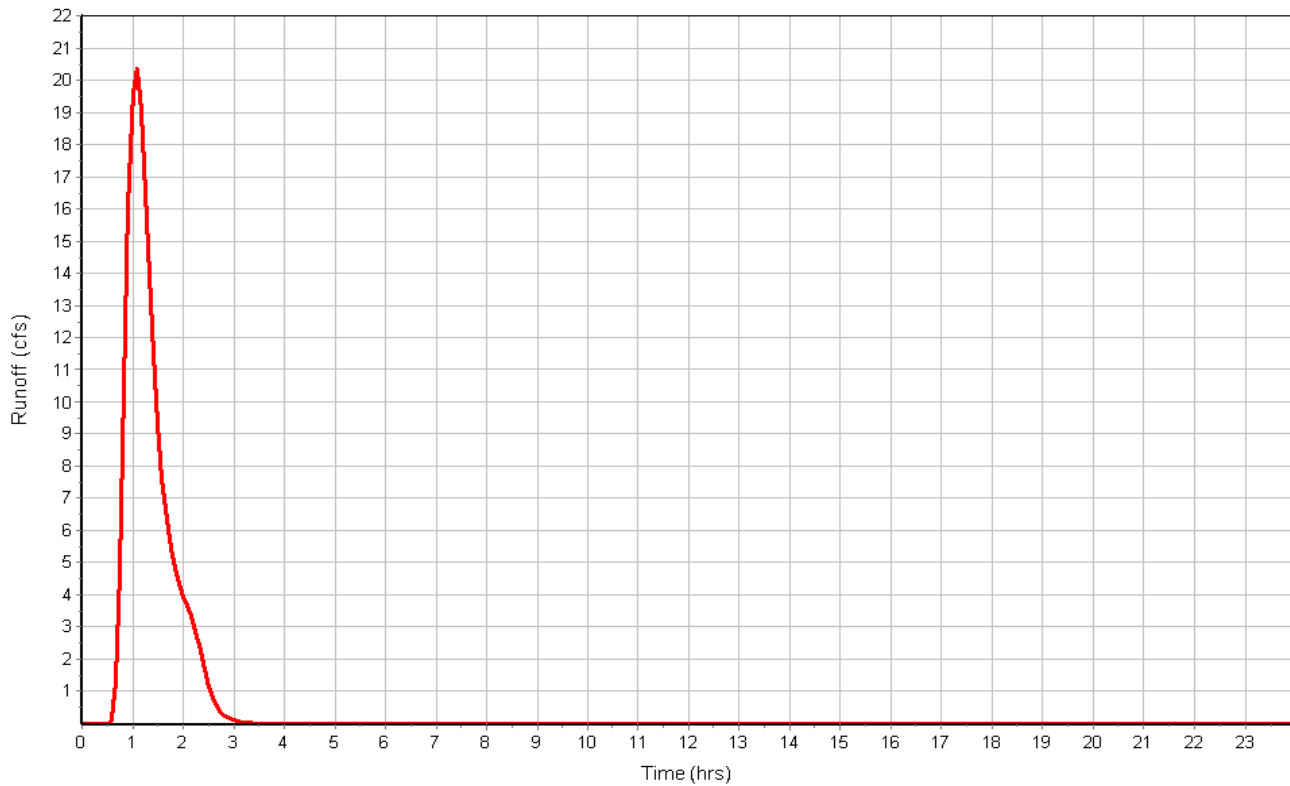
Total Rainfall (in) 2.82
 Total Runoff (in) 0.90
 Peak Runoff (cfs) 20.40
 Weighted Curve Number 76.00
 Time of Concentration (days hh:mm:ss) 0 00:34:34

Subbasin : K

Rainfall Intensity Graph



Runoff Hydrograph



Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft ²)	Minimum Pipe Cover (ft)
1	ABC	7318.50	7328.50	10.00	7318.50	0.00	7328.50	0.00	0.00	0.00
2	B1	7385.00	7395.00	10.00	7385.00	0.00	7395.00	0.00	0.00	0.00
3	B2	7380.00	7390.00	10.00	7380.00	0.00	7390.00	0.00	0.00	0.00
4	Cc1	7379.00	7389.00	10.00	7379.00	0.00	7389.00	0.00	0.00	0.00
5	Da2	7385.00	7395.00	10.00	7385.00	0.00	7395.00	0.00	0.00	0.00
6	Db2	7412.00	7422.00	10.00	7412.00	0.00	7422.00	0.00	0.00	0.00
7	Ee1	7417.00	7427.00	10.00	7417.00	0.00	7427.00	0.00	0.00	0.00
8	EF1	7276.00	7286.00	10.00	7276.00	0.00	7286.00	0.00	0.00	0.00
9	GHD	7300.00	7310.00	10.00	7300.00	0.00	7310.00	0.00	0.00	0.00
10	NUL	7280.00	7290.00	10.00	7280.00	0.00	7290.00	0.00	0.00	0.00
11	OS-J	7410.00	7420.00	10.00	7410.00	0.00	7420.00	0.00	0.00	0.00
12	OS-K	7349.00	7359.00	10.00	7349.00	0.00	7359.00	0.00	0.00	0.00

Junction Results

SN Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Max HGL Depth Attained	Max Surcharge Depth Attained	Min Freeboard Attained	Average HGL Elevation Attained	Average HGL Depth Attained	Time of Max HGL Occurrence	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(days hh:mm)	(days hh:mm)	(ac-in)	(min)
1 ABC	893.19	356.02	7322.62	4.12	0.00	5.88	7318.91	0.41	0 01:48	0 00:00	0.00	0.00
2 B1	662.36	662.36	7388.16	3.16	0.00	6.84	7385.30	0.30	0 01:55	0 00:00	0.00	0.00
3 B2	662.01	0.00	7383.16	3.16	0.00	6.84	7380.30	0.30	0 01:56	0 00:00	0.00	0.00
4 Cc1	47.12	0.00	7381.50	2.50	0.00	7.50	7379.13	0.13	0 01:09	0 00:00	0.00	0.00
5 Da2	46.35	0.00	7386.41	1.41	0.00	8.59	7385.08	0.08	0 01:20	0 00:00	0.00	0.00
6 Db2	13.05	0.00	7412.95	0.95	0.00	9.05	7412.06	0.06	0 01:25	0 00:00	0.00	0.00
7 Ee1	11.93	0.00	7417.70	0.70	0.00	9.30	7417.04	0.04	0 01:15	0 00:00	0.00	0.00
8 EFI	1099.15	142.88	7281.33	5.33	0.00	4.67	7276.59	0.59	0 01:52	0 00:00	0.00	0.00
9 GHD	1043.94	328.71	7304.12	4.12	0.00	5.88	7300.45	0.45	0 01:55	0 00:00	0.00	0.00
10 NUL	1043.21	0.00	7285.33	5.33	0.00	4.67	7280.58	0.58	0 01:48	0 00:00	0.00	0.00
11 OS-J	7.93	7.93	7410.00	0.00	0.00	10.00	7410.00	0.00	0 00:00	0 00:00	0.00	0.00
12 OS-K	20.35	20.35	7349.00	0.00	0.00	10.00	7349.00	0.00	0 00:00	0 00:00	0.00	0.00

Channel Input

SN Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	
1	2473.30	7380.00	0.00	7318.50	0.00	61.50	2.4900	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
2	2839.57	7318.50	0.00	7300.00	0.00	18.50	0.6500	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
3	1717.53	7300.00	0.00	7280.00	0.00	20.00	1.1600	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
4	1277.36	7280.00	0.00	7276.00	0.00	4.00	0.3100	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
5	70.66	7276.00	0.00	7260.00	0.00	16.00	22.6400	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
6	2431.12	7379.00	0.00	7318.50	0.00	60.50	2.4900	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
7	3754.63	7385.00	0.00	7300.00	0.00	85.00	2.2600	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
7a	4064.87	7412.00	0.00	7300.00	0.00	112.00	2.7600	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
8	5201.60	7417.00	0.00	7276.00	0.00	141.00	2.7100	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
10	BR1	492.55	7385.00	0.00	7380.00	0.00	5.00	1.0200	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
11	OverTop-Ca	462.70	7382.00	0.00	7379.00	0.00	3.00	0.6500	Trapezoidal	0.500	106.000	0.0320	0.5000	0.5000	0.0000	0.00	No
12	OverTop-Da	381.56	7388.00	0.00	7385.00	0.00	3.00	0.7900	Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00	No
13	OverTop-Db	227.21	7416.00	0.00	7412.00	0.00	4.00	1.7600	Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00	No
14	OverTop-Ea	427.06	7420.00	0.00	7417.00	0.00	3.00	0.7000	Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00	No

Channel Results

SN Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1 1	661.46	0 02:01	11419.17	0.06	8.84	4.66	2.50	0.25	0.00		
2 2	891.54	0 01:55	5845.14	0.15	5.97	7.93	4.11	0.41	0.00		
3 3	1043.21	0 01:48	7814.45	0.13	7.66	3.74	3.85	0.39	0.00		
4 4	1042.76	0 01:52	4052.37	0.26	4.75	4.48	5.33	0.53	0.00		
5 5	1099.16	0 01:48	34459.47	0.03	22.26	0.05	1.81	0.18	0.00		
6 6	46.40	0 01:33	11423.78	0.00	3.95	10.26	0.55	0.06	0.00		
7 7a	42.74	0 01:31	10895.85	0.00	3.73	16.78	0.54	0.05	0.00		
8 7b	11.06	0 01:42	12020.46	0.00	2.45	27.65	0.23	0.02	0.00		
9 8	8.77	0 01:36	11922.75	0.00	2.34	37.05	0.20	0.02	0.00		
10 BR1	662.01	0 01:56	7296.17	0.09	6.41	1.28	3.16	0.32	0.00		
11 OverTop-Ca	8.73	0 01:24	118.95	0.07	1.55	4.98	0.10	0.21	0.00		
12 OverTop-Da	0.00	0 00:00	131.98	0.00	0.00		0.00	0.00	0.00		
13 OverTop-Db	0.00	0 00:00	197.50	0.00	0.00		0.00	0.00	0.00		
14 OverTop-Ea	0.00	0 00:00	124.75	0.00	0.00		0.00	0.00	0.00		

Pipe Input

SN Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Pipe Slope (%)	Pipe Shape	Pipe Diameter or Height (ft)	Pipe Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow Gate	Flap	No. of Barrels
1 ExCulv1	100.00	7382.00	0.00	7379.00	0.00	3.00	3.0000	CIRCULAR	2.500	2.500	0.0250	0.5000	0.5000	0.0000	0.00	No	1
2 ExCulv2	100.00	7388.00	0.00	7385.00	0.00	3.00	3.0000	CIRCULAR	6.000	6.000	0.0250	0.5000	0.5000	0.0000	0.00	No	1
3 ExCulv3	100.00	7416.00	0.00	7412.00	0.00	4.00	4.0000	CIRCULAR	2.500	2.500	0.0250	0.5000	0.5000	0.0000	0.00	No	1
4 ExCulv4	125.00	7420.00	0.00	7417.00	0.00	3.00	2.4000	CIRCULAR	2.500	2.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1 ExCulv1	39.62	0 01:29	36.94	1.07	8.69	0.19	2.50	1.00	20.00		SURCHARGED
2 ExCulv2	46.35	0 01:20	381.44	0.12	9.10	0.18	1.42	0.24	0.00		Calculated
3 ExCulv3	13.05	0 01:25	42.66	0.31	7.63	0.22	0.95	0.38	0.00		Calculated
4 ExCulv4	11.93	0 01:15	68.84	0.17	10.50	0.20	0.70	0.28	0.00		Calculated

4. FRONTAL STORM RAIN GAGE DATA

Frontal Storm Rain Gage

Time	5Y Values	100Y Values	Time	5Y Values	100Y Values
0:00	0	0	12:00	1.7901	3.0498
0:06	0.00273	0.00465	12:06	1.84129	3.13702
0:12	0.00545	0.00929	12:12	1.88633	3.21374
0:18	0.00824	0.01403	12:18	1.92521	3.27998
0:24	0.01102	0.01877	12:24	1.95793	3.33574
0:30	0.01385	0.0236	12:30	1.9845	3.381
0:36	0.01669	0.02843	12:36	2.00729	3.41982
0:42	0.01958	0.03335	12:42	2.02867	3.45626
0:48	0.02246	0.03827	12:48	2.04865	3.4903
0:54	0.02541	0.04329	12:54	2.06723	3.52194
1:00	0.02835	0.0483	13:00	2.0844	3.5512
1:06	0.03135	0.05341	13:06	2.10049	3.57862
1:12	0.03434	0.05851	13:12	2.11583	3.60474
1:18	0.0374	0.06371	13:18	2.13041	3.62958
1:24	0.04045	0.06891	13:24	2.14423	3.65314
1:30	0.04355	0.0742	13:30	2.1573	3.6754
1:36	0.04666	0.07949	13:36	2.16972	3.69656
1:42	0.04982	0.08487	13:42	2.1816	3.7168
1:48	0.05297	0.09025	13:48	2.19294	3.73612
1:54	0.05619	0.09573	13:54	2.20374	3.75452
2:00	0.0594	0.1012	14:00	2.214	3.772
2:06	0.06267	0.10677	14:06	2.22391	3.78888
2:12	0.06593	0.11233	14:12	2.2336	3.8054
2:18	0.06926	0.11799	14:18	2.24313	3.82163
2:24	0.07258	0.12365	14:24	2.25245	3.8375
2:30	0.07595	0.1294	14:30	2.2616	3.8531
2:36	0.07933	0.13515	14:36	2.27054	3.86832
2:42	0.08276	0.14099	14:42	2.27931	3.88327
2:48	0.08618	0.14683	14:48	2.28787	3.89786
2:54	0.08967	0.15277	14:54	2.29627	3.91216
3:00	0.09315	0.1587	15:00	2.30445	3.9261
3:06	0.09669	0.16473	15:06	2.31247	3.93976
3:12	0.10022	0.17075	15:12	2.32027	3.95306
3:18	0.10381	0.17687	15:18	2.32791	3.96607
3:24	0.10741	0.18299	15:24	2.33534	3.97872
3:30	0.11105	0.1892	15:30	2.3426	3.9911
3:36	0.1147	0.19541	15:36	2.34965	4.0031
3:42	0.1184	0.20171	15:42	2.35653	4.01483
3:48	0.12209	0.20801	15:48	2.3632	4.0262
3:54	0.12585	0.21441	15:54	2.36971	4.03728
4:00	0.1296	0.2208	16:00	2.376	4.048
4:06	0.13341	0.22729	16:06	2.38218	4.05853
4:12	0.13727	0.23386	16:12	2.38828	4.06893
4:18	0.14118	0.24053	16:18	2.39433	4.07923
4:24	0.14515	0.2473	16:24	2.4003	4.0894
4:30	0.14918	0.25415	16:30	2.40621	4.09947
4:36	0.15325	0.2611	16:36	2.41205	4.10941
4:42	0.15738	0.26813	16:42	2.41782	4.11925
4:48	0.16157	0.27526	16:48	2.42352	4.12896
4:54	0.16581	0.28249	16:54	2.42916	4.13857
5:00	0.1701	0.2898	17:00	2.43473	4.14805
5:06	0.17445	0.29721	17:06	2.44023	4.15743
5:12	0.17885	0.3047	17:12	2.44566	4.16668
5:18	0.1833	0.31229	17:18	2.45103	4.17583
5:24	0.18781	0.31998	17:24	2.45632	4.18485
5:30	0.19238	0.32775	17:30	2.46156	4.19377
5:36	0.19699	0.33562	17:36	2.46672	4.20256
5:42	0.20166	0.34357	17:42	2.47182	4.21125
5:48	0.20639	0.35162	17:48	2.47685	4.21981
5:54	0.21117	0.35977	17:54	2.48181	4.22827
6:00	0.216	0.368	18:00	2.4867	4.2366
6:06	0.22089	0.37633	18:06	2.49153	4.24483
6:12	0.22583	0.38474	18:12	2.49629	4.25293
6:18	0.23082	0.39325	18:18	2.50098	4.26093
6:24	0.23587	0.40186	18:24	2.5056	4.2688
6:30	0.24098	0.41055	18:30	2.51016	4.27657
6:36	0.24613	0.41934	18:36	2.51465	4.28421
6:42	0.25134	0.42821	18:42	2.51907	4.29175
6:48	0.25661	0.43718	18:48	2.52342	4.29916
6:54	0.26193	0.44625	18:54	2.52771	4.30647
7:00	0.2673	0.4554	19:00	2.53192	4.31365
7:06	0.27273	0.46465	19:06	2.53608	4.32073
7:12	0.27821	0.47398	19:12	2.54016	4.32768
7:18	0.28374	0.48341	19:18	2.54418	4.33453
7:24	0.28933	0.49294	19:24	2.54812	4.34125
7:30	0.29498	0.50255	19:30	2.55201	4.34787
7:36	0.30067	0.51226	19:36	2.55582	4.35436
7:42	0.30642	0.52205	19:42	2.55957	4.36075
7:48	0.31223	0.53194	19:48	2.56325	4.36701
7:54	0.31809	0.54193	19:54	2.56686	4.37317
8:00	0.324	0.552	20:00	2.5704	4.3792
8:06	0.33008	0.56235	20:06	2.57391	4.38518
8:12	0.33642	0.57316	20:12	2.57739	4.39111
8:18	0.34304	0.58443	20:18	2.58088	4.39705
8:24	0.34992	0.59616	20:24	2.58433	4.40294
8:30	0.35708	0.60835	20:30	2.58779	4.40882
8:36	0.3645	0.621	20:36	2.59122	4.41467
8:42	0.3722	0.63411	20:42	2.59465	4.42051
8:48	0.38016	0.64768	20:48	2.59805	4.4263
8:54	0.3884	0.66171	20:54	2.60145	4.4321
9:00	0.3969	0.6762	21:00	2.60483	4.43785
9:06	0.40554	0.69092	21:06	2.6082	4.4436
9:12	0.41418	0.70564	21:12	2.61155	4.4493
9:18	0.42282	0.72036	21:18	2.6149	4.45501
9:24	0.43146	0.73508	21:24	2.61822	4.46067
9:30	0.4401	0.7498	21:30	2.62154	4.46632
9:36	0.44896	0.76489	21:36	2.62483	4.47194
9:42	0.45824	0.78071	21:42	2.62813	4.47755
9:48	0.46796	0.79727	21:48	2.63139	4.48311
9:54	0.47812	0.81457	21:54	2.63466	4.48868
10:00	0.4887	0.8326	22:00	2.6379	4.4942
10:06	0.49982	0.85155	22:06	2.64114	4.49972
10:12	0.5116	0.87161	22:12	2.64435	4.50519
10:18	0.52402	0.89277	22:18	2.64757	4.51067
10:24	0.53708	0.91503	22:24	2.65075	4.5161
10:30	0.5508	0.9384	22:30	2.65394	4.52152
10:36	0.56538	0.96324	22:36	2.6571	4.52691
10:42	0.58104	0.98992	22:42	2.66026	4.53229
10:48	0.59778	1.01844	22:48	2.66339	4.53762
10:54	0.6156	1.0488	22:54	2.66652	4.54296
11:00	0.6345	1.081	23:00	2.66963	4.54825
11:06	0.65524	1.11633	23:06	2.67273	4.55354
11:12	0.67856	1.15607	23:12	2.67581	4.55878
11:18	0.70448	1.20023	23:18	2.67889	4.56403
11:24	0.733	1.24881	23:24	2.68194	4.56923
11:30	0.7641	1.3018	23:30	2.68499	4.57442
11:36	0.82847	1.41146	23:36	2.68801	4.57958
11:42	0.95677	1.63006	23:42	2.69104	4.58473
11:48	1.16313	1.98163	23:48	2.69403	4.58983
11:54	1.53322	2.61216	23:54	2.69703	4.59494
			24:00:00	2.7	4.6

5.1 STORM MODEL OUTPUTS - EC 5Y

Project Description

File Name WinsomeSubdivisionExistingCondition (24).SPF
 Description McCune Ranch Basins

Project Options

Flow Units CFS
 Elevation Type Depth
 Hydrology Method SCS TR-55
 Time of Concentration (TOC) Method SCS TR-55
 Link Routing Method Kinematic Wave
 Enable Overflow Ponding at Nodes YES
 Skip Steady State Analysis Time Periods ... NO

Analysis Options

Start Analysis On Mar 09, 2018 00:00:00
 End Analysis On Mar 10, 2018 00:00:00
 Start Reporting On Mar 09, 2018 00:00:00
 Antecedent Dry Days 0 days
 Runoff (Dry Weather) Time Step 0 01:00:00 days hh:mm:ss
 Runoff (Wet Weather) Time Step 0 00:05:00 days hh:mm:ss
 Reporting Time Step 0 00:05:00 days hh:mm:ss
 Routing Time Step 30 seconds

Number of Elements

	Qty
Rain Gages	1
Subbasins.....	16
Nodes.....	17
<i>Junctions</i>	12
<i>Outfalls</i>	1
<i>Flow Diversions</i>	4
<i>Inlets</i>	0
<i>Storage Nodes</i>	0
Links.....	18
<i>Channels</i>	14
<i>Pipes</i>	4
<i>Pumps</i>	0
<i>Orifices</i>	0
<i>Weirs</i>	0
<i>Outlets</i>	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1		Time Series	TS-01	Cumulative	inches	Colorado	El Paso	5	2.70	SCS Type II 24-hr

Subbasin Summary

SN	Subbasin ID	Area	Weighted Curve Number	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
		(ac)	(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)	
1	A	915.40	61.83	2.70	0.28	257.23	83.48	0 00:52:35
2	Ba	3836.70	60.34	2.70	0.24	924.64	199.93	0 01:28:25
3	Bb	100.60	69.79	2.70	0.55	54.93	31.83	0 00:39:51
4	Ca	162.70	60.00	2.70	0.23	37.91	12.89	0 00:37:06
5	Cb	70.00	68.70	2.70	0.50	35.28	20.86	0 00:36:41
6	Da	161.30	60.00	2.70	0.23	37.58	12.81	0 00:36:57
7	Db	49.90	60.00	2.70	0.23	11.63	3.61	0 00:43:48
8	Dc	209.50	67.70	2.70	0.47	98.05	51.66	0 00:40:49
9	Ea	37.90	60.00	2.70	0.23	8.83	3.39	0 00:30:07
10	Eb	114.80	67.20	2.70	0.45	51.66	27.72	0 00:38:39
11	F	44.50	69.00	2.70	0.52	22.96	13.62	0 00:37:04
12	G	107.60	74.50	2.70	0.75	80.38	58.82	0 00:33:54
13	H	121.80	71.76	2.70	0.63	76.25	52.59	0 00:33:38
14	I	37.50	79.00	2.70	0.97	36.53	29.73	0 00:31:46
15	J	10.10	69.50	2.70	0.54	5.40	3.85	0 00:29:14
16	K	17.80	76.00	2.70	0.82	14.58	10.81	0 00:34:33

Node Summary

SN	Element ID	Element Type	Invert Elevation	Ground/Rim (Max) Elevation	Initial Water Elevation	Surcharge Elevation	Ponded Area	Peak Inflow	Max HGL Elevation Attained	Max Surcharge Depth Attained	Min Freeboard Attained	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
			(ft)	(ft)	(ft)	(ft)	(ft ²)	(cfs)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-in)	(min)
1	ABC	Junction	7318.50	7328.50	7318.50	7328.50	0.00	276.30	7320.74	0.00	7.76	0 00:00	0.00	0.00
2	B1	Junction	7385.00	7395.00	7385.00	7395.00	0.00	199.65	7386.67	0.00	8.33	0 00:00	0.00	0.00
3	B2	Junction	7380.00	7390.00	7380.00	7390.00	0.00	199.53	7381.67	0.00	8.33	0 00:00	0.00	0.00
4	Cc1	Junction	7379.00	7389.00	7379.00	7389.00	0.00	12.86	7380.02	0.00	8.98	0 00:00	0.00	0.00
5	Da2	Junction	7385.00	7395.00	7385.00	7395.00	0.00	12.78	7385.75	0.00	9.25	0 00:00	0.00	0.00
6	Db2	Junction	7412.00	7422.00	7412.00	7422.00	0.00	3.60	7412.49	0.00	9.51	0 00:00	0.00	0.00
7	Ee1	Junction	7417.00	7427.00	7417.00	7427.00	0.00	3.37	7417.38	0.00	9.62	0 00:00	0.00	0.00
8	EF1	Junction	7276.00	7286.00	7276.00	7286.00	0.00	349.46	7278.99	0.00	7.01	0 00:00	0.00	0.00
9	GHD	Junction	7300.00	7310.00	7300.00	7310.00	0.00	329.81	7302.24	0.00	7.76	0 00:00	0.00	0.00
10	NUL	Junction	7280.00	7290.00	7280.00	7290.00	0.00	329.69	7282.99	0.00	7.01	0 00:00	0.00	0.00
11	OS-J	Junction	7410.00	7420.00	7410.00	7420.00	0.00	3.81	7410.00	0.00	10.00	0 00:00	0.00	0.00
12	OS-K	Junction	7349.00	7359.00	7349.00	7359.00	0.00	10.79	7349.00	0.00	10.00	0 00:00	0.00	0.00
13	Out-01	Outfall	7260.00					349.46	7260.95					
14	C1	Flow Diversions	7382.00	7392.00	7382.00		0.00	12.87	7383.02				0.00	0.00
15	Da1	Flow Diversions	7388.00	7398.00	7388.00		0.00	12.79	7388.75				0.00	0.00
16	Db1	Flow Diversions	7416.00	7426.00	7416.00		0.00	3.60	7416.49				0.00	0.00
17	E1	Flow Diversions	7420.00	7430.00	7420.00		0.00	3.38	7420.38				0.00	0.00

Link Summary

SN Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope (%)	Diameter or Height (ft)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/Total Depth Ratio	Total Time Reported (min)	Surcharged Condition
1	ExCulv1	Pipe	C1 Cc1	100.00	7382.00	7379.00	3.0000	2.500	0.0250	12.86	36.94	0.35	6.85	1.02	0.41	0.00	Calculated
2	ExCulv2	Pipe	Da1 Da2	100.00	7388.00	7385.00	3.0000	6.000	0.0250	12.78	381.44	0.03	6.27	0.75	0.12	0.00	Calculated
3	ExCulv3	Pipe	Db1 Db2	100.00	7416.00	7412.00	4.0000	2.500	0.0250	3.60	42.66	0.08	5.29	0.49	0.20	0.00	Calculated
4	ExCulv4	Pipe	E1 Ee1	125.00	7420.00	7417.00	2.4000	2.500	0.0120	3.37	68.84	0.05	7.29	0.38	0.15	0.00	Calculated
5	1	Channel	B2 ABC	2473.30	7380.00	7318.50	2.4900	10.000	0.0400	199.07	11419.17	0.02	6.13	1.29	0.13	0.00	
6	2	Channel	ABC GHD	2839.57	7318.50	7300.00	0.6500	10.000	0.0400	275.37	5845.14	0.05	4.28	2.24	0.22	0.00	
7	3	Channel	GHD NUL	1717.53	7300.00	7280.00	1.1600	10.000	0.0400	329.69	7814.45	0.04	5.50	2.11	0.21	0.00	
8	4	Channel	NUL EFI	1277.36	7280.00	7276.00	0.3100	10.000	0.0400	329.49	4052.37	0.08	3.46	2.99	0.30	0.00	
9	5	Channel	EFI Out-01	70.66	7276.00	7260.00	22.6400	10.000	0.0400	349.46	34459.47	0.01	15.41	0.95	0.10	0.00	
10	6	Channel	Cc1 ABC	2431.12	7379.00	7318.50	2.4900	10.000	0.0400	11.68	11423.78	0.00	2.32	0.25	0.02	0.00	
11	7a	Channel	Da2 GHD	3754.63	7385.00	7300.00	2.2600	10.000	0.0400	10.43	10895.85	0.00	2.20	0.23	0.02	0.00	
12	7b	Channel	Db2 GHD	4064.87	7412.00	7300.00	2.7600	10.000	0.0400	2.66	12020.46	0.00	1.39	0.10	0.01	0.00	
13	8	Channel	Ee1 EFI	5201.60	7417.00	7276.00	2.7100	10.000	0.0400	1.96	11922.75	0.00	1.25	0.08	0.01	0.00	
14	BR1	Channel	B1 B2	492.55	7385.00	7380.00	1.0200	10.000	0.0400	199.53	7296.17	0.03	4.50	1.66	0.17	0.00	
15	OverTop-Ca	Channel	C1 Cc1	462.70	7382.00	7379.00	0.6500	0.500	0.0320	0.00	118.95	0.00	0.00	0.00	0.00	0.00	
16	OverTop-Da	Channel	Da1 Da2	381.56	7388.00	7385.00	0.7900	0.500	0.0320	0.00	131.98	0.00	0.00	0.00	0.00	0.00	
17	OverTop-Db	Channel	Db1 Db2	227.21	7416.00	7412.00	1.7600	0.500	0.0320	0.00	197.50	0.00	0.00	0.00	0.00	0.00	
18	OverTop-Ea	Channel	E1 Ee1	427.06	7420.00	7417.00	0.7000	0.500	0.0320	0.00	124.75	0.00	0.00	0.00	0.00	0.00	

Subbasin Hydrology

Subbasin : A

Input Data

Area (ac) 915.40
 Weighted Curve Number 61.83
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	823.86	B	60.00
Pasture, grassland, or range, Fair	9.15	D	84.00
Pasture, grassland, or range, Fair	64.08	C	79.00
Pasture, grassland, or range, Fair	9.15	B	69.00
5 Acre Lots, 7% Impervious	9.15	D	77.00
Composite Area & Weighted CN	915.39		61.83

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

$$T_c = (0.007 * ((n * L_f)^{0.8})) / ((P^{0.5}) * (S_f^{0.4}))$$

Where :

T_c = Time of Concentration (hr)
 n = Manning's roughness
 L_f = Flow Length (ft)
 P = 2 yr, 24 hr Rainfall (inches)
 S_f = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (S_f^{0.5}) (unpaved surface)
 V = 20.3282 * (S_f^{0.5}) (paved surface)
 V = 15.0 * (S_f^{0.5}) (grassed waterway surface)
 V = 10.0 * (S_f^{0.5}) (nearly bare & untilled surface)
 V = 9.0 * (S_f^{0.5}) (cultivated straight rows surface)
 V = 7.0 * (S_f^{0.5}) (short grass pasture surface)
 V = 5.0 * (S_f^{0.5}) (woodland surface)
 V = 2.5 * (S_f^{0.5}) (forest w/heavy litter surface)
 T_c = (L_f / V) / (3600 sec/hr)

Where:

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)

Channel Flow Equation :

$$V = (1.49 * (R^{2/3}) * (S_f^{0.5})) / n$$

$$R = A_q / W_p$$

$$T_c = (L_f / V) / (3600 \text{ sec/hr})$$

Where :

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 R = Hydraulic Radius (ft)
 A_q = Flow Area (ft²)
 W_p = Wetted Perimeter (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)
 n = Manning's roughness

	Flowpath A	Flowpath B	Flowpath C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

	Flowpath A	Flowpath B	Flowpath C
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.57	0.00	0.00
Computed Flow Time (min) :	10.62	0.00	0.00

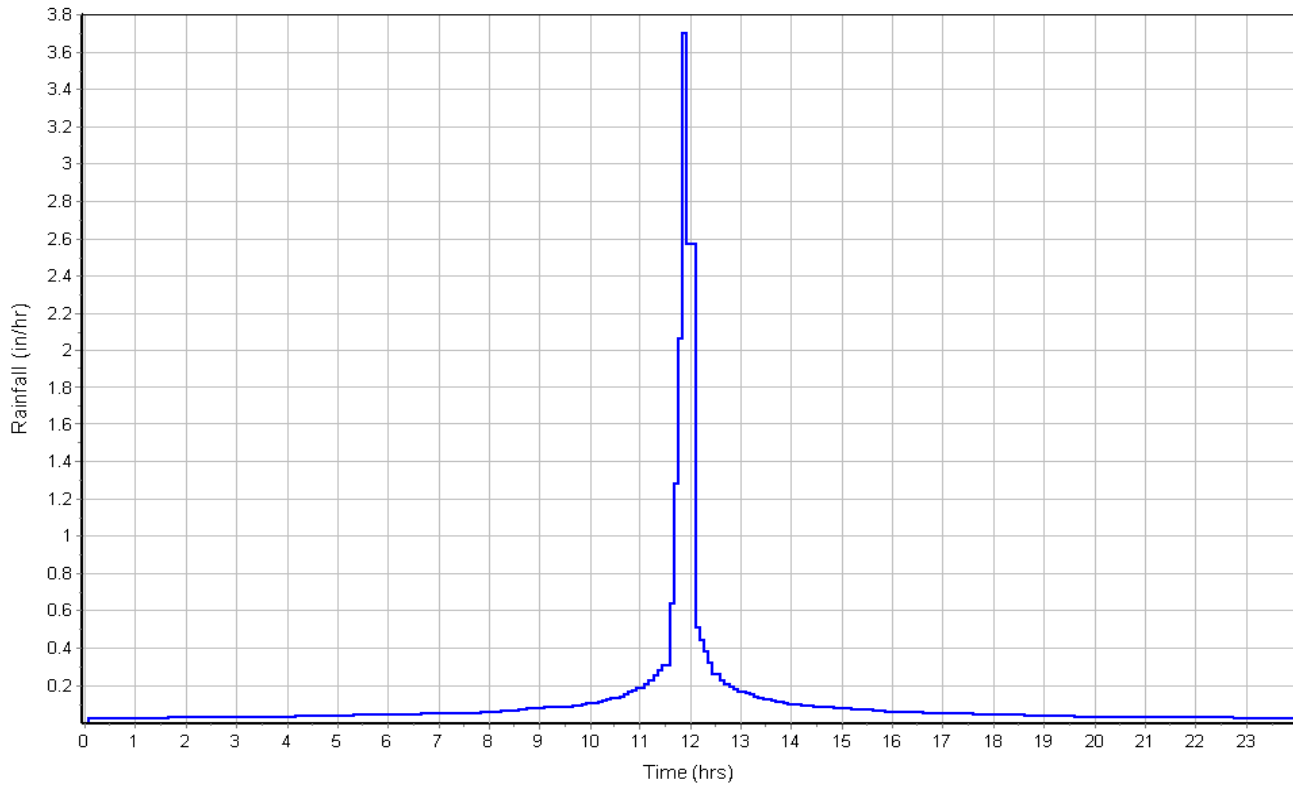
	Flowpath A	Flowpath B	Flowpath C
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	10494	0.00	0.00
Channel Slope (%) :	2	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.36	0.00	0.00
Computed Flow Time (min) :	20.92	0.00	0.00
Total TOC (min)	52.59		

Subbasin Runoff Results

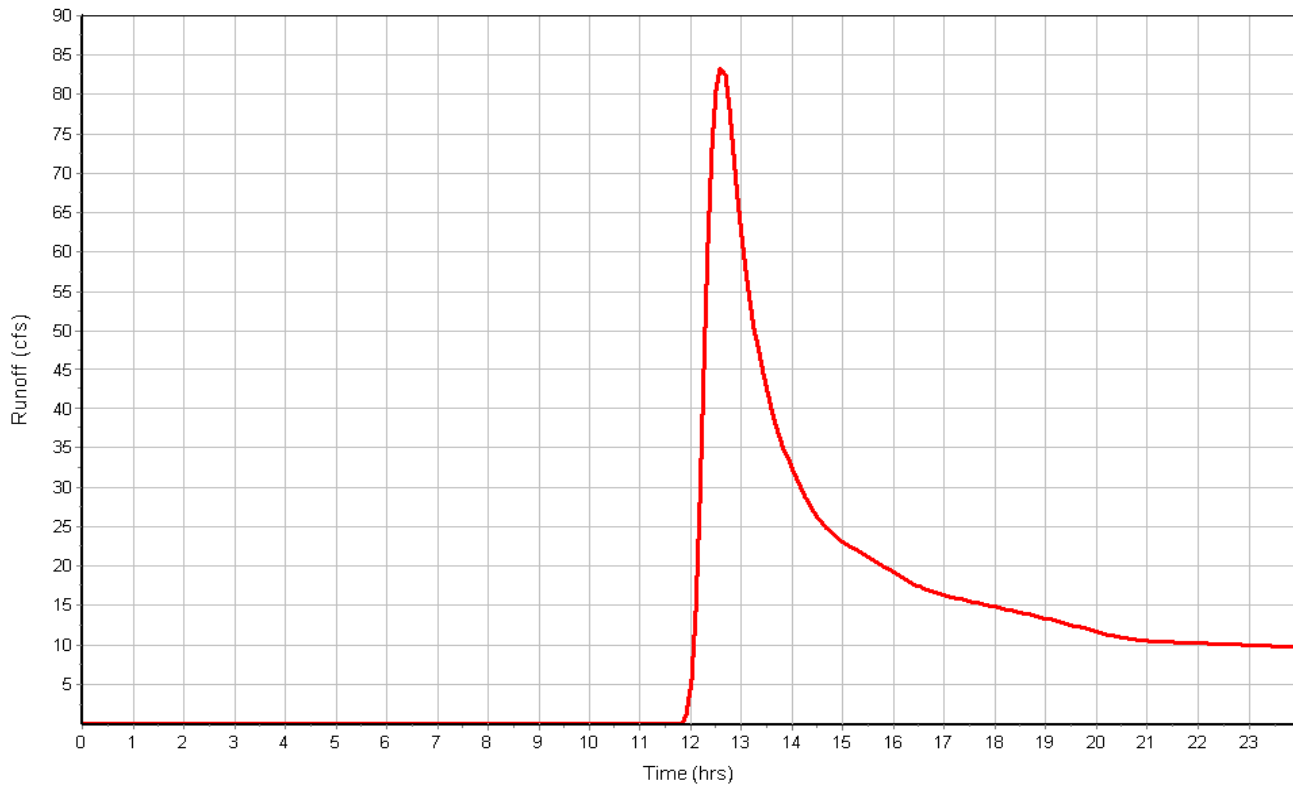
Total Rainfall (in)	2.70
Total Runoff (in)	0.28
Peak Runoff (cfs)	83.48
Weighted Curve Number	61.83
Time of Concentration (days hh:mm:ss)	0 00:52:35

Subbasin : A

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Ba

Input Data

Area (ac) 3836.70
 Weighted Curve Number 60.34
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	3759.97	B	60.00
5 Acre Lots, 7% Impervious	76.73	D	77.00
Composite Area & Weighted CN	3836.70		60.34

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	4	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.40	0.00	0.00
Computed Flow Time (min) :	11.90	0.00	0.00

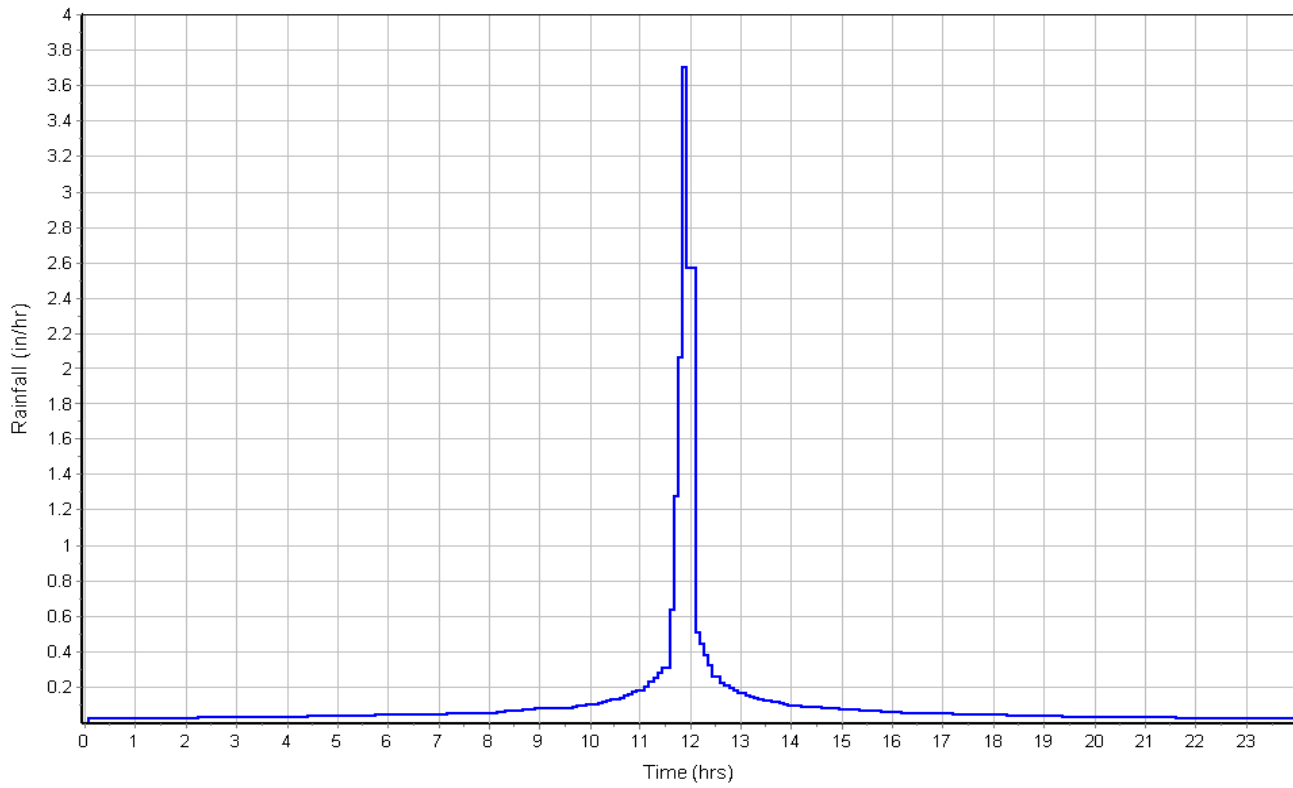
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	23284	0.00	0.00
Channel Slope (%) :	1.4	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	7.00	0.00	0.00
Computed Flow Time (min) :	55.47	0.00	0.00
Total TOC (min)	88.43		

Subbasin Runoff Results

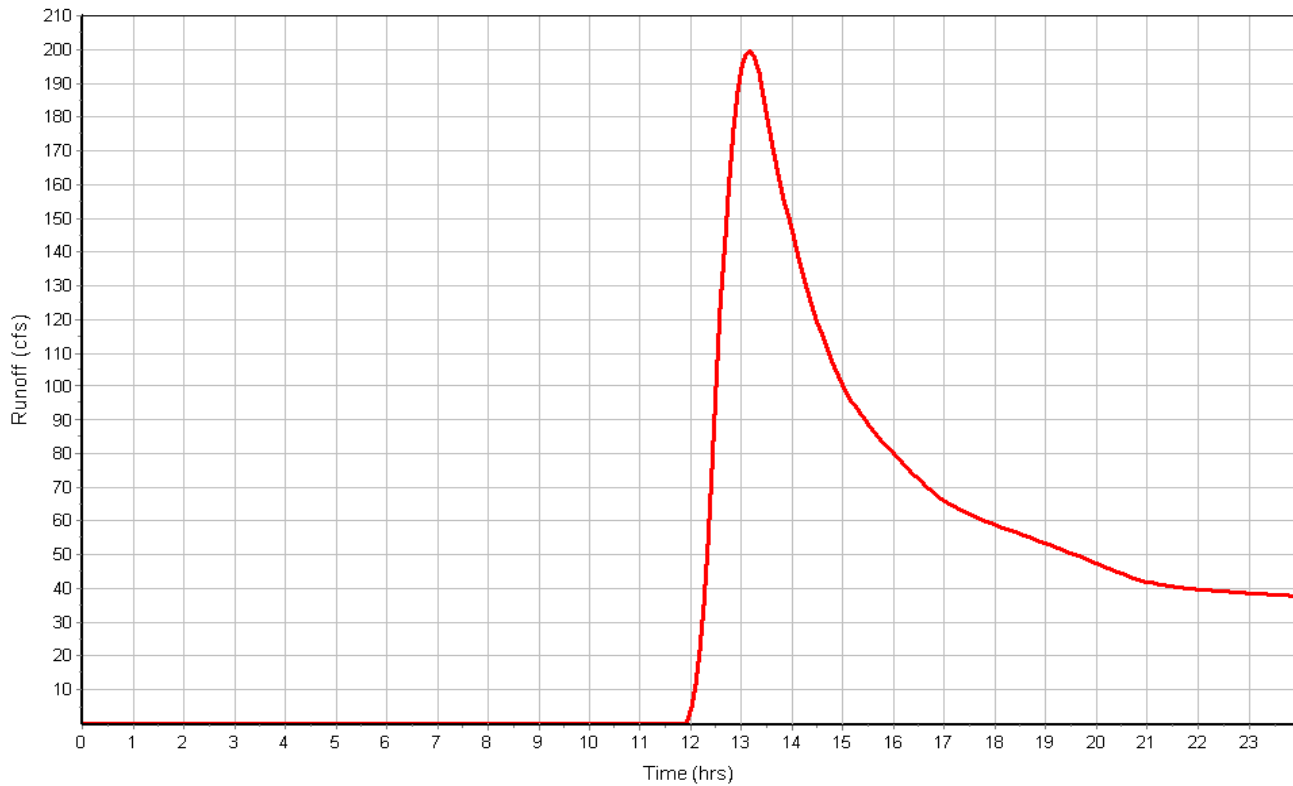
Total Rainfall (in) 2.70
 Total Runoff (in) 0.24
 Peak Runoff (cfs) 199.93
 Weighted Curve Number 60.34
 Time of Concentration (days hh:mm:ss) 0 01:28:26

Subbasin : Ba

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Bb

Input Data

Area (ac) 100.60
 Weighted Curve Number 69.79
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	90.54	B	69.00
Pasture, grassland, or range, Fair	5.03	D	84.00
Composite Area & Weighted CN	95.57		69.79

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.48	0.00	0.00
Computed Flow Time (min) :	11.26	0.00	0.00

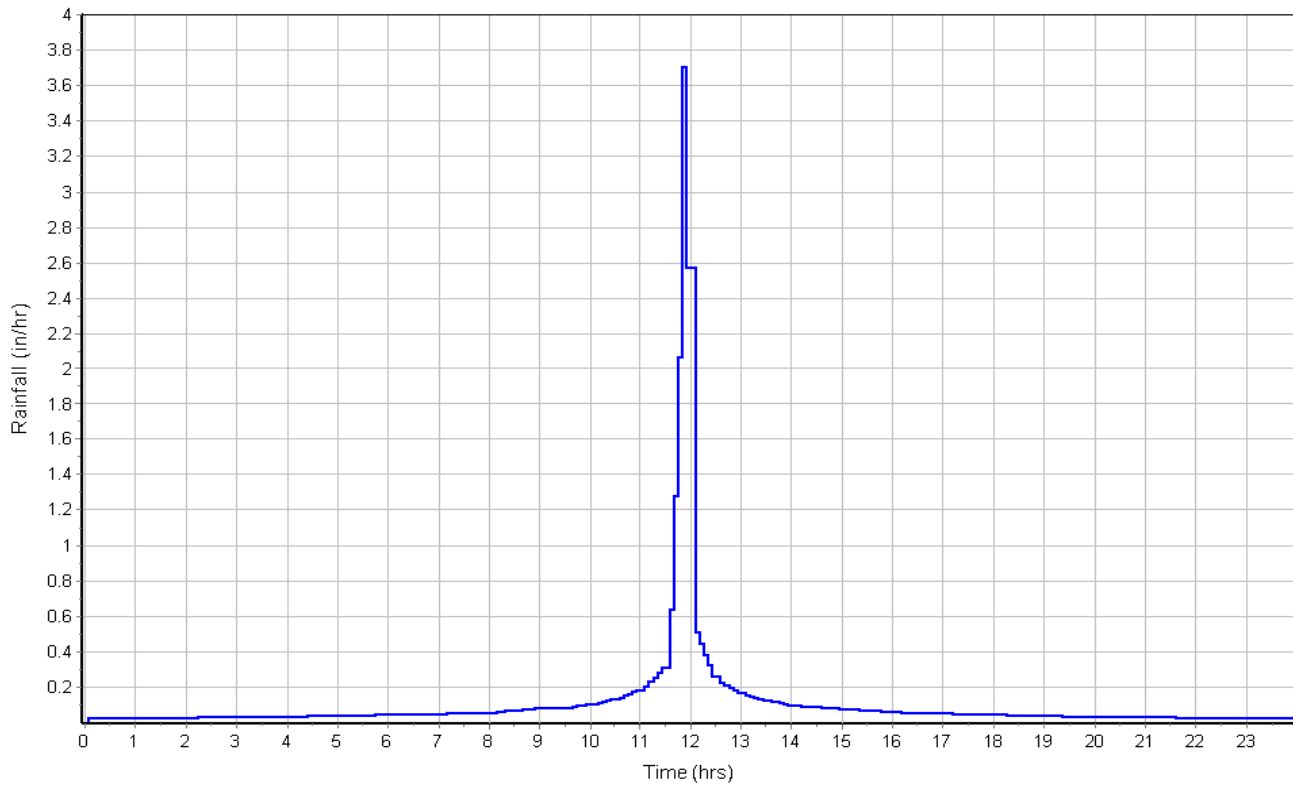
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	4140	0.00	0.00
Channel Slope (%) :	2.4	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	9.16	0.00	0.00
Computed Flow Time (min) :	7.53	0.00	0.00
Total TOC (min)	39.85		

Subbasin Runoff Results

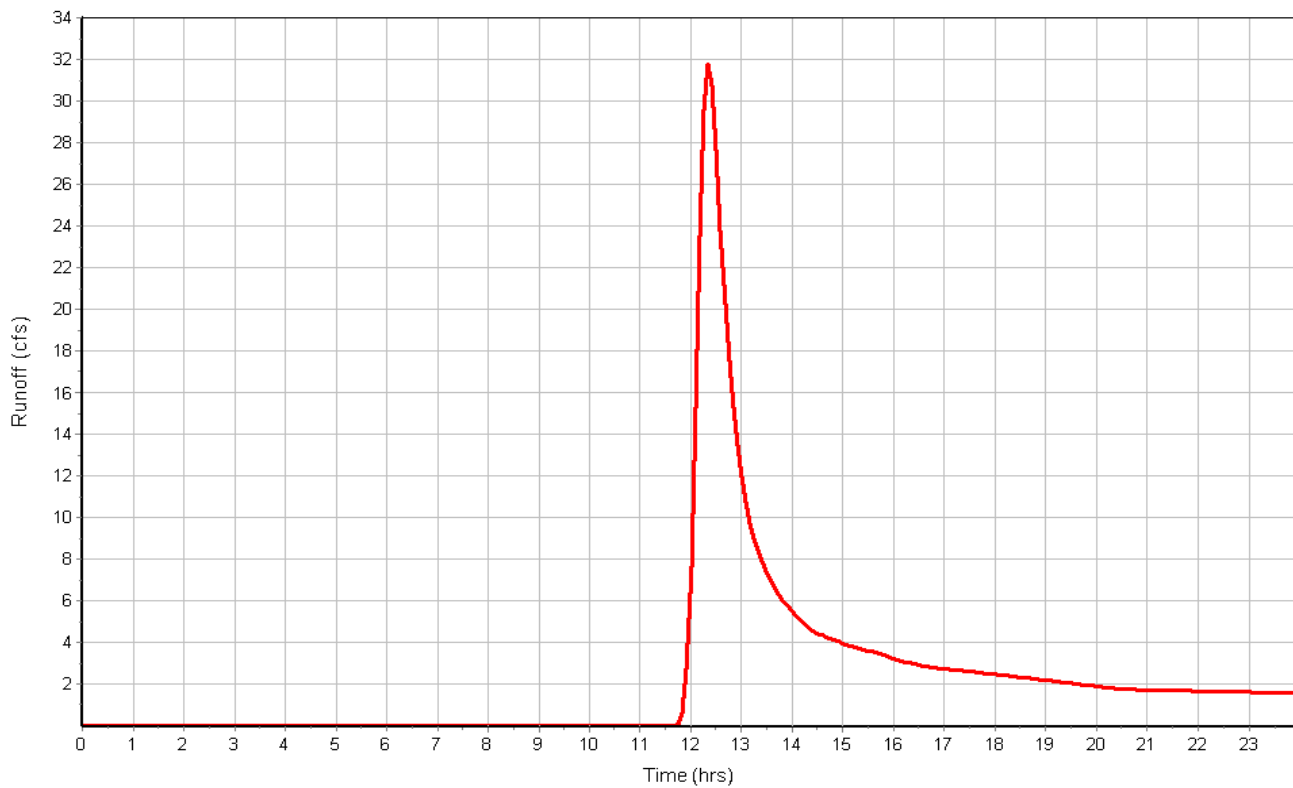
Total Rainfall (in) 2.70
 Total Runoff (in) 0.55
 Peak Runoff (cfs) 31.83
 Weighted Curve Number 69.79
 Time of Concentration (days hh:mm:ss) 0 00:39:51

Subbasin : Bb

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Ca

Input Data

Area (ac) 162.70
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	162.70	B	60.00
Composite Area & Weighted CN	162.70		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.42	0.00	0.00
Computed Flow Time (min) :	11.74	0.00	0.00

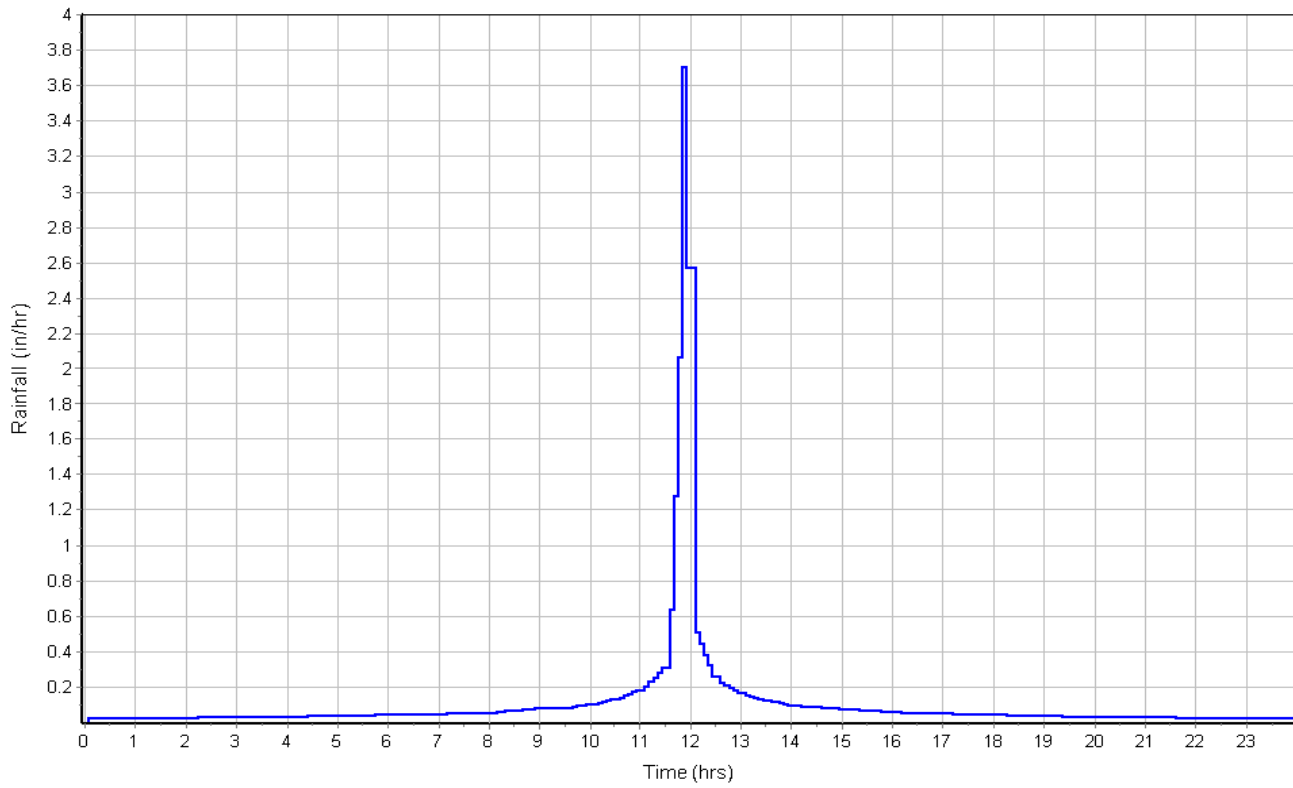
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	3099	0.00	0.00
Channel Slope (%) :	4.1	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.97	0.00	0.00
Computed Flow Time (min) :	4.31	0.00	0.00
Total TOC (min)	37.11		

Subbasin Runoff Results

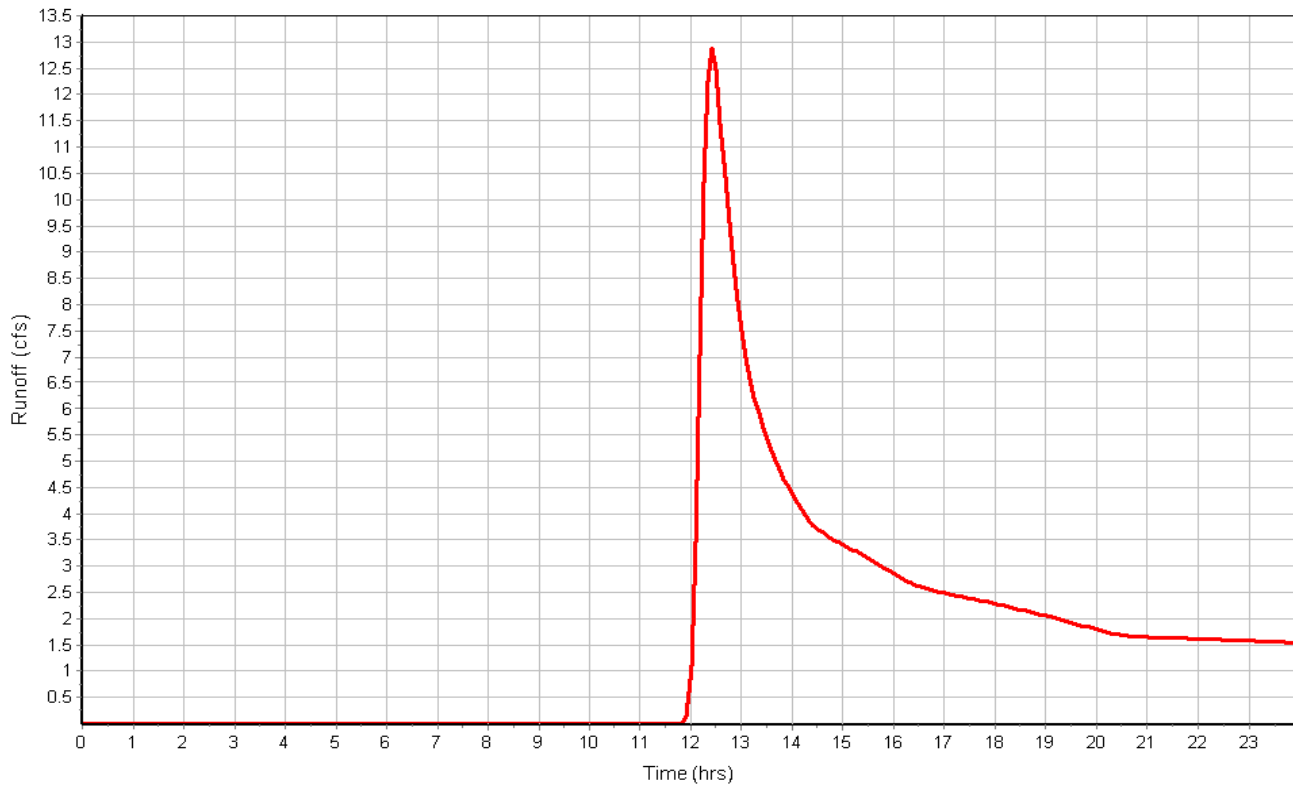
Total Rainfall (in) 2.70
 Total Runoff (in) 0.23
 Peak Runoff (cfs) 12.89
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:37:07

Subbasin : Ca

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Cb

Input Data

Area (ac) 70.00
 Weighted Curve Number 68.70
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods & grass combination, Fair	10.50	B	65.00
Pasture, grassland, or range, Fair	2.10	C	79.00
Pasture, grassland, or range, Fair	57.40	B	69.00
Composite Area & Weighted CN	70.00		68.70

Time of Concentration

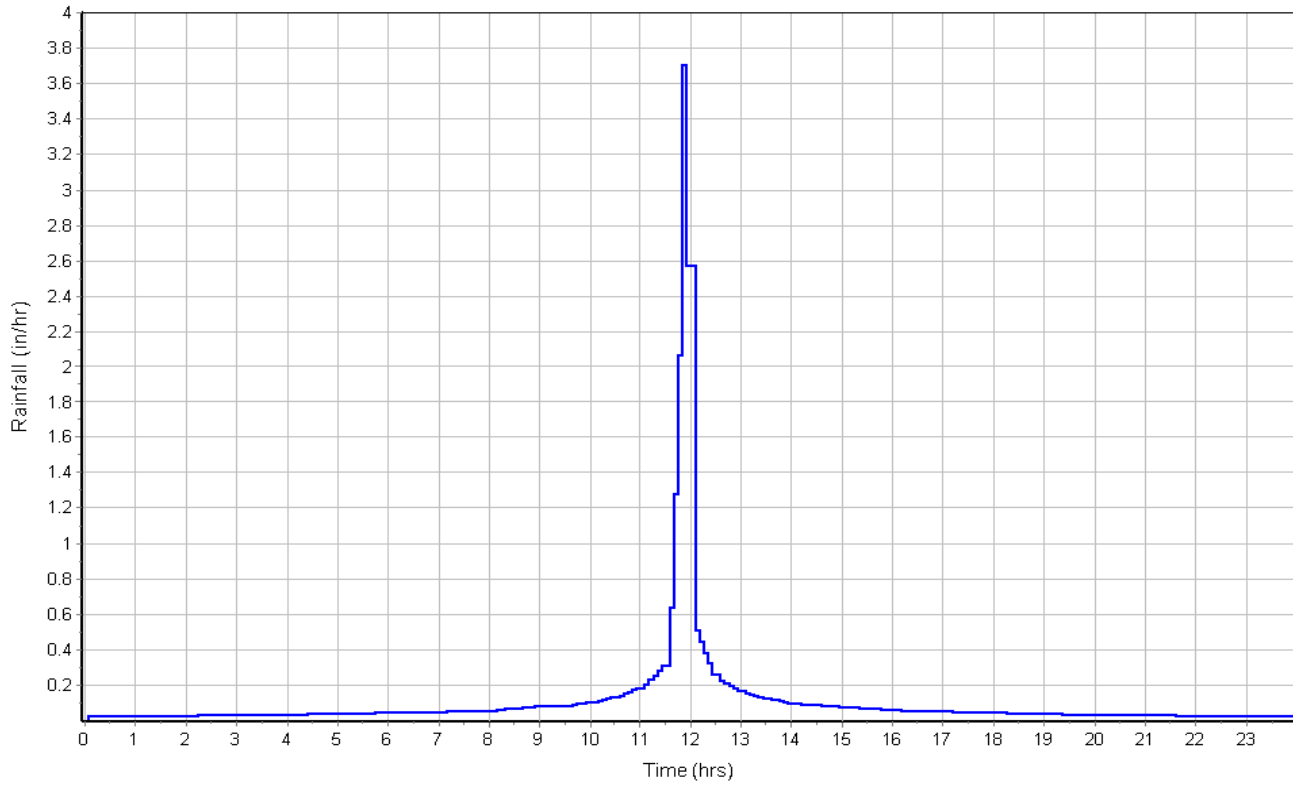
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.6	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.33	0.00	0.00
Computed Flow Time (min) :	12.53	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	2084	0.00	0.00
Channel Slope (%) :	3.6	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.22	0.00	0.00
Computed Flow Time (min) :	3.10	0.00	0.00
Total TOC (min)	36.69		

Subbasin Runoff Results

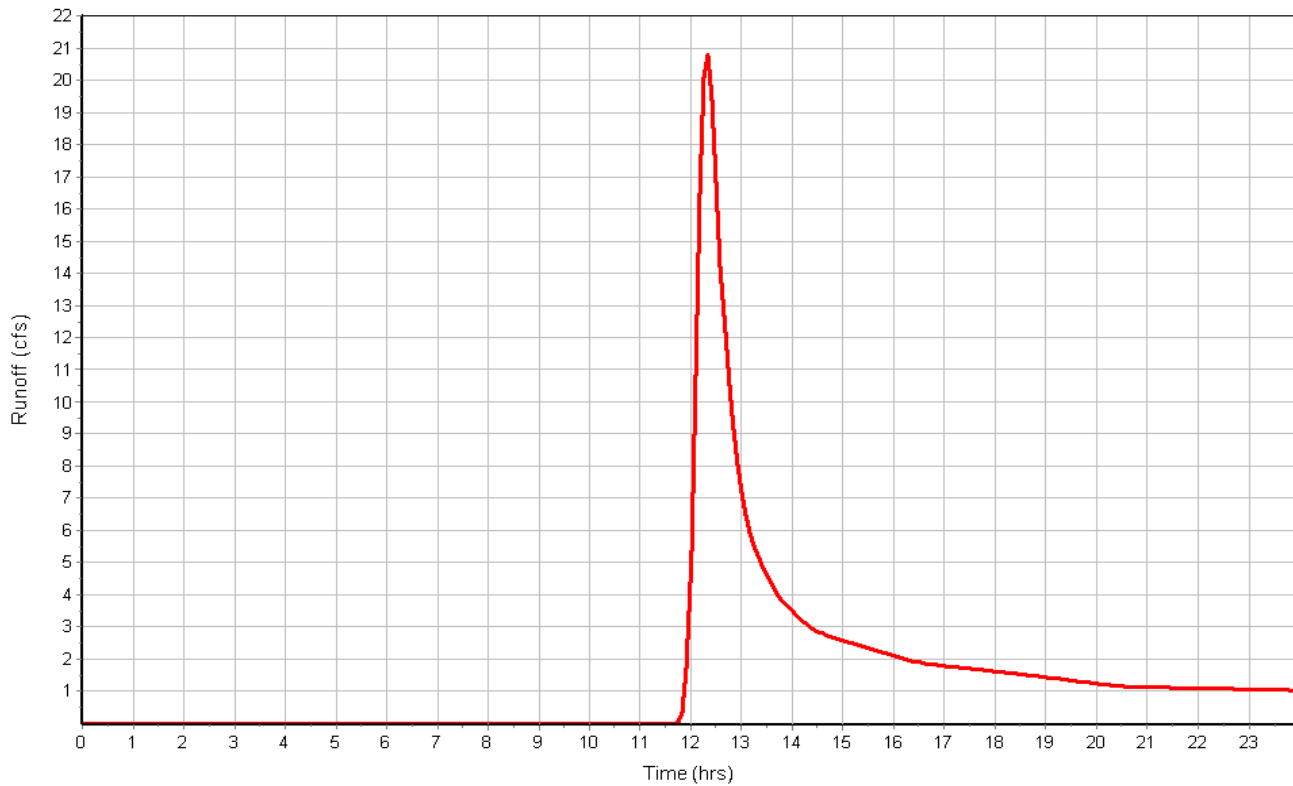
Total Rainfall (in) 2.70
 Total Runoff (in) 0.50
 Peak Runoff (cfs) 20.86
 Weighted Curve Number 68.70
 Time of Concentration (days hh:mm:ss) 0 00:36:41

Subbasin : Cb

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Da

Input Data

Area (ac) 161.30
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	161.30	B	60.00
Composite Area & Weighted CN	161.30		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5.7	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.19	0.00	0.00
Computed Flow Time (min) :	14.01	0.00	0.00

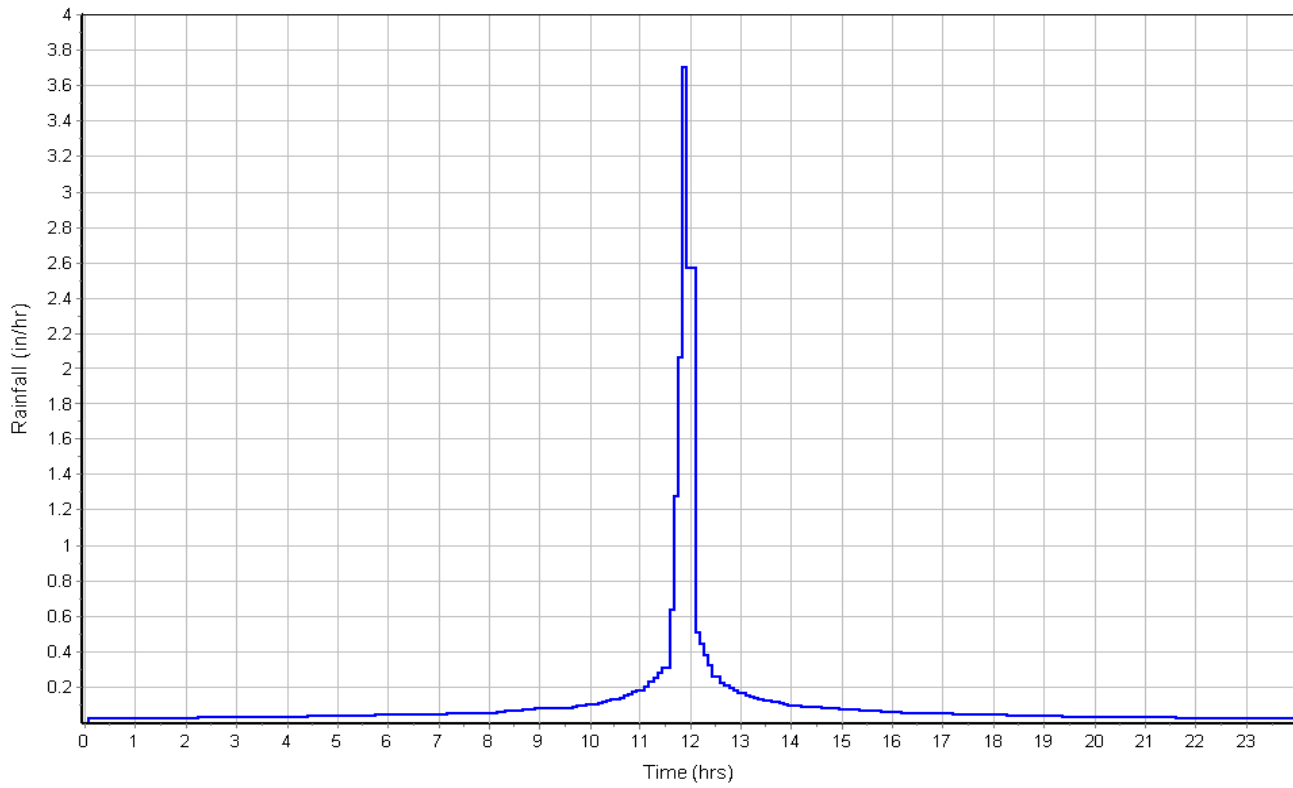
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1601	0.00	0.00
Channel Slope (%) :	5.7	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	14.12	0.00	0.00
Computed Flow Time (min) :	1.89	0.00	0.00
Total TOC (min)	36.95		

Subbasin Runoff Results

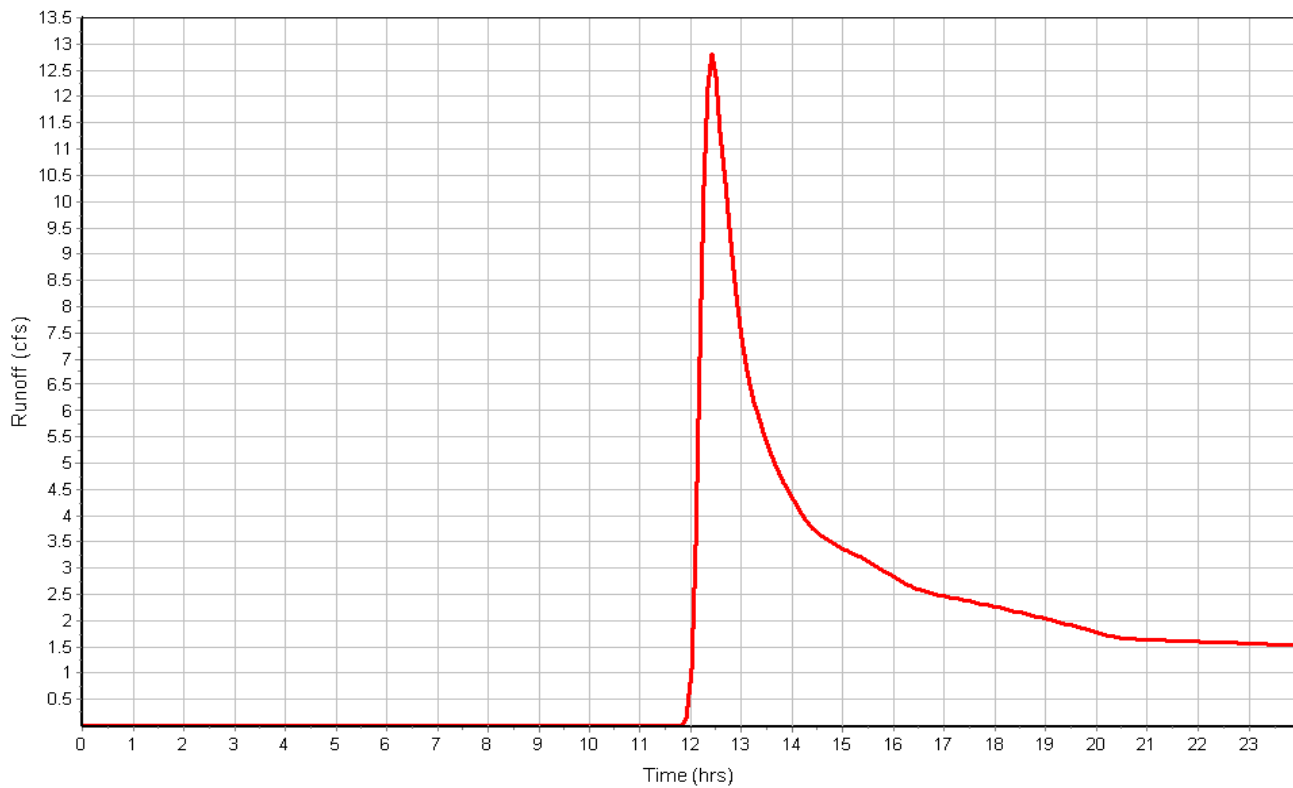
Total Rainfall (in) 2.70
 Total Runoff (in) 0.23
 Peak Runoff (cfs) 12.81
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:36:57

Subbasin : Da

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Db

Input Data

Area (ac) 49.90
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	49.90	B	60.00
Composite Area & Weighted CN	49.90		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.48	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	0.79	0.00	0.00
Computed Flow Time (min) :	21.10	0.00	0.00

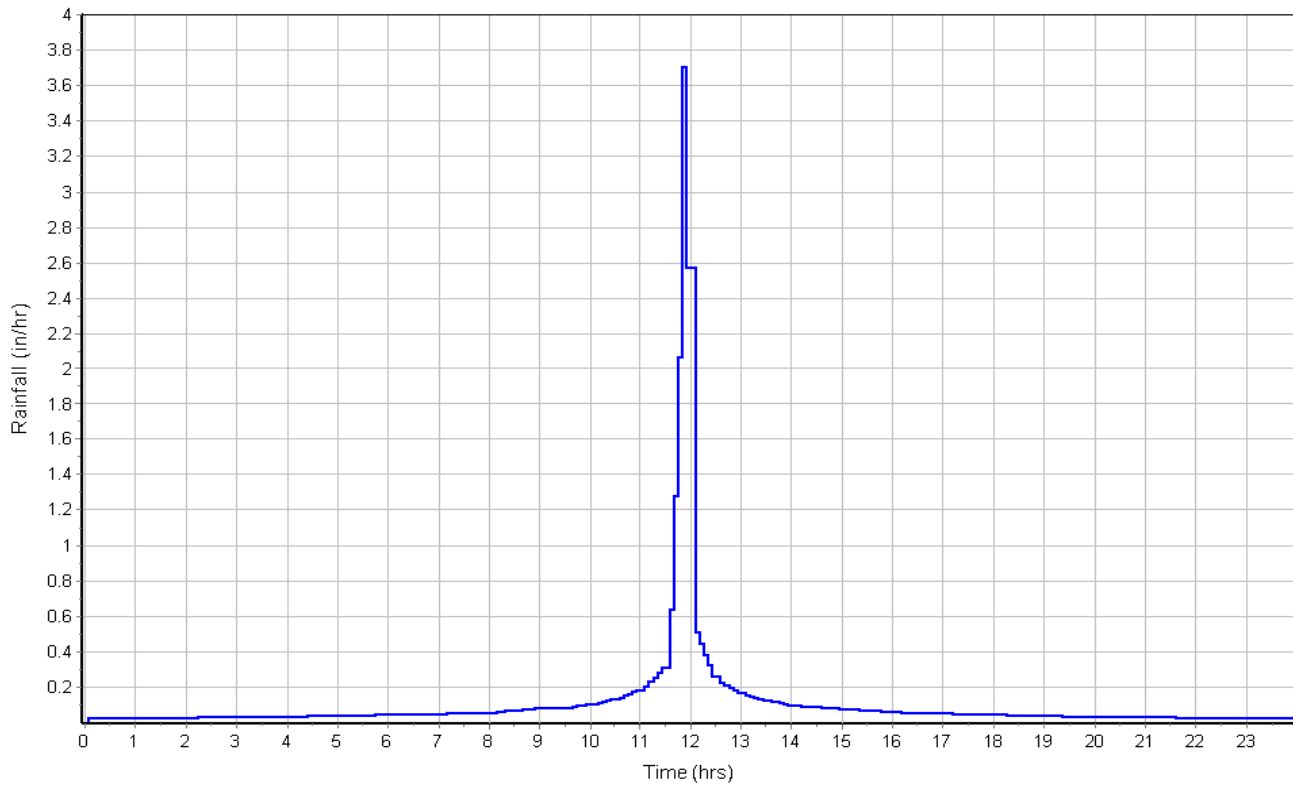
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	922	0.00	0.00
Channel Slope (%) :	2.48	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	9.31	0.00	0.00
Computed Flow Time (min) :	1.65	0.00	0.00
Total TOC (min)	43.81		

Subbasin Runoff Results

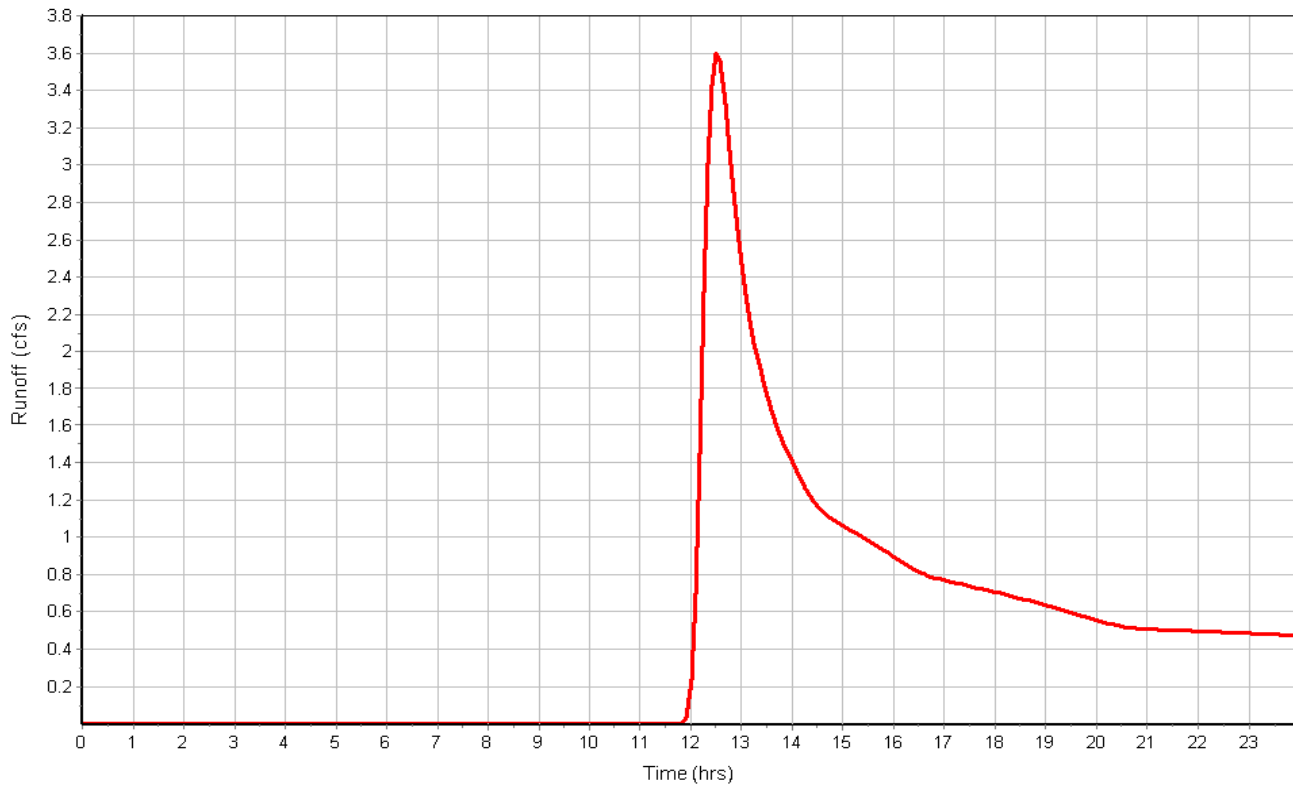
Total Rainfall (in) 2.70
 Total Runoff (in) 0.23
 Peak Runoff (cfs) 3.61
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:43:49

Subbasin : Db

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Dc

Input Data

Area (ac) 209.50
 Weighted Curve Number 67.70
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods & grass combination, Fair	83.80	B	65.00
Pasture, grassland, or range, Fair	4.19	D	84.00
Pasture, grassland, or range, Fair	121.51	B	69.00
Composite Area & Weighted CN	209.50		67.70

Time of Concentration

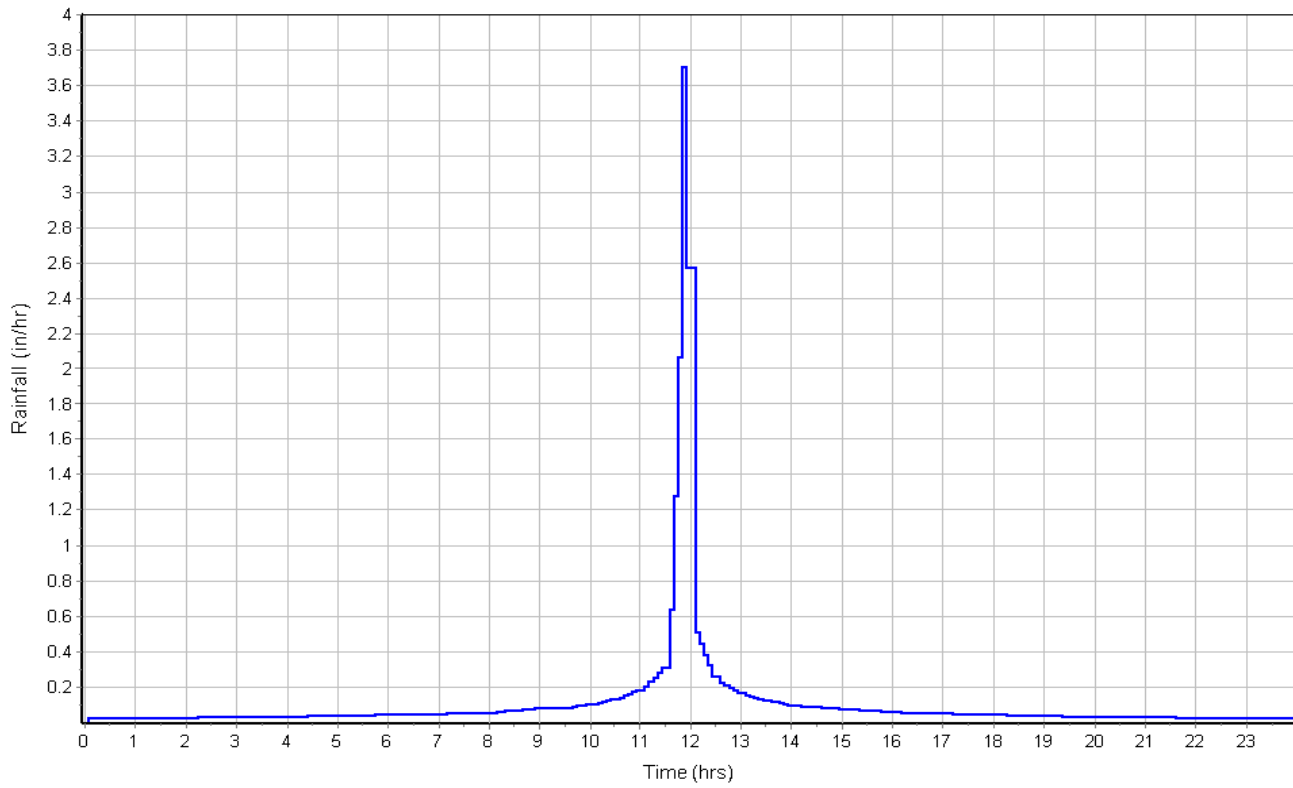
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.21	0.00	0.00
Computed Flow Time (min) :	13.77	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	3678	0.00	0.00
Channel Slope (%) :	3	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.24	0.00	0.00
Computed Flow Time (min) :	5.99	0.00	0.00
Total TOC (min)	40.82		

Subbasin Runoff Results

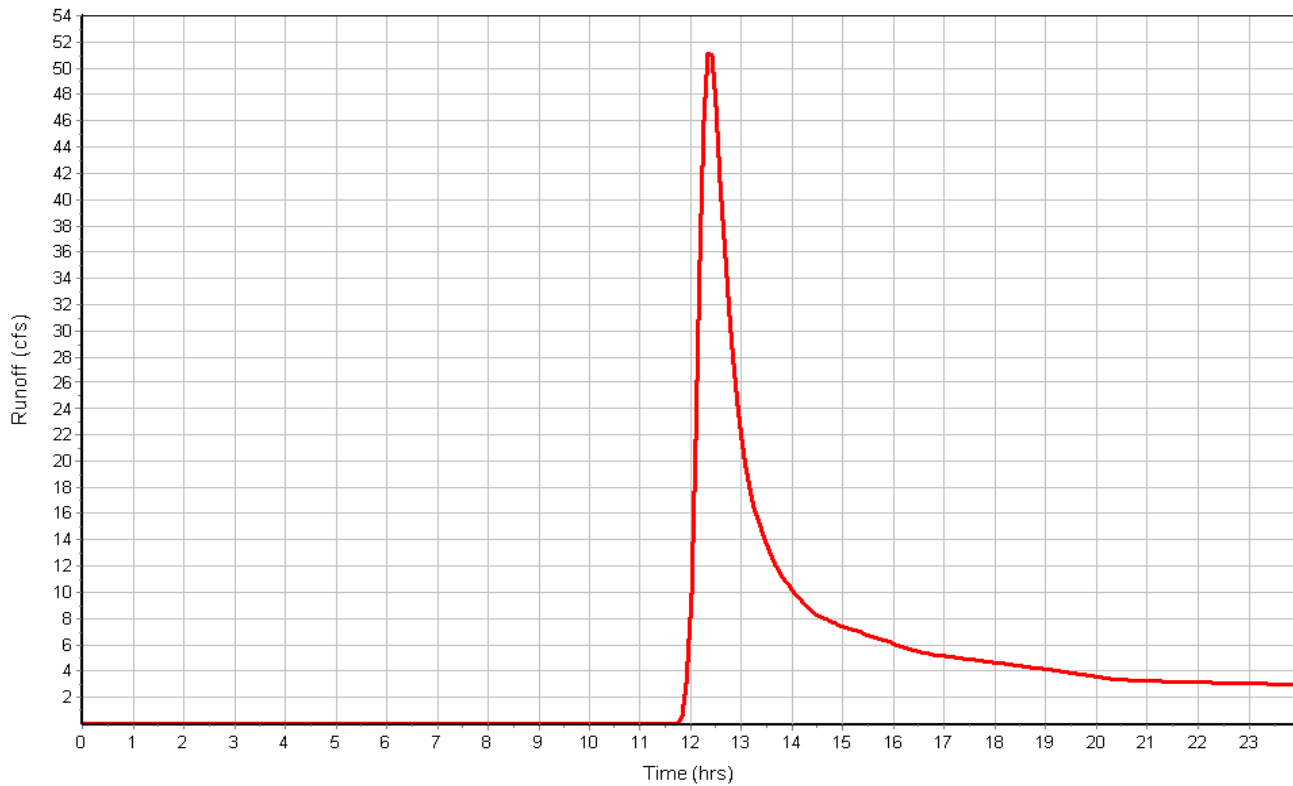
Total Rainfall (in) 2.70
 Total Runoff (in) 0.47
 Peak Runoff (cfs) 51.66
 Weighted Curve Number 67.70
 Time of Concentration (days hh:mm:ss) 0 00:40:49

Subbasin : Dc

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Ea

Input Data

Area (ac) 37.90
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	37.90	B	60.00
Composite Area & Weighted CN	37.90		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.9	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.11	0.00	0.00
Computed Flow Time (min) :	7.51	0.00	0.00

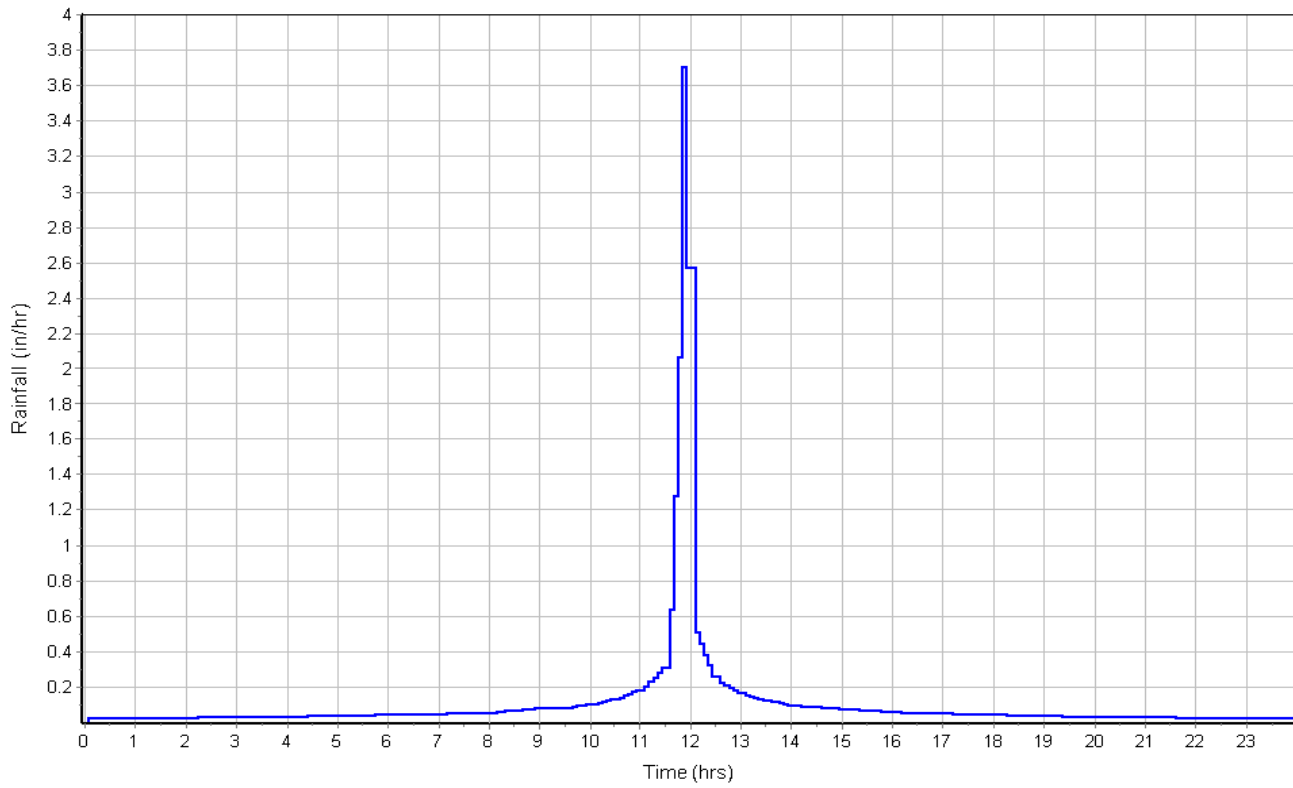
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1227	0.00	0.00
Channel Slope (%) :	4.9	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.09	0.00	0.00
Computed Flow Time (min) :	1.56	0.00	0.00
Total TOC (min)	30.13		

Subbasin Runoff Results

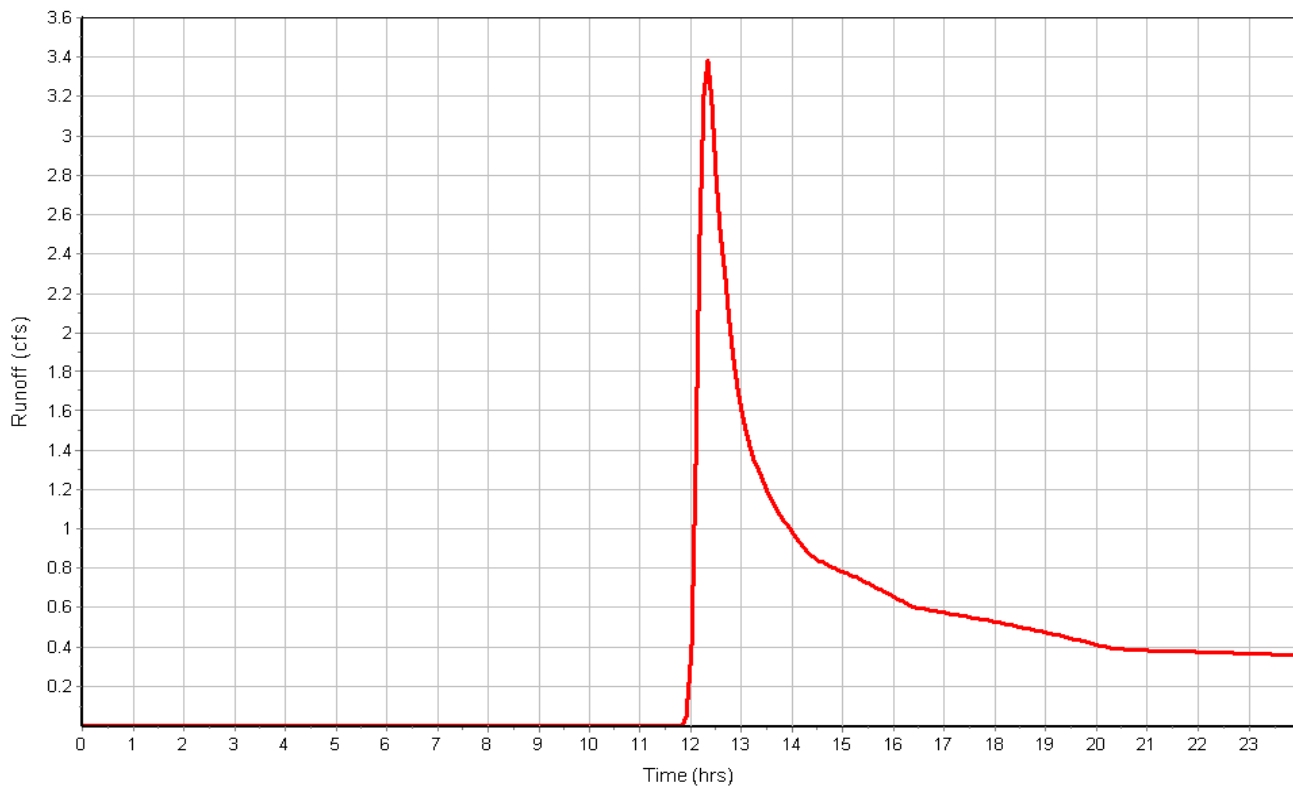
Total Rainfall (in) 2.70
 Total Runoff (in) 0.23
 Peak Runoff (cfs) 3.39
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:30:08

Subbasin : Ea

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Eb

Input Data

Area (ac) 114.80
 Weighted Curve Number 67.20
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	91.84	B	69.00
5 Acre Lots, 7% Impervious	22.96	B	60.00
Composite Area & Weighted CN	114.80		67.20

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	12.25	0.00	0.00

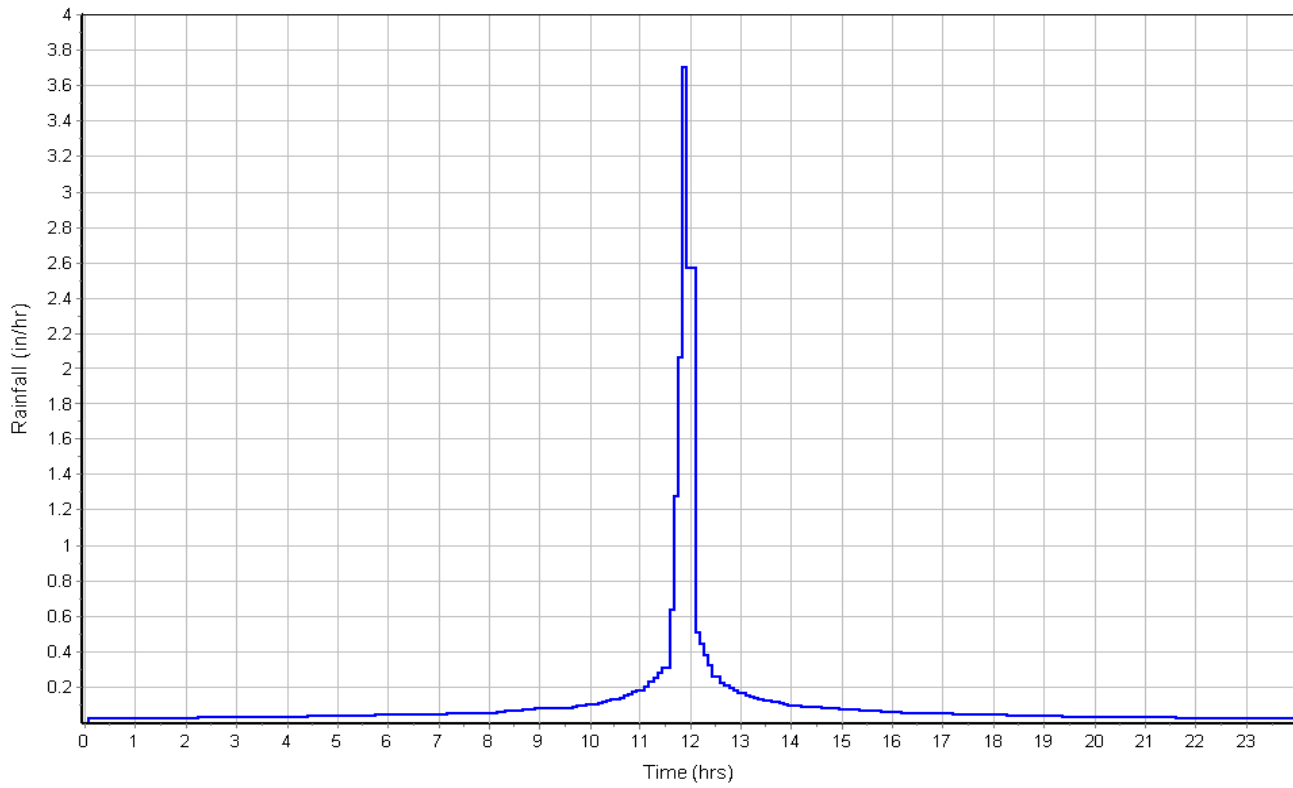
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	3696	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.53	0.00	0.00
Computed Flow Time (min) :	5.34	0.00	0.00
Total TOC (min)	38.66		

Subbasin Runoff Results

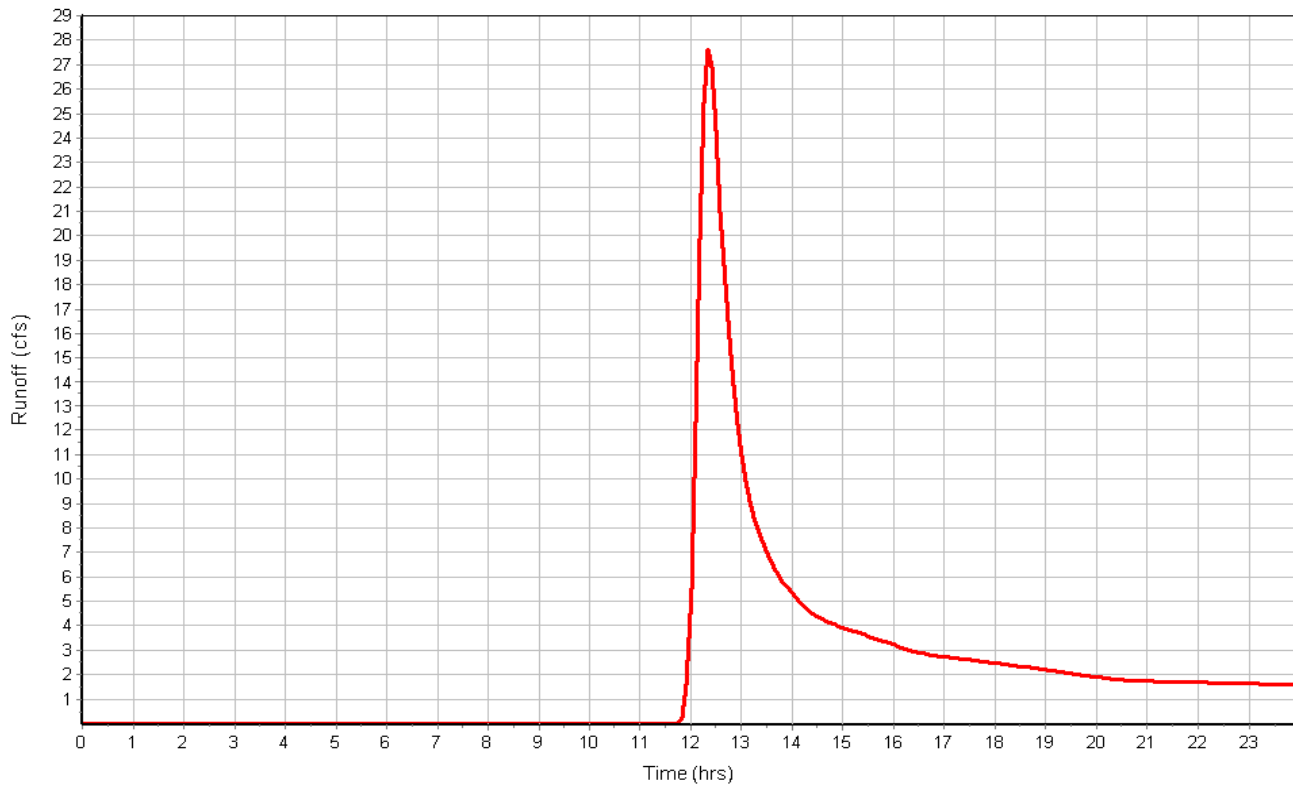
Total Rainfall (in) 2.70
 Total Runoff (in) 0.45
 Peak Runoff (cfs) 27.72
 Weighted Curve Number 67.20
 Time of Concentration (days hh:mm:ss) 0 00:38:40

Subbasin : Eb

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : F

Input Data

Area (ac) 44.50
 Weighted Curve Number 69.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	44.50	B	69.00
Composite Area & Weighted CN	44.50		69.00

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	3.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0.00	0.00
Computed Flow Time (min) :	13.33	0.00	0.00

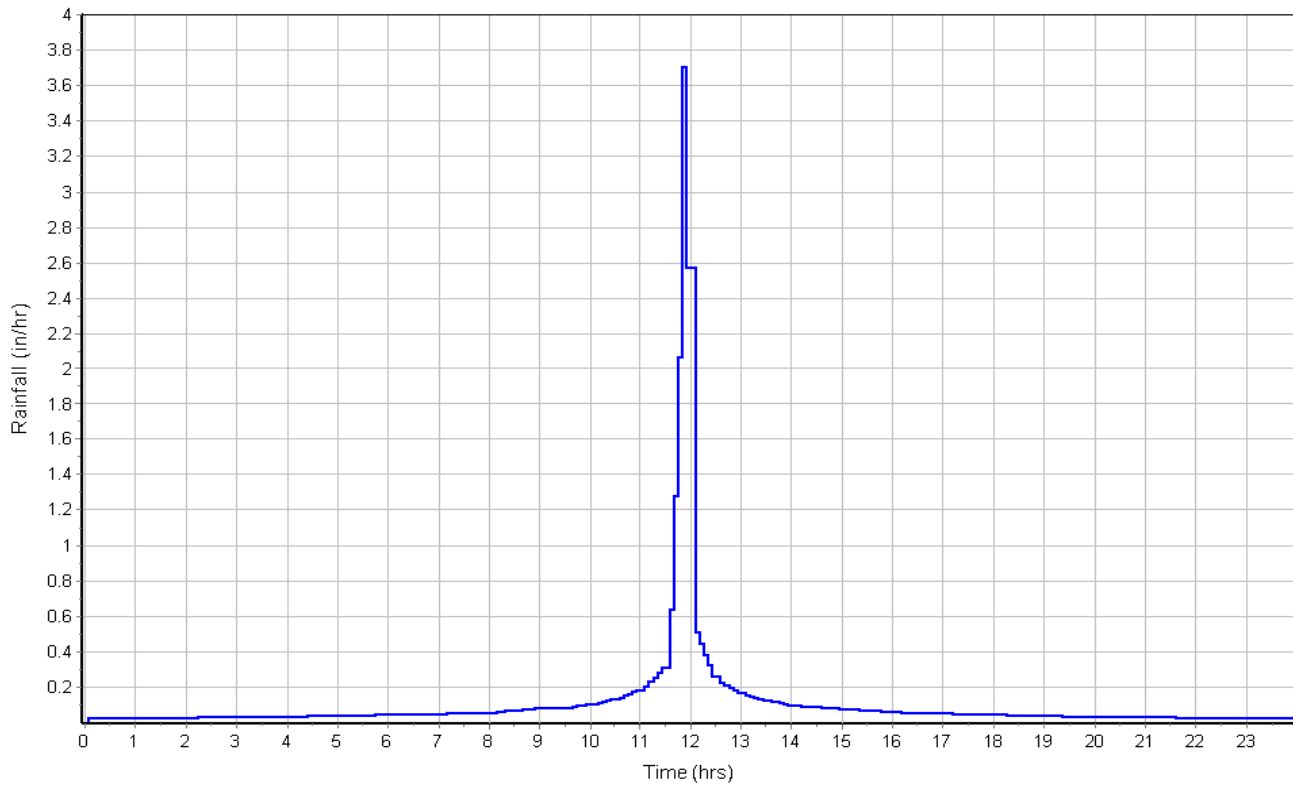
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	1707	0.00	0.00
Channel Slope (%) :	3.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.58	0.00	0.00
Computed Flow Time (min) :	2.69	0.00	0.00
Total TOC (min)	37.08		

Subbasin Runoff Results

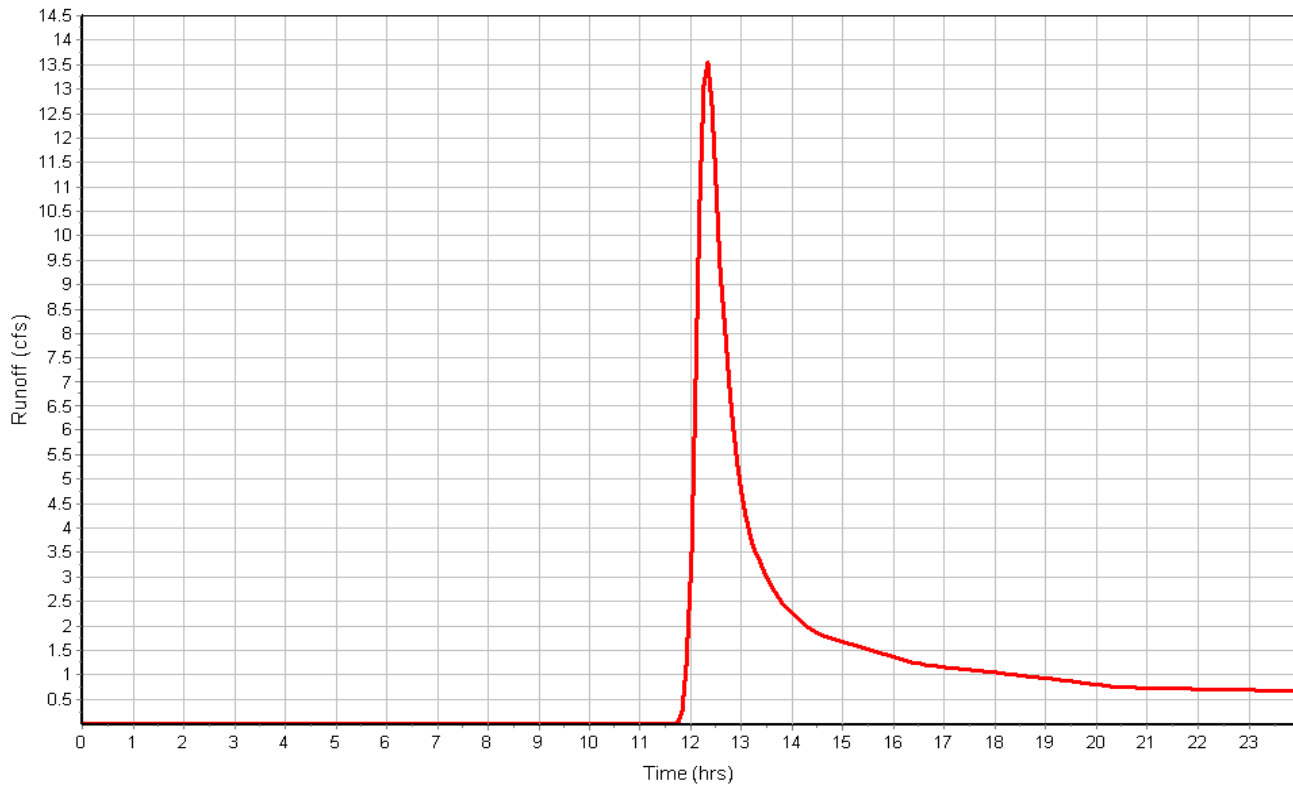
Total Rainfall (in) 2.70
 Total Runoff (in) 0.52
 Peak Runoff (cfs) 13.62
 Weighted Curve Number 69.00
 Time of Concentration (days hh:mm:ss) 0 00:37:05

Subbasin : F

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : G

Input Data

Area (ac) 107.60
 Weighted Curve Number 74.50
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	59.18	C	79.00
Pasture, grassland, or range, Fair	48.42	B	69.00
Composite Area & Weighted CN	107.60		74.50

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.7	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.52	0.00	0.00
Computed Flow Time (min) :	10.96	0.00	0.00

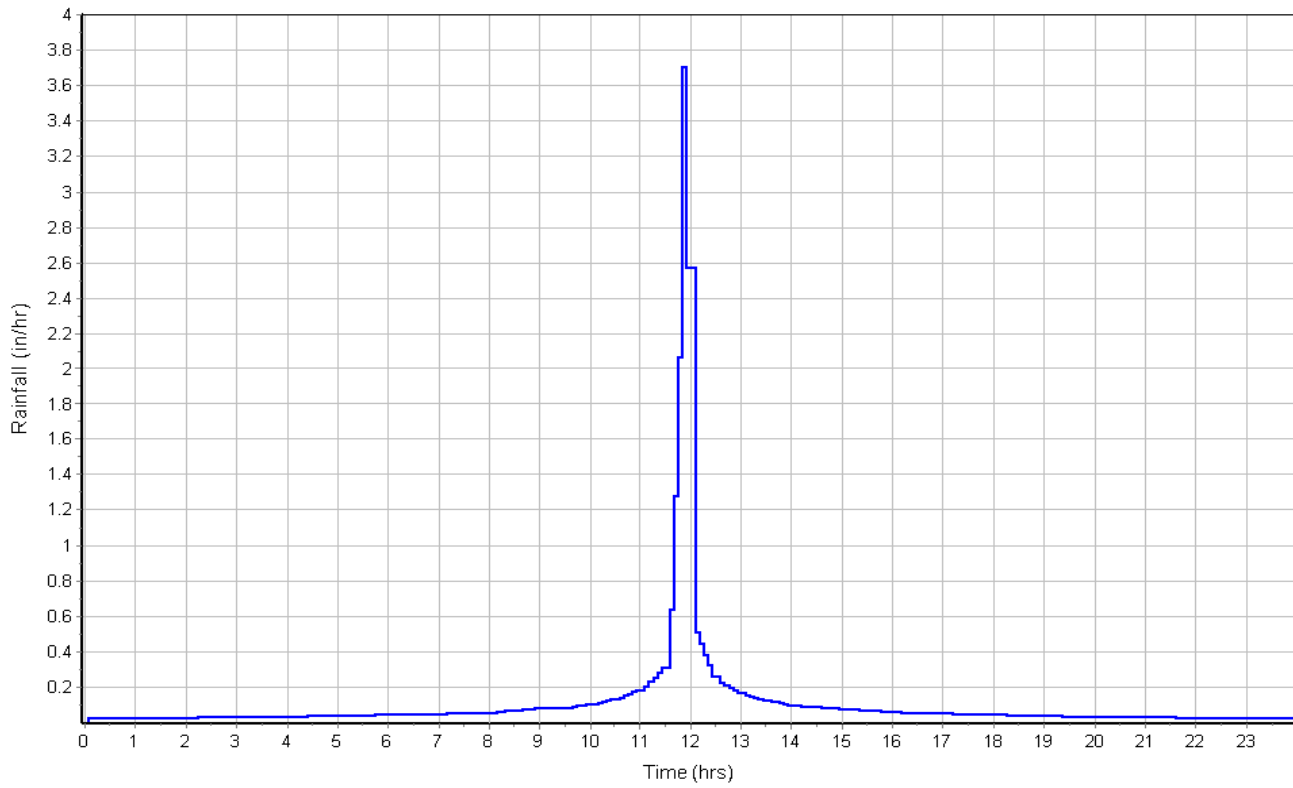
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1441	0.00	0.00
Channel Slope (%) :	4.7	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.82	0.00	0.00
Computed Flow Time (min) :	1.87	0.00	0.00
Total TOC (min)	33.90		

Subbasin Runoff Results

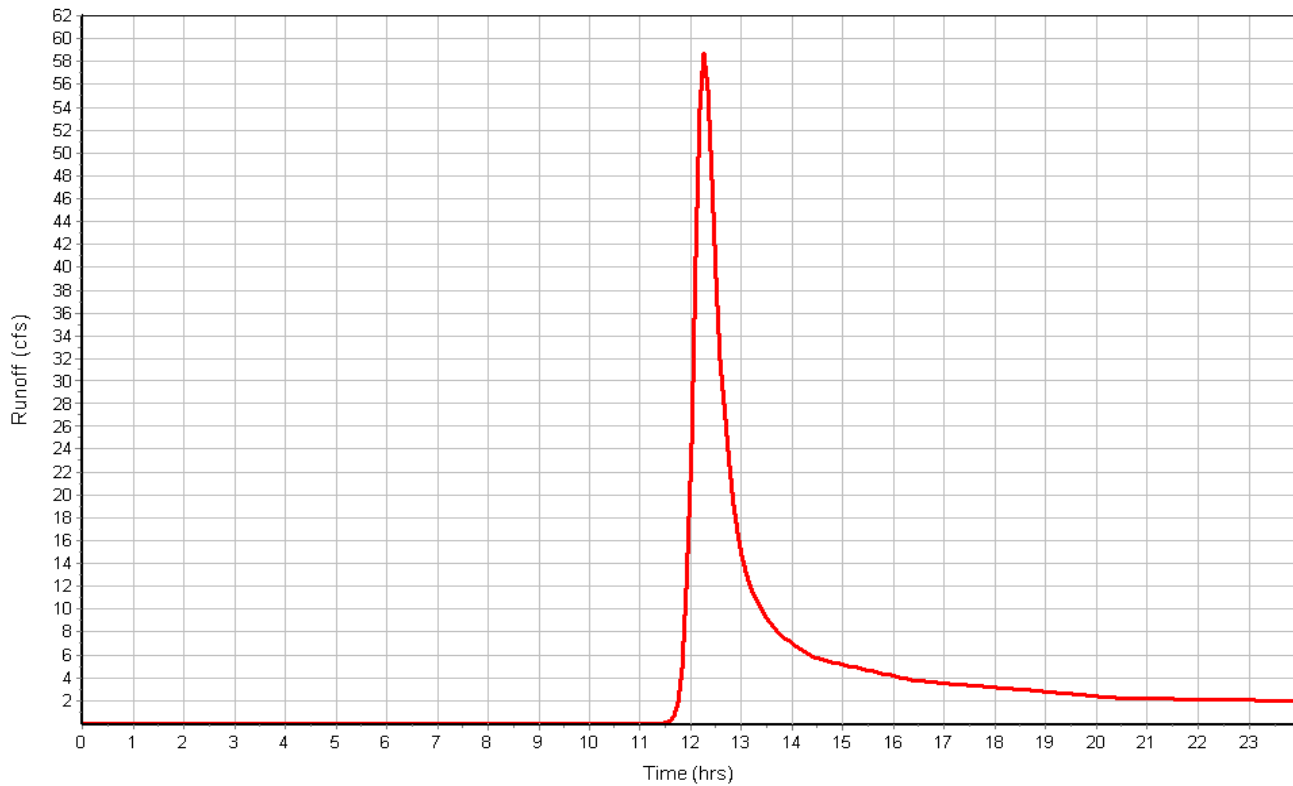
Total Rainfall (in) 2.70
 Total Runoff (in) 0.75
 Peak Runoff (cfs) 58.82
 Weighted Curve Number 74.50
 Time of Concentration (days hh:mm:ss) 0 00:33:54

Subbasin : G

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H

Input Data

Area (ac) 121.80
 Weighted Curve Number 71.76
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	54.81	C	79.00
Woods, Fair	31.67	B	60.00
Pasture, grassland, or range, Fair	30.45	B	69.00
Pasture, grassland, or range, Fair	4.87	D	84.00
Composite Area & Weighted CN	121.80		71.76

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	4.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.43	0.00	0.00
Computed Flow Time (min) :	11.66	0.00	0.00

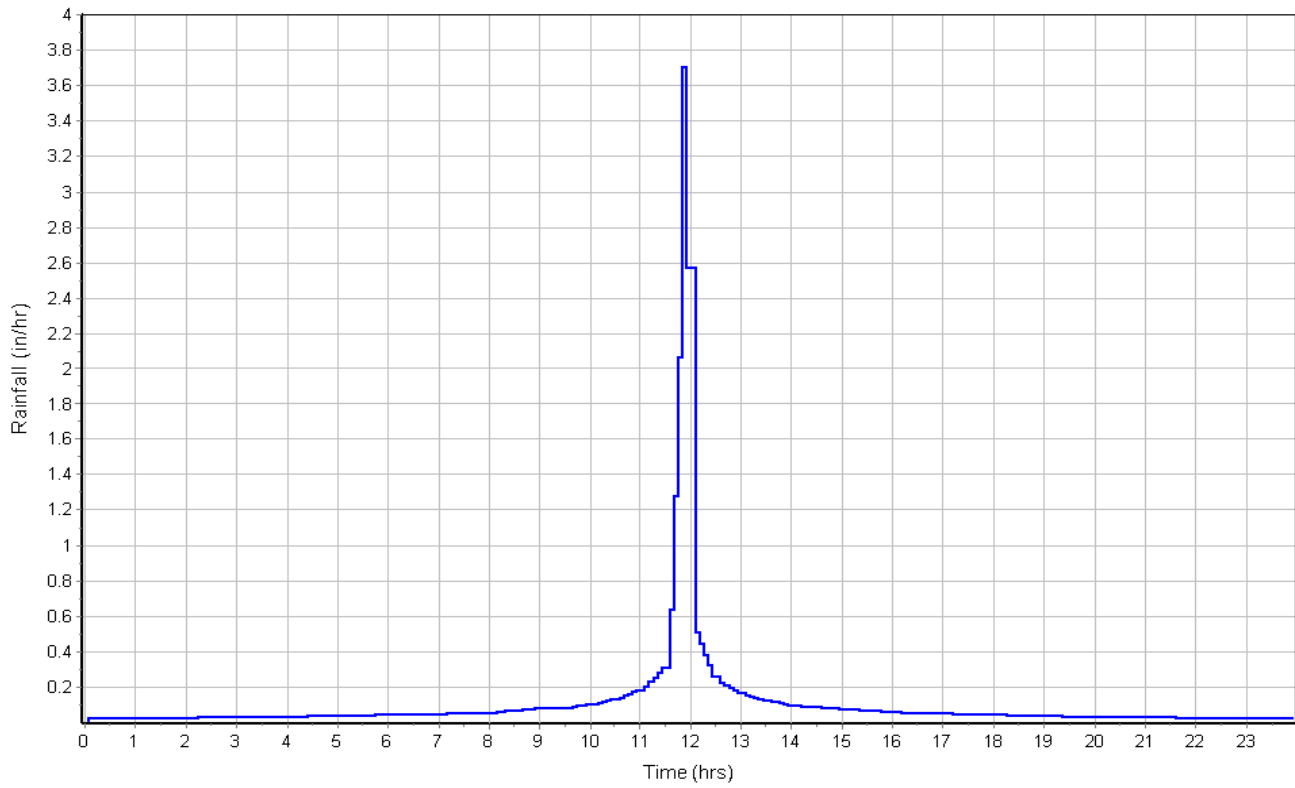
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	676	0.00	0.00
Channel Slope (%) :	4.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.12	0.00	0.00
Computed Flow Time (min) :	0.93	0.00	0.00
Total TOC (min)	33.64		

Subbasin Runoff Results

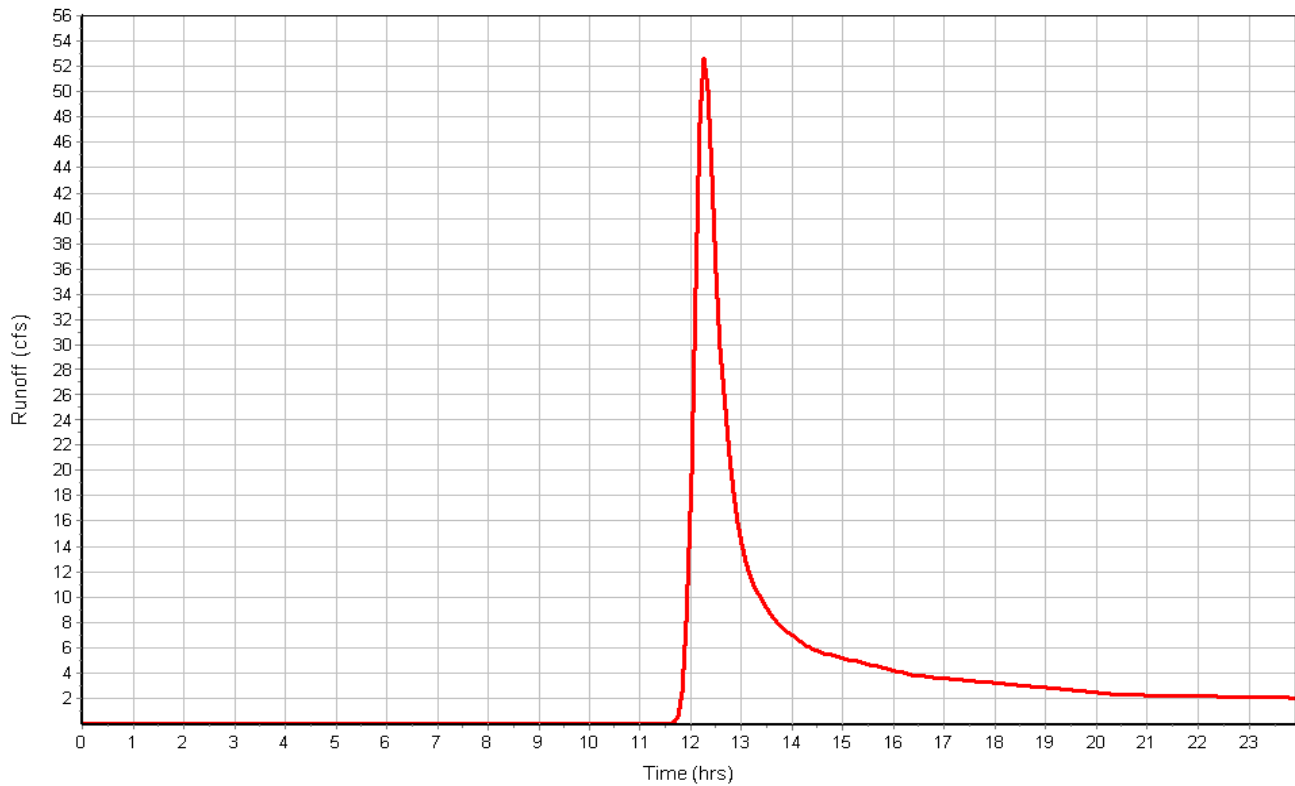
Total Rainfall (in) 2.70
 Total Runoff (in) 0.63
 Peak Runoff (cfs) 52.59
 Weighted Curve Number 71.76
 Time of Concentration (days hh:mm:ss) 0 00:33:38

Subbasin : H

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : I

Input Data

Area (ac) 37.50
 Weighted Curve Number 79.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	37.50	C	79.00
Composite Area & Weighted CN	37.50		79.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.58	0.00	0.00
Computed Flow Time (min) :	10.55	0.00	0.00

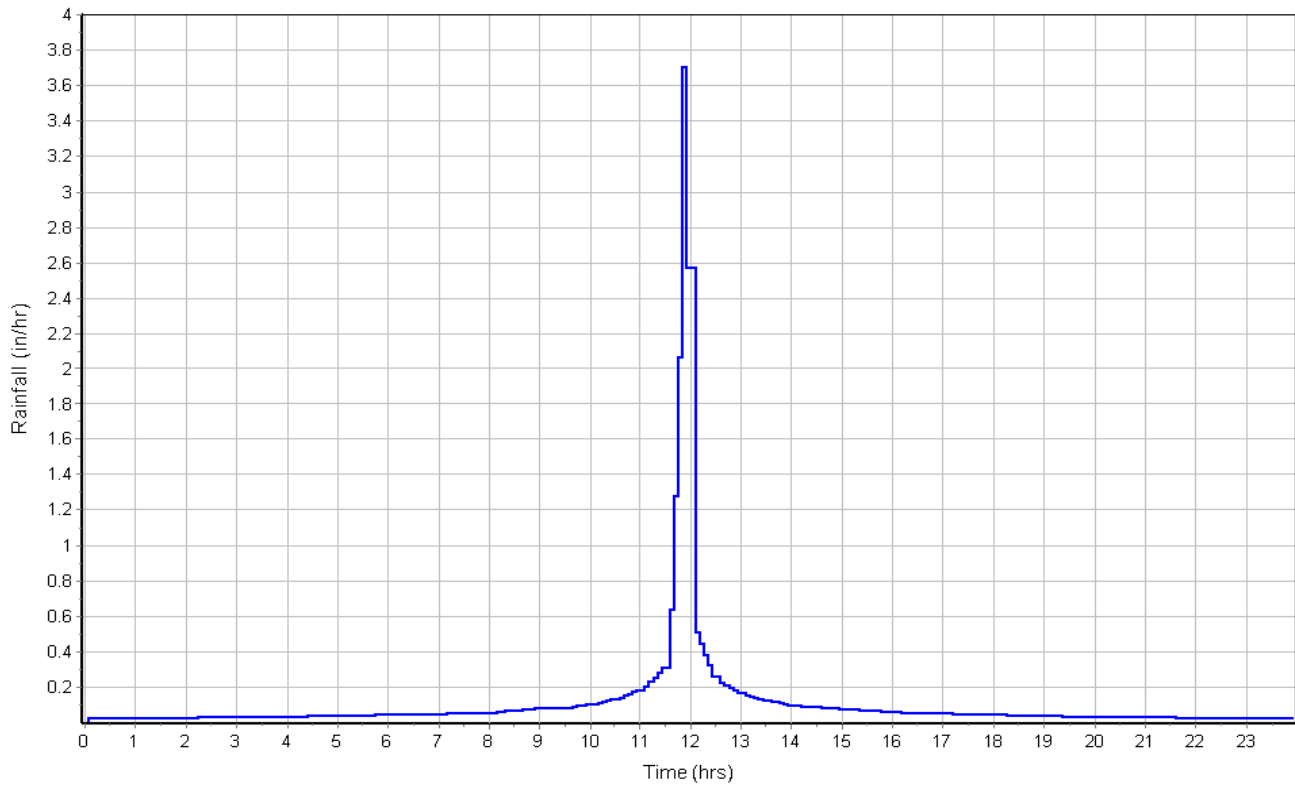
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	134	0.00	0.00
Channel Slope (%) :	5.1	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.35	0.00	0.00
Computed Flow Time (min) :	0.17	0.00	0.00
Total TOC (min)	31.77		

Subbasin Runoff Results

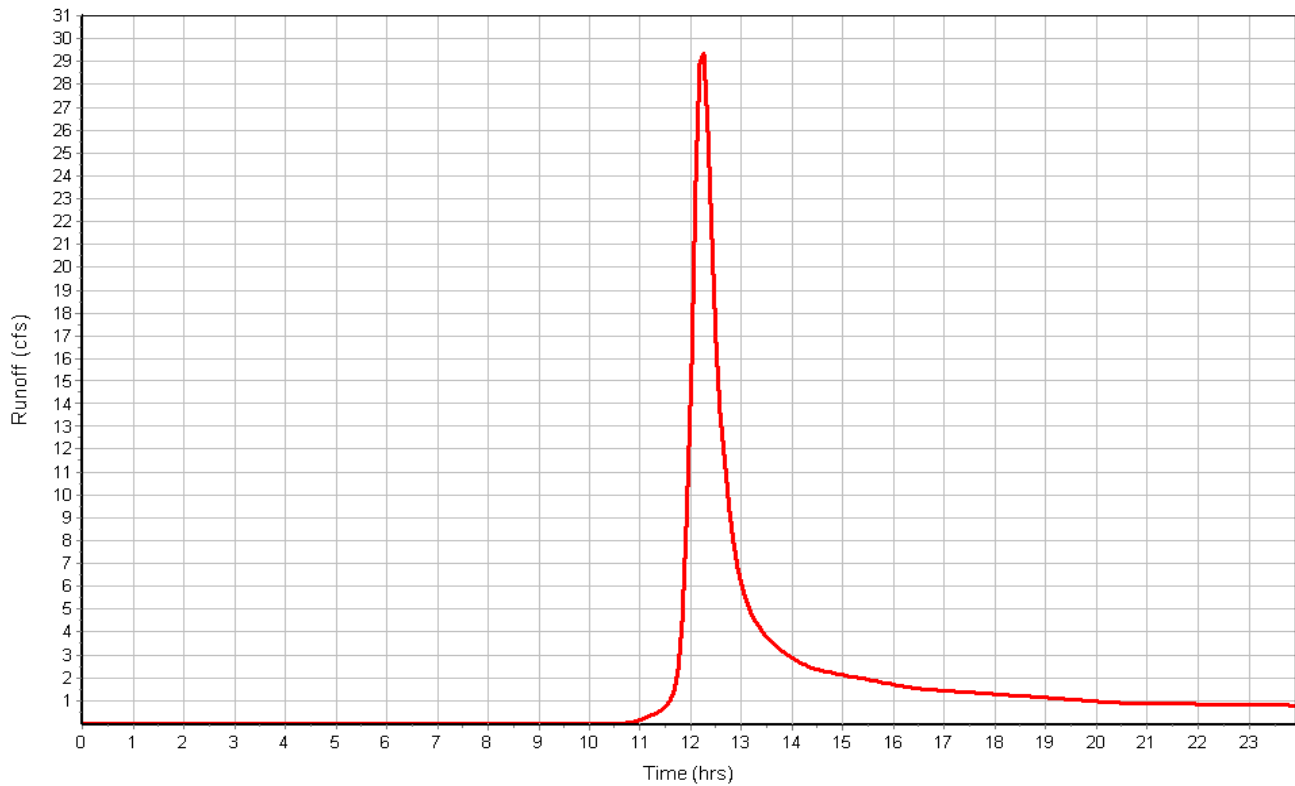
Total Rainfall (in) 2.70
 Total Runoff (in) 0.97
 Peak Runoff (cfs) 29.73
 Weighted Curve Number 79.00
 Time of Concentration (days hh:mm:ss) 0 00:31:46

Subbasin : I

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : J

Input Data

Area (ac) 10.10
 Weighted Curve Number 69.50
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	5.05	B	60.00
Woods, Fair	5.05	D	79.00
Composite Area & Weighted CN	10.10		69.50

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	8.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	2.08	0.00	0.00
Computed Flow Time (min) :	8.01	0.00	0.00

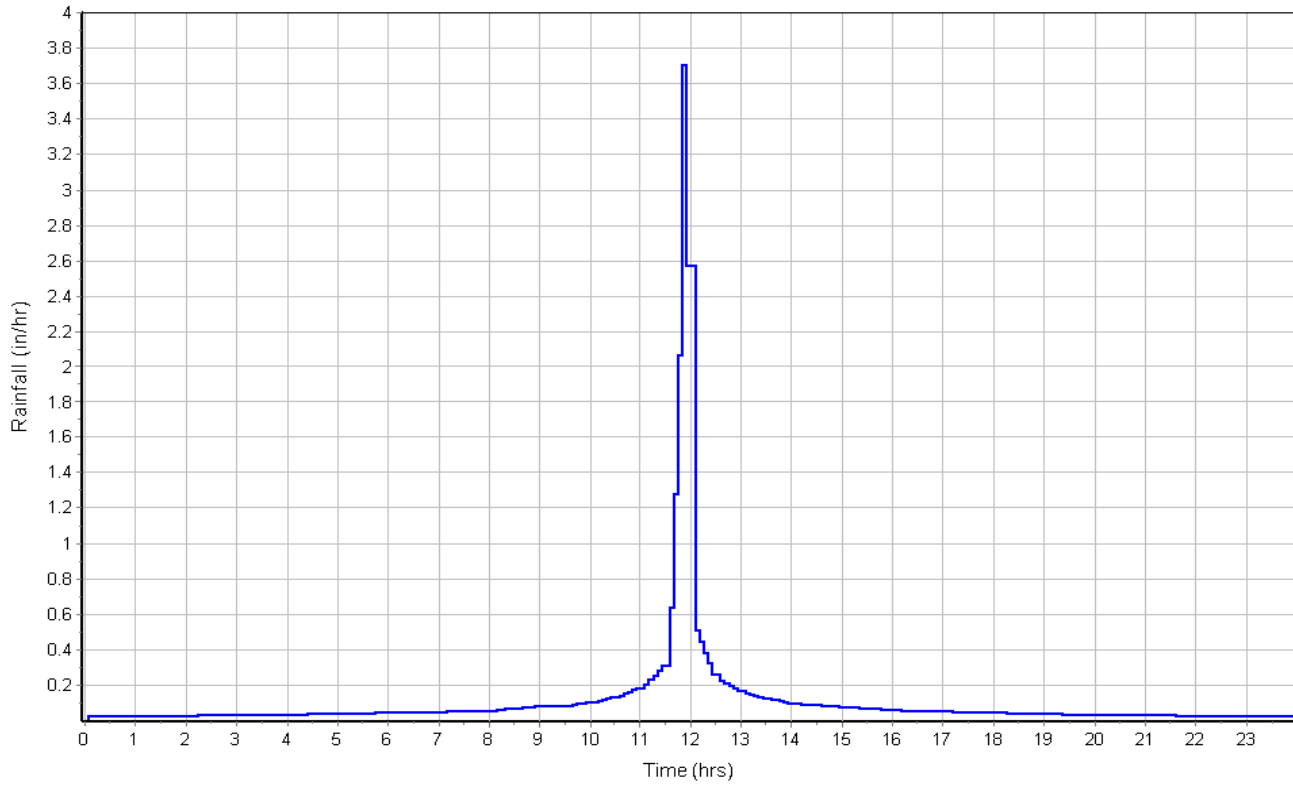
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	134	0.00	0.00
Channel Slope (%) :	5.1	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.35	0.00	0.00
Computed Flow Time (min) :	0.17	0.00	0.00
Total TOC (min)	29.24		

Subbasin Runoff Results

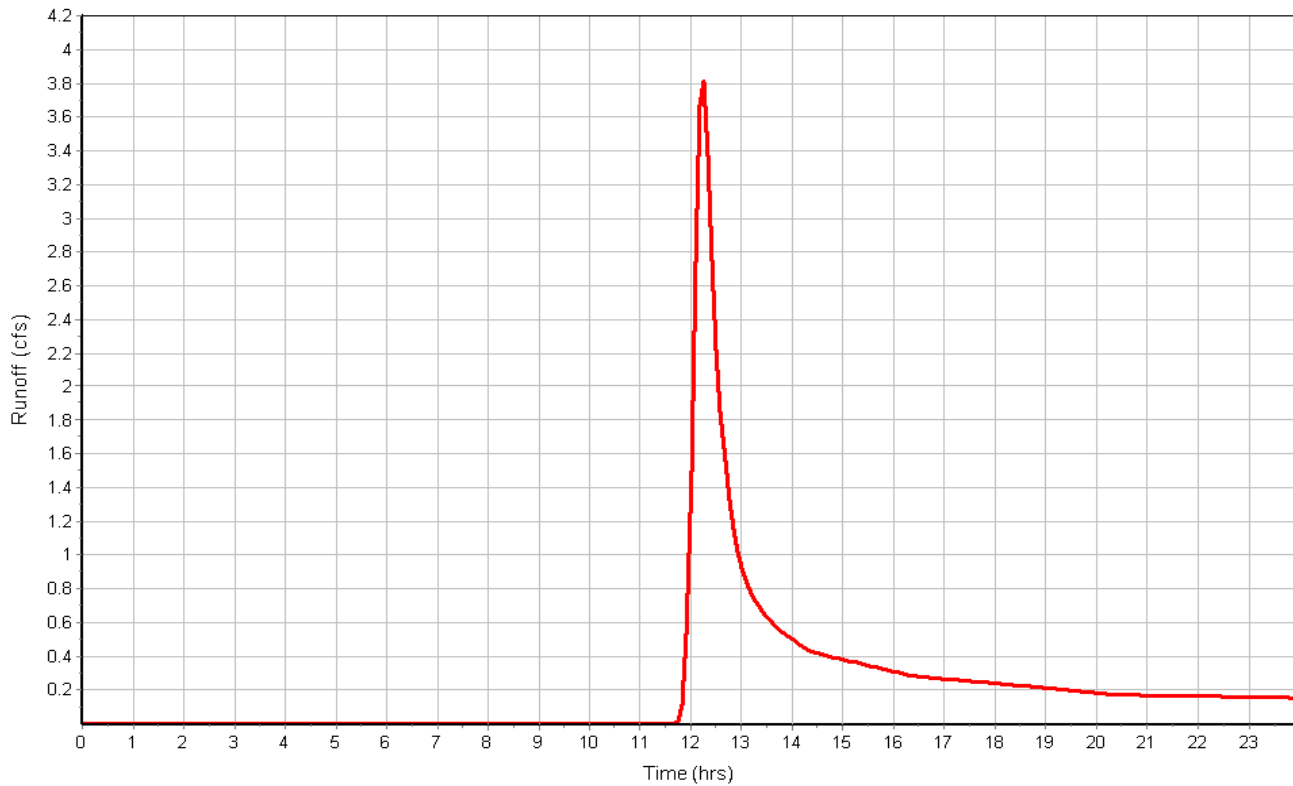
Total Rainfall (in) 2.70
 Total Runoff (in) 0.54
 Peak Runoff (cfs) 3.85
 Weighted Curve Number 69.50
 Time of Concentration (days hh:mm:ss) 0 00:29:14

Subbasin : J

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : K

Input Data

Area (ac) 17.80
 Weighted Curve Number 76.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods & grass combination, Fair	17.80	C	76.00
Composite Area & Weighted CN	17.80		76.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.38	0.00	0.00
Computed Flow Time (min) :	12.08	0.00	0.00

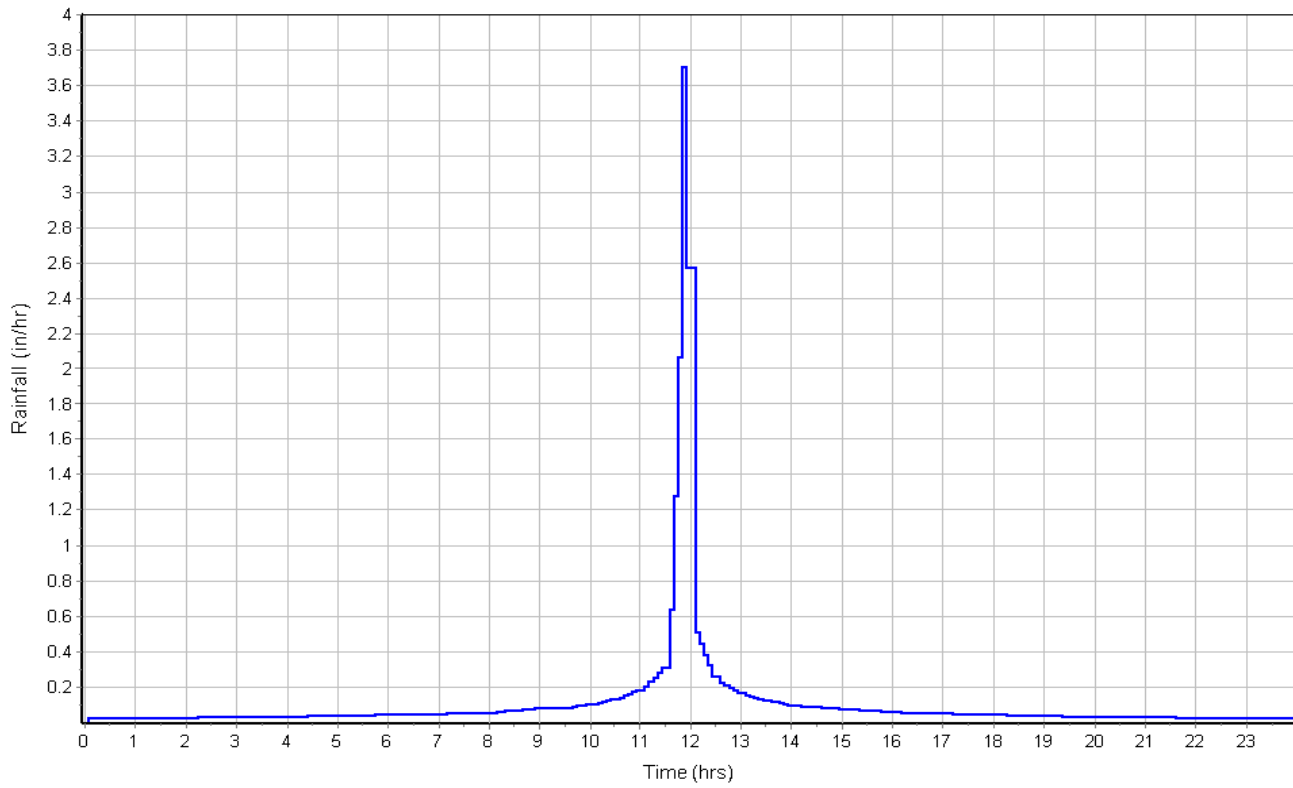
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1000	0.00	0.00
Channel Slope (%) :	3.9	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.68	0.00	0.00
Computed Flow Time (min) :	1.43	0.00	0.00
Total TOC (min)	34.56		

Subbasin Runoff Results

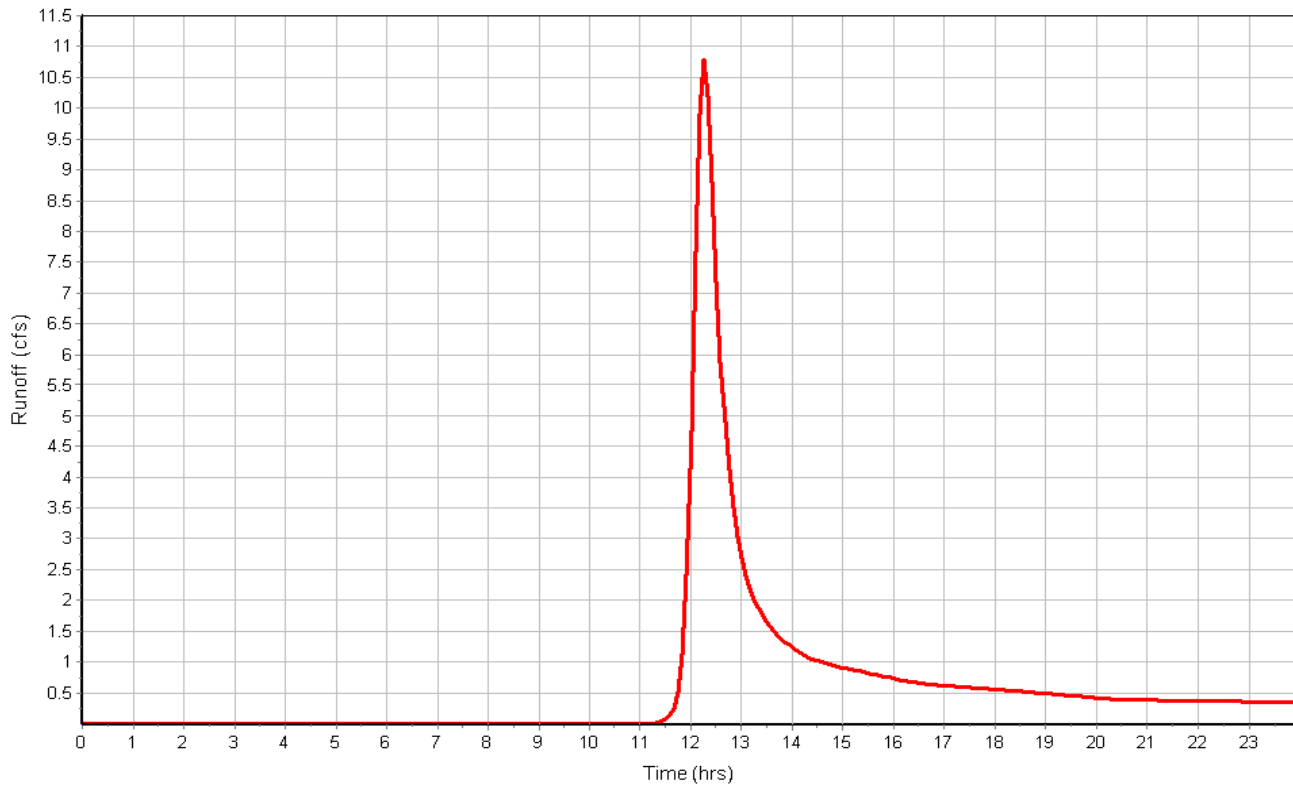
Total Rainfall (in) 2.70
 Total Runoff (in) 0.82
 Peak Runoff (cfs) 10.81
 Weighted Curve Number 76.00
 Time of Concentration (days hh:mm:ss) 0 00:34:34

Subbasin : K

Rainfall Intensity Graph



Runoff Hydrograph



Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft ²)	Minimum Pipe Cover (ft)
1	ABC	7318.50	7328.50	10.00	7318.50	0.00	7328.50	0.00	0.00	0.00
2	B1	7385.00	7395.00	10.00	7385.00	0.00	7395.00	0.00	0.00	0.00
3	B2	7380.00	7390.00	10.00	7380.00	0.00	7390.00	0.00	0.00	0.00
4	Cc1	7379.00	7389.00	10.00	7379.00	0.00	7389.00	0.00	0.00	0.00
5	Da2	7385.00	7395.00	10.00	7385.00	0.00	7395.00	0.00	0.00	0.00
6	Db2	7412.00	7422.00	10.00	7412.00	0.00	7422.00	0.00	0.00	0.00
7	Ee1	7417.00	7427.00	10.00	7417.00	0.00	7427.00	0.00	0.00	0.00
8	EF1	7276.00	7286.00	10.00	7276.00	0.00	7286.00	0.00	0.00	0.00
9	GHD	7300.00	7310.00	10.00	7300.00	0.00	7310.00	0.00	0.00	0.00
10	NUL	7280.00	7290.00	10.00	7280.00	0.00	7290.00	0.00	0.00	0.00
11	OS-J	7410.00	7420.00	10.00	7410.00	0.00	7420.00	0.00	0.00	0.00
12	OS-K	7349.00	7359.00	10.00	7349.00	0.00	7359.00	0.00	0.00	0.00

Junction Results

SN Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Max HGL Depth Attained	Max Surcharge Depth Attained	Min Freeboard Attained	Average HGL Elevation Attained	Average HGL Depth Attained	Time of Max HGL Occurrence	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(days hh:mm)	(days hh:mm)	(ac-in)	(min)
1 ABC	276.30	124.95	7320.74	2.24	0.00	7.76	7319.13	0.63	0 13:09	0 00:00	0.00	0.00
2 B1	199.65	199.65	7386.67	1.67	0.00	8.33	7385.46	0.46	0 13:15	0 00:00	0.00	0.00
3 B2	199.53	0.00	7381.67	1.67	0.00	8.33	7380.45	0.45	0 13:16	0 00:00	0.00	0.00
4 Cc1	12.86	0.00	7380.02	1.02	0.00	8.98	7379.23	0.23	0 12:30	0 00:00	0.00	0.00
5 Da2	12.78	0.00	7385.75	0.75	0.00	9.25	7385.18	0.18	0 12:30	0 00:00	0.00	0.00
6 Db2	3.60	0.00	7412.49	0.49	0.00	9.51	7412.12	0.12	0 12:35	0 00:00	0.00	0.00
7 Ee1	3.37	0.00	7417.38	0.38	0.00	9.62	7417.09	0.09	0 12:25	0 00:00	0.00	0.00
8 EFI	349.46	67.73	7278.99	2.99	0.00	7.01	7276.86	0.86	0 13:17	0 00:00	0.00	0.00
9 GHD	329.81	157.22	7302.24	2.24	0.00	7.76	7300.65	0.65	0 13:18	0 00:00	0.00	0.00
10 NUL	329.69	0.00	7282.99	2.99	0.00	7.01	7280.86	0.86	0 13:12	0 00:00	0.00	0.00
11 OS-J	3.81	3.81	7410.00	0.00	0.00	10.00	7410.00	0.00	0 00:00	0 00:00	0.00	0.00
12 OS-K	10.79	10.79	7349.00	0.00	0.00	10.00	7349.00	0.00	0 00:00	0 00:00	0.00	0.00

Channel Input

SN Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	
1	2473.30	7380.00	0.00	7318.50	0.00	61.50	2.4900	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
2	2839.57	7318.50	0.00	7300.00	0.00	18.50	0.6500	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
3	1717.53	7300.00	0.00	7280.00	0.00	20.00	1.1600	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
4	1277.36	7280.00	0.00	7276.00	0.00	4.00	0.3100	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
5	70.66	7276.00	0.00	7260.00	0.00	16.00	22.6400	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
6	2431.12	7379.00	0.00	7318.50	0.00	60.50	2.4900	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
7	3754.63	7385.00	0.00	7300.00	0.00	85.00	2.2600	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
7a	4064.87	7412.00	0.00	7300.00	0.00	112.00	2.7600	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
8	5201.60	7417.00	0.00	7276.00	0.00	141.00	2.7100	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No	
10	BR1	492.55	7385.00	0.00	7380.00	0.00	5.00	1.0200	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
11	OverTop-Ca	462.70	7382.00	0.00	7379.00	0.00	3.00	0.6500	Trapezoidal	0.500	106.000	0.0320	0.5000	0.5000	0.0000	0.00	No
12	OverTop-Da	381.56	7388.00	0.00	7385.00	0.00	3.00	0.7900	Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00	No
13	OverTop-Db	227.21	7416.00	0.00	7412.00	0.00	4.00	1.7600	Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00	No
14	OverTop-Ea	427.06	7420.00	0.00	7417.00	0.00	3.00	0.7000	Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00	No

Channel Results

SN Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1 1	199.07	0 13:21	11419.17	0.02	6.13	6.72	1.29	0.13	0.00		
2 2	275.37	0 13:18	5845.14	0.05	4.28	11.06	2.24	0.22	0.00		
3 3	329.69	0 13:12	7814.45	0.04	5.50	5.20	2.11	0.21	0.00		
4 4	329.49	0 13:17	4052.37	0.08	3.46	6.15	2.99	0.30	0.00		
5 5	349.46	0 13:13	34459.47	0.01	15.41	0.08	0.95	0.10	0.00		
6 6	11.68	0 12:43	11423.78	0.00	2.32	17.46	0.25	0.02	0.00		
7 7a	10.43	0 12:48	10895.85	0.00	2.20	28.44	0.23	0.02	0.00		
8 7b	2.66	0 13:11	12020.46	0.00	1.39	48.74	0.10	0.01	0.00		
9 8	1.96	0 13:05	11922.75	0.00	1.25	69.35	0.08	0.01	0.00		
10 BR1	199.53	0 13:16	7296.17	0.03	4.50	1.82	1.66	0.17	0.00		
11 OverTop-Ca	0.00	0 00:00	118.95	0.00	0.00		0.00	0.00	0.00		
12 OverTop-Da	0.00	0 00:00	131.98	0.00	0.00		0.00	0.00	0.00		
13 OverTop-Db	0.00	0 00:00	197.50	0.00	0.00		0.00	0.00	0.00		
14 OverTop-Ea	0.00	0 00:00	124.75	0.00	0.00		0.00	0.00	0.00		

Pipe Input

SN Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Pipe Slope (%)	Pipe Shape	Pipe Diameter or Height (ft)	Pipe Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow Gate	Flap	No. of Barrels
1 ExCulv1	100.00	7382.00	0.00	7379.00	0.00	3.00	3.0000	CIRCULAR	2.500	2.500	0.0250	0.5000	0.5000	0.0000	0.00	No	1
2 ExCulv2	100.00	7388.00	0.00	7385.00	0.00	3.00	3.0000	CIRCULAR	6.000	6.000	0.0250	0.5000	0.5000	0.0000	0.00	No	1
3 ExCulv3	100.00	7416.00	0.00	7412.00	0.00	4.00	4.0000	CIRCULAR	2.500	2.500	0.0250	0.5000	0.5000	0.0000	0.00	No	1
4 ExCulv4	125.00	7420.00	0.00	7417.00	0.00	3.00	2.4000	CIRCULAR	2.500	2.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1	ExCulv1	12.86	0 12:30	36.94	0.35	6.85	0.24	1.02	0.41	0.00		Calculated
2	ExCulv2	12.78	0 12:30	381.44	0.03	6.27	0.27	0.75	0.12	0.00		Calculated
3	ExCulv3	3.60	0 12:35	42.66	0.08	5.29	0.32	0.49	0.20	0.00		Calculated
4	ExCulv4	3.37	0 12:25	68.84	0.05	7.29	0.29	0.38	0.15	0.00		Calculated

5.2 STORM MODEL OUTPUTS - EC 100Y

Project Description

File Name WinsomeSubdivisionExistingCondition (24).SPF
 Description McCune Ranch Basins

Project Options

Flow Units CFS
 Elevation Type Depth
 Hydrology Method SCS TR-55
 Time of Concentration (TOC) Method SCS TR-55
 Link Routing Method Kinematic Wave
 Enable Overflow Ponding at Nodes YES
 Skip Steady State Analysis Time Periods ... NO

Analysis Options

Start Analysis On Mar 09, 2018 00:00:00
 End Analysis On Mar 10, 2018 00:00:00
 Start Reporting On Mar 09, 2018 00:00:00
 Antecedent Dry Days 0 days
 Runoff (Dry Weather) Time Step 0 01:00:00 days hh:mm:ss
 Runoff (Wet Weather) Time Step 0 00:05:00 days hh:mm:ss
 Reporting Time Step 0 00:05:00 days hh:mm:ss
 Routing Time Step 30 seconds

Number of Elements

	Qty
Rain Gages	1
Subbasins.....	16
Nodes.....	17
<i>Junctions</i>	12
<i>Outfalls</i>	1
<i>Flow Diversions</i>	4
<i>Inlets</i>	0
<i>Storage Nodes</i>	0
Links.....	18
<i>Channels</i>	14
<i>Pipes</i>	4
<i>Pumps</i>	0
<i>Orifices</i>	0
<i>Weirs</i>	0
<i>Outlets</i>	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1		Time Series	TS-01	Cumulative	inches	Colorado	El Paso	100	4.60	SCS Type II 24-hr

Subbasin Summary

SN	Subbasin ID	Area	Weighted Curve Number	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
		(ac)	(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)	
1	A	915.40	61.83	4.60	1.19	1086.58	569.36	0 00:52:35
2	Ba	3836.70	60.34	4.60	1.10	4201.19	1456.88	0 01:28:25
3	Bb	100.60	69.79	4.60	1.73	173.94	122.65	0 00:39:51
4	Ca	162.70	60.00	4.60	1.07	174.74	113.24	0 00:37:06
5	Cb	70.00	68.70	4.60	1.65	115.50	85.50	0 00:36:41
6	Da	161.30	60.00	4.60	1.07	173.24	112.62	0 00:36:57
7	Db	49.90	60.00	4.60	1.07	53.59	30.80	0 00:43:48
8	Dc	209.50	67.70	4.60	1.58	330.80	225.21	0 00:40:49
9	Ea	37.90	60.00	4.60	1.07	40.70	30.47	0 00:30:07
10	Eb	114.80	67.20	4.60	1.54	177.25	124.57	0 00:38:39
11	F	44.50	69.00	4.60	1.67	74.40	54.82	0 00:37:04
12	G	107.60	74.50	4.60	2.09	224.78	181.59	0 00:33:54
13	H	121.80	71.76	4.60	1.88	228.50	182.95	0 00:33:38
14	I	37.50	79.00	4.60	2.46	92.29	78.56	0 00:31:46
15	J	10.10	69.50	4.60	1.71	17.25	14.89	0 00:29:14
16	K	17.80	76.00	4.60	2.21	39.34	31.51	0 00:34:33

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft ²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	ABC	Junction	7318.50	7328.50	7318.50	7328.50	0.00	1944.07	7324.52	0.00	3.98	0 00:00	0.00	0.00
2	B1	Junction	7385.00	7395.00	7385.00	7395.00	0.00	1455.28	7389.70	0.00	5.30	0 00:00	0.00	0.00
3	B2	Junction	7380.00	7390.00	7380.00	7390.00	0.00	1454.55	7384.70	0.00	5.30	0 00:00	0.00	0.00
4	Cc1	Junction	7379.00	7389.00	7379.00	7389.00	0.00	111.82	7381.50	0.00	7.50	0 00:00	0.00	0.00
5	Da2	Junction	7385.00	7395.00	7385.00	7395.00	0.00	111.33	7387.22	0.00	7.78	0 00:00	0.00	0.00
6	Db2	Junction	7412.00	7422.00	7412.00	7422.00	0.00	30.54	7413.57	0.00	8.43	0 00:00	0.00	0.00
7	Ee1	Junction	7417.00	7427.00	7417.00	7427.00	0.00	30.05	7418.16	0.00	8.84	0 00:00	0.00	0.00
8	EF1	Junction	7276.00	7286.00	7276.00	7286.00	0.00	2355.04	7283.65	0.00	2.35	0 00:00	0.00	0.00
9	GHD	Junction	7300.00	7310.00	7300.00	7310.00	0.00	2247.57	7306.02	0.00	3.98	0 00:00	0.00	0.00
10	NUL	Junction	7280.00	7290.00	7280.00	7290.00	0.00	2246.18	7287.65	0.00	2.35	0 00:00	0.00	0.00
11	OS-J	Junction	7410.00	7420.00	7410.00	7420.00	0.00	14.79	7410.00	0.00	10.00	0 00:00	0.00	0.00
12	OS-K	Junction	7349.00	7359.00	7349.00	7359.00	0.00	31.42	7349.00	0.00	10.00	0 00:00	0.00	0.00
13	Out-01	Outfall	7260.00					2355.01	7262.73					
14	C1	Flow Diversions	7382.00	7392.00	7382.00		0.00	112.05	7384.50				0.00	0.00
15	Da1	Flow Diversions	7388.00	7398.00	7388.00		0.00	111.36	7390.22				0.00	0.00
16	Db1	Flow Diversions	7416.00	7426.00	7416.00		0.00	30.55	7417.57				0.00	0.00
17	E1	Flow Diversions	7420.00	7430.00	7420.00		0.00	30.13	7421.16				0.00	0.00

Link Summary

SN Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope (%)	Diameter or Height (ft)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Reported (min)	Surcharged Condition
1	ExCulv1	Pipe	C1 Cc1	100.00	7382.00	7379.00	3.0000	2.500	0.0250	39.49	36.94	1.07	8.68	2.50	1.00	55.00	SURCHARGED
2	ExCulv2	Pipe	Da1 Da2	100.00	7388.00	7385.00	3.0000	6.000	0.0250	111.33	381.44	0.29	11.70	2.22	0.37	0.00	Calculated
3	ExCulv3	Pipe	Db1 Db2	100.00	7416.00	7412.00	4.0000	2.500	0.0250	30.54	42.66	0.72	9.44	1.57	0.63	0.00	Calculated
4	ExCulv4	Pipe	E1 Ee1	125.00	7420.00	7417.00	2.4000	2.500	0.0120	30.05	68.84	0.44	13.55	1.16	0.46	0.00	Calculated
5	1	Channel	B2 ABC	2473.30	7380.00	7318.50	2.4900	10.000	0.0400	1452.07	11419.17	0.13	11.05	3.75	0.38	0.00	
6	2	Channel	ABC GHD	2839.57	7318.50	7300.00	0.6500	10.000	0.0400	1939.55	5845.14	0.33	7.35	6.01	0.60	0.00	
7	3	Channel	GHD NUL	1717.53	7300.00	7280.00	1.1600	10.000	0.0400	2246.18	7814.45	0.29	9.42	5.62	0.56	0.00	
8	4	Channel	NUL EFI	1277.36	7280.00	7276.00	0.3100	10.000	0.0400	2244.11	4052.37	0.55	5.81	7.64	0.76	0.00	
9	5	Channel	EF1 Out-01	70.66	7276.00	7260.00	22.6400	10.000	0.0400	2355.01	34459.47	0.07	27.92	2.73	0.27	0.00	
10	6	Channel	Cc1 ABC	2431.12	7379.00	7318.50	2.4900	10.000	0.0400	108.91	11423.78	0.01	5.14	0.91	0.09	0.00	
11	7a	Channel	Da2 GHD	3754.63	7385.00	7300.00	2.2600	10.000	0.0400	105.02	10895.85	0.01	5.06	0.91	0.09	0.00	
12	7b	Channel	Db2 GHD	4064.87	7412.00	7300.00	2.7600	10.000	0.0400	27.49	12020.46	0.00	3.42	0.39	0.04	0.00	
13	8	Channel	Ee1 EFI	5201.60	7417.00	7276.00	2.7100	10.000	0.0400	22.77	11922.75	0.00	3.32	0.35	0.03	0.00	
14	BR1	Channel	B1 B2	492.55	7385.00	7380.00	1.0200	10.000	0.0400	1454.55	7296.17	0.20	7.97	4.70	0.47	0.00	
15	OverTop-Ca	Channel	C1 Cc1	462.70	7382.00	7379.00	0.6500	0.500	0.0320	74.88	118.95	0.63	1.95	0.38	0.76	0.00	
16	OverTop-Da	Channel	Da1 Da2	381.56	7388.00	7385.00	0.7900	0.500	0.0320	0.00	131.98	0.00	0.00	0.00	0.00	0.00	
17	OverTop-Db	Channel	Db1 Db2	227.21	7416.00	7412.00	1.7600	0.500	0.0320	0.00	197.50	0.00	0.00	0.00	0.00	0.00	
18	OverTop-Ea	Channel	E1 Ee1	427.06	7420.00	7417.00	0.7000	0.500	0.0320	0.00	124.75	0.00	0.00	0.00	0.00	0.00	

Subbasin Hydrology

Subbasin : A

Input Data

Area (ac) 915.40
 Weighted Curve Number 61.83
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	823.86	B	60.00
Pasture, grassland, or range, Fair	9.15	D	84.00
Pasture, grassland, or range, Fair	64.08	C	79.00
Pasture, grassland, or range, Fair	9.15	B	69.00
5 Acre Lots, 7% Impervious	9.15	D	77.00
Composite Area & Weighted CN	915.39		61.83

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

$$T_c = (0.007 * ((n * L_f)^{0.8})) / ((P^{0.5}) * (S_f^{0.4}))$$

Where :

T_c = Time of Concentration (hr)
 n = Manning's roughness
 L_f = Flow Length (ft)
 P = 2 yr, 24 hr Rainfall (inches)
 S_f = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (S_f^{0.5}) (unpaved surface)
 V = 20.3282 * (S_f^{0.5}) (paved surface)
 V = 15.0 * (S_f^{0.5}) (grassed waterway surface)
 V = 10.0 * (S_f^{0.5}) (nearly bare & untilled surface)
 V = 9.0 * (S_f^{0.5}) (cultivated straight rows surface)
 V = 7.0 * (S_f^{0.5}) (short grass pasture surface)
 V = 5.0 * (S_f^{0.5}) (woodland surface)
 V = 2.5 * (S_f^{0.5}) (forest w/heavy litter surface)
 T_c = (L_f / V) / (3600 sec/hr)

Where:

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)

Channel Flow Equation :

$$V = (1.49 * (R^{2/3}) * (S_f^{0.5})) / n$$

$$R = A_q / W_p$$

$$T_c = (L_f / V) / (3600 \text{ sec/hr})$$

Where :

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 R = Hydraulic Radius (ft)
 A_q = Flow Area (ft²)
 W_p = Wetted Perimeter (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)
 n = Manning's roughness

	Flowpath A	Flowpath B	Flowpath C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

	Flowpath A	Flowpath B	Flowpath C
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.57	0.00	0.00
Computed Flow Time (min) :	10.62	0.00	0.00

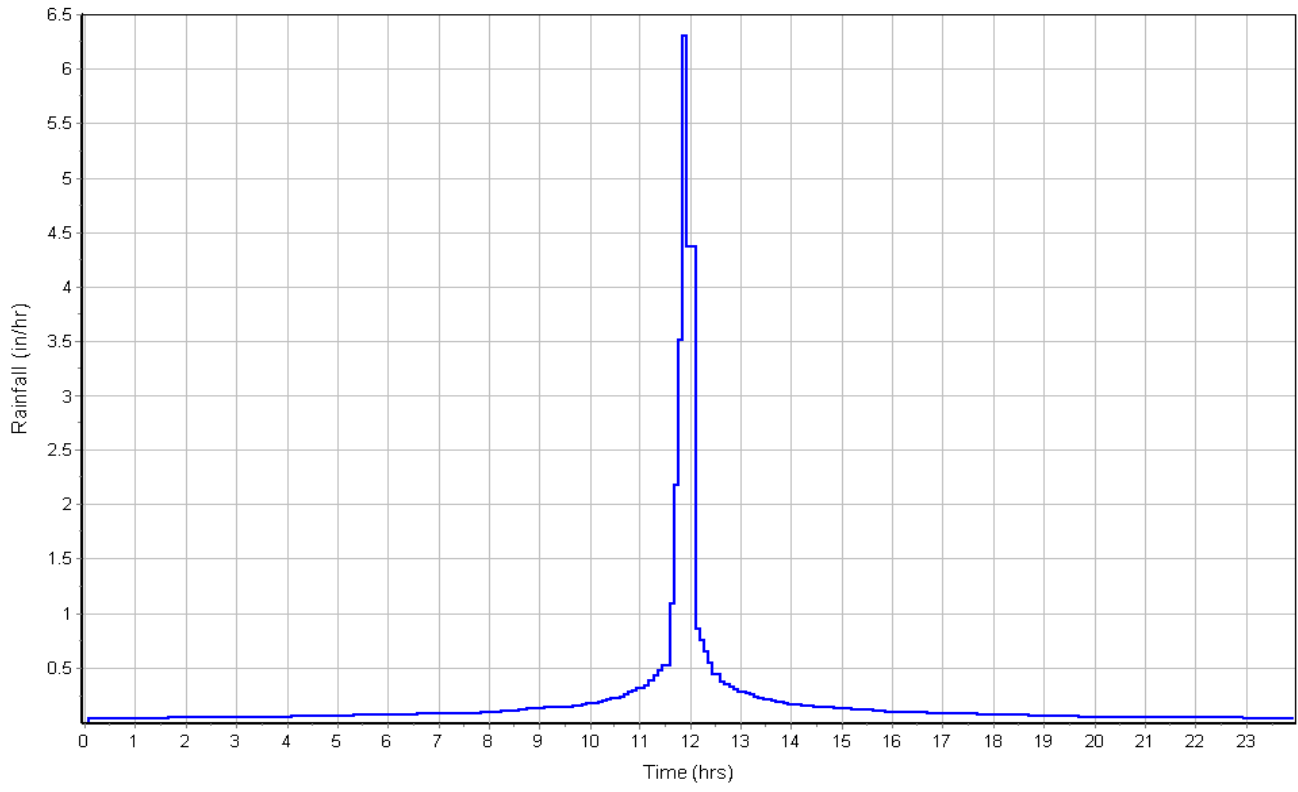
	Flowpath A	Flowpath B	Flowpath C
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	10494	0.00	0.00
Channel Slope (%) :	2	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.36	0.00	0.00
Computed Flow Time (min) :	20.92	0.00	0.00
Total TOC (min)	52.59		

Subbasin Runoff Results

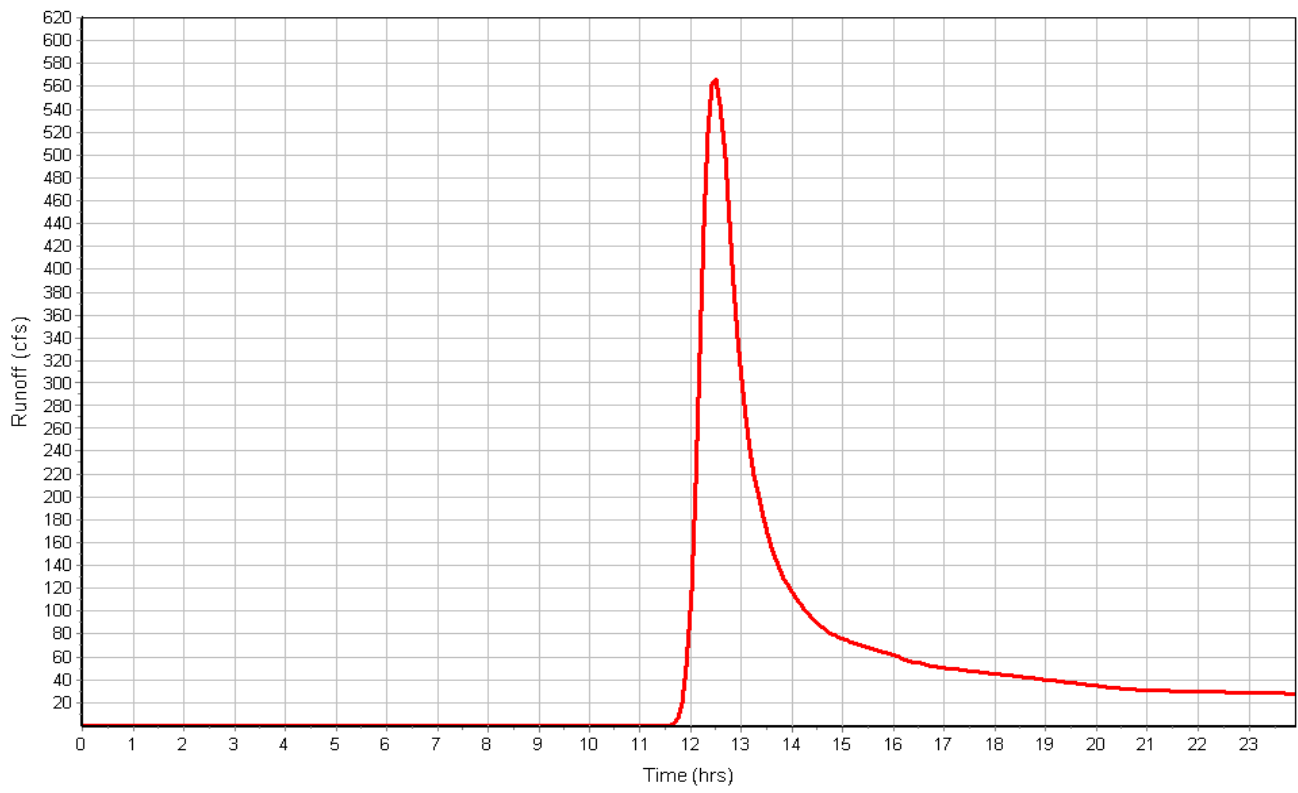
Total Rainfall (in)	4.60
Total Runoff (in)	1.19
Peak Runoff (cfs)	569.36
Weighted Curve Number	61.83
Time of Concentration (days hh:mm:ss)	0 00:52:35

Subbasin : A

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Ba

Input Data

Area (ac) 3836.70
 Weighted Curve Number 60.34
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	3759.97	B	60.00
5 Acre Lots, 7% Impervious	76.73	D	77.00
Composite Area & Weighted CN	3836.70		60.34

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	4	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.40	0.00	0.00
Computed Flow Time (min) :	11.90	0.00	0.00

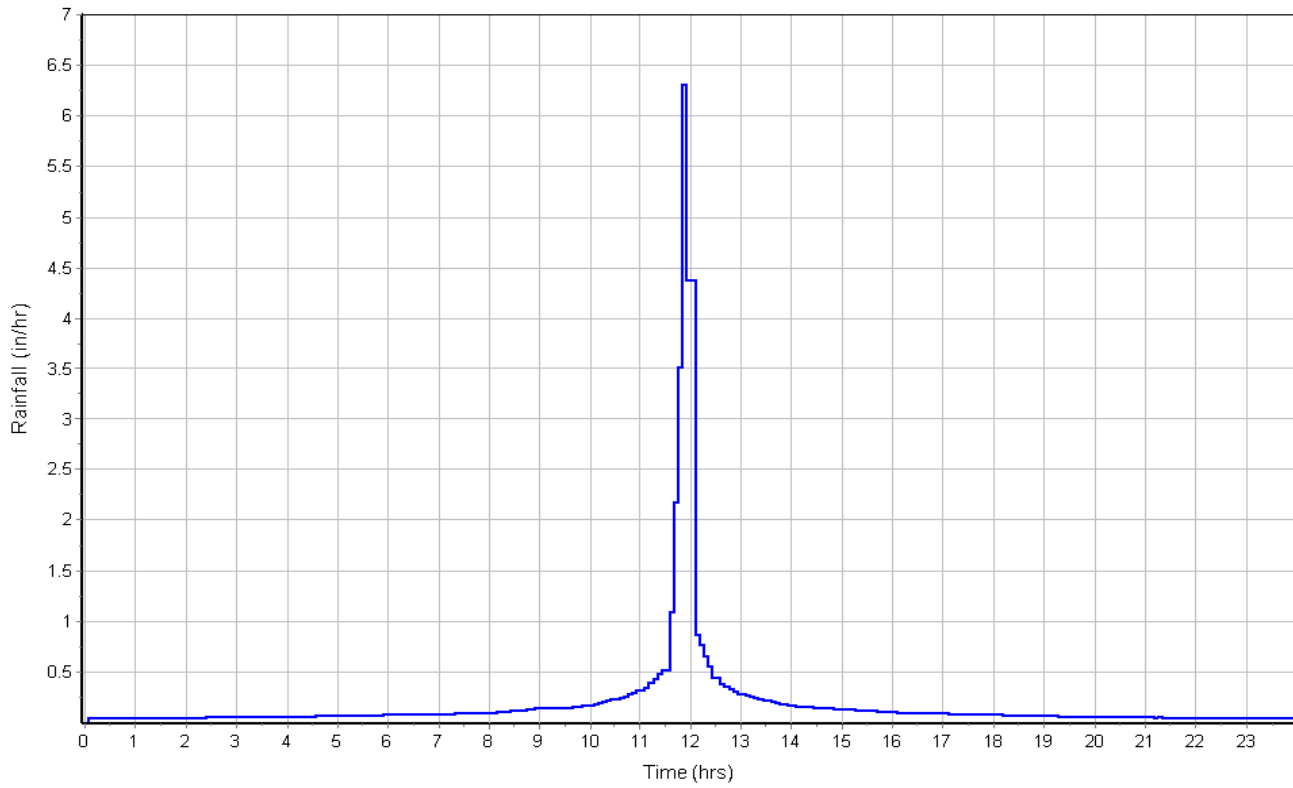
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	23284	0.00	0.00
Channel Slope (%) :	1.4	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	7.00	0.00	0.00
Computed Flow Time (min) :	55.47	0.00	0.00
Total TOC (min)	88.43		

Subbasin Runoff Results

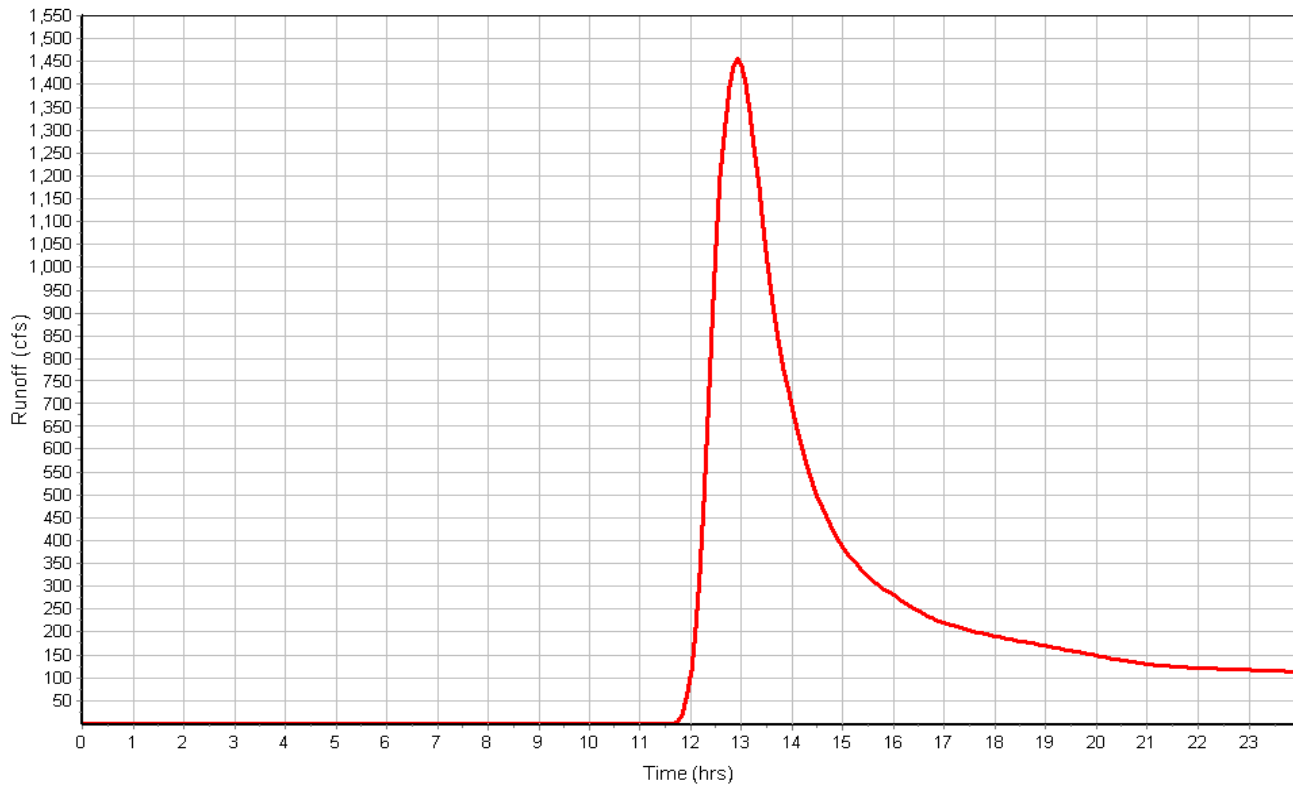
Total Rainfall (in) 4.60
 Total Runoff (in) 1.10
 Peak Runoff (cfs) 1456.88
 Weighted Curve Number 60.34
 Time of Concentration (days hh:mm:ss) 0 01:28:26

Subbasin : Ba

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Bb

Input Data

Area (ac) 100.60
 Weighted Curve Number 69.79
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	90.54	B	69.00
Pasture, grassland, or range, Fair	5.03	D	84.00
Composite Area & Weighted CN	95.57		69.79

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.48	0.00	0.00
Computed Flow Time (min) :	11.26	0.00	0.00

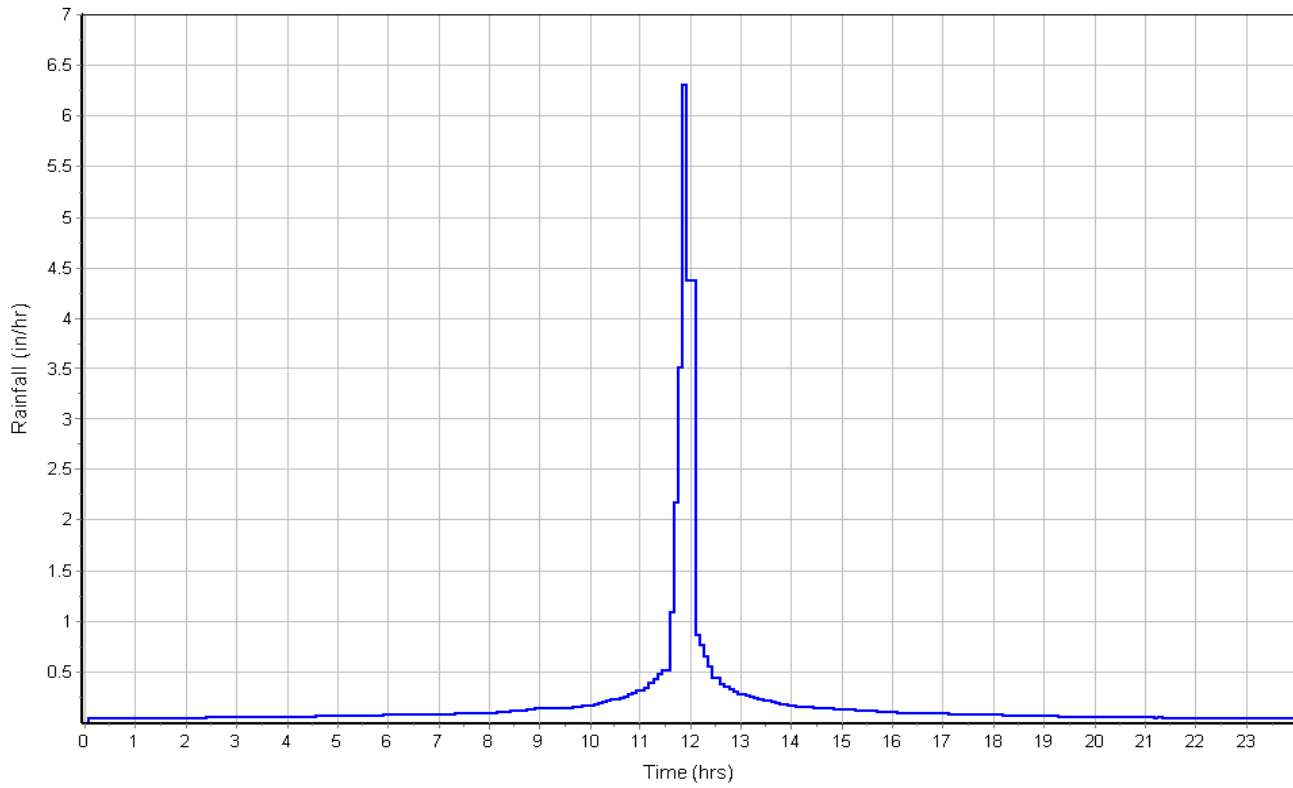
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	4140	0.00	0.00
Channel Slope (%) :	2.4	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	9.16	0.00	0.00
Computed Flow Time (min) :	7.53	0.00	0.00
Total TOC (min)	39.85		

Subbasin Runoff Results

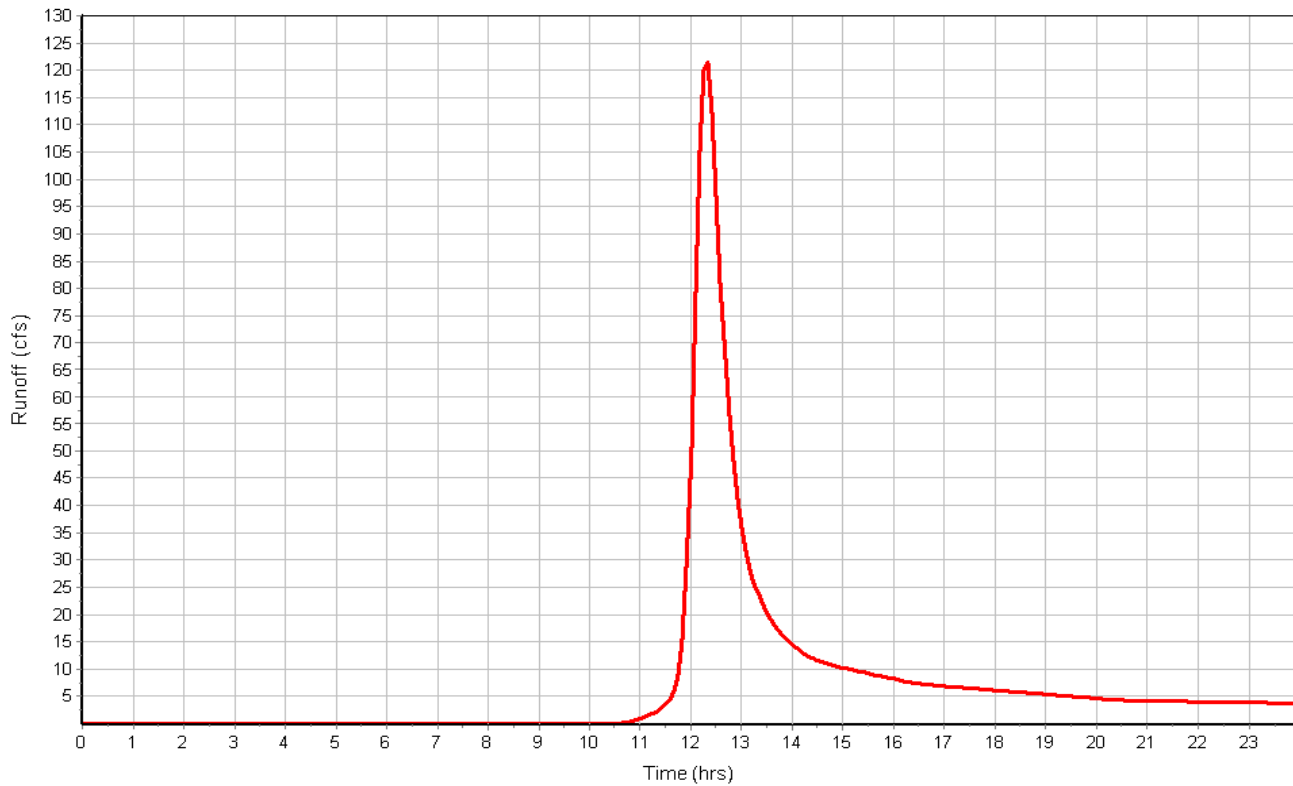
Total Rainfall (in) 4.60
 Total Runoff (in) 1.73
 Peak Runoff (cfs) 122.65
 Weighted Curve Number 69.79
 Time of Concentration (days hh:mm:ss) 0 00:39:51

Subbasin : Bb

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Ca

Input Data

Area (ac) 162.70
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	162.70	B	60.00
Composite Area & Weighted CN	162.70		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.42	0.00	0.00
Computed Flow Time (min) :	11.74	0.00	0.00

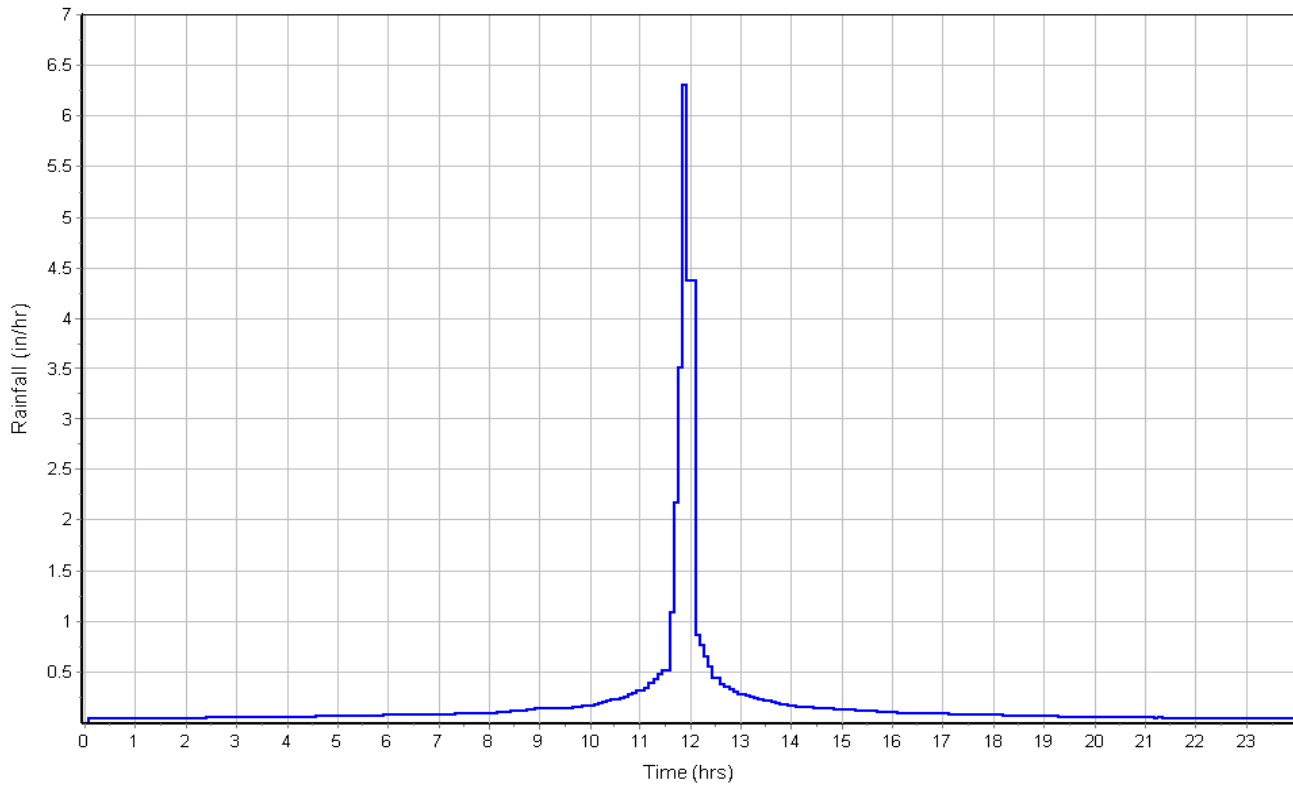
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	3099	0.00	0.00
Channel Slope (%) :	4.1	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.97	0.00	0.00
Computed Flow Time (min) :	4.31	0.00	0.00
Total TOC (min)	37.11		

Subbasin Runoff Results

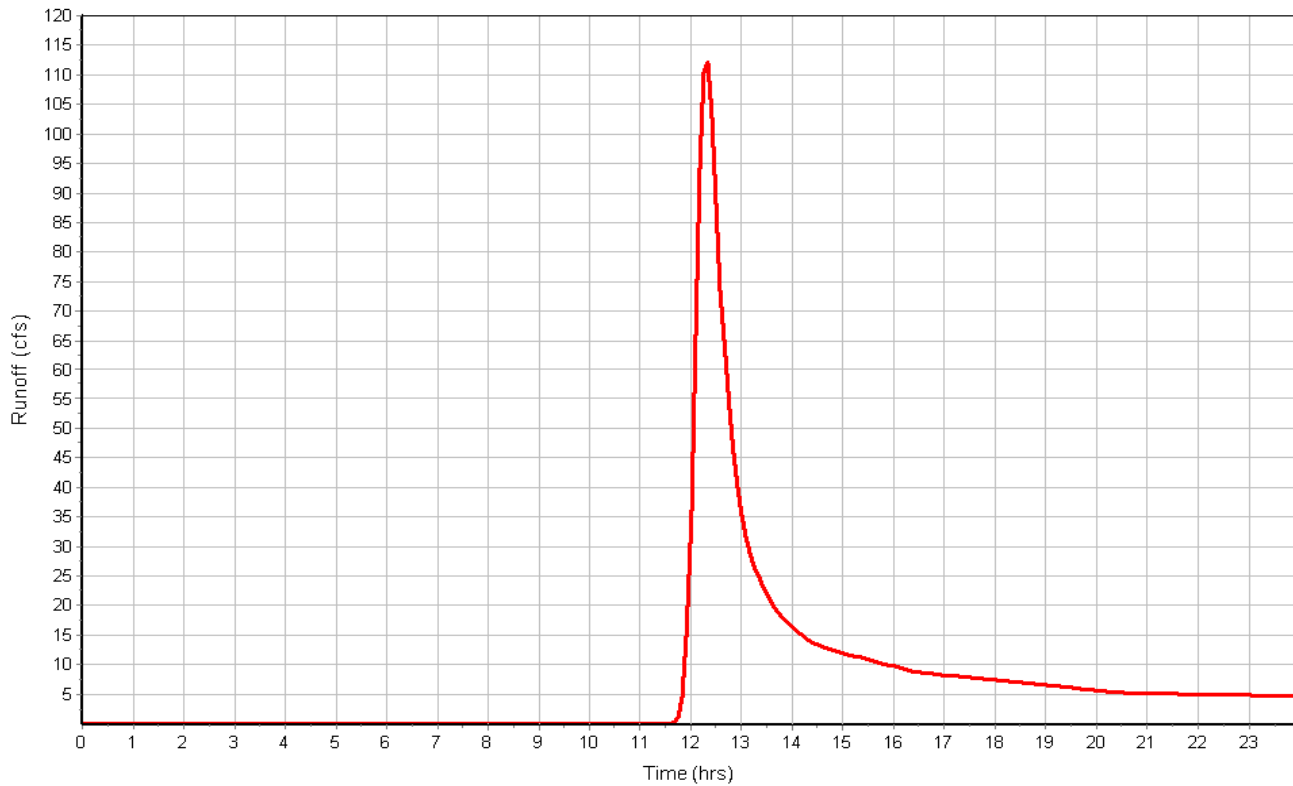
Total Rainfall (in) 4.60
 Total Runoff (in) 1.07
 Peak Runoff (cfs) 113.24
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:37:07

Subbasin : Ca

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Cb

Input Data

Area (ac) 70.00
 Weighted Curve Number 68.70
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods & grass combination, Fair	10.50	B	65.00
Pasture, grassland, or range, Fair	2.10	C	79.00
Pasture, grassland, or range, Fair	57.40	B	69.00
Composite Area & Weighted CN	70.00		68.70

Time of Concentration

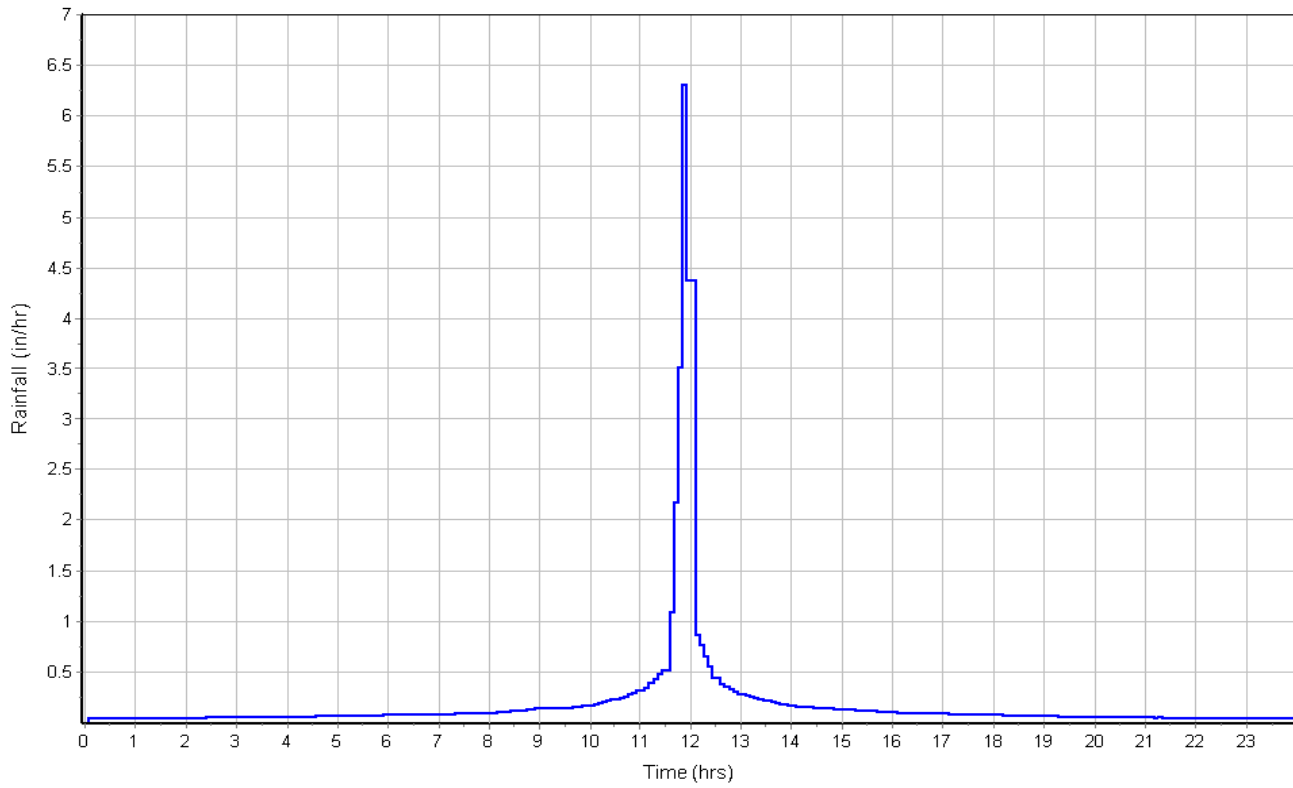
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.6	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.33	0.00	0.00
Computed Flow Time (min) :	12.53	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	2084	0.00	0.00
Channel Slope (%) :	3.6	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.22	0.00	0.00
Computed Flow Time (min) :	3.10	0.00	0.00
Total TOC (min)	36.69		

Subbasin Runoff Results

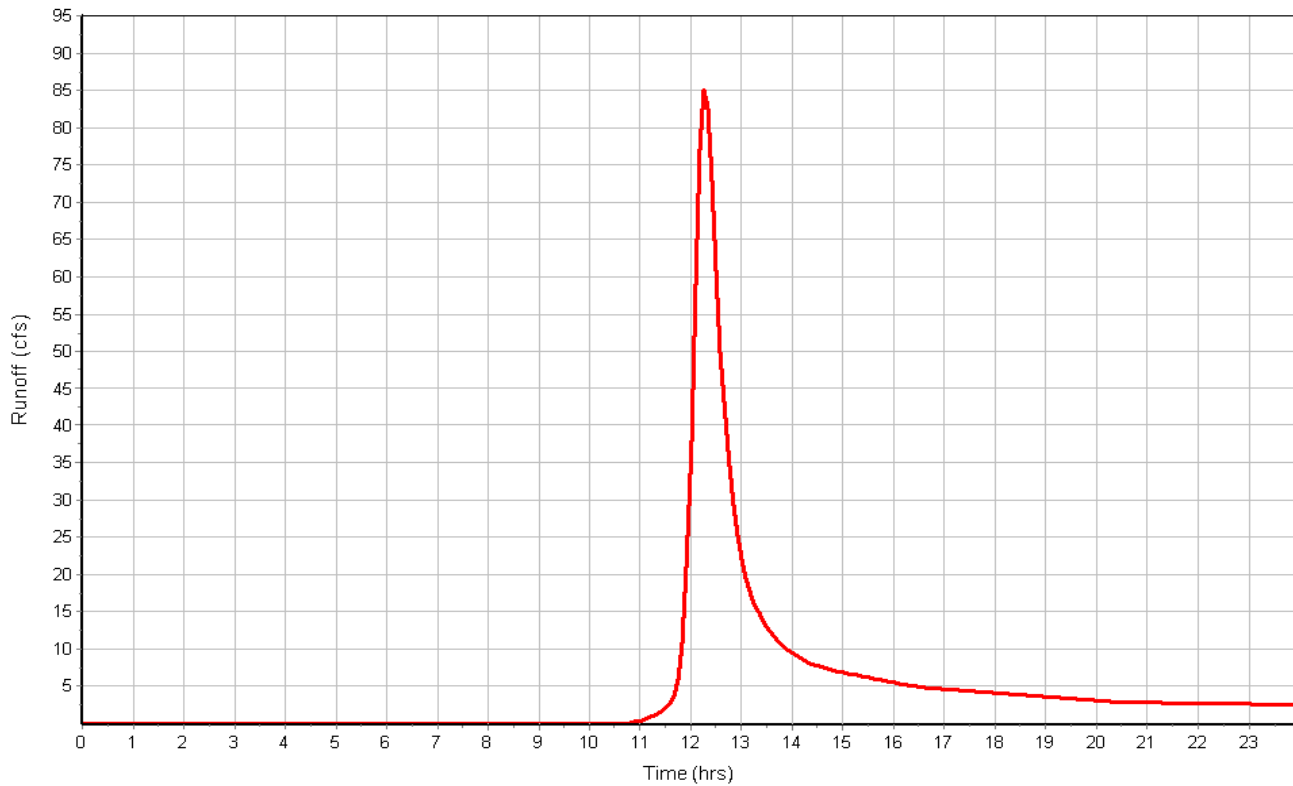
Total Rainfall (in) 4.60
 Total Runoff (in) 1.65
 Peak Runoff (cfs) 85.50
 Weighted Curve Number 68.70
 Time of Concentration (days hh:mm:ss) 0 00:36:41

Subbasin : Cb

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Da

Input Data

Area (ac) 161.30
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	161.30	B	60.00
Composite Area & Weighted CN	161.30		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5.7	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.19	0.00	0.00
Computed Flow Time (min) :	14.01	0.00	0.00

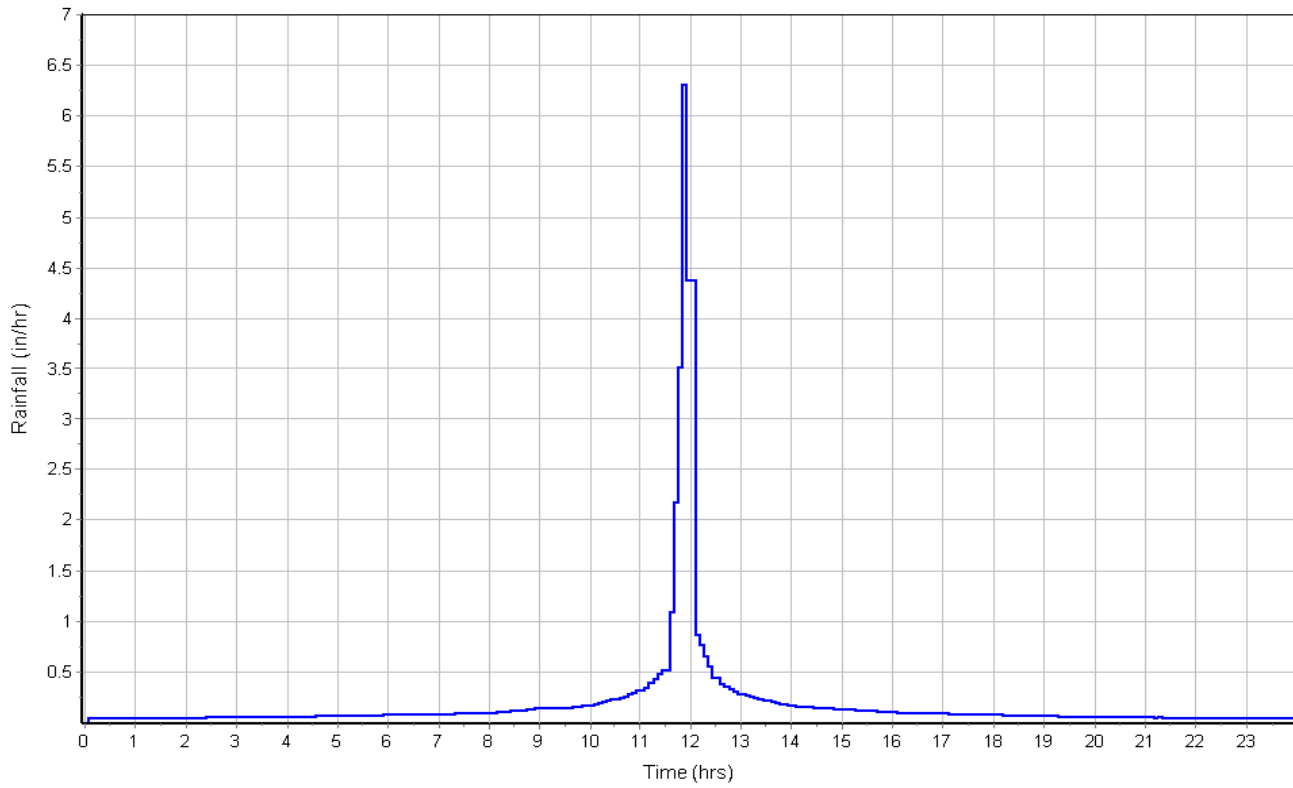
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1601	0.00	0.00
Channel Slope (%) :	5.7	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	14.12	0.00	0.00
Computed Flow Time (min) :	1.89	0.00	0.00
Total TOC (min)	36.95		

Subbasin Runoff Results

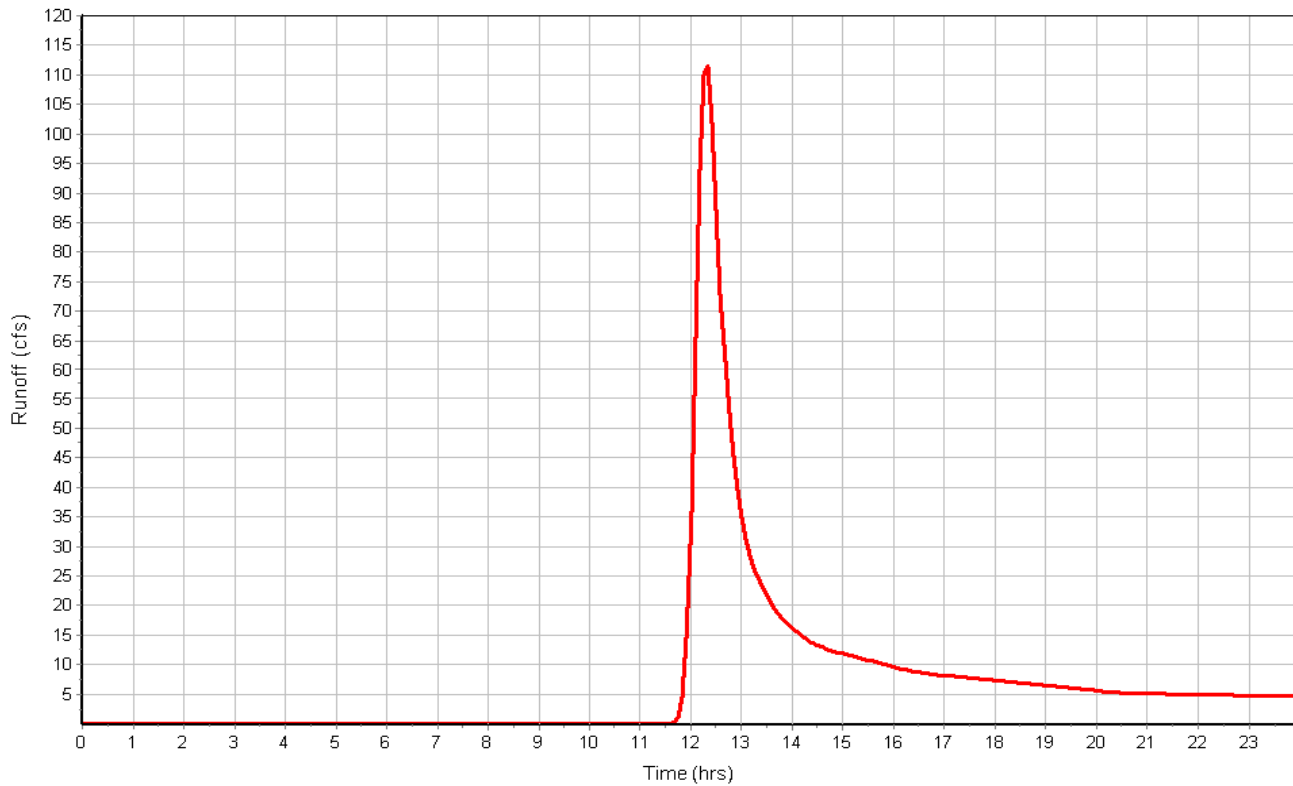
Total Rainfall (in) 4.60
 Total Runoff (in) 1.07
 Peak Runoff (cfs) 112.62
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:36:57

Subbasin : Da

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Db

Input Data

Area (ac) 49.90
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	49.90	B	60.00
Composite Area & Weighted CN	49.90		60.00

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	2.48	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	0.79	0.00	0.00
Computed Flow Time (min) :	21.10	0.00	0.00

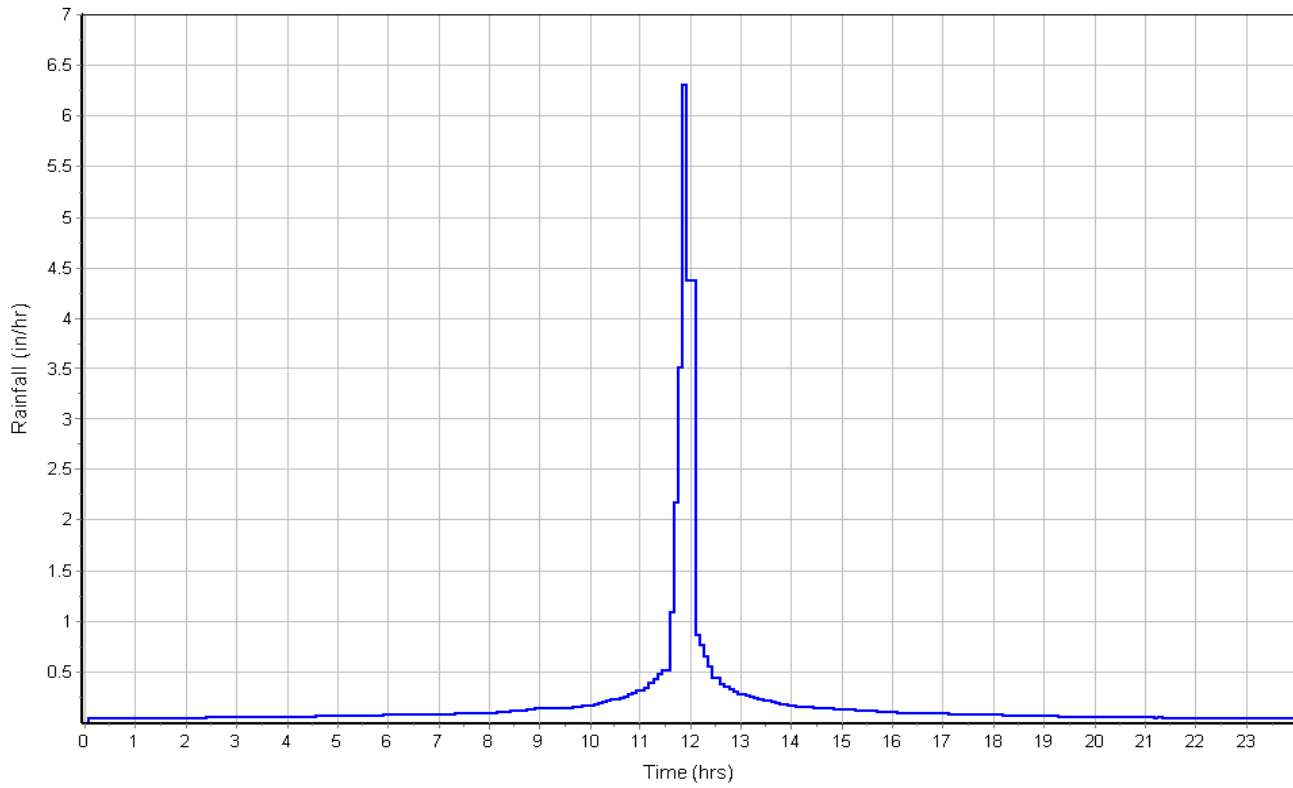
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	922	0.00	0.00
Channel Slope (%) :	2.48	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	9.31	0.00	0.00
Computed Flow Time (min) :	1.65	0.00	0.00
Total TOC (min)	43.81		

Subbasin Runoff Results

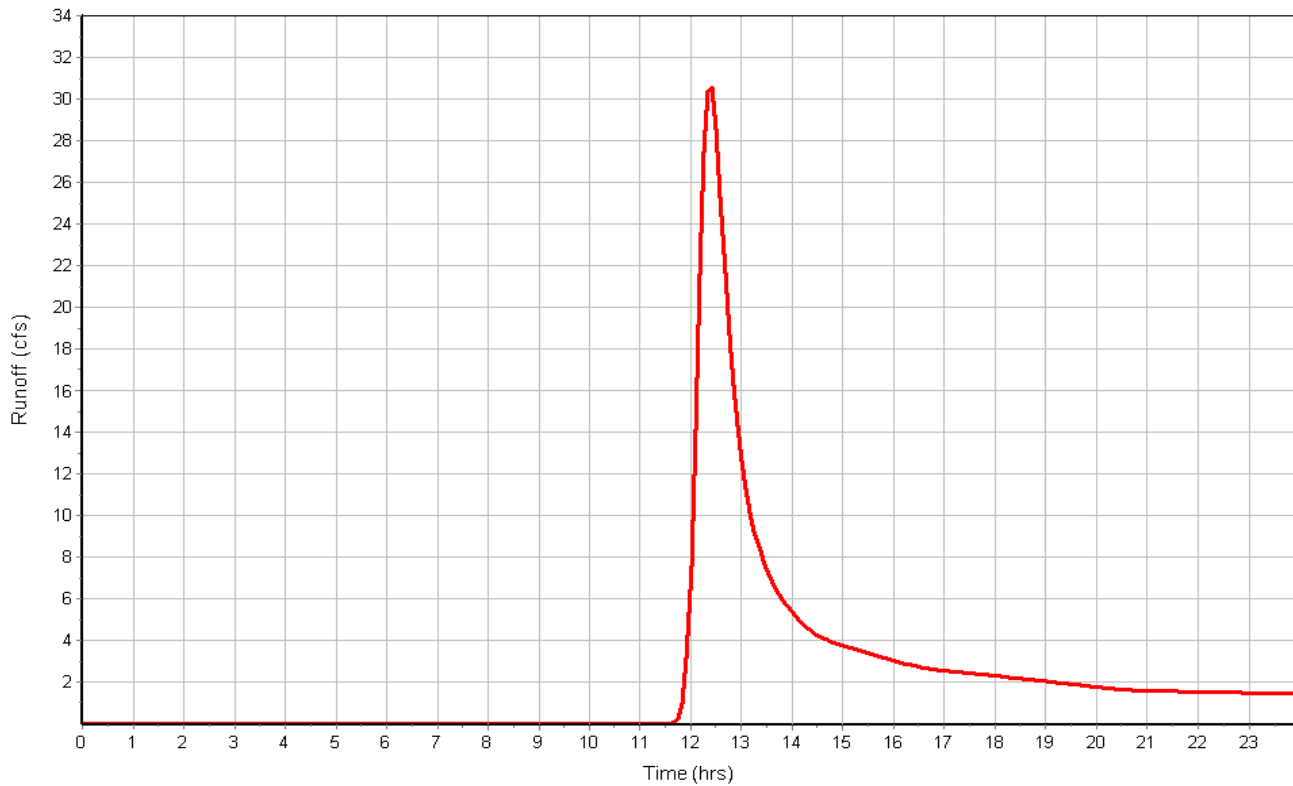
Total Rainfall (in) 4.60
 Total Runoff (in) 1.07
 Peak Runoff (cfs) 30.80
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:43:49

Subbasin : Db

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Dc

Input Data

Area (ac) 209.50
 Weighted Curve Number 67.70
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods & grass combination, Fair	83.80	B	65.00
Pasture, grassland, or range, Fair	4.19	D	84.00
Pasture, grassland, or range, Fair	121.51	B	69.00
Composite Area & Weighted CN	209.50		67.70

Time of Concentration

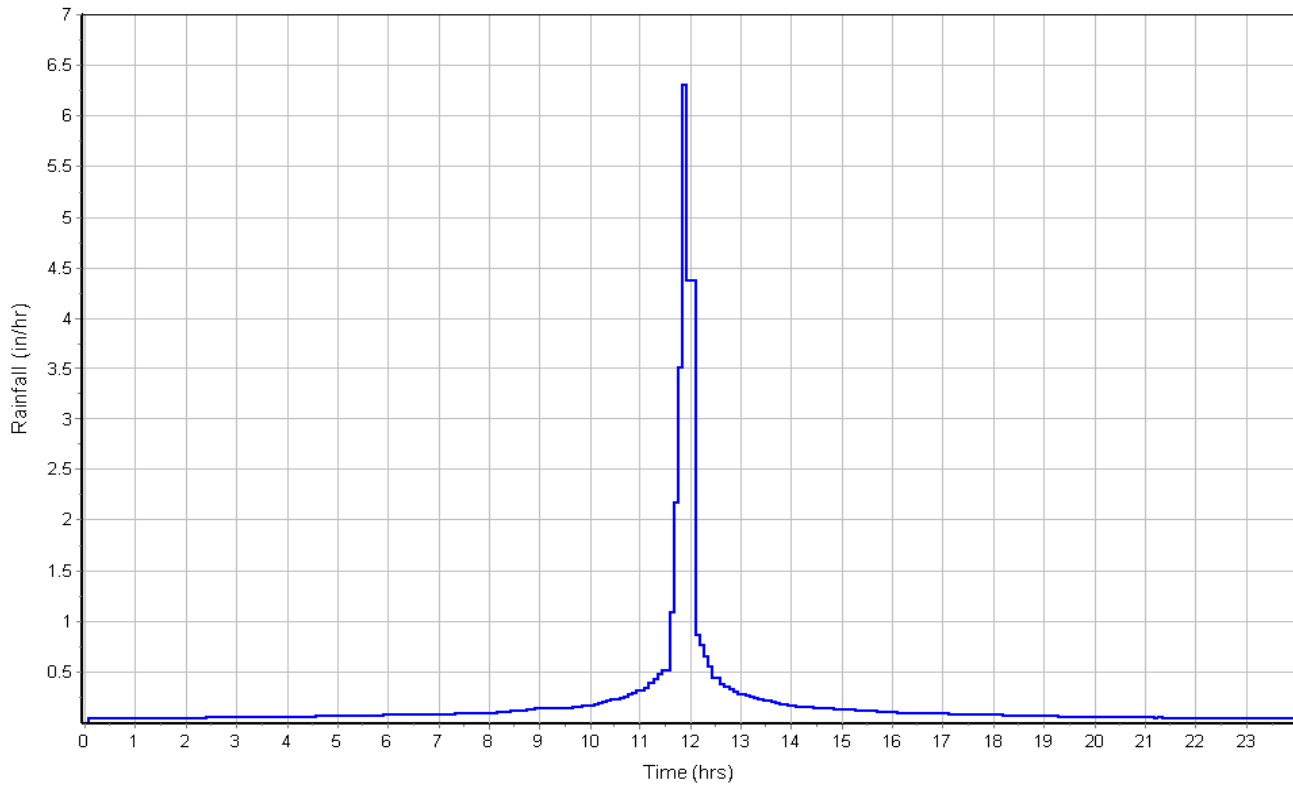
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.21	0.00	0.00
Computed Flow Time (min) :	13.77	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	3678	0.00	0.00
Channel Slope (%) :	3	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.24	0.00	0.00
Computed Flow Time (min) :	5.99	0.00	0.00
Total TOC (min)	40.82		

Subbasin Runoff Results

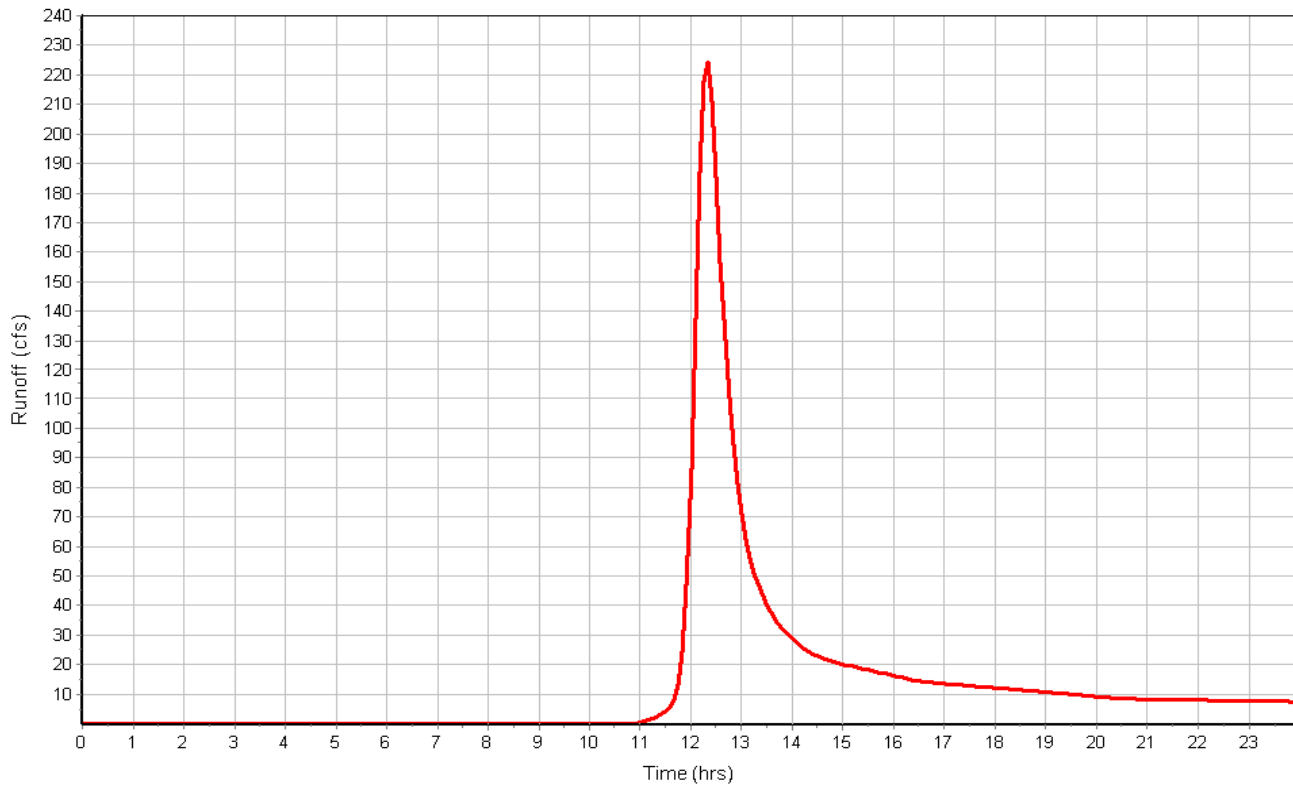
Total Rainfall (in) 4.60
 Total Runoff (in) 1.58
 Peak Runoff (cfs) 225.21
 Weighted Curve Number 67.70
 Time of Concentration (days hh:mm:ss) 0 00:40:49

Subbasin : Dc

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Ea

Input Data

Area (ac) 37.90
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	37.90	B	60.00
Composite Area & Weighted CN	37.90		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.9	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.11	0.00	0.00
Computed Flow Time (min) :	7.51	0.00	0.00

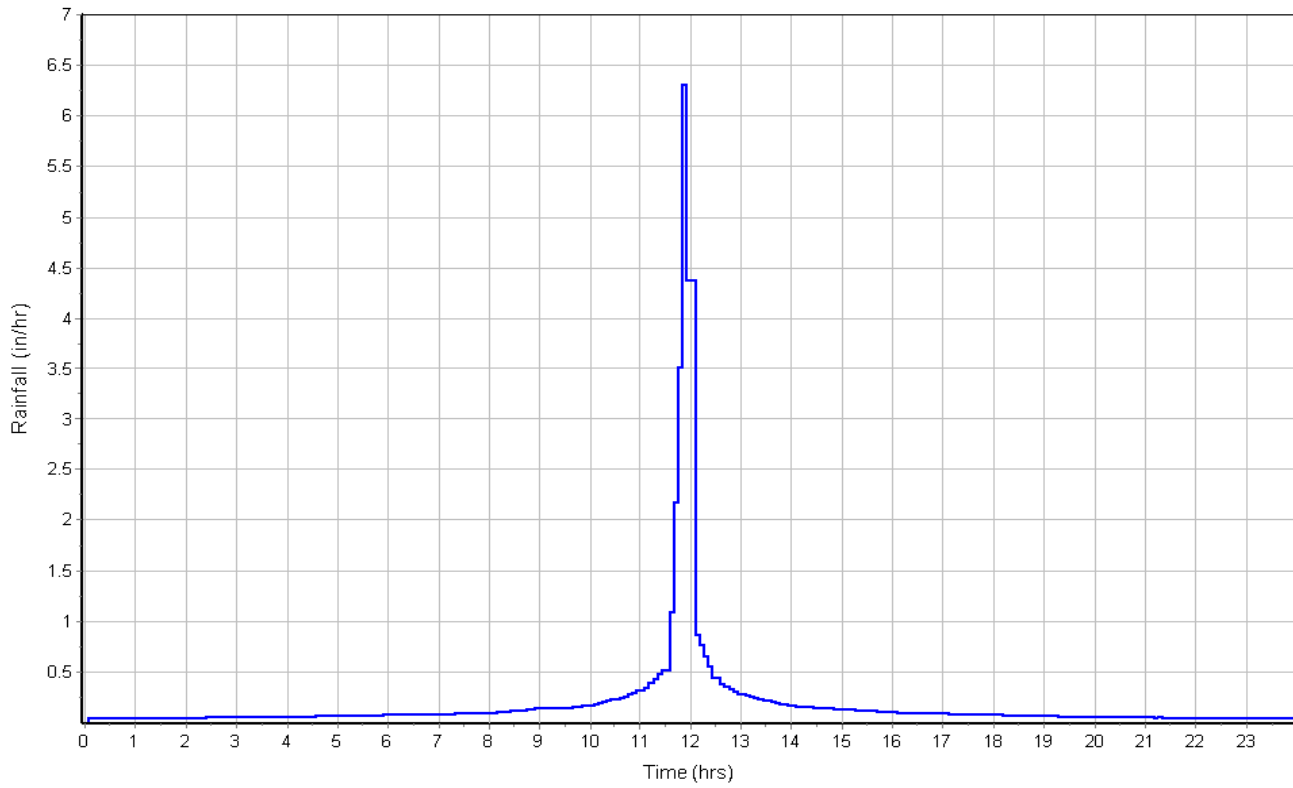
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1227	0.00	0.00
Channel Slope (%) :	4.9	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.09	0.00	0.00
Computed Flow Time (min) :	1.56	0.00	0.00
Total TOC (min)	30.13		

Subbasin Runoff Results

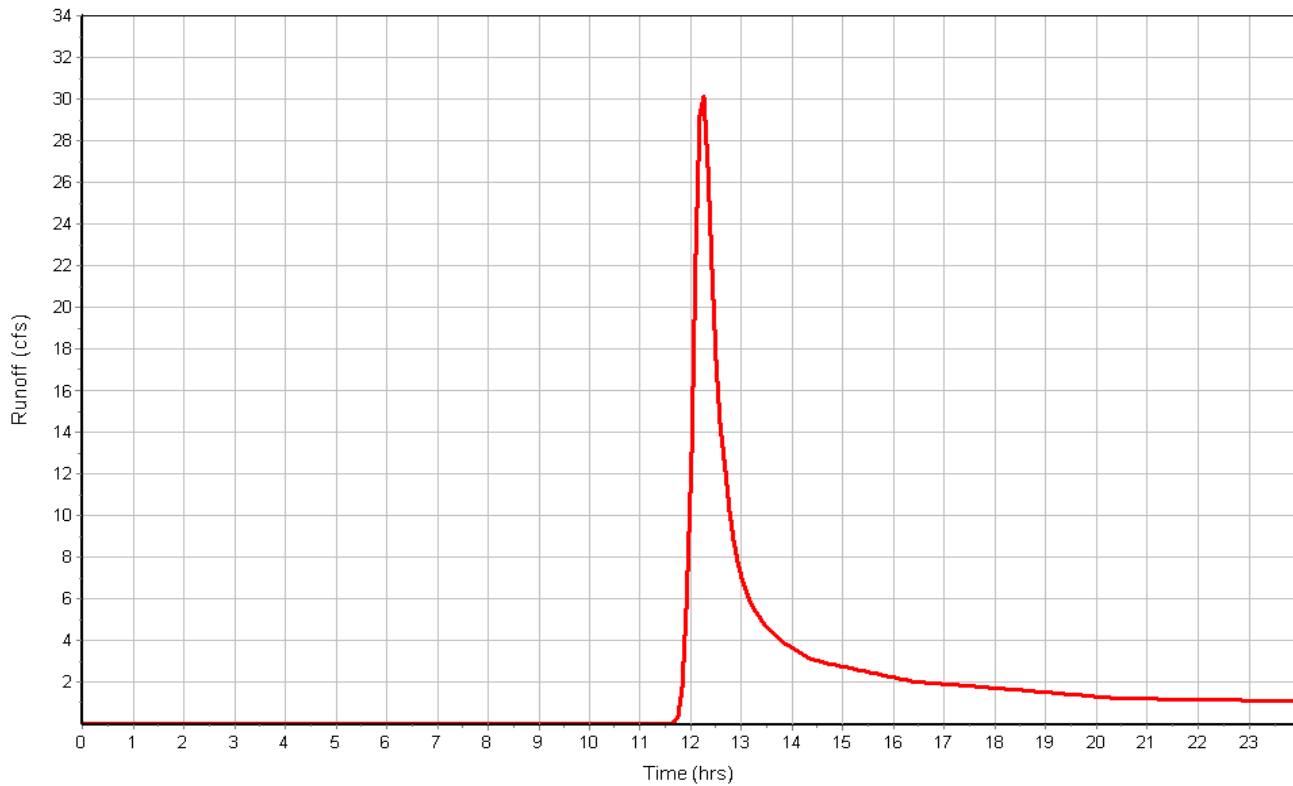
Total Rainfall (in) 4.60
 Total Runoff (in) 1.07
 Peak Runoff (cfs) 30.47
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:30:08

Subbasin : Ea

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Eb

Input Data

Area (ac) 114.80
 Weighted Curve Number 67.20
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	91.84	B	69.00
5 Acre Lots, 7% Impervious	22.96	B	60.00
Composite Area & Weighted CN	114.80		67.20

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	12.25	0.00	0.00

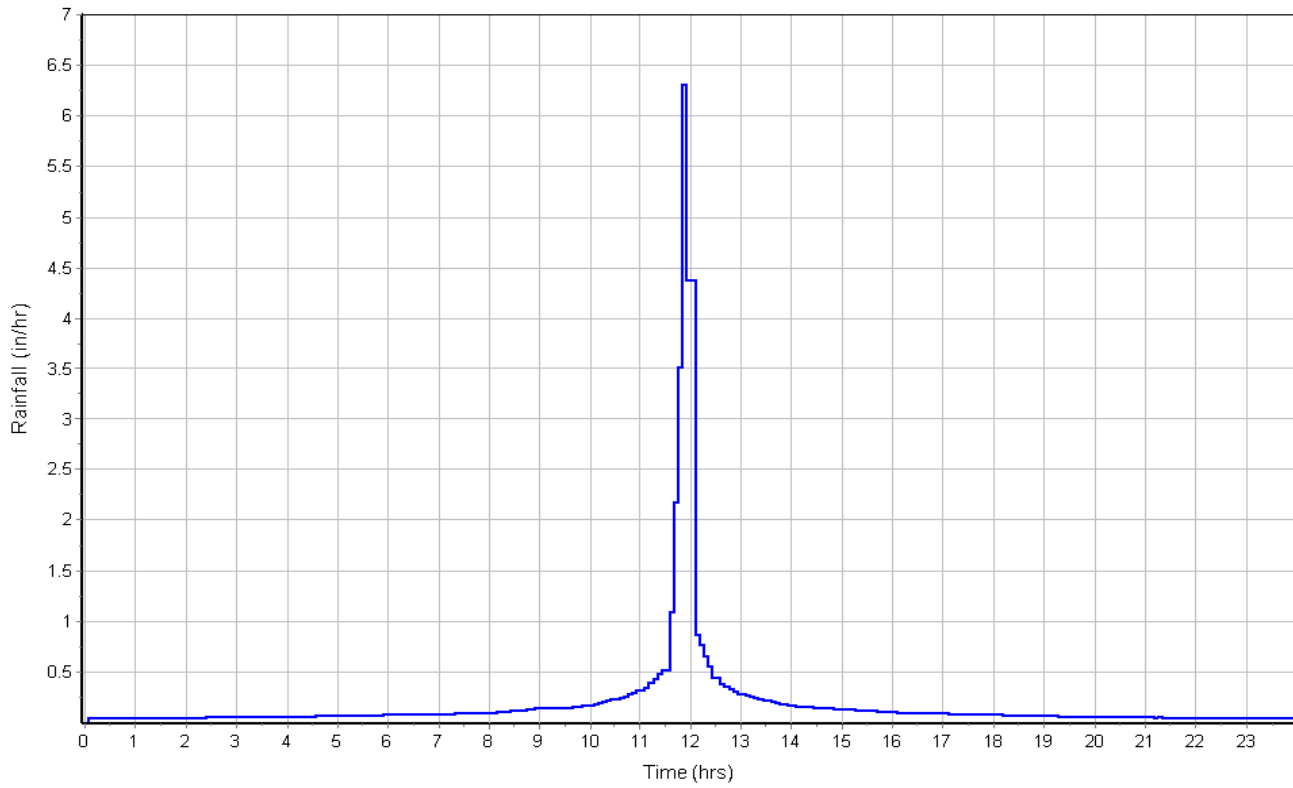
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	3696	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.53	0.00	0.00
Computed Flow Time (min) :	5.34	0.00	0.00
Total TOC (min)	38.66		

Subbasin Runoff Results

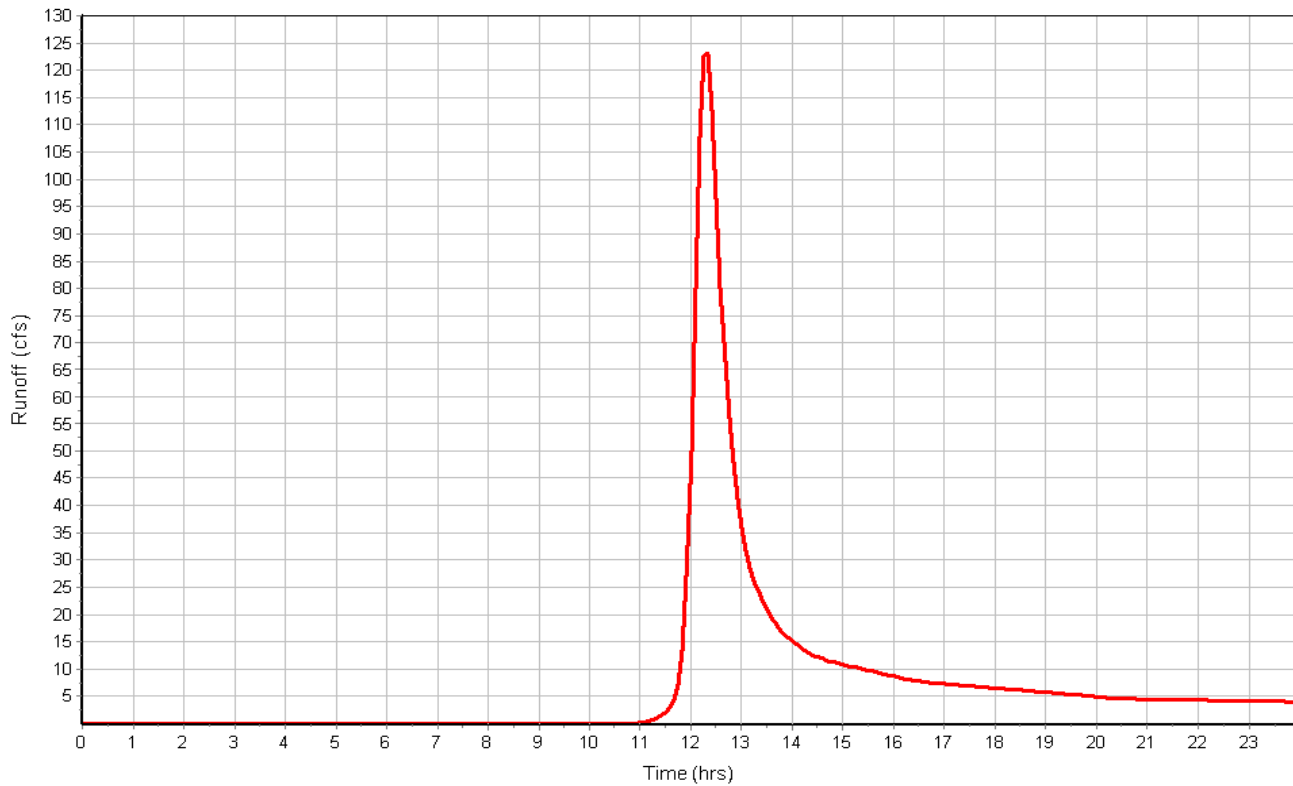
Total Rainfall (in) 4.60
 Total Runoff (in) 1.54
 Peak Runoff (cfs) 124.57
 Weighted Curve Number 67.20
 Time of Concentration (days hh:mm:ss) 0 00:38:40

Subbasin : Eb

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : F

Input Data

Area (ac) 44.50
 Weighted Curve Number 69.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	44.50	B	69.00
Composite Area & Weighted CN	44.50		69.00

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	3.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0.00	0.00
Computed Flow Time (min) :	13.33	0.00	0.00

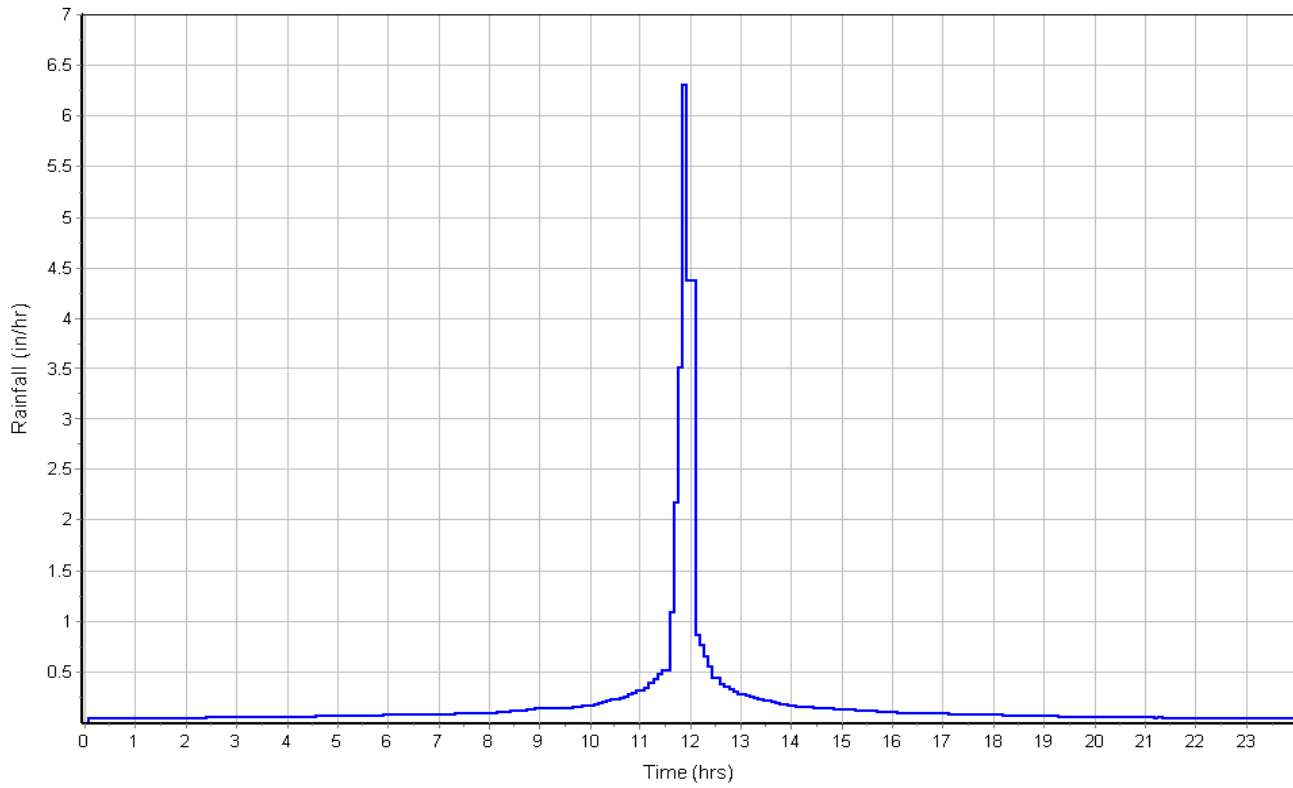
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	1707	0.00	0.00
Channel Slope (%) :	3.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.58	0.00	0.00
Computed Flow Time (min) :	2.69	0.00	0.00
Total TOC (min)	37.08		

Subbasin Runoff Results

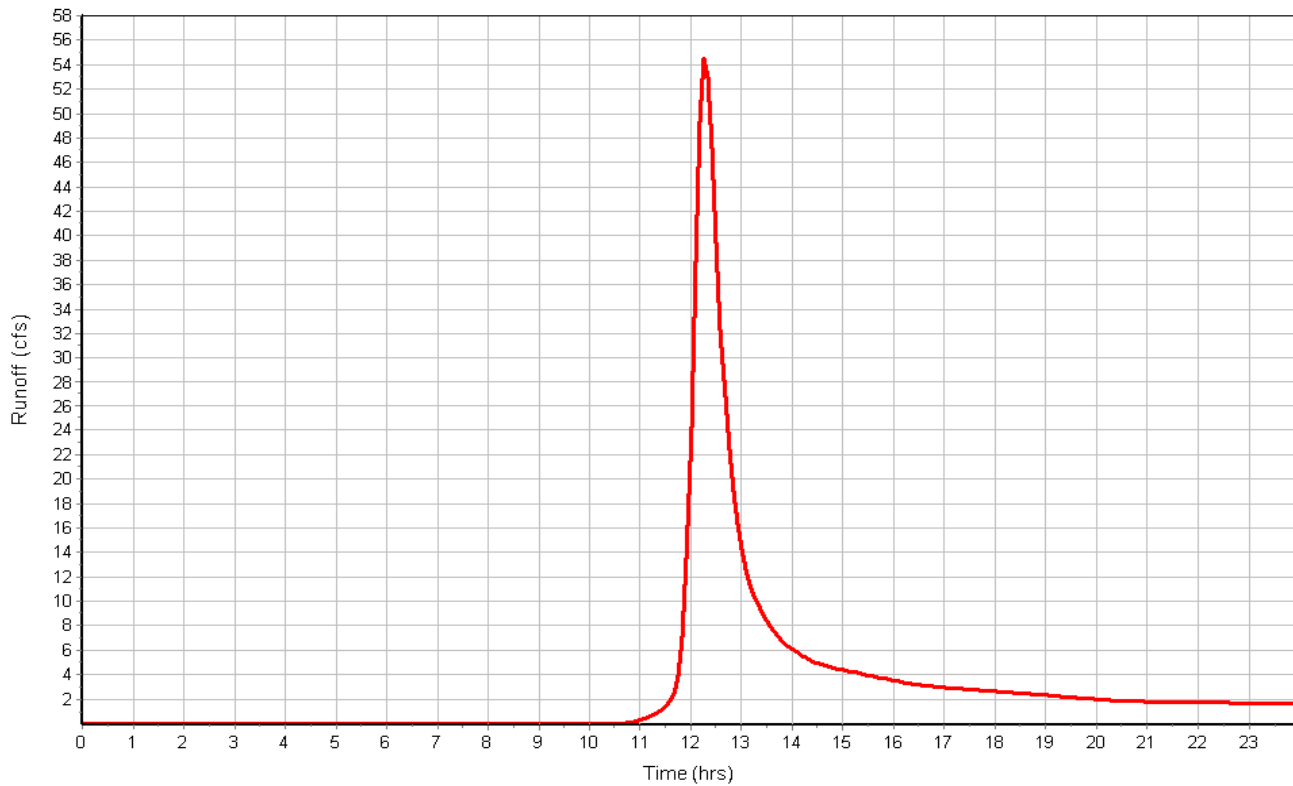
Total Rainfall (in) 4.60
 Total Runoff (in) 1.67
 Peak Runoff (cfs) 54.82
 Weighted Curve Number 69.00
 Time of Concentration (days hh:mm:ss) 0 00:37:05

Subbasin : F

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : G

Input Data

Area (ac) 107.60
 Weighted Curve Number 74.50
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	59.18	C	79.00
Pasture, grassland, or range, Fair	48.42	B	69.00
Composite Area & Weighted CN	107.60		74.50

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.7	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.52	0.00	0.00
Computed Flow Time (min) :	10.96	0.00	0.00

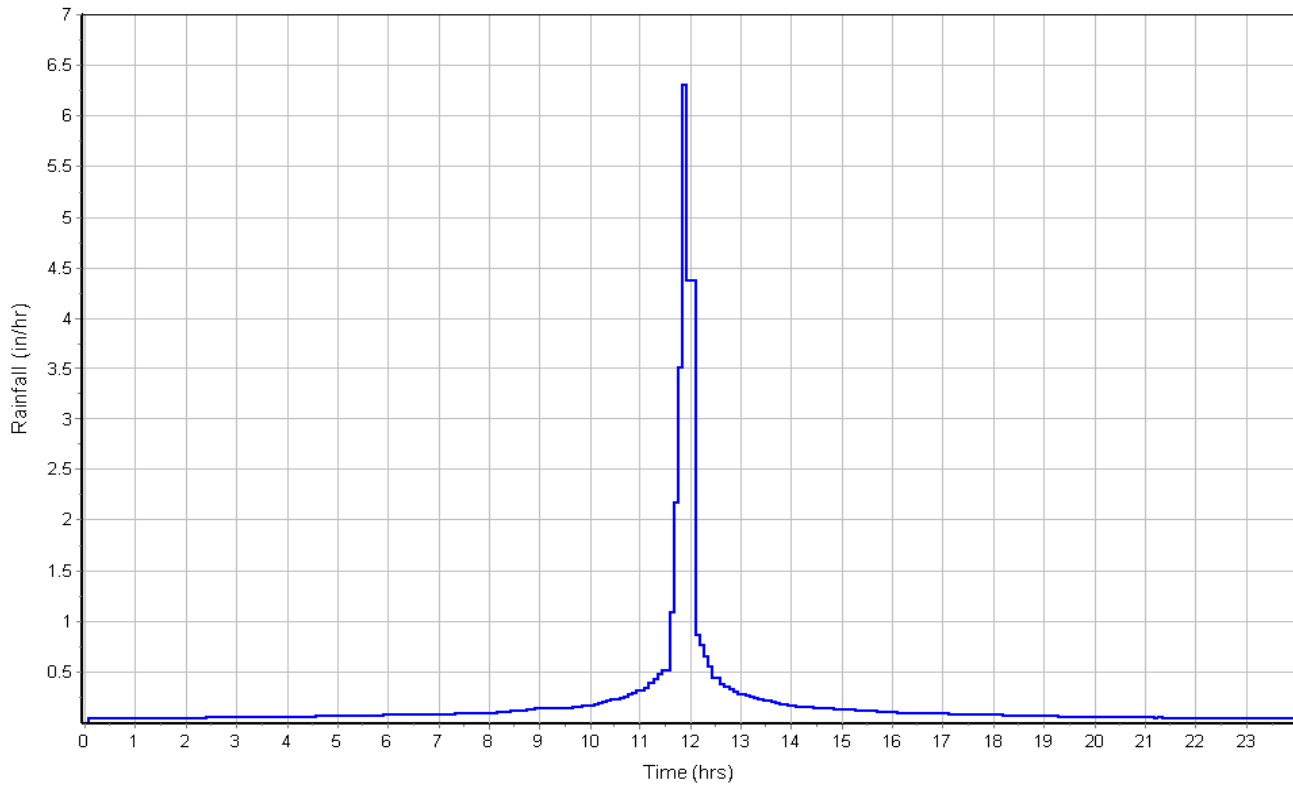
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1441	0.00	0.00
Channel Slope (%) :	4.7	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.82	0.00	0.00
Computed Flow Time (min) :	1.87	0.00	0.00
Total TOC (min)	33.90		

Subbasin Runoff Results

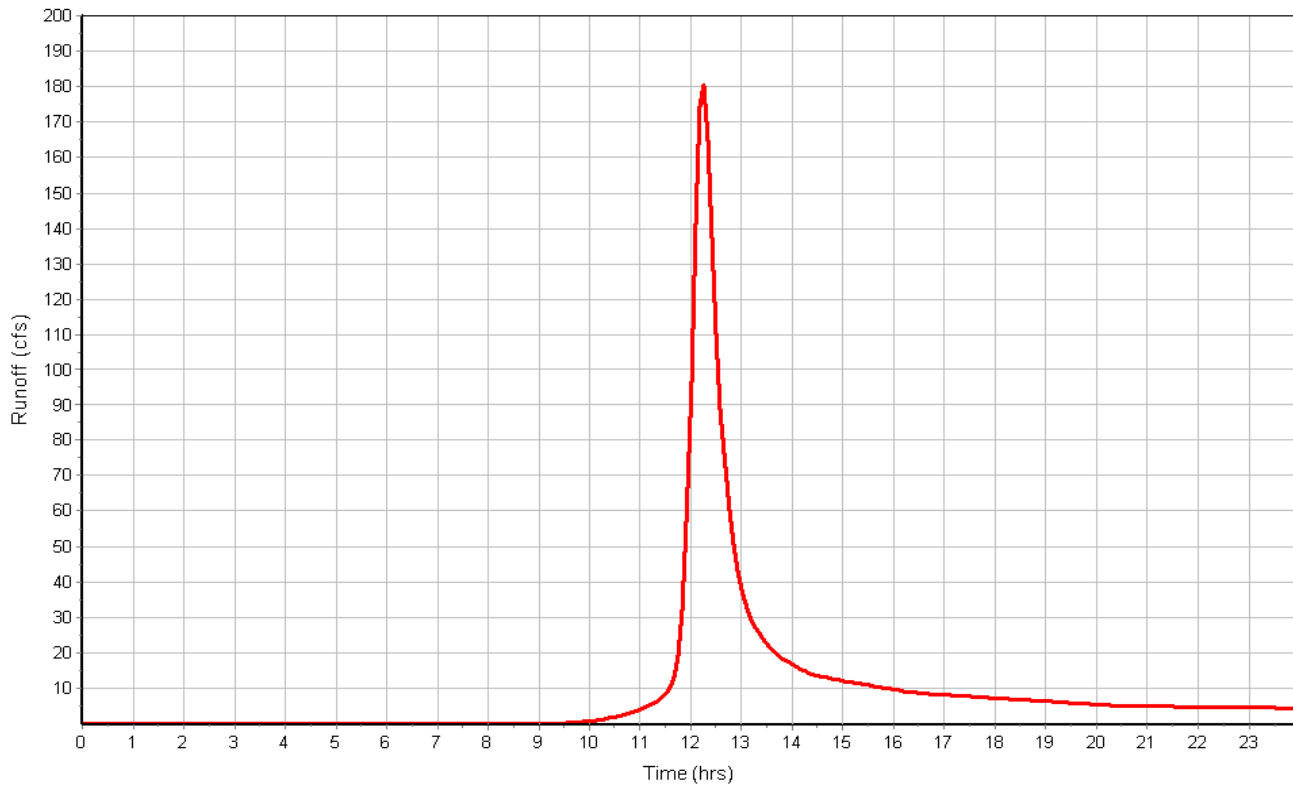
Total Rainfall (in) 4.60
 Total Runoff (in) 2.09
 Peak Runoff (cfs) 181.59
 Weighted Curve Number 74.50
 Time of Concentration (days hh:mm:ss) 0 00:33:54

Subbasin : G

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H

Input Data

Area (ac) 121.80
 Weighted Curve Number 71.76
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	54.81	C	79.00
Woods, Fair	31.67	B	60.00
Pasture, grassland, or range, Fair	30.45	B	69.00
Pasture, grassland, or range, Fair	4.87	D	84.00
Composite Area & Weighted CN	121.80		71.76

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	4.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.43	0.00	0.00
Computed Flow Time (min) :	11.66	0.00	0.00

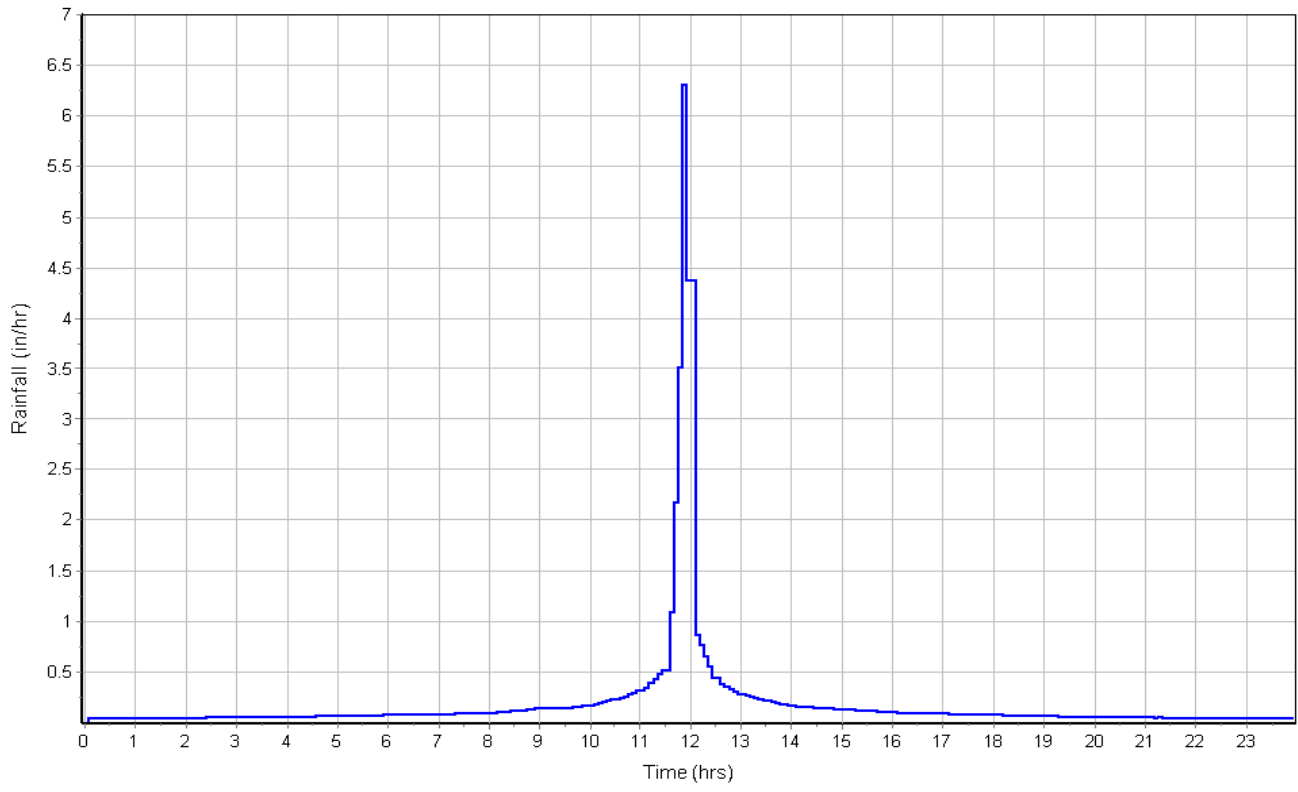
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	676	0.00	0.00
Channel Slope (%) :	4.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.12	0.00	0.00
Computed Flow Time (min) :	0.93	0.00	0.00
Total TOC (min)	33.64		

Subbasin Runoff Results

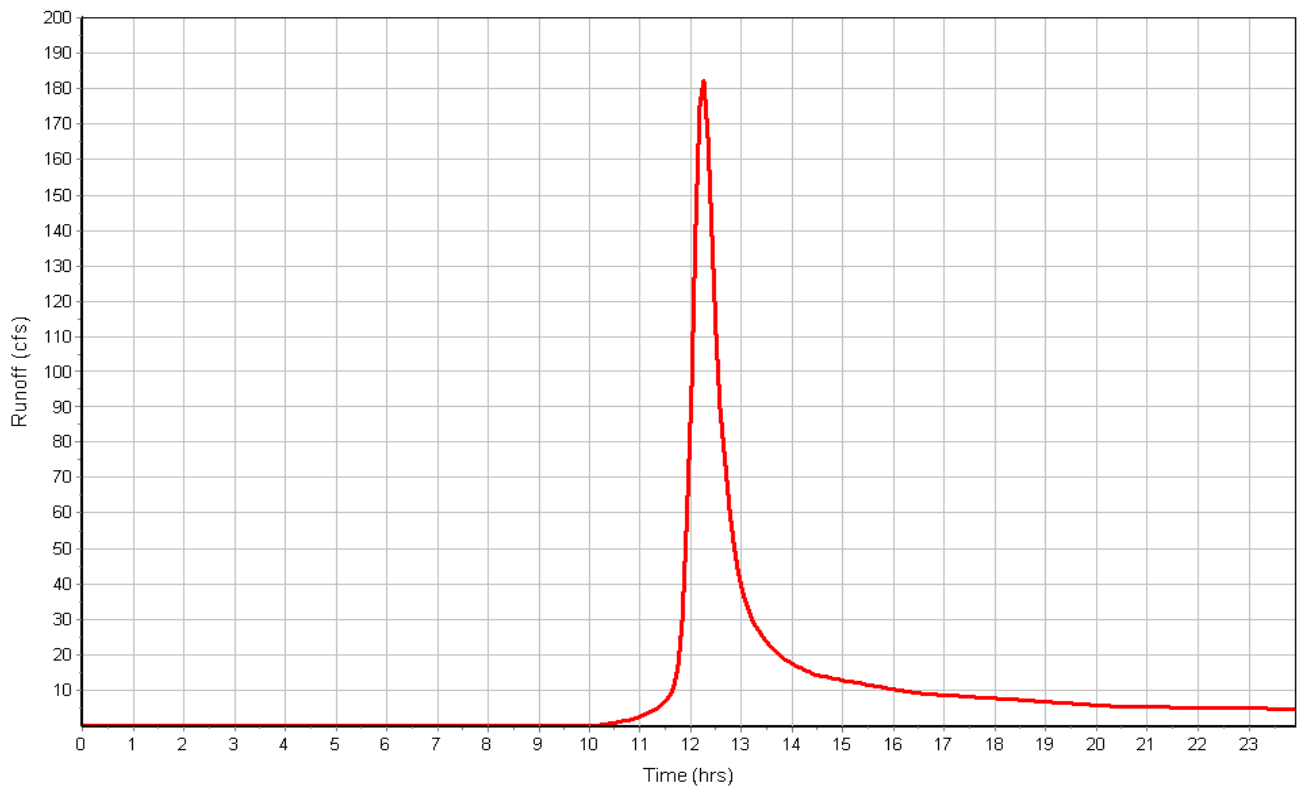
Total Rainfall (in) 4.60
 Total Runoff (in) 1.88
 Peak Runoff (cfs) 182.95
 Weighted Curve Number 71.76
 Time of Concentration (days hh:mm:ss) 0 00:33:38

Subbasin : H

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : I

Input Data

Area (ac) 37.50
 Weighted Curve Number 79.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	37.50	C	79.00
Composite Area & Weighted CN	37.50		79.00

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	5.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.58	0.00	0.00
Computed Flow Time (min) :	10.55	0.00	0.00

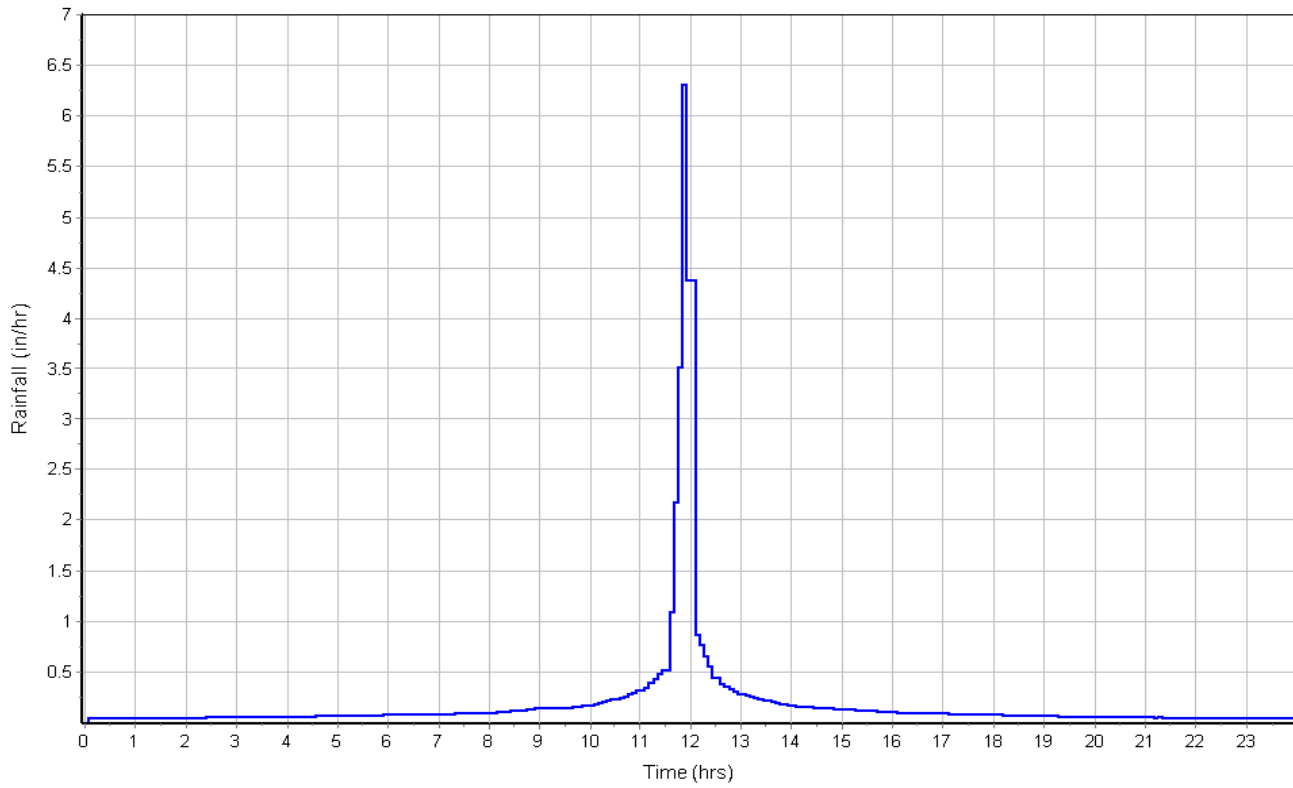
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	134	0.00	0.00
Channel Slope (%) :	5.1	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.35	0.00	0.00
Computed Flow Time (min) :	0.17	0.00	0.00
Total TOC (min)	31.77		

Subbasin Runoff Results

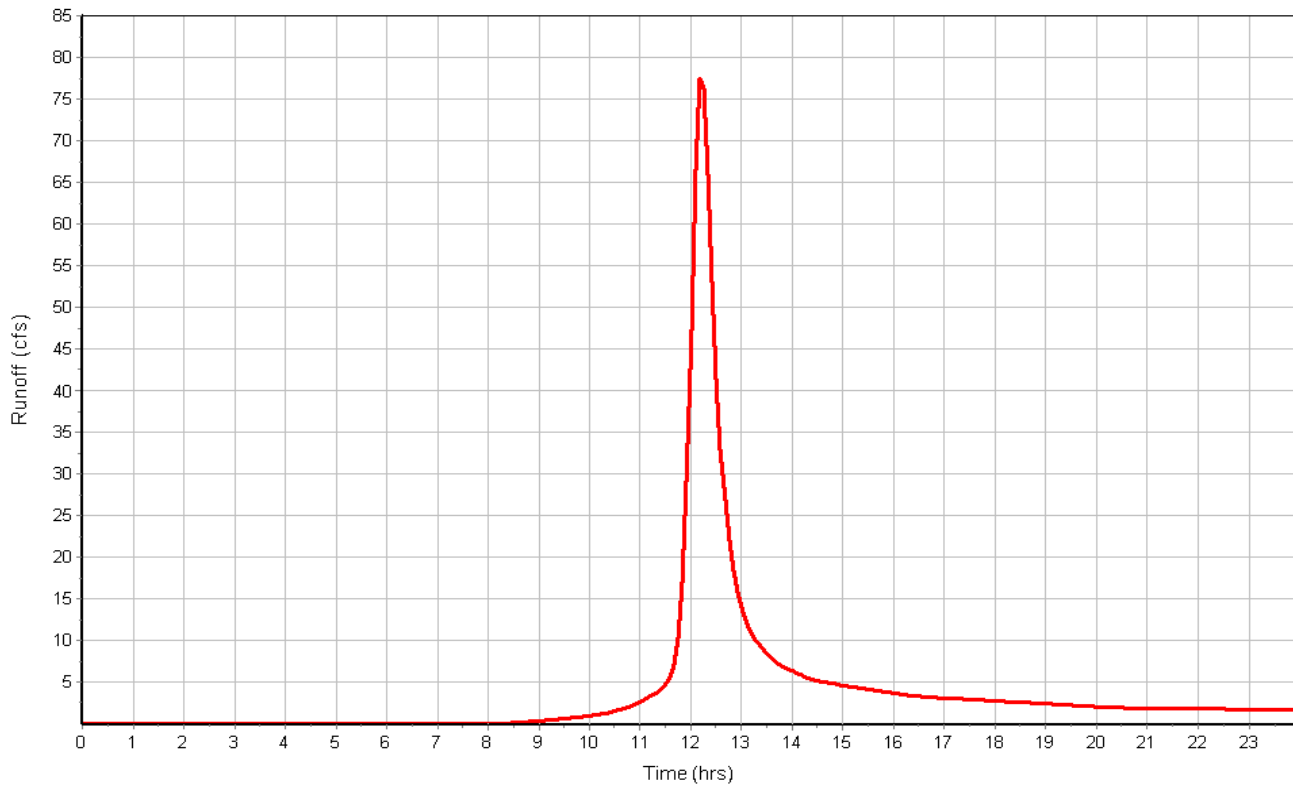
Total Rainfall (in) 4.60
 Total Runoff (in) 2.46
 Peak Runoff (cfs) 78.56
 Weighted Curve Number 79.00
 Time of Concentration (days hh:mm:ss) 0 00:31:46

Subbasin : I

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : J

Input Data

Area (ac) 10.10
 Weighted Curve Number 69.50
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	5.05	B	60.00
Woods, Fair	5.05	D	79.00
Composite Area & Weighted CN	10.10		69.50

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	8.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	2.08	0.00	0.00
Computed Flow Time (min) :	8.01	0.00	0.00

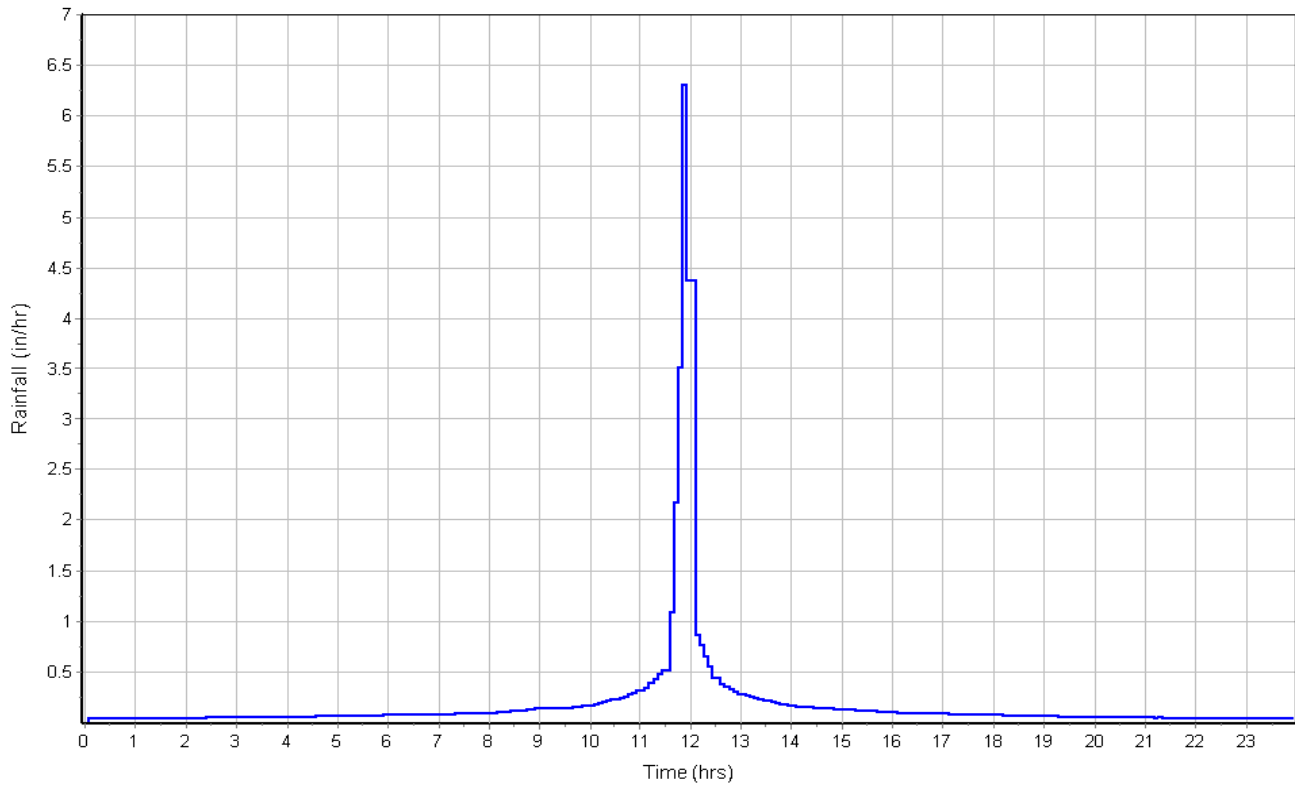
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	134	0.00	0.00
Channel Slope (%) :	5.1	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.35	0.00	0.00
Computed Flow Time (min) :	0.17	0.00	0.00
Total TOC (min)	29.24		

Subbasin Runoff Results

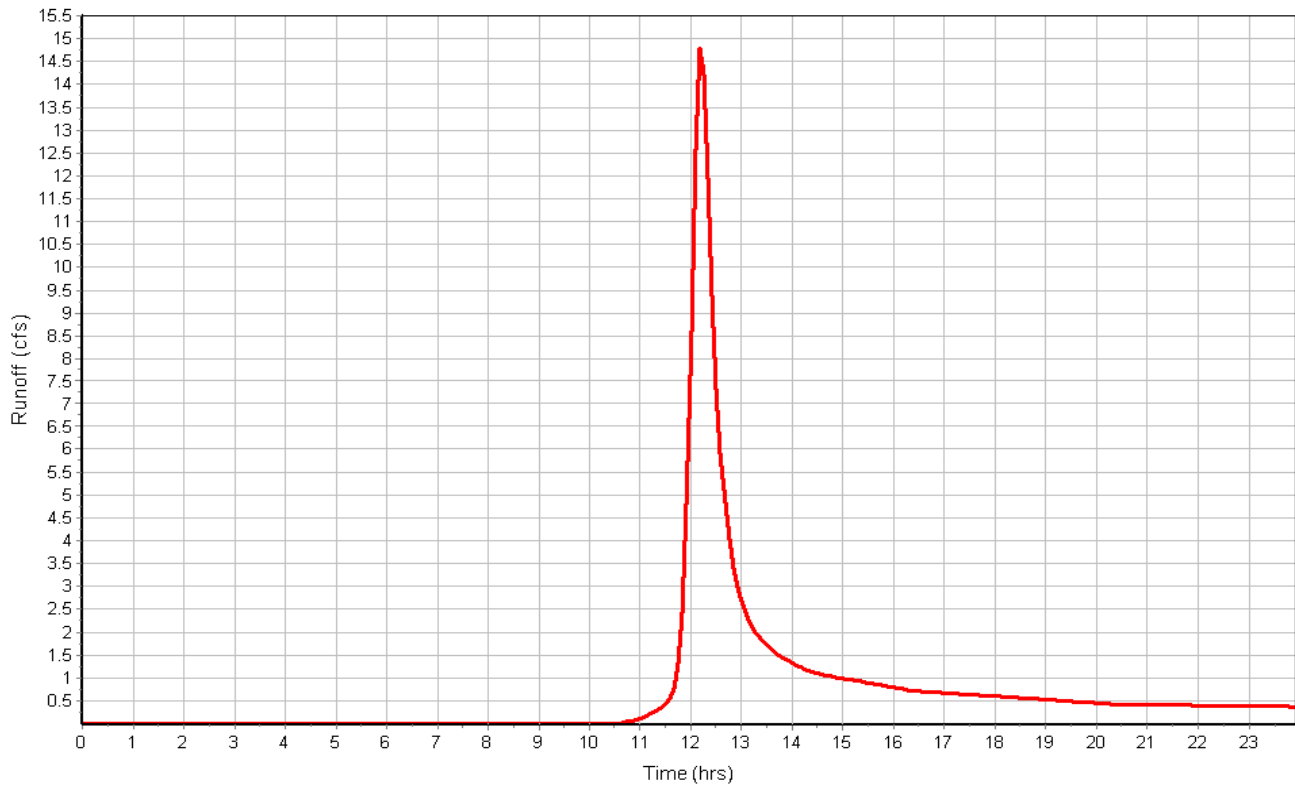
Total Rainfall (in) 4.60
 Total Runoff (in) 1.71
 Peak Runoff (cfs) 14.89
 Weighted Curve Number 69.50
 Time of Concentration (days hh:mm:ss) 0 00:29:14

Subbasin : J

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : K

Input Data

Area (ac) 17.80
 Weighted Curve Number 76.00
 Rain Gage ID Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods & grass combination, Fair	17.80	C	76.00
Composite Area & Weighted CN	17.80		76.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.38	0.00	0.00
Computed Flow Time (min) :	12.08	0.00	0.00

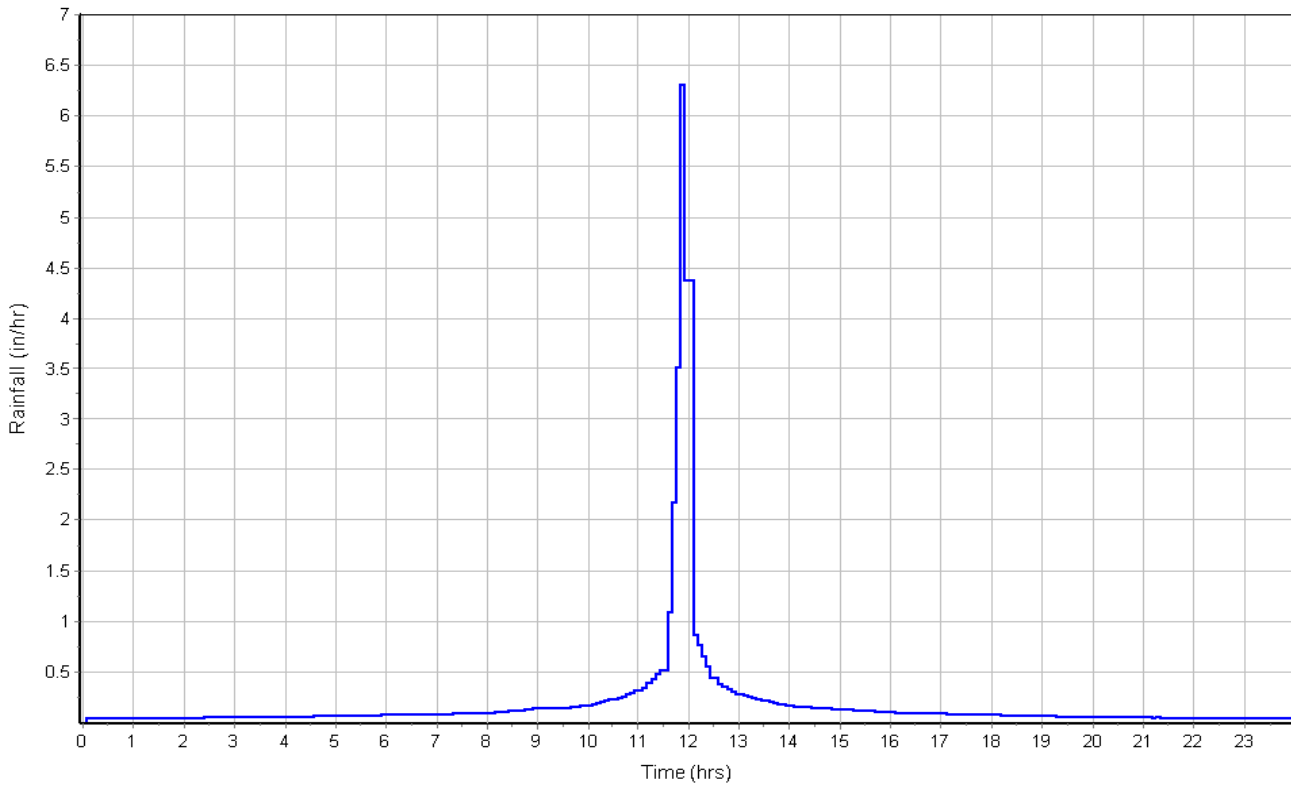
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1000	0.00	0.00
Channel Slope (%) :	3.9	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.68	0.00	0.00
Computed Flow Time (min) :	1.43	0.00	0.00
Total TOC (min)	34.56		

Subbasin Runoff Results

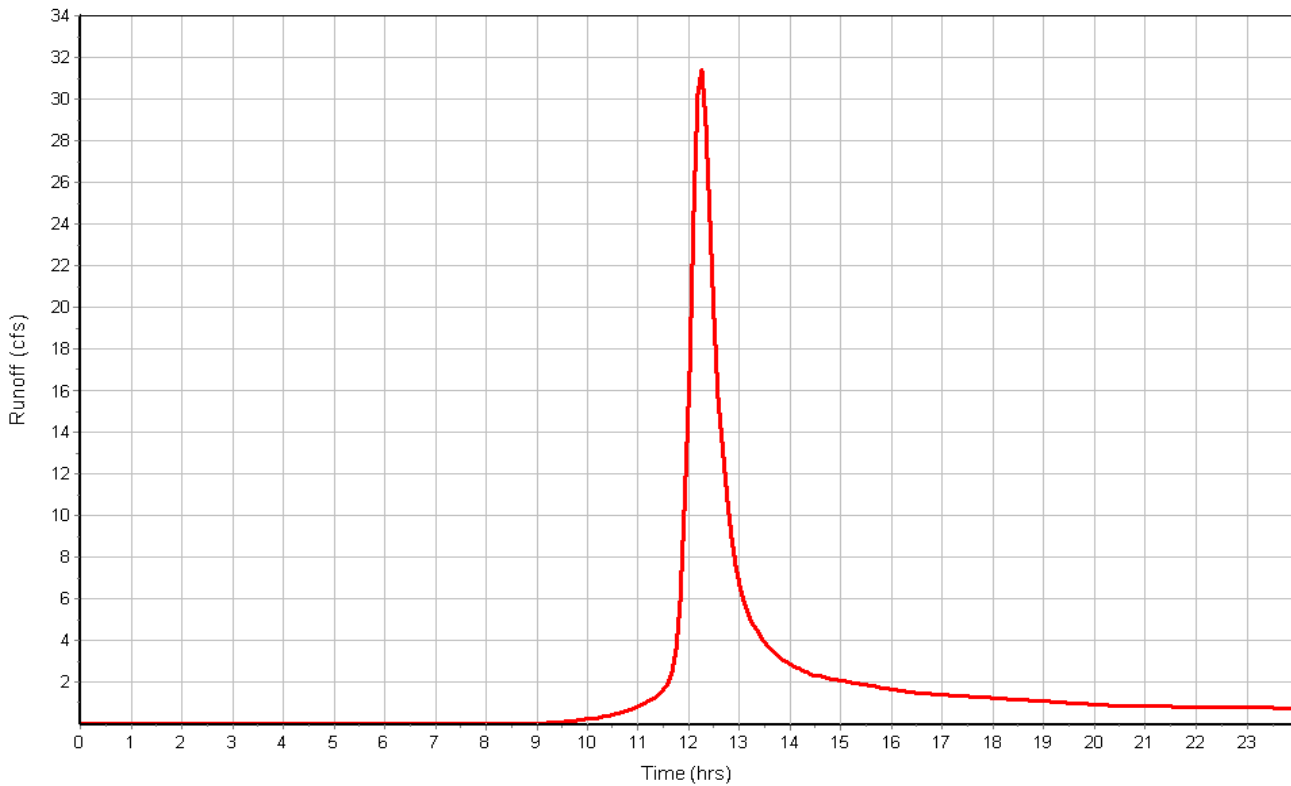
Total Rainfall (in) 4.60
 Total Runoff (in) 2.21
 Peak Runoff (cfs) 31.51
 Weighted Curve Number 76.00
 Time of Concentration (days hh:mm:ss) 0 00:34:34

Subbasin : K

Rainfall Intensity Graph



Runoff Hydrograph



Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft ²)	Minimum Pipe Cover (ft)
1	ABC	7318.50	7328.50	10.00	7318.50	0.00	7328.50	0.00	0.00	0.00
2	B1	7385.00	7395.00	10.00	7385.00	0.00	7395.00	0.00	0.00	0.00
3	B2	7380.00	7390.00	10.00	7380.00	0.00	7390.00	0.00	0.00	0.00
4	Cc1	7379.00	7389.00	10.00	7379.00	0.00	7389.00	0.00	0.00	0.00
5	Da2	7385.00	7395.00	10.00	7385.00	0.00	7395.00	0.00	0.00	0.00
6	Db2	7412.00	7422.00	10.00	7412.00	0.00	7422.00	0.00	0.00	0.00
7	Ee1	7417.00	7427.00	10.00	7417.00	0.00	7427.00	0.00	0.00	0.00
8	EF1	7276.00	7286.00	10.00	7276.00	0.00	7286.00	0.00	0.00	0.00
9	GHD	7300.00	7310.00	10.00	7300.00	0.00	7310.00	0.00	0.00	0.00
10	NUL	7280.00	7290.00	10.00	7280.00	0.00	7290.00	0.00	0.00	0.00
11	OS-J	7410.00	7420.00	10.00	7410.00	0.00	7420.00	0.00	0.00	0.00
12	OS-K	7349.00	7359.00	10.00	7349.00	0.00	7359.00	0.00	0.00	0.00

Junction Results

SN Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1 ABC	1944.07	747.32	7324.52	6.02	0.00	3.98	7319.85	1.35	0 12:52	0 00:00	0.00	0.00
2 B1	1455.28	1455.28	7389.70	4.70	0.00	5.30	7386.01	1.01	0 13:00	0 00:00	0.00	0.00
3 B2	1454.55	0.00	7384.70	4.70	0.00	5.30	7381.01	1.01	0 13:00	0 00:00	0.00	0.00
4 Cc1	111.82	0.00	7381.50	2.50	0.00	7.50	7379.48	0.48	0 12:06	0 00:00	0.00	0.00
5 Da2	111.33	0.00	7387.22	2.22	0.00	7.78	7385.36	0.36	0 12:25	0 00:00	0.00	0.00
6 Db2	30.54	0.00	7413.57	1.57	0.00	8.43	7412.25	0.25	0 12:30	0 00:00	0.00	0.00
7 Ee1	30.05	0.00	7418.16	1.16	0.00	8.84	7417.17	0.17	0 12:20	0 00:00	0.00	0.00
8 EFi	2355.04	253.49	7283.65	7.65	0.00	2.35	7277.76	1.76	0 12:53	0 00:00	0.00	0.00
9 GHD	2247.57	580.28	7306.02	6.02	0.00	3.98	7301.37	1.37	0 12:55	0 00:00	0.00	0.00
10 NUL	2246.18	0.00	7287.65	7.65	0.00	2.35	7281.77	1.77	0 12:51	0 00:00	0.00	0.00
11 OS-J	14.79	14.79	7410.00	0.00	0.00	10.00	7410.00	0.00	0 00:00	0 00:00	0.00	0.00
12 OS-K	31.42	31.42	7349.00	0.00	0.00	10.00	7349.00	0.00	0 00:00	0 00:00	0.00	0.00

Channel Input

SN Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate
1 1	2473.30	7380.00	0.00	7318.50	0.00	61.50	2.4900	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
2 2	2839.57	7318.50	0.00	7300.00	0.00	18.50	0.6500	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
3 3	1717.53	7300.00	0.00	7280.00	0.00	20.00	1.1600	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
4 4	1277.36	7280.00	0.00	7276.00	0.00	4.00	0.3100	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
5 5	70.66	7276.00	0.00	7260.00	0.00	16.00	22.6400	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
6 6	2431.12	7379.00	0.00	7318.50	0.00	60.50	2.4900	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
7 7a	3754.63	7385.00	0.00	7300.00	0.00	85.00	2.2600	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
8 7b	4064.87	7412.00	0.00	7300.00	0.00	112.00	2.7600	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
9 8	5201.60	7417.00	0.00	7276.00	0.00	141.00	2.7100	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
10 BR1	492.55	7385.00	0.00	7380.00	0.00	5.00	1.0200	Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00	No
11 OverTop-Ca	462.70	7382.00	0.00	7379.00	0.00	3.00	0.6500	Trapezoidal	0.500	106.000	0.0320	0.5000	0.5000	0.0000	0.00	No
12 OverTop-Da	381.56	7388.00	0.00	7385.00	0.00	3.00	0.7900	Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00	No
13 OverTop-Db	227.21	7416.00	0.00	7412.00	0.00	4.00	1.7600	Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00	No
14 OverTop-Ea	427.06	7420.00	0.00	7417.00	0.00	3.00	0.7000	Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00	No

Channel Results

SN Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1 1	1452.07	0 13:03	11419.17	0.13	11.05	3.73	3.75	0.38	0.00		
2 2	1939.55	0 12:55	5845.14	0.33	7.35	6.44	6.01	0.60	0.00		
3 3	2246.18	0 12:51	7814.45	0.29	9.42	3.04	5.62	0.56	0.00		
4 4	2244.11	0 12:53	4052.37	0.55	5.81	3.66	7.64	0.76	0.00		
5 5	2355.01	0 12:51	34459.47	0.07	27.92	0.04	2.73	0.27	0.00		
6 6	108.91	0 12:32	11423.78	0.01	5.14	7.88	0.91	0.09	0.00		
7 7a	105.02	0 12:32	10895.85	0.01	5.06	12.37	0.91	0.09	0.00		
8 7b	27.49	0 12:42	12020.46	0.00	3.42	19.81	0.39	0.04	0.00		
9 8	22.77	0 12:35	11922.75	0.00	3.32	26.11	0.35	0.03	0.00		
10 BR1	1454.55	0 13:00	7296.17	0.20	7.97	1.03	4.70	0.47	0.00		
11 OverTop-Ca	74.88	0 12:26	118.95	0.63	1.95	3.95	0.38	0.76	0.00		
12 OverTop-Da	0.00	0 00:00	131.98	0.00	0.00		0.00	0.00	0.00		
13 OverTop-Db	0.00	0 00:00	197.50	0.00	0.00		0.00	0.00	0.00		
14 OverTop-Ea	0.00	0 00:00	124.75	0.00	0.00		0.00	0.00	0.00		

Pipe Input

SN Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Pipe Slope (%)	Pipe Shape	Pipe Diameter or Height (ft)	Pipe Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow Gate	No. of Barrels
1 ExCulv1	100.00	7382.00	0.00	7379.00	0.00	3.00	3.0000	CIRCULAR	2.500	2.500	0.0250	0.5000	0.5000	0.0000	0.00 No	1
2 ExCulv2	100.00	7388.00	0.00	7385.00	0.00	3.00	3.0000	CIRCULAR	6.000	6.000	0.0250	0.5000	0.5000	0.0000	0.00 No	1
3 ExCulv3	100.00	7416.00	0.00	7412.00	0.00	4.00	4.0000	CIRCULAR	2.500	2.500	0.0250	0.5000	0.5000	0.0000	0.00 No	1
4 ExCulv4	125.00	7420.00	0.00	7417.00	0.00	3.00	2.4000	CIRCULAR	2.500	2.500	0.0120	0.5000	0.5000	0.0000	0.00 No	1

Pipe Results

SN Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1 ExCulv1	39.49	0 13:01	36.94	1.07	8.68	0.19	2.50	1.00	55.00		SURCHARGED
2 ExCulv2	111.33	0 12:25	381.44	0.29	11.70	0.14	2.22	0.37	0.00		Calculated
3 ExCulv3	30.54	0 12:30	42.66	0.72	9.44	0.18	1.57	0.63	0.00		Calculated
4 ExCulv4	30.05	0 12:20	68.84	0.44	13.55	0.15	1.16	0.46	0.00		Calculated

5.3 STORM MODEL OUTPUTS - PC 5Y

Project Description

File Name WinsomeSubdivisionProposedCondition (25).SPF

Project Options

Flow Units CFS
 Elevation Type Depth
 Hydrology Method SCS TR-55
 Time of Concentration (TOC) Method SCS TR-55
 Link Routing Method Kinematic Wave
 Enable Overflow Ponding at Nodes YES
 Skip Steady State Analysis Time Periods NO

Analysis Options

Start Analysis On Sep 14, 2018 00:00:00
 End Analysis On Sep 15, 2018 00:00:00
 Start Reporting On Sep 14, 2018 00:00:00
 Antecedent Dry Days 0 days
 Runoff (Dry Weather) Time Step 0 01:00:00 days hh:mm:ss
 Runoff (Wet Weather) Time Step 0 00:05:00 days hh:mm:ss
 Reporting Time Step 0 00:05:00 days hh:mm:ss
 Routing Time Step 30 seconds

Number of Elements

	Qty
Rain Gages	1
Subbasins.....	43
Nodes.....	67
<i>Junctions</i>	56
<i>Outfalls</i>	1
<i>Flow Diversions</i>	4
<i>Inlets</i>	0
<i>Storage Nodes</i>	6
Links.....	68
<i>Channels</i>	40
<i>Pipes</i>	22
<i>Pumps</i>	0
<i>Orifices</i>	6
<i>Weirs</i>	0
<i>Outlets</i>	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	Rain Gage-1	Time Series	TS-01	Cumulative	inches	Colorado	El Paso	5	2.70	SCS Type II 24-hr

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	A1	865.90	60.36	2.70	0.24	209.55	57.80	0 00:57:07
2	A2	37.00	66.00	2.70	0.41	15.13	7.91	0 00:36:58
3	A3	41.48	76.50	2.70	0.84	34.97	26.68	0 00:33:28
4	B1	3836.70	60.34	2.70	0.24	924.64	207.15	0 01:22:47
5	B2	13.10	64.00	2.70	0.35	4.52	2.80	0 00:24:24
6	B3	54.90	65.10	2.70	0.38	20.81	10.16	0 00:38:21
7	B4	41.48	68.50	2.70	0.50	20.62	11.58	0 00:38:59
8	C1	162.70	60.00	2.70	0.23	37.91	12.89	0 00:37:06
9	C2	22.40	64.00	2.70	0.35	7.73	4.04	0 00:31:25
10	C3	16.10	64.00	2.70	0.35	5.55	3.13	0 00:28:09
11	C4	23.80	65.00	2.70	0.38	8.95	4.18	0 00:40:37
12	D1.1	161.30	60.00	2.70	0.23	37.58	12.81	0 00:36:57
13	D1.2	49.90	60.00	2.70	0.23	11.63	3.61	0 00:43:48
14	D2	68.70	64.75	2.70	0.37	25.28	12.98	0 00:34:32
15	D3	41.20	64.00	2.70	0.35	14.21	6.44	0 00:38:52
16	D4	34.30	64.00	2.70	0.35	11.83	6.36	0 00:30:08
17	D5	12.80	67.20	2.70	0.45	5.76	3.67	0 00:30:17
18	D6	41.80	61.65	2.70	0.28	11.54	4.42	0 00:39:06
19	E0	37.90	60.00	2.70	0.23	8.83	3.01	0 00:37:01
20	E1.1	7.90	76.00	2.70	0.82	6.47	1.67	0 02:23:47
21	E1.2	16.30	62.00	2.70	0.29	4.66	1.94	0 00:35:56
22	E2	2.60	64.00	2.70	0.34	0.89	0.58	0 00:22:37
23	E3	19.80	64.00	2.70	0.35	6.83	3.94	0 00:27:12
24	E4	18.20	64.00	2.70	0.35	6.28	3.55	0 00:27:57
25	E5	13.50	64.00	2.70	0.35	4.66	2.70	0 00:26:58
26	E6	28.90	62.40	2.70	0.30	8.58	4.32	0 00:28:04
27	E7	9.80	62.00	2.70	0.29	2.80	1.50	0 00:24:19
28	F1	42.90	60.40	2.70	0.24	10.42	3.79	0 00:35:34
29	G1	25.20	66.00	2.70	0.41	10.31	6.77	0 00:26:37
30	G2	21.20	72.70	2.70	0.67	14.12	9.89	0 00:34:07
31	H1	13.90	70.80	2.70	0.59	8.15	6.40	0 00:26:51
32	H2	39.10	67.20	2.70	0.45	17.60	10.58	0 00:32:45
33	H3	5.80	66.00	2.70	0.41	2.37	1.67	0 00:23:55
34	H4	27.10	73.75	2.70	0.71	19.32	14.06	0 00:33:22
35	H5	20.20	74.80	2.70	0.76	15.37	11.71	0 00:32:12
36	H6	31.60	66.60	2.70	0.43	13.56	7.57	0 00:35:09
37	H7	25.80	70.50	2.70	0.57	14.81	10.49	0 00:30:48
38	H8	8.50	74.55	2.70	0.75	6.37	5.62	0 00:25:27
39	H9	6.90	70.80	2.70	0.59	4.04	3.41	0 00:24:00
40	I1	6.80	72.00	2.70	0.64	4.32	3.79	0 00:23:49
41	I2	14.80	72.00	2.70	0.64	9.41	8.28	0 00:23:29
42	J1	10.10	60.00	2.70	0.23	2.34	1.07	0 00:22:52
43	K1	17.80	69.60	2.70	0.54	9.59	7.82	0 00:23:58

Node Summary

SN	Element ID	Element Type	Invert Elevation	Ground/Rim (Max) Elevation	Initial Water Elevation	Surcharge Elevation	Ponded Area	Peak Inflow	Max HGL Elevation Attained	Max Surcharge Depth Attained	Min Freeboard	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
			(ft)	(ft)	(ft)	(ft)	(ft²)	(cfs)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-in)	(min)
1	Jun-A1	Junction	7340.00	7346.00	7340.00	7346.00	0.00	57.58	7340.76	0.00	9.24	0 00:00	0.00	0.00
2	Jun-A2	Junction	7393.00	7399.00	7393.00	7399.00	0.00	7.90	7393.14	0.00	9.86	0 00:00	0.00	0.00
3	Jun-B1	Junction	7385.00	7391.00	7385.00	7391.00	0.00	206.85	7386.34	0.00	8.66	0 00:00	0.00	0.00
4	Jun-B2-1	Junction	7375.00	7381.00	7375.00	7381.00	0.00	2.73	7375.31	0.00	5.69	0 00:00	0.00	0.00
5	Jun-B2-2	Junction	7371.00	7377.00	7371.00	7377.00	0.00	2.73	7371.31	0.00	9.69	0 00:00	0.00	0.00
6	Jun-B3	Junction	7334.00	7340.00	7334.00	7340.00	0.00	210.17	7335.79	0.00	8.21	0 00:00	0.00	0.00
7	Jun-BOX1-1	Junction	7318.50	7324.50	7318.50	7324.50	0.00	279.04	7320.29	0.00	8.21	0 00:00	0.00	0.00
8	Jun-BOX1-2	Junction	7318.00	7324.00	7318.00	7324.00	0.00	279.03	7320.05	0.00	7.95	0 00:00	0.00	0.00
9	Jun-BOX2-1	Junction	7280.00	7286.00	7280.00	7286.00	0.00	324.39	7282.19	0.00	7.81	0 00:00	0.00	0.00
10	Jun-BOX2-2	Junction	7279.50	7285.50	7279.50	7285.50	0.00	324.38	7281.66	0.00	7.84	0 00:00	0.00	0.00
11	Jun-C0-2	Junction	7379.00	7385.00	7379.00	7385.00	0.00	12.86	7380.02	0.00	8.98	0 00:00	0.00	0.00
12	Jun-C1-1	Junction	7363.00	7369.00	7363.00	7369.00	0.00	15.88	7363.63	0.00	9.37	0 00:00	0.00	0.00
13	Jun-C1-2	Junction	7360.00	7366.00	7360.00	7366.00	0.00	15.88	7360.63	0.00	9.37	0 00:00	0.00	0.00
14	Jun-C2-1	Junction	7341.00	7347.00	7341.00	7347.00	0.00	17.72	7341.62	0.00	9.38	0 00:00	0.00	0.00
15	Jun-C2-2	Junction	7337.00	7343.00	7337.00	7343.00	0.00	17.72	7337.62	0.00	9.38	0 00:00	0.00	0.00
16	Jun-C4	Junction	7310.00	7316.00	7310.00	7316.00	0.00	292.22	7312.10	0.00	7.90	0 00:00	0.00	0.00
17	Jun-D1.1-2	Junction	7385.00	7391.00	7385.00	7391.00	0.00	12.78	7385.75	0.00	9.25	0 00:00	0.00	0.00
18	Jun-D1.2-2	Junction	7412.00	7418.00	7412.00	7418.00	0.00	3.60	7412.49	0.00	9.51	0 00:00	0.00	0.00
19	Jun-D1-1	Junction	7329.00	7335.00	7329.00	7335.00	0.00	22.37	7329.87	0.00	9.13	0 00:00	0.00	0.00
20	Jun-D1-2	Junction	7328.00	7334.00	7328.00	7334.00	0.00	22.37	7328.87	0.00	9.13	0 00:00	0.00	0.00
21	Jun-D3-1	Junction	7372.00	7378.00	7372.00	7378.00	0.00	8.66	7372.52	0.00	9.48	0 00:00	0.00	0.00
22	Jun-D3-2	Junction	7370.00	7376.00	7370.00	7376.00	0.00	8.66	7370.52	0.00	9.48	0 00:00	0.00	0.00
23	Jun-D4-1	Junction	7337.50	7343.50	7337.50	7343.50	0.00	12.42	7338.30	0.00	9.20	0 00:00	0.00	0.00
24	Jun-D4-2	Junction	7337.00	7343.00	7337.00	7343.00	0.00	12.42	7337.80	0.00	9.20	0 00:00	0.00	0.00
25	Jun-D5	Junction	7300.00	7306.00	7300.00	7306.00	0.00	308.24	7302.10	0.00	7.90	0 00:00	0.00	0.00
26	Jun-D6	Junction	7287.00	7293.00	7287.00	7293.00	0.00	8.69	7287.20	0.00	9.80	0 00:00	0.00	0.00
27	Jun-E0-2	Junction	7417.00	7423.00	7417.00	7423.00	0.00	3.00	7417.35	0.00	9.65	0 00:00	0.00	0.00
28	Jun-E1.1	Junction	7400.00	7406.00	7400.00	7406.00	0.00	2.34	7400.42	0.00	5.58	0 00:00	0.00	0.00
29	Jun-E1.2-1	Junction	7381.00	7387.00	7381.00	7387.00	0.00	2.81	7381.42	0.00	5.58	0 00:00	0.00	0.00
30	Jun-E1.2-2	Junction	7380.00	7386.00	7380.00	7386.00	0.00	2.81	7380.38	0.00	9.62	0 00:00	0.00	0.00
31	Jun-E2-1	Junction	7401.00	7407.00	7401.00	7407.00	0.00	0.58	7401.17	0.00	5.83	0 00:00	0.00	0.00
32	Jun-E2-2	Junction	7399.00	7405.00	7399.00	7405.00	0.00	0.58	7399.17	0.00	9.83	0 00:00	0.00	0.00
33	Jun-E3-1	Junction	7369.00	7375.00	7369.00	7375.00	0.00	4.14	7369.44	0.00	9.56	0 00:00	0.00	0.00
34	Jun-E3-2	Junction	7367.50	7373.50	7367.50	7373.50	0.00	4.14	7367.94	0.00	9.56	0 00:00	0.00	0.00
35	Jun-E4-1	Junction	7337.00	7343.00	7337.00	7343.00	0.00	6.72	7337.54	0.00	9.46	0 00:00	0.00	0.00
36	Jun-E4-2	Junction	7336.00	7342.00	7336.00	7342.00	0.00	6.72	7336.54	0.00	9.46	0 00:00	0.00	0.00
37	Jun-E5-1	Junction	7336.50	7342.50	7336.50	7342.50	0.00	2.68	7336.82	0.00	5.68	0 00:00	0.00	0.00
38	Jun-E5-2	Junction	7333.00	7339.00	7333.00	7339.00	0.00	2.68	7333.32	0.00	9.68	0 00:00	0.00	0.00
39	Jun-E7	Junction	7318.00	7324.00	7318.00	7324.00	0.00	9.46	7318.25	0.00	9.75	0 00:00	0.00	0.00
40	Jun-F1	Junction	7327.00	7333.00	7327.00	7333.00	0.00	5.43	7327.26	0.00	9.74	0 00:00	0.00	0.00
41	Jun-G1-1	Junction	7375.50	7381.50	7375.50	7381.50	0.00	6.63	7375.99	0.00	5.51	0 00:00	0.00	0.00
42	Jun-G1-2	Junction	7373.00	7379.00	7373.00	7379.00	0.00	6.62	7373.49	0.00	9.51	0 00:00	0.00	0.00
43	Jun-H1-1	Junction	7391.50	7397.50	7391.50	7397.50	0.00	6.32	7392.03	0.00	5.47	0 00:00	0.00	0.00
44	Jun-H1-2	Junction	7389.00	7395.00	7389.00	7395.00	0.00	6.31	7389.53	0.00	9.47	0 00:00	0.00	0.00
45	Jun-H2-1	Junction	7334.00	7340.00	7334.00	7340.00	0.00	10.49	7334.61	0.00	5.39	0 00:00	0.00	0.00
46	Jun-H2-2	Junction	7332.00	7338.00	7332.00	7338.00	0.00	10.48	7332.61	0.00	9.39	0 00:00	0.00	0.00
47	Jun-H3-1	Junction	7379.50	7385.50	7379.50	7385.50	0.00	1.66	7379.75	0.00	5.75	0 00:00	0.00	0.00
48	Jun-H3-2	Junction	7376.00	7382.00	7376.00	7382.00	0.00	1.67	7376.25	0.00	9.75	0 00:00	0.00	0.00
49	Jun-H6	Junction	7292.00	7298.00	7292.00	7298.00	0.00	313.58	7294.19	0.00	7.81	0 00:00	0.00	0.00
50	Jun-H8	Junction	7276.00	7282.00	7276.00	7282.00	0.00	330.65	7278.16	0.00	7.84	0 00:00	0.00	0.00
51	Jun-H9	Junction	7300.00	7306.00	7300.00	7306.00	0.00	9.23	7300.04	0.00	9.96	0 00:00	0.00	0.00
52	Jun-I1-1	Junction	7355.50	7361.50	7355.50	7361.50	0.00	3.77	7356.02	0.00	5.48	0 00:00	0.00	0.00
53	Jun-I1-2	Junction	7354.50	7360.50	7354.50	7360.50	0.00	3.76	7355.02	0.00	9.48	0 00:00	0.00	0.00
54	Jun-I2	Junction	7319.00	7325.00	7319.00	7325.00	0.00	11.82	7319.24	0.00	9.76	0 00:00	0.00	0.00
55	Jun-J1	Junction	7357.00	7363.00	7357.00	7363.00	0.00	1.05	7357.00	0.00	6.00	0 00:00	0.00	0.00
56	Jun-K1	Junction	7313.00	7319.00	7313.00	7319.00	0.00	7.81	7313.00	0.00	6.00	0 00:00	0.00	0.00
57	Out-02	Outfall	0.00					334.22	0.34					
58	Jun-C-1	Flow Diversions	7382.00	7388.00	7382.00		0.00	12.87	7383.02				0.00	0.00
59	Jun-D1.1-1	Flow Diversions	7388.00	7394.00	7388.00		0.00	12.79	7388.75				0.00	0.00
60	Jun-D1.2-1	Flow Diversions	7416.00	7422.00	7416.00		0.00	3.60	7416.49				0.00	0.00
61	Jun-E0-1	Flow Diversions	7420.00	7426.00	7420.00		0.00	3.00	7420.35				0.00	0.00
62	P1	Storage Node	7311.00	7317.50	7311.00		0.00	35.55	7312.30				0.00	0.00
63	P2	Storage Node	7297.00	7303.50	7297.00		0.00	17.89	7297.86				0.00	0.00
64	P3	Storage Node	7289.00	7297.00	7289.00		0.00	16.06	7290.04				0.00	0.00
65	P4	Storage Node	7301.00	7306.50	7301.00		0.00	14.77	7302.42				0.00	0.00
66	P5	Storage Node	7289.00	7296.00	7289.00		0.00	12.24	7290.16				0.00	0.00
67	P6	Storage Node	7400.00	7406.00	7400.00		0.00	3.63	7400.57				0.00	0.00

Link Summary

SN Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Reported	Surcharged Condition
				(ft)	(ft)	(ft)	(%)	(ft)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1	BoxCulv-1	Pipe	Jun-BOX1-1 Jun-BOX1-2	100.00	7318.50	7318.00	0.5000	6.000	0.0120	279.03	2828.15	0.10	8.32	1.05	0.17	0.00	Calculated
2	BoxCulv-2	Pipe	Jun-BOX2-1 Jun-BOX2-2	100.00	7280.00	7279.50	0.5000	6.000	0.0120	324.38	2828.15	0.11	8.80	1.15	0.19	0.00	Calculated
3	Culv-B2	Pipe	Jun-B2-1 Jun-B2-2	60.00	7375.00	7371.00	6.6700	1.500	0.0120	2.73	29.38	0.09	10.42	0.31	0.21	0.00	Calculated
4	Culv-C2	Pipe	Jun-C1-1 Jun-C1-2	60.00	7363.00	7360.00	5.0000	3.000	0.0120	15.88	161.57	0.10	14.55	0.63	0.21	0.00	Calculated
5	Culv-C3	Pipe	Jun-C2-1 Jun-C2-2	60.00	7341.00	7337.00	6.6700	3.000	0.0120	17.72	186.57	0.09	16.64	0.62	0.21	0.00	Calculated
6	Culv-D2	Pipe	Jun-D1-1 Jun-D1-2	60.00	7329.00	7328.00	1.6700	4.500	0.0120	22.37	275.03	0.08	10.42	0.86	0.19	0.00	Calculated
7	Culv-D3	Pipe	Jun-D3-1 Jun-D3-2	60.00	7372.00	7370.00	3.3300	3.000	0.0120	8.66	131.92	0.07	10.50	0.52	0.17	0.00	Calculated
8	Culv-D4	Pipe	Jun-D4-1 Jun-D4-2	60.00	7337.50	7337.00	0.8300	4.000	0.0120	12.42	142.06	0.09	6.96	0.80	0.20	0.00	Calculated
9	Culv-E1.2	Pipe	Jun-E1.2-1 Jun-E1.2-2	60.00	7381.00	7380.00	1.6700	2.500	0.0120	2.81	57.37	0.05	6.07	0.38	0.15	0.00	Calculated
10	Culv-E2	Pipe	Jun-E2-1 Jun-E2-2	60.00	7401.00	7399.00	3.3300	1.500	0.0120	0.58	20.78	0.03	5.17	0.17	0.11	0.00	Calculated
11	Culv-E3	Pipe	Jun-E3-1 Jun-E3-2	60.00	7369.00	7367.50	2.5000	2.000	0.0120	4.14	38.75	0.11	8.05	0.44	0.22	0.00	Calculated
12	Culv-E4	Pipe	Jun-E4-1 Jun-E4-2	60.00	7337.00	7336.00	1.6700	3.000	0.0120	6.72	93.28	0.07	7.68	0.54	0.18	0.00	Calculated
13	Culv-E5	Pipe	Jun-E5-1 Jun-E5-2	60.00	7336.50	7333.00	5.8300	1.500	0.0120	2.68	27.48	0.10	9.88	0.32	0.21	0.00	Calculated
14	Culv-G1	Pipe	Jun-G1-1 Jun-G1-2	60.00	7375.50	7373.00	4.1700	2.000	0.0120	6.62	50.03	0.13	11.05	0.49	0.25	0.00	Calculated
15	Culv-H1	Pipe	Jun-H1-1 Jun-H1-2	60.00	7391.50	7389.00	4.1700	1.500	0.0120	6.31	23.23	0.27	11.19	0.53	0.36	0.00	Calculated
16	Culv-H2	Pipe	Jun-H2-1 Jun-H2-2	60.00	7334.00	7332.00	3.3300	2.500	0.0120	10.48	81.13	0.13	11.40	0.61	0.24	0.00	Calculated
17	Culv-H3	Pipe	Jun-H3-1 Jun-H3-2	60.00	7379.50	7376.00	5.8300	1.500	0.0120	1.67	27.48	0.06	8.60	0.25	0.17	0.00	Calculated
18	Culv-I1	Pipe	Jun-I1-1 Jun-I1-2	60.00	7355.50	7354.50	1.6700	1.500	0.0120	3.76	14.69	0.26	6.96	0.52	0.35	0.00	Calculated
19	ExCulv-C1	Pipe	Jun-C-1 Jun-C0-2	100.00	7382.00	7379.00	3.0000	2.500	0.0250	12.86	36.94	0.35	6.85	1.02	0.41	0.00	Calculated
20	ExCulv-D1.1	Pipe	Jun-D1.1-1 Jun-D1.1-2	100.00	7388.00	7385.00	3.0000	6.000	0.0250	12.78	381.44	0.03	6.27	0.75	0.12	0.00	Calculated
21	ExCulv-D1.2	Pipe	Jun-D1.2-1 Jun-D1.2-2	100.00	7416.00	7412.00	4.0000	2.500	0.0250	3.60	42.66	0.08	5.29	0.49	0.20	0.00	Calculated
22	ExCulv-E0	Pipe	Jun-E0-1 Jun-E0-2	125.00	7420.00	7417.00	2.4000	2.500	0.0120	3.00	68.84	0.04	7.05	0.35	0.14	0.00	Calculated
23	Conveyance-1	Channel	Jun-BOX1-2 Jun-C4	866.29	7318.00	7310.00	0.9200	10.000	0.0400	278.92	6959.03	0.04	4.82	2.05	0.21	0.00	
24	Conveyance-2	Channel	Jun-C4 Jun-D5	1071.31	7310.00	7300.00	0.9300	10.000	0.0400	292.13	6996.45	0.04	4.91	2.10	0.21	0.00	
25	Conveyance-3	Channel	Jun-D5 Jun-H6	736.36	7300.00	7292.00	1.0900	10.000	0.0400	308.17	7548.06	0.04	5.26	2.07	0.21	0.00	
26	Conveyance-4	Channel	Jun-H6 Jun-BOX2-1	1308.67	7292.00	7280.00	0.9200	10.000	0.0400	313.39	6934.43	0.05	4.98	2.19	0.22	0.00	
27	Conveyance-5	Channel	Jun-BOX2-2 Jun-H8	340.25	7279.50	7276.00	1.0300	10.000	0.0400	324.38	7344.64	0.04	5.24	2.16	0.22	0.00	
28	Link-A1	Channel	Jun-A1 Jun-BOX1-1	1609.87	7340.00	7318.50	1.3400	10.000	0.0400	57.42	8368.72	0.01	3.31	0.76	0.08	0.00	
29	Link-A2	Channel	Jun-A2 Jun-BOX1-1	991.55	7393.00	7318.50	7.5100	10.000	0.0400	7.75	19849.80	0.00	2.73	0.14	0.01	0.00	
30	Link-B1	Channel	Jun-B1 Jun-B3	2137.84	7385.00	7334.00	2.3900	10.000	0.0400	206.34	11184.92	0.02	6.11	1.34	0.13	0.00	
31	Link-B2	Channel	Jun-B2-2 Jun-BOX1-1	1548.66	7371.00	7318.50	3.3900	10.000	0.0400	2.22	13333.28	0.00	1.40	0.08	0.01	0.00	
32	Link-B3	Channel	Jun-B3 Jun-BOX1-1	1801.86	7334.00	7318.50	0.8600	10.000	0.0400	209.83	6716.46	0.03	4.33	1.79	0.18	0.00	
33	Link-B4-3	Channel	Jun-C2-2 Jun-BOX1-1	155.46	7337.00	7318.50	11.9000	10.000	0.0400	17.72	24981.12	0.00	4.26	0.20	0.02	0.00	
34	Link-C1	Channel	Jun-C0-2 Jun-C1-1	799.51	7379.00	7363.00	2.0000	10.000	0.0400	12.68	10244.33	0.00	2.19	0.28	0.03	0.00	
35	Link-C2	Channel	Jun-C1-2 Jun-C2-1	861.57	7360.00	7341.00	2.2100	10.000	0.0400	15.71	10753.92	0.00	2.44	0.31	0.03	0.00	
36	Link-D1.1	Channel	Jun-D1.1-2 Jun-D1-1	1827.50	7385.00	7329.00	3.0600	10.000	0.0400	12.22	12676.54	0.00	2.49	0.24	0.02	0.00	
37	Link-D3	Channel	Jun-D1.2-2 Jun-D3-1	1312.44	7412.00	7372.00	3.0500	10.000	0.0400	3.45	12642.29	0.00	1.53	0.11	0.01	0.00	
38	Link-D4	Channel	Jun-D3-2 Jun-D4-1	1169.72	7370.00	7337.50	2.7800	10.000	0.0400	8.53	12070.80	0.00	2.08	0.20	0.02	0.00	
39	Link-D5	Channel	Jun-D1-2 Jun-D5	1270.02	7328.00	7300.00	2.2000	10.000	0.0400	22.11	10752.49	0.00	2.77	0.37	0.04	0.00	
40	Link-D6	Channel	Jun-D4-2 P3	1418.47	7337.00	7289.00	3.3800	10.000	0.0400	12.31	13321.28	0.00	2.54	0.23	0.02	0.00	
41	Link-E1.1	Channel	Jun-E0-2 P6	1328.59	7417.00	7400.00	1.2800	10.000	0.0400	2.64	8191.52	0.00	1.07	0.12	0.01	0.00	
42	Link-E1.2	Channel	Jun-E1.1 Jun-E1.2-1	791.59	7400.00	7381.00	2.4000	2.500	0.0400	2.34	164.41	0.01	2.30	0.41	0.17	0.00	
43	Link-E3	Channel	Jun-E2-2 Jun-E3-1	974.31	7399.00	7369.00	3.0800	10.000	0.0400	0.42	12707.13	0.00	0.71	0.03	0.00	0.00	
44	Link-E4	Channel	Jun-E3-2 Jun-E4-1	1141.92	7367.50	7337.00	2.6700	10.000	0.0400	3.76	11834.98	0.00	1.55	0.12	0.01	0.00	
45	Link-E6	Channel	Jun-E5-2 P5	858.58	7333.00	7289.00	5.1200	10.000	0.0400	2.52	16393.49	0.00	1.61	0.08	0.01	0.00	
46	Link-E6-2	Channel	Jun-E7 P5	1915.96	7318.00	7289.00	1.5100	10.000	0.0400	9.10	8909.25	0.00	1.79	0.25	0.02	0.00	
47	Link-E7	Channel	Jun-E4-2 Jun-E7	712.94	7336.00	7318.00	2.5200	10.000	0.0400	6.61	11506.55	0.00	1.85	0.18	0.02	0.00	
48	Link-F1	Channel	Jun-E1.2-2 Jun-F1	1032.69	7380.00	7327.00	5.1300	10.000	0.0400	2.81	16405.46	0.00	1.62	0.09	0.01	0.00	
49	Link-F1-2	Channel	Jun-F1 Jun-E7	1886.42	7327.00	7318.00	0.4800	10.000	0.0400	4.23	5001.93	0.00	0.94	0.22	0.02	0.00	
50	Link-G2	Channel	Jun-G1-2 P1	1241.36	7373.00	7311.00	4.9900	10.000	0.0400	6.29	16183.87	0.00	2.28	0.14	0.01	0.00	
51	Link-H4	Channel	Jun-H1-2 P1	1249.62	7389.00	7311.00	6.2400	10.000	0.0400	6.01	18092.30	0.00	2.40	0.13	0.01	0.00	
52	Link-H6	Channel	Jun-H2-2 P2	586.28	7332.00	7297.00	5.9700	10.000	0.0400	10.39	17693.63	0.00	2.84	0.18	0.02	0.00	
53	Link-H7-1	Channel	Jun-H3-2 Jun-BOX2-1	1205.71	7376.00	7280.00	7.9600	10.000	0.0400	1.43	20433.82	0.00	1.52	0.05	0.00	0.00	
54	Link-H9	Channel	Jun-I2 P4	633.71	7319.00	7301.00	2.8400	10.000	0.0400	11.58	12204.68	0.00	2.36	0.23	0.02	0.00	
55	Link-I2-1	Channel	Jun-I1-2 Jun-I2	461.48	7354.50	7319.00	7.6900	10.000	0.0400	3.69	20085.06	0.00	2.06	0.09	0.01	0.00	
56	Link-Out-1	Channel	Jun-H8 Out-02	1089.60	7276.00	0.00	667.7700	10.000	0.0400	330.65	187132.04	0.00	45.05	0.34	0.03	0.00	
57	Link-Out-2	Channel	Jun-H9 Out-02	865.85	7300.00	0.00	843.1000	10.000	0.0400	9.23	210269.10	0.00	12.11	0.04	0.00	0.00	
58	Link-P3	Channel	Jun-D6 Jun-BOX2-1	264.79	7287.00	7280.00	2.6400	10.000	0.0400	8.69	11774.26	0.00	2.04	0.20	0.02	0.00	

Link Summary

SN Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Reported	Surcharged Condition
				(ft)	(ft)	(ft)	(%)	(ft)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
59	OverTop-C1	Channel Jun-C-1	Jun-C0-2	118.65	7382.00	7379.00	2.5300	0.500	0.0320	0.00	236.68	0.00	0.00	0.00	0.00	0.00	0.00
60	OverTop-D1.1	Channel Jun-D1.1-1	Jun-D1.1-2	192.86	7388.00	7385.00	1.5600	0.500	0.0320	0.00	185.64	0.00	0.00	0.00	0.00	0.00	0.00
61	OverTop-D1.2	Channel Jun-D1.2-1	Jun-D1.2-2	163.53	7416.00	7412.00	2.4500	0.500	0.0320	0.00	232.79	0.00	0.00	0.00	0.00	0.00	0.00
62	OverTop-E0	Channel Jun-E0-1	Jun-E0-2	115.35	7420.00	7417.00	2.6000	0.500	0.0320	0.00	240.05	0.00	0.00	0.00	0.00	0.00	0.00
63	P1	Orifice P1	Jun-C4		7311.00	7310.00		3.000		12.19							
64	P2	Orifice P2	Jun-H6		7297.00	7292.00		2.500		5.41							
65	P3	Orifice P3	Jun-D6		7289.00	7287.00		3.000		8.69							
66	P5	Orifice P4	Jun-H9		7301.00	7300.00		2.000		9.23							
67	P6	Orifice P5	Jun-H8		7289.00	7276.00		2.000		6.87							
68	P7	Orifice P6	Jun-E1.1		7400.00	7400.00		2.000		2.34							

Subbasin Hydrology

Subbasin : A1

Input Data

Area (ac) 865.90
 Weighted Curve Number 60.36
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	839.92	B	60.00
Pasture, grassland, or range, Fair	8.66	D	84.00
5 Acre Lots, 7% Impervious	8.66	C	72.00
Composite Area & Weighted CN	857.24		60.36

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

$$T_c = (0.007 * ((n * L_f)^{0.8})) / ((P^{0.5}) * (S_f^{0.4}))$$

Where :

T_c = Time of Concentration (hr)
 n = Manning's roughness
 L_f = Flow Length (ft)
 P = 2 yr, 24 hr Rainfall (inches)
 S_f = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (S_f^{0.5}) (unpaved surface)
 V = 20.3282 * (S_f^{0.5}) (paved surface)
 V = 15.0 * (S_f^{0.5}) (grassed waterway surface)
 V = 10.0 * (S_f^{0.5}) (nearly bare & untilled surface)
 V = 9.0 * (S_f^{0.5}) (cultivated straight rows surface)
 V = 7.0 * (S_f^{0.5}) (short grass pasture surface)
 V = 5.0 * (S_f^{0.5}) (woodland surface)
 V = 2.5 * (S_f^{0.5}) (forest w/heavy litter surface)
 T_c = (L_f / V) / (3600 sec/hr)

Where:

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (S_f^{0.5})) / n
 R = A_q / W_p
 T_c = (L_f / V) / (3600 sec/hr)

Where :

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 R = Hydraulic Radius (ft)
 A_q = Flow Area (ft²)
 W_p = Wetted Perimeter (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)
 n = Manning's roughness

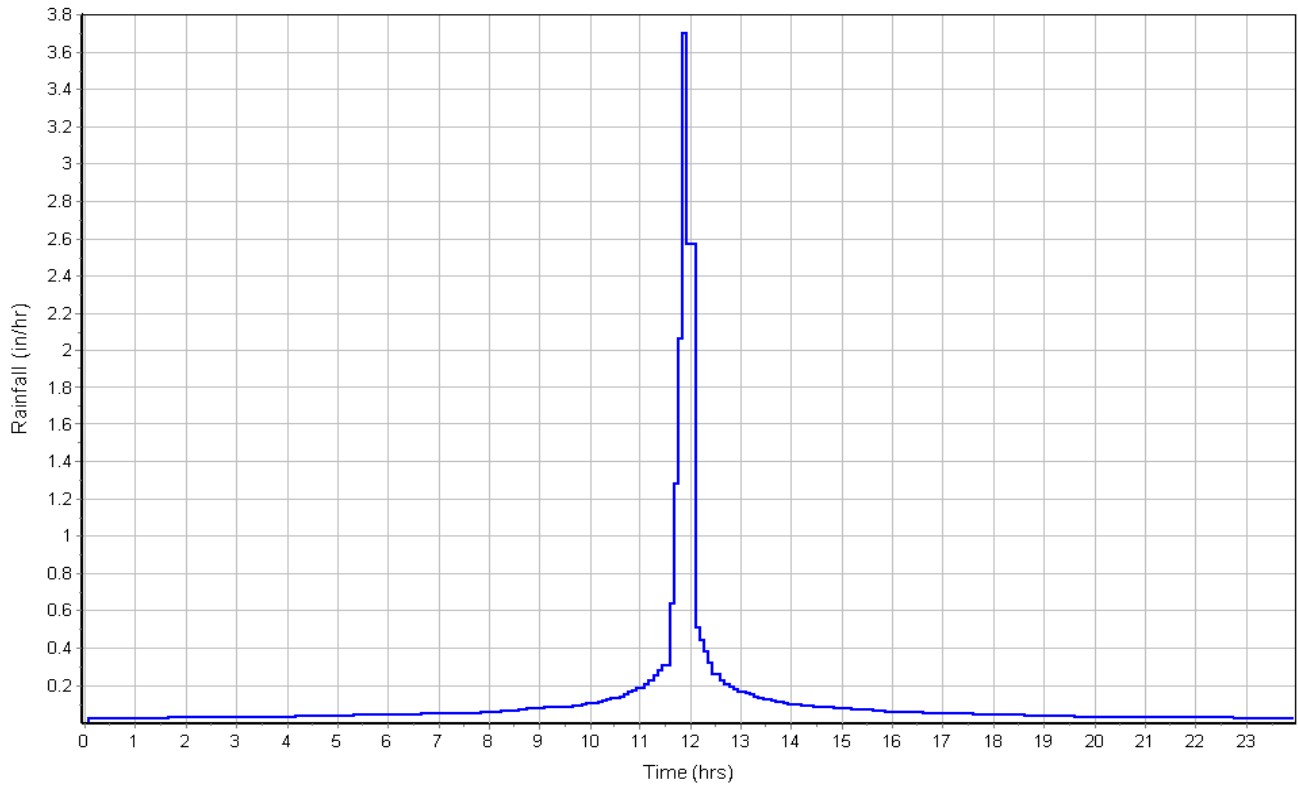
	Flowpath A	Flowpath B	Flowpath C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.57	0.00	0.00
Computed Flow Time (min) :	10.62	0.00	0.00
Channel Flow Computations			
	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	12115	0.00	0.00
Channel Slope (%) :	1.8	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	7.93	0.00	0.00
Computed Flow Time (min) :	25.45	0.00	0.00
Total TOC (min)	57.13		

Subbasin Runoff Results

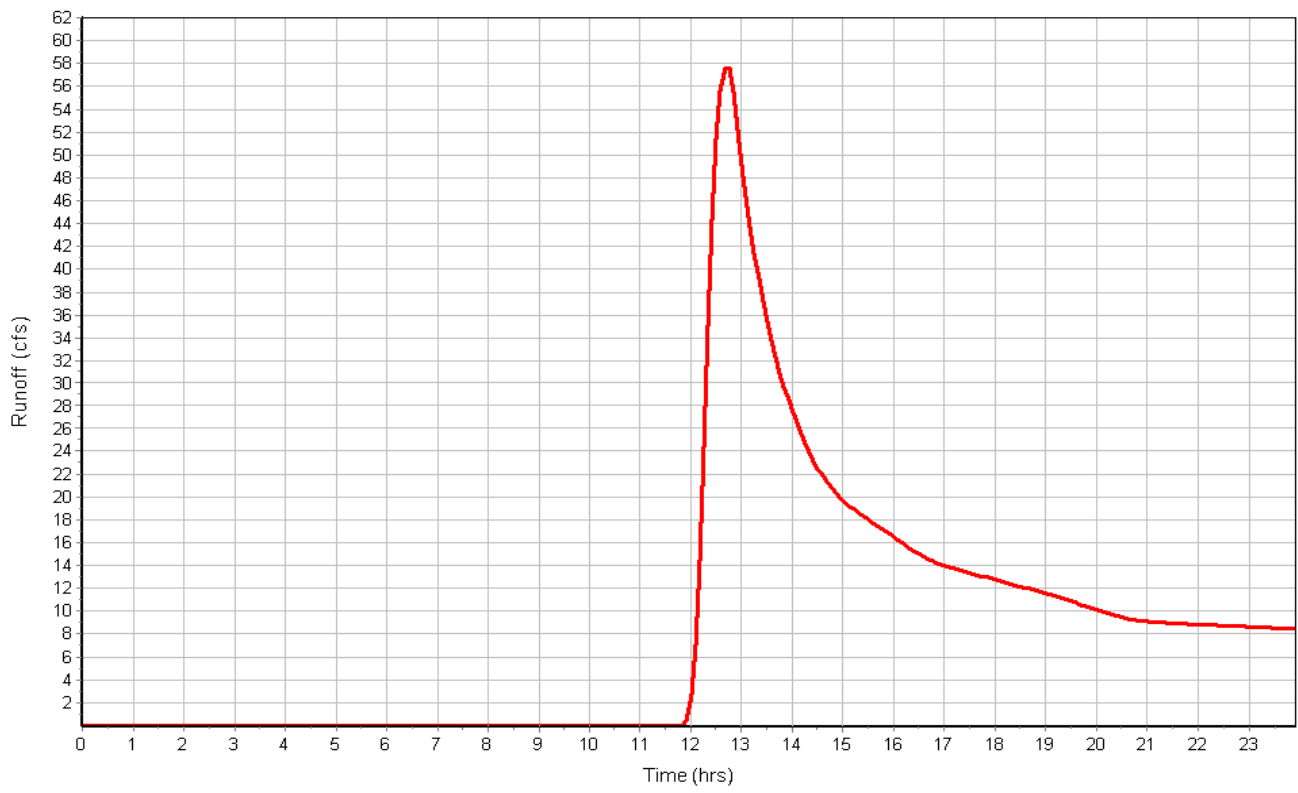
Total Rainfall (in)	2.70
Total Runoff (in)	0.24
Peak Runoff (cfs)	57.80
Weighted Curve Number	60.36
Time of Concentration (days hh:mm:ss)	0 00:57:08

Subbasin : A1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : A2

Input Data

Area (ac) 37.00
 Weighted Curve Number 66.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	18.50	C	72.00
5 Acre Lots, 7% Impervious	18.50	B	60.00
Composite Area & Weighted CN	37.00		66.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.19	0.00	0.00
Computed Flow Time (min) :	14.01	0.00	0.00

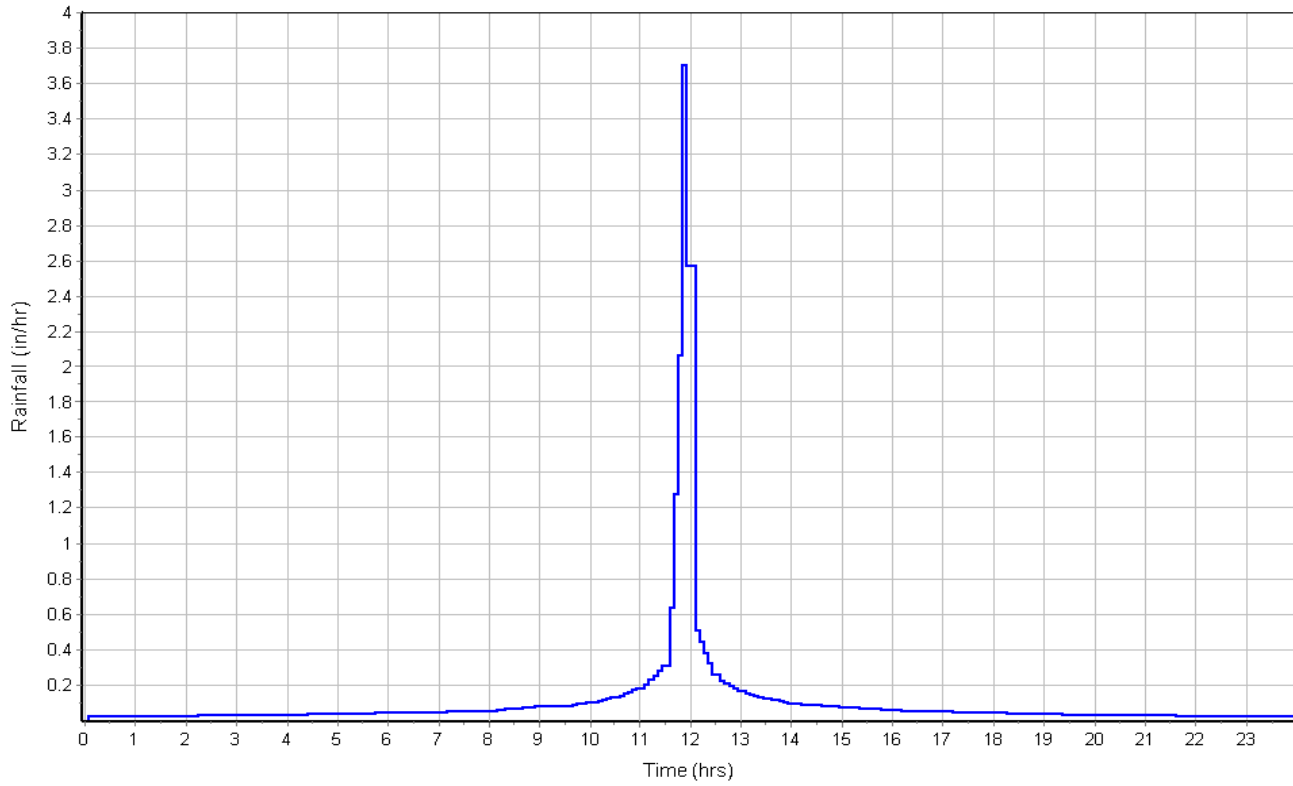
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1157	0.00	0.00
Channel Slope (%) :	2.9	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.07	0.00	0.00
Computed Flow Time (min) :	1.92	0.00	0.00
Total TOC (min)	36.98		

Subbasin Runoff Results

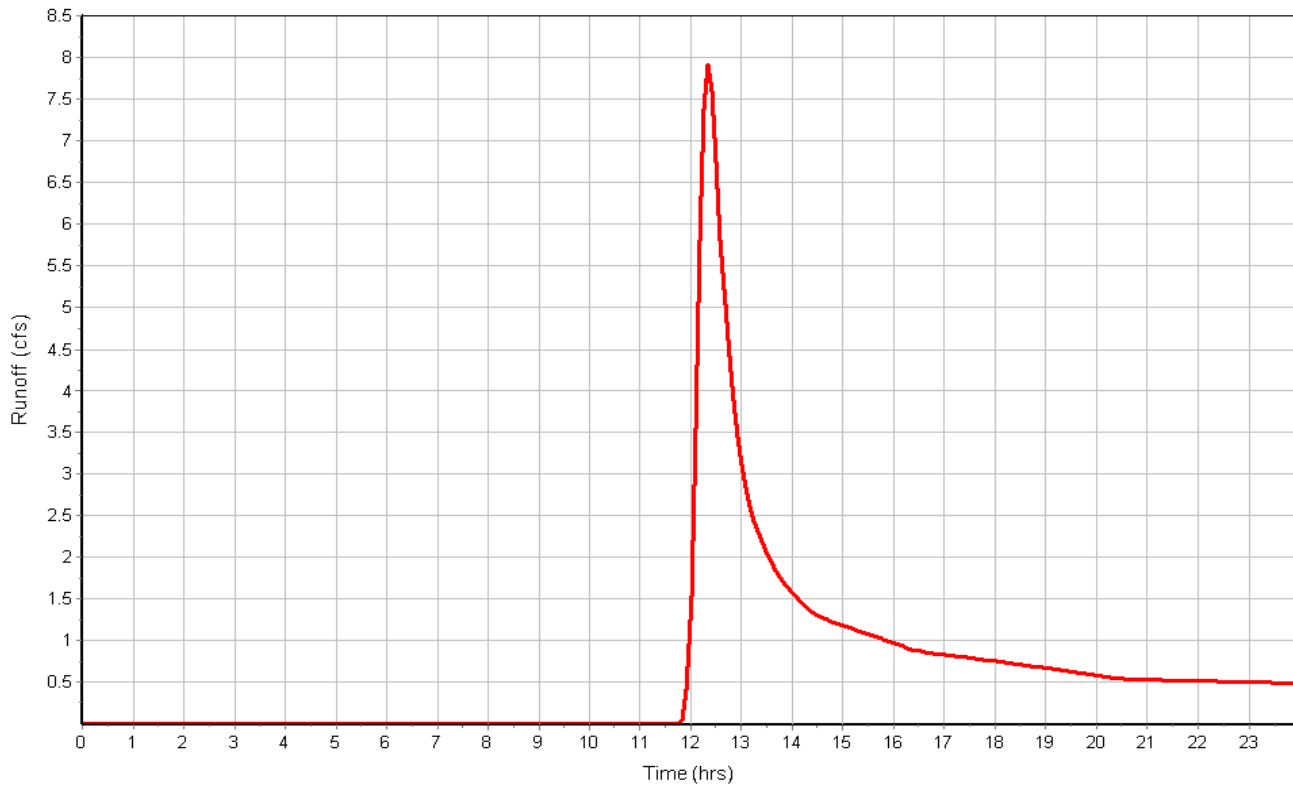
Total Rainfall (in) 2.70
 Total Runoff (in) 0.41
 Peak Runoff (cfs) 7.91
 Weighted Curve Number 66.00
 Time of Concentration (days hh:mm:ss) 0 00:36:59

Subbasin : A2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : A3

Input Data

Area (ac) 41.48
 Weighted Curve Number 76.50
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	20.74	C	72.00
Pasture, grassland, or range, Fair	8.30	D	84.00
Pasture, grassland, or range, Fair	12.44	C	79.00
Composite Area & Weighted CN	41.48		76.50

Time of Concentration

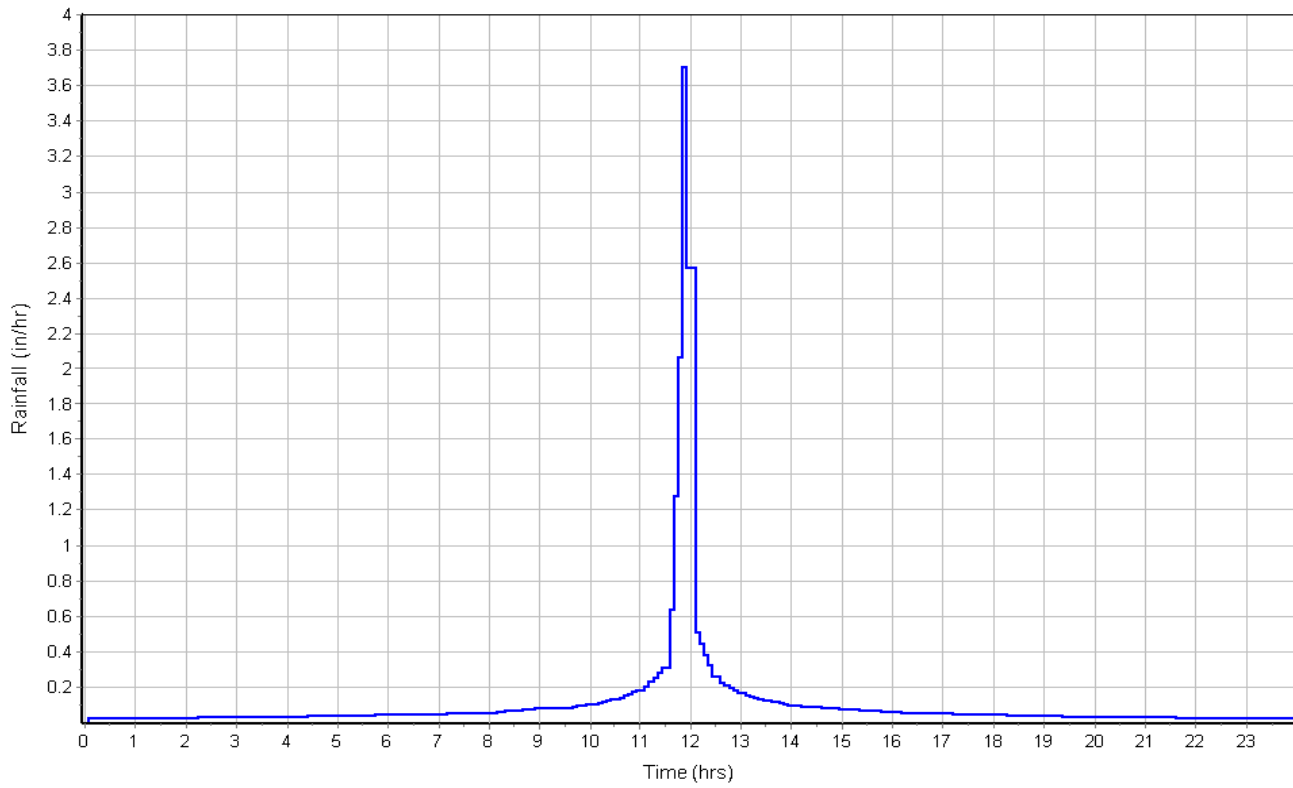
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.53	0.00	0.00
Computed Flow Time (min) :	10.89	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1188	0.00	0.00
Channel Slope (%) :	4.8	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.95	0.00	0.00
Computed Flow Time (min) :	1.53	0.00	0.00
Total TOC (min)	33.48		

Subbasin Runoff Results

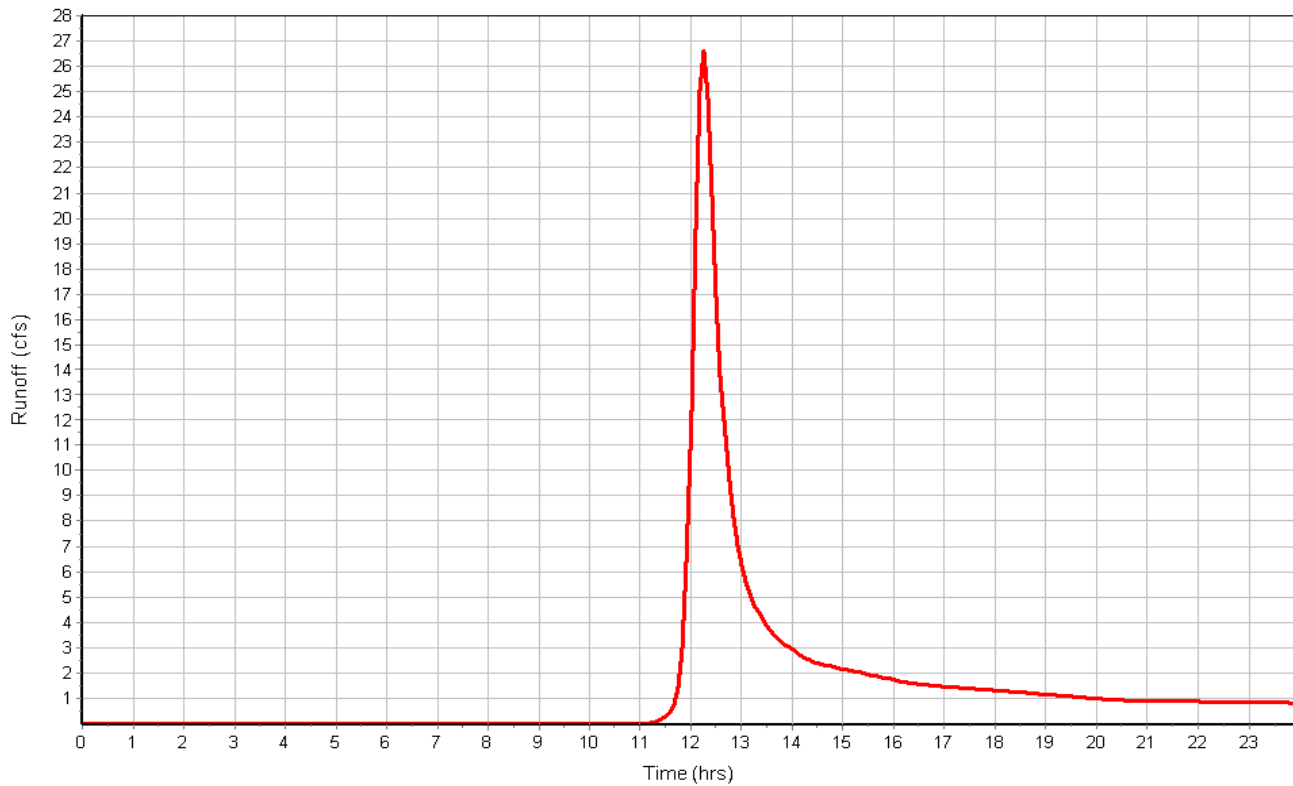
Total Rainfall (in) 2.70
 Total Runoff (in) 0.84
 Peak Runoff (cfs) 26.68
 Weighted Curve Number 76.50
 Time of Concentration (days hh:mm:ss) 0 00:33:29

Subbasin : A3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : B1

Input Data

Area (ac) 3836.70
 Weighted Curve Number 60.34
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	3759.97	B	60.00
5 Acre Lots, 7% Impervious	76.73	D	77.00
Composite Area & Weighted CN	3836.70		60.34

Time of Concentration

	Flowpath A	Flowpath B	Flowpath C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

	Flowpath A	Flowpath B	Flowpath C
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.40	0.00	0.00
Computed Flow Time (min) :	11.90	0.00	0.00

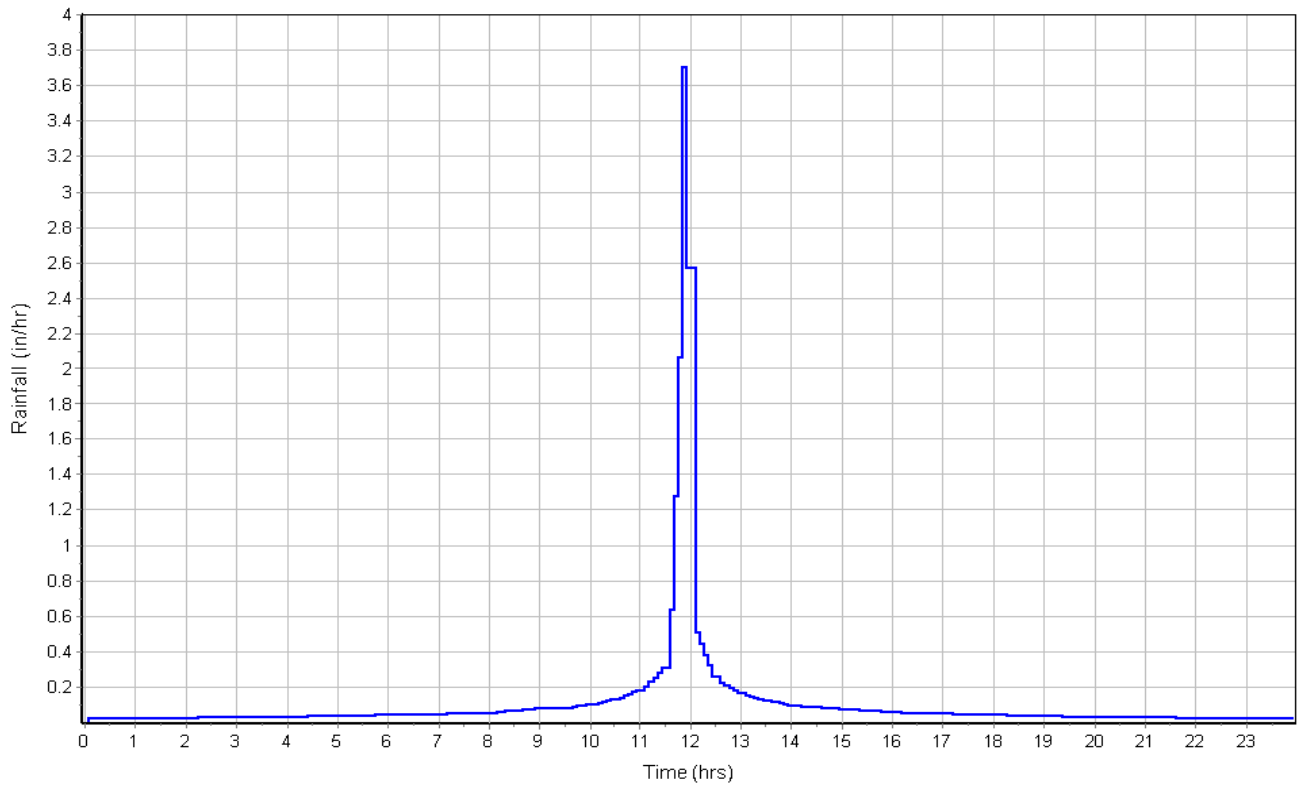
	Flowpath A	Flowpath B	Flowpath C
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	20154	0.00	0.00
Channel Slope (%) :	1.3	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	6.74	0.00	0.00
Computed Flow Time (min) :	49.82	0.00	0.00
Total TOC (min)	82.79		

Subbasin Runoff Results

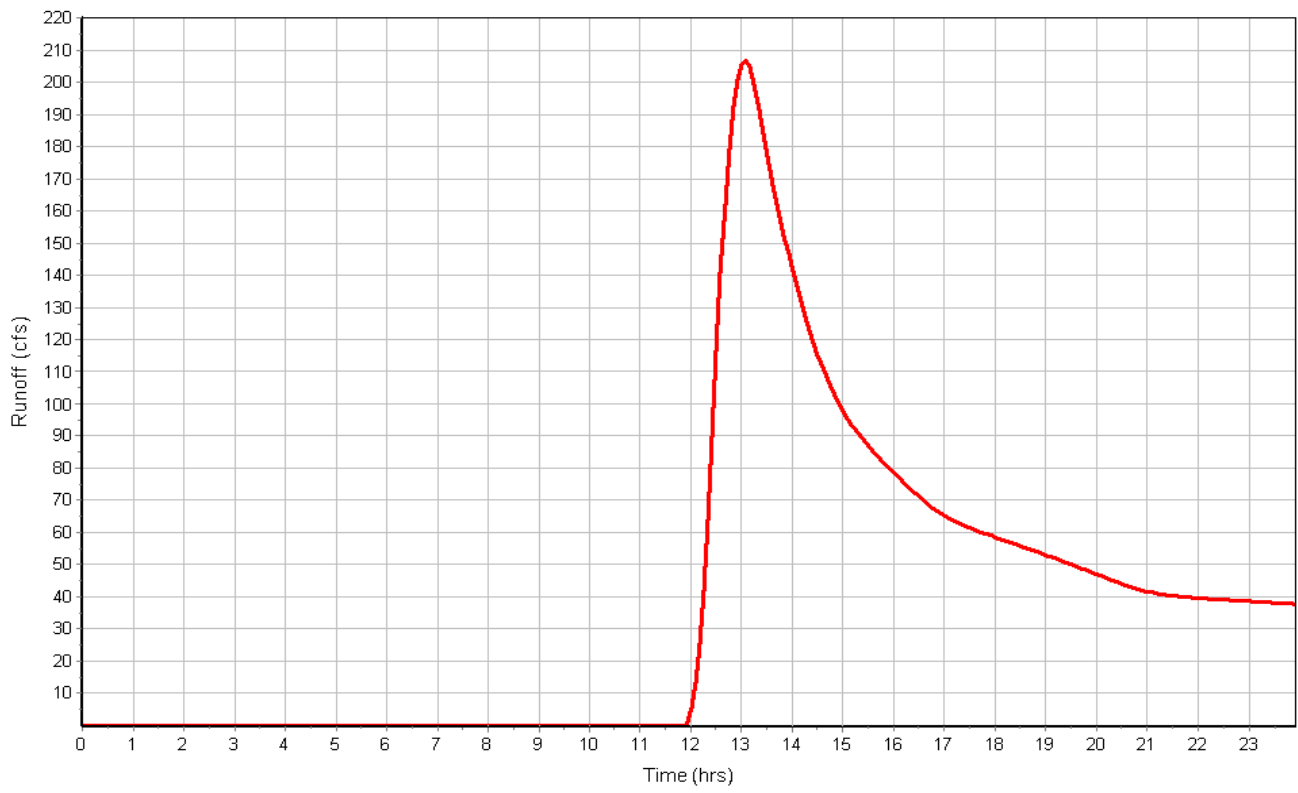
Total Rainfall (in) 2.70
 Total Runoff (in) 0.24
 Peak Runoff (cfs) 207.15
 Weighted Curve Number 60.34
 Time of Concentration (days hh:mm:ss) 0 01:22:47

Subbasin : B1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : B2

Input Data

Area (ac) 13.10
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	13.10	B	64.00
Composite Area & Weighted CN	13.10		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	5.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.60	0.00	0.00
Computed Flow Time (min) :	3.13	0.00	0.00

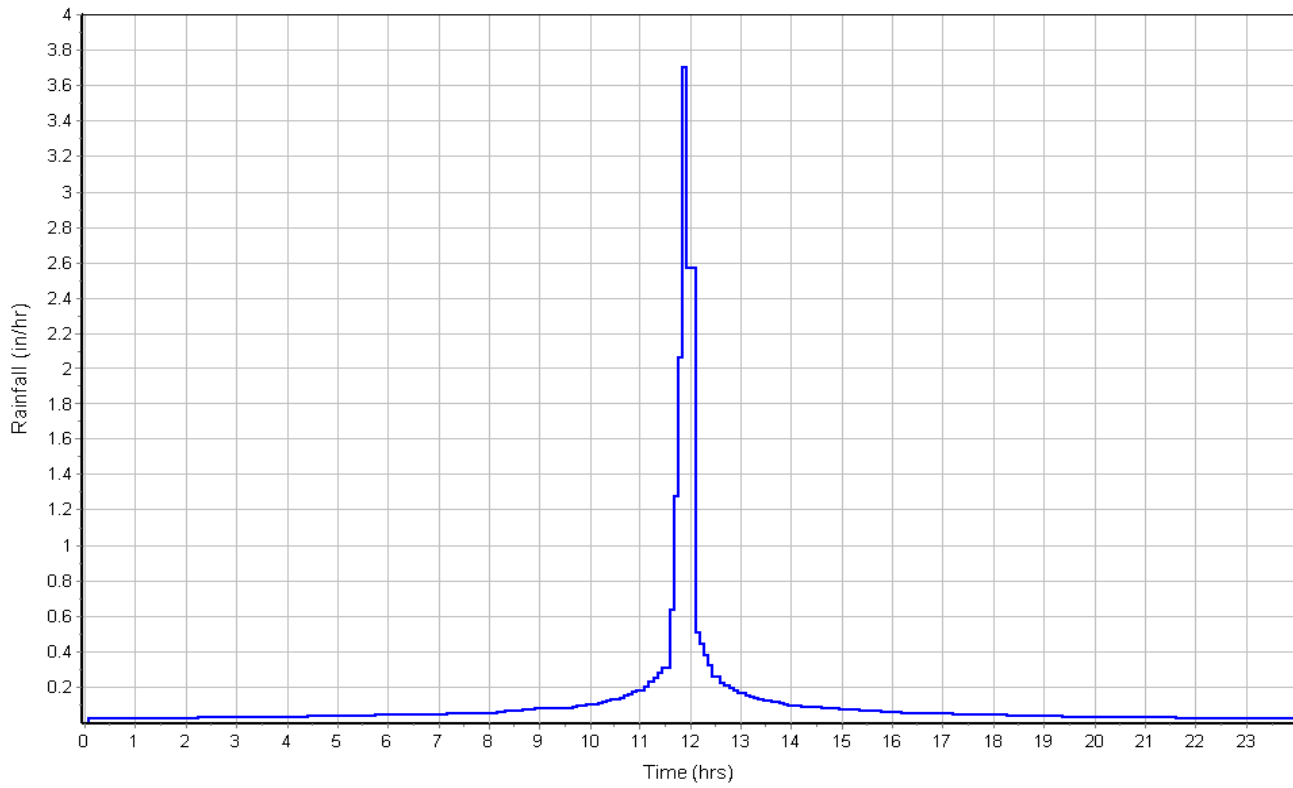
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	177	0.00	0.00
Channel Slope (%) :	5.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.48	0.00	0.00
Computed Flow Time (min) :	0.22	0.00	0.00
Total TOC (min)	24.40		

Subbasin Runoff Results

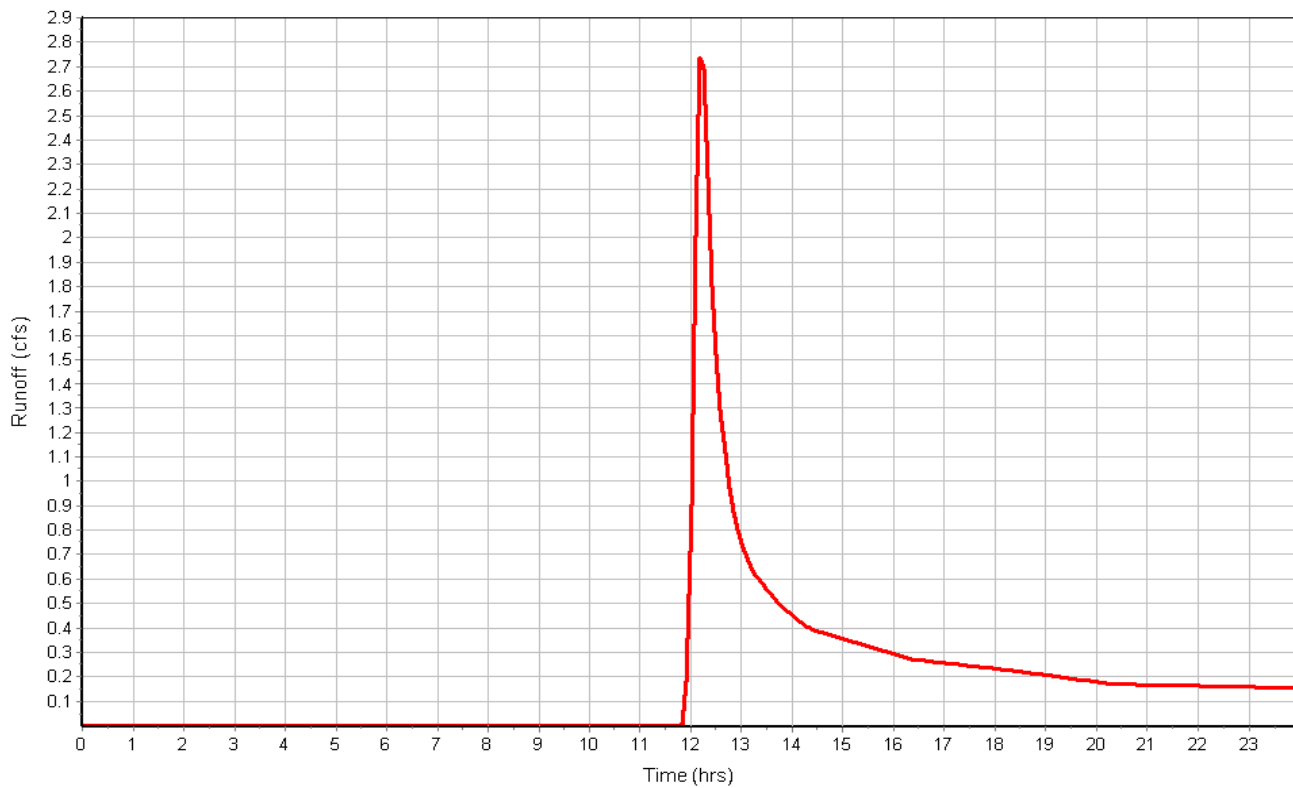
Total Rainfall (in) 2.70
 Total Runoff (in) 0.35
 Peak Runoff (cfs) 2.80
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:24:24

Subbasin : B2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : B3

Input Data

Area (ac) 54.90
 Weighted Curve Number 65.10
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	38.43	B	60.00
5 Acre Lots, 7% Impervious	16.47	D	77.00
Composite Area & Weighted CN	54.90		65.10

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.27	0.00	0.00
Computed Flow Time (min) :	13.12	0.00	0.00

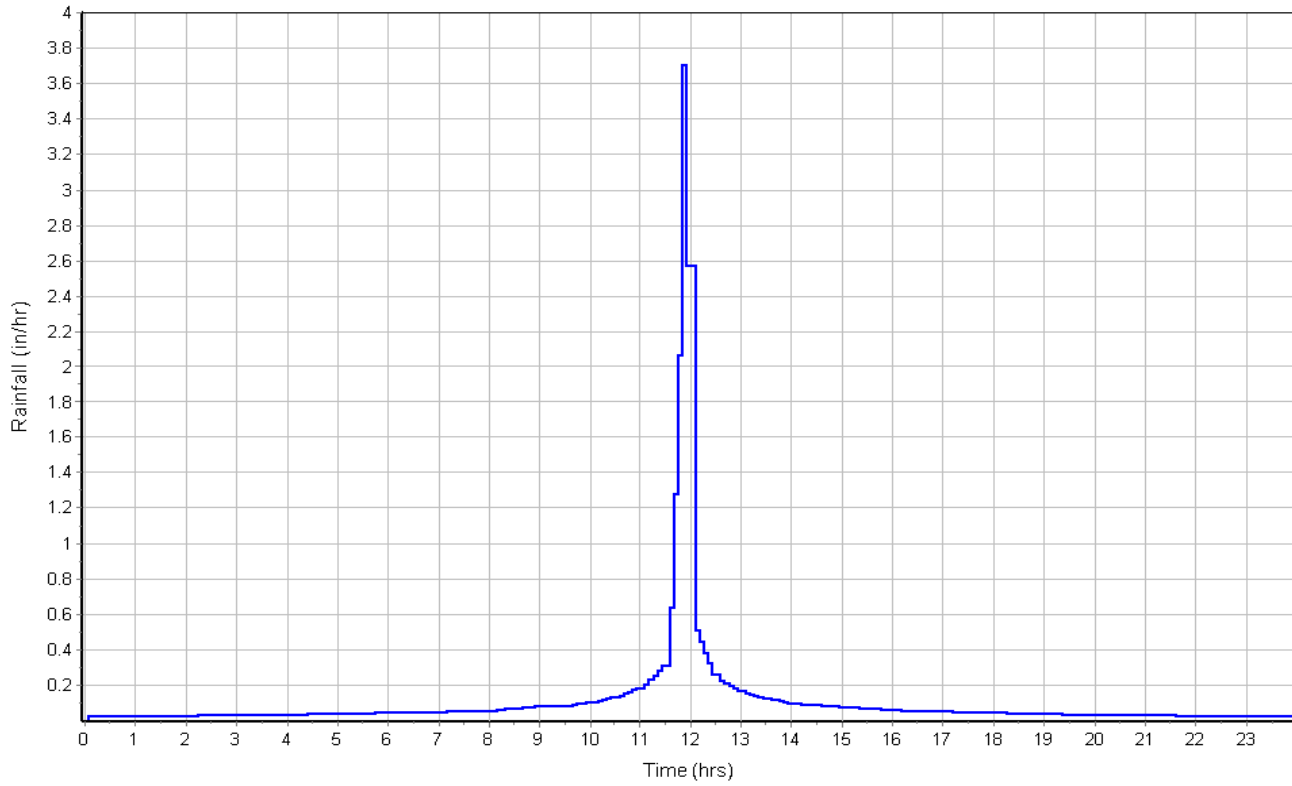
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	2693	0.00	0.00
Channel Slope (%) :	3.3	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.74	0.00	0.00
Computed Flow Time (min) :	4.18	0.00	0.00
Total TOC (min)	38.36		

Subbasin Runoff Results

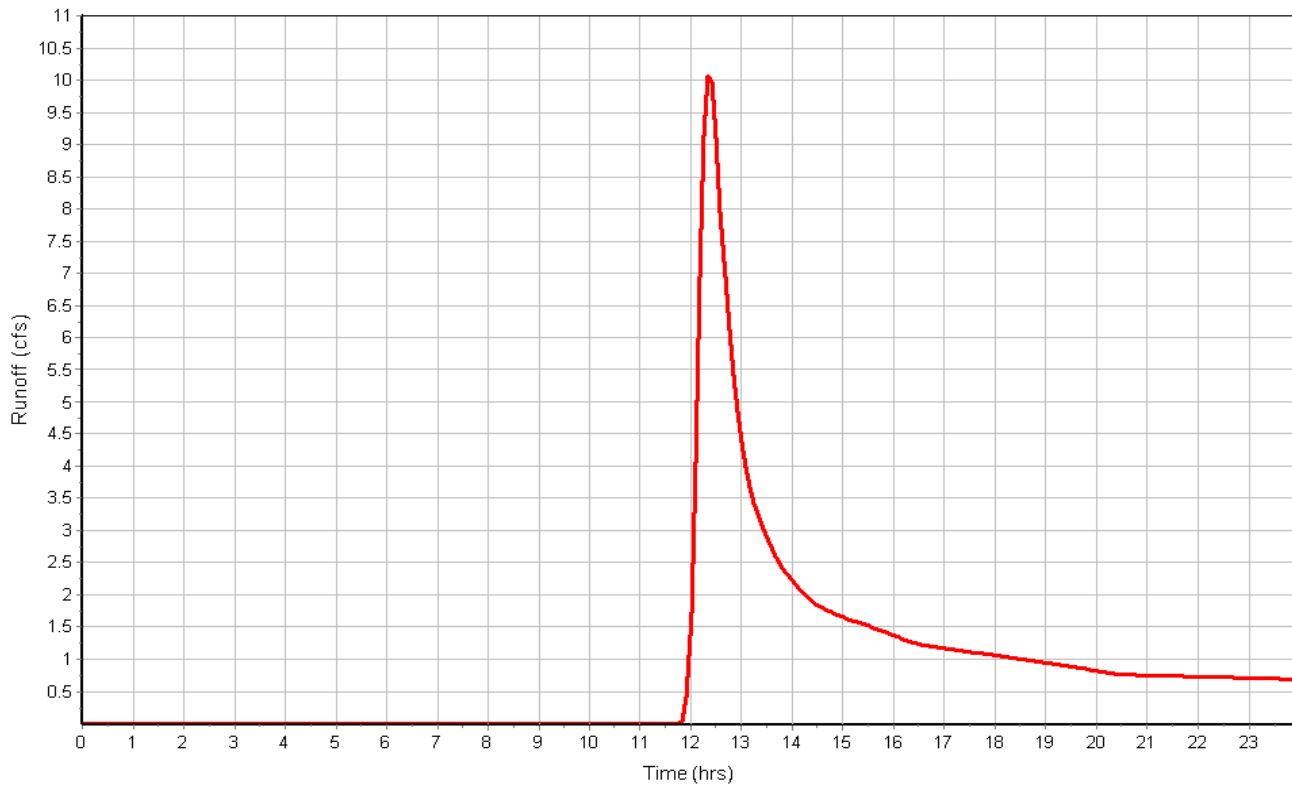
Total Rainfall (in) 2.70
 Total Runoff (in) 0.38
 Peak Runoff (cfs) 10.16
 Weighted Curve Number 65.10
 Time of Concentration (days hh:mm:ss) 0 00:38:22

Subbasin : B3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : B4

Input Data

Area (ac) 41.48
 Weighted Curve Number 68.50
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	22.81	B	64.00
Pasture, grassland, or range, Fair	12.44	B	69.00
Pasture, grassland, or range, Fair	6.22	D	84.00
Composite Area & Weighted CN	41.47		68.50

Time of Concentration

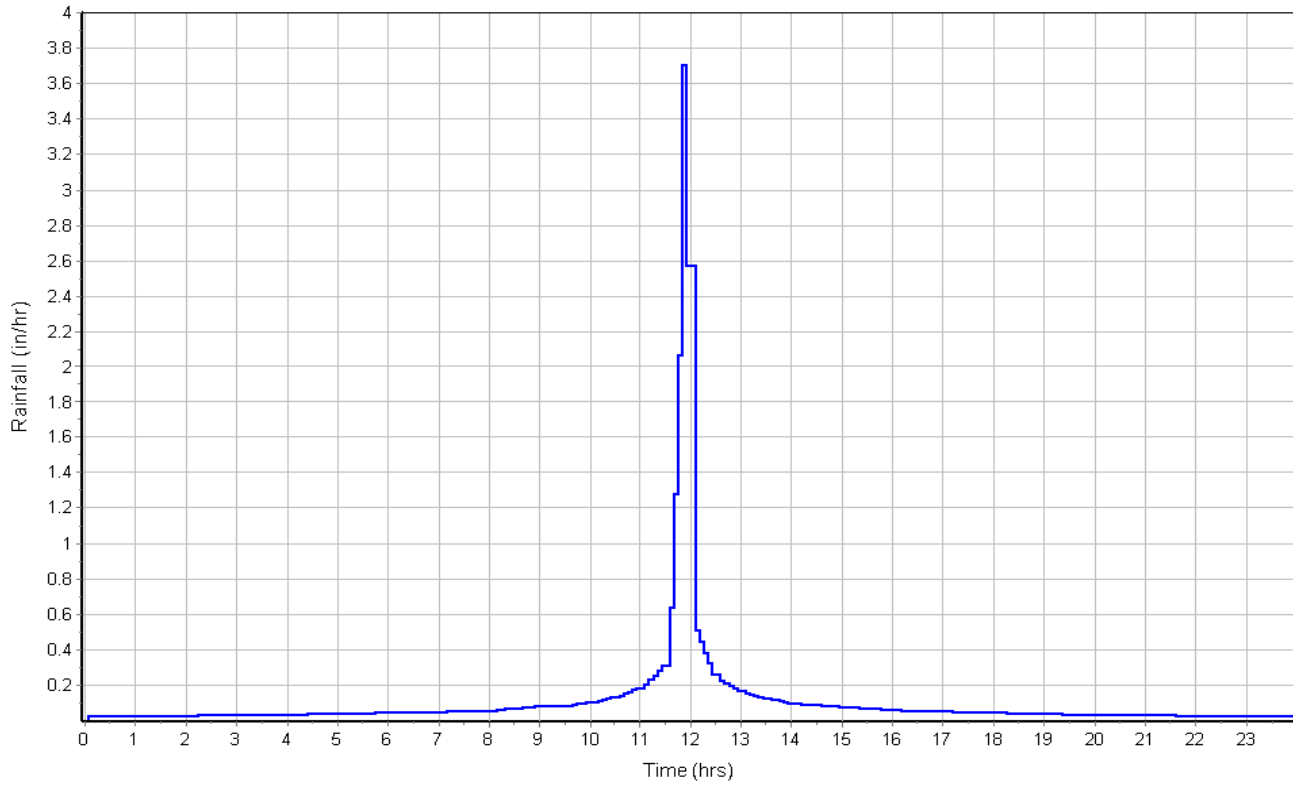
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	15.72	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1188	0.00	0.00
Channel Slope (%) :	2.3	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.97	0.00	0.00
Computed Flow Time (min) :	2.21	0.00	0.00
Total TOC (min)	38.99		

Subbasin Runoff Results

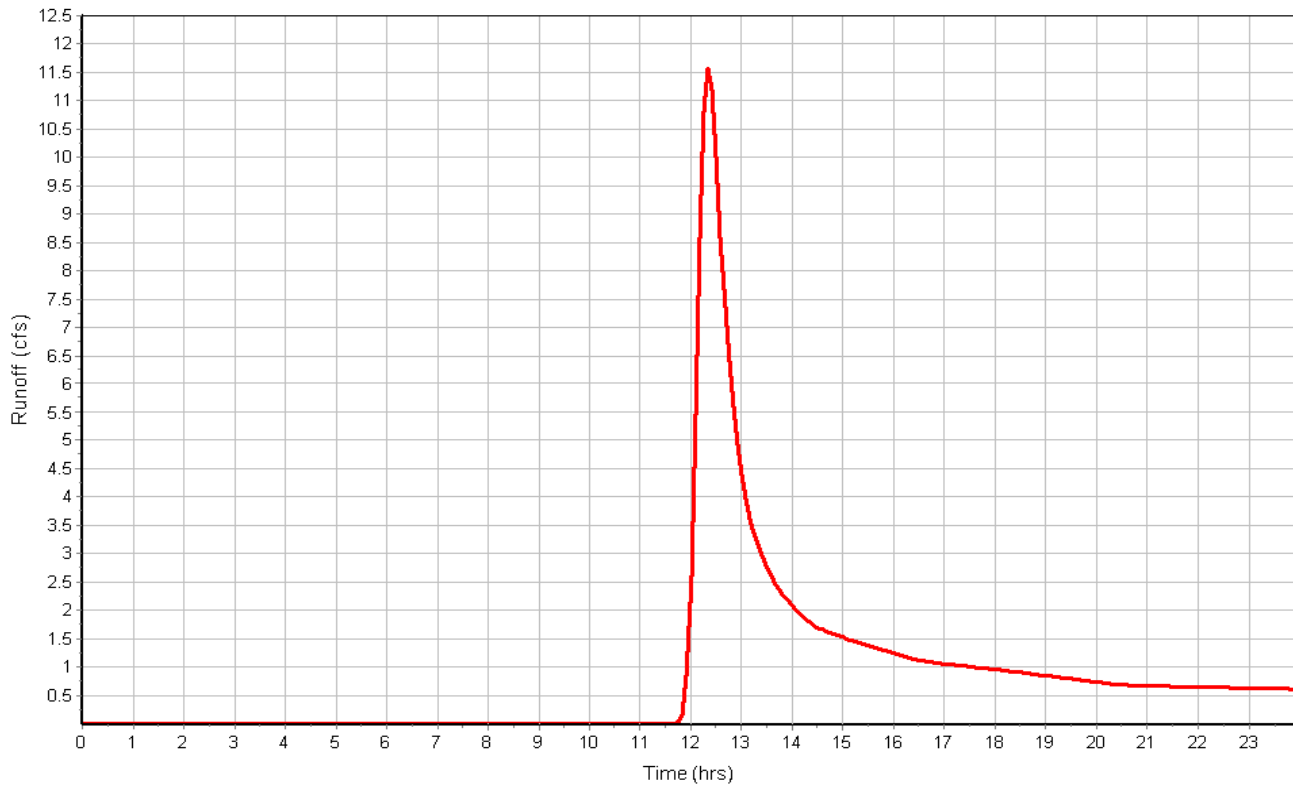
Total Rainfall (in) 2.70
 Total Runoff (in) 0.50
 Peak Runoff (cfs) 11.58
 Weighted Curve Number 68.50
 Time of Concentration (days hh:mm:ss) 0 00:38:59

Subbasin : B4

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : C1

Input Data

Area (ac) 162.70
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	162.70	B	60.00
Composite Area & Weighted CN	162.70		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.42	0.00	0.00
Computed Flow Time (min) :	11.74	0.00	0.00

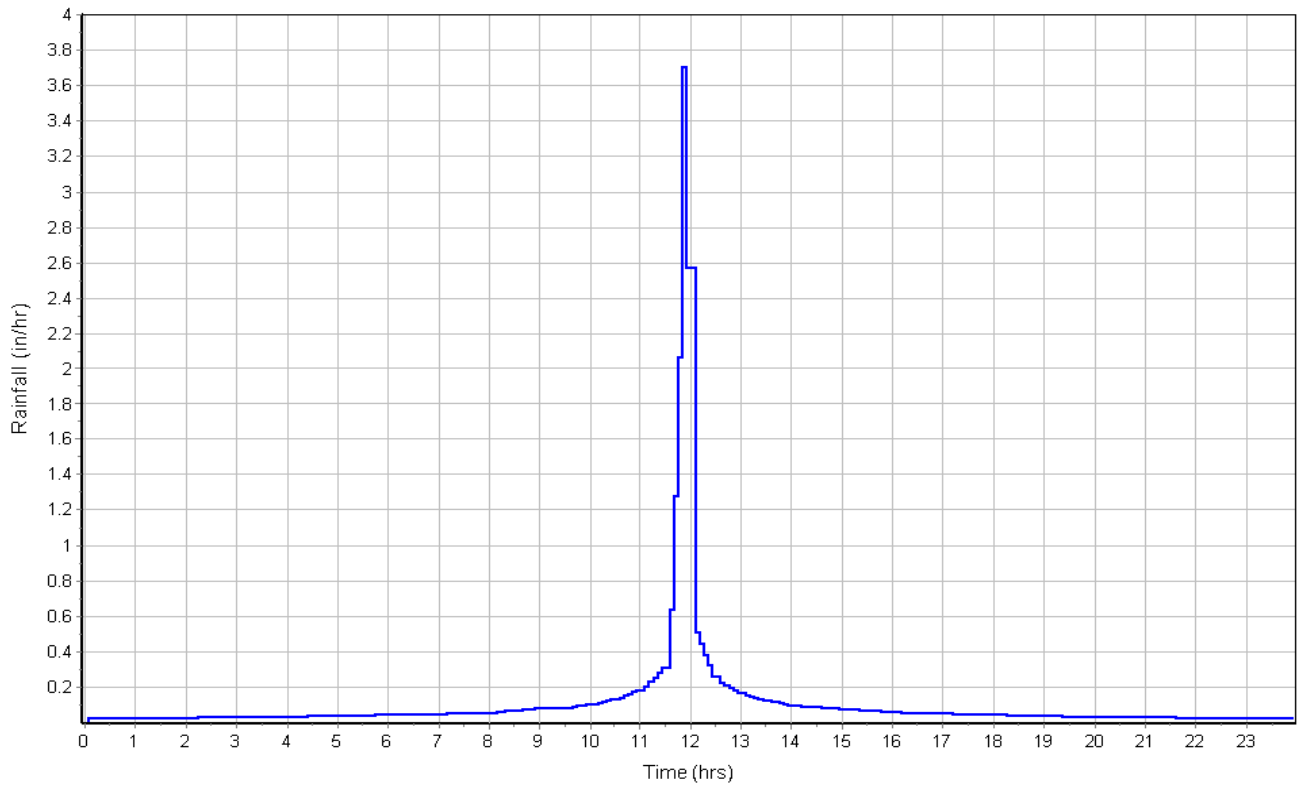
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	3099	0.00	0.00
Channel Slope (%) :	4.1	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.97	0.00	0.00
Computed Flow Time (min) :	4.31	0.00	0.00
Total TOC (min)	37.11		

Subbasin Runoff Results

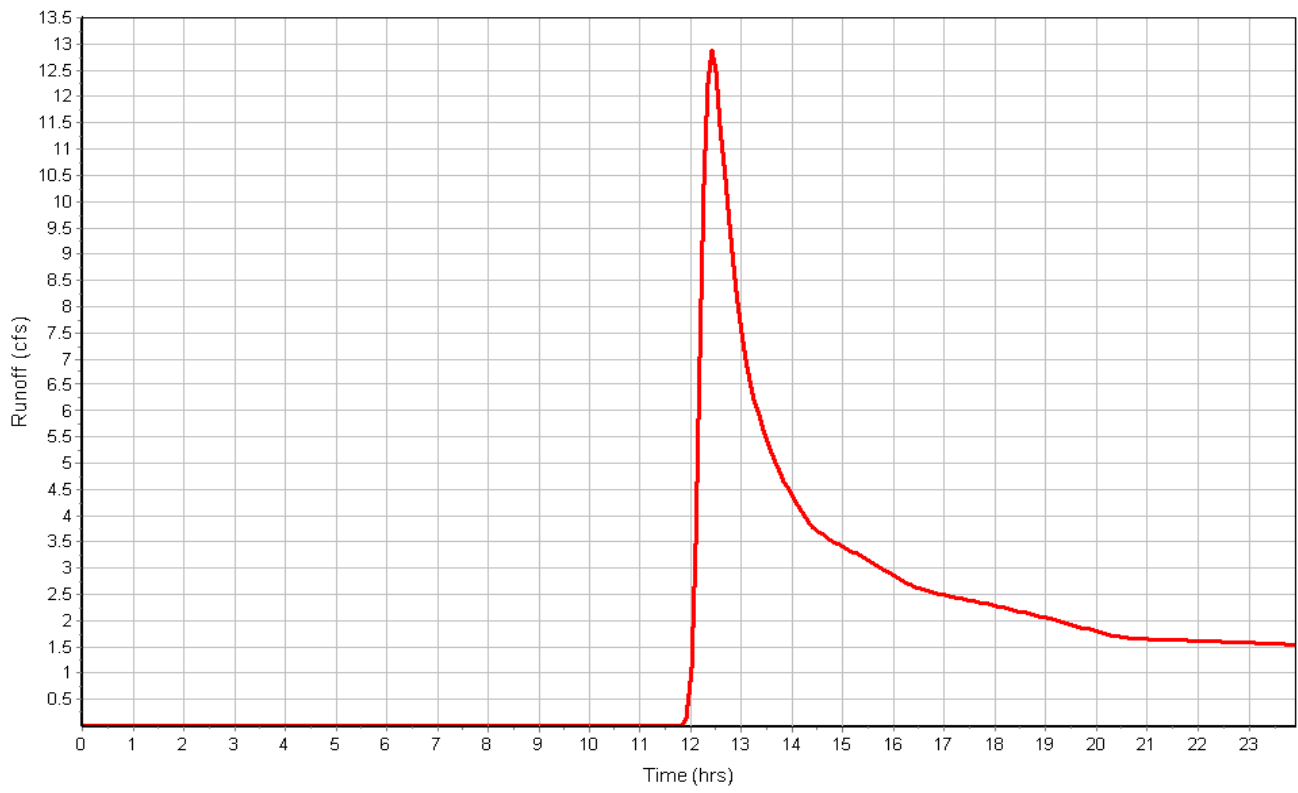
Total Rainfall (in) 2.70
 Total Runoff (in) 0.23
 Peak Runoff (cfs) 12.89
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:37:07

Subbasin : C1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : C2

Input Data

Area (ac) 22.40
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	22.40	B	64.00
Composite Area & Weighted CN	22.40		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.57	0.00	0.00
Computed Flow Time (min) :	5.31	0.00	0.00

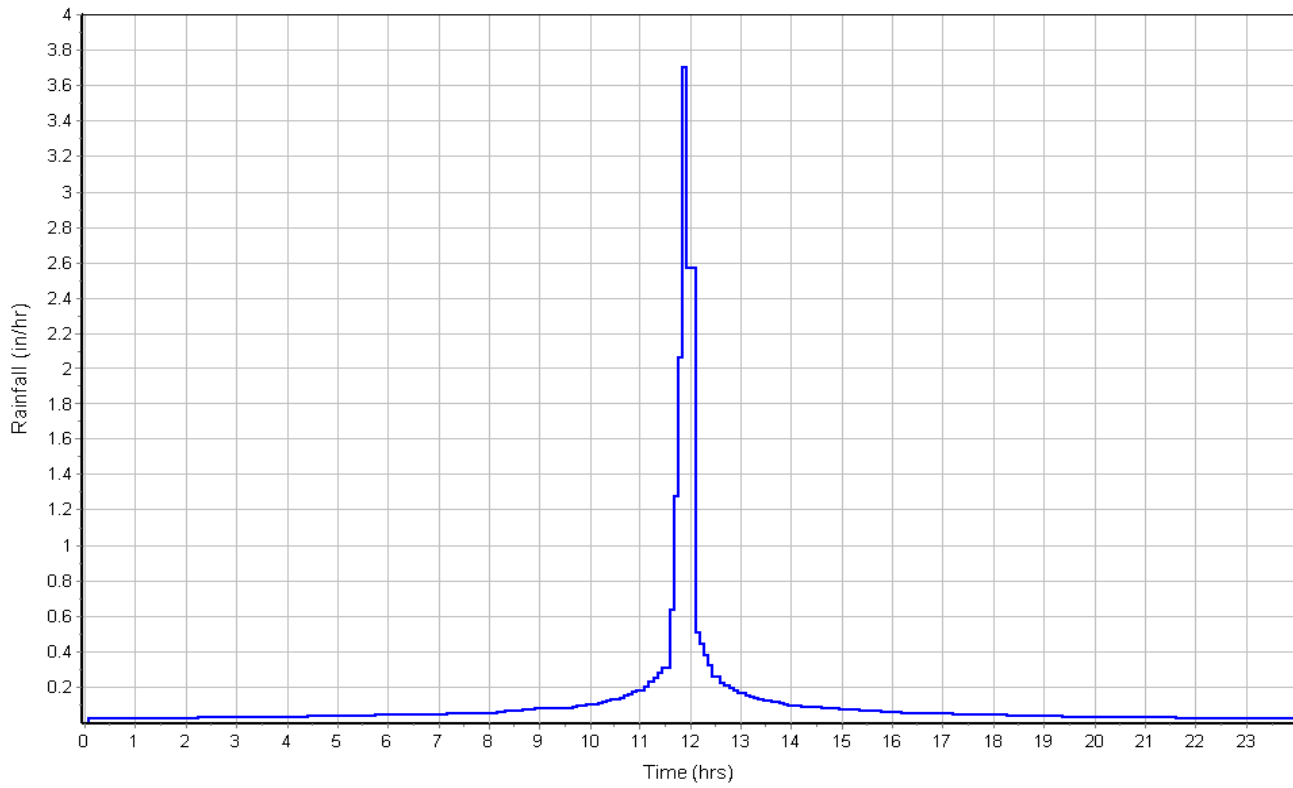
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	401	0.00	0.00
Channel Slope (%) :	.05	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	1.32	0.00	0.00
Computed Flow Time (min) :	5.05	0.00	0.00
Total TOC (min)	31.42		

Subbasin Runoff Results

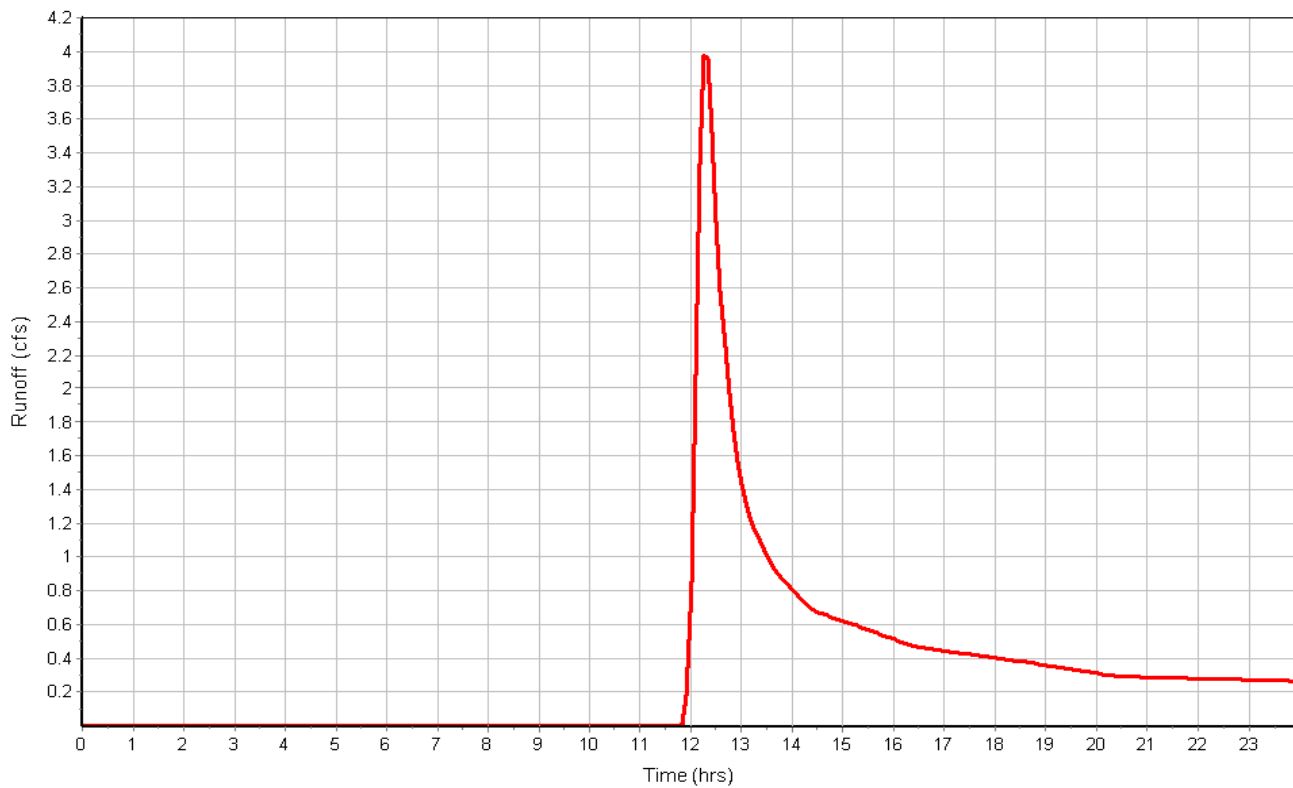
Total Rainfall (in) 2.70
 Total Runoff (in) 0.35
 Peak Runoff (cfs) 4.04
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:31:25

Subbasin : C2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : C3

Input Data

Area (ac) 16.10
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	16.10	B	64.00
Composite Area & Weighted CN	16.10		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	6.13	0.00	0.00

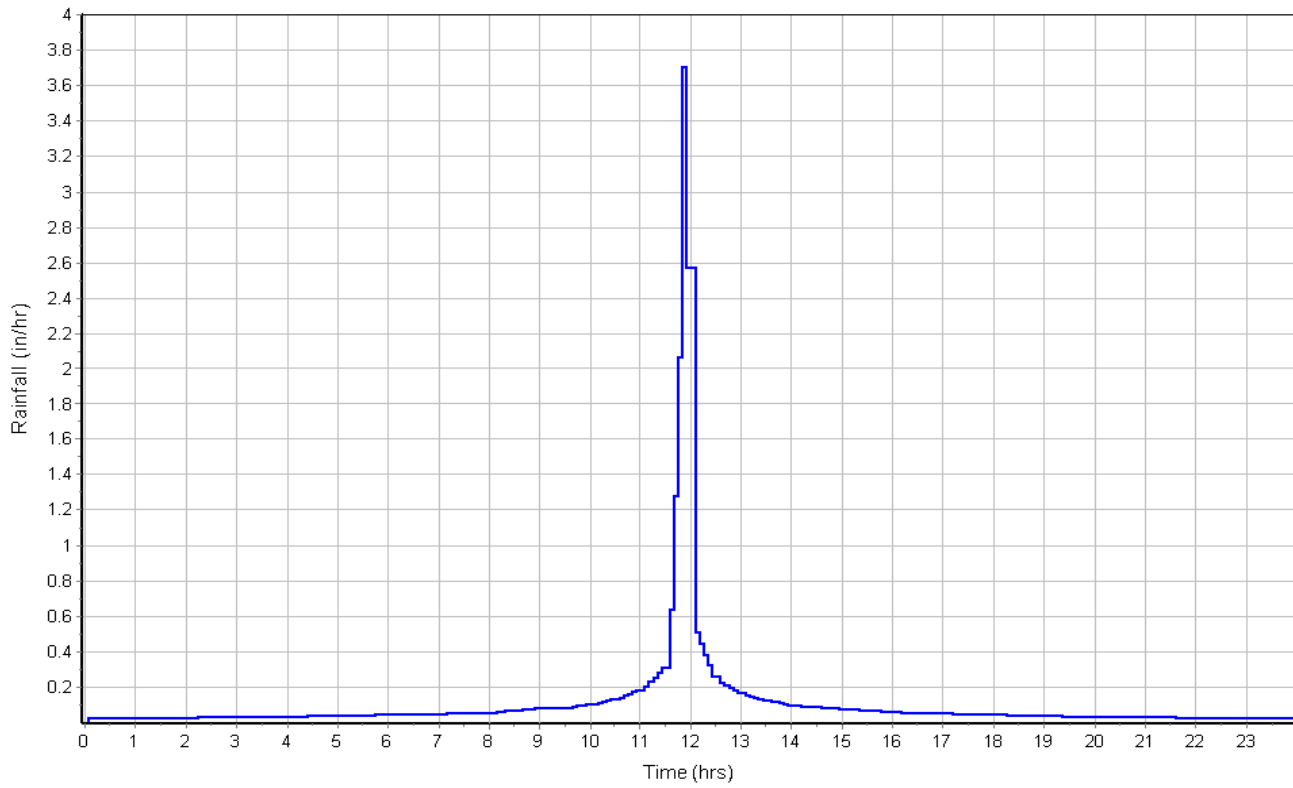
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	666	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.53	0.00	0.00
Computed Flow Time (min) :	0.96	0.00	0.00
Total TOC (min)	28.15		

Subbasin Runoff Results

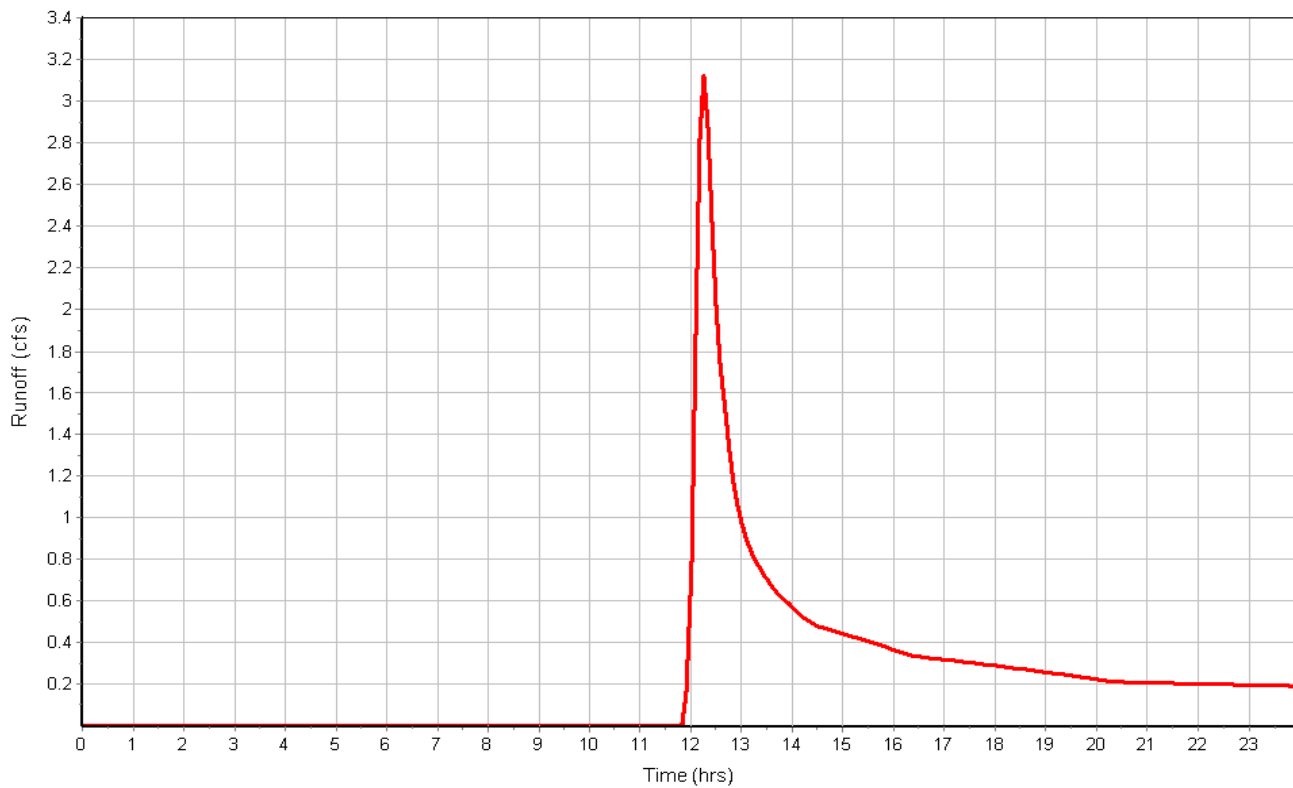
Total Rainfall (in) 2.70
 Total Runoff (in) 0.35
 Peak Runoff (cfs) 3.13
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:28:09

Subbasin : C3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : C4

Input Data

Area (ac) 23.80
 Weighted Curve Number 65.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	11.90	B	60.00
Pasture, grassland, or range, Fair	1.19	C	79.00
Pasture, grassland, or range, Fair	10.71	B	69.00
Composite Area & Weighted CN	23.80		65.00

Time of Concentration

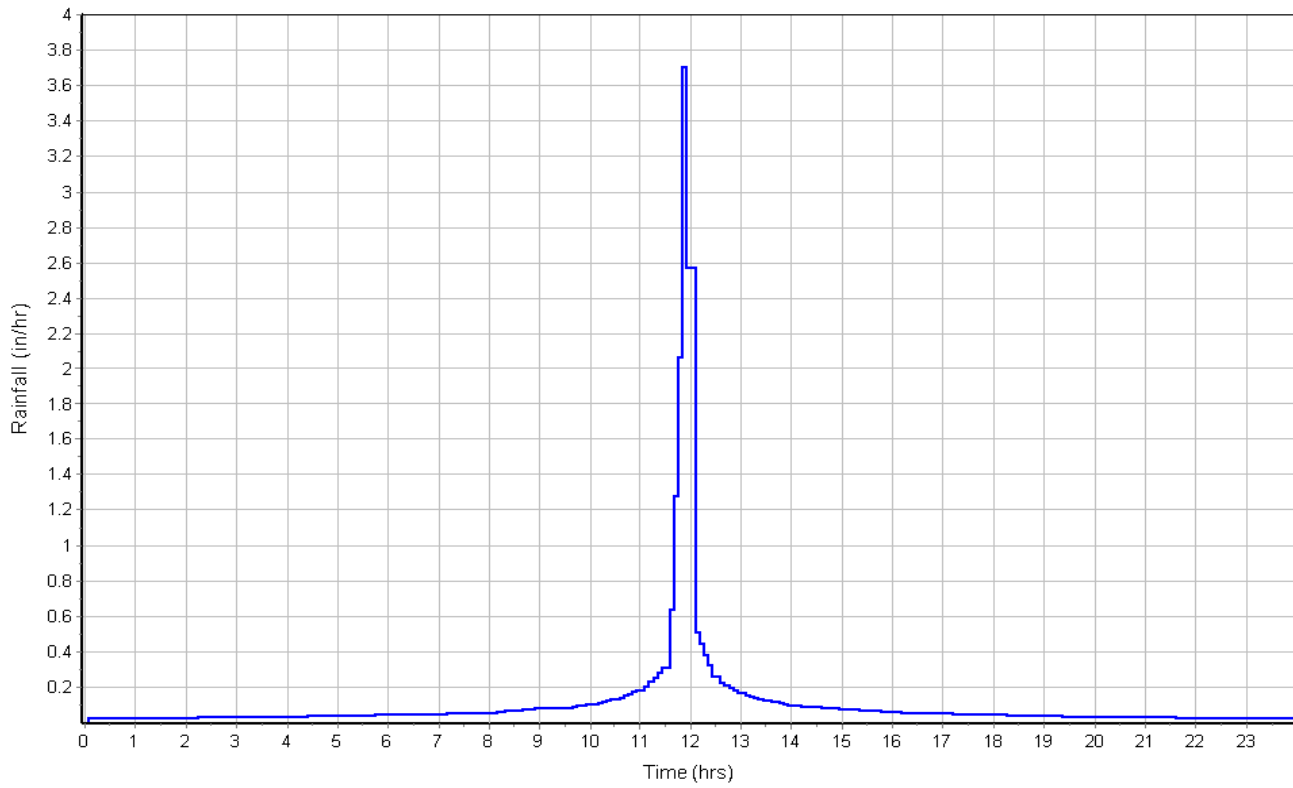
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	1.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	0.96	0.00	0.00
Computed Flow Time (min) :	17.36	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1074	0.00	0.00
Channel Slope (%) :	1.9	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.15	0.00	0.00
Computed Flow Time (min) :	2.20	0.00	0.00
Total TOC (min)	40.62		

Subbasin Runoff Results

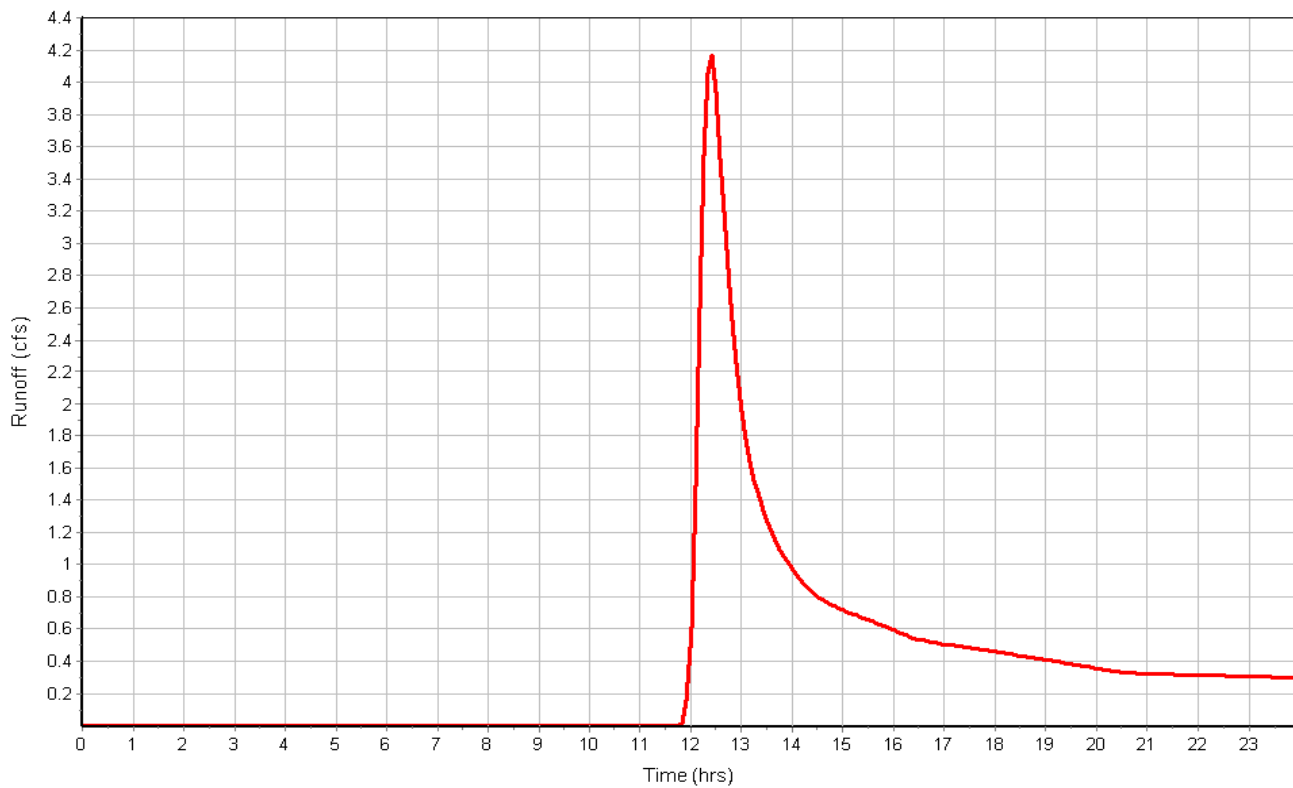
Total Rainfall (in) 2.70
 Total Runoff (in) 0.38
 Peak Runoff (cfs) 4.18
 Weighted Curve Number 65.00
 Time of Concentration (days hh:mm:ss) 0 00:40:37

Subbasin : C4

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D1.1

Input Data

Area (ac) 161.30
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	161.30	B	60.00
Composite Area & Weighted CN	161.30		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5.7	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.19	0.00	0.00
Computed Flow Time (min) :	14.01	0.00	0.00

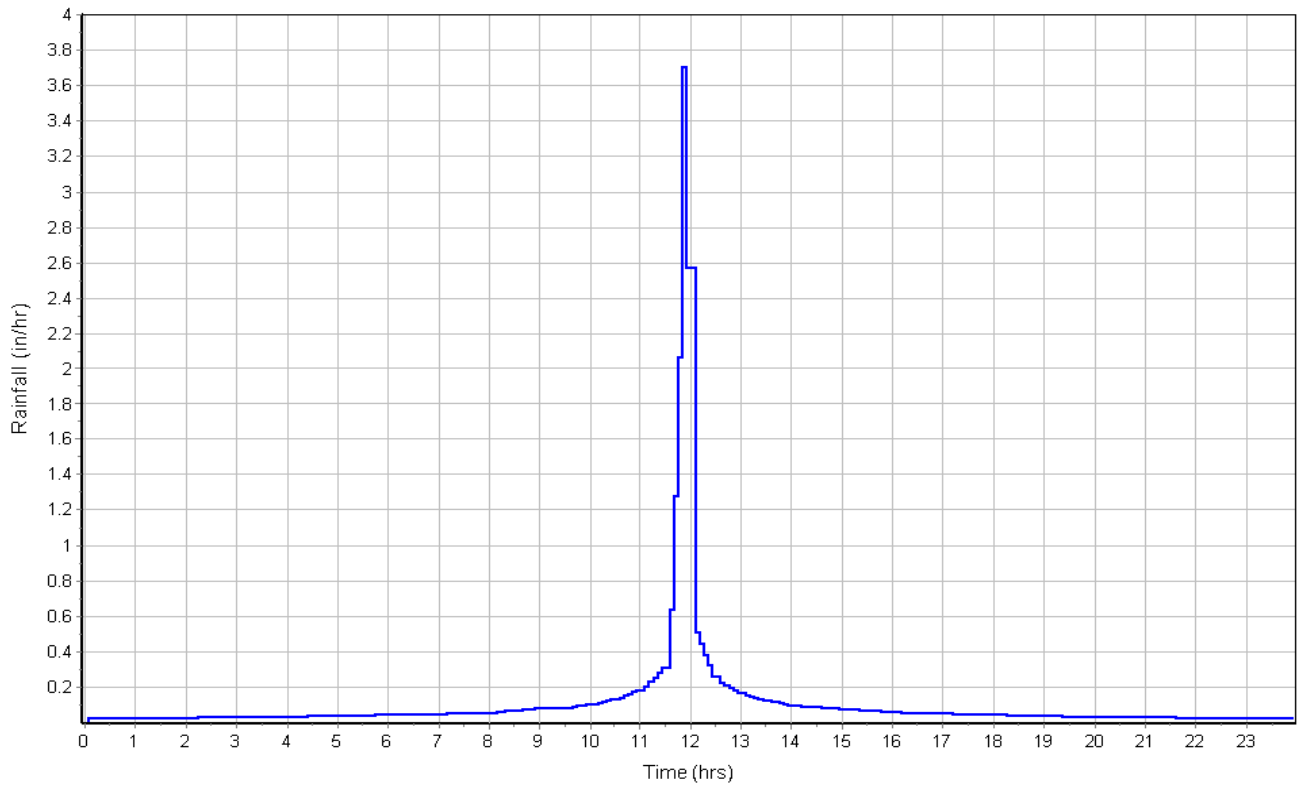
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1601	0.00	0.00
Channel Slope (%) :	5.7	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	14.12	0.00	0.00
Computed Flow Time (min) :	1.89	0.00	0.00
Total TOC (min)	36.95		

Subbasin Runoff Results

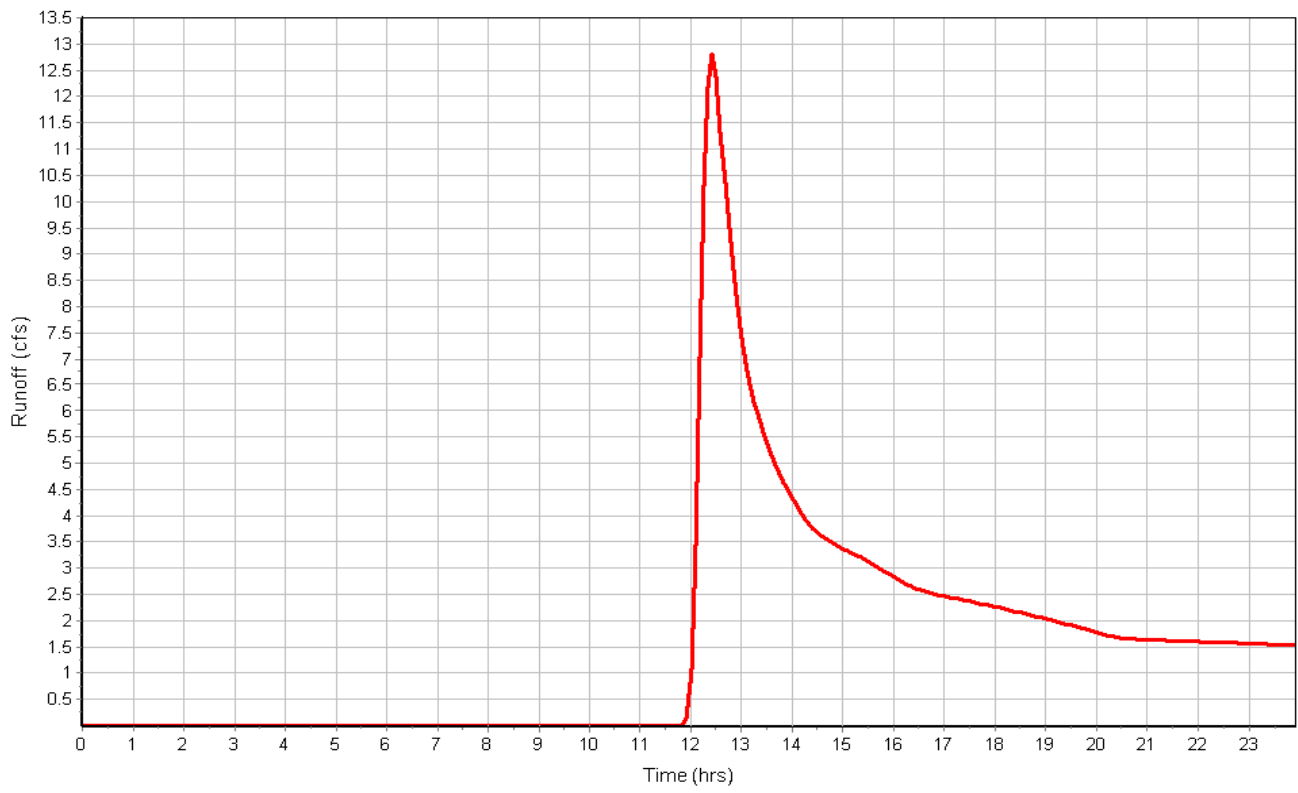
Total Rainfall (in) 2.70
 Total Runoff (in) 0.23
 Peak Runoff (cfs) 12.81
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:36:57

Subbasin : D1.1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D1.2

Input Data

Area (ac) 49.90
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	49.90	B	60.00
Composite Area & Weighted CN	49.90		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.48	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	0.79	0.00	0.00
Computed Flow Time (min) :	21.10	0.00	0.00

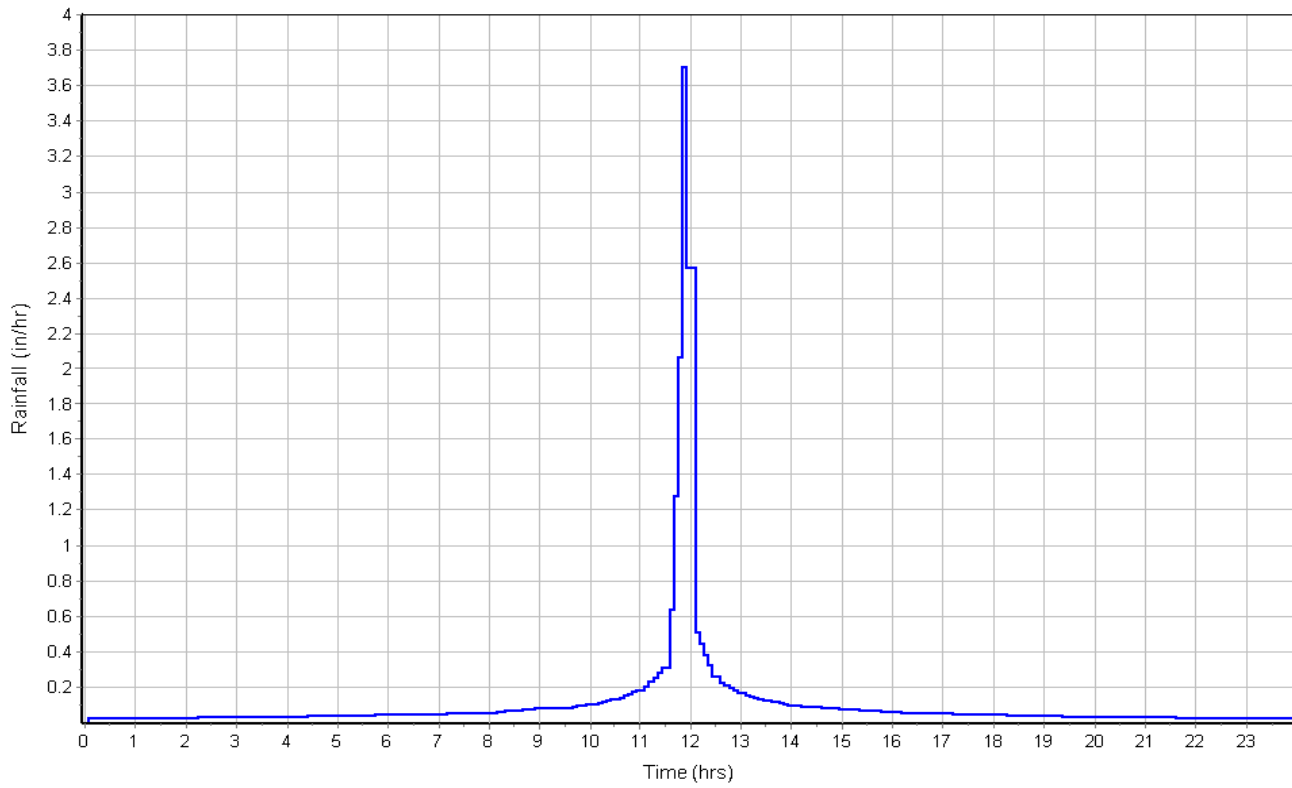
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	922	0.00	0.00
Channel Slope (%) :	2.48	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	9.31	0.00	0.00
Computed Flow Time (min) :	1.65	0.00	0.00
Total TOC (min)	43.81		

Subbasin Runoff Results

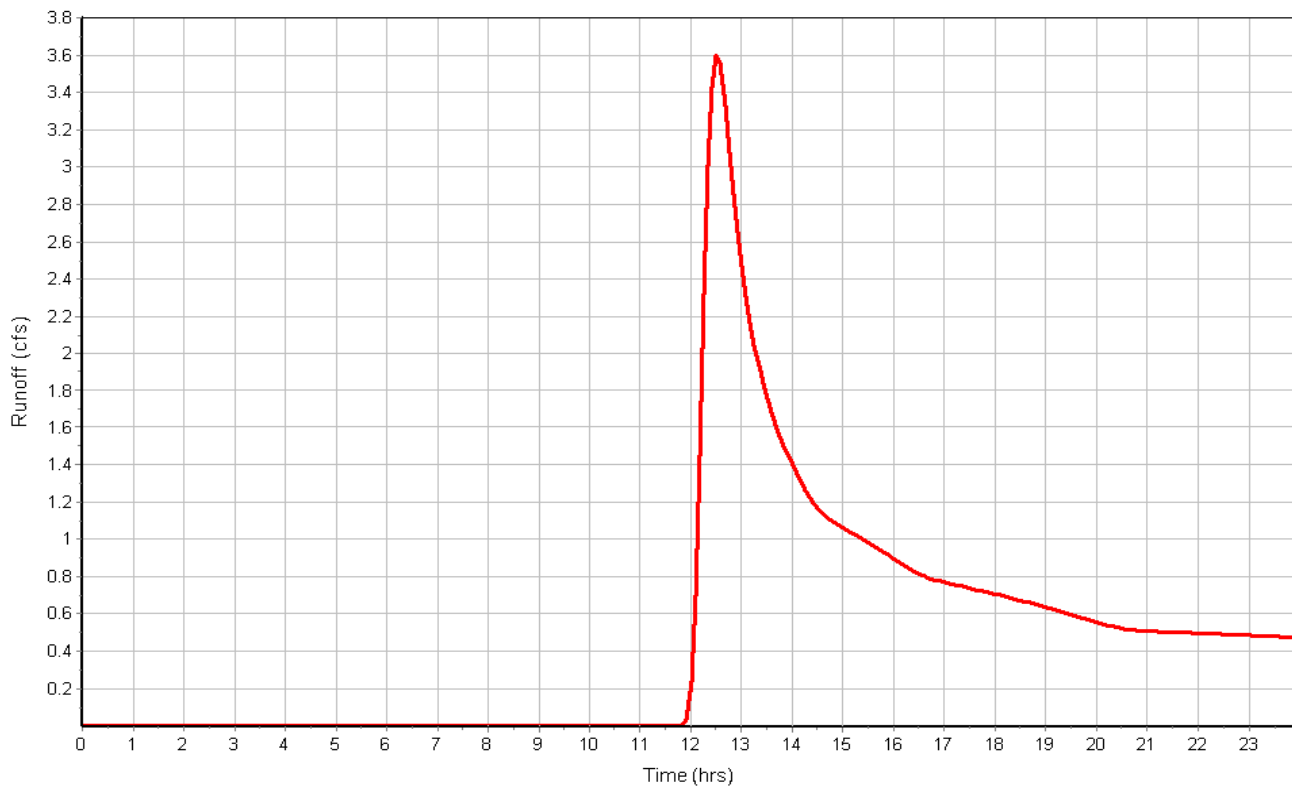
Total Rainfall (in) 2.70
 Total Runoff (in) 0.23
 Peak Runoff (cfs) 3.61
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:43:49

Subbasin : D1.2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D2

Input Data

Area (ac) 68.70
 Weighted Curve Number 64.75
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	10.31	B	69.00
2.5 Acre Lots, 11% Impervious	58.40	B	64.00
Composite Area & Weighted CN	68.71		64.75

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	12.25	0.00	0.00

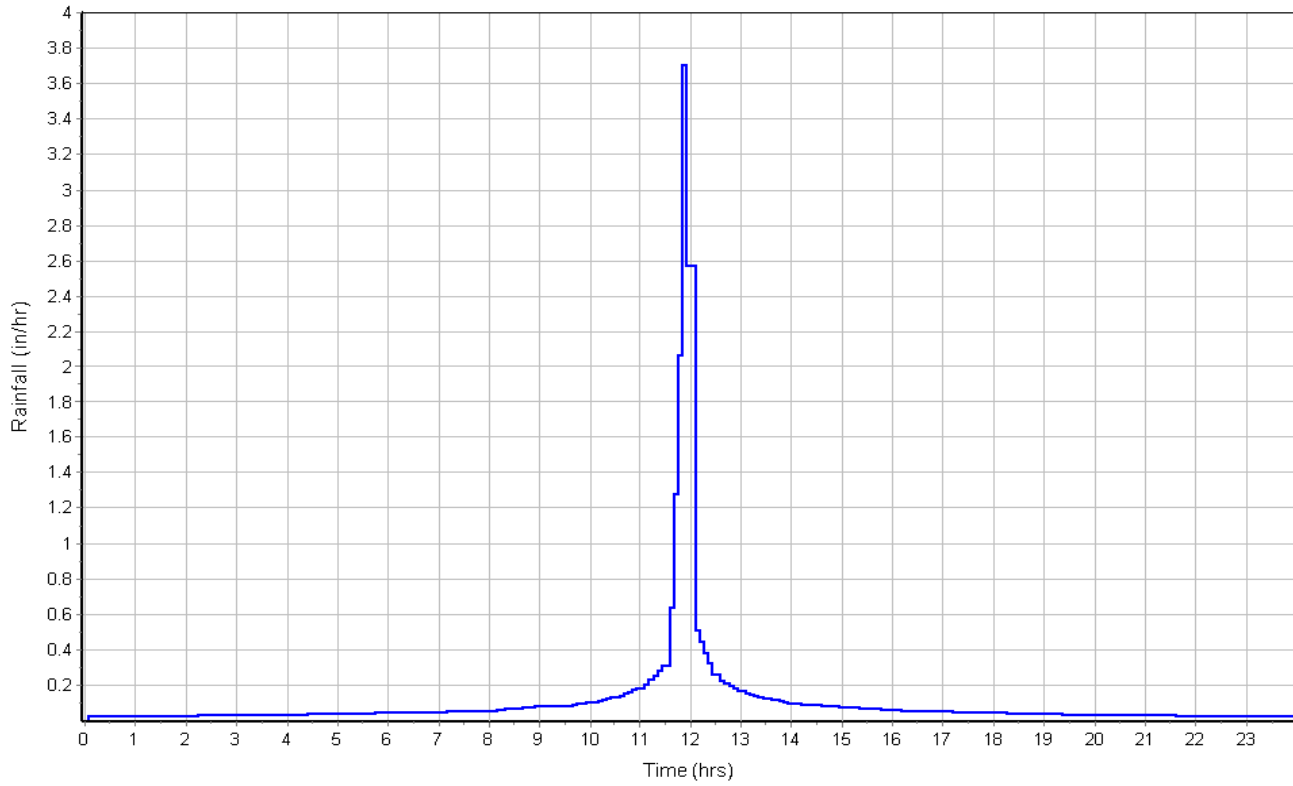
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	848	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.53	0.00	0.00
Computed Flow Time (min) :	1.23	0.00	0.00
Total TOC (min)	34.54		

Subbasin Runoff Results

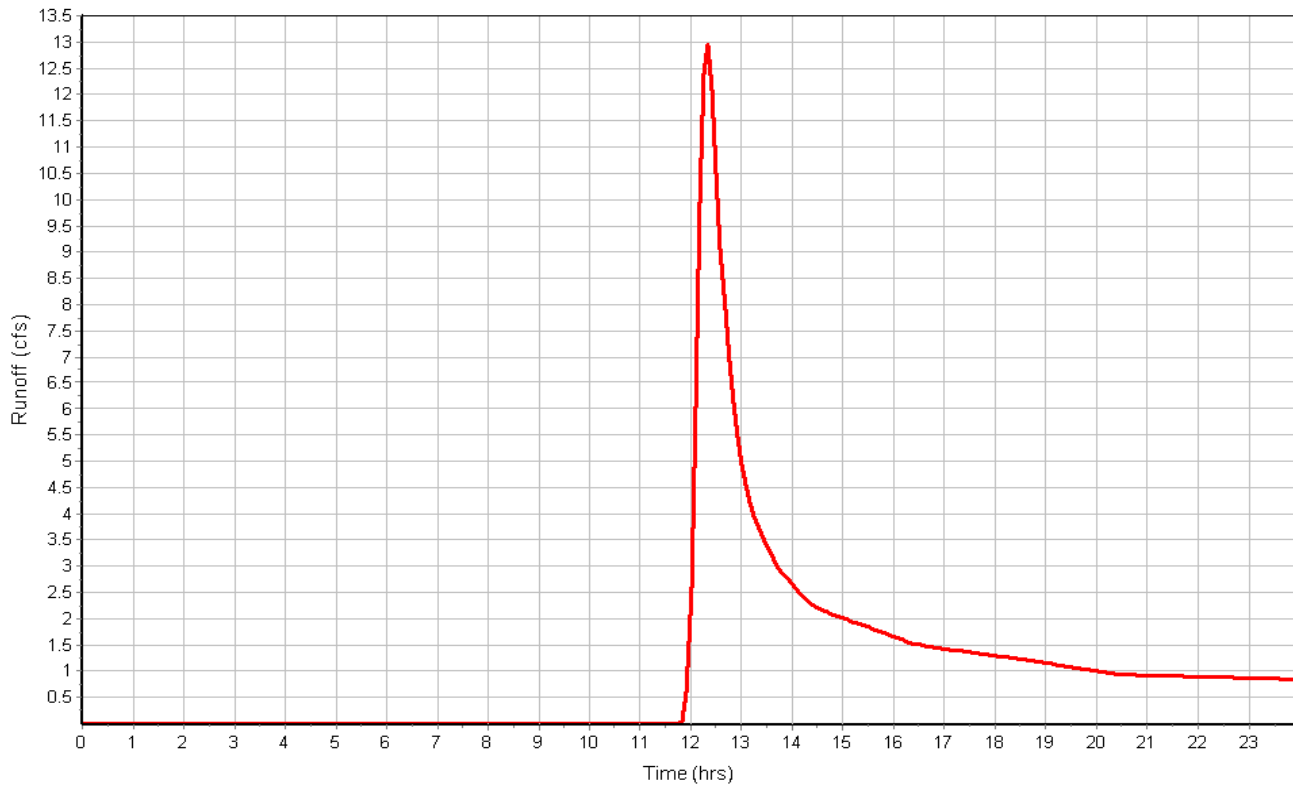
Total Rainfall (in) 2.70
 Total Runoff (in) 0.37
 Peak Runoff (cfs) 12.98
 Weighted Curve Number 64.75
 Time of Concentration (days hh:mm:ss) 0 00:34:32

Subbasin : D2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D3

Input Data

Area (ac) 41.20
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	41.20	B	64.00
Composite Area & Weighted CN	41.20		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	15.72	0.00	0.00

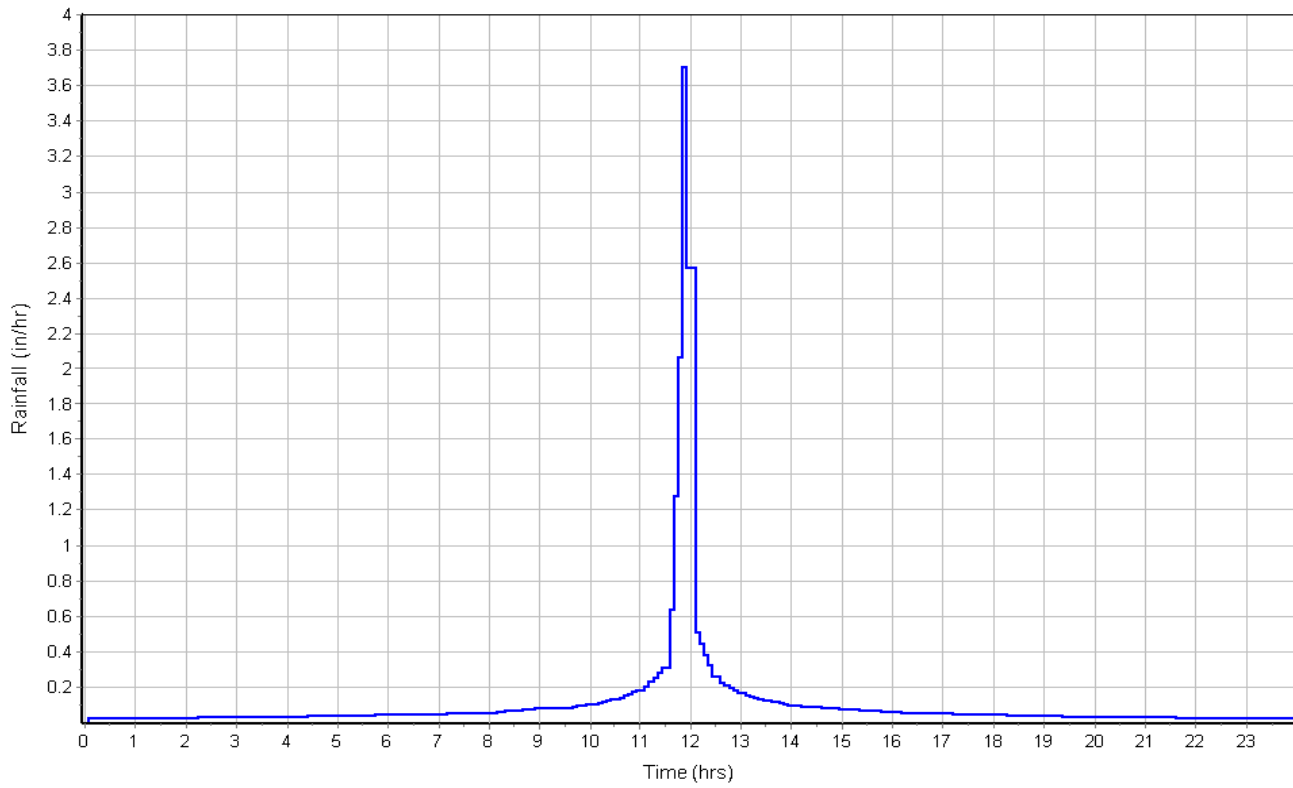
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1128	0.00	0.00
Channel Slope (%) :	2.3	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.97	0.00	0.00
Computed Flow Time (min) :	2.10	0.00	0.00
Total TOC (min)	38.88		

Subbasin Runoff Results

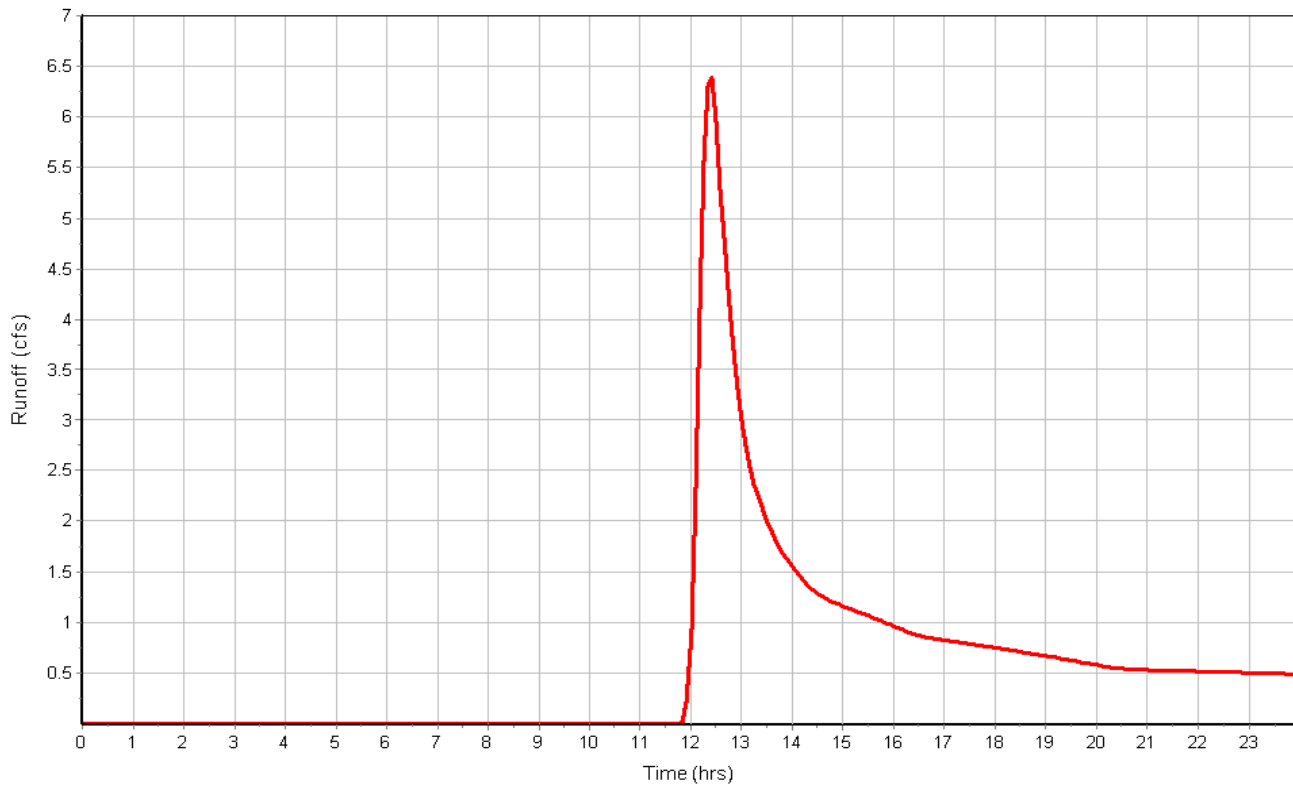
Total Rainfall (in) 2.70
 Total Runoff (in) 0.35
 Peak Runoff (cfs) 6.44
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:38:53

Subbasin : D3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D4

Input Data

Area (ac) 34.30
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	34.30	B	64.00
Composite Area & Weighted CN	34.30		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	2.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	7.86	0.00	0.00

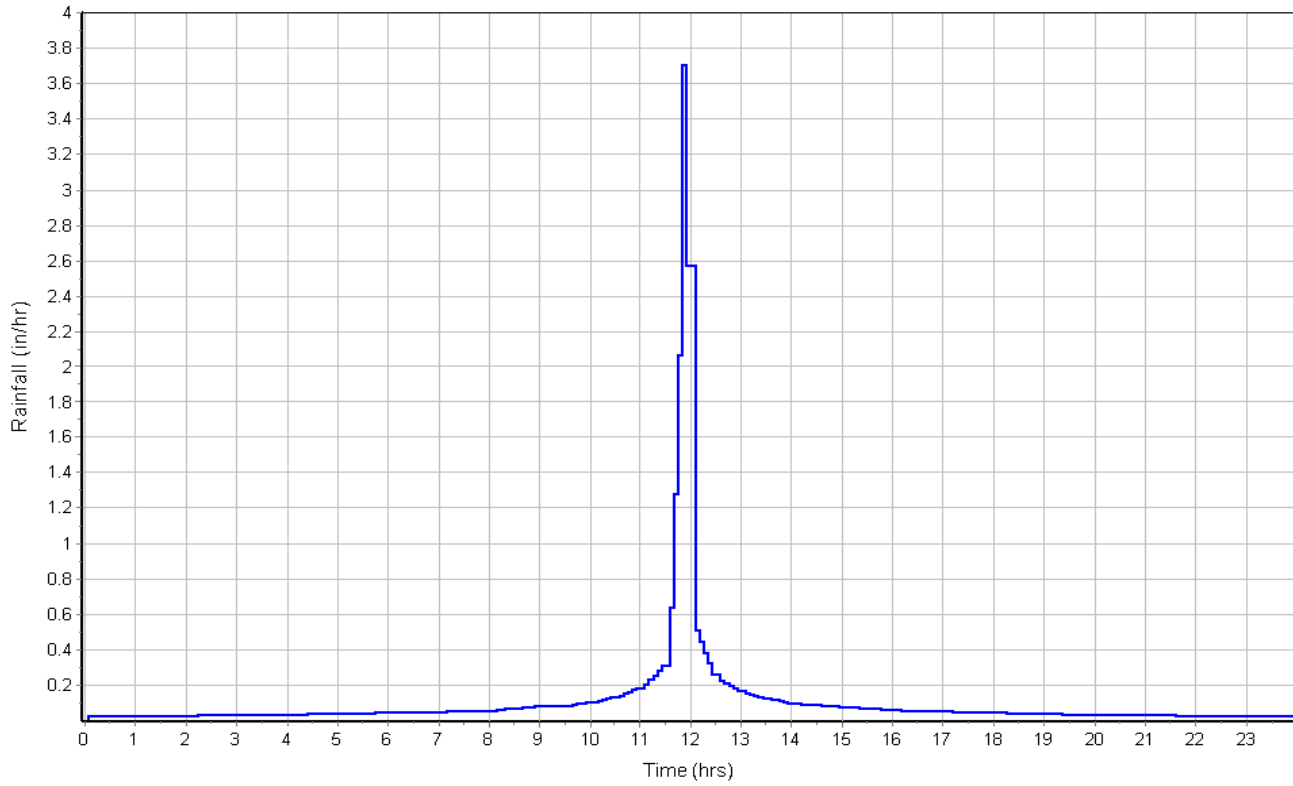
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	658	0.00	0.00
Channel Slope (%) :	2.3	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.97	0.00	0.00
Computed Flow Time (min) :	1.22	0.00	0.00
Total TOC (min)	30.14		

Subbasin Runoff Results

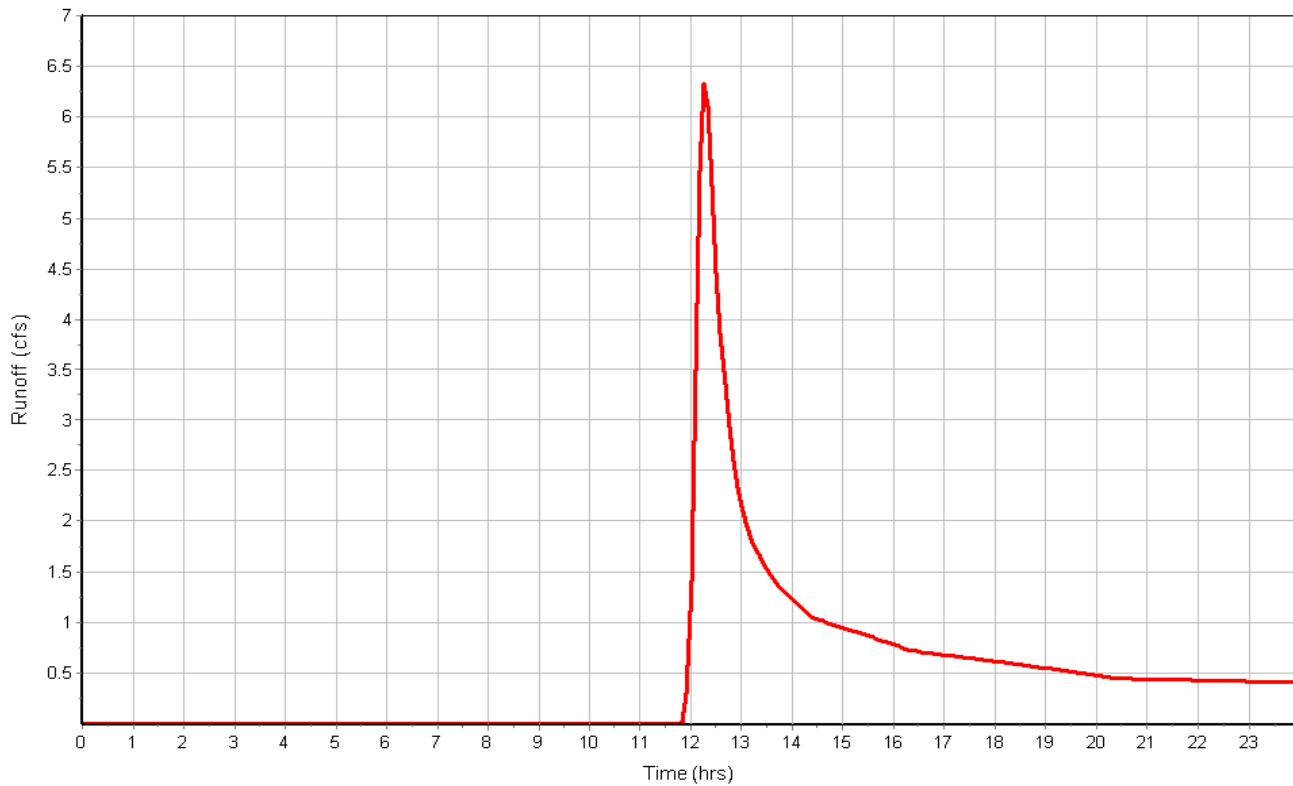
Total Rainfall (in) 2.70
 Total Runoff (in) 0.35
 Peak Runoff (cfs) 6.36
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:30:08

Subbasin : D4

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D5

Input Data

Area (ac) 12.80
 Weighted Curve Number 67.20
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	2.56	B	60.00
Pasture, grassland, or range, Fair	10.24	B	69.00
Composite Area & Weighted CN	12.80		67.20

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	2.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.01	0.00	0.00
Computed Flow Time (min) :	8.25	0.00	0.00

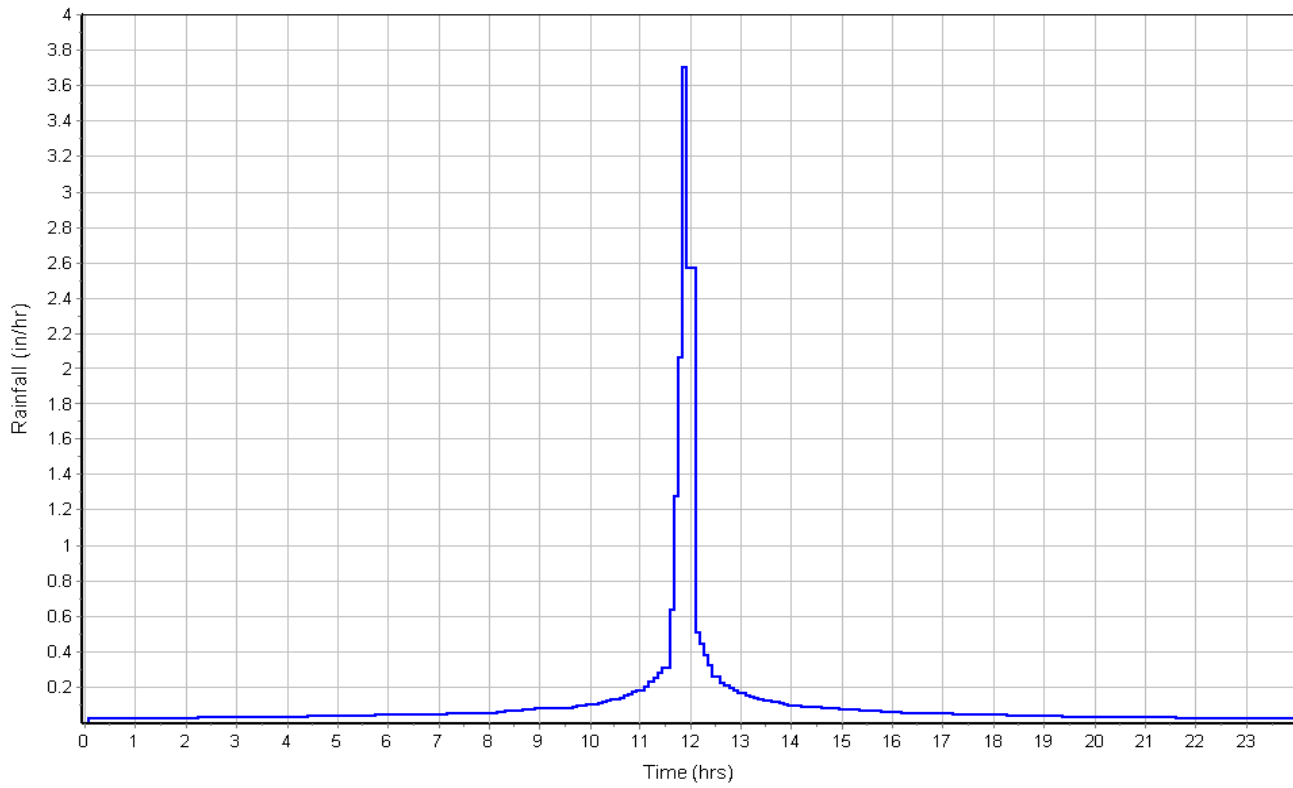
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	506	0.00	0.00
Channel Slope (%) :	2.1	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.57	0.00	0.00
Computed Flow Time (min) :	0.98	0.00	0.00
Total TOC (min)	30.29		

Subbasin Runoff Results

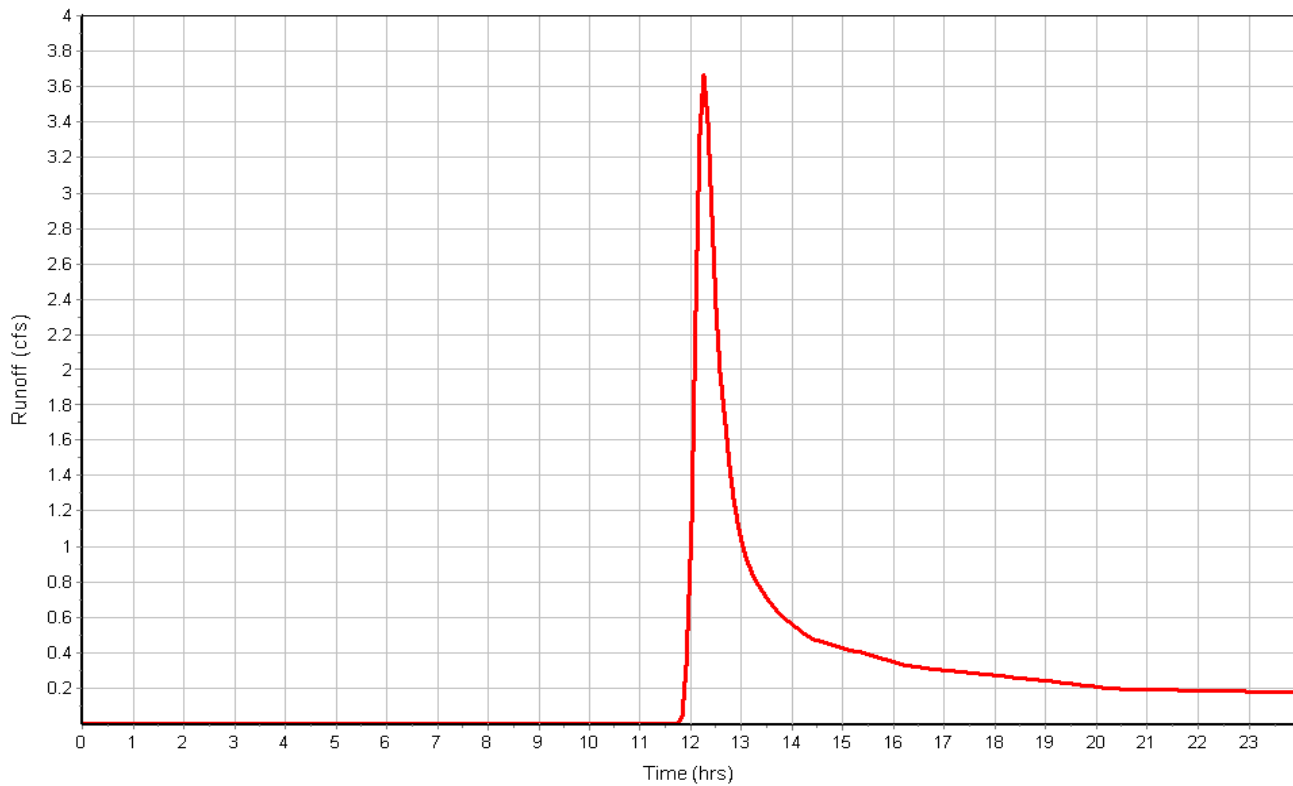
Total Rainfall (in) 2.70
 Total Runoff (in) 0.45
 Peak Runoff (cfs) 3.67
 Weighted Curve Number 67.20
 Time of Concentration (days hh:mm:ss) 0 00:30:17

Subbasin : D5

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D6

Input Data

Area (ac) 41.80
 Weighted Curve Number 61.65
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	37.62	B	60.00
Pasture, grassland, or range, Fair	2.09	D	84.00
Pasture, grassland, or range, Fair	2.09	B	69.00
Composite Area & Weighted CN	41.80		61.65

Time of Concentration

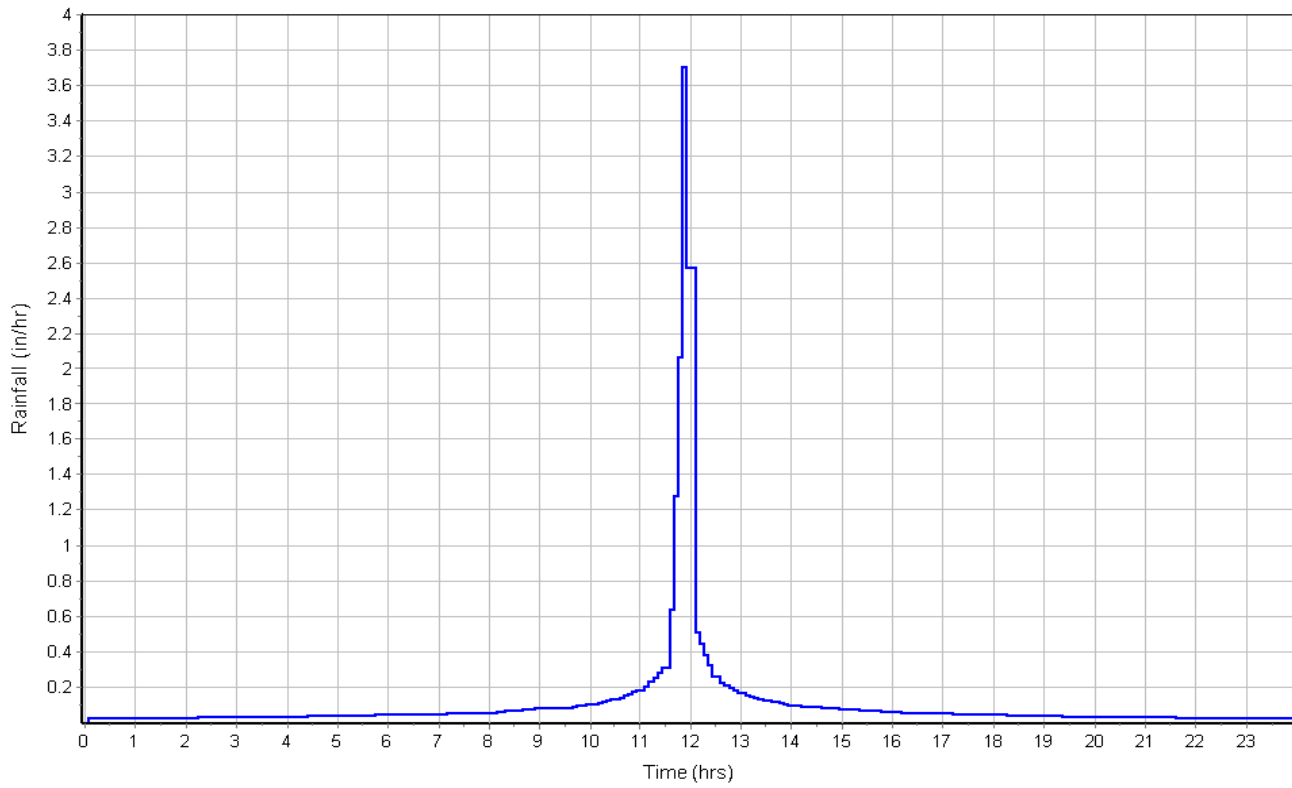
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	15.72	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1255	0.00	0.00
Channel Slope (%) :	2.3	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.97	0.00	0.00
Computed Flow Time (min) :	2.33	0.00	0.00
Total TOC (min)	39.11		

Subbasin Runoff Results

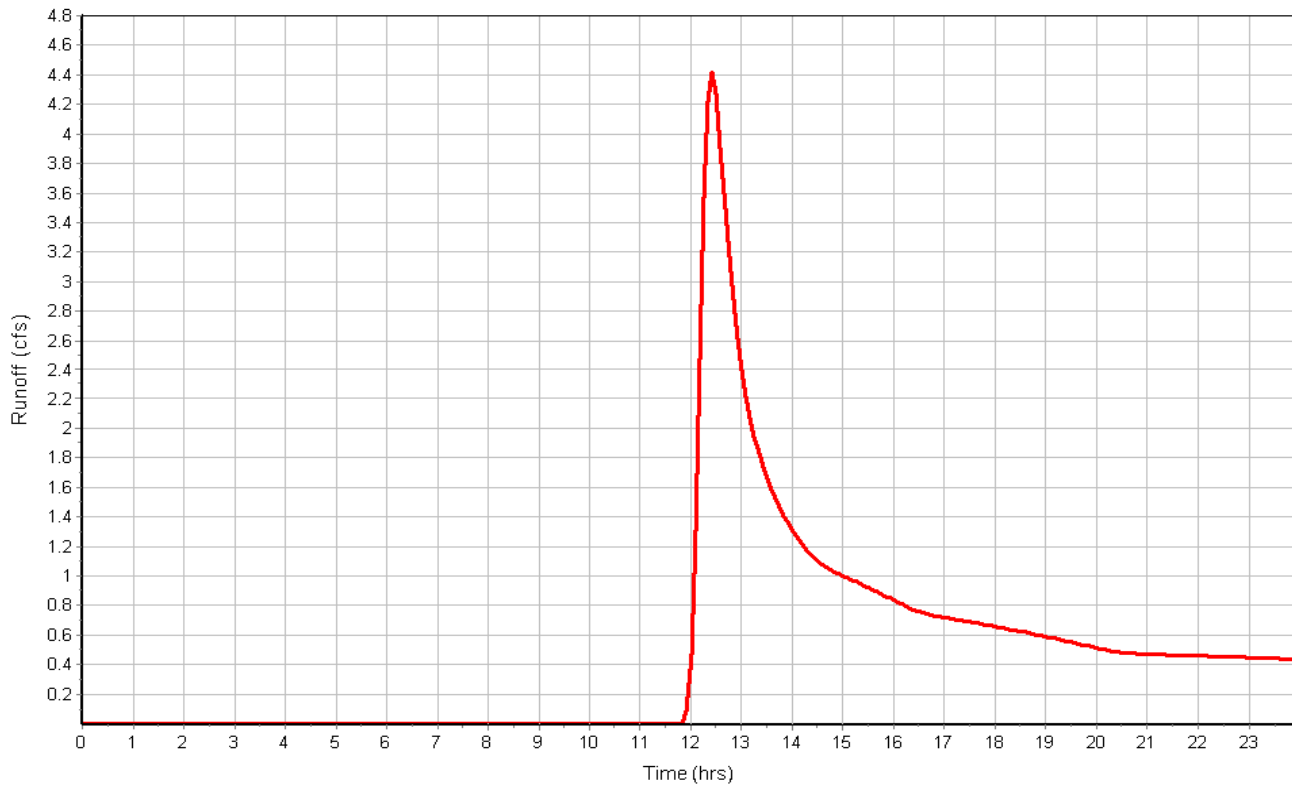
Total Rainfall (in) 2.70
 Total Runoff (in) 0.28
 Peak Runoff (cfs) 4.42
 Weighted Curve Number 61.65
 Time of Concentration (days hh:mm:ss) 0 00:39:07

Subbasin : D6

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E0

Input Data

Area (ac) 37.90
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	37.90	B	60.00
Composite Area & Weighted CN	37.90		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.9	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.11	0.00	0.00
Computed Flow Time (min) :	15.02	0.00	0.00

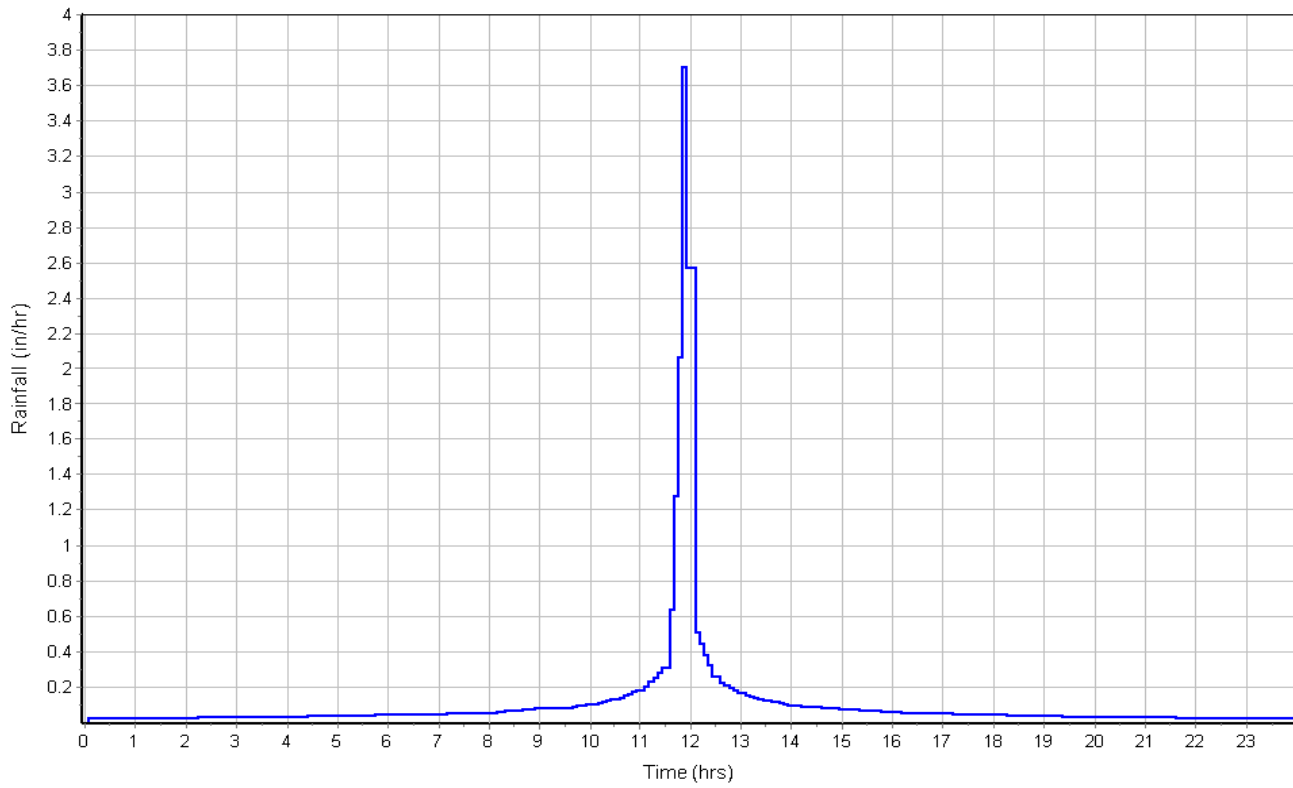
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	748	0.00	0.00
Channel Slope (%) :	4.9	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.09	0.00	0.00
Computed Flow Time (min) :	0.95	0.00	0.00
Total TOC (min)	37.03		

Subbasin Runoff Results

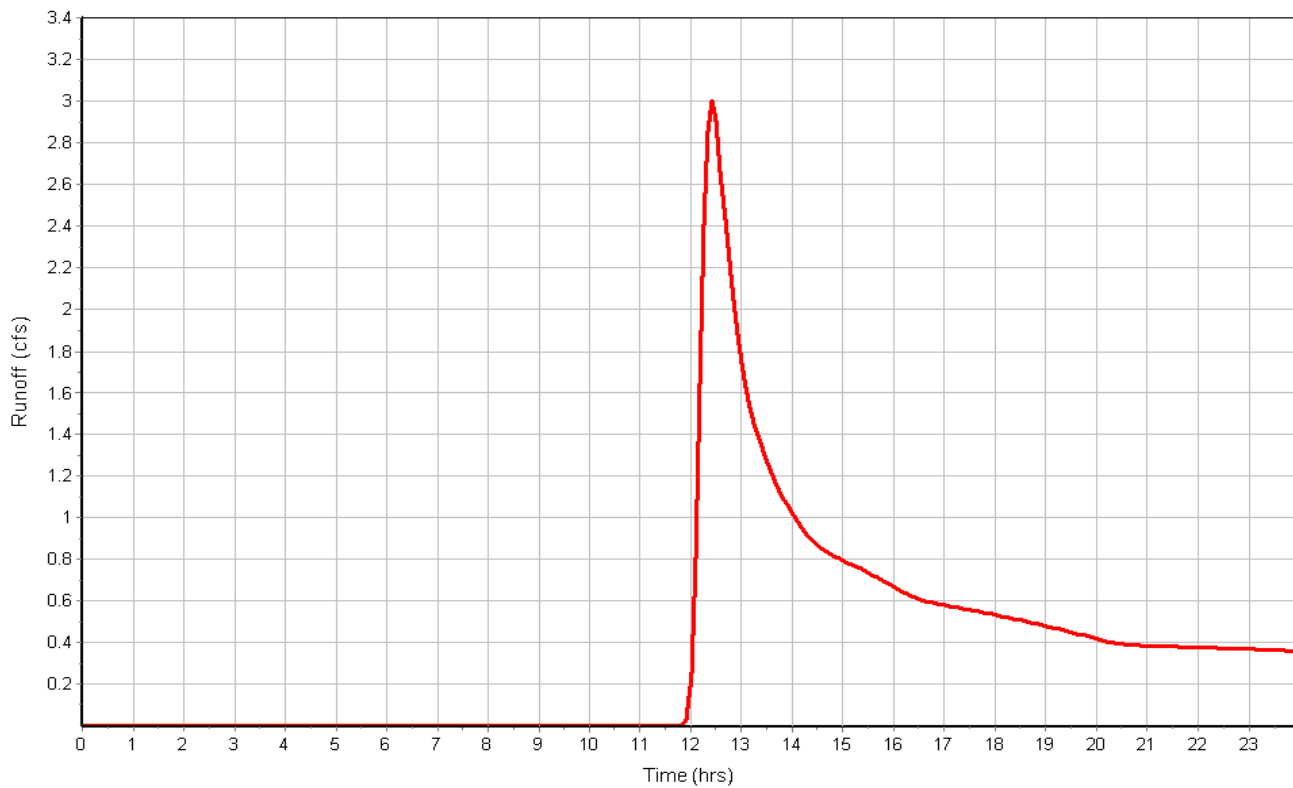
Total Rainfall (in) 2.70
 Total Runoff (in) 0.23
 Peak Runoff (cfs) 3.01
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:37:02

Subbasin : E0

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E1.1

Input Data

Area (ac) 7.90
 Weighted Curve Number 76.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	3.95	B	60.00
Urban commercial, 85% imp	3.95	B	92.00
Composite Area & Weighted CN	7.90		76.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	.02	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.04	0.00	0.00
Computed Flow Time (min) :	132.87	0.00	0.00

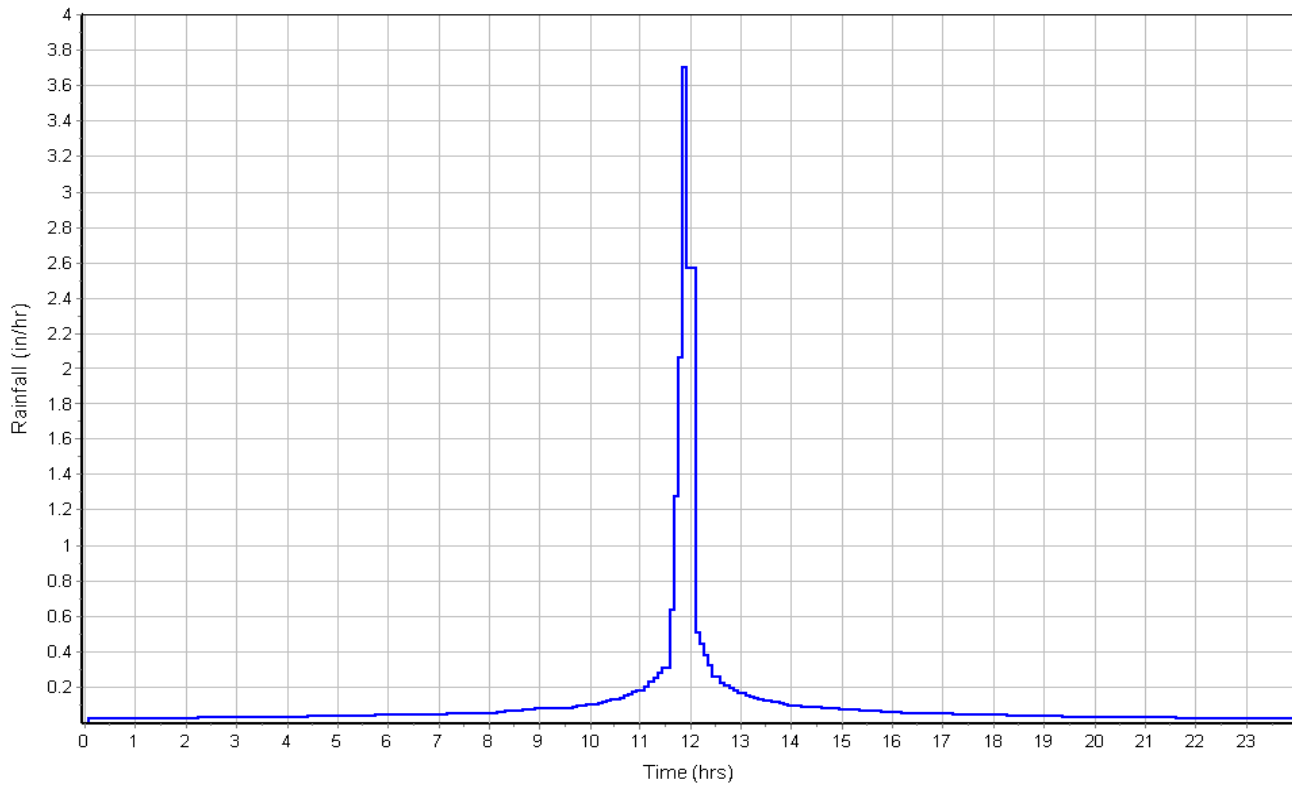
Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	583	0.00	0.00
Slope (%) :	3.17	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	0.89	0.00	0.00
Computed Flow Time (min) :	10.92	0.00	0.00
Total TOC (min)	143.79		

Subbasin Runoff Results

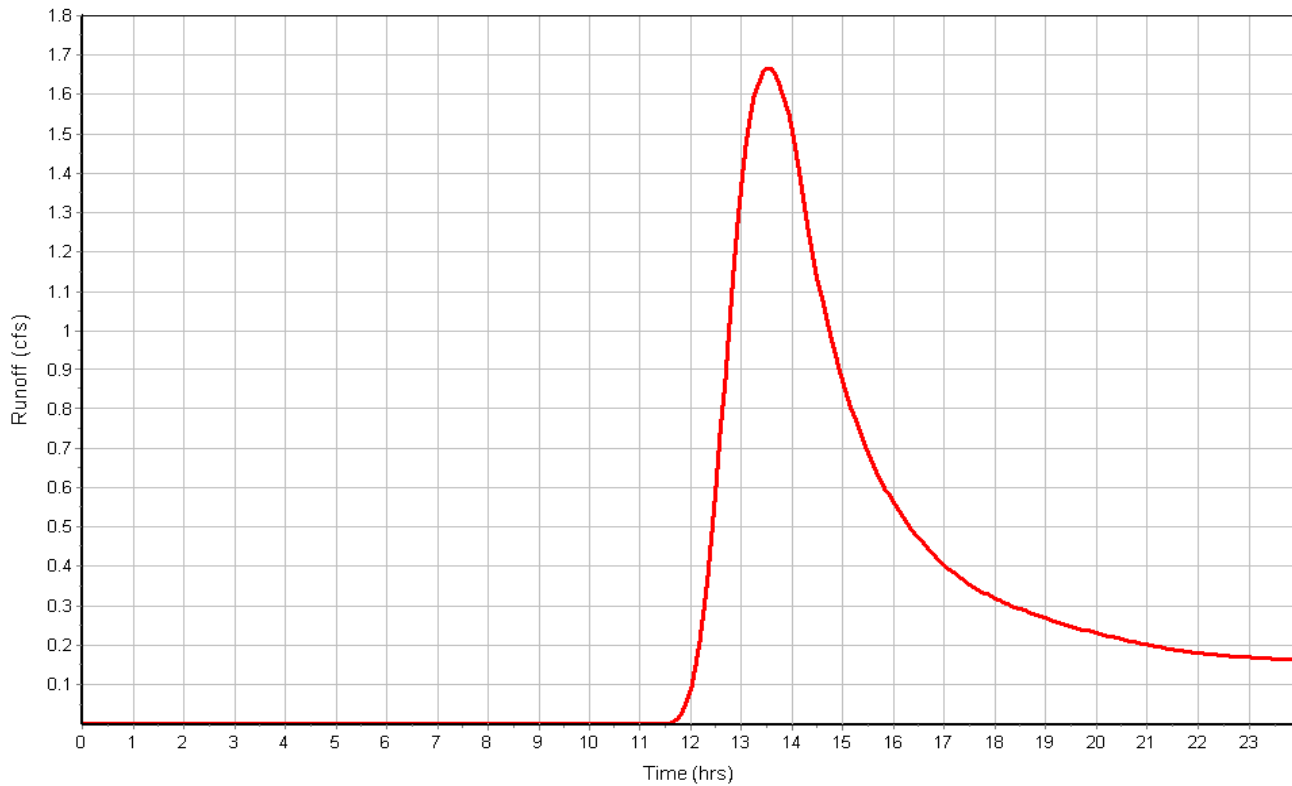
Total Rainfall (in) 2.70
 Total Runoff (in) 0.82
 Peak Runoff (cfs) 1.67
 Weighted Curve Number 76.00
 Time of Concentration (days hh:mm:ss) 0 02:23:47

Subbasin : E1.1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E1.2

Input Data

Area (ac) 16.30
 Weighted Curve Number 62.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	8.15	B	60.00
2.5 Acre Lots, 11% Impervious	8.15	B	64.00
Composite Area & Weighted CN	16.30		62.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.7	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.15	0.00	0.00
Computed Flow Time (min) :	14.49	0.00	0.00

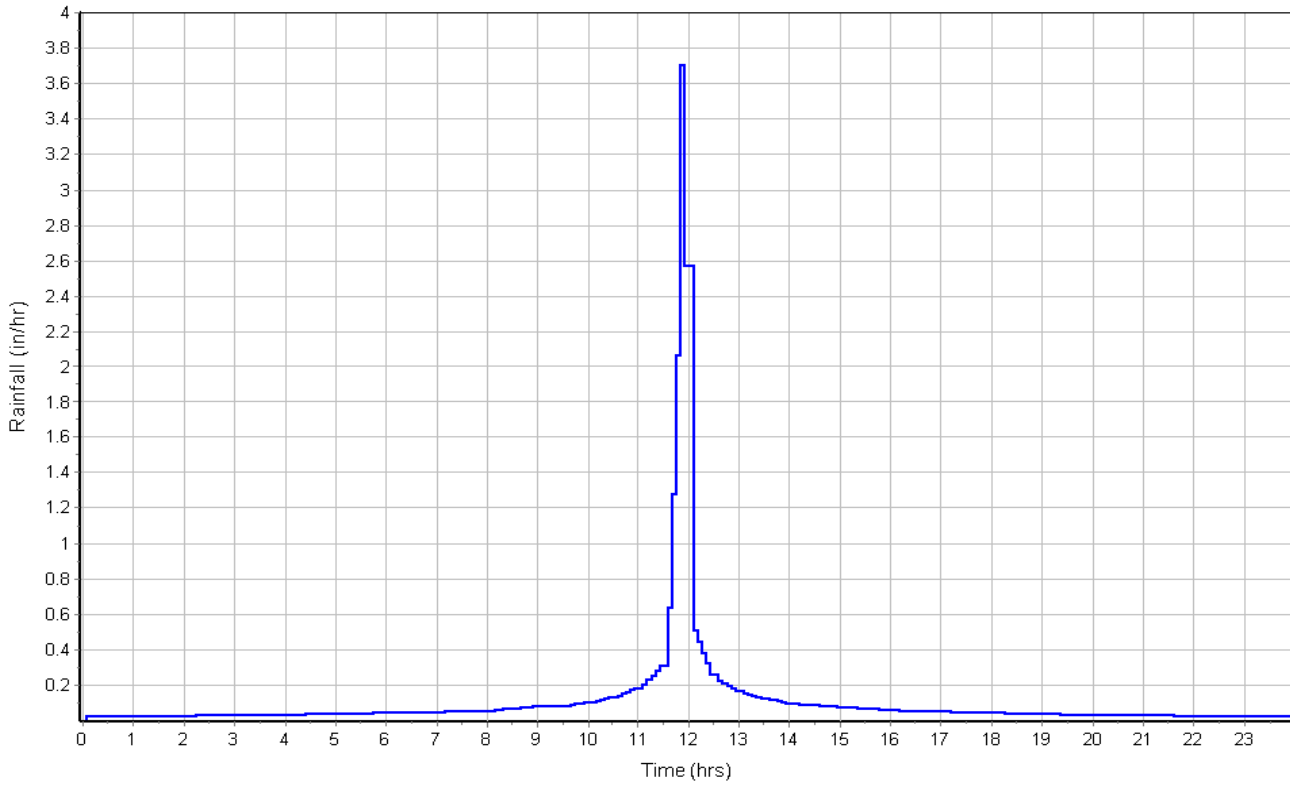
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	228	0.00	0.00
Channel Slope (%) :	2.7	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	9.72	0.00	0.00
Computed Flow Time (min) :	0.39	0.00	0.00
Total TOC (min)	35.94		

Subbasin Runoff Results

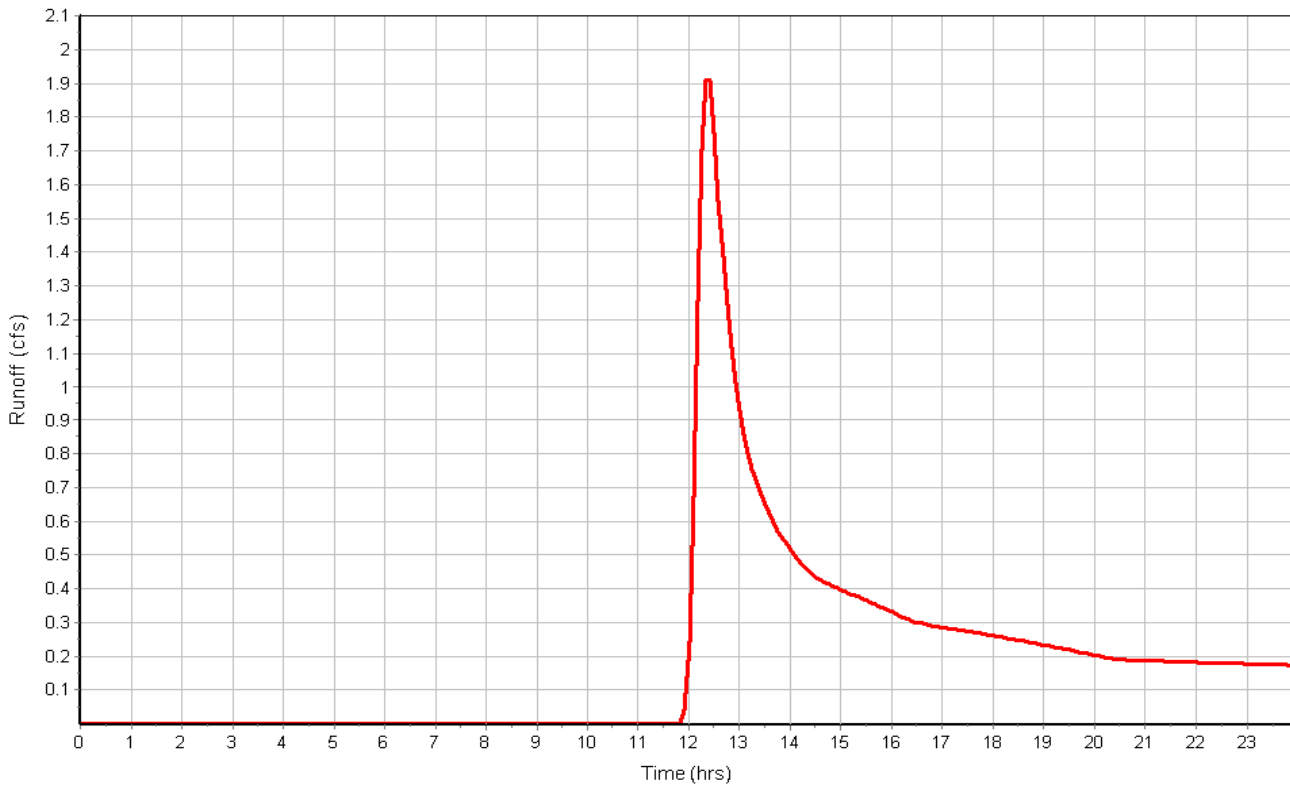
Total Rainfall (in) 2.70
 Total Runoff (in) 0.29
 Peak Runoff (cfs) 1.94
 Weighted Curve Number 62.00
 Time of Concentration (days hh:mm:ss) 0 00:35:56

Subbasin : E1.2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E2

Input Data

Area (ac) 2.60
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	2.60	B	64.00
Composite Area & Weighted CN	2.60		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	5.4	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.16	0.00	0.00
Computed Flow Time (min) :	1.44	0.00	0.00

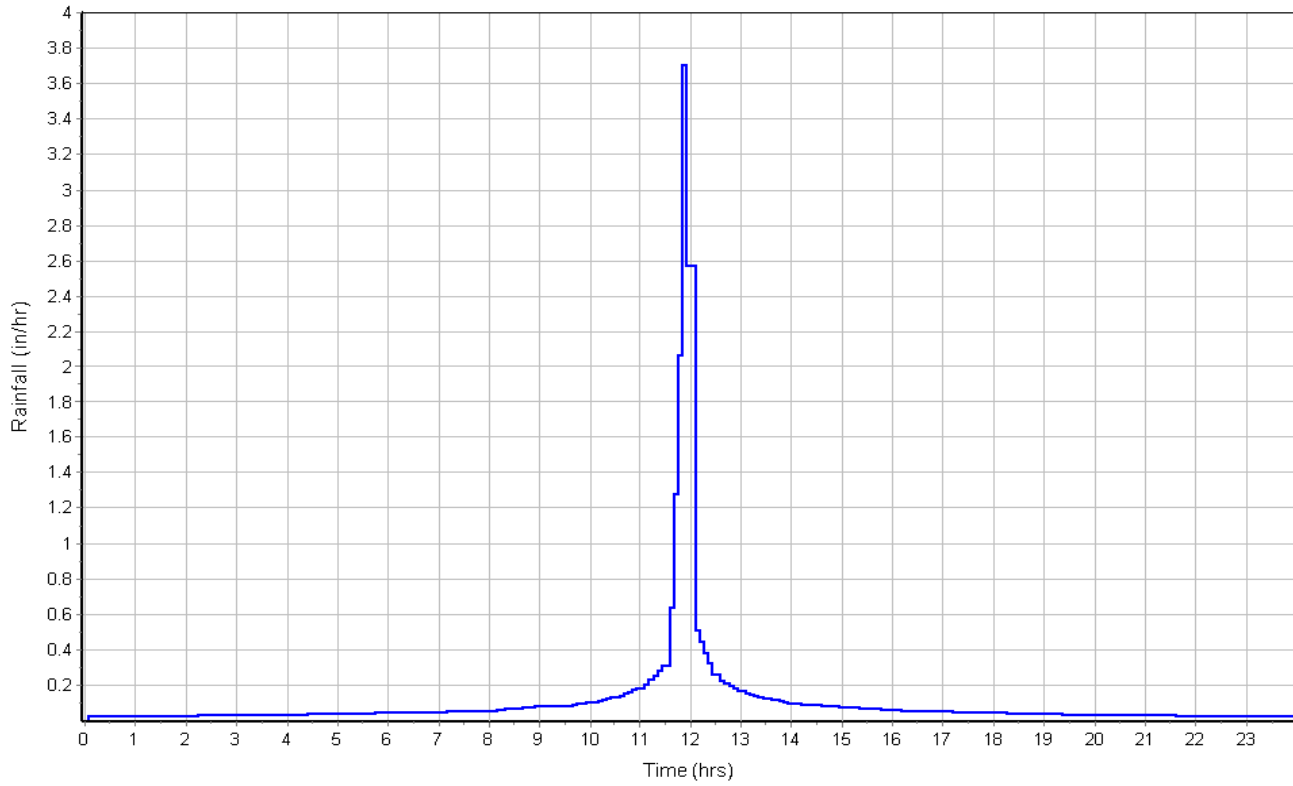
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	101	0.00	0.00
Channel Slope (%) :	5.4	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.74	0.00	0.00
Computed Flow Time (min) :	0.12	0.00	0.00
Total TOC (min)	22.62		

Subbasin Runoff Results

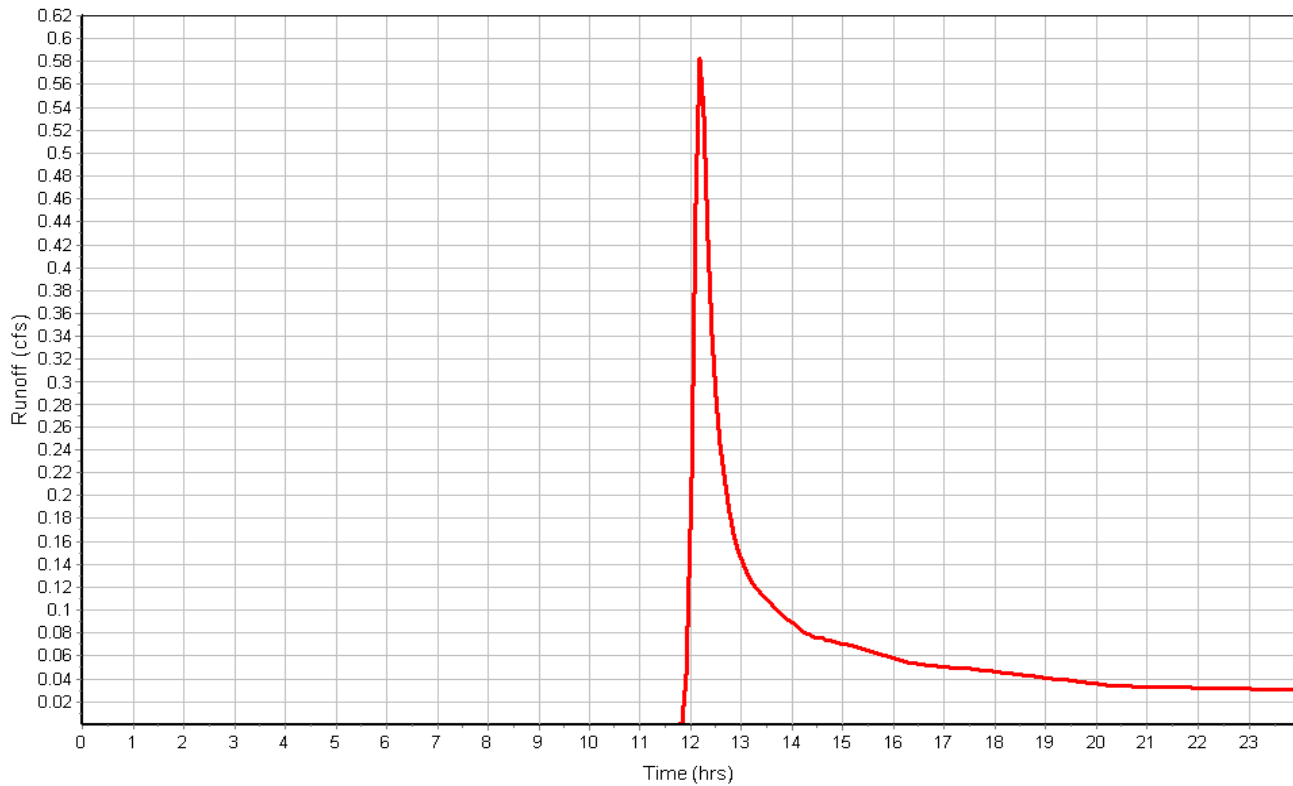
Total Rainfall (in) 2.70
 Total Runoff (in) 0.34
 Peak Runoff (cfs) 0.58
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:22:37

Subbasin : E2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E3

Input Data

Area (ac) 19.80
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	19.80	B	64.00
Composite Area & Weighted CN	19.80		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.6	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.50	0.00	0.00
Computed Flow Time (min) :	5.56	0.00	0.00

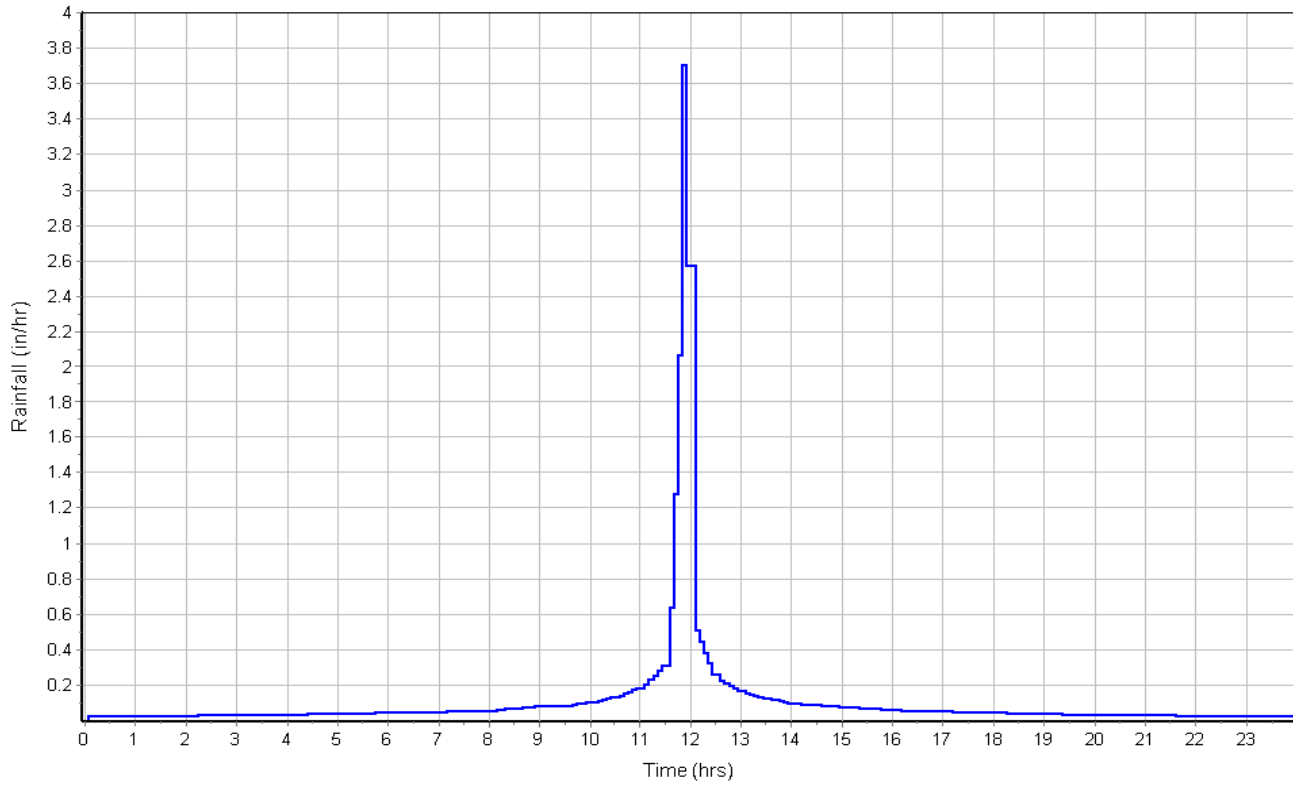
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	453	0.00	0.00
Channel Slope (%) :	4.6	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.68	0.00	0.00
Computed Flow Time (min) :	0.60	0.00	0.00
Total TOC (min)	27.21		

Subbasin Runoff Results

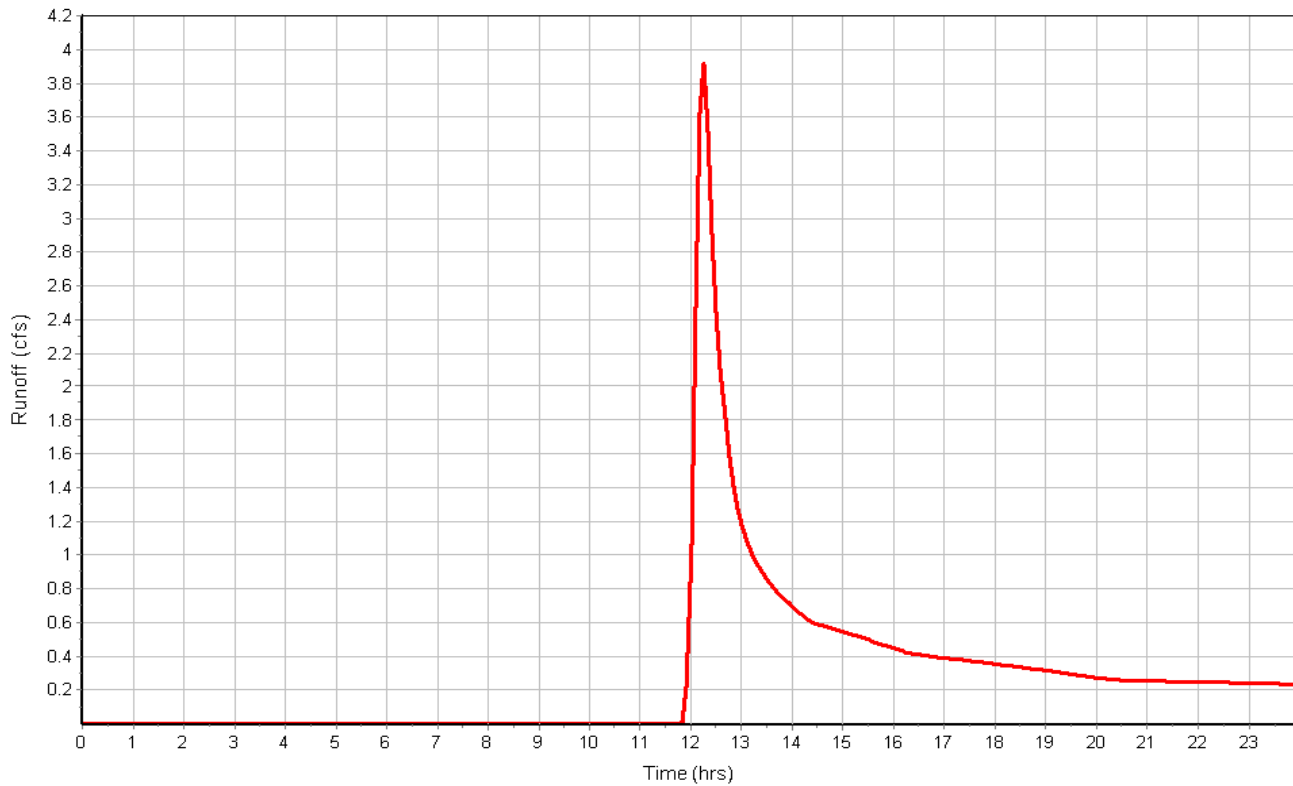
Total Rainfall (in) 2.70
 Total Runoff (in) 0.35
 Peak Runoff (cfs) 3.94
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:27:13

Subbasin : E3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E4

Input Data

Area (ac) 18.20
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	18.20	B	64.00
Composite Area & Weighted CN	18.20		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	6.13	0.00	0.00

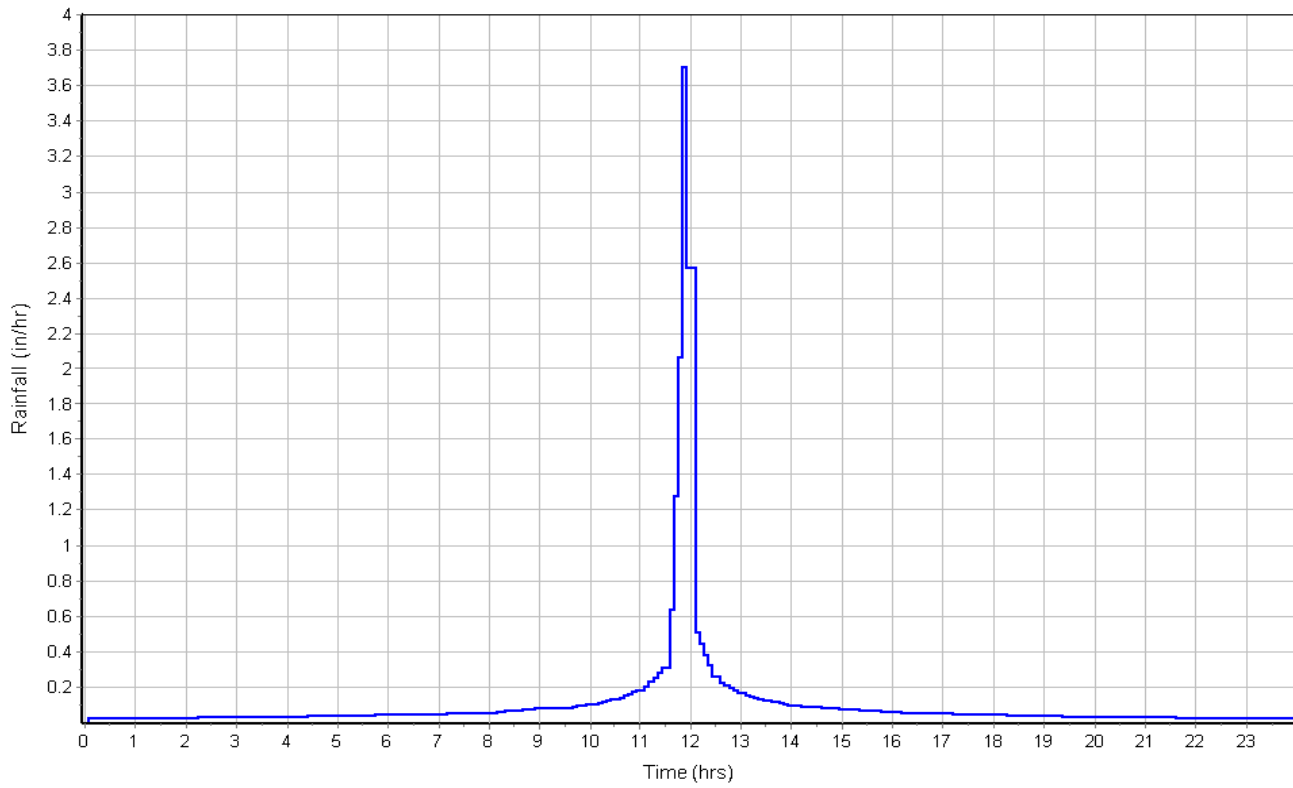
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	528	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.53	0.00	0.00
Computed Flow Time (min) :	0.76	0.00	0.00
Total TOC (min)	27.95		

Subbasin Runoff Results

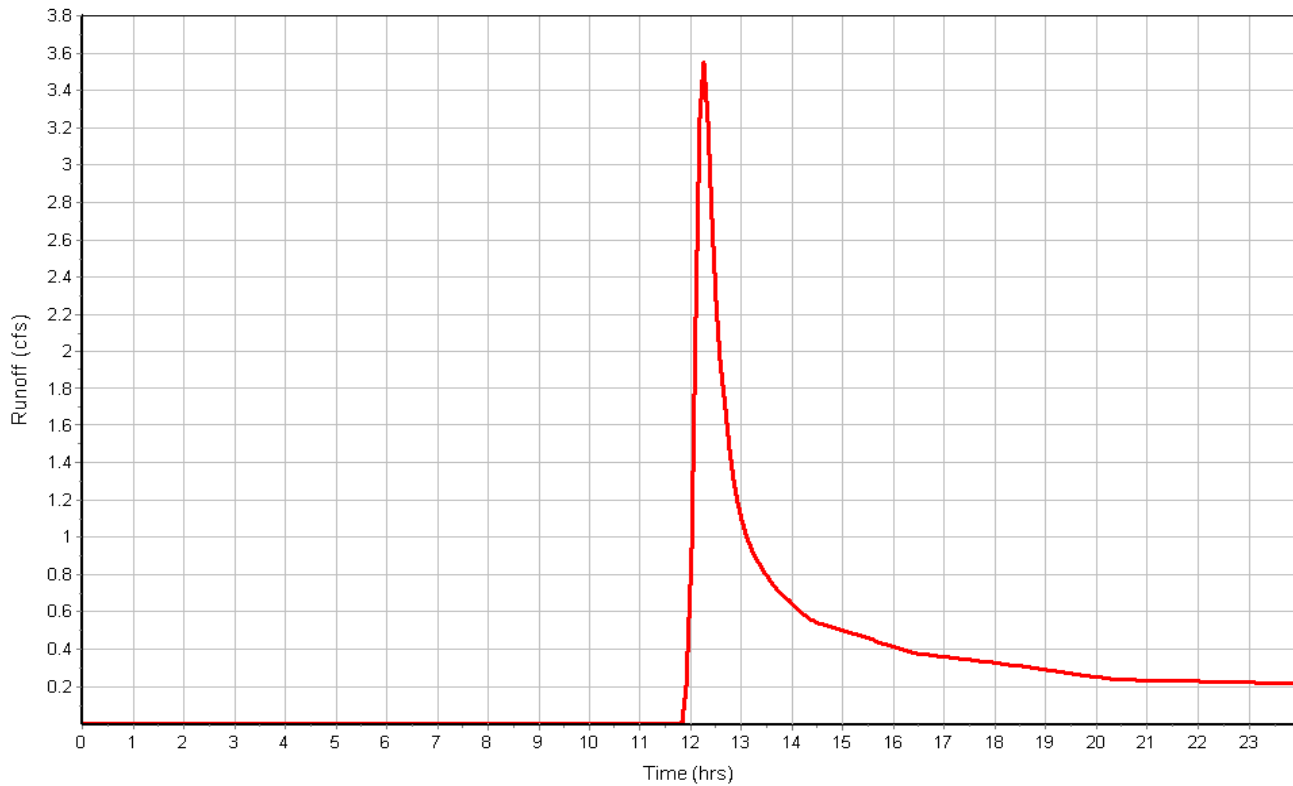
Total Rainfall (in) 2.70
 Total Runoff (in) 0.35
 Peak Runoff (cfs) 3.55
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:27:57

Subbasin : E4

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E5

Input Data

Area (ac) 13.50
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	13.50	B	64.00
Composite Area & Weighted CN	13.50		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.7	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.52	0.00	0.00
Computed Flow Time (min) :	5.48	0.00	0.00

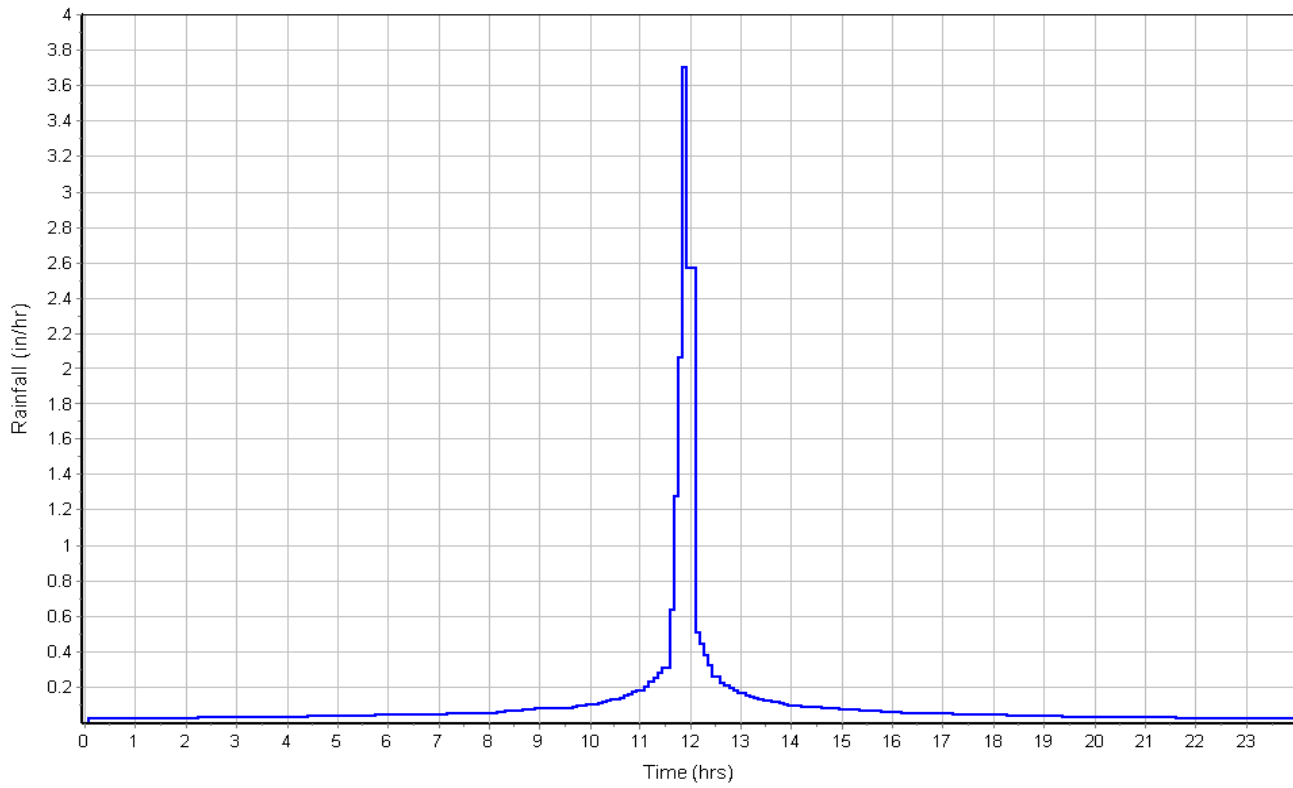
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	335	0.00	0.00
Channel Slope (%) :	4.7	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.82	0.00	0.00
Computed Flow Time (min) :	0.44	0.00	0.00
Total TOC (min)	26.98		

Subbasin Runoff Results

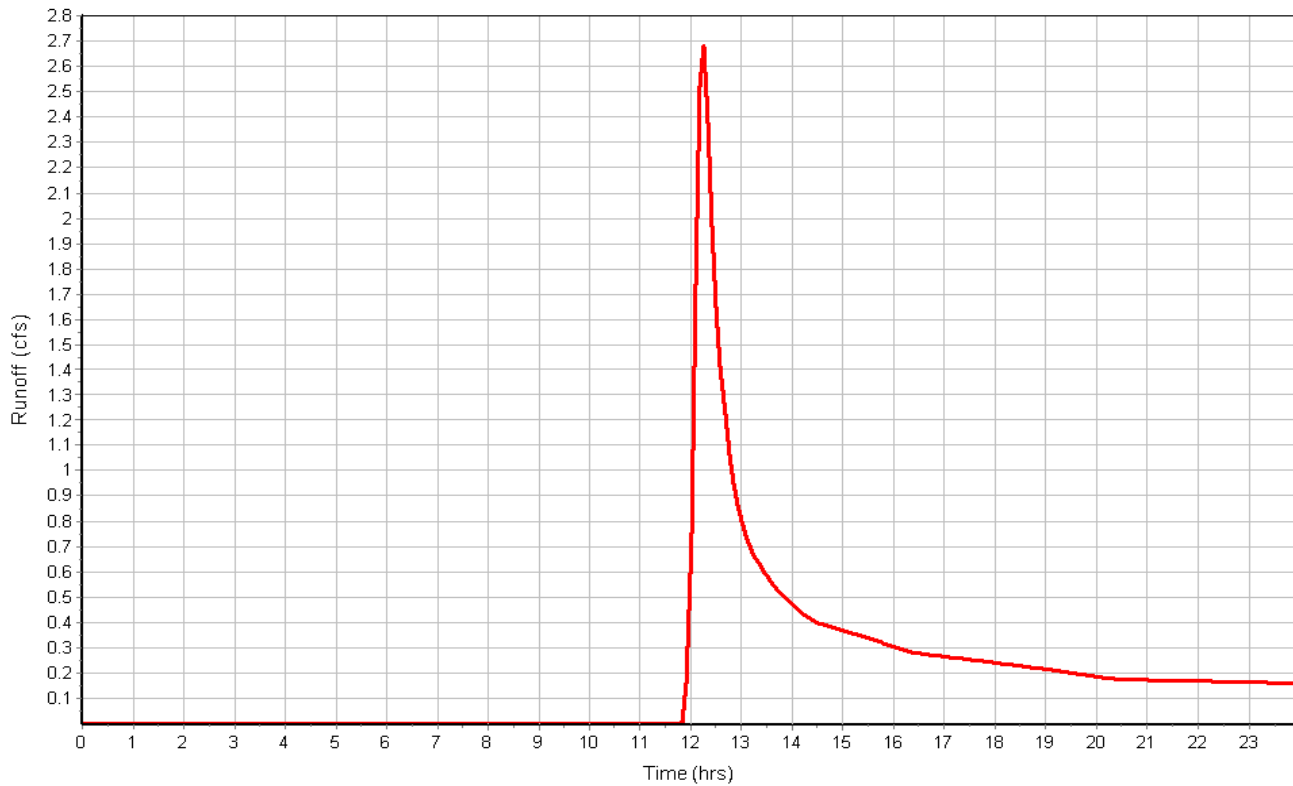
Total Rainfall (in) 2.70
 Total Runoff (in) 0.35
 Peak Runoff (cfs) 2.70
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:26:59

Subbasin : E5

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E6

Input Data

Area (ac) 28.90
 Weighted Curve Number 62.40
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	8.67	B	64.00
5 Acre Lots, 7% Impervious	18.79	B	60.00
Pasture, grassland, or range, Fair	1.45	D	84.00
Composite Area & Weighted CN	28.91		62.40

Time of Concentration

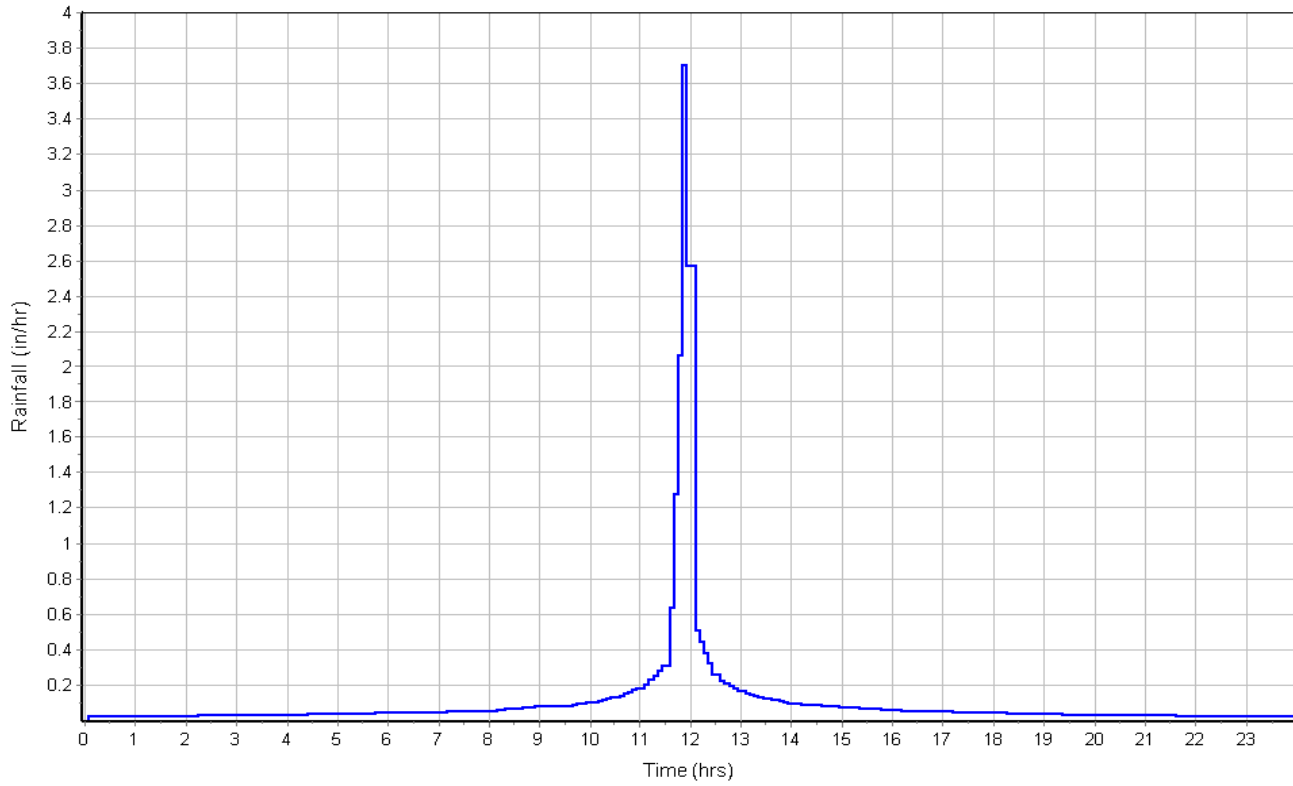
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.43	0.00	0.00
Computed Flow Time (min) :	5.83	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	859	0.00	0.00
Channel Slope (%) :	4.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.12	0.00	0.00
Computed Flow Time (min) :	1.18	0.00	0.00
Total TOC (min)	28.07		

Subbasin Runoff Results

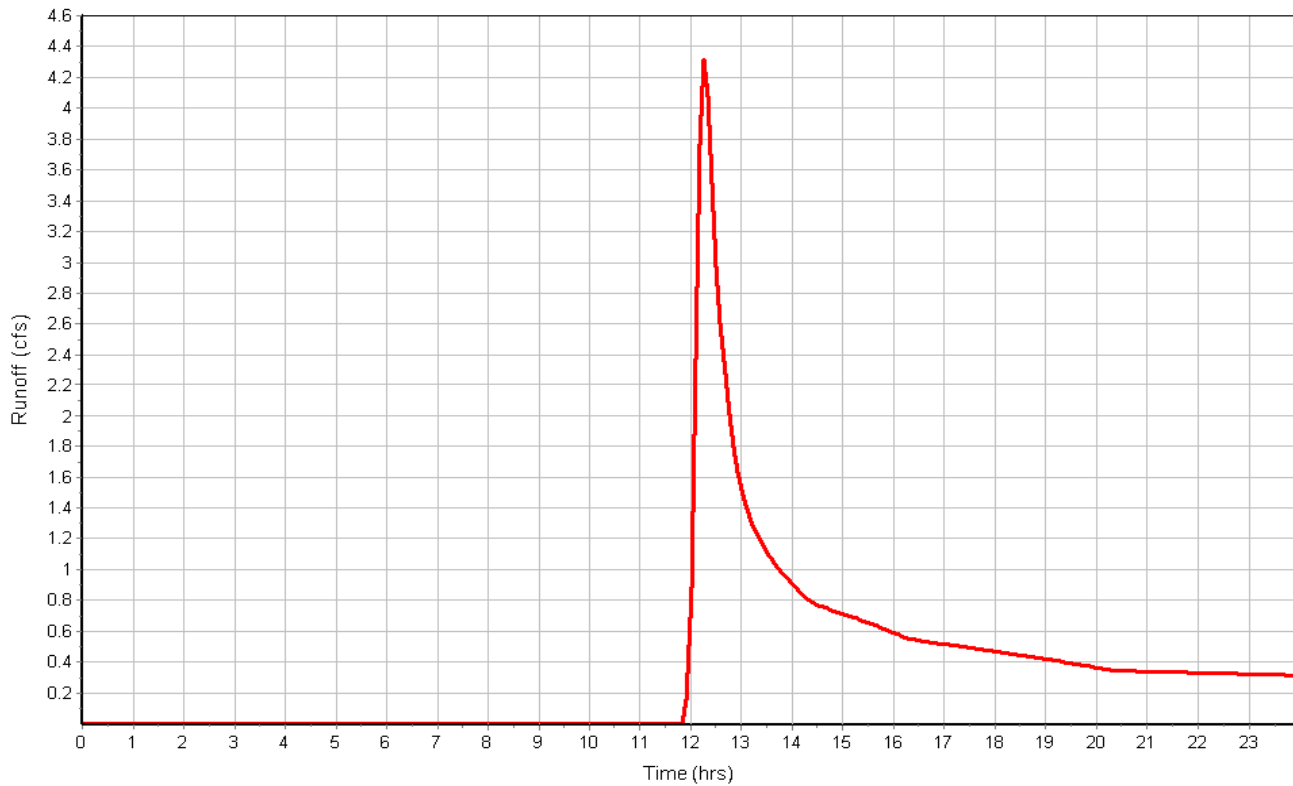
Total Rainfall (in) 2.70
 Total Runoff (in) 0.30
 Peak Runoff (cfs) 4.32
 Weighted Curve Number 62.40
 Time of Concentration (days hh:mm:ss) 0 00:28:04

Subbasin : E6

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E7

Input Data

Area (ac) 9.80
 Weighted Curve Number 62.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	4.90	B	60.00
2.5 Acre Lots, 11% Impervious	4.90	B	64.00
Composite Area & Weighted CN	9.80		62.00

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	200	0.00
Slope (%) :	3.5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.31	0.00	0.00
Computed Flow Time (min) :	2.54	0.00	0.00

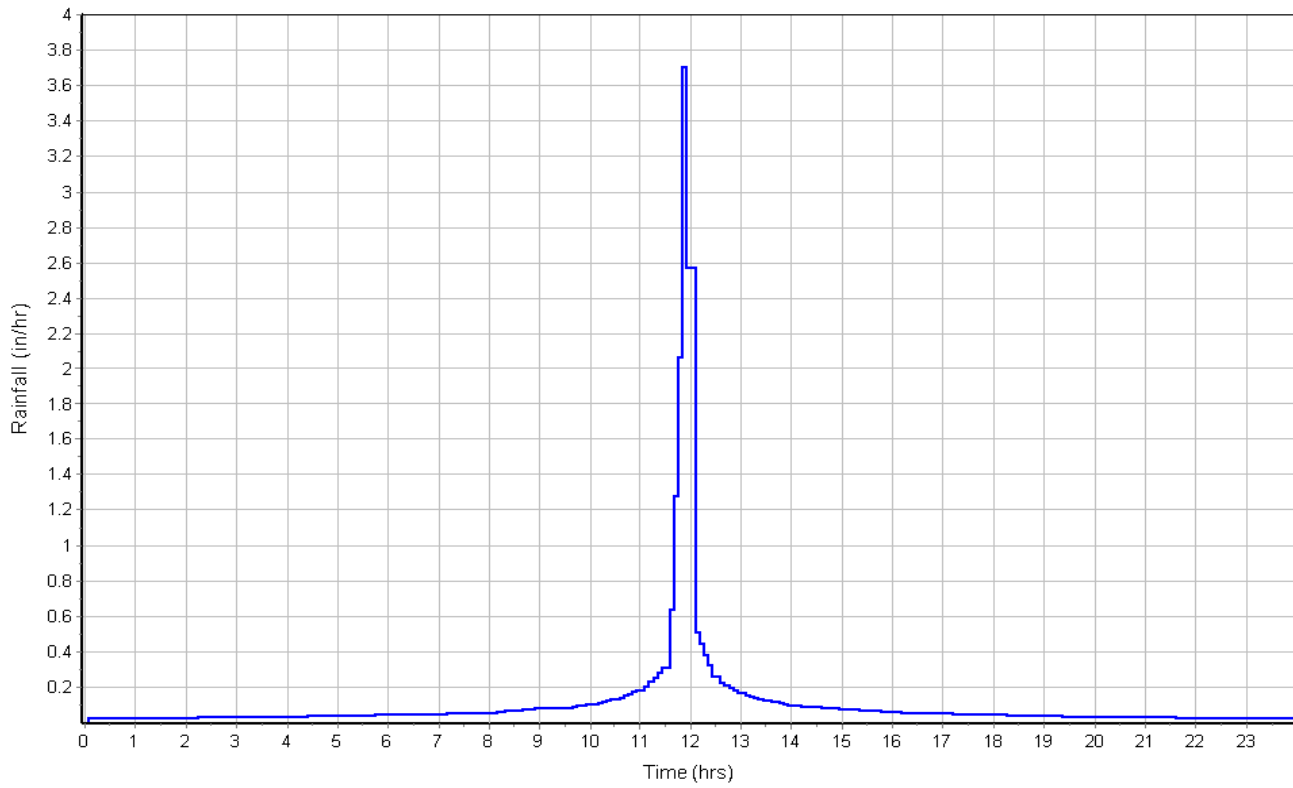
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	474	0.00	0.00
Channel Slope (%) :	3.5	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.06	0.00	0.00
Computed Flow Time (min) :	0.71	0.00	0.00
Total TOC (min)	24.32		

Subbasin Runoff Results

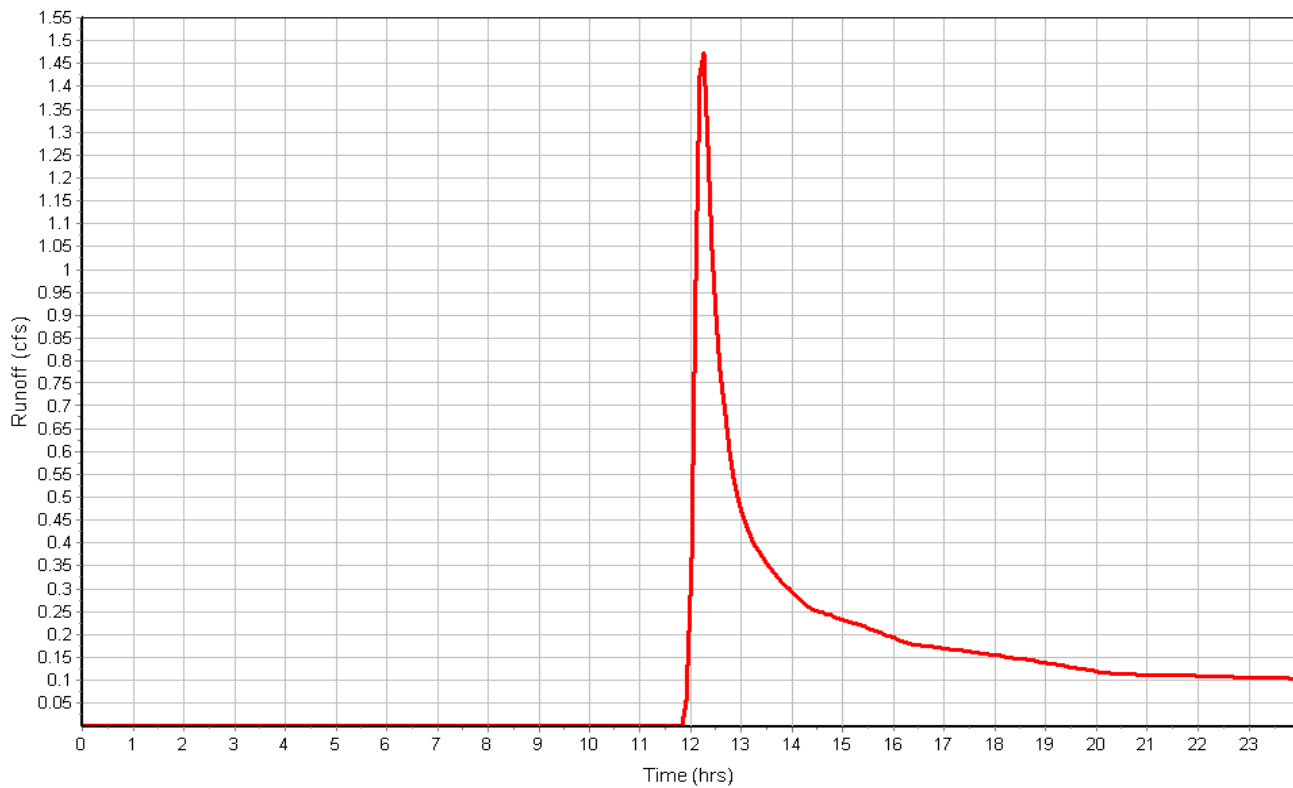
Total Rainfall (in) 2.70
 Total Runoff (in) 0.29
 Peak Runoff (cfs) 1.50
 Weighted Curve Number 62.00
 Time of Concentration (days hh:mm:ss) 0 00:24:19

Subbasin : E7

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : F1

Input Data

Area (ac) 42.90
 Weighted Curve Number 60.40
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	38.61	B	60.00
2.5 Acre Lots, 11% Impervious	4.29	B	64.00
Composite Area & Weighted CN	42.90		60.40

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	3.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0.00	0.00
Computed Flow Time (min) :	13.33	0.00	0.00

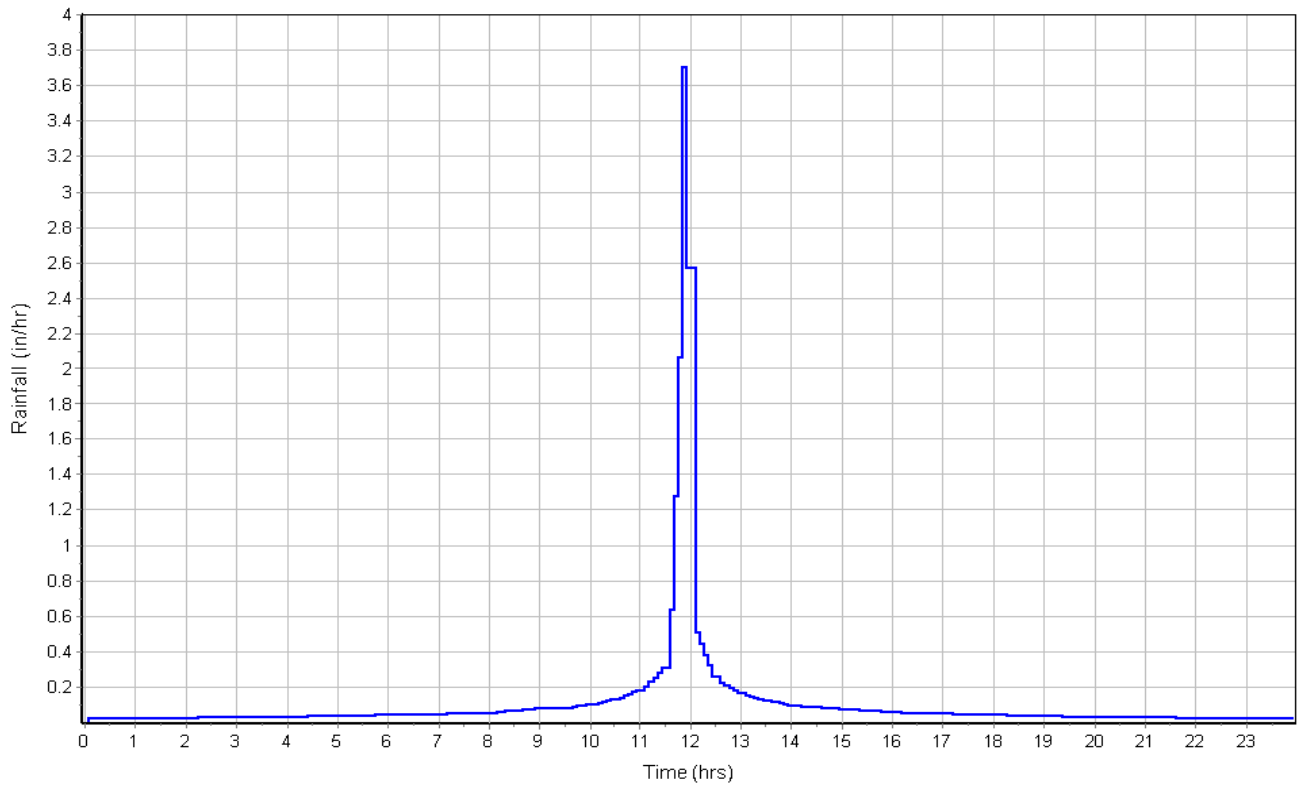
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	745	0.00	0.00
Channel Slope (%) :	3.2	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.58	0.00	0.00
Computed Flow Time (min) :	1.17	0.00	0.00
Total TOC (min)	35.57		

Subbasin Runoff Results

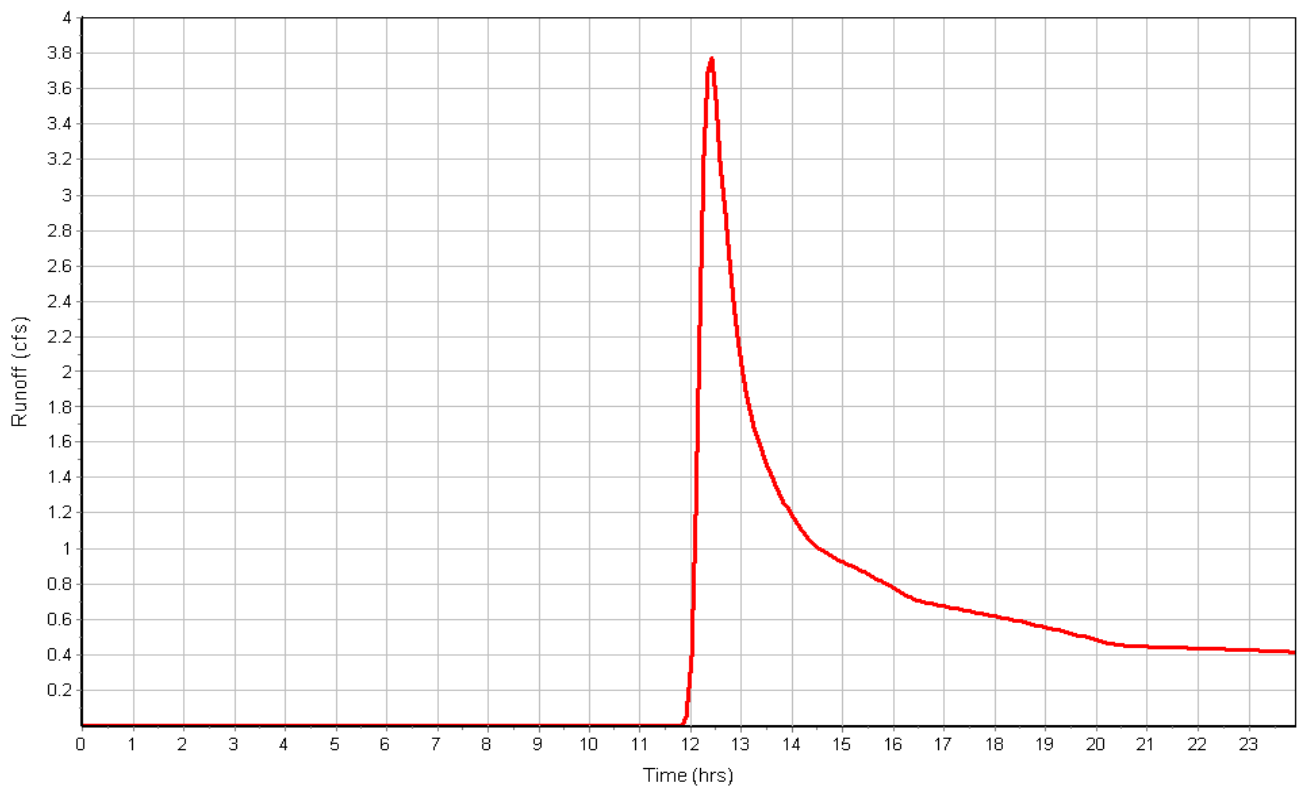
Total Rainfall (in) 2.70
 Total Runoff (in) 0.24
 Peak Runoff (cfs) 3.79
 Weighted Curve Number 60.40
 Time of Concentration (days hh:mm:ss) 0 00:35:34

Subbasin : F1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : G1

Input Data

Area (ac) 25.20
 Weighted Curve Number 66.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	12.60	C	72.00
Woods, Fair	12.60	B	60.00
Composite Area & Weighted CN	25.20		66.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	6.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.73	0.00	0.00
Computed Flow Time (min) :	4.82	0.00	0.00

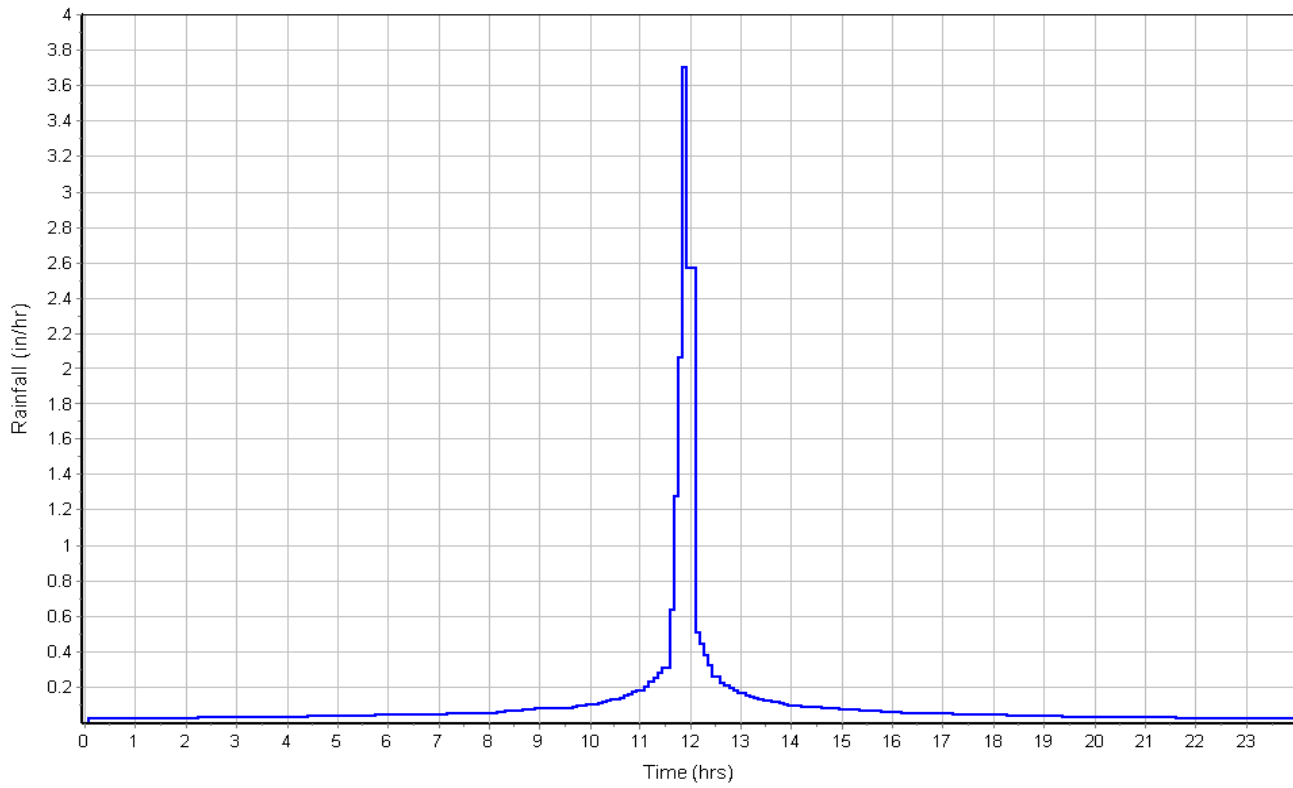
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	658	0.00	0.00
Channel Slope (%) :	6.1	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	14.60	0.00	0.00
Computed Flow Time (min) :	0.75	0.00	0.00
Total TOC (min)	26.63		

Subbasin Runoff Results

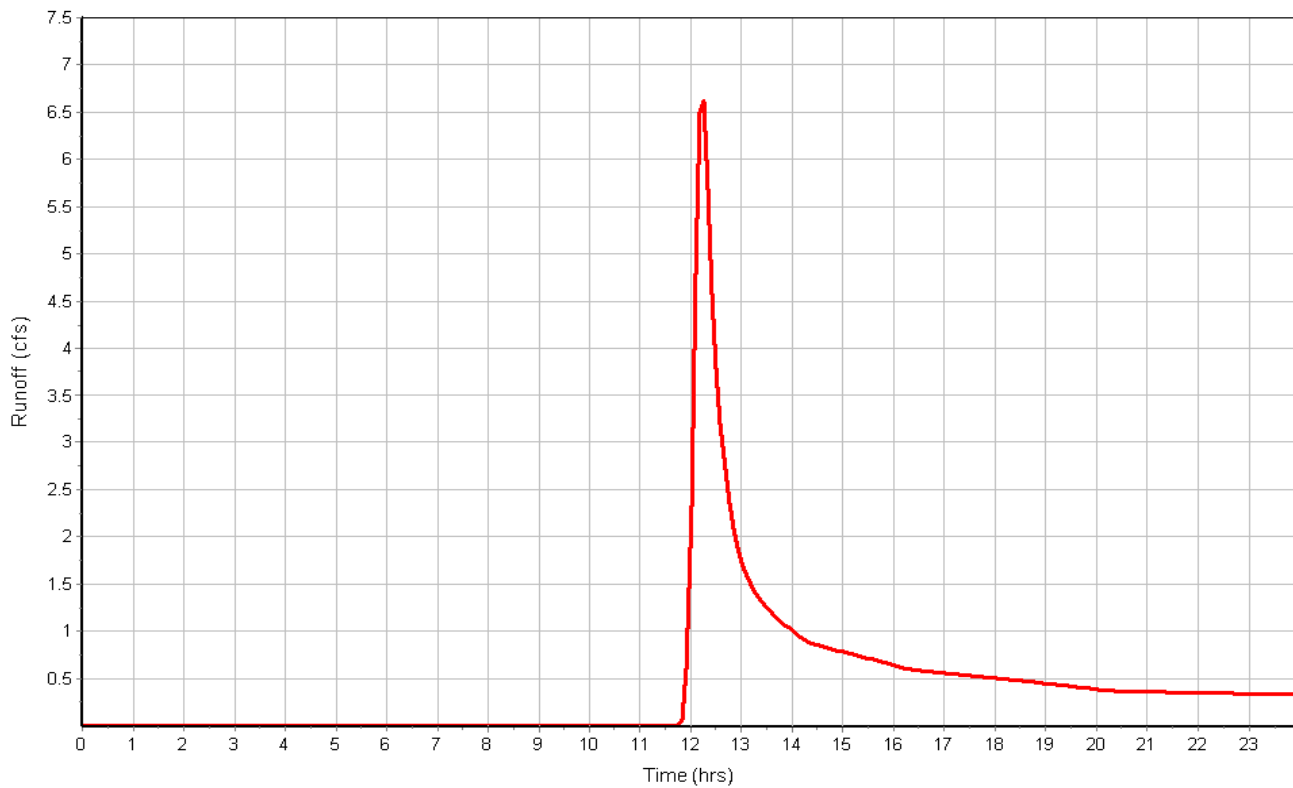
Total Rainfall (in) 2.70
 Total Runoff (in) 0.41
 Peak Runoff (cfs) 6.77
 Weighted Curve Number 66.00
 Time of Concentration (days hh:mm:ss) 0 00:26:38

Subbasin : G1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : G2

Input Data

Area (ac) 21.20
 Weighted Curve Number 72.70
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	19.08	C	72.00
Pasture, grassland, or range, Fair	2.12	C	79.00
Composite Area & Weighted CN	21.20		72.70

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	3.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.38	0.00	0.00
Computed Flow Time (min) :	12.08	0.00	0.00

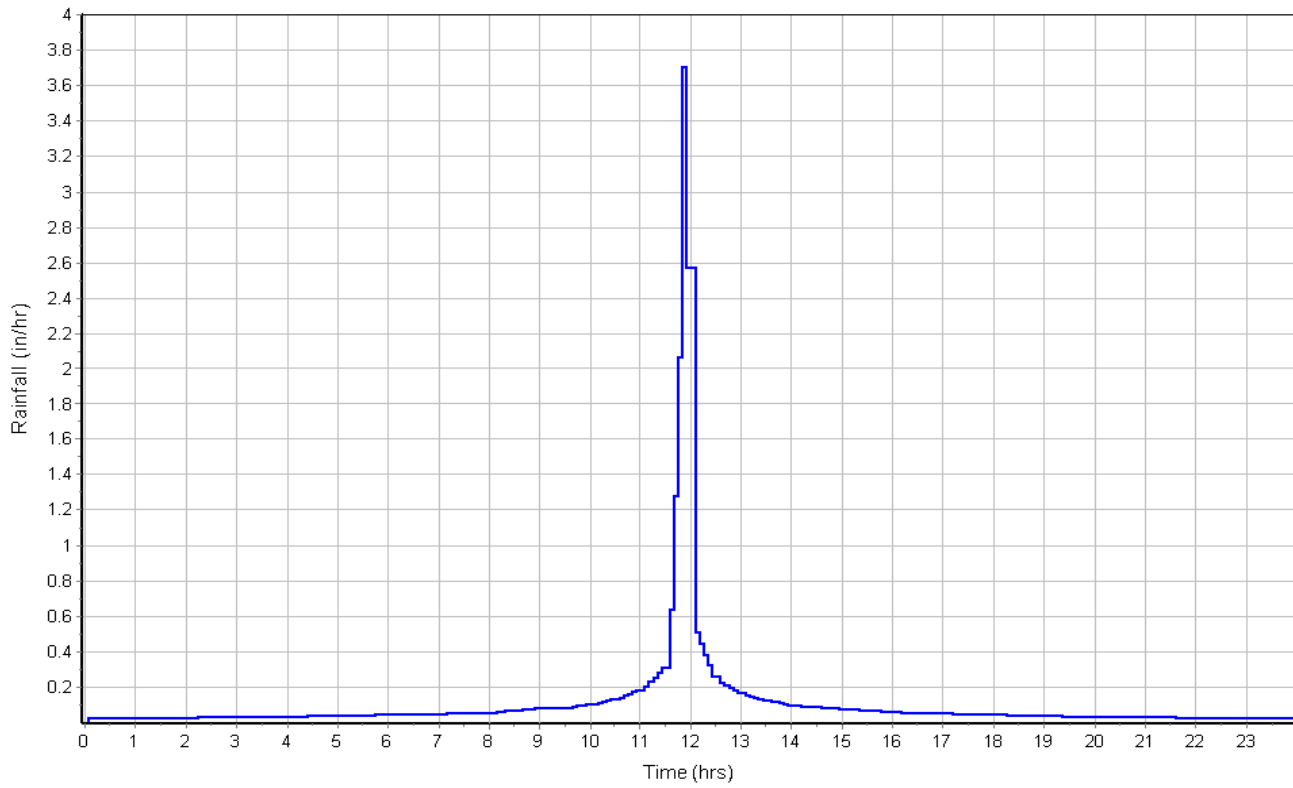
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	695	0.00	0.00
Channel Slope (%) :	3.9	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.68	0.00	0.00
Computed Flow Time (min) :	0.99	0.00	0.00
Total TOC (min)	34.13		

Subbasin Runoff Results

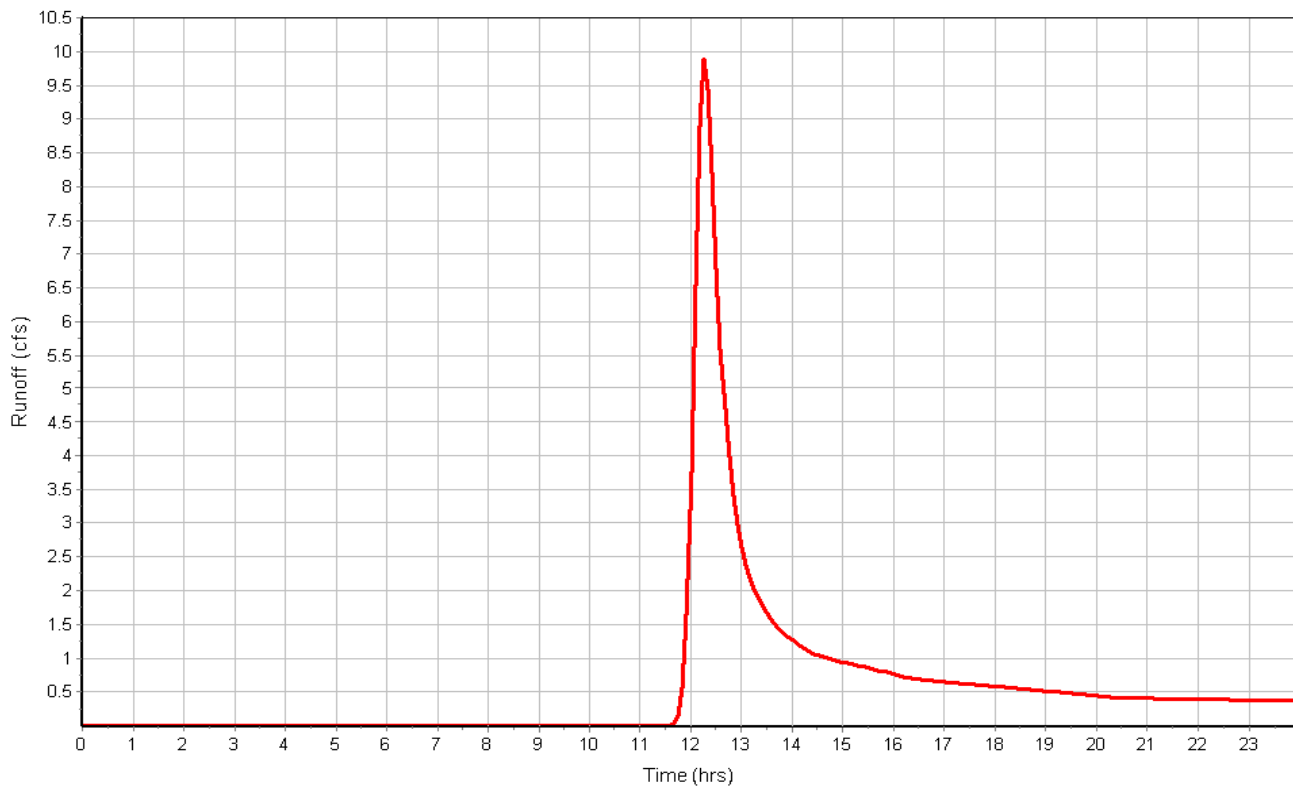
Total Rainfall (in) 2.70
 Total Runoff (in) 0.67
 Peak Runoff (cfs) 9.89
 Weighted Curve Number 72.70
 Time of Concentration (days hh:mm:ss) 0 00:34:08

Subbasin : G2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H1

Input Data

Area (ac) 13.90
 Weighted Curve Number 70.80
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	1.39	B	60.00
5 Acre Lots, 7% Impervious	12.51	C	72.00
Composite Area & Weighted CN	13.90		70.80

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	500	0.00
Slope (%) :	4.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.55	0.00	0.00
Computed Flow Time (min) :	5.38	0.00	0.00

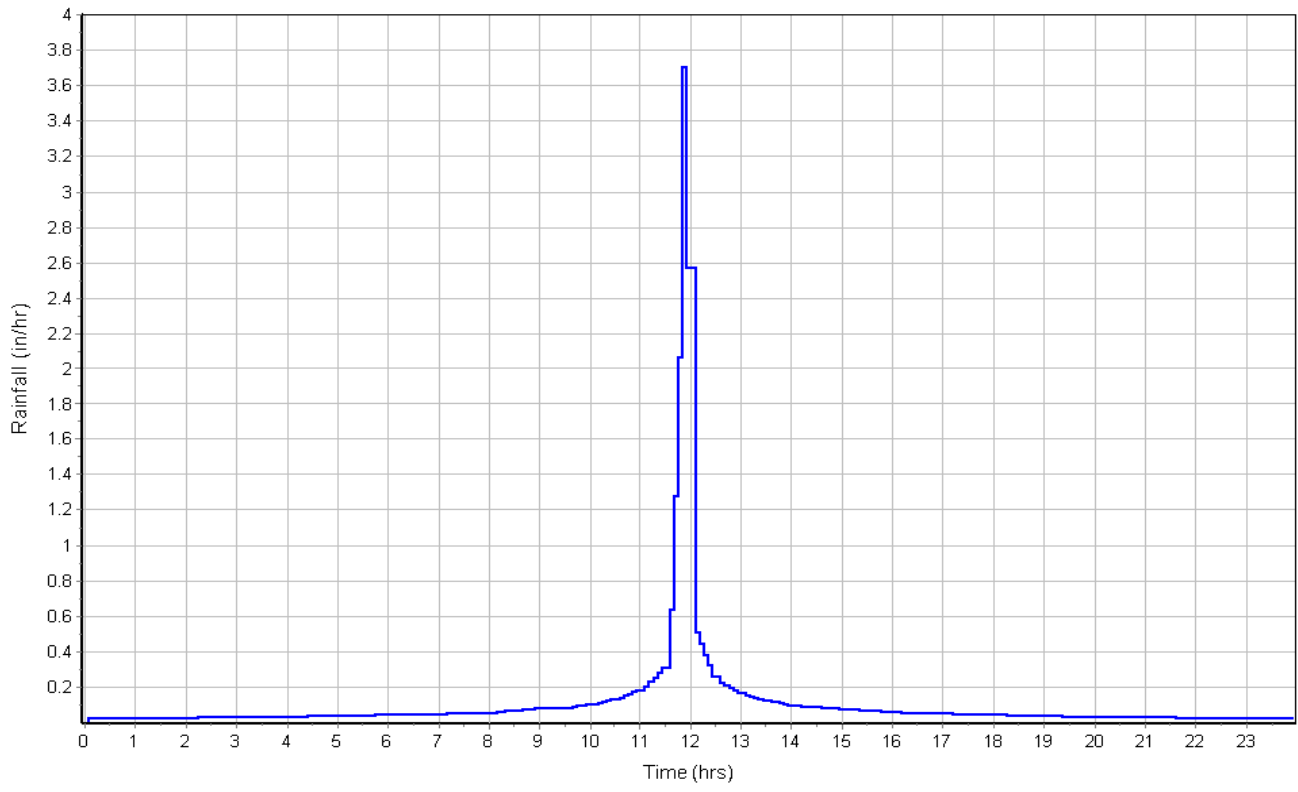
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	328	0.00	0.00
Channel Slope (%) :	4.9	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.09	0.00	0.00
Computed Flow Time (min) :	0.42	0.00	0.00
Total TOC (min)	26.85		

Subbasin Runoff Results

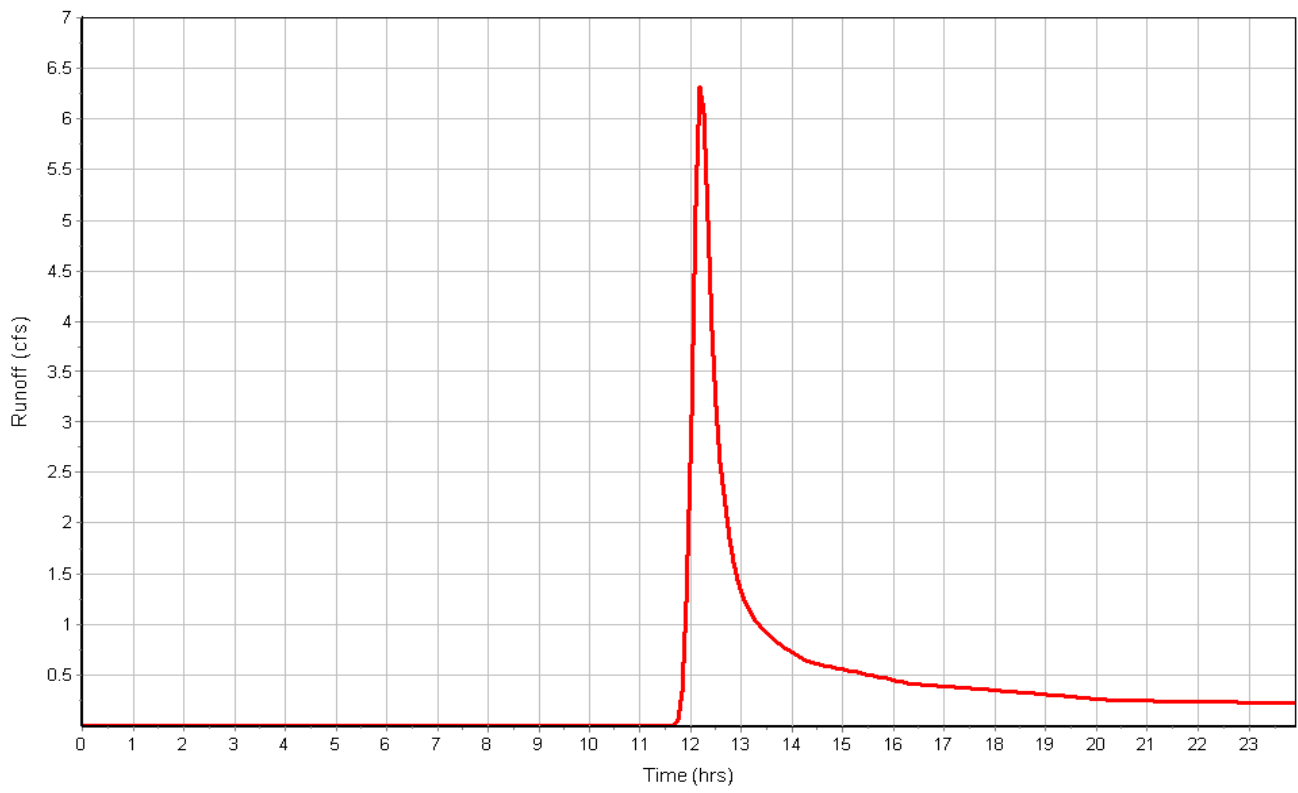
Total Rainfall (in) 2.70
 Total Runoff (in) 0.59
 Peak Runoff (cfs) 6.40
 Weighted Curve Number 70.80
 Time of Concentration (days hh:mm:ss) 0 00:26:51

Subbasin : H1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H2

Input Data

Area (ac) 39.10
 Weighted Curve Number 67.20
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	15.64	B	60.00
5 Acre Lots, 7% Impervious	23.46	C	72.00
Composite Area & Weighted CN	39.10		67.20

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.57	0.00	0.00
Computed Flow Time (min) :	10.62	0.00	0.00

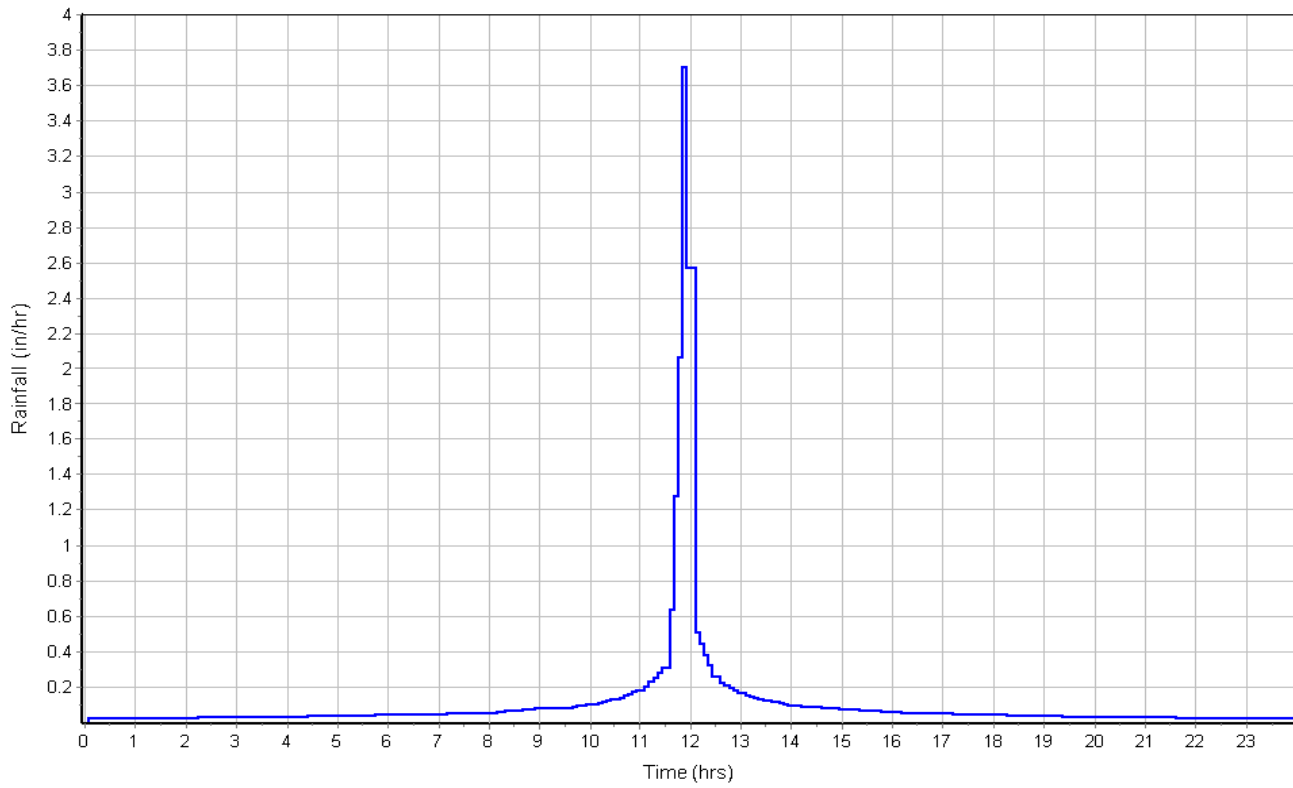
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	851	0.00	0.00
Channel Slope (%) :	5	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.22	0.00	0.00
Computed Flow Time (min) :	1.07	0.00	0.00
Total TOC (min)	32.75		

Subbasin Runoff Results

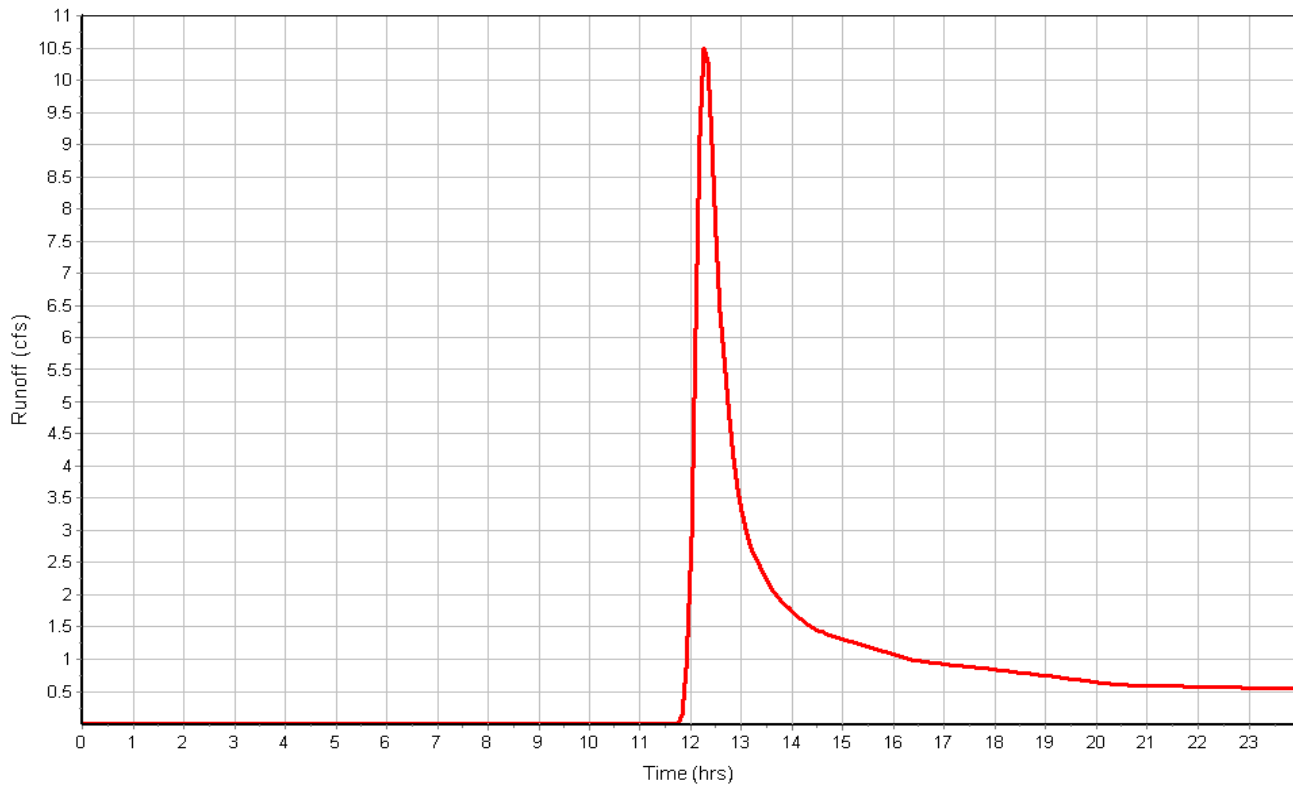
Total Rainfall (in) 2.70
 Total Runoff (in) 0.45
 Peak Runoff (cfs) 10.58
 Weighted Curve Number 67.20
 Time of Concentration (days hh:mm:ss) 0 00:32:45

Subbasin : H2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H3

Input Data

Area (ac) 5.80
 Weighted Curve Number 66.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	2.90	C	72.00
Woods, Fair	2.90	B	60.00
Composite Area & Weighted CN	5.80		66.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	200	0.00	0.00
Slope (%) :	3.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0.00	0.00
Computed Flow Time (min) :	2.67	0.00	0.00

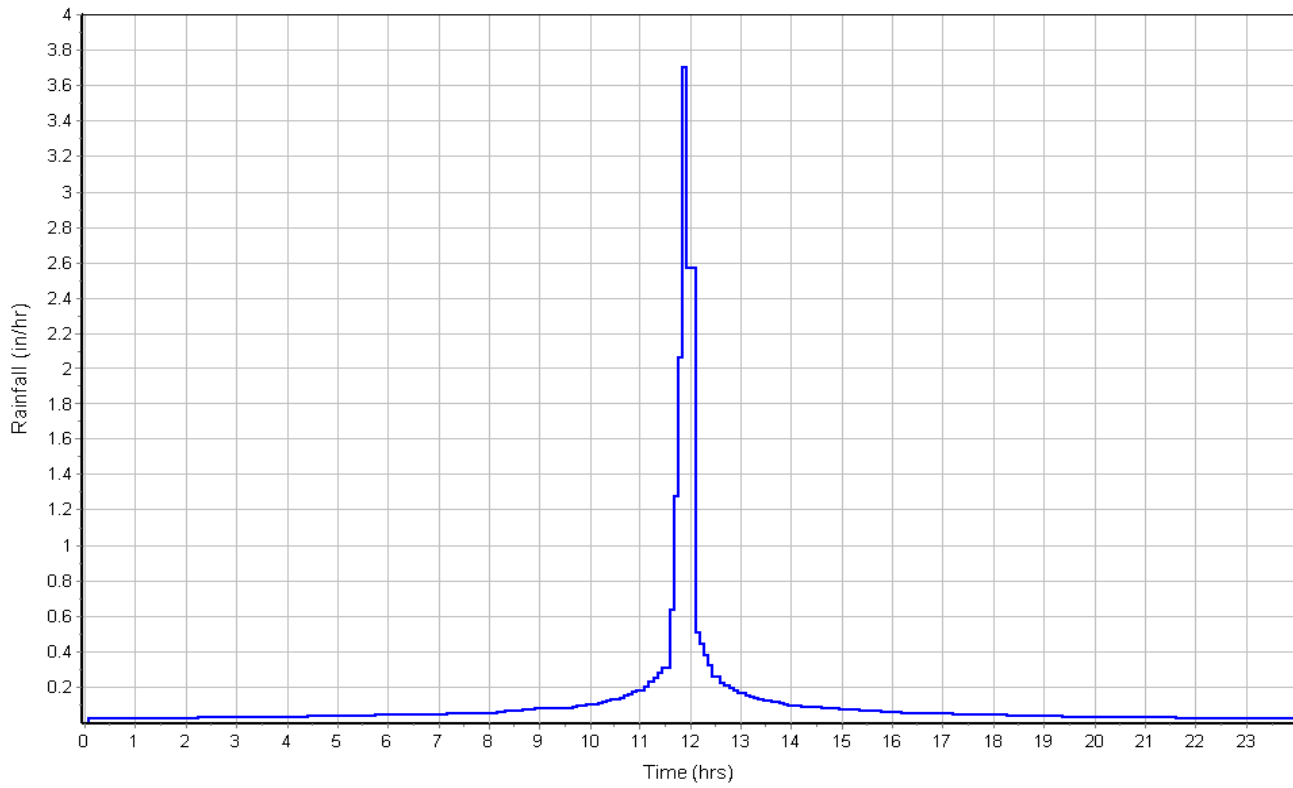
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	133	0.00	0.00
Channel Slope (%) :	3.2	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.58	0.00	0.00
Computed Flow Time (min) :	0.21	0.00	0.00
Total TOC (min)	23.93		

Subbasin Runoff Results

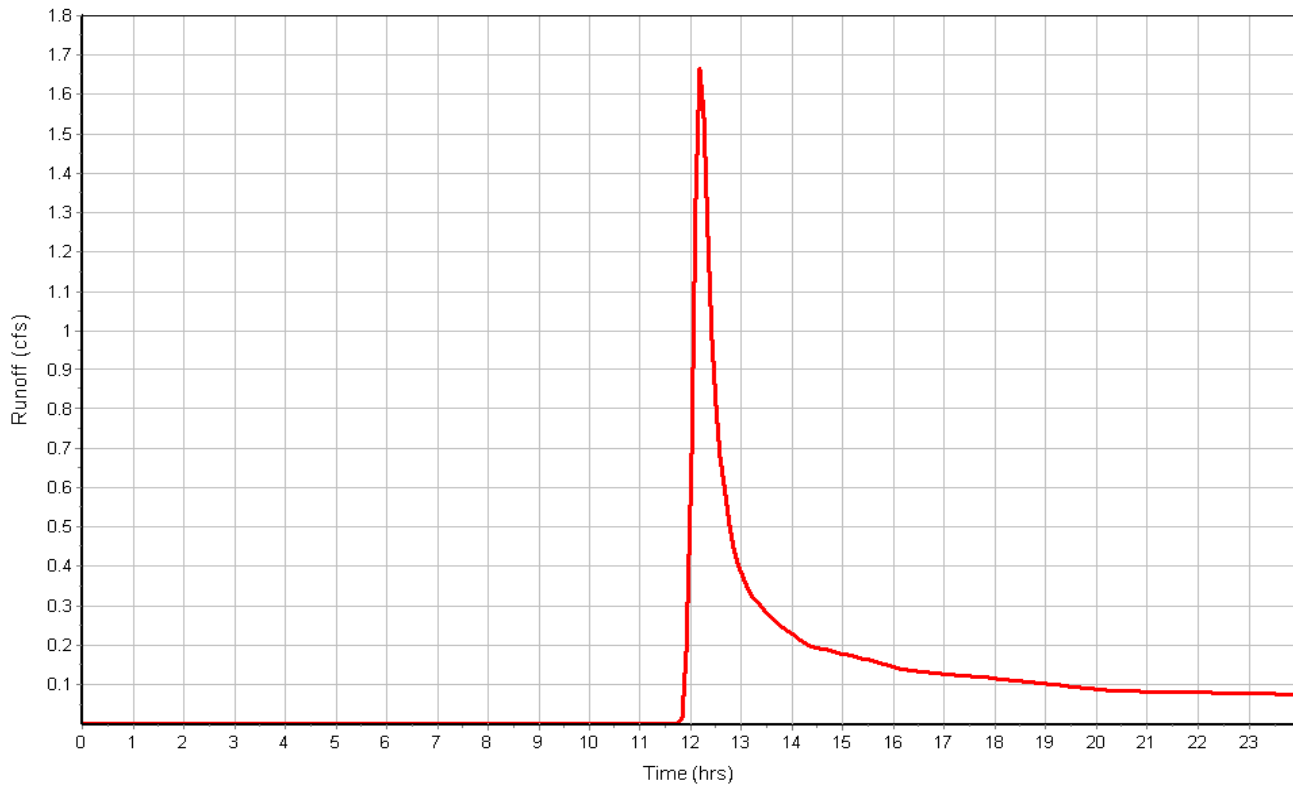
Total Rainfall (in) 2.70
 Total Runoff (in) 0.41
 Peak Runoff (cfs) 1.67
 Weighted Curve Number 66.00
 Time of Concentration (days hh:mm:ss) 0 00:23:56

Subbasin : H3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H4

Input Data

Area (ac) 27.10
 Weighted Curve Number 73.75
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	20.33	C	72.00
Pasture, grassland, or range, Fair	6.78	C	79.00
Composite Area & Weighted CN	27.11		73.75

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	4.5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.48	0.00	0.00
Computed Flow Time (min) :	11.26	0.00	0.00

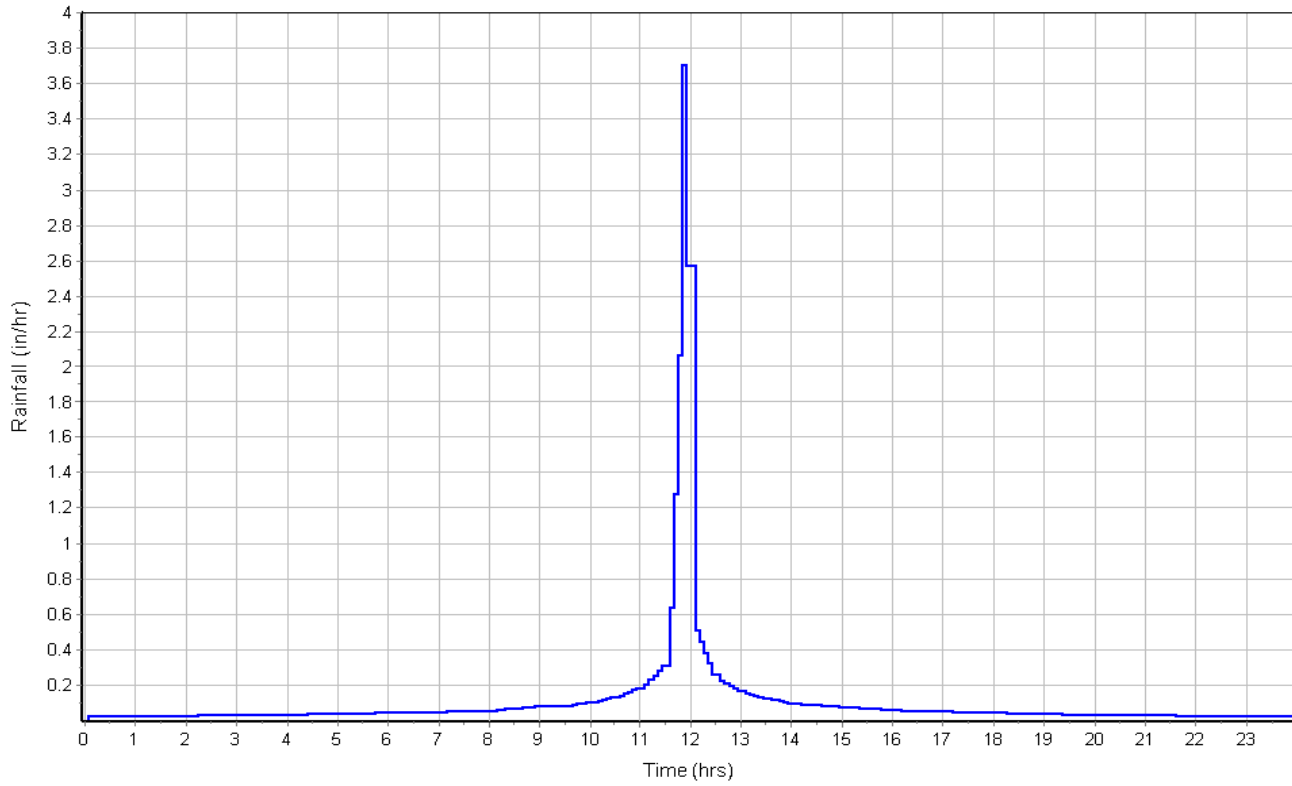
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	791	0.00	0.00
Channel Slope (%) :	4.5	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.54	0.00	0.00
Computed Flow Time (min) :	1.05	0.00	0.00
Total TOC (min)	33.37		

Subbasin Runoff Results

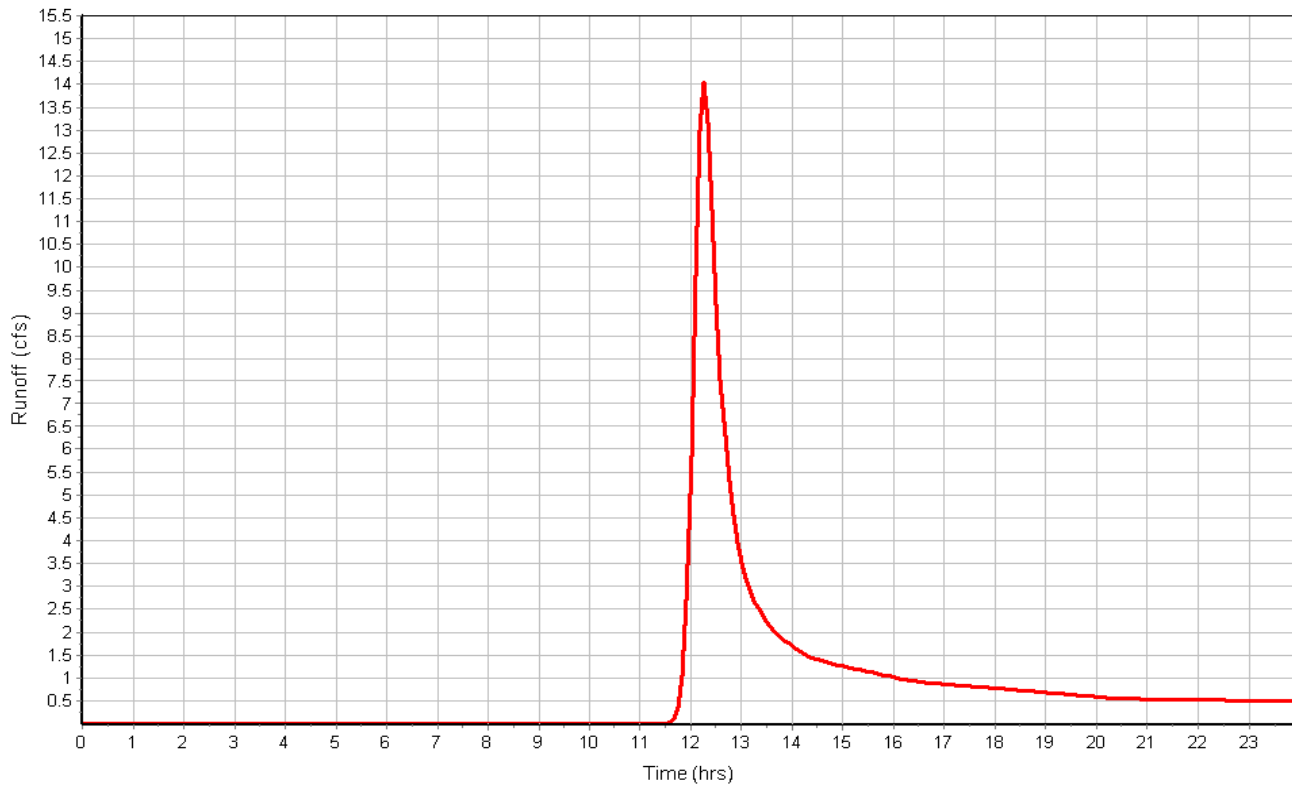
Total Rainfall (in) 2.70
 Total Runoff (in) 0.71
 Peak Runoff (cfs) 14.06
 Weighted Curve Number 73.75
 Time of Concentration (days hh:mm:ss) 0 00:33:22

Subbasin : H4

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H5

Input Data

Area (ac) 20.20
 Weighted Curve Number 74.80
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	8.08	C	79.00
5 Acre Lots, 7% Impervious	12.12	C	72.00
Composite Area & Weighted CN	20.20		74.80

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.61	0.00	0.00
Computed Flow Time (min) :	10.35	0.00	0.00

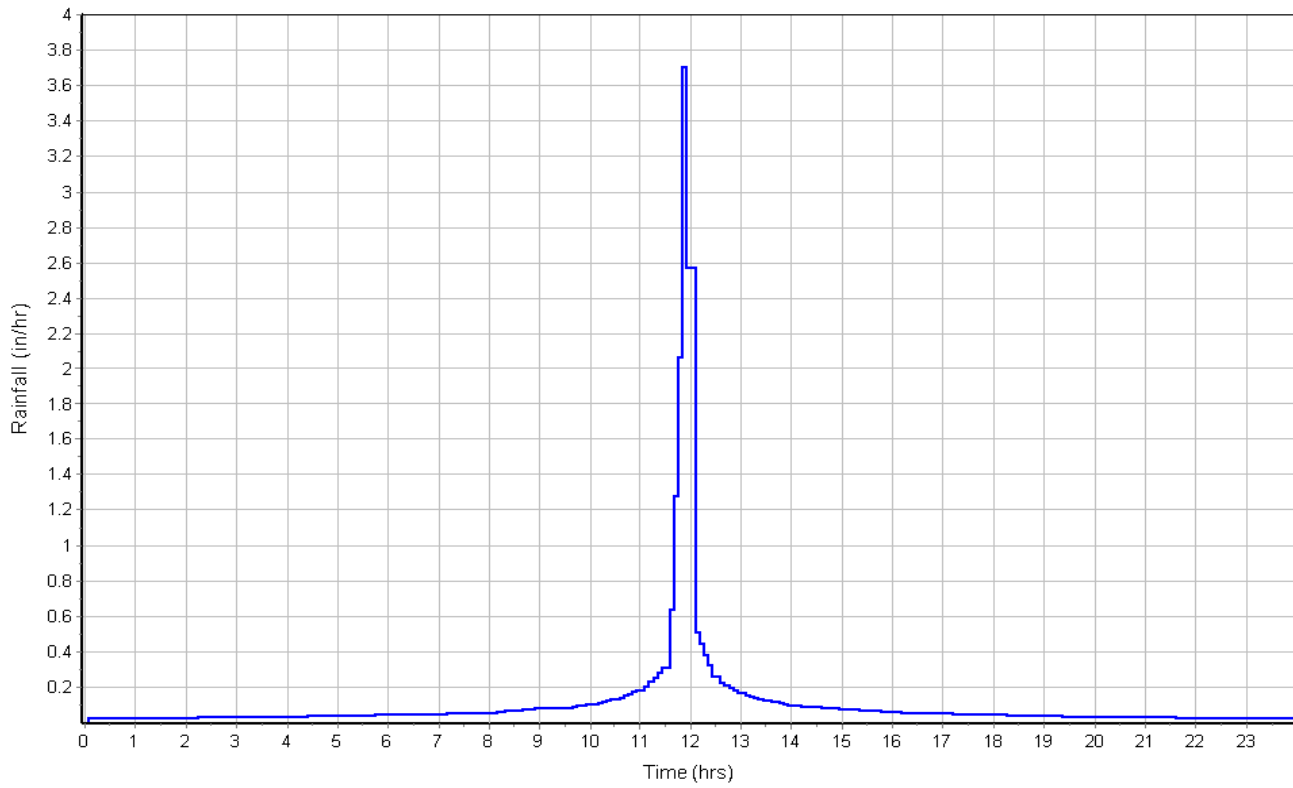
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	655	0.00	0.00
Channel Slope (%) :	5.3	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.61	0.00	0.00
Computed Flow Time (min) :	0.80	0.00	0.00
Total TOC (min)	32.21		

Subbasin Runoff Results

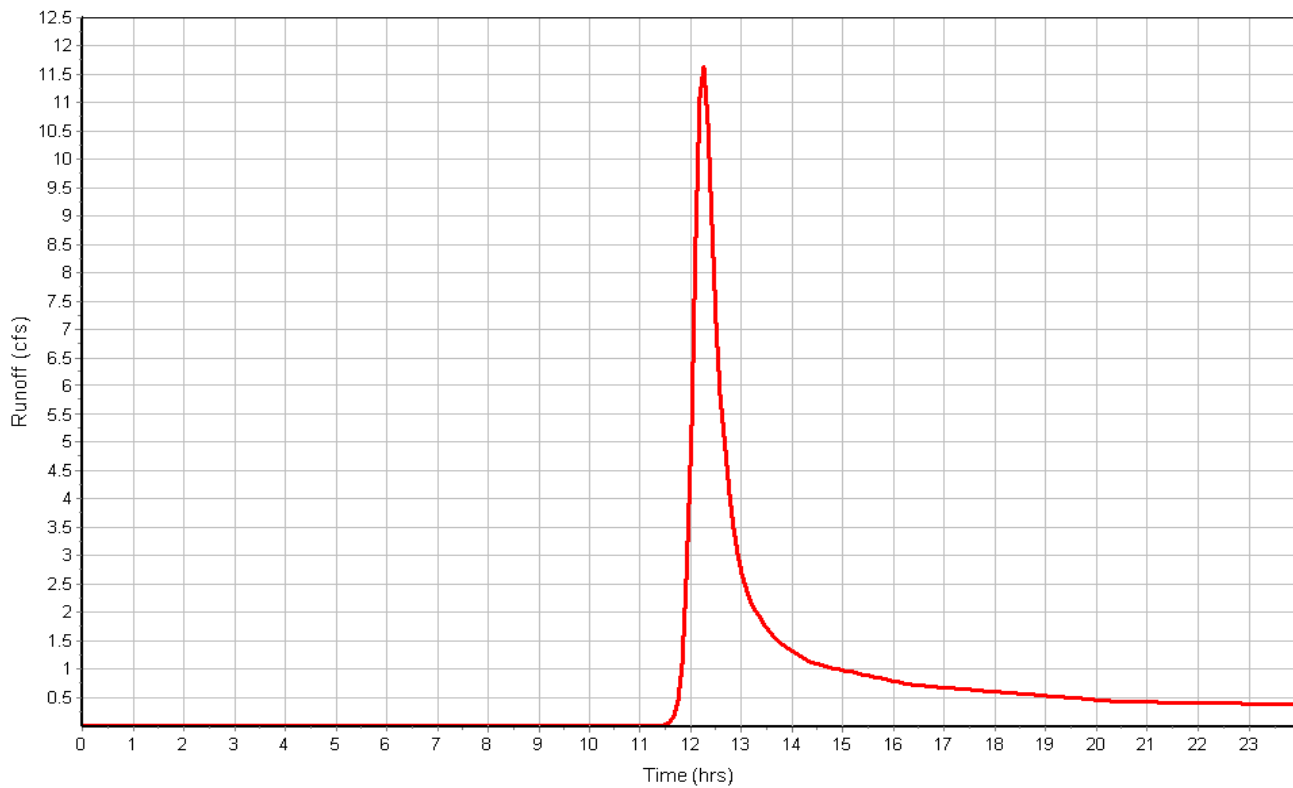
Total Rainfall (in) 2.70
 Total Runoff (in) 0.76
 Peak Runoff (cfs) 11.71
 Weighted Curve Number 74.80
 Time of Concentration (days hh:mm:ss) 0 00:32:13

Subbasin : H5

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H6

Input Data

Area (ac) 31.60
 Weighted Curve Number 66.60
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	11.06	B	60.00
Pasture, grassland, or range, Fair	18.96	B	69.00
Pasture, grassland, or range, Fair	1.58	D	84.00
Composite Area & Weighted CN	31.60		66.60

Time of Concentration

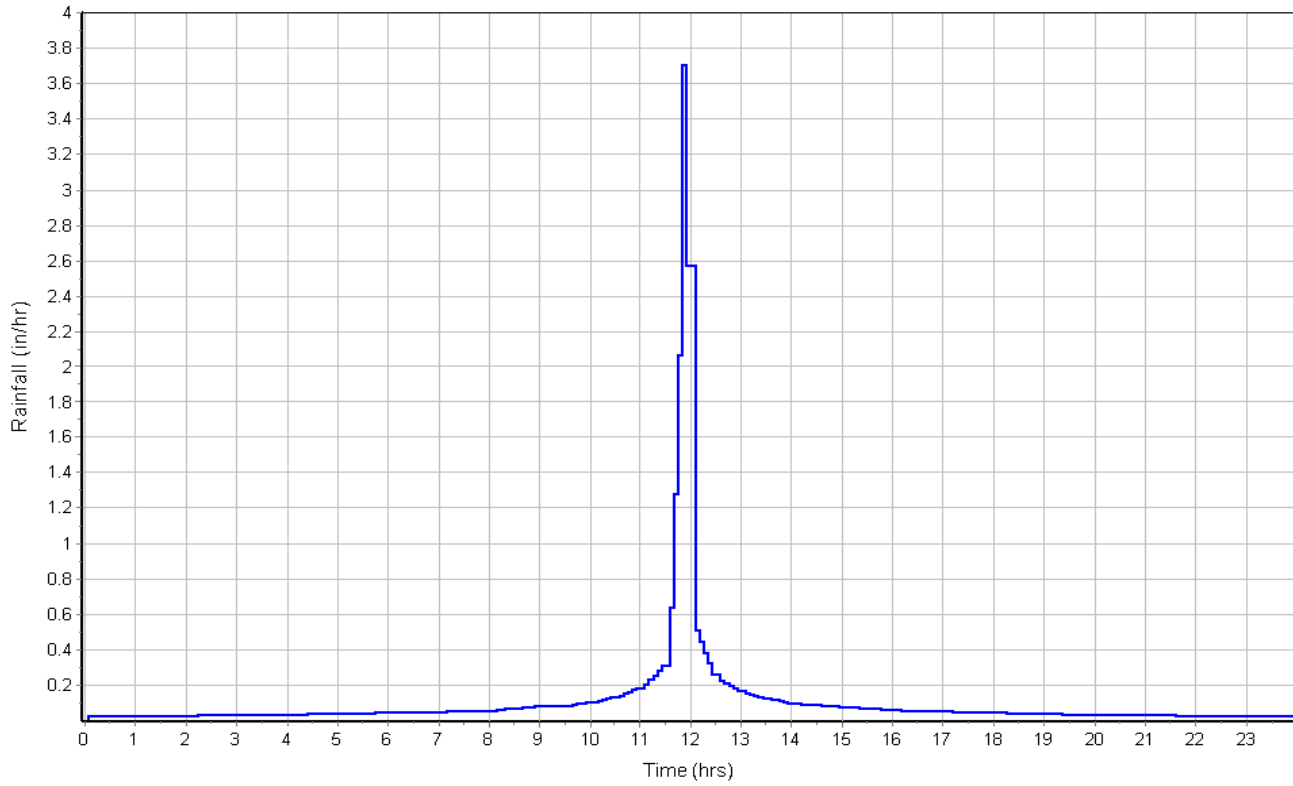
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	12.25	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1275	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.53	0.00	0.00
Computed Flow Time (min) :	1.84	0.00	0.00
Total TOC (min)	35.16		

Subbasin Runoff Results

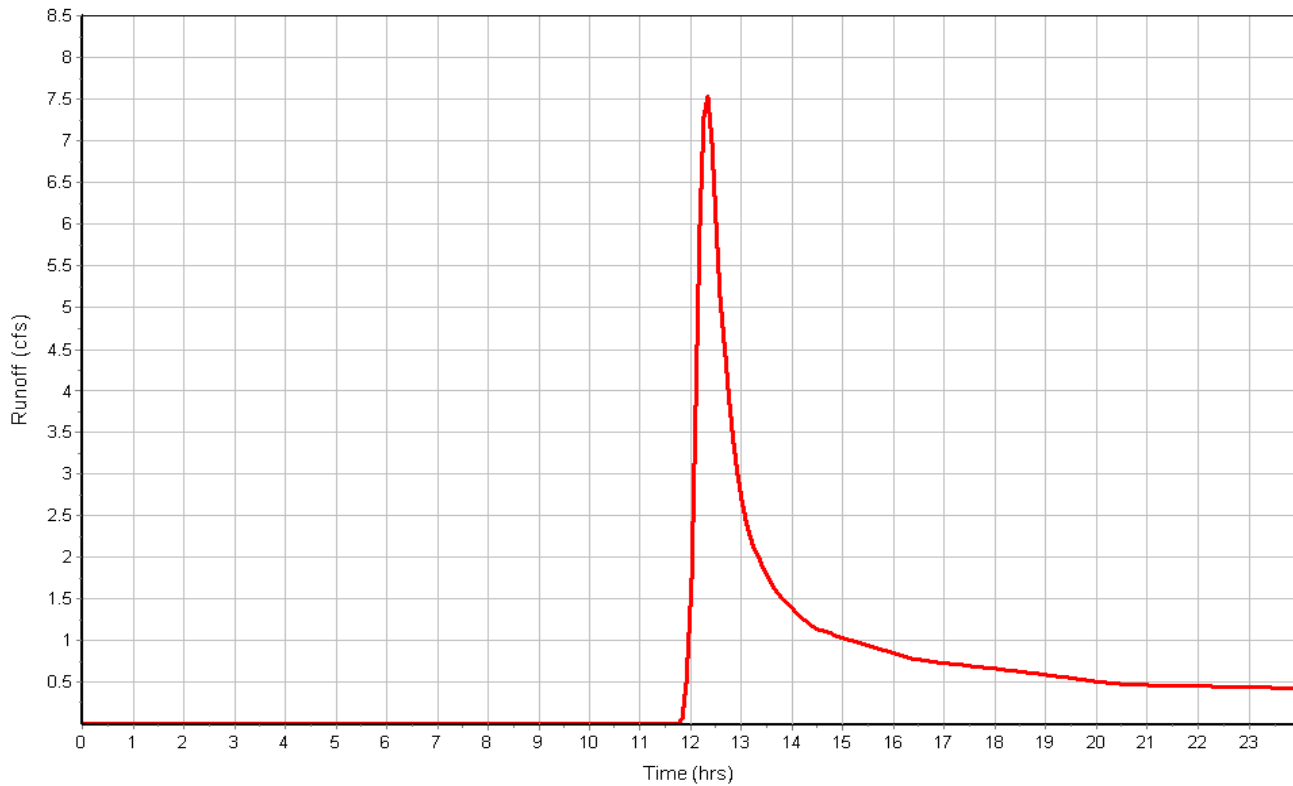
Total Rainfall (in) 2.70
 Total Runoff (in) 0.43
 Peak Runoff (cfs) 7.57
 Weighted Curve Number 66.60
 Time of Concentration (days hh:mm:ss) 0 00:35:10

Subbasin : H6

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H7

Input Data

Area (ac) 25.80
 Weighted Curve Number 70.50
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	10.32	C	72.00
Pasture, grassland, or range, Fair	7.74	C	79.00
5 Acre Lots, 7% Impervious	7.74	B	60.00
Composite Area & Weighted CN	25.80		70.50

Time of Concentration

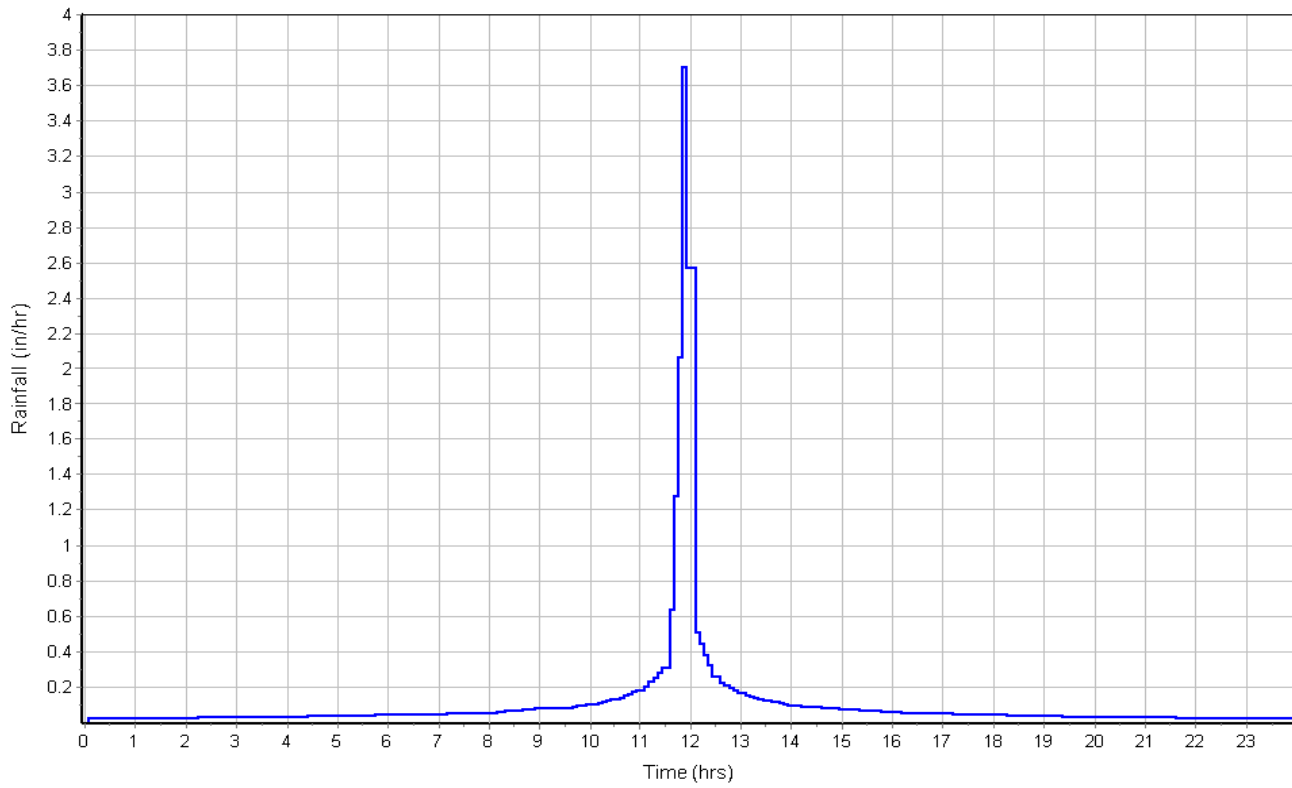
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	6.5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.78	0.00	0.00
Computed Flow Time (min) :	9.36	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	343	0.00	0.00
Channel Slope (%) :	6.5	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	15.08	0.00	0.00
Computed Flow Time (min) :	0.38	0.00	0.00
Total TOC (min)	30.80		

Subbasin Runoff Results

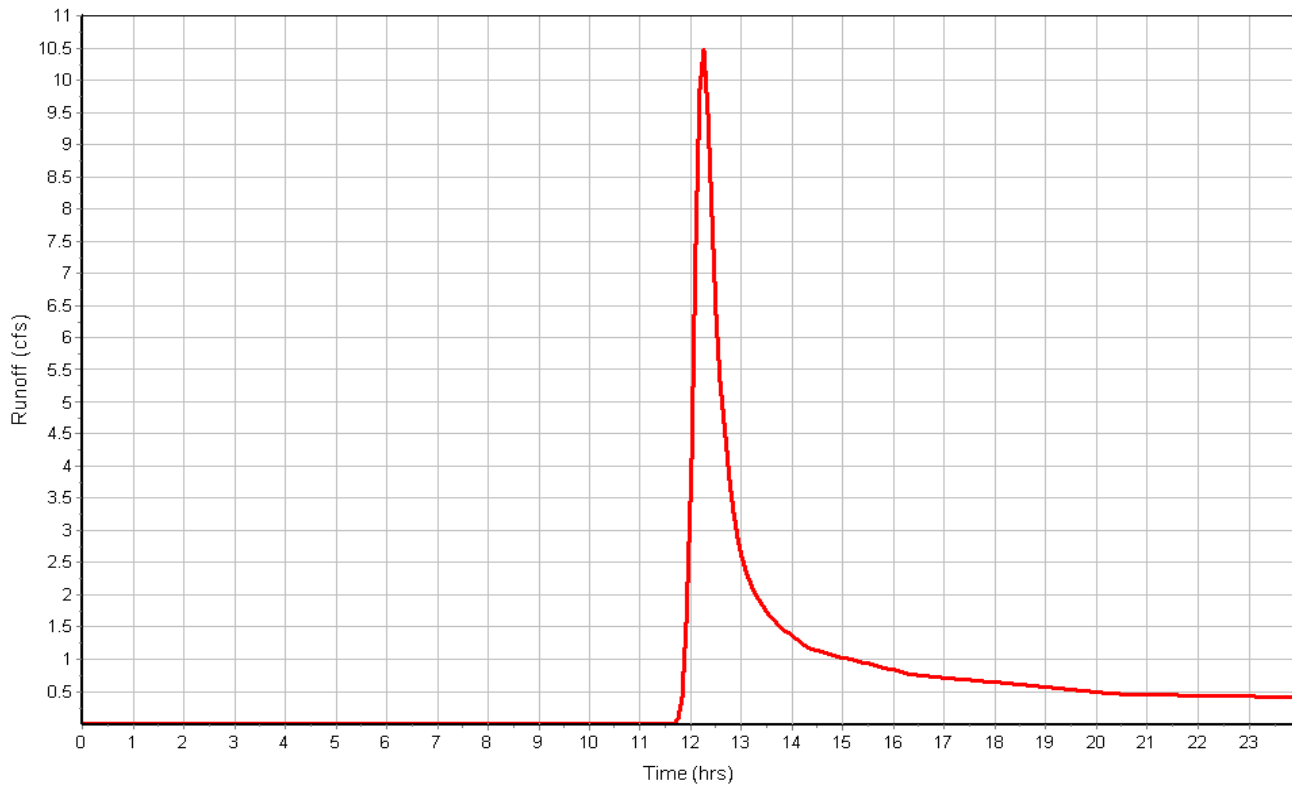
Total Rainfall (in) 2.70
 Total Runoff (in) 0.57
 Peak Runoff (cfs) 10.49
 Weighted Curve Number 70.50
 Time of Concentration (days hh:mm:ss) 0 00:30:48

Subbasin : H7

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H8

Input Data

Area (ac) 8.50
 Weighted Curve Number 74.55
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	2.55	B	60.00
Pasture, grassland, or range, Fair	2.13	D	84.00
Pasture, grassland, or range, Fair	3.83	C	79.00
Composite Area & Weighted CN	8.51		74.55

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	7.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.97	0.00	0.00
Computed Flow Time (min) :	4.23	0.00	0.00

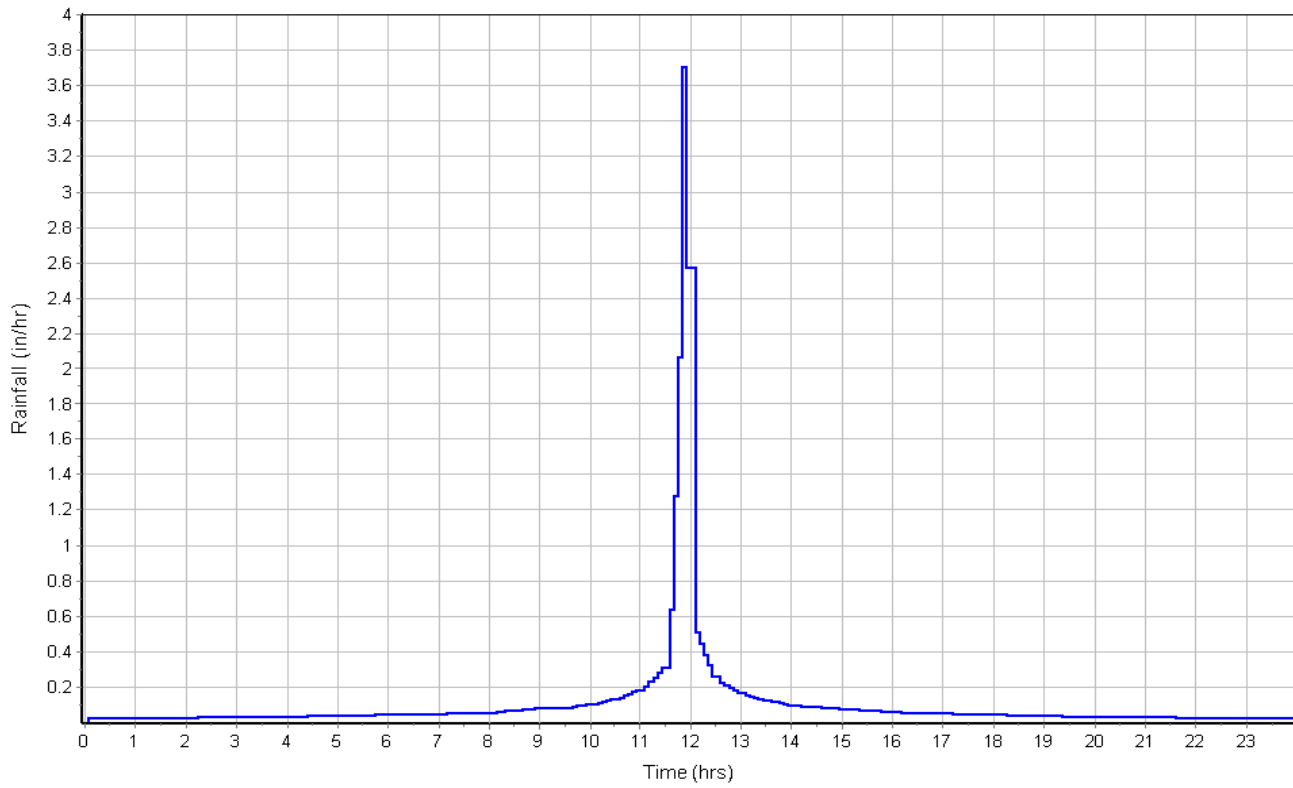
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	159	0.00	0.00
Channel Slope (%) :	7.9	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	16.62	0.00	0.00
Computed Flow Time (min) :	0.16	0.00	0.00
Total TOC (min)	25.45		

Subbasin Runoff Results

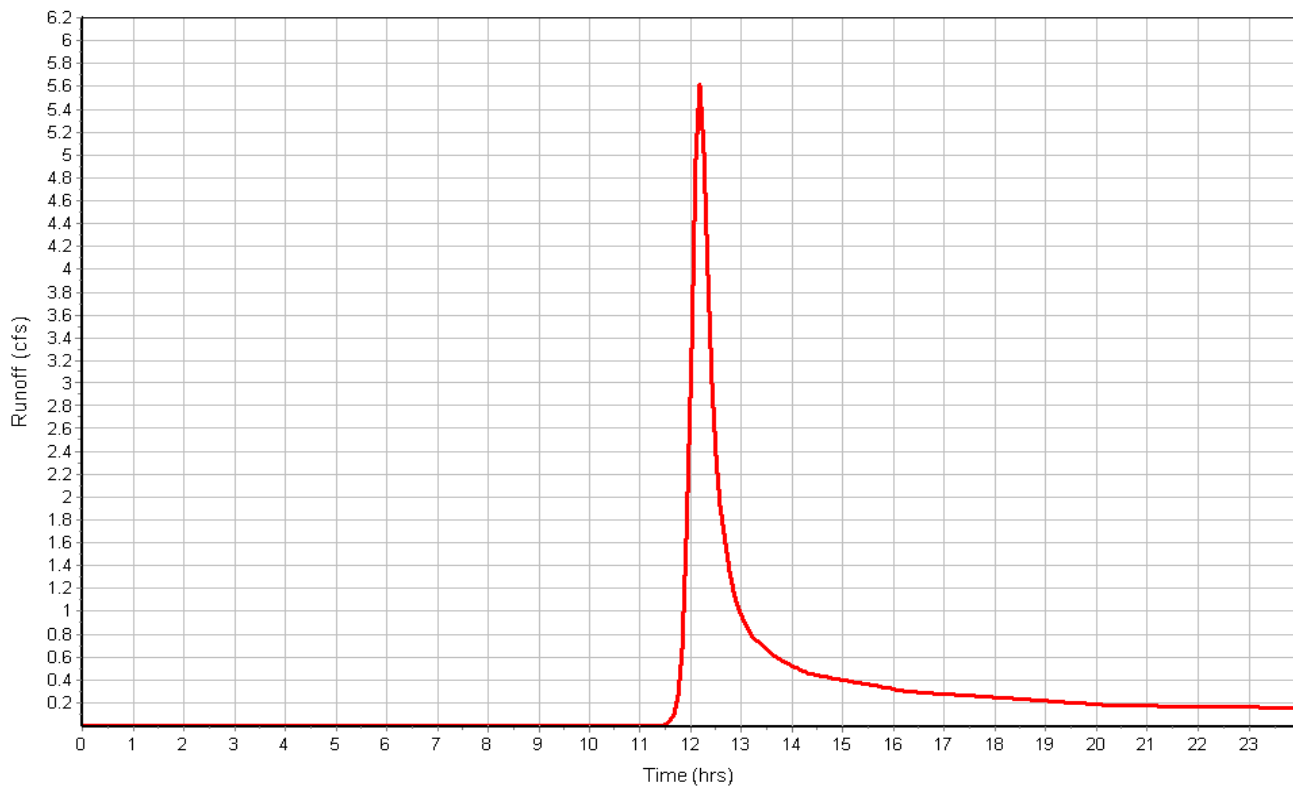
Total Rainfall (in) 2.70
 Total Runoff (in) 0.75
 Peak Runoff (cfs) 5.62
 Weighted Curve Number 74.55
 Time of Concentration (days hh:mm:ss) 0 00:25:27

Subbasin : H8

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H9

Input Data

Area (ac) 6.90
 Weighted Curve Number 70.80
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	0.69	B	60.00
5 Acre Lots, 7% Impervious	6.21	C	72.00
Composite Area & Weighted CN	6.90		70.80

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	6.7	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.81	0.00	0.00
Computed Flow Time (min) :	2.76	0.00	0.00

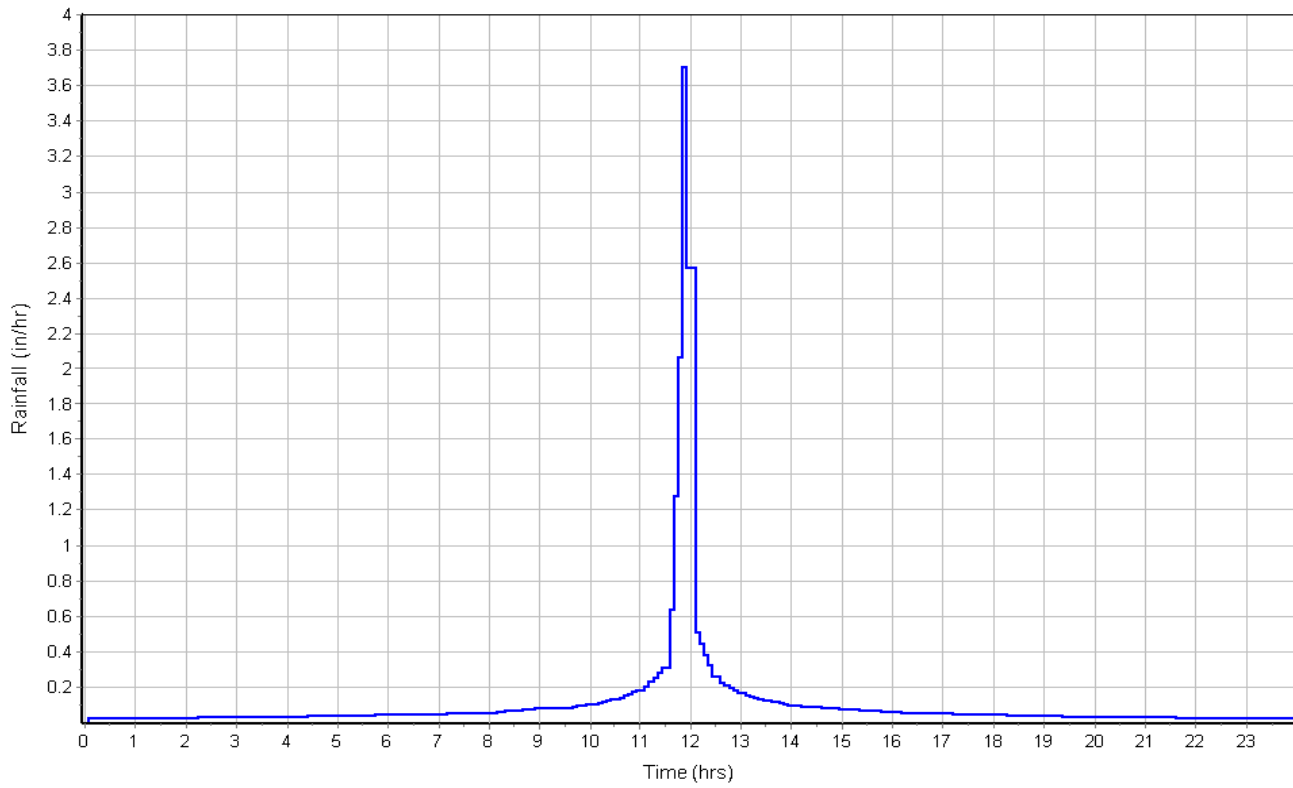
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	171	0.00	0.00
Channel Slope (%) :	6.7	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	15.31	0.00	0.00
Computed Flow Time (min) :	0.19	0.00	0.00
Total TOC (min)	24.01		

Subbasin Runoff Results

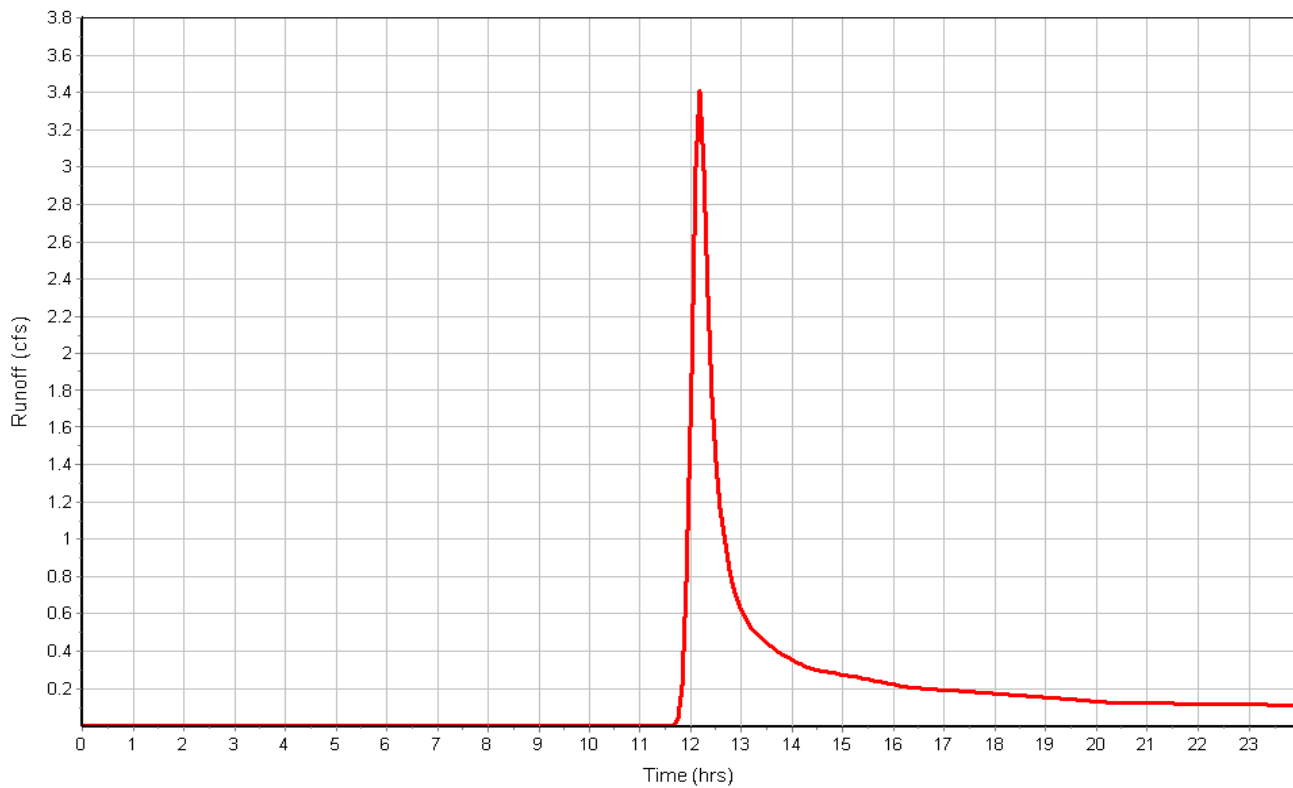
Total Rainfall (in) 2.70
 Total Runoff (in) 0.59
 Peak Runoff (cfs) 3.41
 Weighted Curve Number 70.80
 Time of Concentration (days hh:mm:ss) 0 00:24:01

Subbasin : H9

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : I1

Input Data

Area (ac) 6.80
 Weighted Curve Number 72.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	6.80	C	72.00
Composite Area & Weighted CN	6.80		72.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	200	0.00	0.00
Slope (%) :	4	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.40	0.00	0.00
Computed Flow Time (min) :	2.38	0.00	0.00

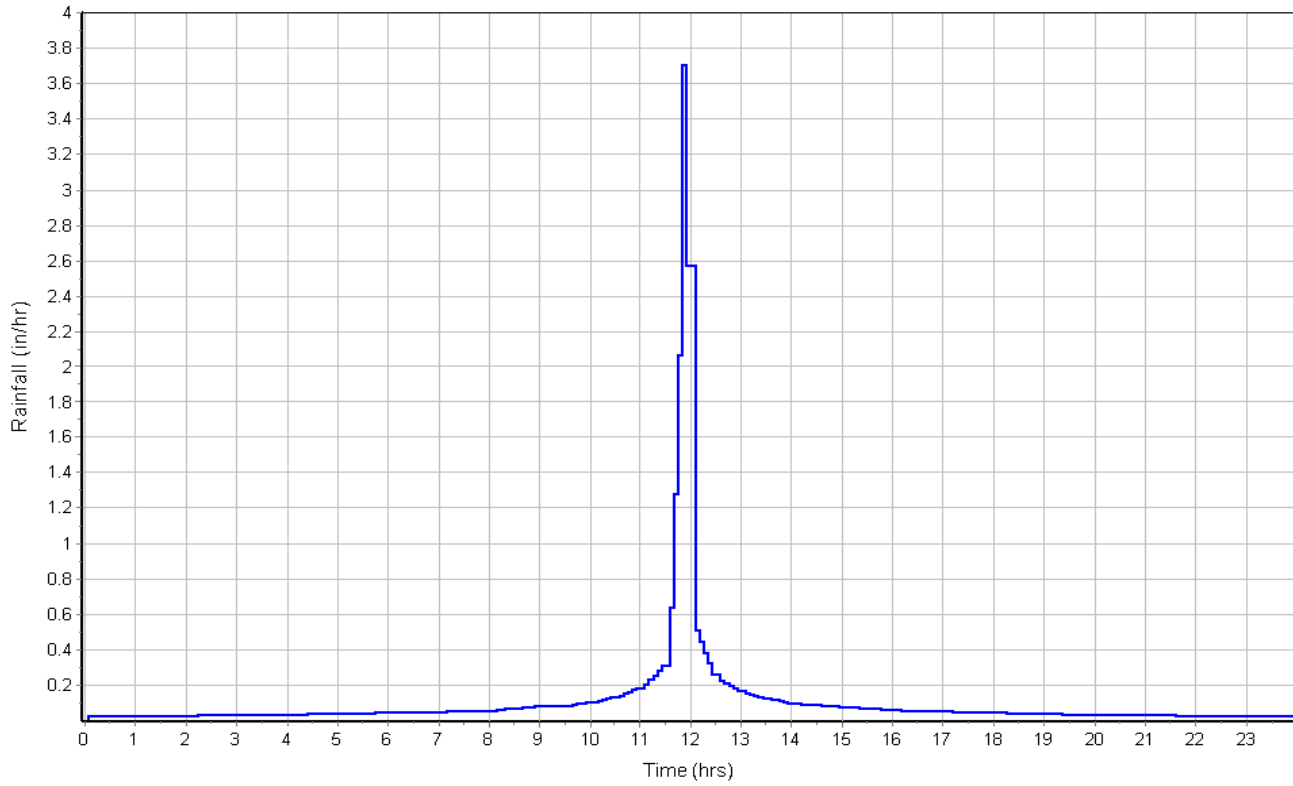
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	268	0.00	0.00
Channel Slope (%) :	4	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.83	0.00	0.00
Computed Flow Time (min) :	0.38	0.00	0.00
Total TOC (min)	23.82		

Subbasin Runoff Results

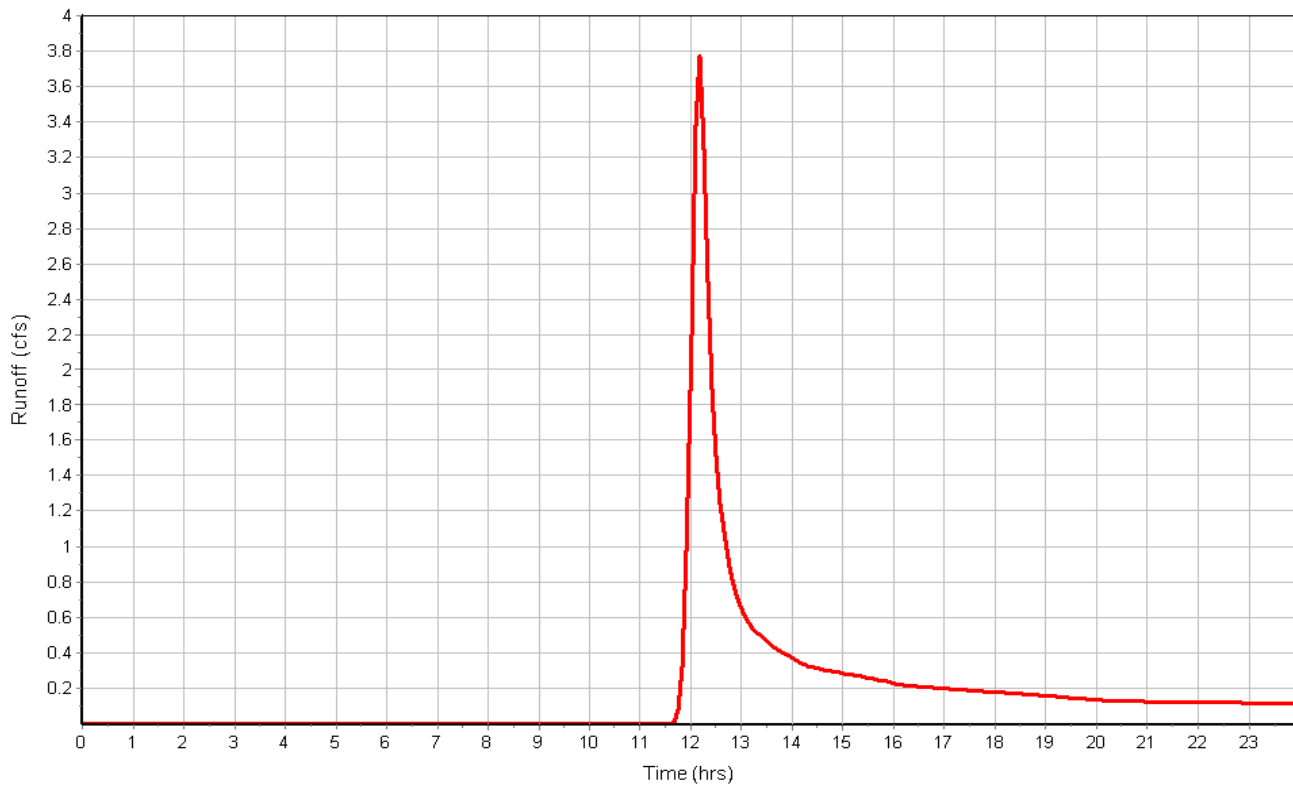
Total Rainfall (in) 2.70
 Total Runoff (in) 0.64
 Peak Runoff (cfs) 3.79
 Weighted Curve Number 72.00
 Time of Concentration (days hh:mm:ss) 0 00:23:49

Subbasin : I1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : I2

Input Data

Area (ac) 14.80
 Weighted Curve Number 72.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	14.80	C	72.00
Composite Area & Weighted CN	14.80		72.00

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	200	0.00
Slope (%) :	5.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.60	0.00	0.00
Computed Flow Time (min) :	2.08	0.00	0.00

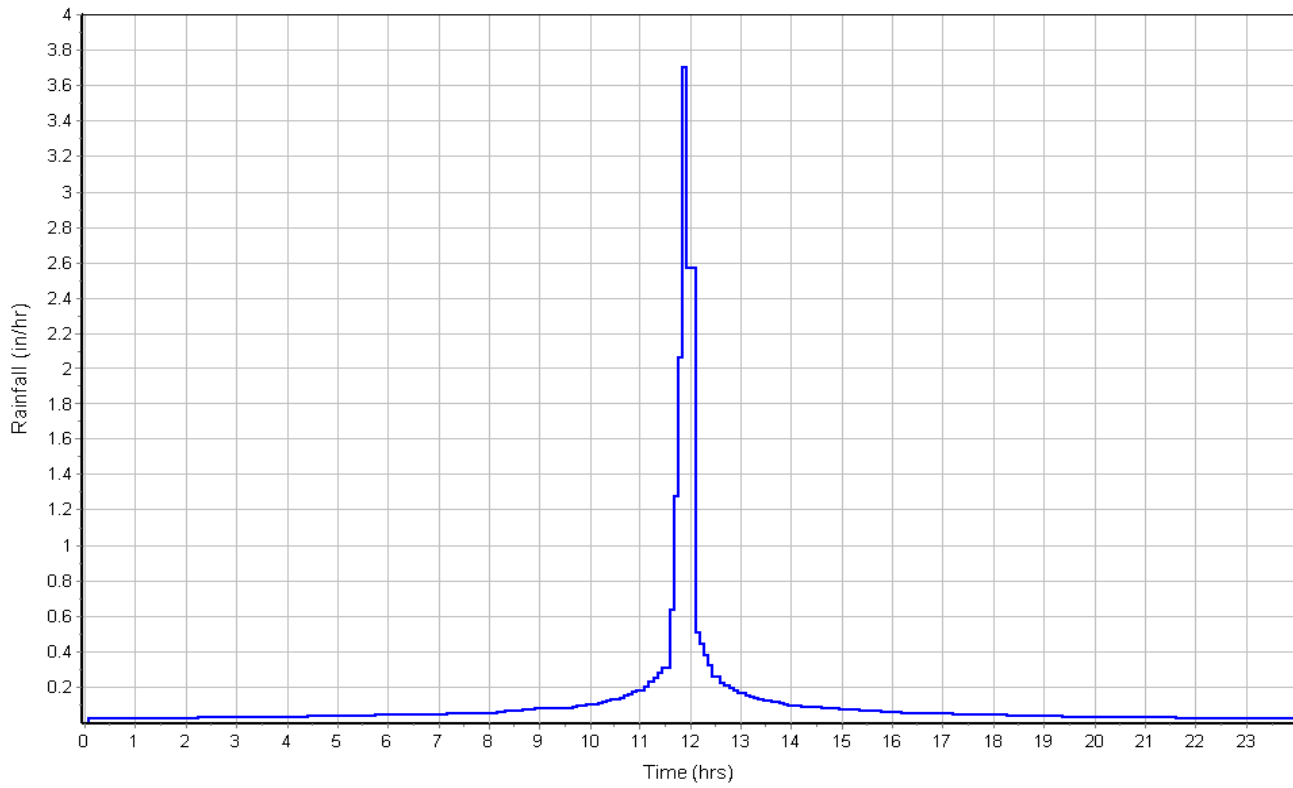
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	285	0.00	0.00
Channel Slope (%) :	5.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.48	0.00	0.00
Computed Flow Time (min) :	0.35	0.00	0.00
Total TOC (min)	23.49		

Subbasin Runoff Results

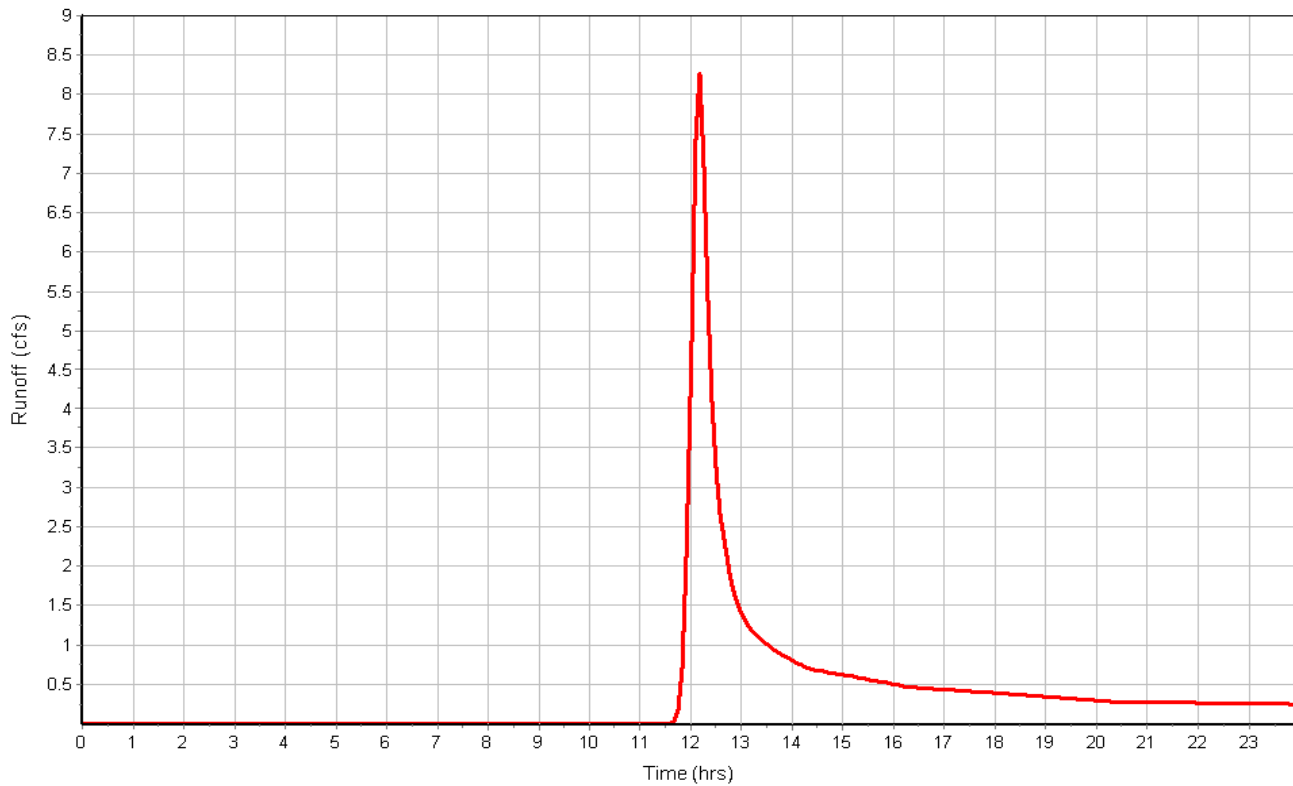
Total Rainfall (in) 2.70
 Total Runoff (in) 0.64
 Peak Runoff (cfs) 8.28
 Weighted Curve Number 72.00
 Time of Concentration (days hh:mm:ss) 0 00:23:29

Subbasin : I2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : J1

Input Data

Area (ac) 10.10
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	10.10	B	60.00
Composite Area & Weighted CN	10.10		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	200	0.00	0.00
Slope (%) :	8.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	2.08	0.00	0.00
Computed Flow Time (min) :	1.60	0.00	0.00

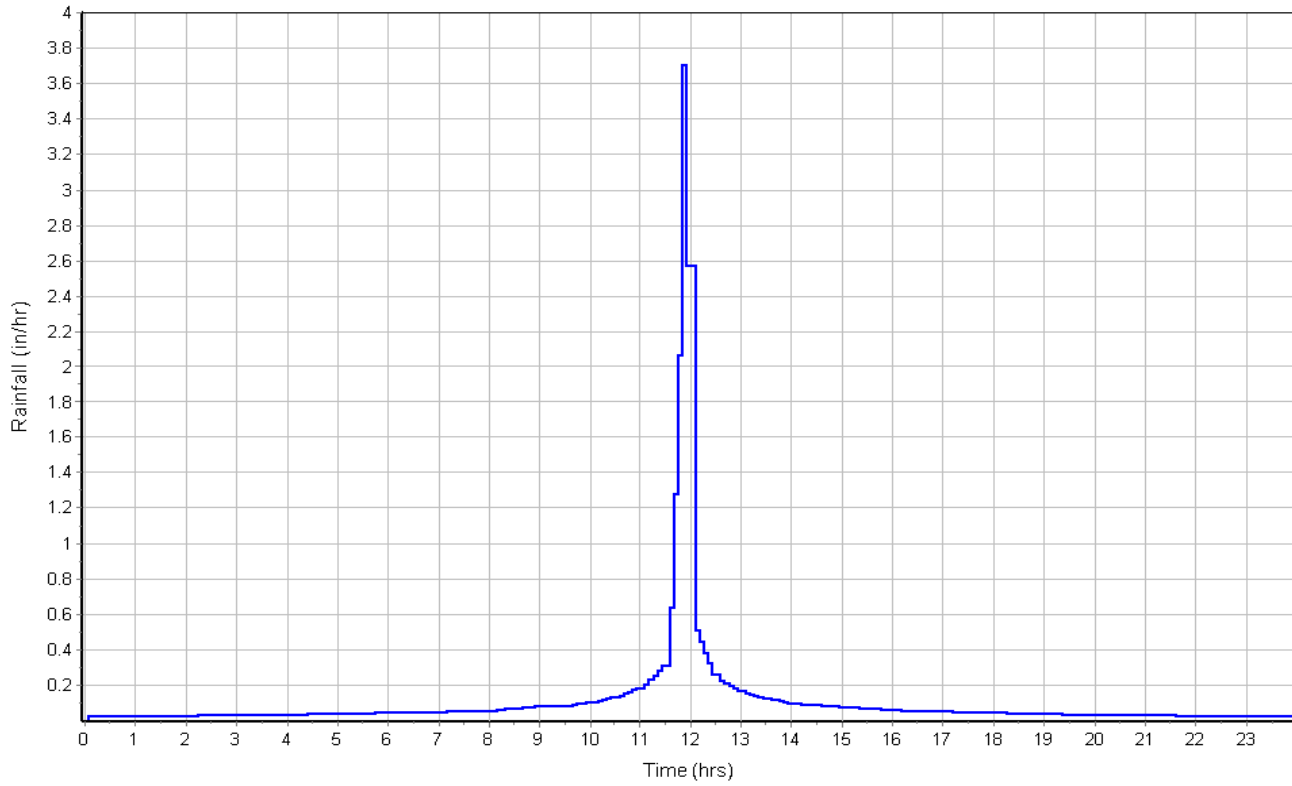
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	228	0.00	0.00
Channel Slope (%) :	8.8	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	17.54	0.00	0.00
Computed Flow Time (min) :	0.22	0.00	0.00
Total TOC (min)	22.88		

Subbasin Runoff Results

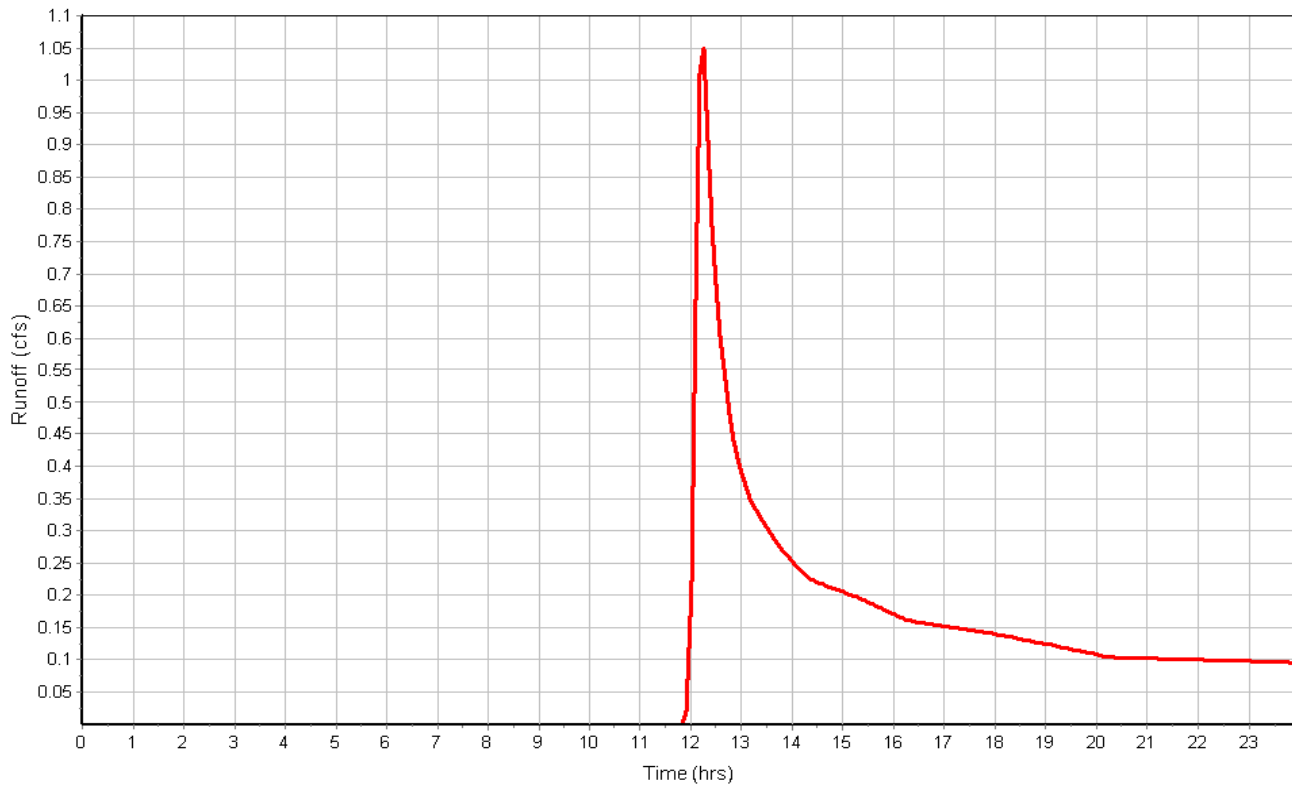
Total Rainfall (in) 2.70
 Total Runoff (in) 0.23
 Peak Runoff (cfs) 1.07
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:22:53

Subbasin : J1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : K1

Input Data

Area (ac) 17.80
 Weighted Curve Number 69.60
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	3.56	B	60.00
5 Acre Lots, 7% Impervious	14.24	C	72.00
Composite Area & Weighted CN	17.80		69.60

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	200	0.00	0.00
Slope (%) :	3.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.38	0.00	0.00
Computed Flow Time (min) :	2.42	0.00	0.00

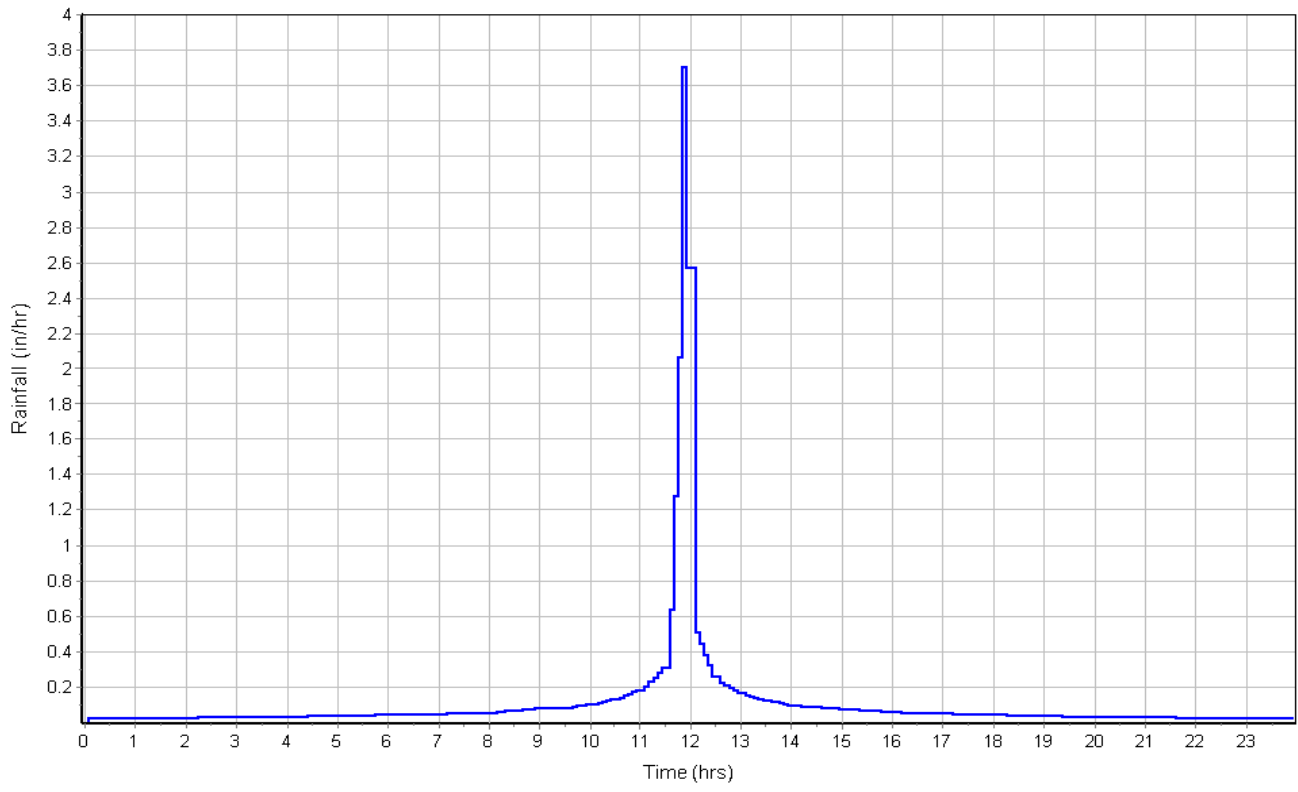
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	354	0.00	0.00
Channel Slope (%) :	3.9	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.68	0.00	0.00
Computed Flow Time (min) :	0.51	0.00	0.00
Total TOC (min)	23.98		

Subbasin Runoff Results

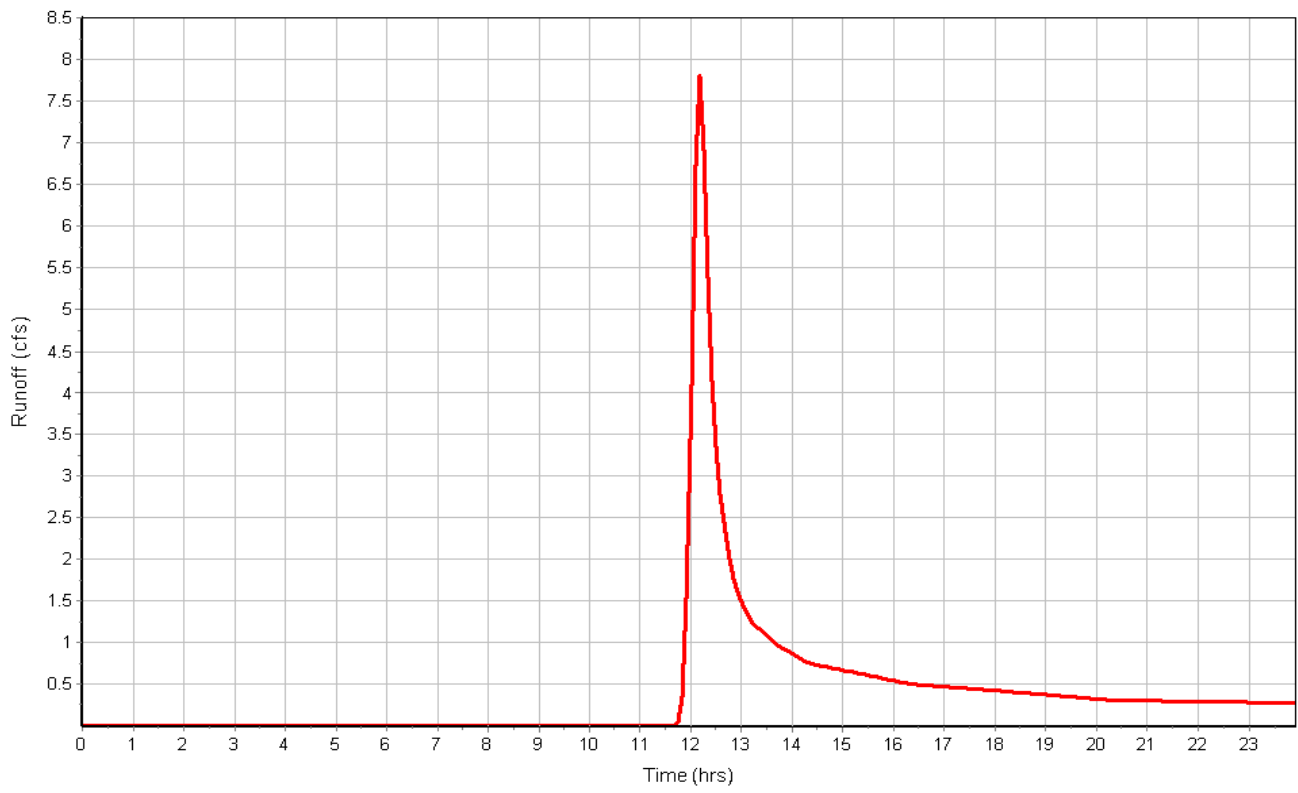
Total Rainfall (in) 2.70
 Total Runoff (in) 0.54
 Peak Runoff (cfs) 7.82
 Weighted Curve Number 69.60
 Time of Concentration (days hh:mm:ss) 0 00:23:59

Subbasin : K1

Rainfall Intensity Graph



Runoff Hydrograph



Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft ²)	Minimum Pipe Cover (ft)
1	Jun-A1	7340.00	7346.00	6.00	7340.00	0.00	7346.00	0.00	0.00	0.00
2	Jun-A2	7393.00	7399.00	6.00	7393.00	0.00	7399.00	0.00	0.00	0.00
3	Jun-B1	7385.00	7391.00	6.00	7385.00	0.00	7391.00	0.00	0.00	0.00
4	Jun-B2-1	7375.00	7381.00	6.00	7375.00	0.00	7381.00	0.00	0.00	0.00
5	Jun-B2-2	7371.00	7377.00	6.00	7371.00	0.00	7377.00	0.00	0.00	0.00
6	Jun-B3	7334.00	7340.00	6.00	7334.00	0.00	7340.00	0.00	0.00	0.00
7	Jun-BOX1-1	7318.50	7324.50	6.00	7318.50	0.00	7324.50	0.00	0.00	0.00
8	Jun-BOX1-2	7318.00	7324.00	6.00	7318.00	0.00	7324.00	0.00	0.00	0.00
9	Jun-BOX2-1	7280.00	7286.00	6.00	7280.00	0.00	7286.00	0.00	0.00	0.00
10	Jun-BOX2-2	7279.50	7285.50	6.00	7279.50	0.00	7285.50	0.00	0.00	0.00
11	Jun-C0-2	7379.00	7385.00	6.00	7379.00	0.00	7385.00	0.00	0.00	0.00
12	Jun-C1-1	7363.00	7369.00	6.00	7363.00	0.00	7369.00	0.00	0.00	0.00
13	Jun-C1-2	7360.00	7366.00	6.00	7360.00	0.00	7366.00	0.00	0.00	0.00
14	Jun-C2-1	7341.00	7347.00	6.00	7341.00	0.00	7347.00	0.00	0.00	0.00
15	Jun-C2-2	7337.00	7343.00	6.00	7337.00	0.00	7343.00	0.00	0.00	0.00
16	Jun-C4	7310.00	7316.00	6.00	7310.00	0.00	7316.00	0.00	0.00	0.00
17	Jun-D1.1-2	7385.00	7391.00	6.00	7385.00	0.00	7391.00	0.00	0.00	0.00
18	Jun-D1.2-2	7412.00	7418.00	6.00	7412.00	0.00	7418.00	0.00	0.00	0.00
19	Jun-D1-1	7329.00	7335.00	6.00	7329.00	0.00	7335.00	0.00	0.00	0.00
20	Jun-D1-2	7328.00	7334.00	6.00	7328.00	0.00	7334.00	0.00	0.00	0.00
21	Jun-D3-1	7372.00	7378.00	6.00	7372.00	0.00	7378.00	0.00	0.00	0.00
22	Jun-D3-2	7370.00	7376.00	6.00	7370.00	0.00	7376.00	0.00	0.00	0.00
23	Jun-D4-1	7337.50	7343.50	6.00	7337.50	0.00	7343.50	0.00	0.00	0.00
24	Jun-D4-2	7337.00	7343.00	6.00	7337.00	0.00	7343.00	0.00	0.00	0.00
25	Jun-D5	7300.00	7306.00	6.00	7300.00	0.00	7306.00	0.00	0.00	0.00
26	Jun-D6	7287.00	7293.00	6.00	7287.00	0.00	7293.00	0.00	0.00	0.00
27	Jun-E0-2	7417.00	7423.00	6.00	7417.00	0.00	7423.00	0.00	0.00	0.00
28	Jun-E1.1	7400.00	7406.00	6.00	7400.00	0.00	7406.00	0.00	0.00	0.00
29	Jun-E1.2-1	7381.00	7387.00	6.00	7381.00	0.00	7387.00	0.00	0.00	0.00
30	Jun-E1.2-2	7380.00	7386.00	6.00	7380.00	0.00	7386.00	0.00	0.00	0.00
31	Jun-E2-1	7401.00	7407.00	6.00	7401.00	0.00	7407.00	0.00	0.00	0.00
32	Jun-E2-2	7399.00	7405.00	6.00	7399.00	0.00	7405.00	0.00	0.00	0.00
33	Jun-E3-1	7369.00	7375.00	6.00	7369.00	0.00	7375.00	0.00	0.00	0.00
34	Jun-E3-2	7367.50	7373.50	6.00	7367.50	0.00	7373.50	0.00	0.00	0.00
35	Jun-E4-1	7337.00	7343.00	6.00	7337.00	0.00	7343.00	0.00	0.00	0.00
36	Jun-E4-2	7336.00	7342.00	6.00	7336.00	0.00	7342.00	0.00	0.00	0.00
37	Jun-E5-1	7336.50	7342.50	6.00	7336.50	0.00	7342.50	0.00	0.00	0.00
38	Jun-E5-2	7333.00	7339.00	6.00	7333.00	0.00	7339.00	0.00	0.00	0.00
39	Jun-E7	7318.00	7324.00	6.00	7318.00	0.00	7324.00	0.00	0.00	0.00
40	Jun-F1	7327.00	7333.00	6.00	7327.00	0.00	7333.00	0.00	0.00	0.00
41	Jun-G1-1	7375.50	7381.50	6.00	7375.50	0.00	7381.50	0.00	0.00	0.00
42	Jun-G1-2	7373.00	7379.00	6.00	7373.00	0.00	7379.00	0.00	0.00	0.00
43	Jun-H1-1	7391.50	7397.50	6.00	7391.50	0.00	7397.50	0.00	0.00	0.00
44	Jun-H1-2	7389.00	7395.00	6.00	7389.00	0.00	7395.00	0.00	0.00	0.00
45	Jun-H2-1	7334.00	7340.00	6.00	7334.00	0.00	7340.00	0.00	0.00	0.00
46	Jun-H2-2	7332.00	7338.00	6.00	7332.00	0.00	7338.00	0.00	0.00	0.00
47	Jun-H3-1	7379.50	7385.50	6.00	7379.50	0.00	7385.50	0.00	0.00	0.00
48	Jun-H3-2	7376.00	7382.00	6.00	7376.00	0.00	7382.00	0.00	0.00	0.00
49	Jun-H6	7292.00	7298.00	6.00	7292.00	0.00	7298.00	0.00	0.00	0.00
50	Jun-H8	7276.00	7282.00	6.00	7276.00	0.00	7282.00	0.00	0.00	0.00
51	Jun-H9	7300.00	7306.00	6.00	7300.00	0.00	7306.00	0.00	0.00	0.00
52	Jun-I1-1	7355.50	7361.50	6.00	7355.50	0.00	7361.50	0.00	0.00	0.00
53	Jun-I1-2	7354.50	7360.50	6.00	7354.50	0.00	7360.50	0.00	0.00	0.00
54	Jun-I2	7319.00	7325.00	6.00	7319.00	0.00	7325.00	0.00	0.00	0.00
55	Jun-J1	7357.00	7363.00	6.00	7357.00	0.00	7363.00	0.00	0.00	0.00
56	Jun-K1	7313.00	7319.00	6.00	7313.00	0.00	7319.00	0.00	0.00	0.00

Junction Results

SN	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation	Max HGL Depth Attained	Max Surge Depth Attained	Min Freeboard Attained	Average HGL Elevation	Average HGL Depth Attained	Time of Max HGL Occurrence	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
		(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(days hh:mm)	(days hh:mm)	(ac-in)	(min)
1	Jun-A1	57.58	57.58	7340.76	0.76	0.00	9.24	7340.18	0.18	0 12:50	0 00:00	0.00	0.00
2	Jun-A2	7.90	7.90	7393.14	0.14	0.00	9.86	7393.02	0.02	0 12:25	0 00:00	0.00	0.00
3	Jun-B1	206.85	206.85	7386.34	1.34	0.00	8.66	7385.36	0.36	0 13:10	0 00:00	0.00	0.00
4	Jun-B2-1	2.73	2.73	7375.31	0.31	0.00	5.69	7375.06	0.06	0 12:15	0 00:00	0.00	0.00
5	Jun-B2-2	2.73	0.00	7371.31	0.31	0.00	9.69	7371.05	0.05	0 12:15	0 00:00	0.00	0.00
6	Jun-B3	210.17	10.07	7335.79	1.79	0.00	8.21	7334.48	0.48	0 13:12	0 00:00	0.00	0.00
7	Jun-BOX1-1	279.04	37.37	7320.29	1.79	0.00	8.21	7318.98	0.48	0 13:18	0 00:00	0.00	0.00
8	Jun-BOX1-2	279.03	0.00	7320.05	2.05	0.00	7.95	7318.56	0.56	0 13:10	0 00:00	0.00	0.00
9	Jun-BOX2-1	324.39	10.47	7282.19	2.19	0.00	7.81	7280.60	0.60	0 13:18	0 00:00	0.00	0.00
10	Jun-BOX2-2	324.38	0.00	7281.66	2.16	0.00	7.84	7280.09	0.59	0 13:18	0 00:00	0.00	0.00
11	Jun-C0-2	12.86	0.00	7380.02	1.02	0.00	8.98	7379.23	0.23	0 12:30	0 00:00	0.00	0.00
12	Jun-C1-1	15.88	3.97	7363.63	0.63	0.00	9.37	7363.15	0.15	0 12:32	0 00:00	0.00	0.00
13	Jun-C1-2	15.88	0.00	7360.63	0.63	0.00	9.37	7360.15	0.15	0 12:32	0 00:00	0.00	0.00
14	Jun-C2-1	17.72	3.12	7341.62	0.62	0.00	9.38	7341.15	0.15	0 12:35	0 00:00	0.00	0.00
15	Jun-C2-2	17.72	0.00	7337.62	0.62	0.00	9.38	7337.15	0.15	0 12:35	0 00:00	0.00	0.00
16	Jun-C4	292.22	4.16	7312.10	2.10	0.00	7.90	7310.57	0.57	0 13:12	0 00:00	0.00	0.00
17	Jun-D1.1-2	12.78	0.00	7385.75	0.75	0.00	9.25	7385.18	0.18	0 12:30	0 00:00	0.00	0.00
18	Jun-D1.2-2	3.60	0.00	7412.49	0.49	0.00	9.51	7412.12	0.12	0 12:35	0 00:00	0.00	0.00
19	Jun-D1-1	22.37	12.95	7329.87	0.87	0.00	9.13	7329.20	0.20	0 12:33	0 00:00	0.00	0.00
20	Jun-D1-2	22.37	0.00	7328.87	0.87	0.00	9.13	7328.20	0.20	0 12:33	0 00:00	0.00	0.00
21	Jun-D3-1	8.66	6.39	7372.52	0.52	0.00	9.48	7372.13	0.13	0 12:36	0 00:00	0.00	0.00
22	Jun-D3-2	8.66	0.00	7370.52	0.52	0.00	9.48	7370.13	0.13	0 12:36	0 00:00	0.00	0.00
23	Jun-D4-1	12.42	6.32	7338.30	0.80	0.00	9.20	7337.69	0.19	0 12:37	0 00:00	0.00	0.00
24	Jun-D4-2	12.42	0.00	7337.80	0.80	0.00	9.20	7337.19	0.19	0 12:37	0 00:00	0.00	0.00
25	Jun-D5	308.24	15.31	7302.10	2.10	0.00	7.90	7300.58	0.58	0 13:15	0 00:00	0.00	0.00
26	Jun-D6	8.69	0.00	7287.20	0.20	0.00	9.80	7287.06	0.06	0 13:28	0 00:00	0.00	0.00
27	Jun-E0-2	3.00	0.00	7417.35	0.35	0.00	9.65	7417.09	0.09	0 12:30	0 00:00	0.00	0.00
28	Jun-E1-1	2.34	0.00	7400.42	0.42	0.00	5.58	7400.14	0.14	0 14:21	0 00:00	0.00	0.00
29	Jun-E1.2-1	2.81	1.91	7381.42	0.42	0.00	5.58	7381.15	0.15	0 14:25	0 00:00	0.00	0.00
30	Jun-E1.2-2	2.81	0.00	7380.38	0.38	0.00	9.62	7380.14	0.14	0 14:17	0 00:00	0.00	0.00
31	Jun-E2-1	0.58	0.58	7401.17	0.17	0.00	5.83	7401.03	0.03	0 12:13	0 00:00	0.00	0.00
32	Jun-E2-2	0.58	0.00	7399.17	0.17	0.00	9.83	7399.03	0.03	0 12:15	0 00:00	0.00	0.00
33	Jun-E3-1	4.14	3.92	7369.44	0.44	0.00	9.56	7369.08	0.08	0 12:20	0 00:00	0.00	0.00
34	Jun-E3-2	4.14	0.00	7367.94	0.44	0.00	9.56	7367.58	0.08	0 12:20	0 00:00	0.00	0.00
35	Jun-E4-1	6.72	3.55	7337.54	0.54	0.00	9.46	7337.11	0.11	0 12:25	0 00:00	0.00	0.00
36	Jun-E4-2	6.72	0.00	7336.54	0.54	0.00	9.46	7336.11	0.11	0 12:27	0 00:00	0.00	0.00
37	Jun-E5-1	2.68	2.68	7336.82	0.32	0.00	5.68	7336.56	0.06	0 12:20	0 00:00	0.00	0.00
38	Jun-E5-2	2.68	0.00	7333.32	0.32	0.00	9.68	7333.06	0.06	0 12:20	0 00:00	0.00	0.00
39	Jun-E7	9.46	1.47	7318.25	0.25	0.00	9.75	7318.08	0.08	0 12:40	0 00:00	0.00	0.00
40	Jun-F1	5.43	3.77	7327.26	0.26	0.00	9.74	7327.08	0.08	0 12:32	0 00:00	0.00	0.00
41	Jun-G1-1	6.63	6.63	7375.99	0.49	0.00	5.51	7375.58	0.08	0 12:20	0 00:00	0.00	0.00
42	Jun-G1-2	6.62	0.00	7373.49	0.49	0.00	9.51	7373.08	0.08	0 12:20	0 00:00	0.00	0.00
43	Jun-H1-1	6.32	6.32	7392.03	0.53	0.00	5.47	7391.58	0.08	0 12:15	0 00:00	0.00	0.00
44	Jun-H1-2	6.31	0.00	7389.53	0.53	0.00	9.47	7389.08	0.08	0 12:15	0 00:00	0.00	0.00
45	Jun-H2-1	10.49	10.49	7334.61	0.61	0.00	5.39	7334.11	0.11	0 12:20	0 00:00	0.00	0.00
46	Jun-H2-2	10.48	0.00	7332.61	0.61	0.00	9.39	7332.11	0.11	0 12:20	0 00:00	0.00	0.00
47	Jun-H3-1	1.66	1.66	7379.75	0.25	0.00	5.75	7379.54	0.04	0 12:15	0 00:00	0.00	0.00
48	Jun-H3-2	1.67	0.00	7376.25	0.25	0.00	9.75	7376.04	0.04	0 12:15	0 00:00	0.00	0.00
49	Jun-H6	313.58	0.00	7294.19	2.19	0.00	7.81	7292.60	0.60	0 13:14	0 00:00	0.00	0.00
50	Jun-H8	330.65	5.61	7278.16	2.16	0.00	7.84	7276.59	0.59	0 13:19	0 00:00	0.00	0.00
51	Jun-H9	9.23	0.00	7300.04	0.04	0.00	9.96	7300.01	0.01	0 12:30	0 00:00	0.00	0.00
52	Jun-I1-1	3.77	3.77	7356.02	0.52	0.00	5.48	7355.57	0.07	0 12:15	0 00:00	0.00	0.00
53	Jun-I1-2	3.76	0.00	7355.02	0.52	0.00	9.48	7354.57	0.07	0 12:15	0 00:00	0.00	0.00
54	Jun-I2	11.82	8.27	7319.24	0.24	0.00	9.76	7319.03	0.03	0 12:15	0 00:00	0.00	0.00
55	Jun-J1	1.05	1.05	7357.00	0.00	0.00	6.00	7357.00	0.00	0 00:00	0 00:00	0.00	0.00
56	Jun-K1	7.81	7.81	7313.00	0.00	0.00	6.00	7313.00	0.00	0 00:00	0 00:00	0.00	0.00

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Shape Slope (%)	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flap Flow Gate (cfs)
1	Conveyance-1	866.29	7318.00	0.00	7310.00	0.00	8.00	0.9200 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
2	Conveyance-2	1071.31	7310.00	0.00	7300.00	0.00	10.00	0.9300 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
3	Conveyance-3	736.36	7300.00	0.00	7292.00	0.00	8.00	1.0900 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
4	Conveyance-4	1308.67	7292.00	0.00	7280.00	0.00	12.00	0.9200 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
5	Conveyance-5	340.25	7279.50	0.00	7276.00	0.00	3.50	1.0300 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
6	Link-A1	1609.87	7340.00	0.00	7318.50	0.00	21.50	1.3400 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
7	Link-A2	991.55	7393.00	0.00	7318.50	0.00	74.50	7.5100 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
8	Link-B1	2137.84	7385.00	0.00	7334.00	0.00	51.00	2.3900 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
9	Link-B2	1548.66	7371.00	0.00	7318.50	0.00	52.50	3.3900 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
10	Link-B3	1801.86	7334.00	0.00	7318.50	0.00	15.50	0.8600 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
11	Link-B4-3	155.46	7337.00	0.00	7318.50	0.00	18.50	11.9000 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
12	Link-C1	799.51	7379.00	0.00	7363.00	0.00	16.00	2.0000 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
13	Link-C2	861.57	7360.00	0.00	7341.00	0.00	19.00	2.2100 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
14	Link-D1.1	1827.50	7385.00	0.00	7329.00	0.00	56.00	3.0600 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
15	Link-D3	1312.44	7412.00	0.00	7372.00	0.00	40.00	3.0500 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
16	Link-D4	1169.72	7370.00	0.00	7337.50	0.00	32.50	2.7800 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
17	Link-D5	1270.02	7328.00	0.00	7300.00	0.00	28.00	2.2000 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
18	Link-D6	1418.47	7337.00	0.00	7289.00	0.00	48.00	3.3800 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
19	Link-E1.1	1328.59	7417.00	0.00	7400.00	0.00	17.00	1.2800 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
20	Link-E1.2	791.59	7400.00	0.00	7381.00	0.00	19.00	2.4000 Trapezoidal	2.500	18.500	0.0400	0.5000	0.5000	0.0000	0.00 No
21	Link-E3	974.31	7399.00	0.00	7369.00	0.00	30.00	3.0800 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
22	Link-E4	1141.92	7367.50	0.00	7337.00	0.00	30.50	2.6700 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
23	Link-E6	858.58	7333.00	0.00	7289.00	0.00	44.00	5.1200 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
24	Link-E6-2	1915.96	7318.00	0.00	7289.00	0.00	29.00	1.5100 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
25	Link-E7	712.94	7336.00	0.00	7318.00	0.00	18.00	2.5200 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
26	Link-F1	1032.69	7380.00	0.00	7327.00	0.00	53.00	5.1300 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
27	Link-F1-2	1886.42	7327.00	0.00	7318.00	0.00	9.00	0.4800 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
28	Link-G2	1241.36	7373.00	0.00	7311.00	0.00	62.00	4.9900 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
29	Link-H4	1249.62	7389.00	0.00	7311.00	0.00	78.00	6.2400 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
30	Link-H6	586.28	7332.00	0.00	7297.00	0.00	35.00	5.9700 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
31	Link-H7-1	1205.71	7376.00	0.00	7280.00	0.00	96.00	7.9600 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
32	Link-H9	633.71	7319.00	0.00	7301.00	0.00	18.00	2.8400 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
33	Link-I2-1	461.48	7354.50	0.00	7319.00	0.00	35.50	7.6900 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
34	Link-Out-1	1089.60	7276.00	0.00	0.00	0.00	7276.00	667.7700 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
35	Link-Out-2	865.85	7300.00	0.00	0.00	0.00	7300.00	843.1000 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
36	Link-P3	264.79	7287.00	0.00	7280.00	0.00	7.00	2.6400 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
37	OverTop-C1	118.65	7382.00	0.00	7379.00	0.00	3.00	2.5300 Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00 No
38	OverTop-D1.1	192.86	7388.00	0.00	7385.00	0.00	3.00	1.5600 Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00 No
39	OverTop-D1.2	163.53	7416.00	0.00	7412.00	0.00	4.00	2.4500 Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00 No
40	OverTop-E0	115.35	7420.00	0.00	7417.00	0.00	3.00	2.6000 Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00 No

Channel Results

SN Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1 Conveyance-1	278.92	0 13:13	6959.03	0.04	4.82	3.00	2.05	0.21	0.00		0.00
2 Conveyance-2	292.13	0 13:15	6996.45	0.04	4.91	3.64	2.10	0.21	0.00		0.00
3 Conveyance-3	308.17	0 13:14	7548.06	0.04	5.26	2.33	2.07	0.21	0.00		0.00
4 Conveyance-4	313.39	0 13:18	6934.43	0.05	4.98	4.38	2.19	0.22	0.00		0.00
5 Conveyance-5	324.38	0 13:19	7344.64	0.04	5.24	1.08	2.16	0.22	0.00		0.00
6 Link-A1	57.42	0 12:52	8368.72	0.01	3.31	8.11	0.76	0.08	0.00		0.00
7 Link-A2	7.75	0 12:30	19849.80	0.00	2.73	6.05	0.14	0.01	0.00		0.00
8 Link-B1	206.34	0 13:13	11184.92	0.02	6.11	5.83	1.34	0.13	0.00		0.00
9 Link-B2	2.22	0 12:30	13333.28	0.00	1.40	18.44	0.08	0.01	0.00		0.00
10 Link-B3	209.83	0 13:18	6716.46	0.03	4.33	6.94	1.79	0.18	0.00		0.00
11 Link-B4-3	17.72	0 12:35	24981.12	0.00	4.26	0.61	0.20	0.02	0.00		0.00
12 Link-C1	12.68	0 12:36	10244.33	0.00	2.19	6.08	0.28	0.03	0.00		0.00
13 Link-C2	15.71	0 12:37	10753.92	0.00	2.44	5.89	0.31	0.03	0.00		0.00
14 Link-D1.1	12.22	0 12:39	12676.54	0.00	2.49	12.23	0.24	0.02	0.00		0.00
15 Link-D3	3.45	0 12:46	12642.29	0.00	1.53	14.30	0.11	0.01	0.00		0.00
16 Link-D4	8.53	0 12:43	12070.80	0.00	2.08	9.37	0.20	0.02	0.00		0.00
17 Link-D5	22.11	0 12:39	10752.49	0.00	2.77	7.64	0.37	0.04	0.00		0.00
18 Link-D6	12.31	0 12:43	13321.28	0.00	2.54	9.31	0.23	0.02	0.00		0.00
19 Link-E1.1	2.64	0 12:45	8191.52	0.00	1.07	20.69	0.12	0.01	0.00		0.00
20 Link-E1.2	2.34	0 14:25	164.41	0.01	2.30	5.74	0.41	0.17	0.00		0.00
21 Link-E3	0.42	0 12:30	12707.13	0.00	0.71	22.87	0.03	0.00	0.00		0.00
22 Link-E4	3.76	0 12:30	11834.98	0.00	1.55	12.28	0.12	0.01	0.00		0.00
23 Link-E6	2.52	0 12:26	16393.49	0.00	1.61	8.89	0.08	0.01	0.00		0.00
24 Link-E6-2	9.10	0 12:55	8909.25	0.00	1.79	17.84	0.25	0.02	0.00		0.00
25 Link-E7	6.61	0 12:31	11506.55	0.00	1.85	6.42	0.18	0.02	0.00		0.00
26 Link-F1	2.81	0 14:24	16405.46	0.00	1.62	10.62	0.09	0.01	0.00		0.00
27 Link-F1-2	4.23	0 12:56	5001.93	0.00	0.94	33.45	0.22	0.02	0.00		0.00
28 Link-G2	6.29	0 12:23	16183.87	0.00	2.28	9.07	0.14	0.01	0.00		0.00
29 Link-H4	6.01	0 12:22	18092.30	0.00	2.40	8.68	0.13	0.01	0.00		0.00
30 Link-H6	10.39	0 12:26	17693.63	0.00	2.84	3.44	0.18	0.02	0.00		0.00
31 Link-H7-1	1.43	0 12:25	20433.82	0.00	1.52	13.22	0.05	0.00	0.00		0.00
32 Link-H9	11.58	0 12:18	12204.68	0.00	2.36	4.48	0.23	0.02	0.00		0.00
33 Link-I2-1	3.69	0 12:17	20085.06	0.00	2.06	3.73	0.09	0.01	0.00		0.00
34 Link-Out-1	330.65	0 13:19	187132.04	0.00	45.05	0.40	0.34	0.03	0.00		0.00
35 Link-Out-2	9.23	0 12:31	210269.10	0.00	12.11	1.19	0.04	0.00	0.00		0.00
36 Link-P3	8.69	0 13:30	11774.26	0.00	2.04	2.16	0.20	0.02	0.00		0.00
37 OverTop-C1	0.00	0 00:00	236.68	0.00	0.00		0.00	0.00	0.00		0.00
38 OverTop-D1.1	0.00	0 00:00	185.64	0.00	0.00		0.00	0.00	0.00		0.00
39 OverTop-D1.2	0.00	0 00:00	232.79	0.00	0.00		0.00	0.00	0.00		0.00
40 OverTop-E0	0.00	0 00:00	240.05	0.00	0.00		0.00	0.00	0.00		0.00

Pipe Input

SN Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Pipe Slope (%)	Pipe Shape	Pipe Diameter or Height (ft)	Pipe Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1 BoxCulv-1	100.00	7318.50	0.00	7318.00	0.00	0.50	0.5000	Rectangular	6.000	16.000	0.0120	0.5000	0.5000	0.0000	0.00	No	2
2 BoxCulv-2	100.00	7280.00	0.00	7279.50	0.00	0.50	0.5000	Rectangular	6.000	16.000	0.0120	0.5000	0.5000	0.0000	0.00	No	2
3 Culv-B2	60.00	7375.00	0.00	7371.00	0.00	4.00	6.6700	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
4 Culv-C2	60.00	7363.00	0.00	7360.00	0.00	3.00	5.0000	CIRCULAR	3.000	3.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
5 Culv-C3	60.00	7341.00	0.00	7337.00	0.00	4.00	6.6700	CIRCULAR	3.000	3.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
6 Culv-D2	60.00	7329.00	0.00	7328.00	0.00	1.00	1.6700	CIRCULAR	4.500	4.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
7 Culv-D3	60.00	7372.00	0.00	7370.00	0.00	2.00	3.3300	CIRCULAR	3.000	3.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
8 Culv-D4	60.00	7337.50	0.00	7337.00	0.00	0.50	0.8300	CIRCULAR	4.000	4.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
9 Culv-E1.2	60.00	7381.00	0.00	7380.00	0.00	1.00	1.6700	CIRCULAR	2.500	2.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
10 Culv-E2	60.00	7401.00	0.00	7399.00	0.00	2.00	3.3300	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
11 Culv-E3	60.00	7369.00	0.00	7367.50	0.00	1.50	2.5000	CIRCULAR	2.000	2.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
12 Culv-E4	60.00	7337.00	0.00	7336.00	0.00	1.00	1.6700	CIRCULAR	3.000	3.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
13 Culv-E5	60.00	7336.50	0.00	7333.00	0.00	3.50	5.8300	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
14 Culv-G1	60.00	7375.50	0.00	7373.00	0.00	2.50	4.1700	CIRCULAR	2.000	2.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
15 Culv-H1	60.00	7391.50	0.00	7389.00	0.00	2.50	4.1700	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
16 Culv-H2	60.00	7334.00	0.00	7332.00	0.00	2.00	3.3300	CIRCULAR	2.500	2.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
17 Culv-H3	60.00	7379.50	0.00	7376.00	0.00	3.50	5.8300	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
18 Culv-I1	60.00	7355.50	0.00	7354.50	0.00	1.00	1.6700	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
19 ExCulv-C1	100.00	7382.00	0.00	7379.00	0.00	3.00	3.0000	CIRCULAR	2.500	2.500	0.0250	0.5000	0.5000	0.0000	0.00	No	1
20 ExCulv-D1.1	100.00	7388.00	0.00	7385.00	0.00	3.00	3.0000	CIRCULAR	6.000	6.000	0.0250	0.5000	0.5000	0.0000	0.00	No	1
21 ExCulv-D1.2	100.00	7416.00	0.00	7412.00	0.00	4.00	4.0000	CIRCULAR	2.500	2.500	0.0250	0.5000	0.5000	0.0000	0.00	No	1
22 ExCulv-E0	125.00	7420.00	0.00	7417.00	0.00	3.00	2.4000	CIRCULAR	2.500	2.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1 BoxCulv-1	279.03	0 13:10	2828.15	0.10	8.32	0.20	1.05	0.17	0.00		Calculated
2 BoxCulv-2	324.38	0 13:18	2828.15	0.11	8.80	0.19	1.15	0.19	0.00		Calculated
3 Culv-B2	2.73	0 12:15	29.38	0.09	10.42	0.10	0.31	0.21	0.00		Calculated
4 Culv-C2	15.88	0 12:32	161.57	0.10	14.55	0.07	0.63	0.21	0.00		Calculated
5 Culv-C3	17.72	0 12:35	186.57	0.09	16.64	0.06	0.62	0.21	0.00		Calculated
6 Culv-D2	22.37	0 12:33	275.03	0.08	10.42	0.10	0.86	0.19	0.00		Calculated
7 Culv-D3	8.66	0 12:36	131.92	0.07	10.50	0.10	0.52	0.17	0.00		Calculated
8 Culv-D4	12.42	0 12:37	142.06	0.09	6.96	0.14	0.80	0.20	0.00		Calculated
9 Culv-E1.2	2.81	0 14:17	57.37	0.05	6.07	0.16	0.38	0.15	0.00		Calculated
10 Culv-E2	0.58	0 12:15	20.78	0.03	5.17	0.19	0.17	0.11	0.00		Calculated
11 Culv-E3	4.14	0 12:20	38.75	0.11	8.05	0.12	0.44	0.22	0.00		Calculated
12 Culv-E4	6.72	0 12:27	93.28	0.07	7.68	0.13	0.54	0.18	0.00		Calculated
13 Culv-E5	2.68	0 12:20	27.48	0.10	9.88	0.10	0.32	0.21	0.00		Calculated
14 Culv-G1	6.62	0 12:20	50.03	0.13	11.05	0.09	0.49	0.25	0.00		Calculated
15 Culv-H1	6.31	0 12:15	23.23	0.27	11.19	0.09	0.53	0.36	0.00		Calculated
16 Culv-H2	10.48	0 12:20	81.13	0.13	11.40	0.09	0.61	0.24	0.00		Calculated
17 Culv-H3	1.67	0 12:15	27.48	0.06	8.60	0.12	0.25	0.17	0.00		Calculated
18 Culv-I1	3.76	0 12:15	14.69	0.26	6.96	0.14	0.52	0.35	0.00		Calculated
19 ExCulv-C1	12.86	0 12:30	36.94	0.35	6.85	0.24	1.02	0.41	0.00		Calculated
20 ExCulv-D1.1	12.78	0 12:30	381.44	0.03	6.27	0.27	0.75	0.12	0.00		Calculated
21 ExCulv-D1.2	3.60	0 12:35	42.66	0.08	5.29	0.32	0.49	0.20	0.00		Calculated
22 ExCulv-E0	3.00	0 12:30	68.84	0.04	7.05	0.30	0.35	0.14	0.00		Calculated

Storage Nodes

Storage Node : P1

Input Data

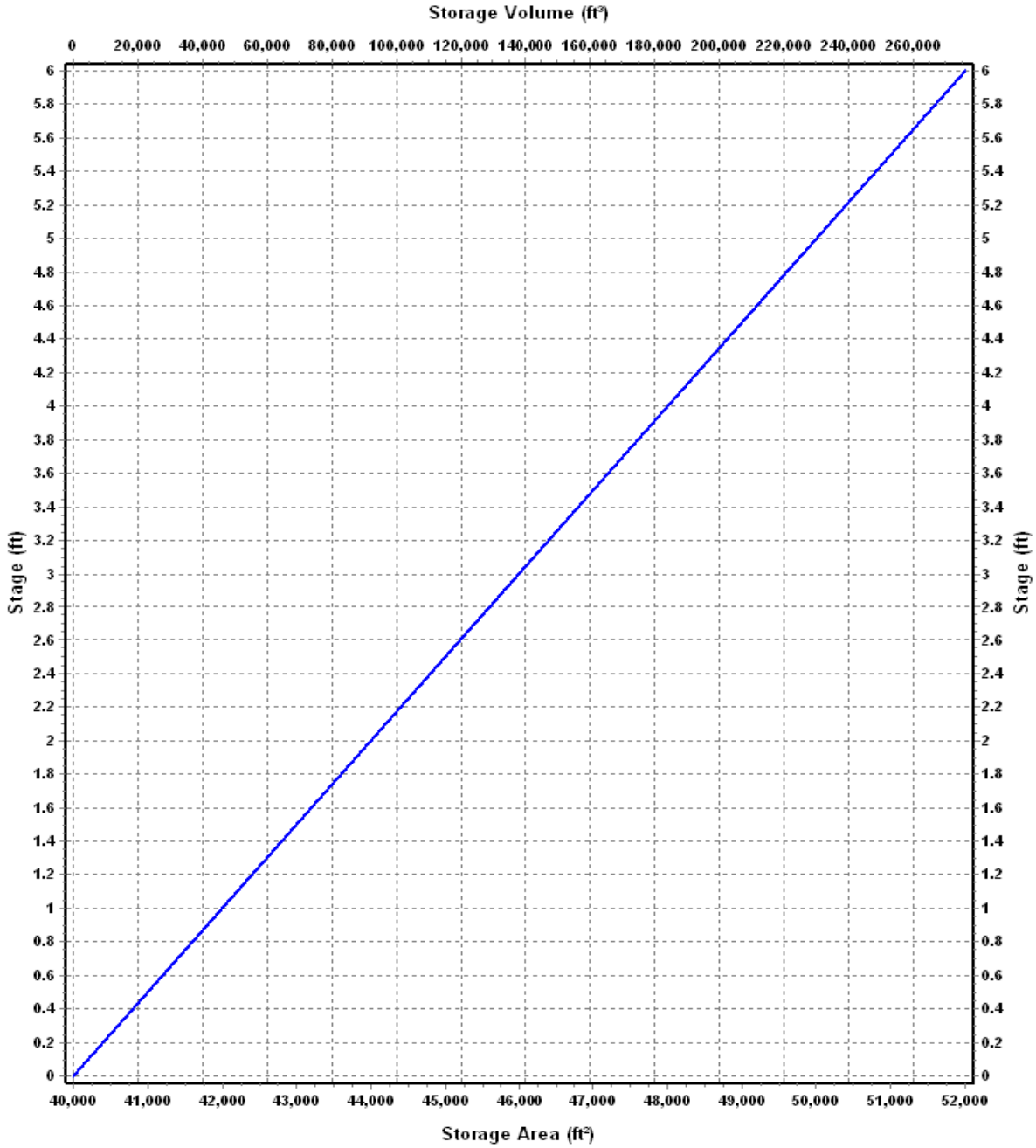
Invert Elevation (ft) 7311.00
Max (Rim) Elevation (ft) 7317.50
Max (Rim) Offset (ft) 6.50
Initial Water Elevation (ft) 7311.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

Storage Area Volume Curves

Storage Curve : P1

Stage (ft)	Storage Area (ft ²)	Storage Volume (ft ³)
0	40000	0.000
6	52000	276000.00

Storage Area Volume Curves



— Storage Area — Storage Volume

Storage Node : P1 (continued)

Outflow Orifices

SN Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1 P1	Side	CIRCULAR	No	3.00			7311.00	0.61

Output Summary Results

Peak Inflow (cfs)	35.55
Peak Lateral Inflow (cfs)	23.93
Peak Outflow (cfs)	12.19
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7312.3
Max HGL Depth Attained (ft)	1.30
Average HGL Elevation Attained (ft)	7311.29
Average HGL Depth Attained (ft)	0.29
Time of Max HGL Occurrence (days hh:mm)	0 12:57
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : P2

Input Data

Invert Elevation (ft) 7297.00
Max (Rim) Elevation (ft) 7303.50
Max (Rim) Offset (ft) 6.50
Initial Water Elevation (ft) 7297.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

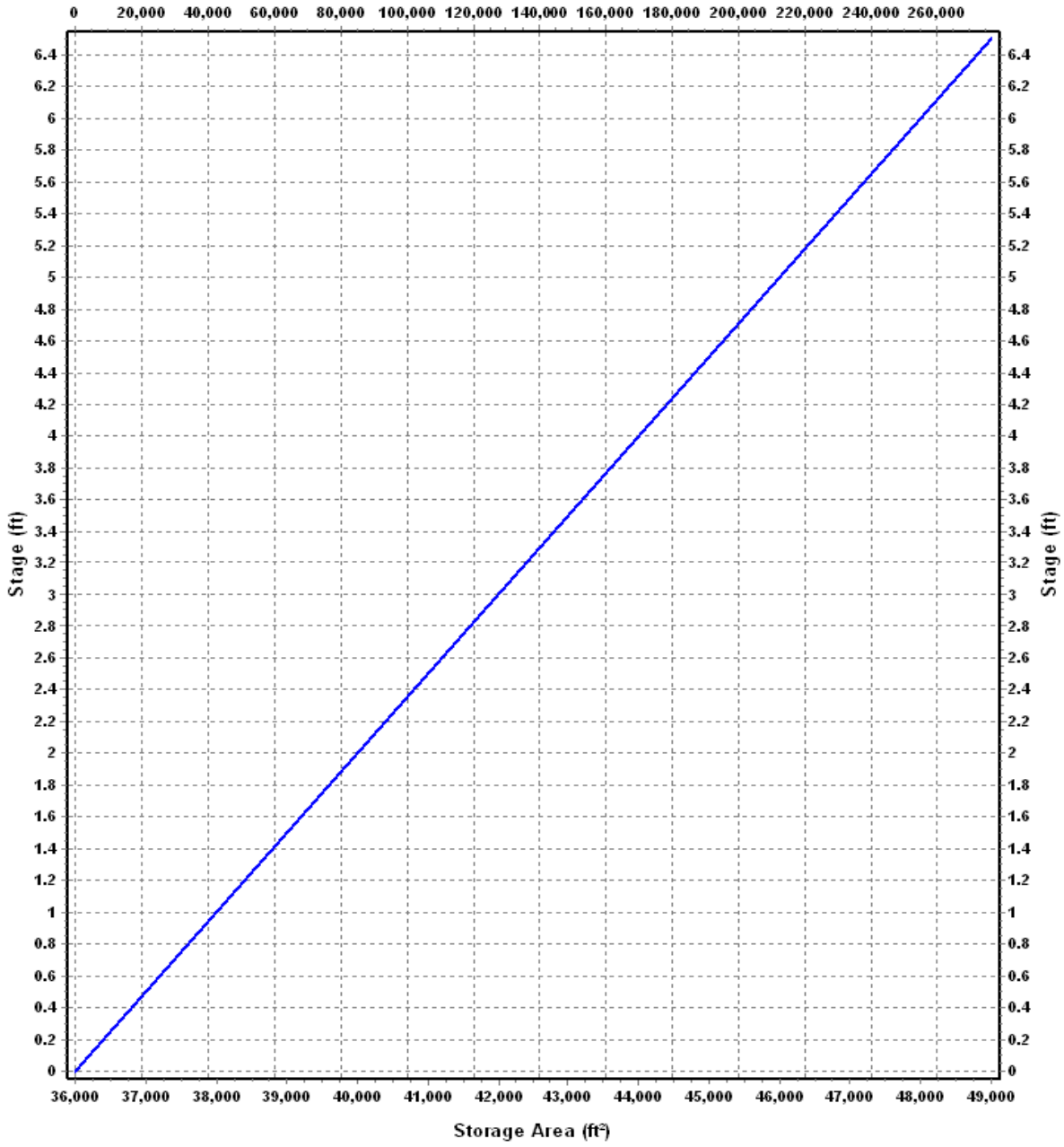
Storage Area Volume Curves

Storage Curve : P2

Stage (ft)	Storage Area (ft ²)	Storage Volume (ft ³)
0	36000	0.000
6.5	49000	276250.00

Storage Area Volume Curves

Storage Volume (ft³)



— Storage Area — Storage Volume

Storage Node : P2 (continued)

Outflow Orifices

SN Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1 P2	Side	CIRCULAR	No	2.50			7297.00	0.61

Output Summary Results

Peak Inflow (cfs)	17.89
Peak Lateral Inflow (cfs)	7.53
Peak Outflow (cfs)	5.41
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7297.86
Max HGL Depth Attained (ft)	0.86
Average HGL Elevation Attained (ft)	7297.23
Average HGL Depth Attained (ft)	0.23
Time of Max HGL Occurrence (days hh:mm)	0 13:13
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : P3

Input Data

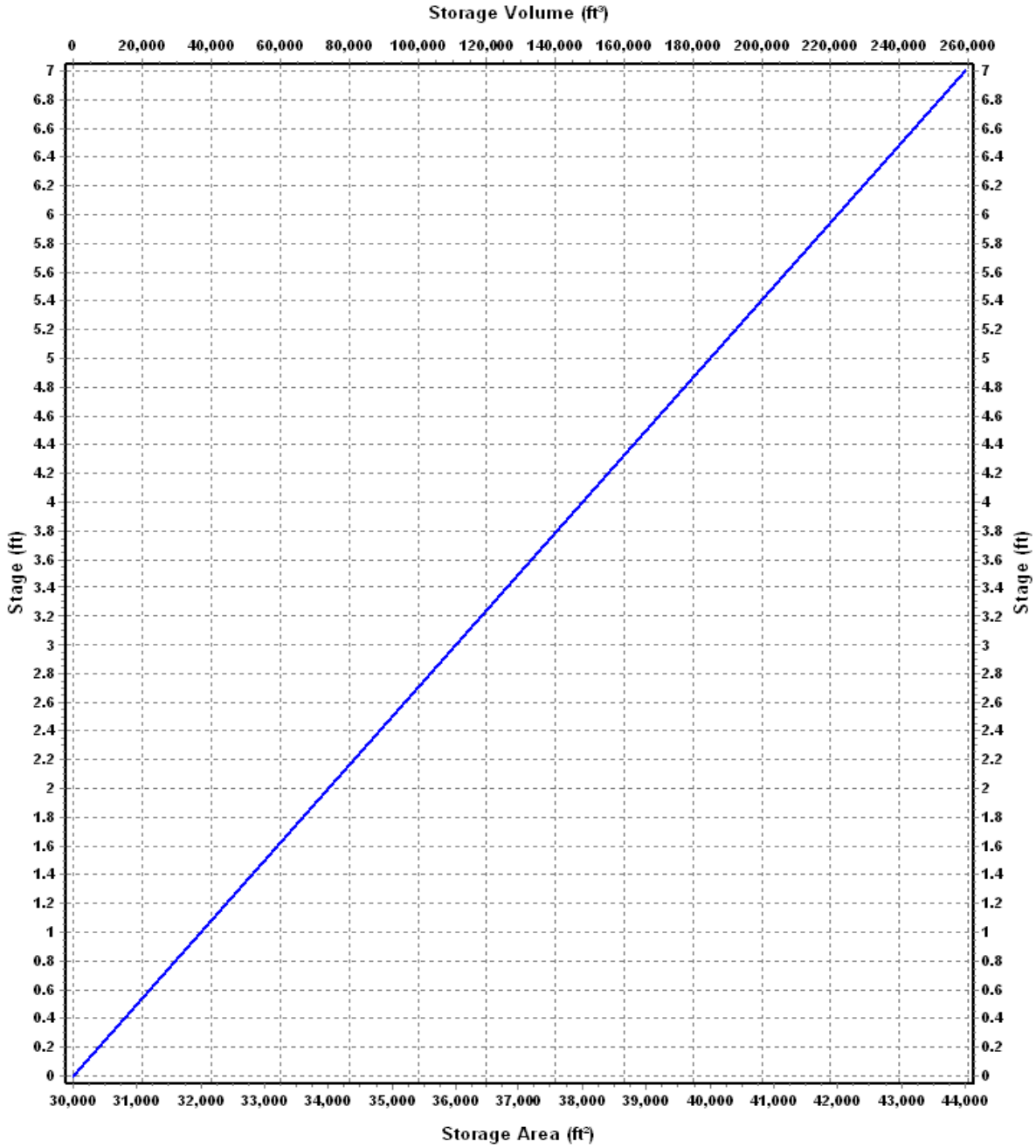
Invert Elevation (ft) 7289.00
Max (Rim) Elevation (ft) 7297.00
Max (Rim) Offset (ft) 8.00
Initial Water Elevation (ft) 7289.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

Storage Area Volume Curves

Storage Curve : P3

Stage (ft)	Storage Area (ft ²)	Storage Volume (ft ³)
0	30000	0.000
7	44000	259000.00

Storage Area Volume Curves



— Storage Area — Storage Volume

Storage Node : P3 (continued)

Outflow Orifices

SN Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1 P3	Side	CIRCULAR	No	3.00			7289.00	0.61

Output Summary Results

Peak Inflow (cfs)	16.06
Peak Lateral Inflow (cfs)	4.42
Peak Outflow (cfs)	8.69
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7290.04
Max HGL Depth Attained (ft)	1.04
Average HGL Elevation Attained (ft)	7289.28
Average HGL Depth Attained (ft)	0.28
Time of Max HGL Occurrence (days hh:mm)	0 13:28
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : P4

Input Data

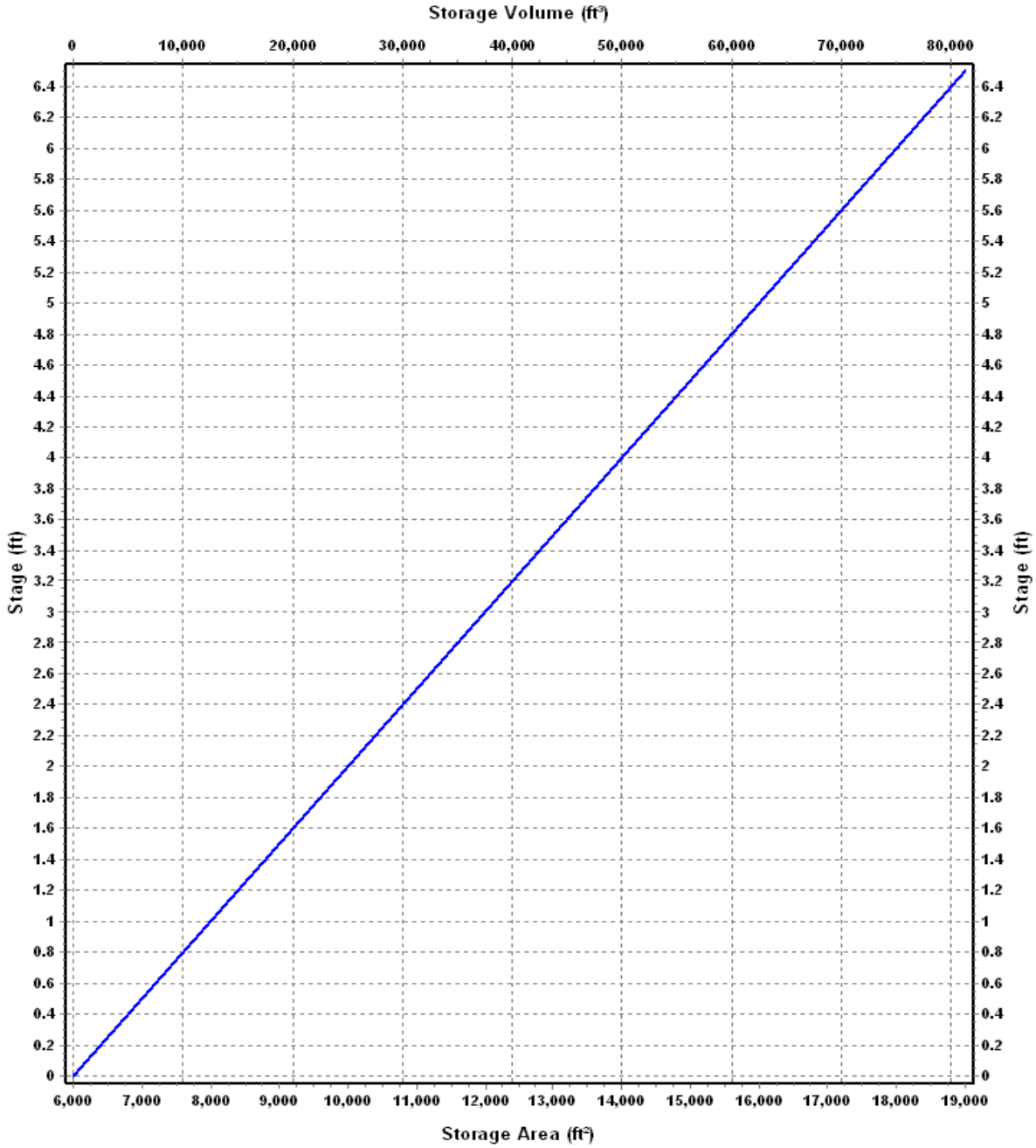
Invert Elevation (ft) 7301.00
Max (Rim) Elevation (ft) 7306.50
Max (Rim) Offset (ft) 5.50
Initial Water Elevation (ft) 7301.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

Storage Area Volume Curves

Storage Curve : P5

Stage	Storage Area	Storage Volume
(ft)	(ft ²)	(ft ³)
0	6000	0.000
6.5	19000	81250.00

Storage Area Volume Curves



— Storage Area — Storage Volume

Storage Node : P4 (continued)

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	P5	Side	CIRCULAR	No	2.00			7301.00	0.61

Output Summary Results

Peak Inflow (cfs)	14.77
Peak Lateral Inflow (cfs)	3.41
Peak Outflow (cfs)	9.23
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7302.42
Max HGL Depth Attained (ft)	1.42
Average HGL Elevation Attained (ft)	7301.19
Average HGL Depth Attained (ft)	0.19
Time of Max HGL Occurrence (days hh:mm)	0 12:30
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : P5

Input Data

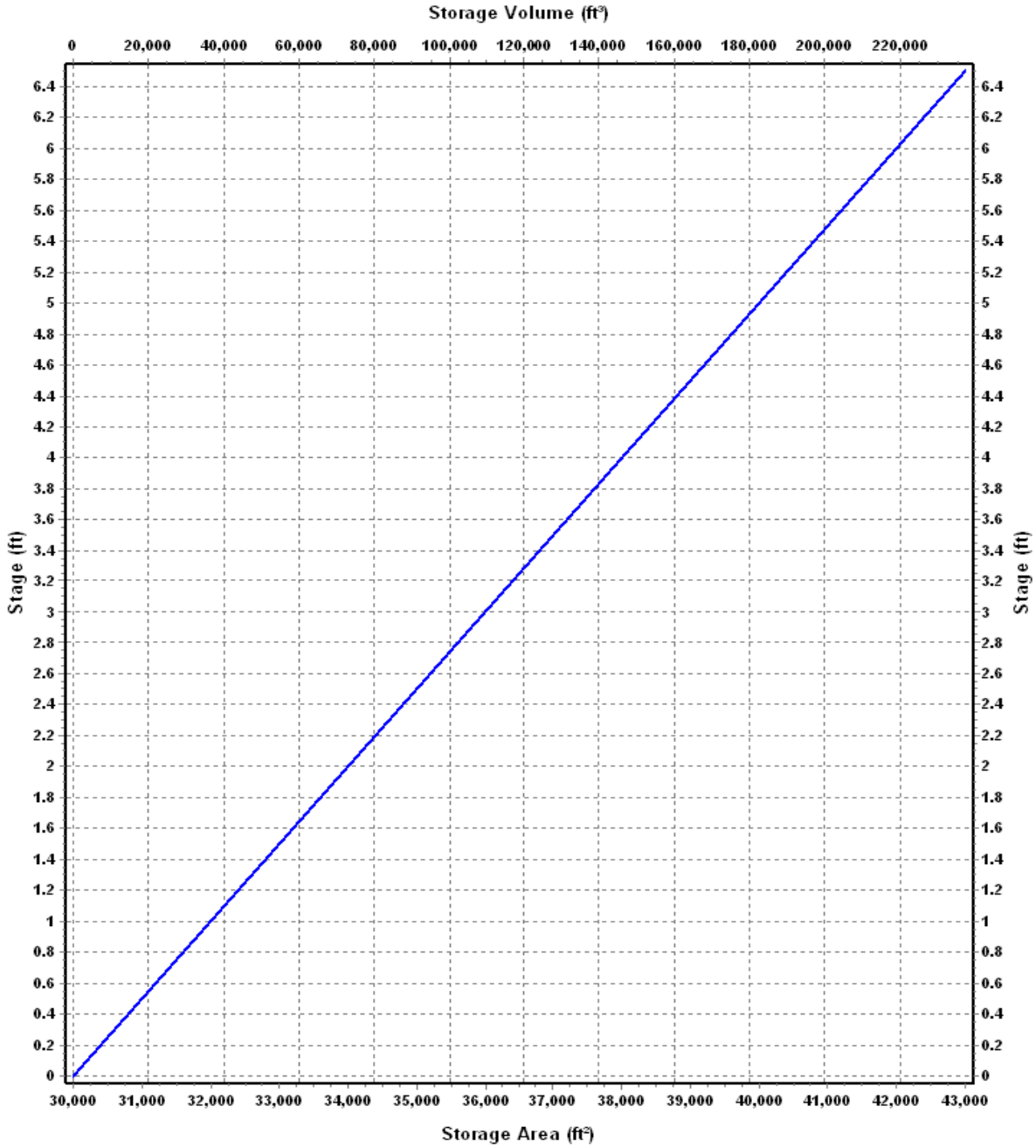
Invert Elevation (ft) 7289.00
Max (Rim) Elevation (ft) 7296.00
Max (Rim) Offset (ft) 7.00
Initial Water Elevation (ft) 7289.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

Storage Area Volume Curves

Storage Curve : P6

Stage (ft)	Storage Area (ft ²)	Storage Volume (ft ³)
0	30000	0.000
6.5	43000	237250.00

Storage Area Volume Curves



— Storage Area — Storage Volume

Storage Node : P5 (continued)

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	P6	Side	CIRCULAR	No	2.00			7289.00	0.61

Output Summary Results

Peak Inflow (cfs)	12.24
Peak Lateral Inflow (cfs)	4.31
Peak Outflow (cfs)	6.87
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7290.16
Max HGL Depth Attained (ft)	1.16
Average HGL Elevation Attained (ft)	7289.41
Average HGL Depth Attained (ft)	0.41
Time of Max HGL Occurrence (days hh:mm)	0 14:29
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : P6

Input Data

Invert Elevation (ft) 7400.00
Max (Rim) Elevation (ft) 7406.00
Max (Rim) Offset (ft) 6.00
Initial Water Elevation (ft) 7400.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

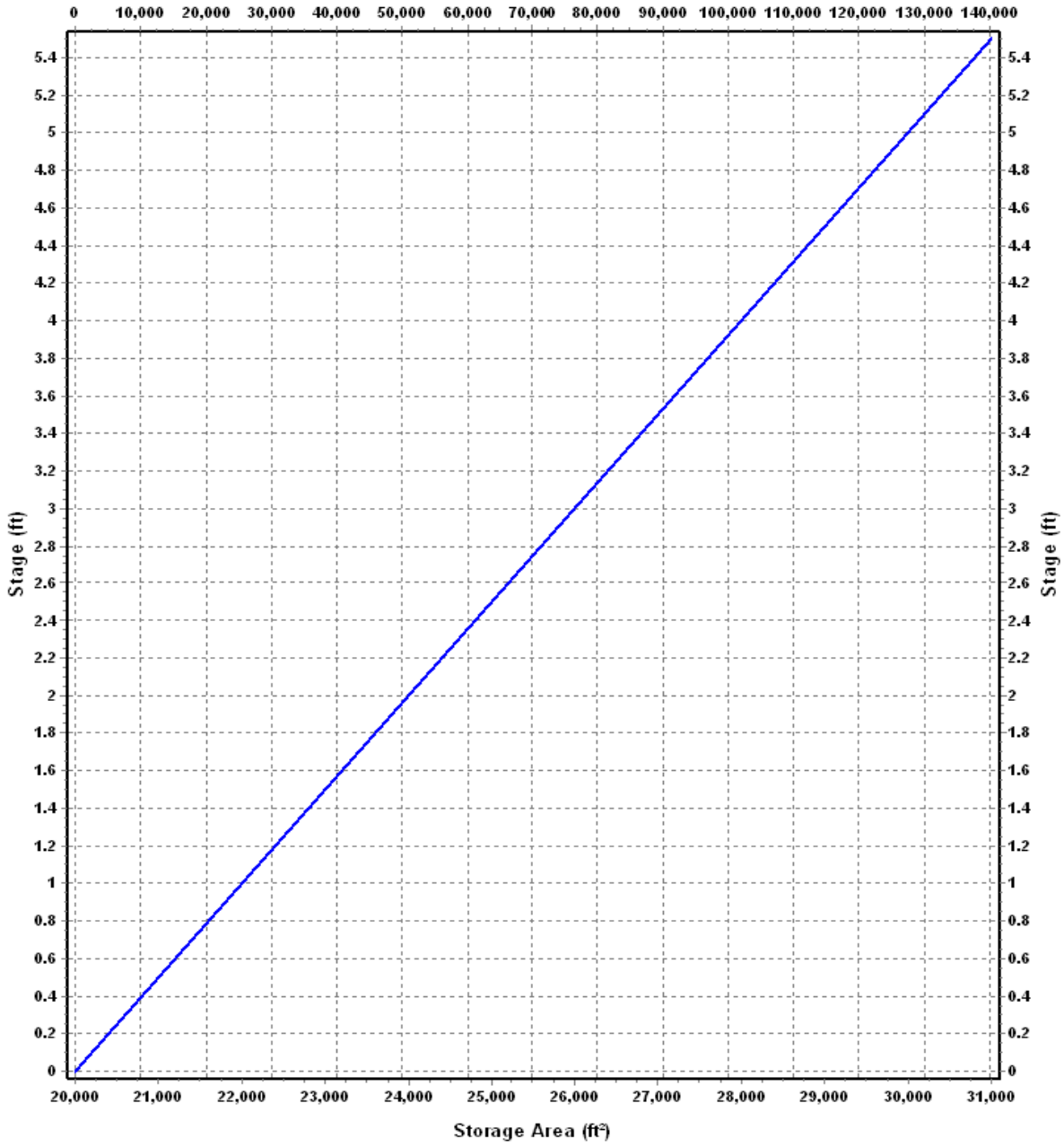
Storage Area Volume Curves

Storage Curve : P7

Stage (ft)	Storage Area (ft ²)	Storage Volume (ft ³)
0	20000	0.000
5.5	31000	140250.00

Storage Area Volume Curves

Storage Volume (ft³)



— Storage Area — Storage Volume

Storage Node : P6 (continued)

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	P7	Side	CIRCULAR	No	2.00			7400.00	0.61

Output Summary Results

Peak Inflow (cfs)	3.63
Peak Lateral Inflow (cfs)	1.67
Peak Outflow (cfs)	2.34
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7400.57
Max HGL Depth Attained (ft)	0.57
Average HGL Elevation Attained (ft)	7400.17
Average HGL Depth Attained (ft)	0.17
Time of Max HGL Occurrence (days hh:mm)	0 14:21
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

5.4 STORM MODEL OUTPUTS - PC 100Y

Project Description

File Name WinsomeSubdivisionProposedCondition (25).SPF

Project Options

Flow Units CFS
 Elevation Type Depth
 Hydrology Method SCS TR-55
 Time of Concentration (TOC) Method SCS TR-55
 Link Routing Method Kinematic Wave
 Enable Overflow Ponding at Nodes YES
 Skip Steady State Analysis Time Periods NO

Analysis Options

Start Analysis On Sep 14, 2018 00:00:00
 End Analysis On Sep 15, 2018 00:00:00
 Start Reporting On Sep 14, 2018 00:00:00
 Antecedent Dry Days 0 days
 Runoff (Dry Weather) Time Step 0 01:00:00 days hh:mm:ss
 Runoff (Wet Weather) Time Step 0 00:05:00 days hh:mm:ss
 Reporting Time Step 0 00:05:00 days hh:mm:ss
 Routing Time Step 30 seconds

Number of Elements

	Qty
Rain Gages	1
Subbasins.....	43
Nodes.....	67
<i>Junctions</i>	56
<i>Outfalls</i>	1
<i>Flow Diversions</i>	4
<i>Inlets</i>	0
<i>Storage Nodes</i>	6
Links.....	68
<i>Channels</i>	40
<i>Pipes</i>	22
<i>Pumps</i>	0
<i>Orifices</i>	6
<i>Weirs</i>	0
<i>Outlets</i>	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	Rain Gage-1	Time Series	TS-01	Cumulative	inches	Colorado	El Paso	100	4.60	SCS Type II 24-hr

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	A1	865.90	60.36	4.60	1.10	949.03	454.61	0 00:57:07
2	A2	37.00	66.00	4.60	1.46	54.06	38.75	0 00:36:58
3	A3	41.48	76.50	4.60	2.25	93.37	76.62	0 00:33:28
4	B1	3836.70	60.34	4.60	1.10	4201.19	1528.85	0 01:22:47
5	B2	13.10	64.00	4.60	1.33	17.38	15.93	0 00:24:24
6	B3	54.90	65.10	4.60	1.40	76.86	53.05	0 00:38:21
7	B4	41.48	68.50	4.60	1.64	67.86	47.99	0 00:38:59
8	C1	162.70	60.00	4.60	1.07	174.74	113.24	0 00:37:06
9	C2	22.40	64.00	4.60	1.33	29.72	23.14	0 00:31:25
10	C3	16.10	64.00	4.60	1.33	21.36	17.91	0 00:28:09
11	C4	23.80	65.00	4.60	1.39	33.15	21.99	0 00:40:37
12	D1.1	161.30	60.00	4.60	1.07	173.24	112.62	0 00:36:57
13	D1.2	49.90	60.00	4.60	1.07	53.59	30.80	0 00:43:48
14	D2	68.70	64.75	4.60	1.38	94.60	69.94	0 00:34:32
15	D3	41.20	64.00	4.60	1.33	54.67	36.85	0 00:38:52
16	D4	34.30	64.00	4.60	1.33	45.52	36.45	0 00:30:08
17	D5	12.80	67.20	4.60	1.54	19.76	16.37	0 00:30:17
18	D6	41.80	61.65	4.60	1.18	49.16	31.67	0 00:39:06
19	E0	37.90	60.00	4.60	1.07	40.70	26.42	0 00:37:01
20	E1.1	7.90	76.00	4.60	2.21	17.46	4.93	0 02:23:47
21	E1.2	16.30	62.00	4.60	1.20	19.53	13.44	0 00:35:56
22	E2	2.60	64.00	4.60	1.33	3.45	3.30	0 00:22:37
23	E3	19.80	64.00	4.60	1.33	26.27	22.50	0 00:27:12
24	E4	18.20	64.00	4.60	1.33	24.15	20.34	0 00:27:57
25	E5	13.50	64.00	4.60	1.33	17.91	15.43	0 00:26:58
26	E6	28.90	62.40	4.60	1.22	35.34	28.98	0 00:28:04
27	E7	9.80	62.00	4.60	1.20	11.74	10.46	0 00:24:19
28	F1	42.90	60.40	4.60	1.10	47.15	31.68	0 00:35:34
29	G1	25.20	66.00	4.60	1.46	36.82	32.61	0 00:26:37
30	G2	21.20	72.70	4.60	1.95	41.30	32.95	0 00:34:07
31	H1	13.90	70.80	4.60	1.80	25.08	23.02	0 00:26:51
32	H2	39.10	67.20	4.60	1.54	60.37	47.54	0 00:32:45
33	H3	5.80	66.00	4.60	1.46	8.47	8.03	0 00:23:55
34	H4	27.10	73.75	4.60	2.03	55.01	44.75	0 00:33:22
35	H5	20.20	74.80	4.60	2.11	42.68	35.73	0 00:32:12
36	H6	31.60	66.60	4.60	1.50	47.46	35.44	0 00:35:09
37	H7	25.80	70.50	4.60	1.78	45.98	38.72	0 00:30:48
38	H8	8.50	74.55	4.60	2.09	17.79	17.12	0 00:25:27
39	H9	6.90	70.80	4.60	1.80	12.45	12.20	0 00:24:00
40	I1	6.80	72.00	4.60	1.90	12.89	12.75	0 00:23:49
41	I2	14.80	72.00	4.60	1.90	28.05	28.00	0 00:23:29
42	J1	10.10	60.00	4.60	1.07	10.85	9.68	0 00:22:52
43	K1	17.80	69.60	4.60	1.72	30.54	29.72	0 00:23:58

Node Summary

SN	Element ID	Element Type	Invert Elevation	Ground/Rim (Max) Elevation	Initial Water Elevation	Surcharge Elevation	Ponded Area	Peak Inflow	Max HGL Elevation	Max Surcharge Depth Attained	Min Freeboard Attained	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
			(ft)	(ft)	(ft)	(ft)	(ft²)	(cfs)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-in)	(min)
1	Jun-A1	Junction	7340.00	7346.00	7340.00	7346.00	0.00	451.33	7342.41	0.00	7.59	0 00:00	0.00	0.00
2	Jun-A2	Junction	7393.00	7399.00	7393.00	7399.00	0.00	38.39	7393.36	0.00	9.64	0 00:00	0.00	0.00
3	Jun-B1	Junction	7385.00	7391.00	7385.00	7391.00	0.00	1527.49	7388.90	0.00	6.10	0 00:00	0.00	0.00
4	Jun-B2-1	Junction	7375.00	7381.00	7375.00	7381.00	0.00	15.83	7375.78	0.00	5.22	0 00:00	0.00	0.00
5	Jun-B2-2	Junction	7371.00	7377.00	7371.00	7377.00	0.00	15.80	7371.78	0.00	9.22	0 00:00	0.00	0.00
6	Jun-B3	Junction	7334.00	7340.00	7334.00	7340.00	0.00	1543.60	7339.04	0.00	4.96	0 00:00	0.00	0.00
7	Jun-BOX1-1	Junction	7318.50	7324.50	7318.50	7324.50	0.00	2027.73	7323.54	0.00	4.96	0 00:00	0.00	0.00
8	Jun-BOX1-2	Junction	7318.00	7324.00	7318.00	7324.00	0.00	2027.67	7323.66	0.00	4.34	0 00:00	0.00	0.00
9	Jun-BOX2-1	Junction	7280.00	7286.00	7280.00	7286.00	0.00	2288.31	7285.91	0.00	4.09	0 00:00	0.00	0.00
10	Jun-BOX2-2	Junction	7279.50	7285.50	7279.50	7285.50	0.00	2288.30	7285.34	0.00	4.16	0 00:00	0.00	0.00
11	Jun-C0-2	Junction	7379.00	7385.00	7379.00	7385.00	0.00	111.92	7381.50	0.00	7.50	0 00:00	0.00	0.00
12	Jun-C1-1	Junction	7363.00	7369.00	7363.00	7369.00	0.00	131.78	7365.06	0.00	7.94	0 00:00	0.00	0.00
13	Jun-C1-2	Junction	7360.00	7366.00	7360.00	7366.00	0.00	131.79	7362.06	0.00	7.94	0 00:00	0.00	0.00
14	Jun-C2-1	Junction	7341.00	7347.00	7341.00	7347.00	0.00	145.36	7342.99	0.00	8.01	0 00:00	0.00	0.00
15	Jun-C2-2	Junction	7337.00	7343.00	7337.00	7343.00	0.00	145.36	7338.99	0.00	8.01	0 00:00	0.00	0.00
16	Jun-C4	Junction	7310.00	7316.00	7310.00	7316.00	0.00	2089.34	7315.72	0.00	4.28	0 00:00	0.00	0.00
17	Jun-D1.1-2	Junction	7385.00	7391.00	7385.00	7391.00	0.00	111.33	7387.22	0.00	7.78	0 00:00	0.00	0.00
18	Jun-D1.2-2	Junction	7412.00	7418.00	7412.00	7418.00	0.00	30.54	7413.57	0.00	8.43	0 00:00	0.00	0.00
19	Jun-D1-1	Junction	7329.00	7335.00	7329.00	7335.00	0.00	174.66	7331.61	0.00	7.39	0 00:00	0.00	0.00
20	Jun-D1-2	Junction	7328.00	7334.00	7328.00	7334.00	0.00	174.65	7330.61	0.00	7.39	0 00:00	0.00	0.00
21	Jun-D3-1	Junction	7372.00	7378.00	7372.00	7378.00	0.00	64.38	7373.48	0.00	8.52	0 00:00	0.00	0.00
22	Jun-D3-2	Junction	7370.00	7376.00	7370.00	7376.00	0.00	64.38	7371.48	0.00	8.52	0 00:00	0.00	0.00
23	Jun-D4-1	Junction	7337.50	7343.50	7337.50	7343.50	0.00	91.28	7339.83	0.00	7.67	0 00:00	0.00	0.00
24	Jun-D4-2	Junction	7337.00	7343.00	7337.00	7343.00	0.00	91.28	7339.33	0.00	7.67	0 00:00	0.00	0.00
25	Jun-D5	Junction	7300.00	7306.00	7300.00	7306.00	0.00	2184.99	7305.72	0.00	4.28	0 00:00	0.00	0.00
26	Jun-D6	Junction	7287.00	7293.00	7287.00	7293.00	0.00	61.68	7287.65	0.00	9.35	0 00:00	0.00	0.00
27	Jun-E0-2	Junction	7417.00	7423.00	7417.00	7423.00	0.00	26.12	7418.07	0.00	8.93	0 00:00	0.00	0.00
28	Jun-E1.1	Junction	7400.00	7406.00	7400.00	7406.00	0.00	13.96	7400.91	0.00	5.09	0 00:00	0.00	0.00
29	Jun-E1.2-1	Junction	7381.00	7387.00	7381.00	7387.00	0.00	17.98	7381.96	0.00	5.04	0 00:00	0.00	0.00
30	Jun-E1.2-2	Junction	7380.00	7386.00	7380.00	7386.00	0.00	17.98	7380.96	0.00	9.04	0 00:00	0.00	0.00
31	Jun-E2-1	Junction	7401.00	7407.00	7401.00	7407.00	0.00	3.23	7401.40	0.00	5.60	0 00:00	0.00	0.00
32	Jun-E2-2	Junction	7399.00	7405.00	7399.00	7405.00	0.00	3.23	7399.40	0.00	9.60	0 00:00	0.00	0.00
33	Jun-E3-1	Junction	7369.00	7375.00	7369.00	7375.00	0.00	24.75	7370.16	0.00	8.84	0 00:00	0.00	0.00
34	Jun-E3-2	Junction	7367.50	7373.50	7367.50	7373.50	0.00	24.75	7368.66	0.00	8.84	0 00:00	0.00	0.00
35	Jun-E4-1	Junction	7337.00	7343.00	7337.00	7343.00	0.00	43.30	7338.44	0.00	8.56	0 00:00	0.00	0.00
36	Jun-E4-2	Junction	7336.00	7342.00	7336.00	7342.00	0.00	43.29	7337.44	0.00	8.56	0 00:00	0.00	0.00
37	Jun-E5-1	Junction	7336.50	7342.50	7336.50	7342.50	0.00	15.39	7337.30	0.00	5.20	0 00:00	0.00	0.00
38	Jun-E5-2	Junction	7333.00	7339.00	7333.00	7339.00	0.00	15.37	7333.80	0.00	9.20	0 00:00	0.00	0.00
39	Jun-E7	Junction	7318.00	7324.00	7318.00	7324.00	0.00	80.51	7318.89	0.00	9.11	0 00:00	0.00	0.00
40	Jun-F1	Junction	7327.00	7333.00	7327.00	7333.00	0.00	44.65	7327.89	0.00	9.11	0 00:00	0.00	0.00
41	Jun-G1-1	Junction	7375.50	7381.50	7375.50	7381.50	0.00	32.61	7376.68	0.00	4.82	0 00:00	0.00	0.00
42	Jun-G1-2	Junction	7373.00	7379.00	7373.00	7379.00	0.00	32.58	7374.18	0.00	8.82	0 00:00	0.00	0.00
43	Jun-H1-1	Junction	7391.50	7397.50	7391.50	7397.50	0.00	22.97	7392.72	0.00	4.78	0 00:00	0.00	0.00
44	Jun-H1-2	Junction	7389.00	7395.00	7389.00	7395.00	0.00	22.95	7390.21	0.00	8.79	0 00:00	0.00	0.00
45	Jun-H2-1	Junction	7334.00	7340.00	7334.00	7340.00	0.00	47.20	7335.37	0.00	4.63	0 00:00	0.00	0.00
46	Jun-H2-2	Junction	7332.00	7338.00	7332.00	7338.00	0.00	47.18	7333.37	0.00	8.63	0 00:00	0.00	0.00
47	Jun-H3-1	Junction	7379.50	7385.50	7379.50	7385.50	0.00	7.93	7380.05	0.00	5.45	0 00:00	0.00	0.00
48	Jun-H3-2	Junction	7376.00	7382.00	7376.00	7382.00	0.00	7.90	7376.55	0.00	9.45	0 00:00	0.00	0.00
49	Jun-H6	Junction	7292.00	7298.00	7292.00	7298.00	0.00	2216.50	7297.91	0.00	4.09	0 00:00	0.00	0.00
50	Jun-H8	Junction	7276.00	7282.00	7276.00	7282.00	0.00	2323.58	7281.84	0.00	4.16	0 00:00	0.00	0.00
51	Jun-H9	Junction	7300.00	7306.00	7300.00	7306.00	0.00	27.07	7300.07	0.00	9.93	0 00:00	0.00	0.00
52	Jun-I1-1	Junction	7355.50	7361.50	7355.50	7361.50	0.00	12.50	7356.56	0.00	4.94	0 00:00	0.00	0.00
53	Jun-I1-2	Junction	7354.50	7360.50	7354.50	7360.50	0.00	12.50	7355.56	0.00	8.94	0 00:00	0.00	0.00
54	Jun-I2	Junction	7319.00	7325.00	7319.00	7325.00	0.00	39.67	7319.49	0.00	9.51	0 00:00	0.00	0.00
55	Jun-J1	Junction	7357.00	7363.00	7357.00	7363.00	0.00	9.59	7357.00	0.00	6.00	0 00:00	0.00	0.00
56	Jun-K1	Junction	7313.00	7319.00	7313.00	7319.00	0.00	29.26	7313.00	0.00	6.00	0 00:00	0.00	0.00
57	Out-02	Outfall	0.00					2344.70	1.07					
58	Jun-C-1	Flow Diversions	7382.00	7388.00	7382.00		0.00	112.05	7384.50				0.00	0.00
59	Jun-D1.1-1	Flow Diversions	7388.00	7394.00	7388.00		0.00	111.36	7390.22				0.00	0.00
60	Jun-D1.2-1	Flow Diversions	7416.00	7422.00	7416.00		0.00	30.55	7417.57				0.00	0.00
61	Jun-E0-1	Flow Diversions	7420.00	7426.00	7420.00		0.00	26.12	7421.07				0.00	0.00
62	P1	Storage Node	7311.00	7317.50	7311.00		0.00	130.34	7314.91				0.00	0.00
63	P2	Storage Node	7297.00	7303.50	7297.00		0.00	82.19	7300.01				0.00	0.00
64	P3	Storage Node	7289.00	7297.00	7289.00		0.00	120.97	7293.64				0.00	0.00
65	P4	Storage Node	7301.00	7306.50	7301.00		0.00	51.28	7305.06				0.00	0.00
66	P5	Storage Node	7289.00	7296.00	7289.00		0.00	106.25	7295.21				0.00	0.00
67	P6	Storage Node	7400.00	7406.00	7400.00		0.00	27.27	7401.87				0.00	0.00

Link Summary

SN Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Reported	Surcharged Condition
				(ft)	(ft)	(ft)	(%)	(ft)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1	BoxCulv-1	Pipe	Jun-BOX1-1 Jun-BOX1-2	100.00	7318.50	7318.00	0.5000	6.000	0.0120	2027.67	2828.15	0.72	16.52	3.83	0.64	0.00	Calculated
2	BoxCulv-2	Pipe	Jun-BOX2-1 Jun-BOX2-2	100.00	7280.00	7279.50	0.5000	6.000	0.0120	2288.30	2828.15	0.81	17.15	4.17	0.69	0.00	Calculated
3	Culv-B2	Pipe	Jun-B2-1 Jun-B2-2	60.00	7375.00	7371.00	6.6700	1.500	0.0120	15.80	29.38	0.54	16.91	0.78	0.52	0.00	Calculated
4	Culv-C2	Pipe	Jun-C1-1 Jun-C1-2	60.00	7363.00	7360.00	5.0000	3.000	0.0120	131.79	161.57	0.82	25.48	2.06	0.69	0.00	Calculated
5	Culv-C3	Pipe	Jun-C2-1 Jun-C2-2	60.00	7341.00	7337.00	6.6700	3.000	0.0120	145.36	186.57	0.78	29.18	1.99	0.66	0.00	Calculated
6	Culv-D2	Pipe	Jun-D1-1 Jun-D1-2	60.00	7329.00	7328.00	1.6700	4.500	0.0120	174.65	275.03	0.64	18.30	2.61	0.58	0.00	Calculated
7	Culv-D3	Pipe	Jun-D3-1 Jun-D3-2	60.00	7372.00	7370.00	3.3300	3.000	0.0120	64.38	131.92	0.49	18.54	1.47	0.49	0.00	Calculated
8	Culv-D4	Pipe	Jun-D4-1 Jun-D4-2	60.00	7337.50	7337.00	0.8300	4.000	0.0120	91.28	142.06	0.64	12.00	2.33	0.58	0.00	Calculated
9	Culv-E1.2	Pipe	Jun-E1.2-1 Jun-E1.2-2	60.00	7381.00	7380.00	1.6700	2.500	0.0120	17.98	57.37	0.31	10.33	0.96	0.38	0.00	Calculated
10	Culv-E2	Pipe	Jun-E2-1 Jun-E2-2	60.00	7401.00	7399.00	3.3300	1.500	0.0120	3.23	20.78	0.16	8.54	0.40	0.27	0.00	Calculated
11	Culv-E3	Pipe	Jun-E3-1 Jun-E3-2	60.00	7369.00	7367.50	2.5000	2.000	0.0120	24.75	38.75	0.64	13.08	1.16	0.58	0.00	Calculated
12	Culv-E4	Pipe	Jun-E4-1 Jun-E4-2	60.00	7337.00	7336.00	1.6700	3.000	0.0120	43.29	93.28	0.46	12.95	1.44	0.48	0.00	Calculated
13	Culv-E5	Pipe	Jun-E5-1 Jun-E5-2	60.00	7336.50	7333.00	5.8300	1.500	0.0120	15.37	27.48	0.56	15.98	0.80	0.54	0.00	Calculated
14	Culv-G1	Pipe	Jun-G1-1 Jun-G1-2	60.00	7375.50	7373.00	4.1700	2.000	0.0120	32.58	50.03	0.65	16.94	1.18	0.59	0.00	Calculated
15	Culv-H1	Pipe	Jun-H1-1 Jun-H1-2	60.00	7391.50	7389.00	4.1700	1.500	0.0120	22.95	23.23	0.99	14.99	1.21	0.81	0.00	Calculated
16	Culv-H2	Pipe	Jun-H2-1 Jun-H2-2	60.00	7334.00	7332.00	3.3300	2.500	0.0120	47.18	81.13	0.58	17.14	1.37	0.55	0.00	Calculated
17	Culv-H3	Pipe	Jun-H3-1 Jun-H3-2	60.00	7379.50	7376.00	5.8300	1.500	0.0120	7.90	27.48	0.29	13.43	0.55	0.37	0.00	Calculated
18	Culv-I1	Pipe	Jun-I1-1 Jun-I1-2	60.00	7355.50	7354.50	1.6700	1.500	0.0120	12.50	14.69	0.85	9.33	1.06	0.71	0.00	Calculated
19	ExCulv-C1	Pipe	Jun-C-1 Jun-C0-2	100.00	7382.00	7379.00	3.0000	2.500	0.0250	39.49	36.94	1.07	8.68	2.50	1.00	55.00	SURCHARGED
20	ExCulv-D1.1	Pipe	Jun-D1.1-1 Jun-D1.1-2	100.00	7388.00	7385.00	3.0000	6.000	0.0250	111.33	381.44	0.29	11.70	2.22	0.37	0.00	Calculated
21	ExCulv-D1.2	Pipe	Jun-D1.2-1 Jun-D1.2-2	100.00	7416.00	7412.00	4.0000	2.500	0.0250	30.54	42.66	0.72	9.44	1.57	0.63	0.00	Calculated
22	ExCulv-E0	Pipe	Jun-E0-1 Jun-E0-2	125.00	7420.00	7417.00	2.4000	2.500	0.0120	26.12	68.84	0.38	13.05	1.07	0.43	0.00	Calculated
23	Conveyance-1	Channel	Jun-BOX1-2 Jun-C4	866.29	7318.00	7310.00	0.9200	10.000	0.0400	2027.00	6959.03	0.29	8.42	5.65	0.57	0.00	
24	Conveyance-2	Channel	Jun-C4 Jun-D5	1071.31	7310.00	7300.00	0.9300	10.000	0.0400	2088.59	6996.45	0.30	8.52	5.72	0.57	0.00	
25	Conveyance-3	Channel	Jun-D5 Jun-H6	736.36	7300.00	7292.00	1.0900	10.000	0.0400	2184.68	7548.06	0.29	9.11	5.64	0.56	0.00	
26	Conveyance-4	Channel	Jun-H6 Jun-BOX2-1	1308.67	7292.00	7280.00	0.9200	10.000	0.0400	2215.88	6934.43	0.32	8.60	5.91	0.59	0.00	
27	Conveyance-5	Channel	Jun-BOX2-2 Jun-H8	340.25	7279.50	7276.00	1.0300	10.000	0.0400	2288.22	7344.64	0.31	9.04	5.83	0.58	0.00	
28	Link-A1	Channel	Jun-A1 Jun-BOX1-1	1609.87	7340.00	7318.50	1.3400	10.000	0.0400	451.32	8368.72	0.05	6.37	2.40	0.24	0.00	
29	Link-A2	Channel	Jun-A2 Jun-BOX1-1	991.55	7393.00	7318.50	7.5100	10.000	0.0400	38.05	19849.80	0.00	4.96	0.36	0.04	0.00	
30	Link-B1	Channel	Jun-B1 Jun-B3	2137.84	7385.00	7334.00	2.3900	10.000	0.0400	1524.05	11184.92	0.14	11.03	3.89	0.39	0.00	
31	Link-B2	Channel	Jun-B2-2 Jun-BOX1-1	1548.66	7371.00	7318.50	3.3900	10.000	0.0400	14.76	13333.28	0.00	2.85	0.25	0.03	0.00	
32	Link-B3	Channel	Jun-B3 Jun-BOX1-1	1801.86	7334.00	7318.50	0.8600	10.000	0.0400	1541.13	6716.46	0.23	7.64	5.04	0.50	0.00	
33	Link-B4-3	Channel	Jun-C2-2 Jun-BOX1-1	155.46	7337.00	7318.50	11.9000	10.000	0.0400	145.34	24981.12	0.01	9.24	0.69	0.07	0.00	
34	Link-C1	Channel	Jun-C0-2 Jun-C1-1	799.51	7379.00	7363.00	2.0000	10.000	0.0400	111.86	10244.33	0.01	4.73	0.99	0.10	0.00	
35	Link-C2	Channel	Jun-C1-2 Jun-C2-1	861.57	7360.00	7341.00	2.2100	10.000	0.0400	131.77	10753.92	0.01	5.15	1.06	0.11	0.00	
36	Link-D1.1	Channel	Jun-D1.1-2 Jun-D1-1	1827.50	7385.00	7329.00	3.0600	10.000	0.0400	110.73	12676.54	0.01	5.46	0.87	0.09	0.00	
37	Link-D3	Channel	Jun-D1.2-2 Jun-D3-1	1312.44	7412.00	7372.00	3.0500	10.000	0.0400	30.41	12642.29	0.00	3.45	0.41	0.04	0.00	
38	Link-D4	Channel	Jun-D3-2 Jun-D4-1	1169.72	7370.00	7337.50	2.7800	10.000	0.0400	64.13	12070.80	0.01	4.36	0.65	0.07	0.00	
39	Link-D5	Channel	Jun-D1-2 Jun-D5	1270.02	7328.00	7300.00	2.2000	10.000	0.0400	174.29	10752.49	0.02	5.66	1.24	0.12	0.00	
40	Link-D6	Channel	Jun-D4-2 P3	1418.47	7337.00	7289.00	3.3800	10.000	0.0400	90.88	13321.28	0.01	5.24	0.75	0.08	0.00	
41	Link-E1.1	Channel	Jun-E0-2 P6	1328.59	7417.00	7400.00	1.2800	10.000	0.0400	25.44	8191.52	0.00	2.50	0.47	0.05	0.00	
42	Link-E1.2	Channel	Jun-E1.1 Jun-E1.2-1	791.59	7400.00	7381.00	2.4000	2.500	0.0400	13.95	164.41	0.08	3.64	0.91	0.37	0.00	
43	Link-E3	Channel	Jun-E2-2 Jun-E3-1	974.31	7399.00	7369.00	3.0800	10.000	0.0400	2.97	12707.13	0.00	1.52	0.10	0.01	0.00	
44	Link-E4	Channel	Jun-E3-2 Jun-E4-1	1141.92	7367.50	7337.00	2.6700	10.000	0.0400	24.29	11834.98	0.00	3.09	0.37	0.04	0.00	
45	Link-E6	Channel	Jun-E5-2 P5	858.58	7333.00	7289.00	5.1200	10.000	0.0400	14.98	16393.49	0.00	3.13	0.23	0.02	0.00	
46	Link-E6-2	Channel	Jun-E7 P5	1915.96	7318.00	7289.00	1.5100	10.000	0.0400	78.77	8909.25	0.01	3.88	0.88	0.09	0.00	
47	Link-E7	Channel	Jun-E4-2 Jun-E7	712.94	7336.00	7318.00	2.5200	10.000	0.0400	43.13	11506.55	0.00	3.67	0.53	0.05	0.00	
48	Link-F1	Channel	Jun-E1.2-2 Jun-F1	1032.69	7380.00	7327.00	5.1300	10.000	0.0400	17.97	16405.46	0.00	3.31	0.26	0.03	0.00	
49	Link-F1-2	Channel	Jun-F1 Jun-E7	1886.42	7327.00	7318.00	0.4800	10.000	0.0400	41.40	5001.93	0.01	2.16	0.84	0.08	0.00	
50	Link-G2	Channel	Jun-G1-2 P1	1241.36	7373.00	7311.00	4.9900	10.000	0.0400	31.65	16183.87	0.00	4.12	0.36	0.04	0.00	
51	Link-H4	Channel	Jun-H1-2 P1	1249.62	7389.00	7311.00	6.2400	10.000	0.0400	22.33	18092.30	0.00	3.88	0.27	0.03	0.00	
52	Link-H6	Channel	Jun-H2-2 P2	586.28	7332.00	7297.00	5.9700	10.000	0.0400	47.02	17693.63	0.00	4.97	0.44	0.04	0.00	
53	Link-H7-1	Channel	Jun-H3-2 Jun-BOX2-1	1205.71	7376.00	7280.00	7.9600	10.000	0.0400	7.64	20433.82	0.00	2.82	0.13	0.01	0.00	
54	Link-H9	Channel	Jun-I2 P4	633.71	7319.00	7301.00	2.8400	10.000	0.0400	39.58	12204.68	0.00	3.71	0.49	0.05	0.00	
55	Link-I2-1	Channel	Jun-I1-2 Jun-I2	461.48	7354.50	7319.00	7.6900	10.000	0.0400	12.47	20085.06	0.00	3.29	0.18	0.02	0.00	
56	Link-Out-1	Channel	Jun-H8 Out-02	1089.60	7276.00	0.00	667.7700	10.000	0.0400	2323.54	187132.04	0.01	50.00	1.07	0.11	0.00	
57	Link-Out-2	Channel	Jun-H9 Out-02	865.85	7300.00	0.00	843.1000	10.000	0.0400	27.07	210269.10	0.00	18.50	0.07	0.01	0.00	
58	Link-P3	Channel	Jun-D6 Jun-BOX2-1	264.79	7287.00	7280.00	2.6400	10.000	0.0400	61.68	11774.26	0.01	4.20	0.65	0.07	0.00	

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (ft)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Reported Surcharged Condition (min)
59	OverTop-C1	Channel	Jun-C-1	Jun-C0-2	118.65	7382.00	7379.00	2.5300	0.500	0.0320	74.98	236.68	0.32	2.91	0.25	0.50	0.00
60	OverTop-D1.1	Channel	Jun-D1.1-1	Jun-D1.1-2	192.86	7388.00	7385.00	1.5600	0.500	0.0320	0.00	185.64	0.00	0.00	0.00	0.00	0.00
61	OverTop-D1.2	Channel	Jun-D1.2-1	Jun-D1.2-2	163.53	7416.00	7412.00	2.4500	0.500	0.0320	0.00	232.79	0.00	0.00	0.00	0.00	0.00
62	OverTop-E0	Channel	Jun-E0-1	Jun-E0-2	115.35	7420.00	7417.00	2.6000	0.500	0.0320	0.00	240.05	0.00	0.00	0.00	0.00	0.00
63	P1	Orifice	P1	Jun-C4		7311.00	7310.00		3.000		54.04						
64	P2	Orifice	P2	Jun-H6		7297.00	7292.00		2.500		32.05						
65	P3	Orifice	P3	Jun-D6		7289.00	7287.00		3.000		61.68						
66	P5	Orifice	P4	Jun-H9		7301.00	7300.00		2.000		27.07						
67	P6	Orifice	P5	Jun-H8		7289.00	7276.00		2.000		35.32						
68	P7	Orifice	P6	Jun-E1.1		7400.00	7400.00		2.000		13.96						

Subbasin Hydrology

Subbasin : A1

Input Data

Area (ac) 865.90
 Weighted Curve Number 60.36
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	839.92	B	60.00
Pasture, grassland, or range, Fair	8.66	D	84.00
5 Acre Lots, 7% Impervious	8.66	C	72.00
Composite Area & Weighted CN	857.24		60.36

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

$$T_c = (0.007 * ((n * L_f)^{0.8})) / ((P^{0.5}) * (S_f^{0.4}))$$

Where :

T_c = Time of Concentration (hr)
 n = Manning's roughness
 L_f = Flow Length (ft)
 P = 2 yr, 24 hr Rainfall (inches)
 S_f = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (S_f^{0.5}) (unpaved surface)
 V = 20.3282 * (S_f^{0.5}) (paved surface)
 V = 15.0 * (S_f^{0.5}) (grassed waterway surface)
 V = 10.0 * (S_f^{0.5}) (nearly bare & untilled surface)
 V = 9.0 * (S_f^{0.5}) (cultivated straight rows surface)
 V = 7.0 * (S_f^{0.5}) (short grass pasture surface)
 V = 5.0 * (S_f^{0.5}) (woodland surface)
 V = 2.5 * (S_f^{0.5}) (forest w/heavy litter surface)
 T_c = (L_f / V) / (3600 sec/hr)

Where:

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^{2/3}) * (S_f^{0.5})) / n
 R = A_q / W_p
 T_c = (L_f / V) / (3600 sec/hr)

Where :

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 R = Hydraulic Radius (ft)
 A_q = Flow Area (ft²)
 W_p = Wetted Perimeter (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)
 n = Manning's roughness

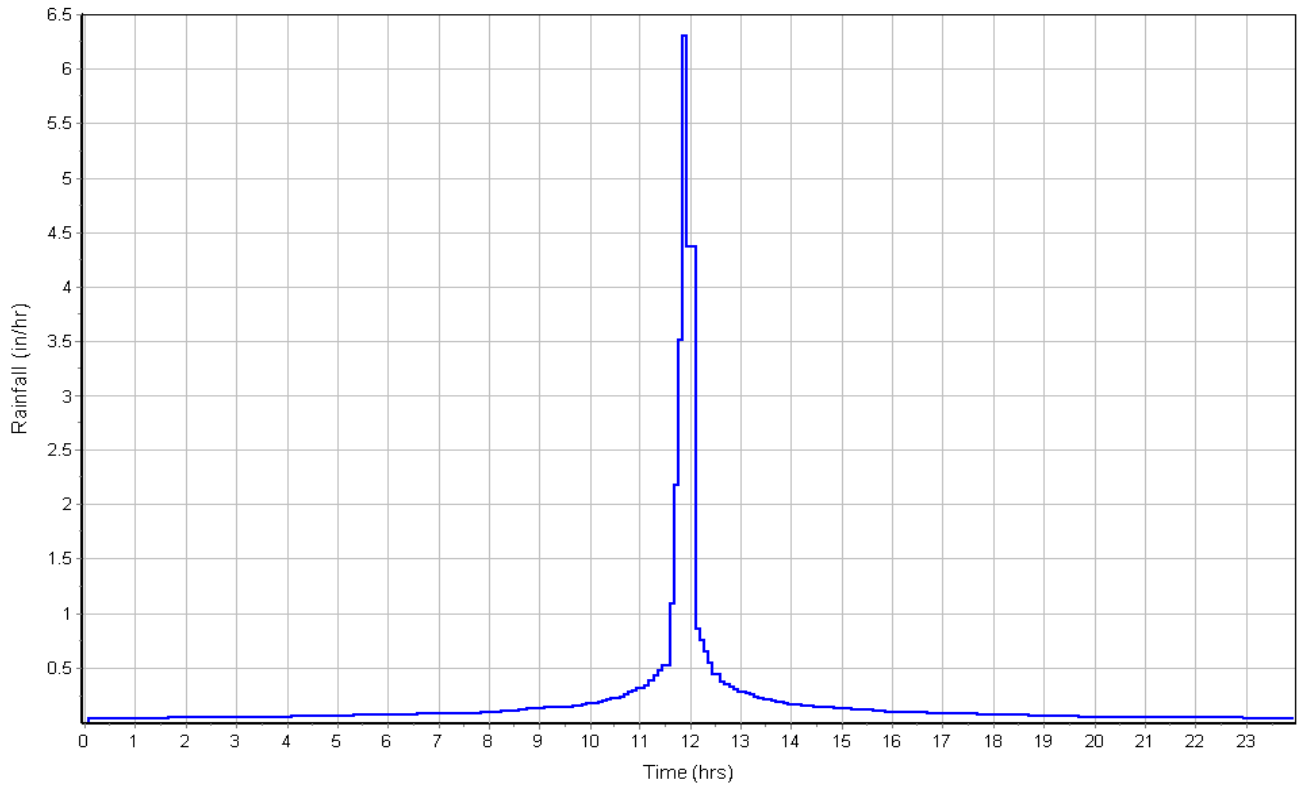
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
	Flowpath	Flowpath	Flowpath
	A	B	C
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.57	0.00	0.00
Computed Flow Time (min) :	10.62	0.00	0.00
	Flowpath	Flowpath	Flowpath
	A	B	C
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	12115	0.00	0.00
Channel Slope (%) :	1.8	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	7.93	0.00	0.00
Computed Flow Time (min) :	25.45	0.00	0.00
Total TOC (min)	57.13		

Subbasin Runoff Results

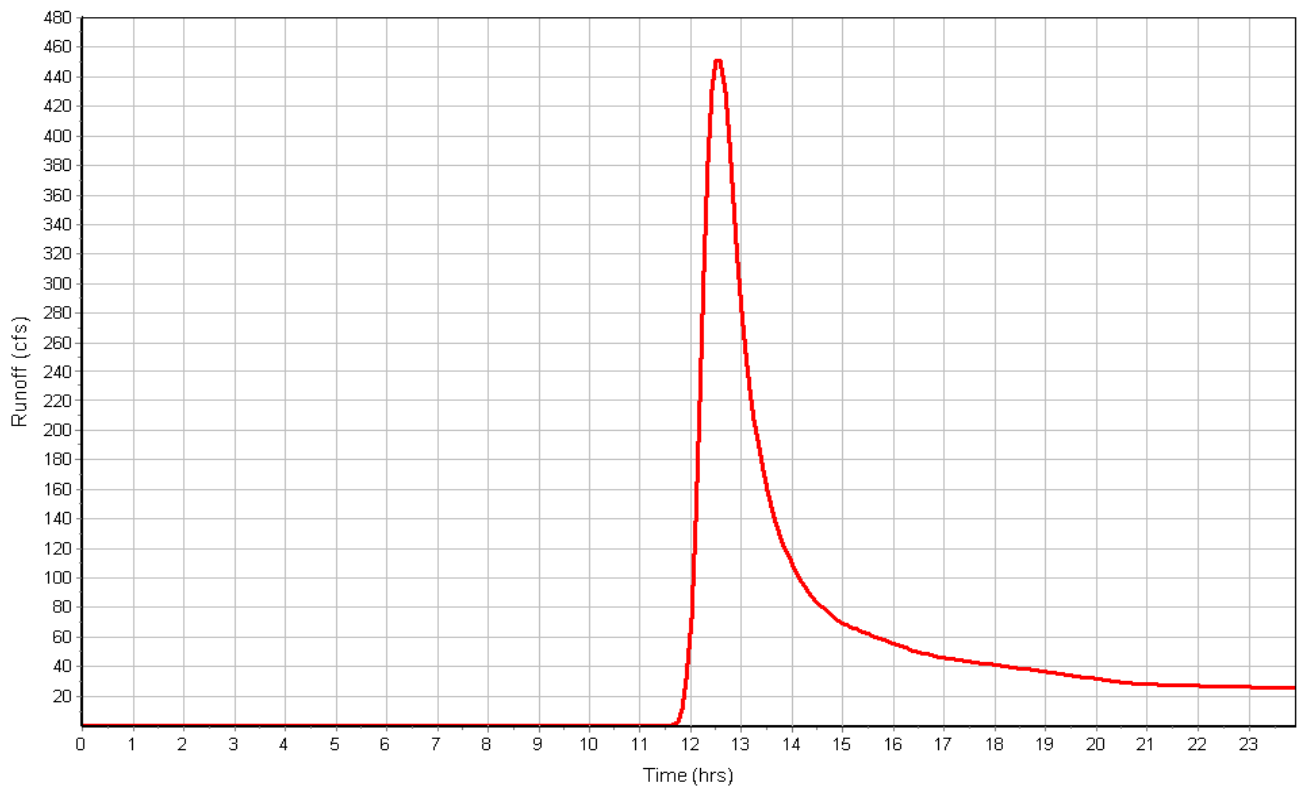
Total Rainfall (in)	4.60
Total Runoff (in)	1.10
Peak Runoff (cfs)	454.61
Weighted Curve Number	60.36
Time of Concentration (days hh:mm:ss)	0 00:57:08

Subbasin : A1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : A2

Input Data

Area (ac) 37.00
 Weighted Curve Number 66.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	18.50	C	72.00
5 Acre Lots, 7% Impervious	18.50	B	60.00
Composite Area & Weighted CN	37.00		66.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.19	0.00	0.00
Computed Flow Time (min) :	14.01	0.00	0.00

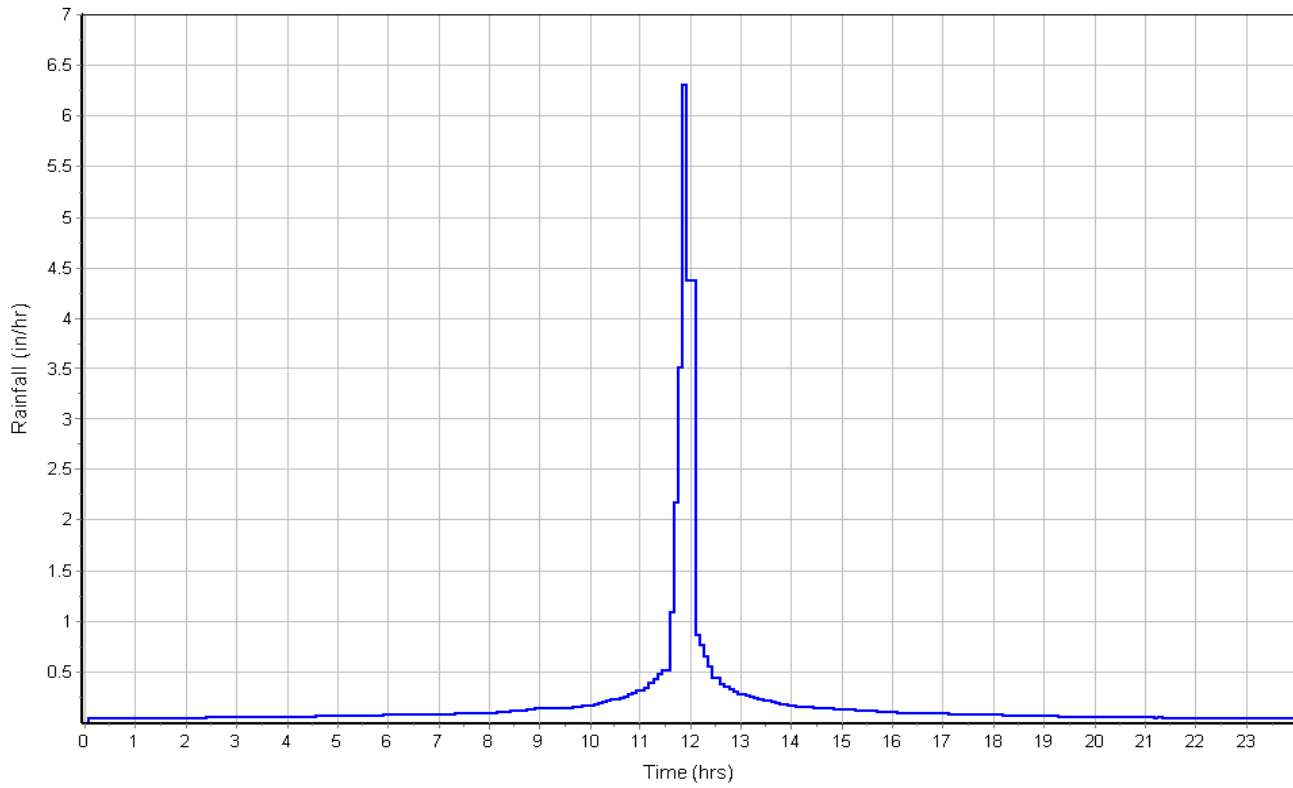
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1157	0.00	0.00
Channel Slope (%) :	2.9	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.07	0.00	0.00
Computed Flow Time (min) :	1.92	0.00	0.00
Total TOC (min)	36.98		

Subbasin Runoff Results

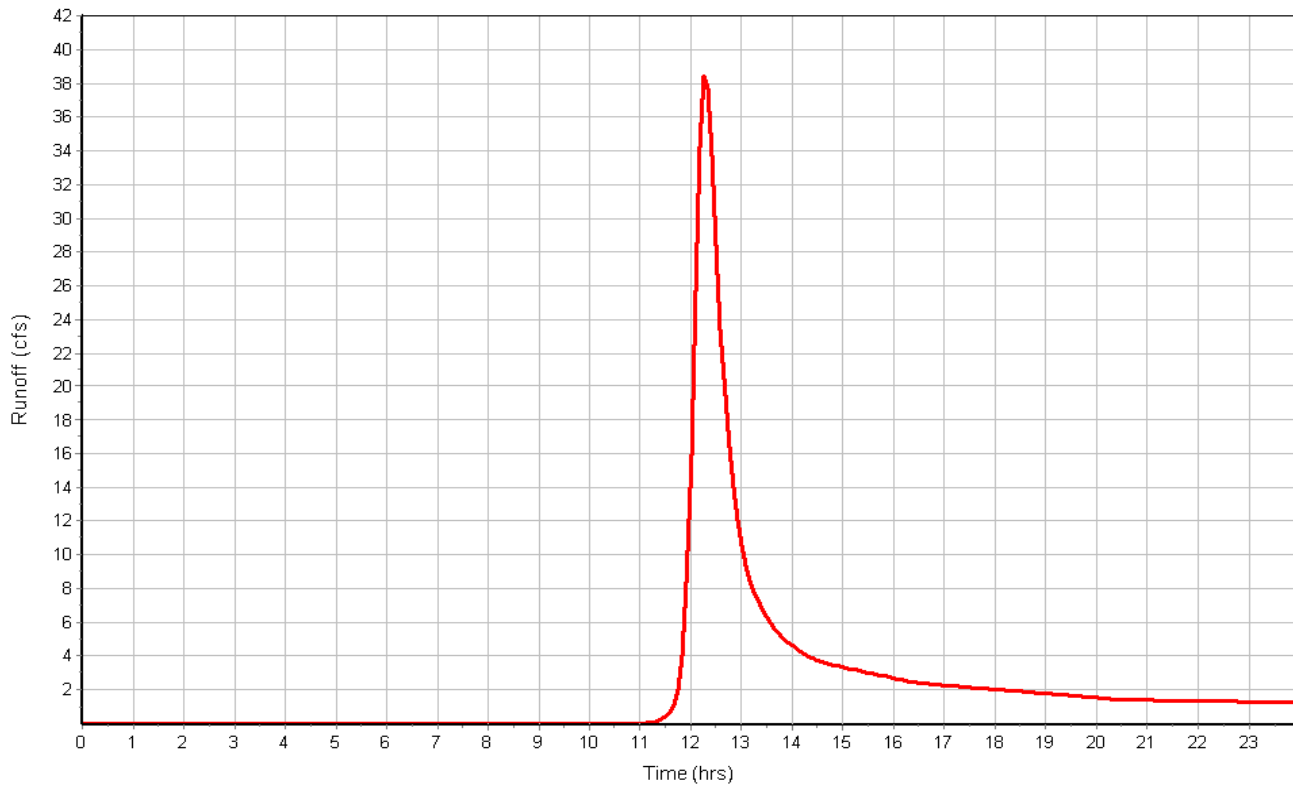
Total Rainfall (in) 4.60
 Total Runoff (in) 1.46
 Peak Runoff (cfs) 38.75
 Weighted Curve Number 66.00
 Time of Concentration (days hh:mm:ss) 0 00:36:59

Subbasin : A2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : A3

Input Data

Area (ac) 41.48
 Weighted Curve Number 76.50
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	20.74	C	72.00
Pasture, grassland, or range, Fair	8.30	D	84.00
Pasture, grassland, or range, Fair	12.44	C	79.00
Composite Area & Weighted CN	41.48		76.50

Time of Concentration

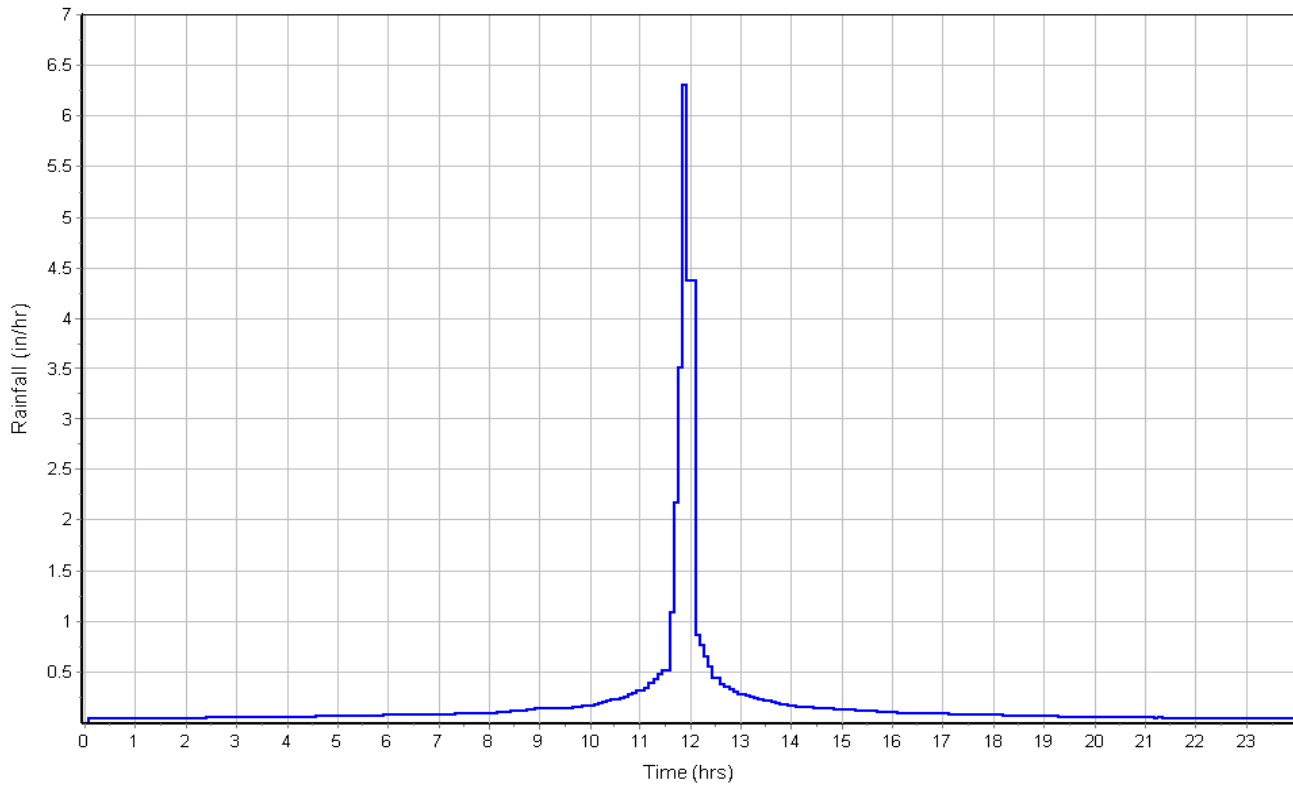
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.53	0.00	0.00
Computed Flow Time (min) :	10.89	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1188	0.00	0.00
Channel Slope (%) :	4.8	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.95	0.00	0.00
Computed Flow Time (min) :	1.53	0.00	0.00
Total TOC (min)	33.48		

Subbasin Runoff Results

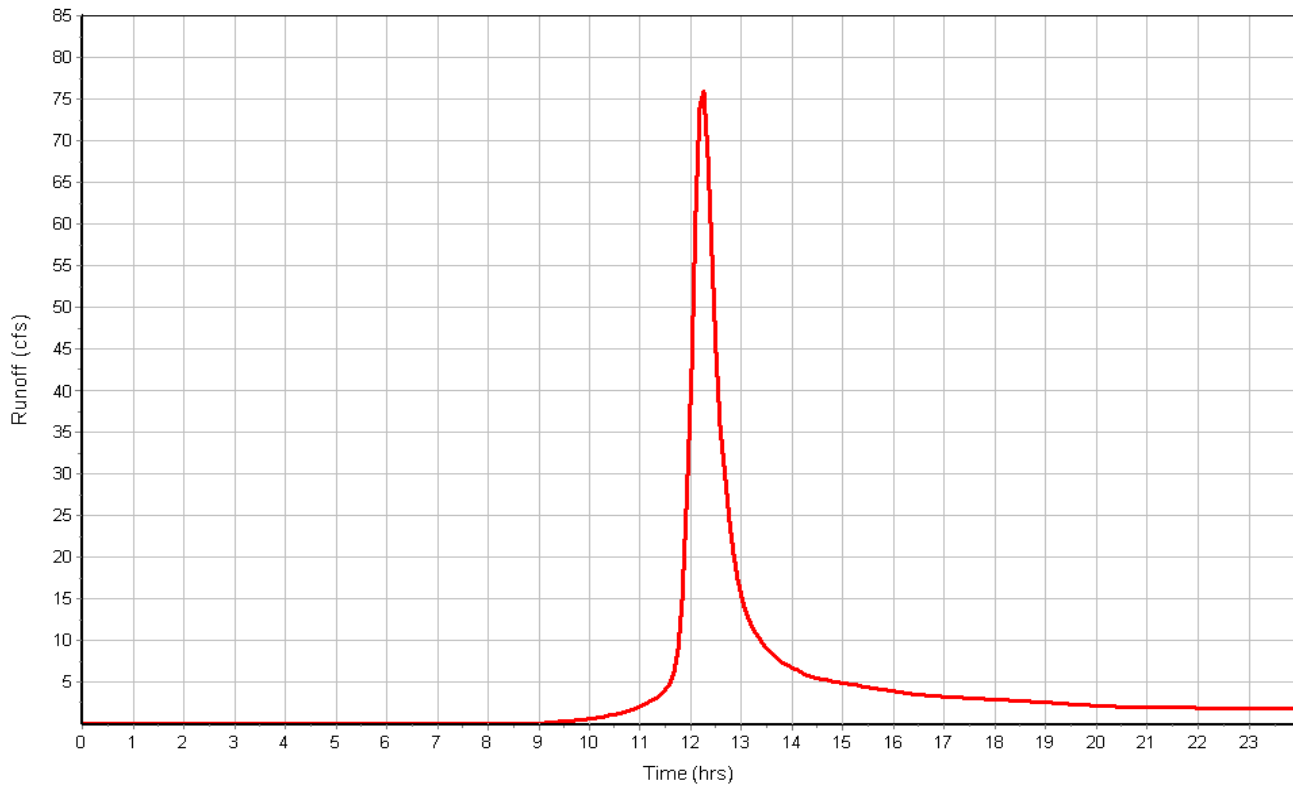
Total Rainfall (in) 4.60
 Total Runoff (in) 2.25
 Peak Runoff (cfs) 76.62
 Weighted Curve Number 76.50
 Time of Concentration (days hh:mm:ss) 0 00:33:29

Subbasin : A3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : B1

Input Data

Area (ac) 3836.70
 Weighted Curve Number 60.34
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	3759.97	B	60.00
5 Acre Lots, 7% Impervious	76.73	D	77.00
Composite Area & Weighted CN	3836.70		60.34

Time of Concentration

	Flowpath A	Flowpath B	Flowpath C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

	Flowpath A	Flowpath B	Flowpath C
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.40	0.00	0.00
Computed Flow Time (min) :	11.90	0.00	0.00

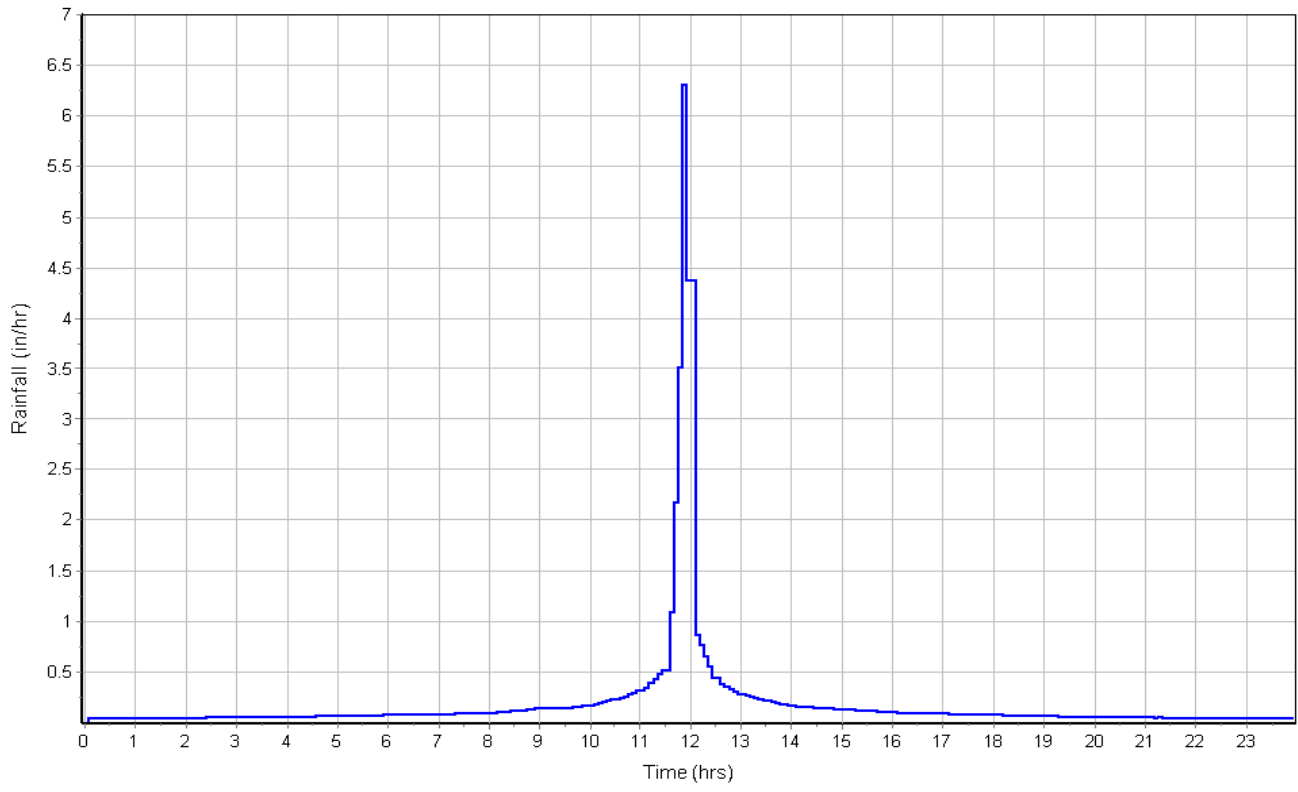
	Flowpath A	Flowpath B	Flowpath C
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	20154	0.00	0.00
Channel Slope (%) :	1.3	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	6.74	0.00	0.00
Computed Flow Time (min) :	49.82	0.00	0.00
Total TOC (min)	82.79		

Subbasin Runoff Results

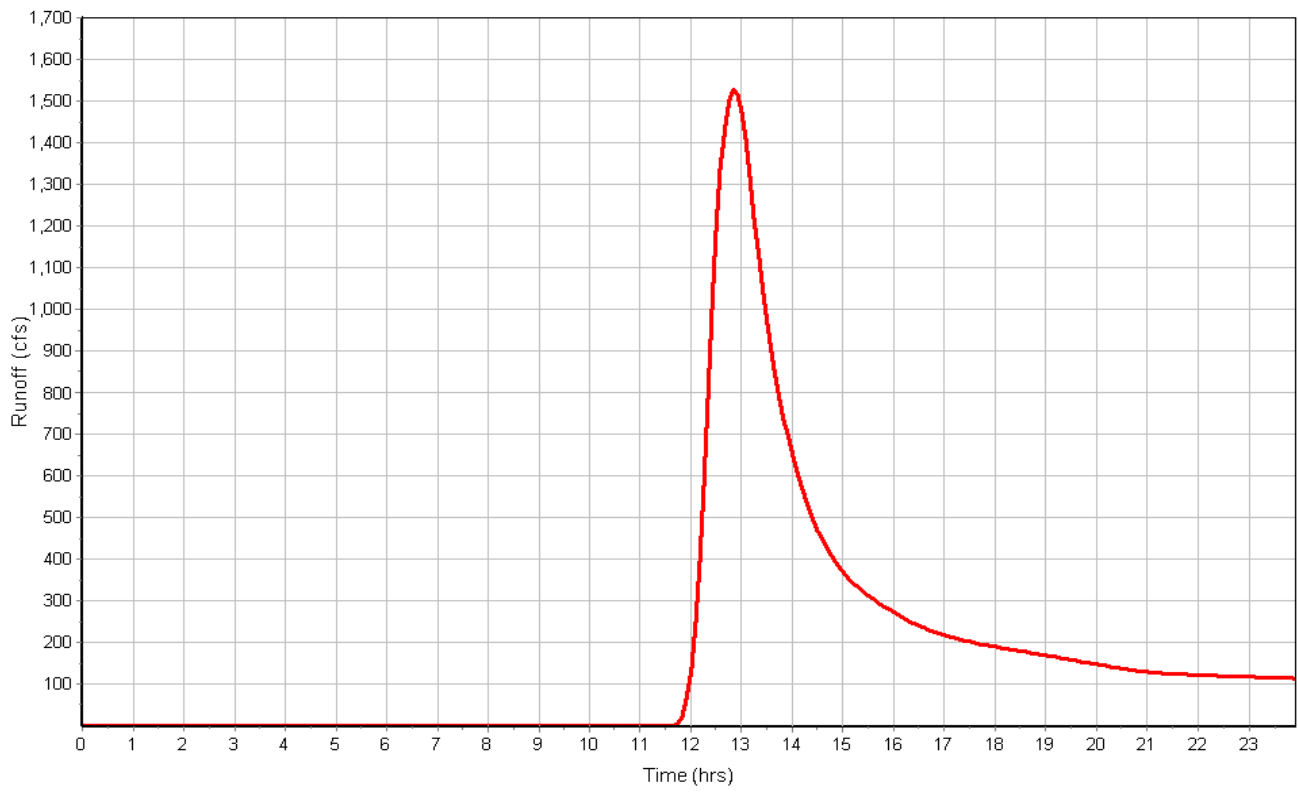
Total Rainfall (in) 4.60
 Total Runoff (in) 1.10
 Peak Runoff (cfs) 1528.85
 Weighted Curve Number 60.34
 Time of Concentration (days hh:mm:ss) 0 01:22:47

Subbasin : B1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : B2

Input Data

Area (ac) 13.10
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	13.10	B	64.00
Composite Area & Weighted CN	13.10		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	5.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.60	0.00	0.00
Computed Flow Time (min) :	3.13	0.00	0.00

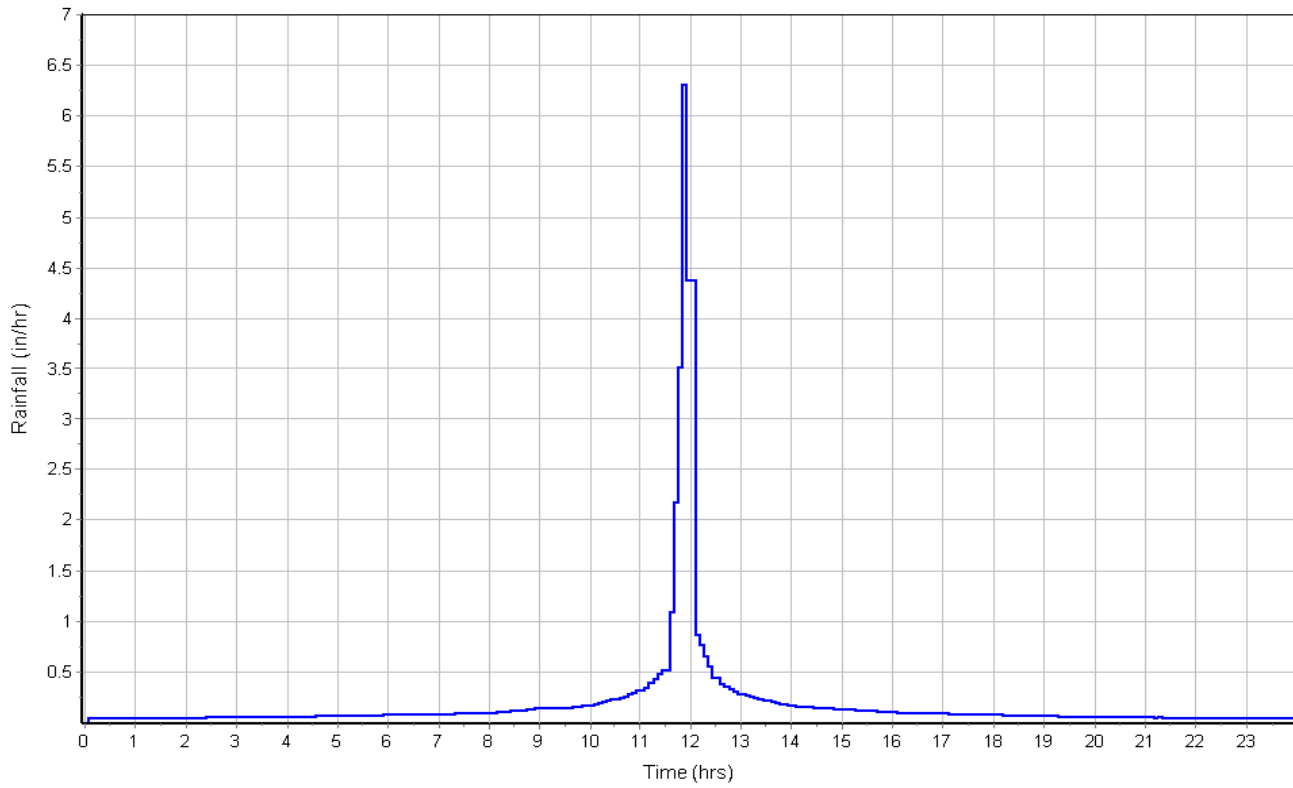
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	177	0.00	0.00
Channel Slope (%) :	5.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.48	0.00	0.00
Computed Flow Time (min) :	0.22	0.00	0.00
Total TOC (min)	24.40		

Subbasin Runoff Results

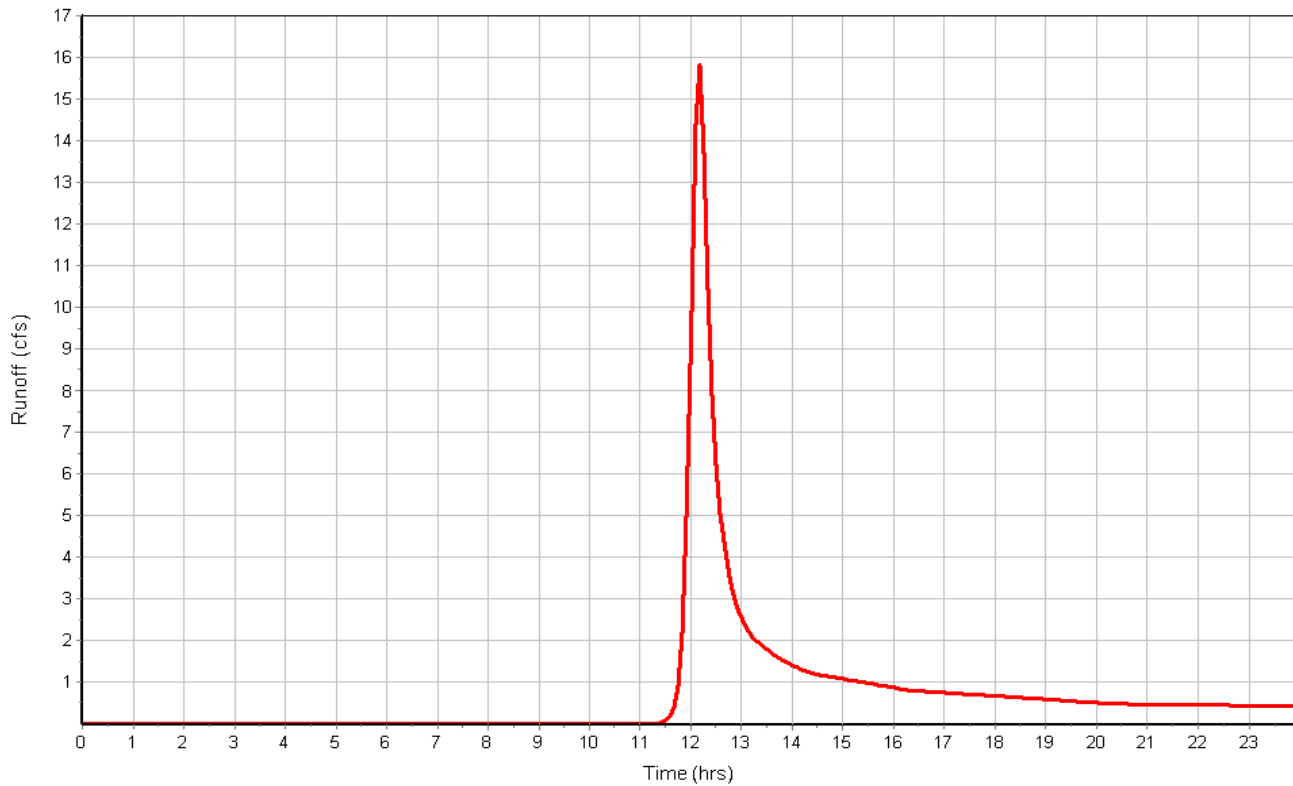
Total Rainfall (in) 4.60
 Total Runoff (in) 1.33
 Peak Runoff (cfs) 15.93
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:24:24

Subbasin : B2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : B3

Input Data

Area (ac) 54.90
 Weighted Curve Number 65.10
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	38.43	B	60.00
5 Acre Lots, 7% Impervious	16.47	D	77.00
Composite Area & Weighted CN	54.90		65.10

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.27	0.00	0.00
Computed Flow Time (min) :	13.12	0.00	0.00

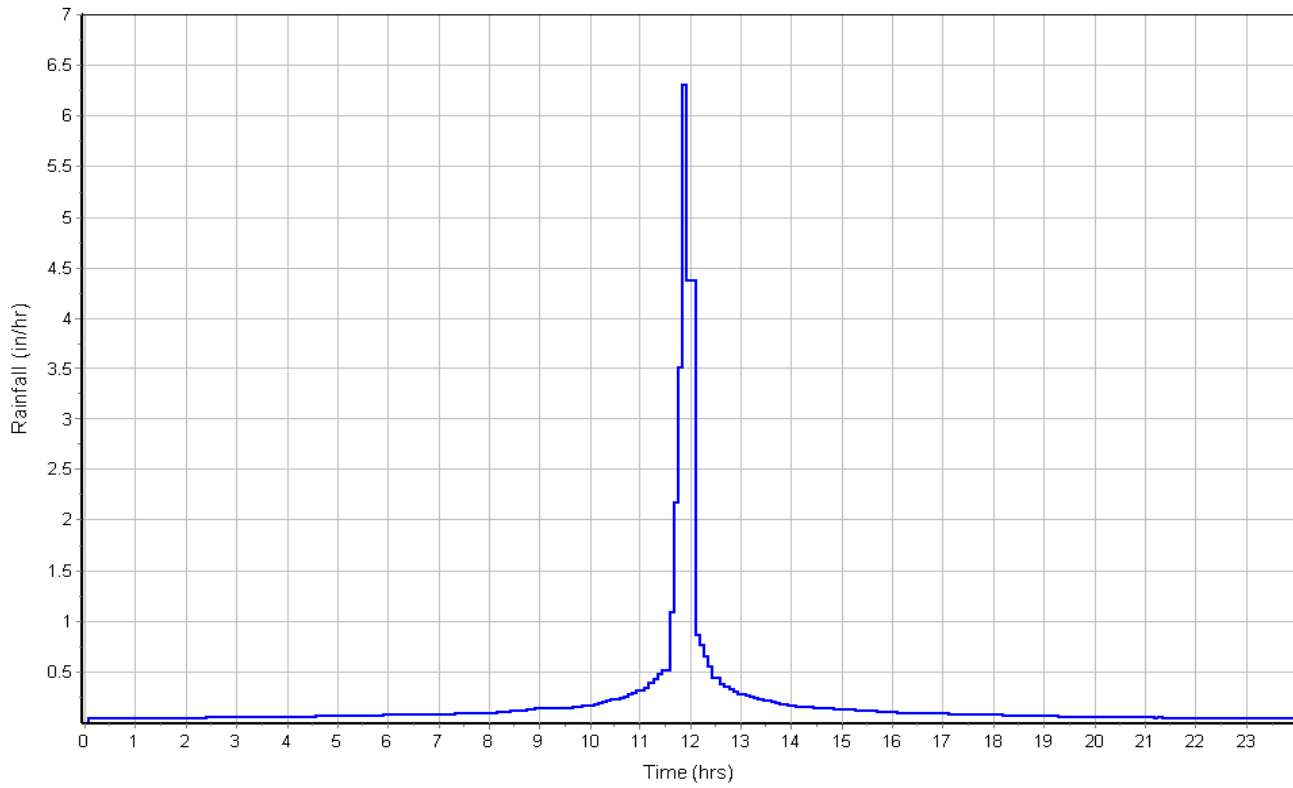
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	2693	0.00	0.00
Channel Slope (%) :	3.3	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.74	0.00	0.00
Computed Flow Time (min) :	4.18	0.00	0.00
Total TOC (min)	38.36		

Subbasin Runoff Results

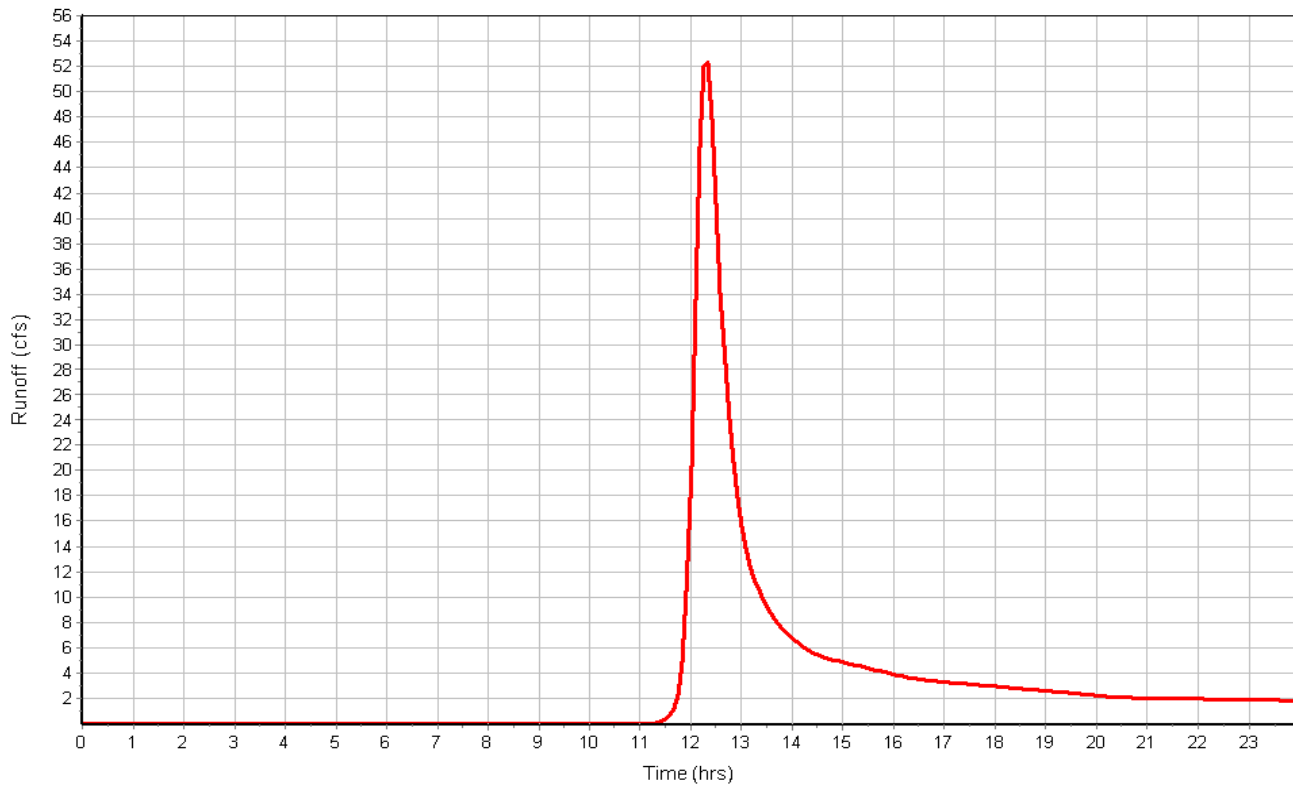
Total Rainfall (in) 4.60
 Total Runoff (in) 1.40
 Peak Runoff (cfs) 53.05
 Weighted Curve Number 65.10
 Time of Concentration (days hh:mm:ss) 0 00:38:22

Subbasin : B3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : B4

Input Data

Area (ac) 41.48
 Weighted Curve Number 68.50
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	22.81	B	64.00
Pasture, grassland, or range, Fair	12.44	B	69.00
Pasture, grassland, or range, Fair	6.22	D	84.00
Composite Area & Weighted CN	41.47		68.50

Time of Concentration

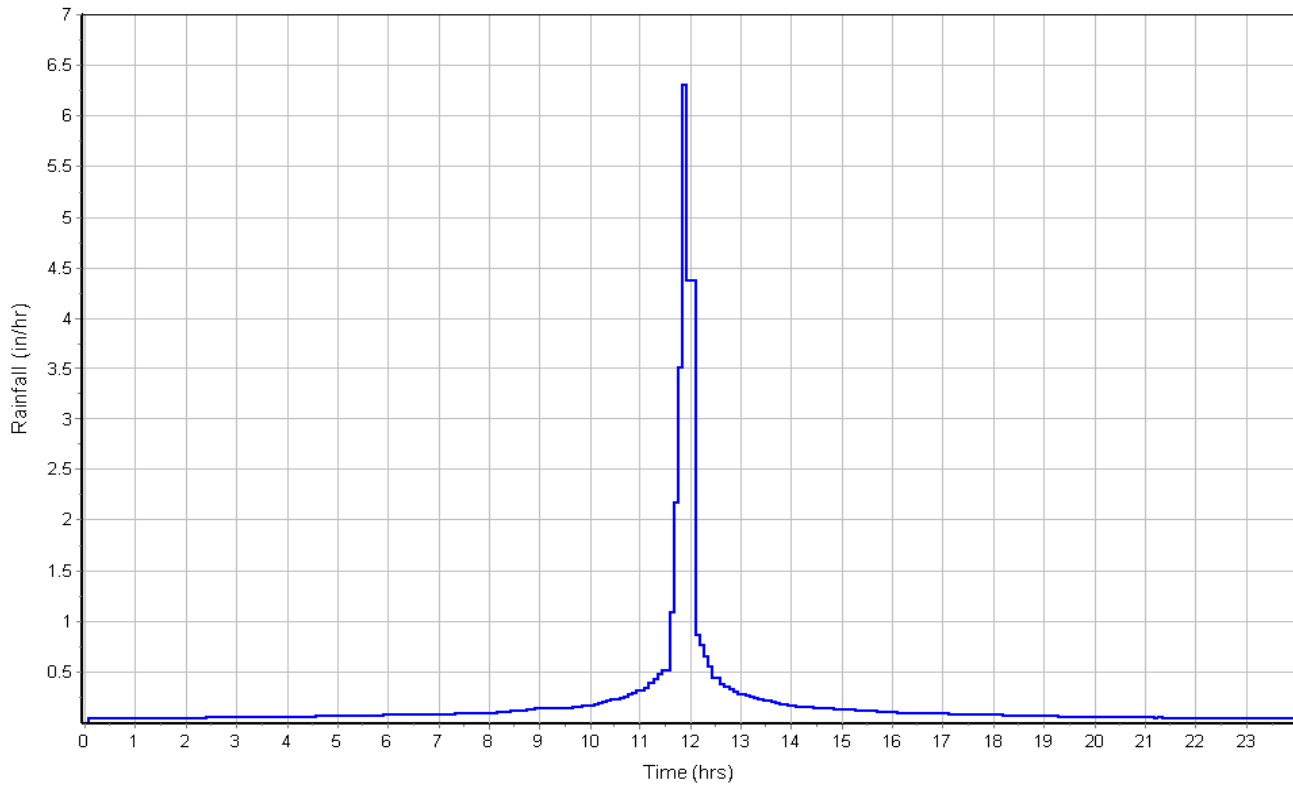
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	15.72	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1188	0.00	0.00
Channel Slope (%) :	2.3	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.97	0.00	0.00
Computed Flow Time (min) :	2.21	0.00	0.00
Total TOC (min)	38.99		

Subbasin Runoff Results

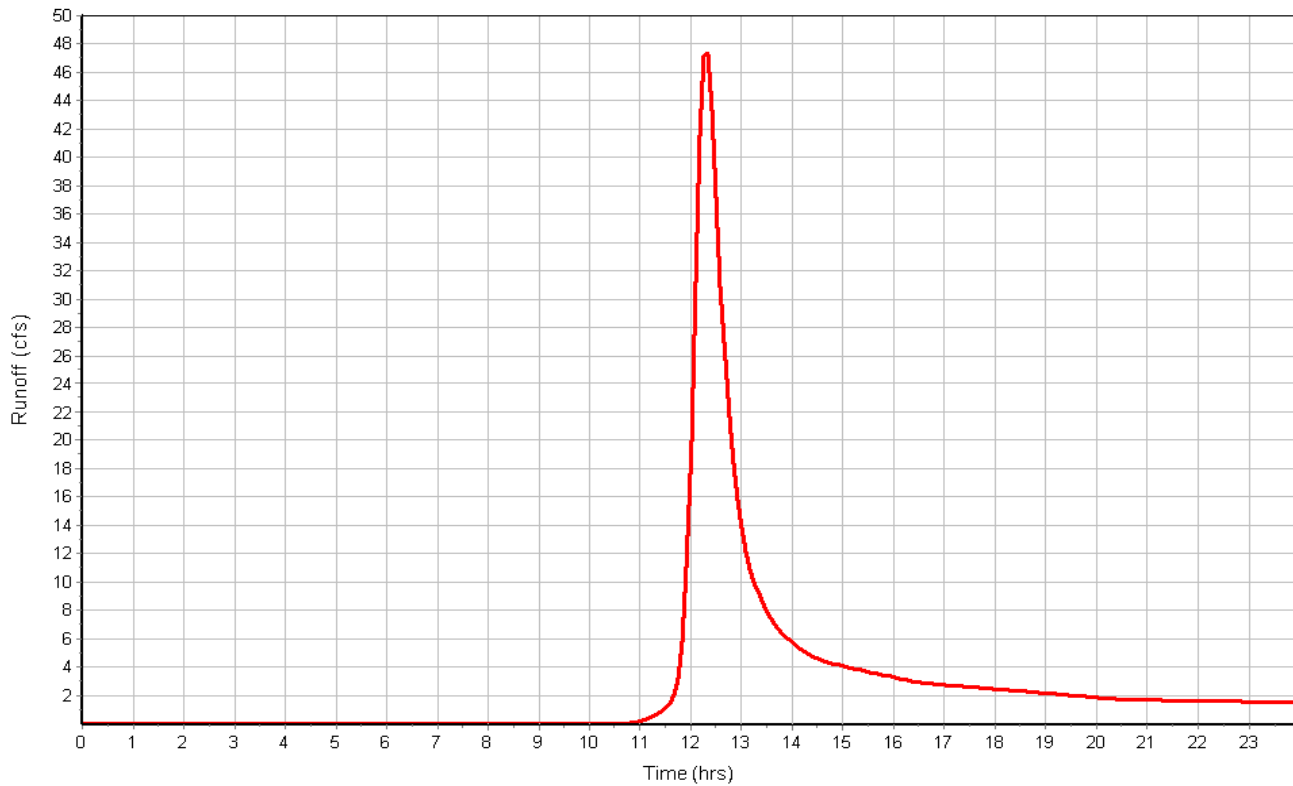
Total Rainfall (in) 4.60
 Total Runoff (in) 1.64
 Peak Runoff (cfs) 47.99
 Weighted Curve Number 68.50
 Time of Concentration (days hh:mm:ss) 0 00:38:59

Subbasin : B4

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : C1

Input Data

Area (ac) 162.70
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	162.70	B	60.00
Composite Area & Weighted CN	162.70		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.42	0.00	0.00
Computed Flow Time (min) :	11.74	0.00	0.00

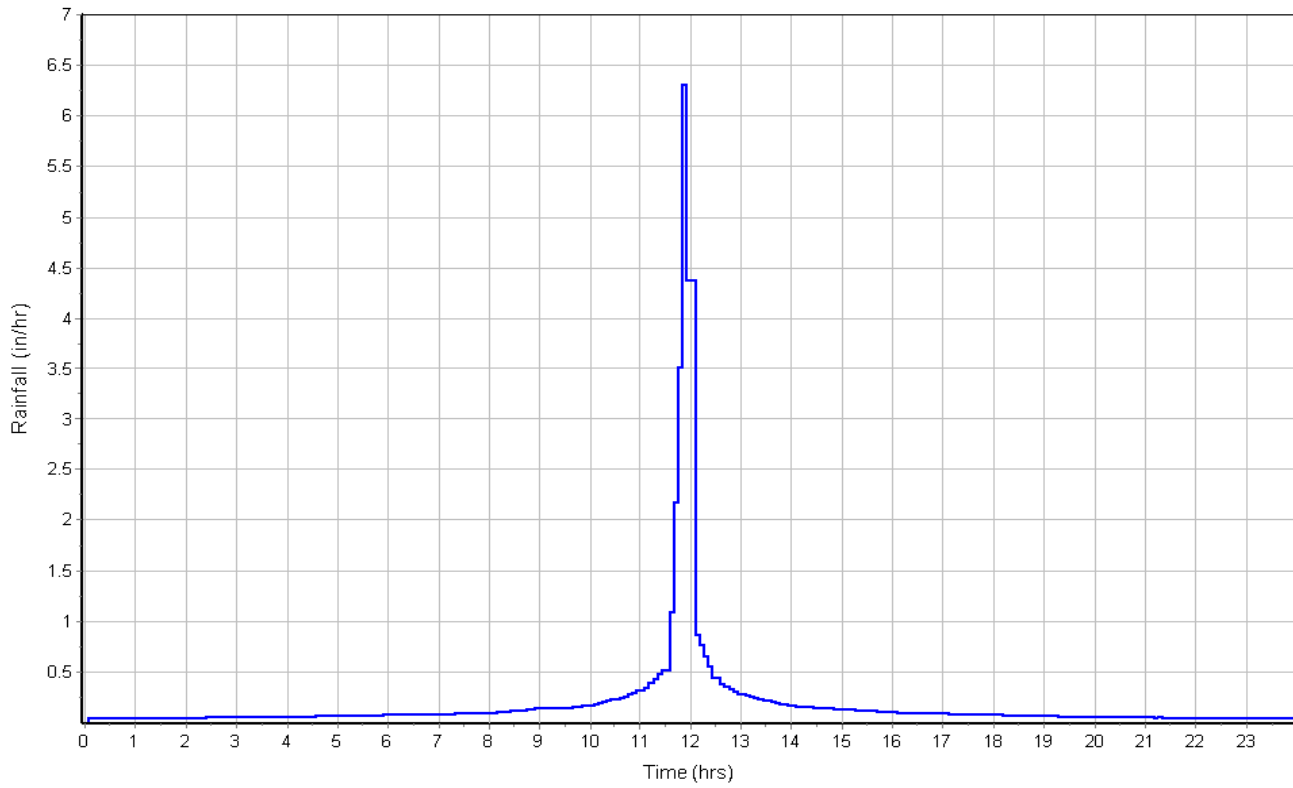
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	3099	0.00	0.00
Channel Slope (%) :	4.1	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.97	0.00	0.00
Computed Flow Time (min) :	4.31	0.00	0.00
Total TOC (min)	37.11		

Subbasin Runoff Results

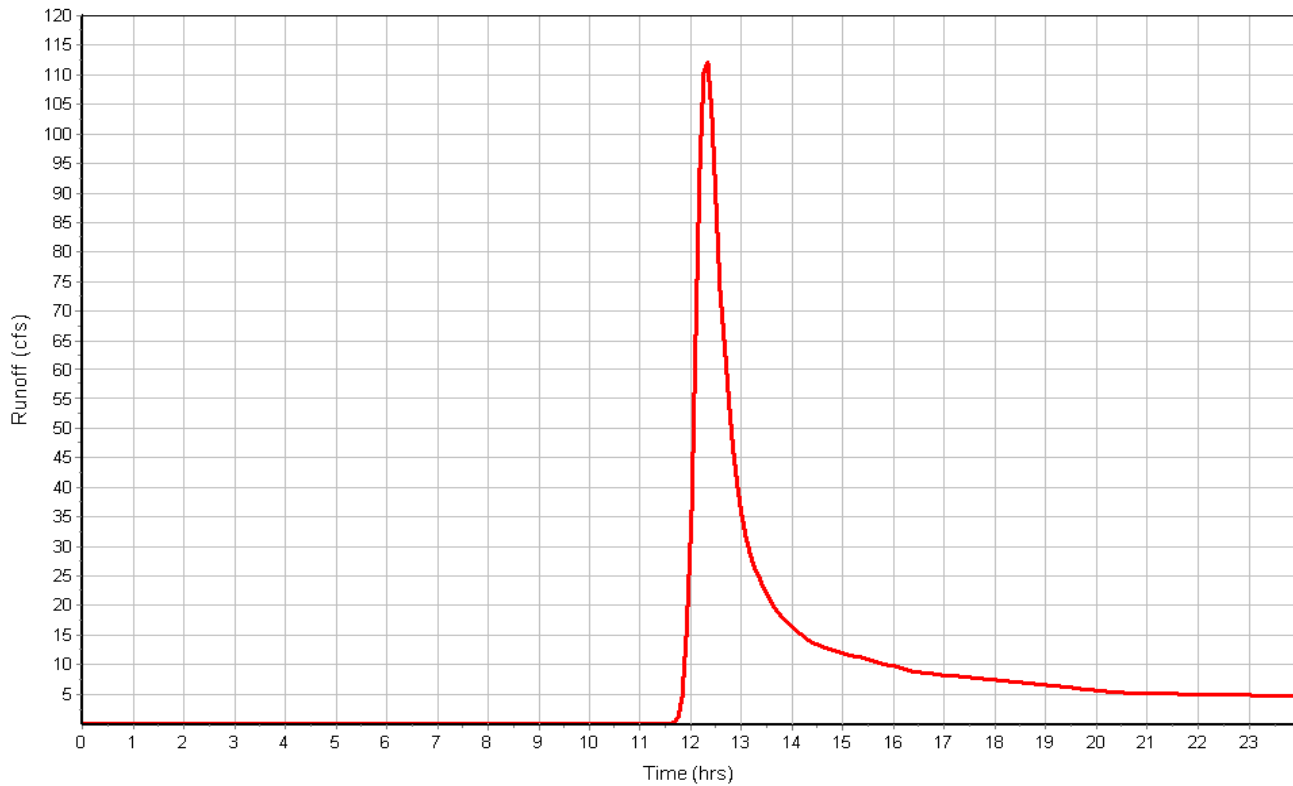
Total Rainfall (in) 4.60
 Total Runoff (in) 1.07
 Peak Runoff (cfs) 113.24
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:37:07

Subbasin : C1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : C2

Input Data

Area (ac) 22.40
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	22.40	B	64.00
Composite Area & Weighted CN	22.40		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.57	0.00	0.00
Computed Flow Time (min) :	5.31	0.00	0.00

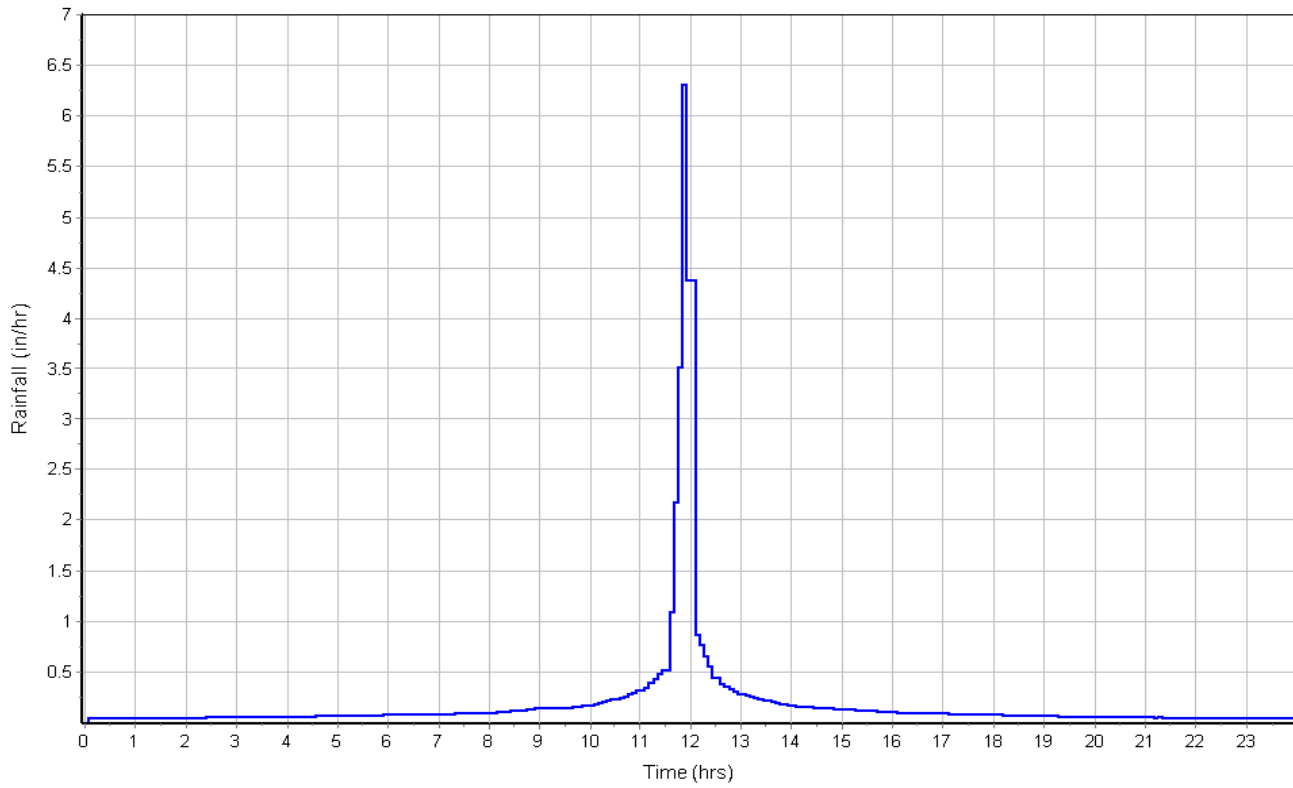
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	401	0.00	0.00
Channel Slope (%) :	.05	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	1.32	0.00	0.00
Computed Flow Time (min) :	5.05	0.00	0.00
Total TOC (min)	31.42		

Subbasin Runoff Results

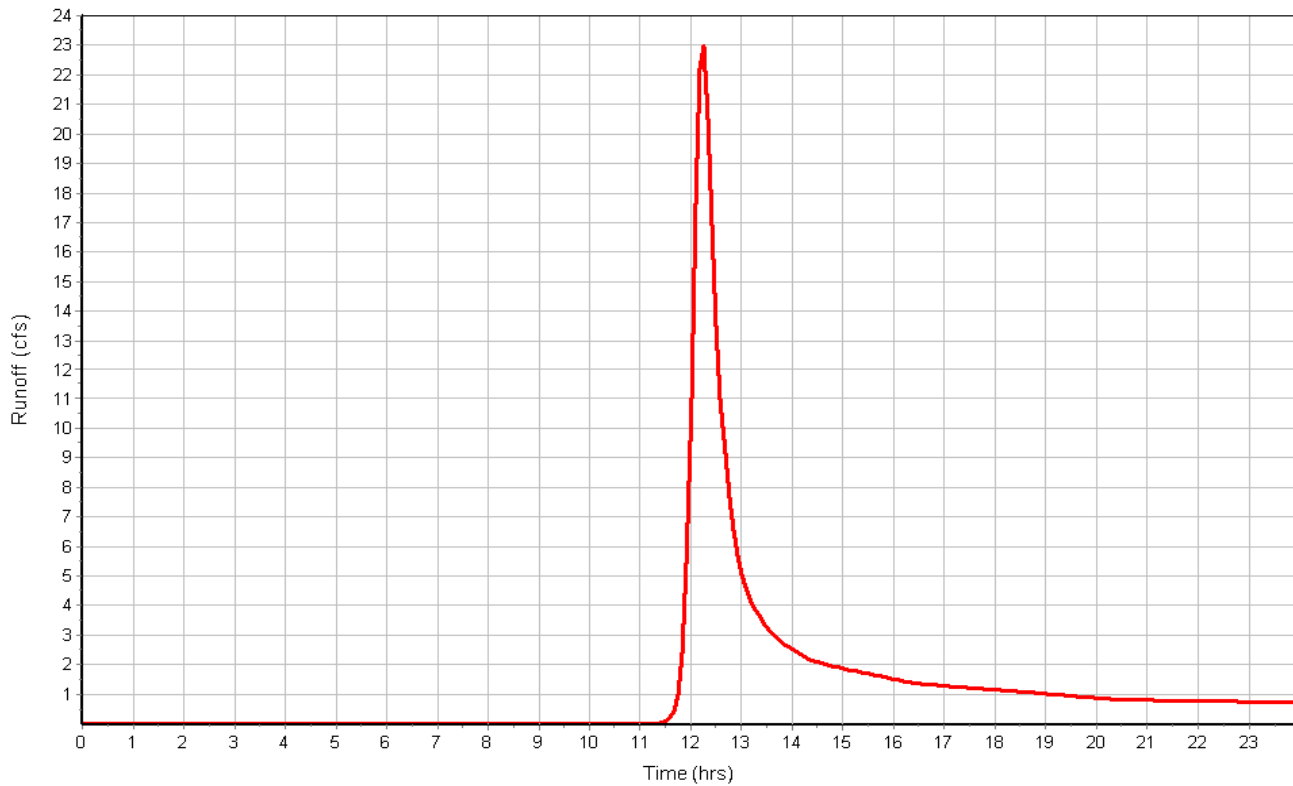
Total Rainfall (in) 4.60
 Total Runoff (in) 1.33
 Peak Runoff (cfs) 23.14
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:31:25

Subbasin : C2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : C3

Input Data

Area (ac) 16.10
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	16.10	B	64.00
Composite Area & Weighted CN	16.10		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	6.13	0.00	0.00

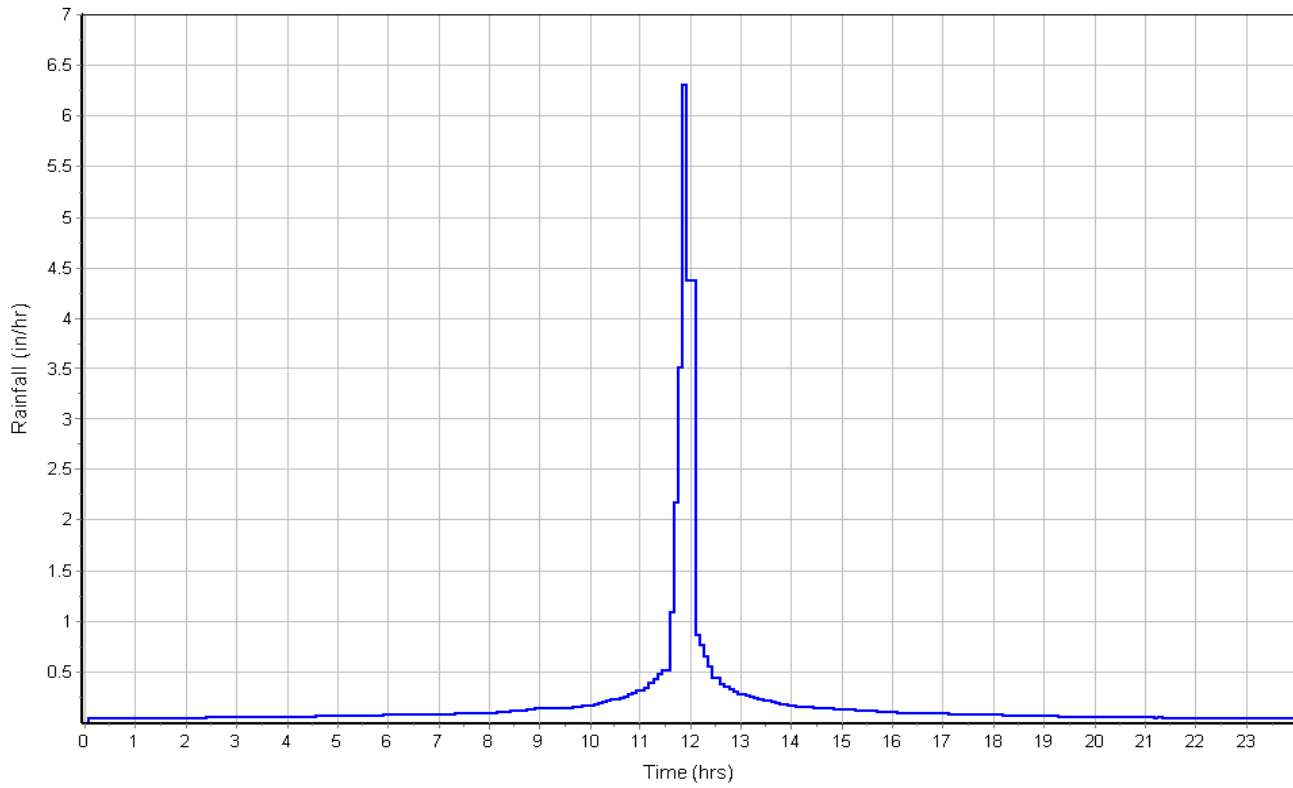
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	666	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.53	0.00	0.00
Computed Flow Time (min) :	0.96	0.00	0.00
Total TOC (min)	28.15		

Subbasin Runoff Results

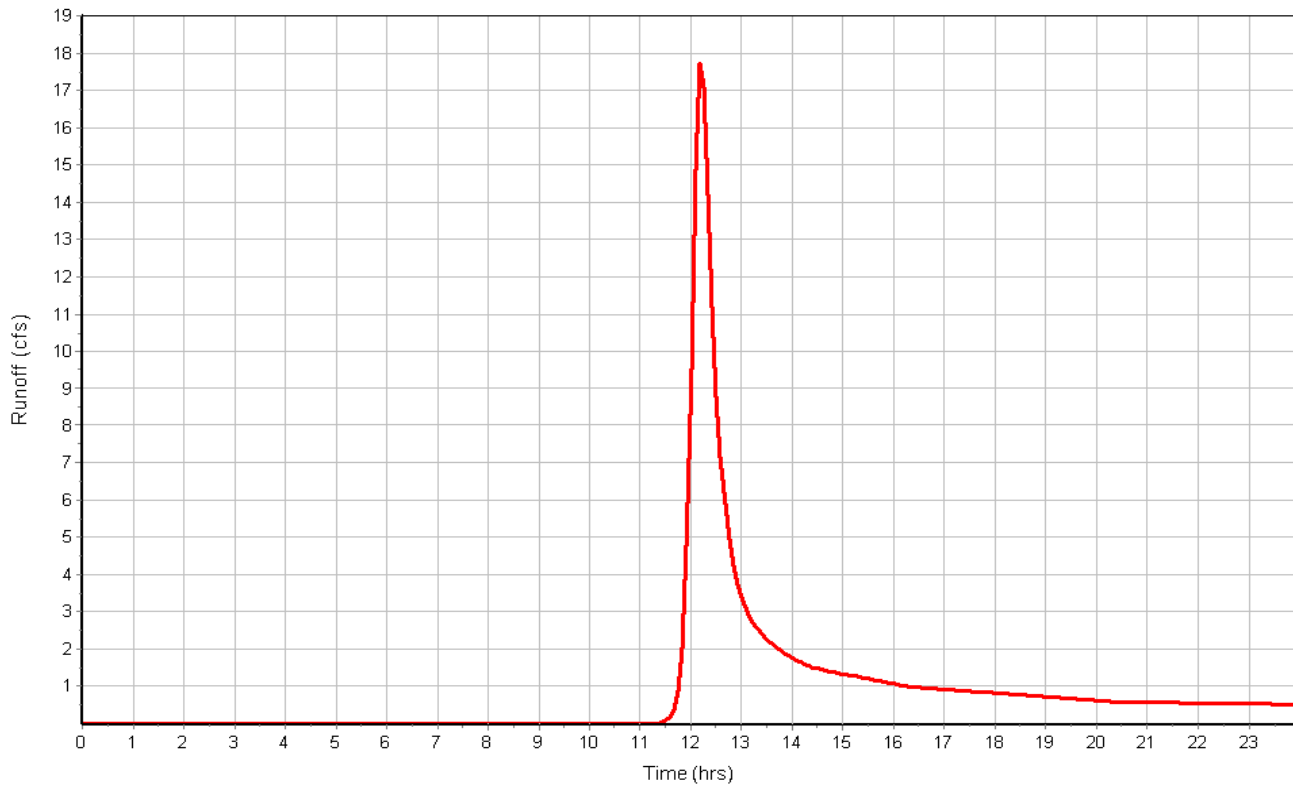
Total Rainfall (in) 4.60
 Total Runoff (in) 1.33
 Peak Runoff (cfs) 17.91
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:28:09

Subbasin : C3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : C4

Input Data

Area (ac) 23.80
 Weighted Curve Number 65.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	11.90	B	60.00
Pasture, grassland, or range, Fair	1.19	C	79.00
Pasture, grassland, or range, Fair	10.71	B	69.00
Composite Area & Weighted CN	23.80		65.00

Time of Concentration

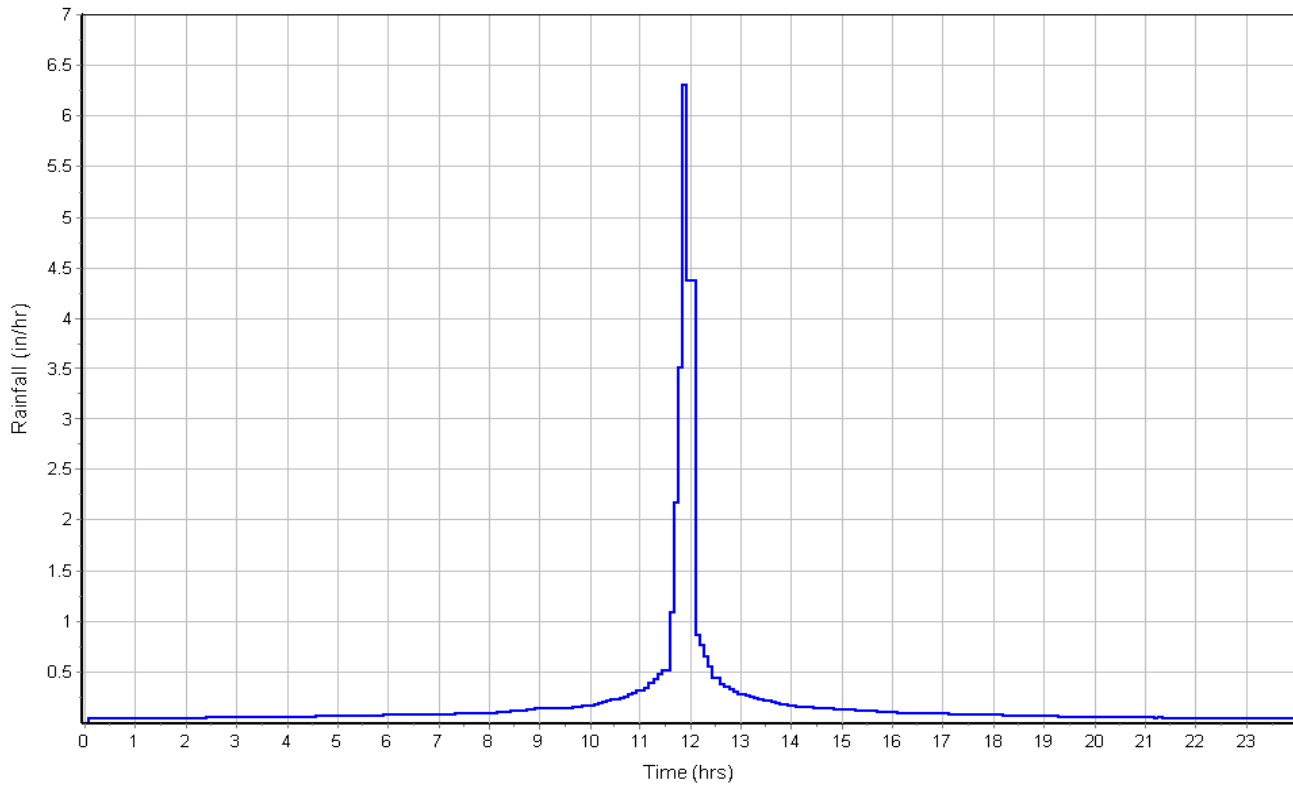
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	1.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	0.96	0.00	0.00
Computed Flow Time (min) :	17.36	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1074	0.00	0.00
Channel Slope (%) :	1.9	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.15	0.00	0.00
Computed Flow Time (min) :	2.20	0.00	0.00
Total TOC (min)	40.62		

Subbasin Runoff Results

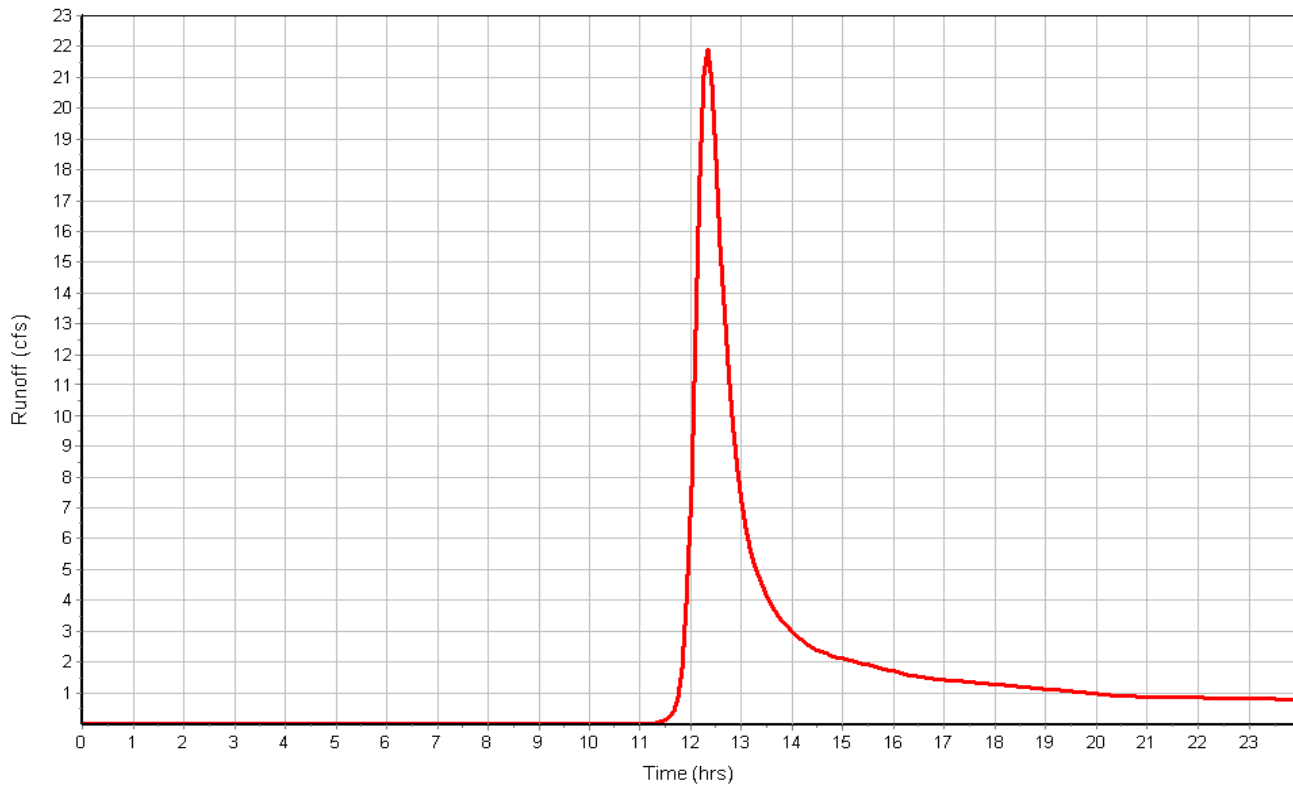
Total Rainfall (in) 4.60
 Total Runoff (in) 1.39
 Peak Runoff (cfs) 21.99
 Weighted Curve Number 65.00
 Time of Concentration (days hh:mm:ss) 0 00:40:37

Subbasin : C4

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D1.1

Input Data

Area (ac) 161.30
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	161.30	B	60.00
Composite Area & Weighted CN	161.30		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5.7	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.19	0.00	0.00
Computed Flow Time (min) :	14.01	0.00	0.00

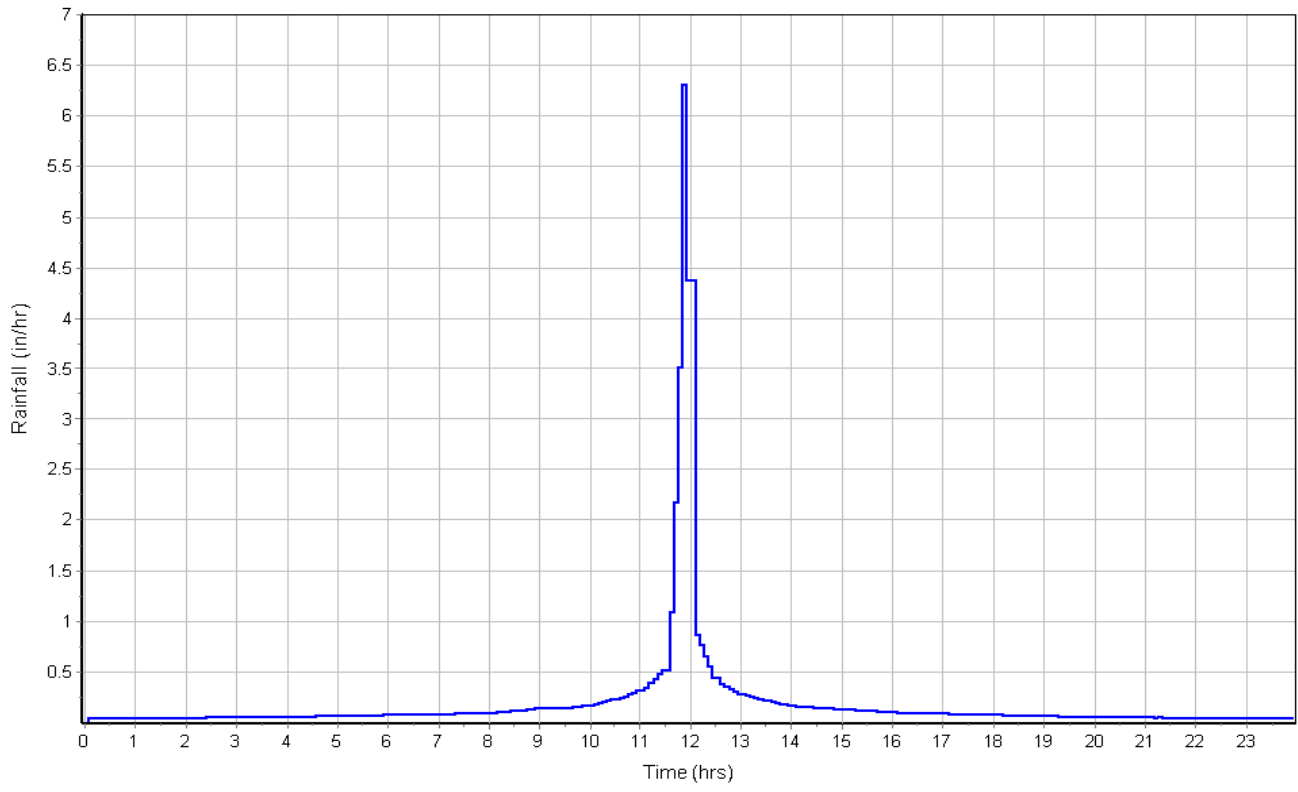
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1601	0.00	0.00
Channel Slope (%) :	5.7	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	14.12	0.00	0.00
Computed Flow Time (min) :	1.89	0.00	0.00
Total TOC (min)	36.95		

Subbasin Runoff Results

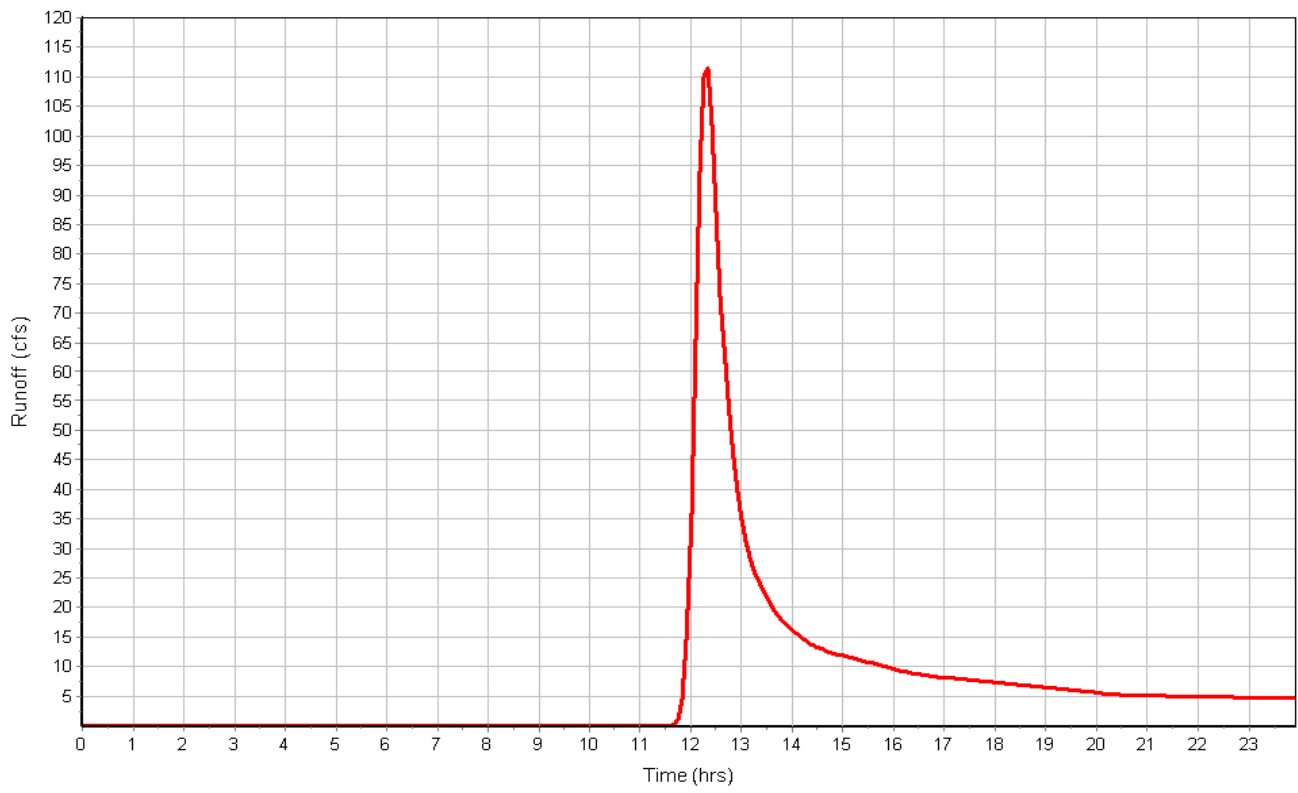
Total Rainfall (in) 4.60
 Total Runoff (in) 1.07
 Peak Runoff (cfs) 112.62
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:36:57

Subbasin : D1.1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D1.2

Input Data

Area (ac) 49.90
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	49.90	B	60.00
Composite Area & Weighted CN	49.90		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.48	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	0.79	0.00	0.00
Computed Flow Time (min) :	21.10	0.00	0.00

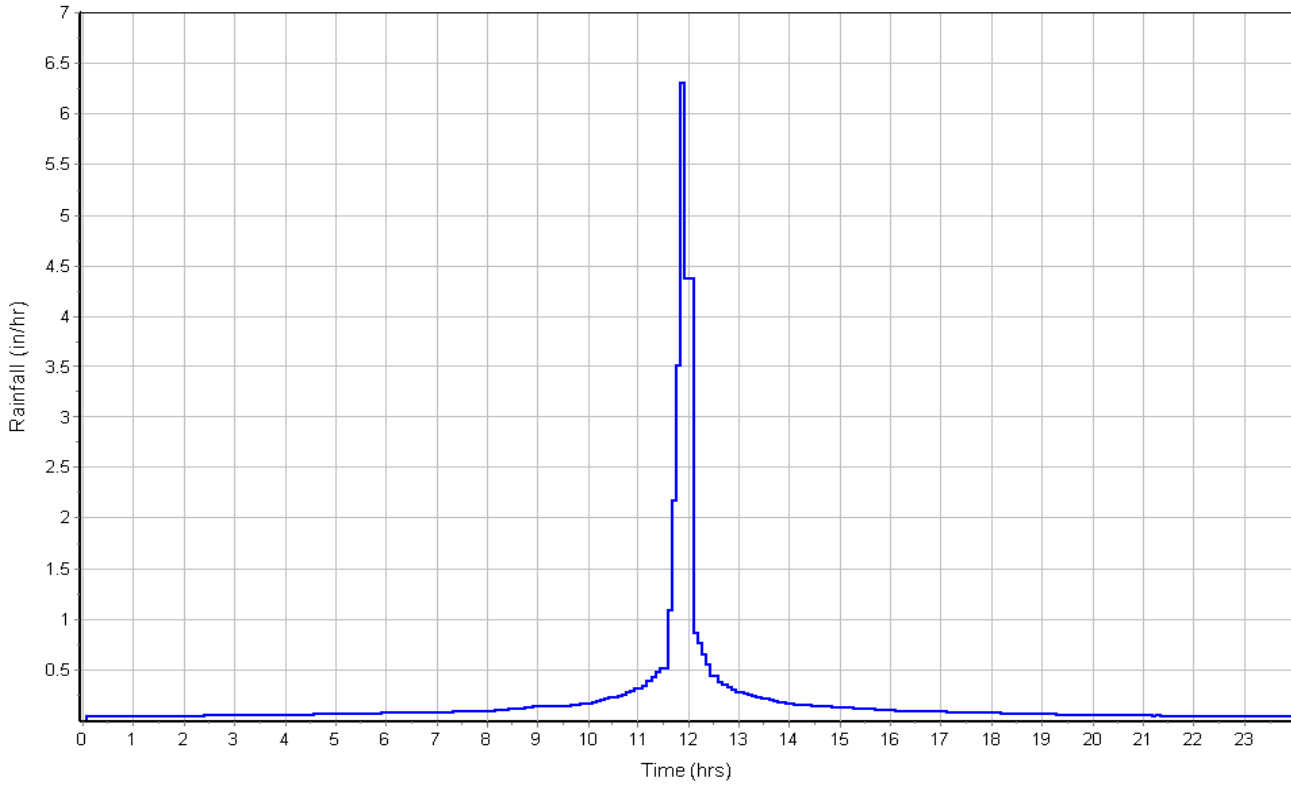
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	922	0.00	0.00
Channel Slope (%) :	2.48	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	9.31	0.00	0.00
Computed Flow Time (min) :	1.65	0.00	0.00
Total TOC (min)	43.81		

Subbasin Runoff Results

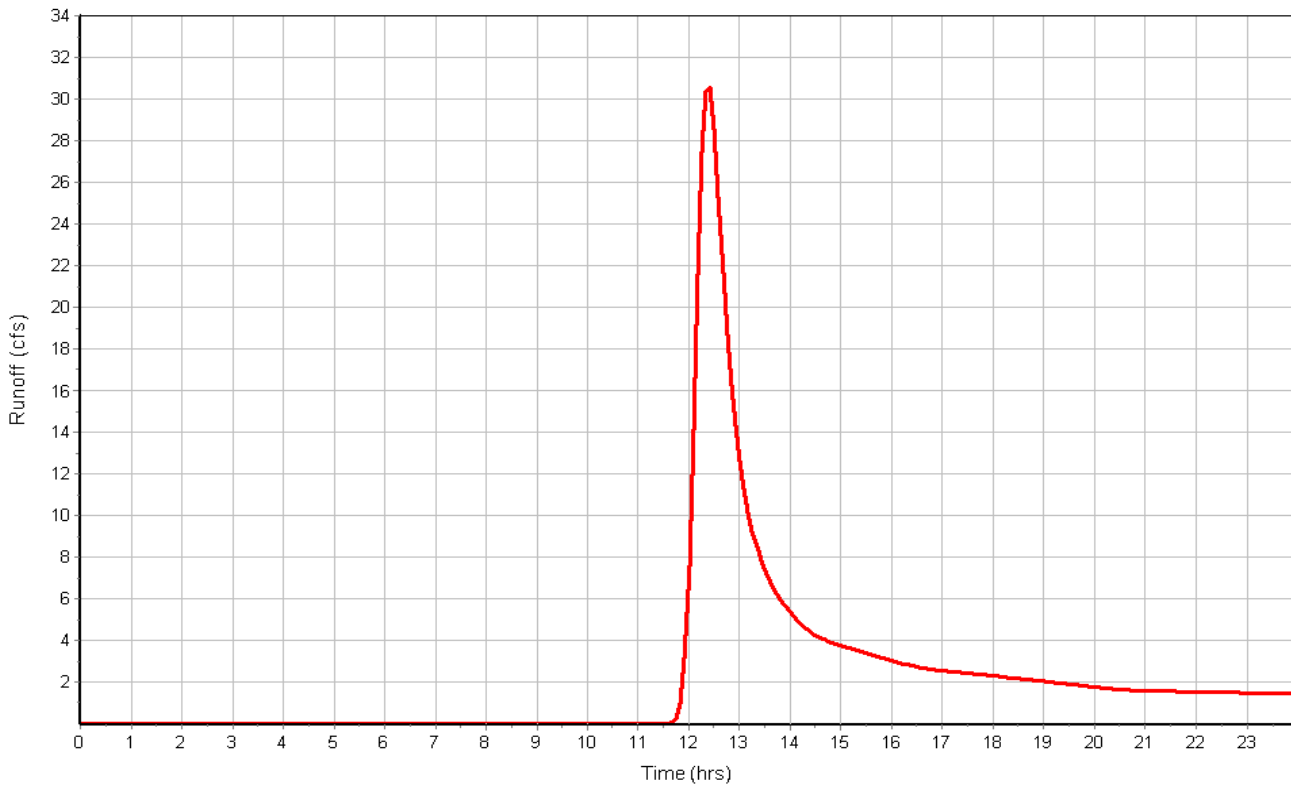
Total Rainfall (in) 4.60
 Total Runoff (in) 1.07
 Peak Runoff (cfs) 30.80
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:43:49

Subbasin : D1.2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D2

Input Data

Area (ac) 68.70
 Weighted Curve Number 64.75
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	10.31	B	69.00
2.5 Acre Lots, 11% Impervious	58.40	B	64.00
Composite Area & Weighted CN	68.71		64.75

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	12.25	0.00	0.00

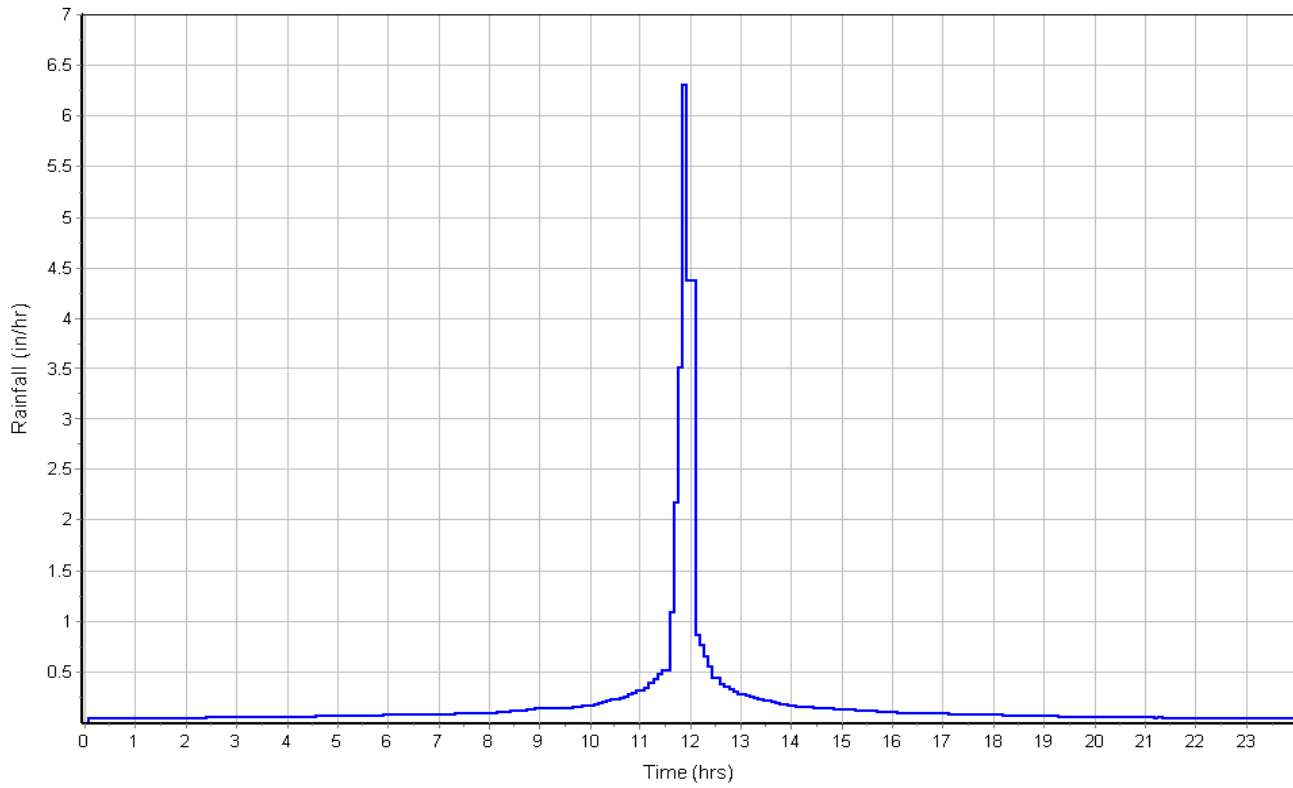
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	848	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.53	0.00	0.00
Computed Flow Time (min) :	1.23	0.00	0.00
Total TOC (min)	34.54		

Subbasin Runoff Results

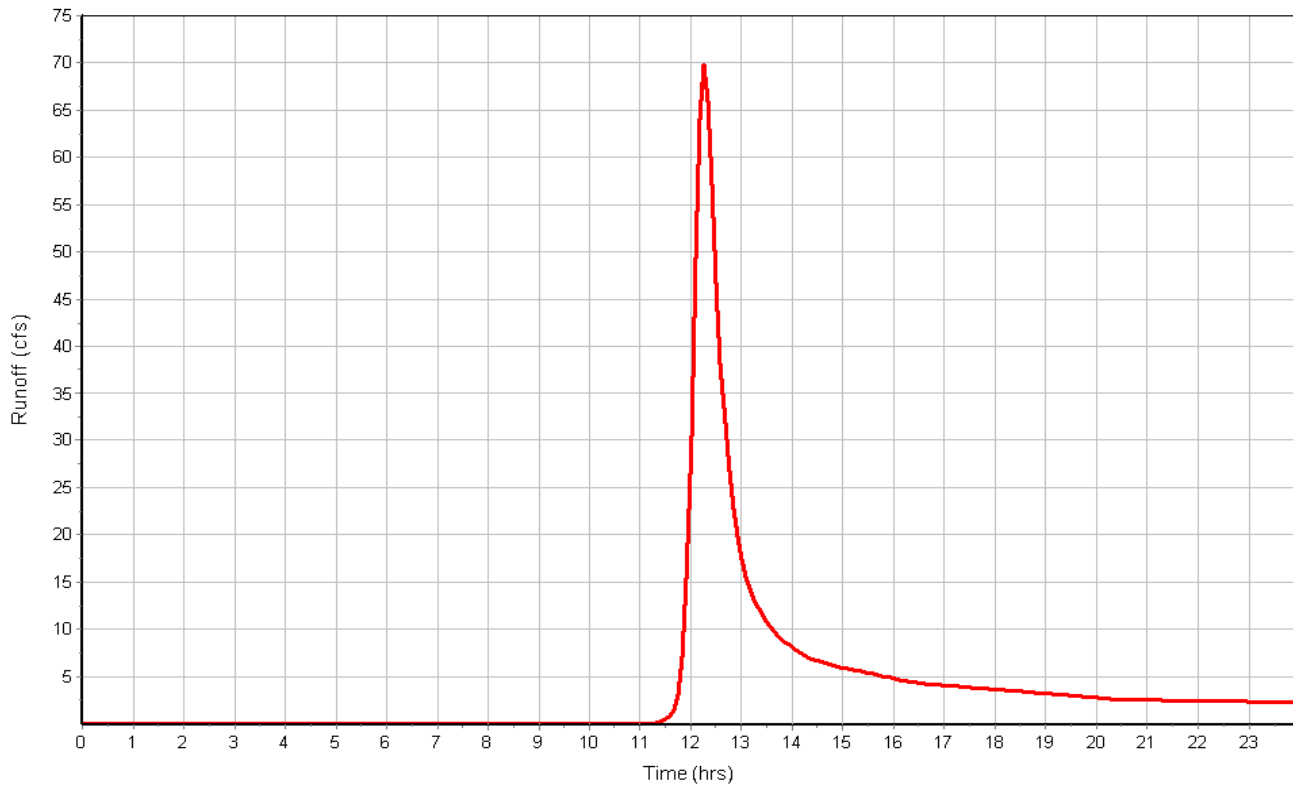
Total Rainfall (in) 4.60
 Total Runoff (in) 1.38
 Peak Runoff (cfs) 69.94
 Weighted Curve Number 64.75
 Time of Concentration (days hh:mm:ss) 0 00:34:32

Subbasin : D2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D3

Input Data

Area (ac) 41.20
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	41.20	B	64.00
Composite Area & Weighted CN	41.20		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	15.72	0.00	0.00

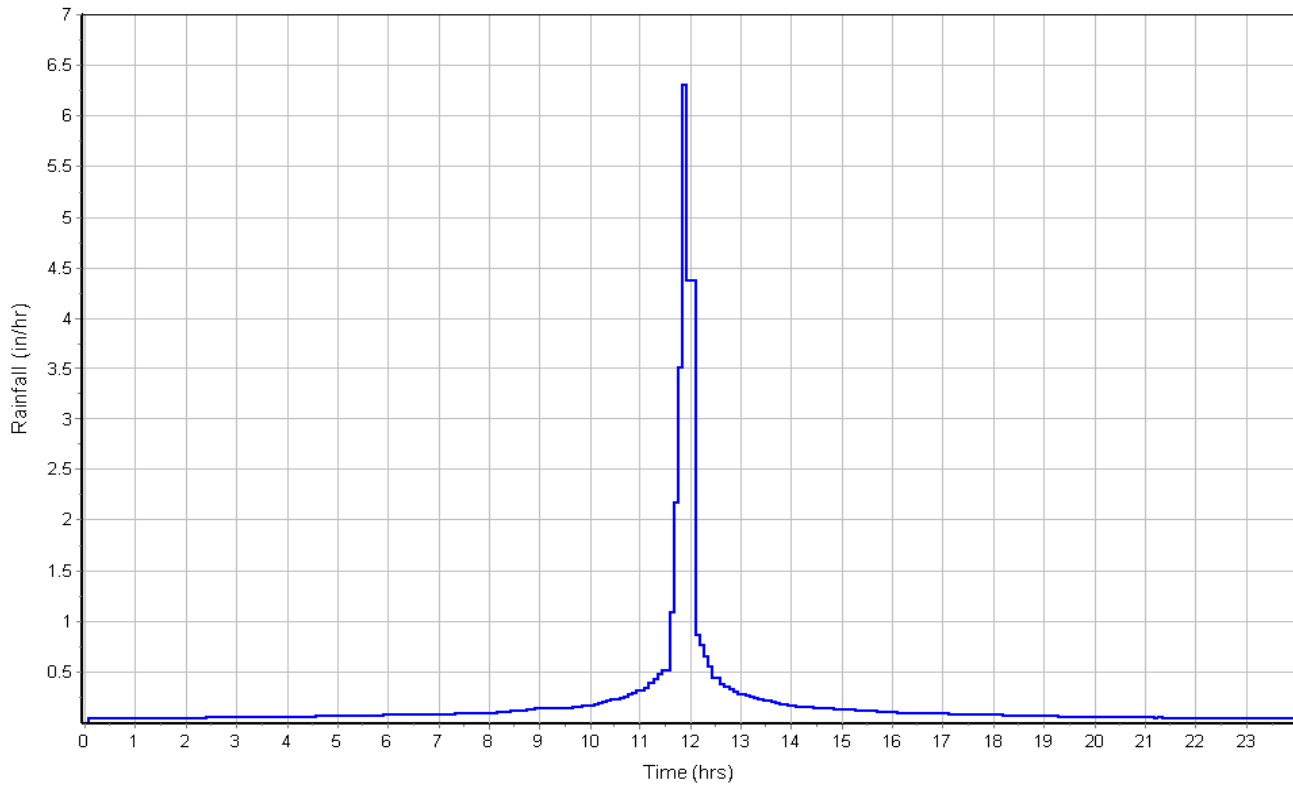
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1128	0.00	0.00
Channel Slope (%) :	2.3	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.97	0.00	0.00
Computed Flow Time (min) :	2.10	0.00	0.00
Total TOC (min)	38.88		

Subbasin Runoff Results

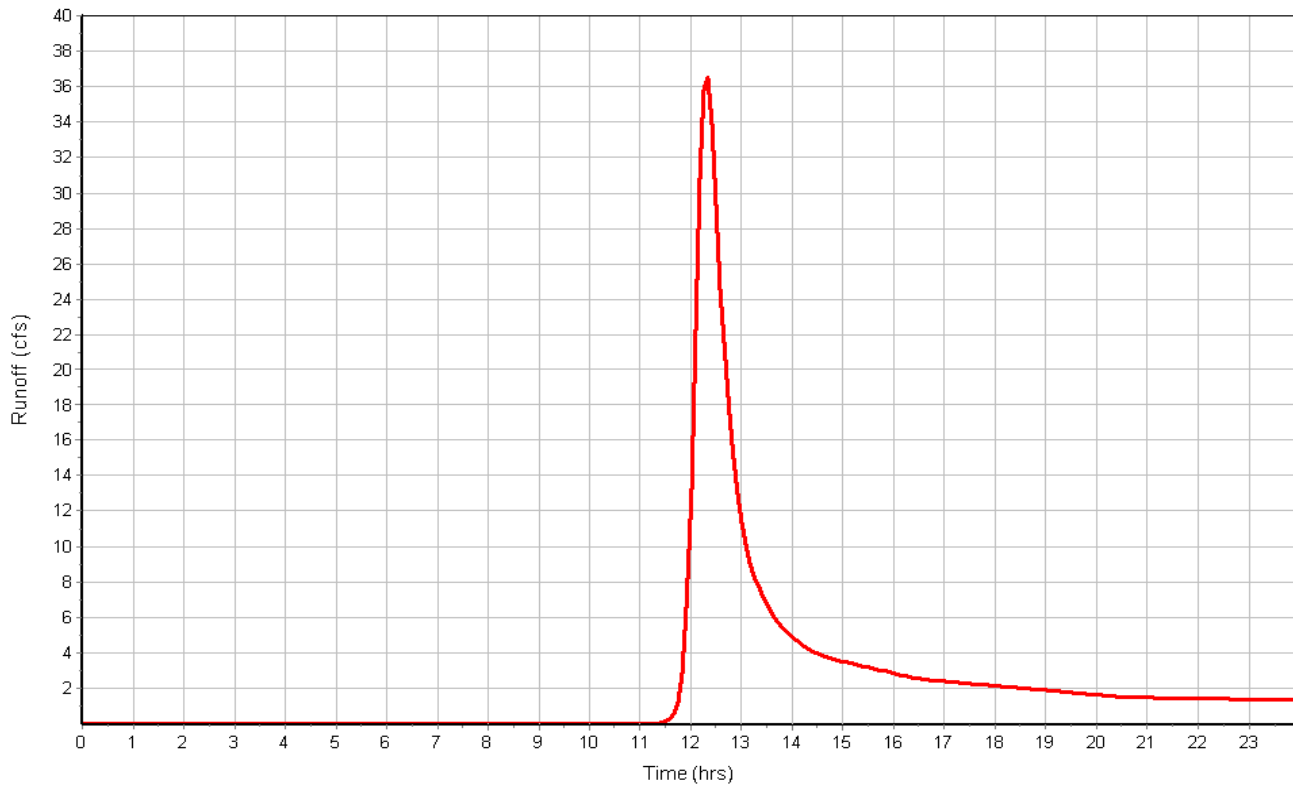
Total Rainfall (in) 4.60
 Total Runoff (in) 1.33
 Peak Runoff (cfs) 36.85
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:38:53

Subbasin : D3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D4

Input Data

Area (ac) 34.30
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	34.30	B	64.00
Composite Area & Weighted CN	34.30		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	2.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	7.86	0.00	0.00

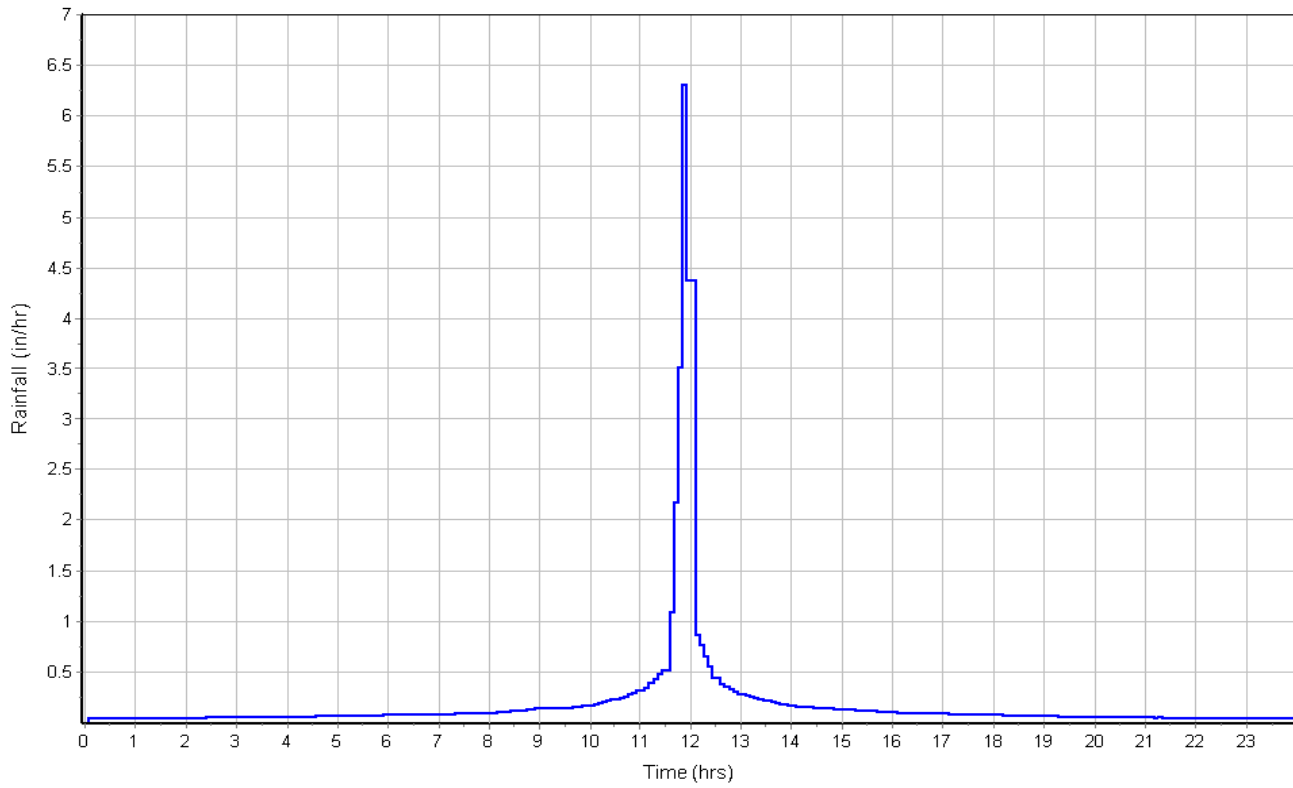
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	658	0.00	0.00
Channel Slope (%) :	2.3	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.97	0.00	0.00
Computed Flow Time (min) :	1.22	0.00	0.00
Total TOC (min)	30.14		

Subbasin Runoff Results

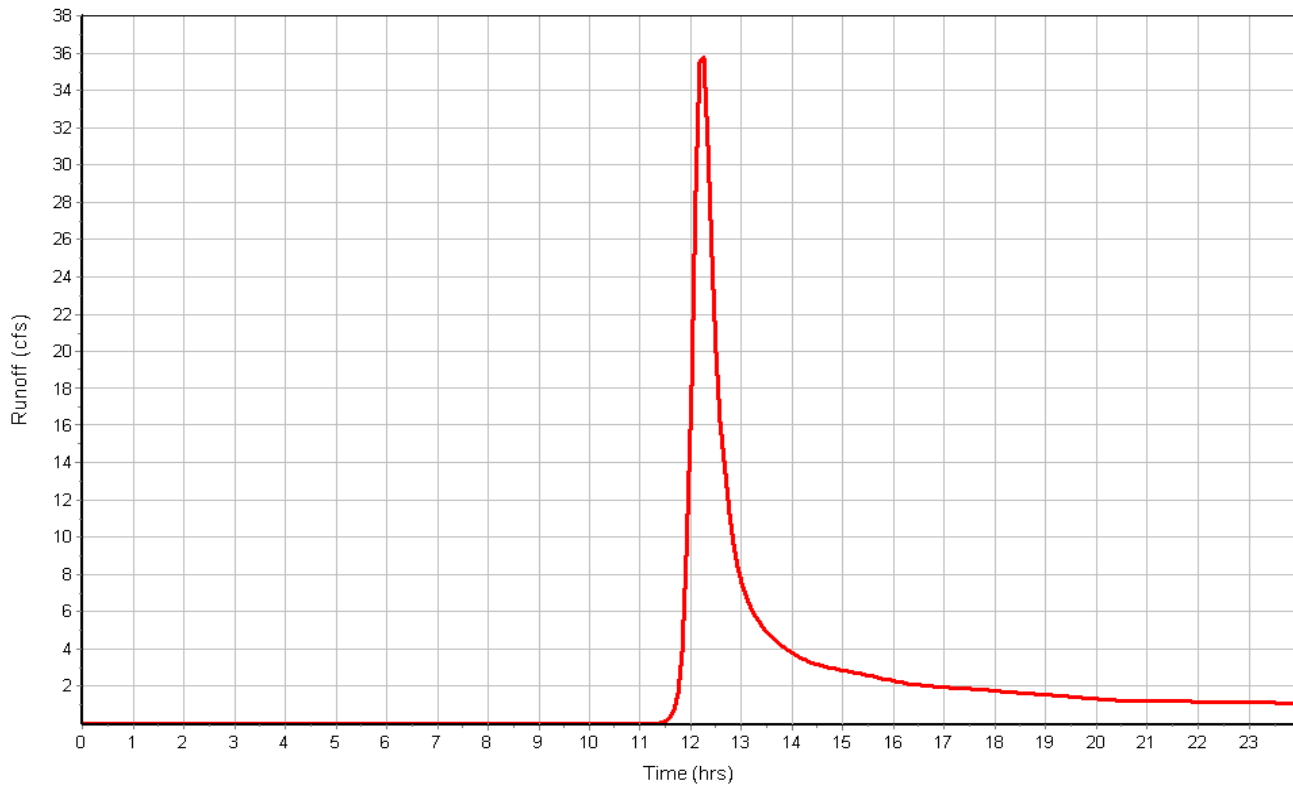
Total Rainfall (in) 4.60
 Total Runoff (in) 1.33
 Peak Runoff (cfs) 36.45
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:30:08

Subbasin : D4

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D5

Input Data

Area (ac) 12.80
 Weighted Curve Number 67.20
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	2.56	B	60.00
Pasture, grassland, or range, Fair	10.24	B	69.00
Composite Area & Weighted CN	12.80		67.20

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	500	0.00
Slope (%) :	2.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.01	0.00	0.00
Computed Flow Time (min) :	8.25	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	506	0.00	0.00
Channel Slope (%) :	2.1	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.57	0.00	0.00
Computed Flow Time (min) :	0.98	0.00	0.00

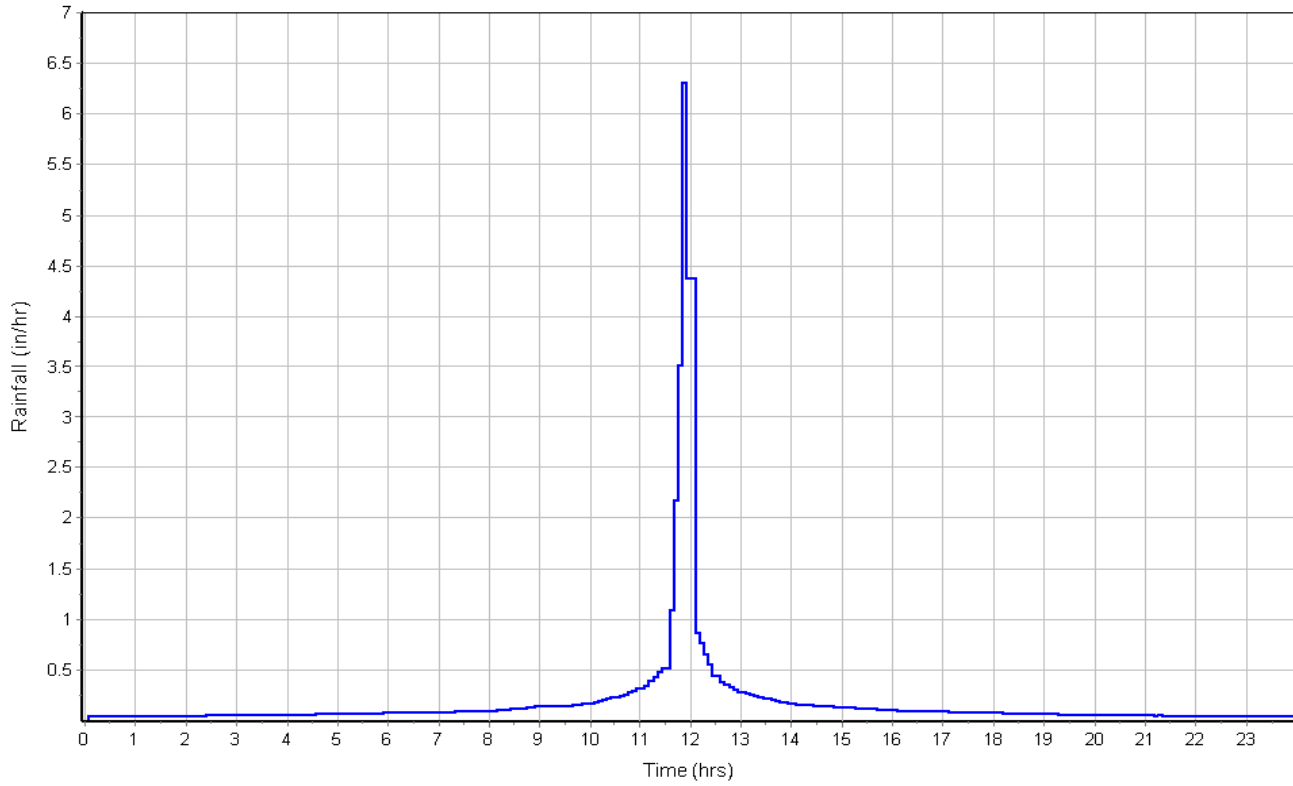
Total TOC (min)30.29

Subbasin Runoff Results

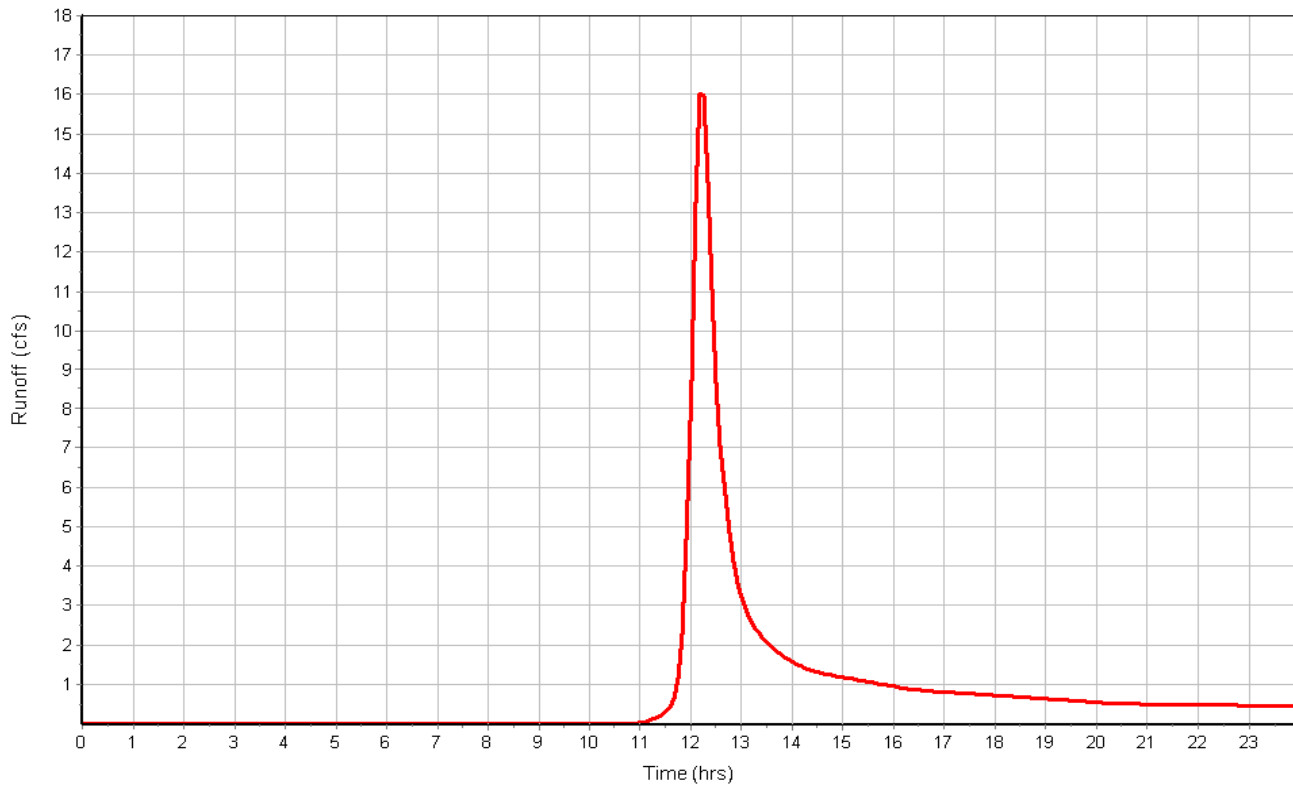
Total Rainfall (in) 4.60
 Total Runoff (in) 1.54
 Peak Runoff (cfs) 16.37
 Weighted Curve Number 67.20
 Time of Concentration (days hh:mm:ss) 0 00:30:17

Subbasin : D5

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : D6

Input Data

Area (ac) 41.80
 Weighted Curve Number 61.65
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	37.62	B	60.00
Pasture, grassland, or range, Fair	2.09	D	84.00
Pasture, grassland, or range, Fair	2.09	B	69.00
Composite Area & Weighted CN	41.80		61.65

Time of Concentration

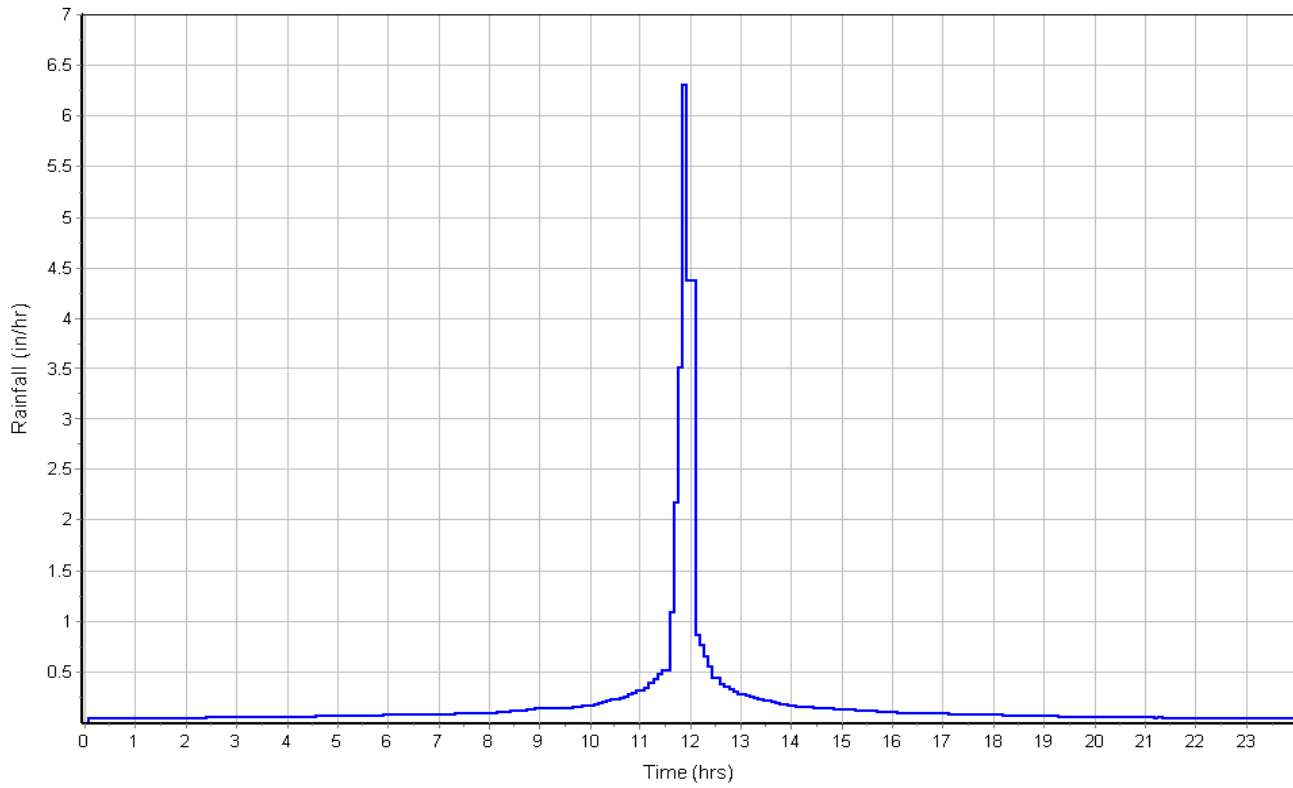
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	15.72	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1255	0.00	0.00
Channel Slope (%) :	2.3	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	8.97	0.00	0.00
Computed Flow Time (min) :	2.33	0.00	0.00
Total TOC (min)	39.11		

Subbasin Runoff Results

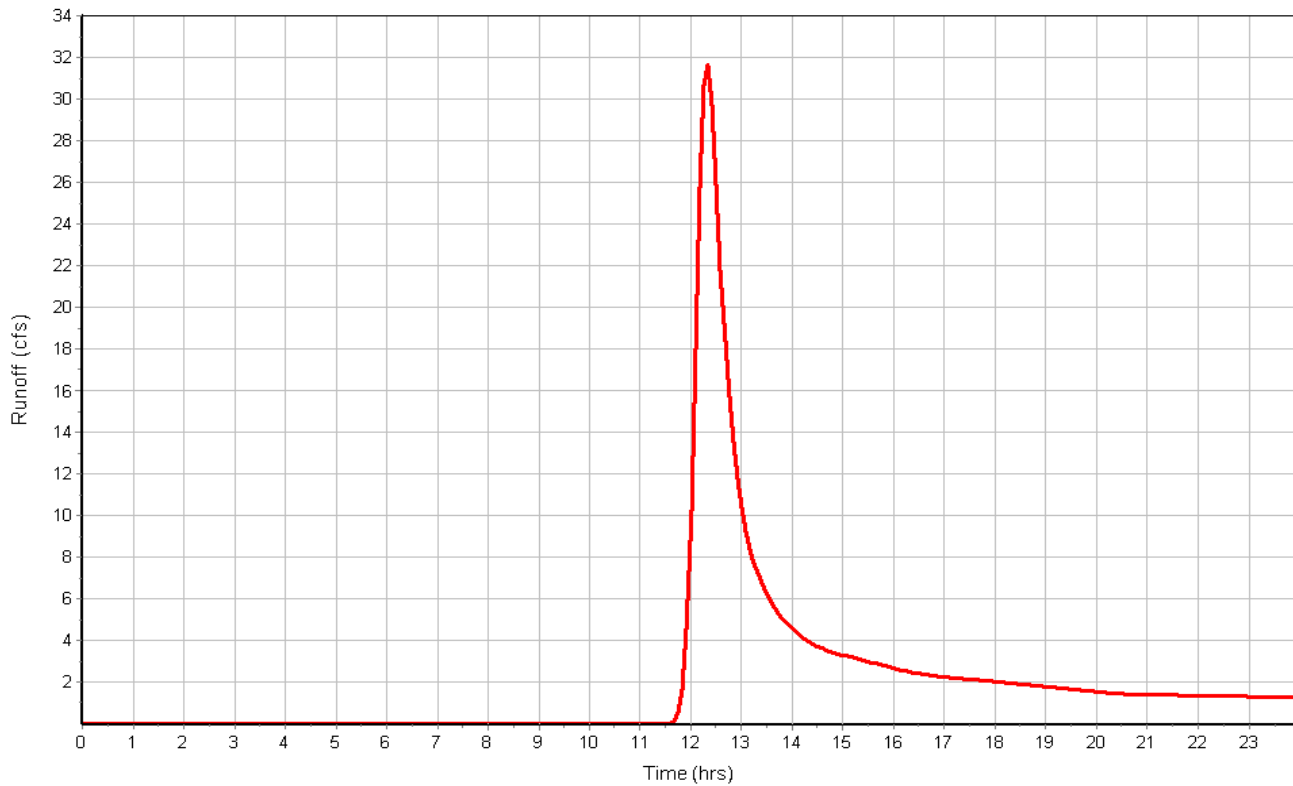
Total Rainfall (in) 4.60
 Total Runoff (in) 1.18
 Peak Runoff (cfs) 31.67
 Weighted Curve Number 61.65
 Time of Concentration (days hh:mm:ss) 0 00:39:07

Subbasin : D6

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E0

Input Data

Area (ac) 37.90
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	37.90	B	60.00
Composite Area & Weighted CN	37.90		60.00

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	4.9	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.11	0.00	0.00
Computed Flow Time (min) :	15.02	0.00	0.00

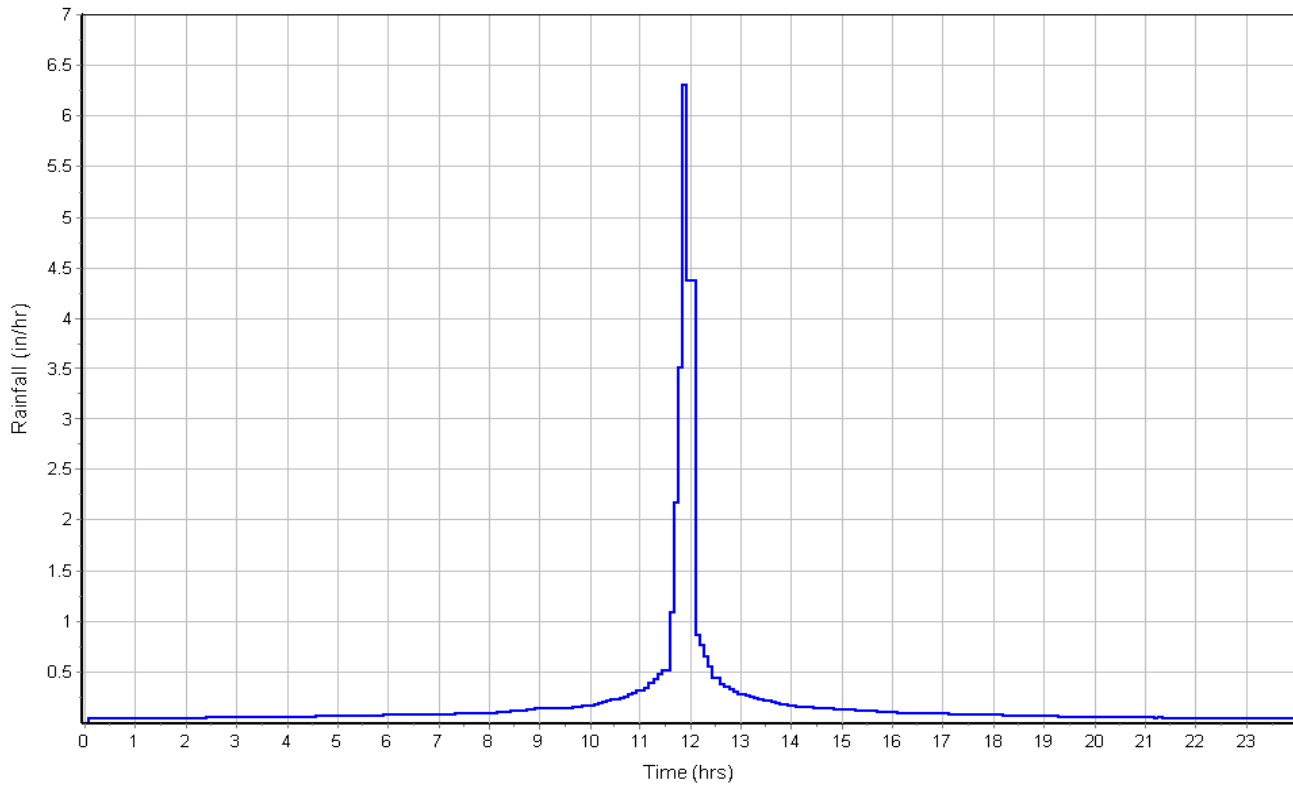
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	748	0.00	0.00
Channel Slope (%) :	4.9	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.09	0.00	0.00
Computed Flow Time (min) :	0.95	0.00	0.00
Total TOC (min)	37.03		

Subbasin Runoff Results

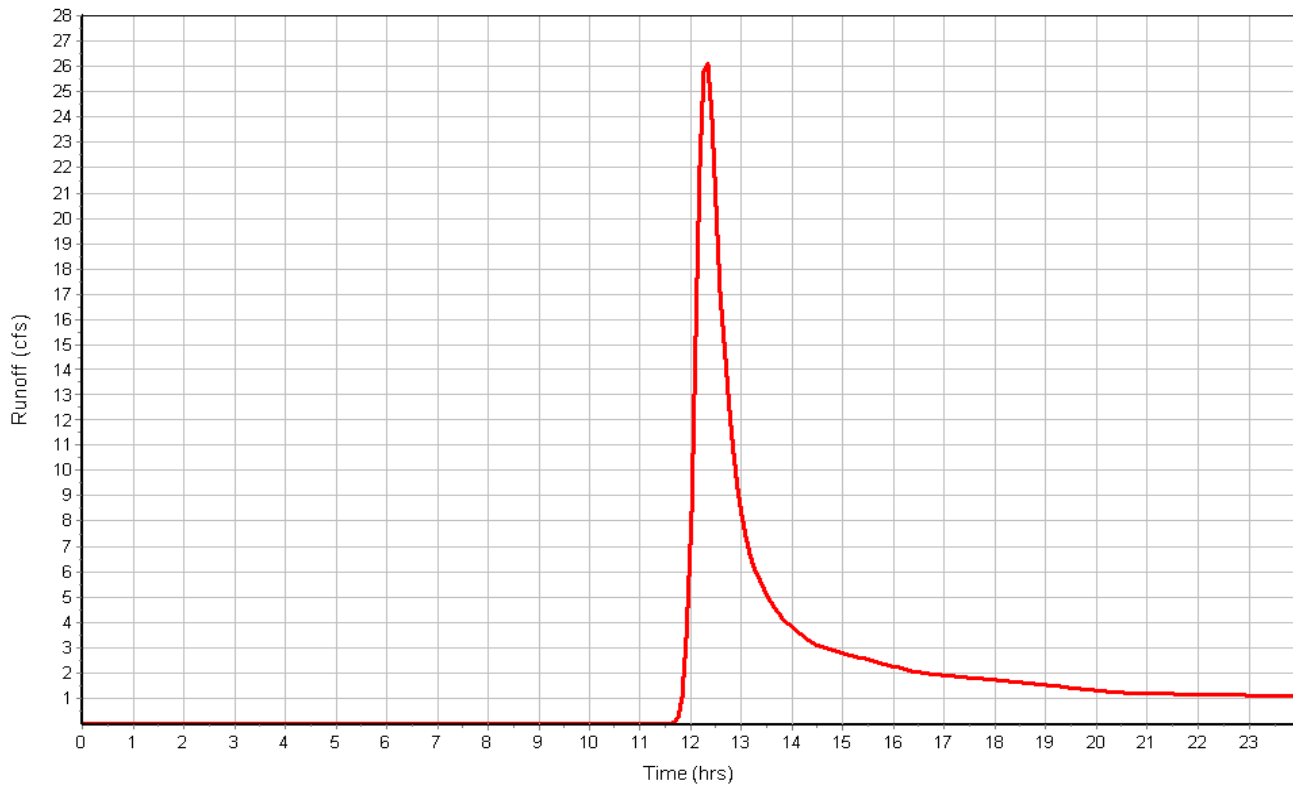
Total Rainfall (in) 4.60
 Total Runoff (in) 1.07
 Peak Runoff (cfs) 26.42
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:37:02

Subbasin : E0

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E1.1

Input Data

Area (ac) 7.90
 Weighted Curve Number 76.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	3.95	B	60.00
Urban commercial, 85% imp	3.95	B	92.00
Composite Area & Weighted CN	7.90		76.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	.02	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.04	0.00	0.00
Computed Flow Time (min) :	132.87	0.00	0.00

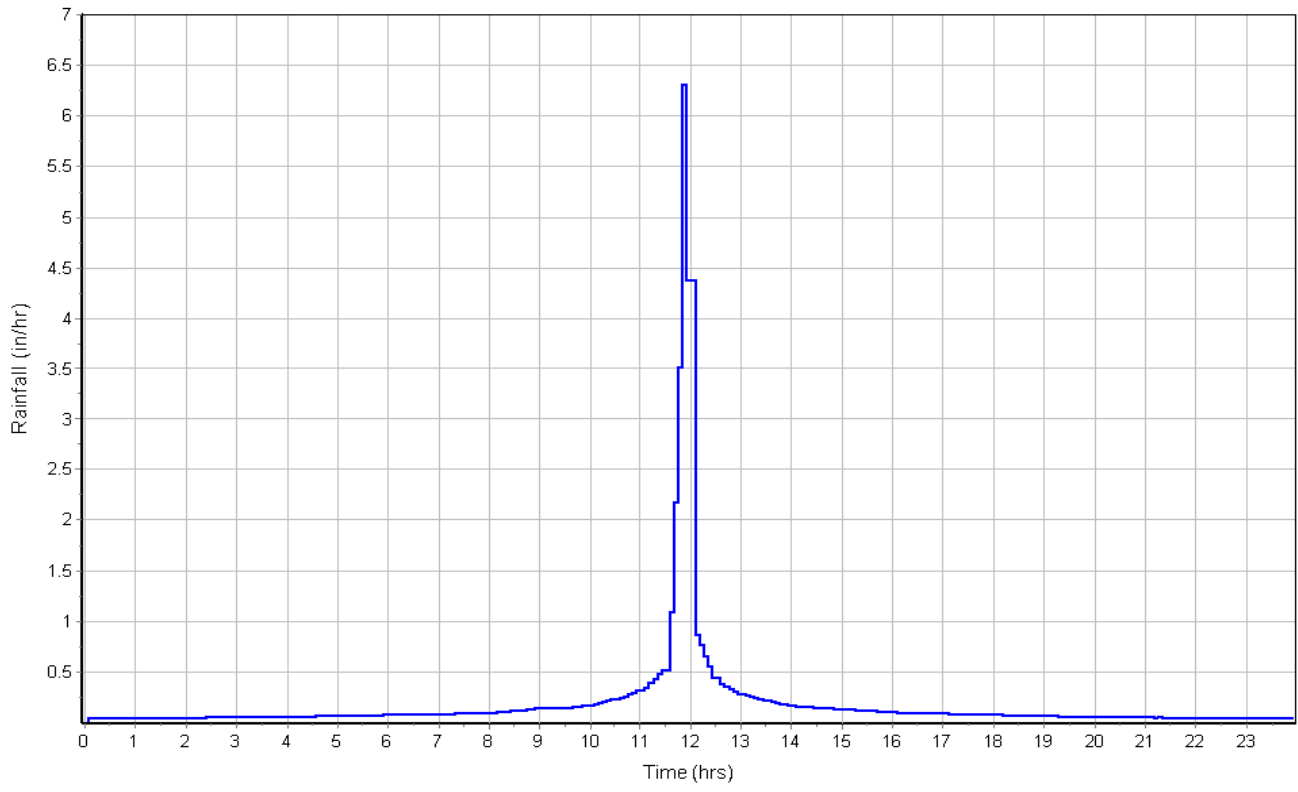
Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	583	0.00	0.00
Slope (%) :	3.17	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	0.89	0.00	0.00
Computed Flow Time (min) :	10.92	0.00	0.00
Total TOC (min)	143.79		

Subbasin Runoff Results

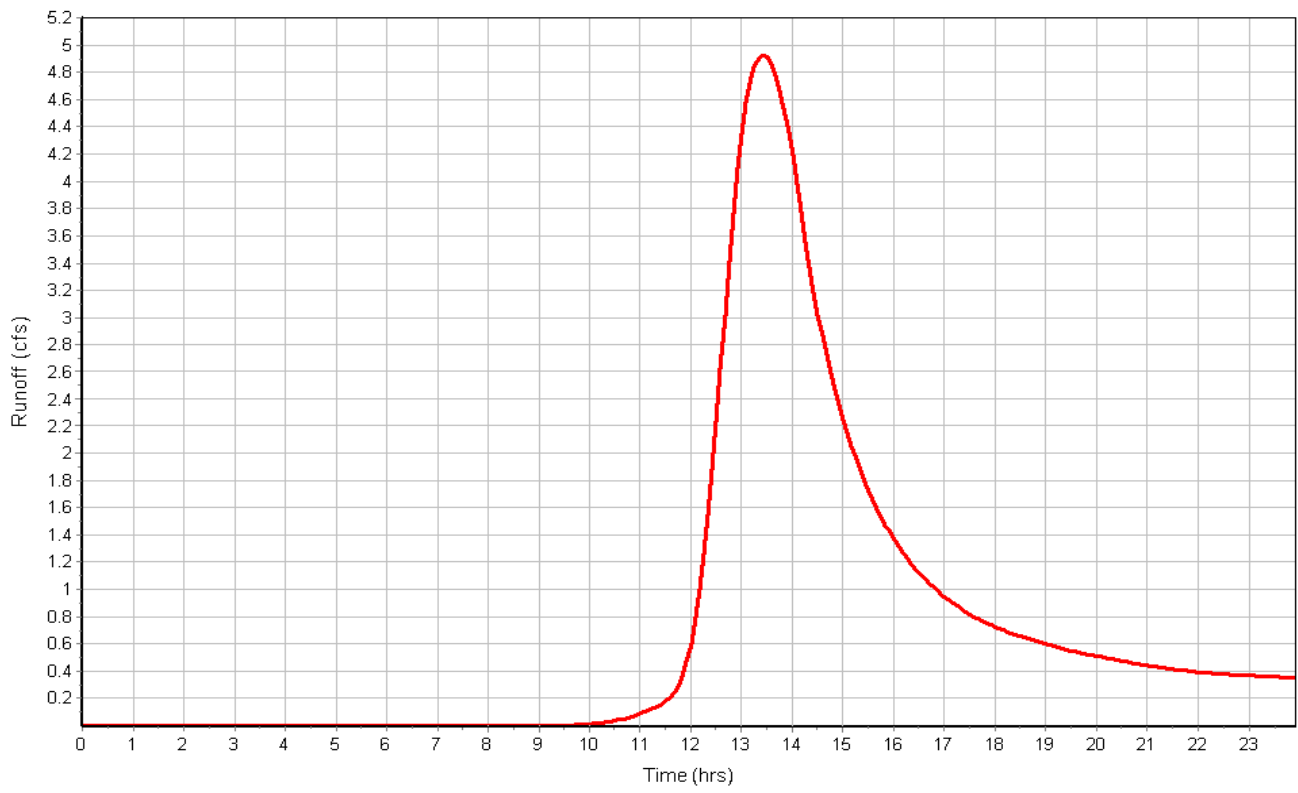
Total Rainfall (in) 4.60
 Total Runoff (in) 2.21
 Peak Runoff (cfs) 4.93
 Weighted Curve Number 76.00
 Time of Concentration (days hh:mm:ss) 0 02:23:47

Subbasin : E1.1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E1.2

Input Data

Area (ac) 16.30
 Weighted Curve Number 62.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	8.15	B	60.00
2.5 Acre Lots, 11% Impervious	8.15	B	64.00
Composite Area & Weighted CN	16.30		62.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.7	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.15	0.00	0.00
Computed Flow Time (min) :	14.49	0.00	0.00

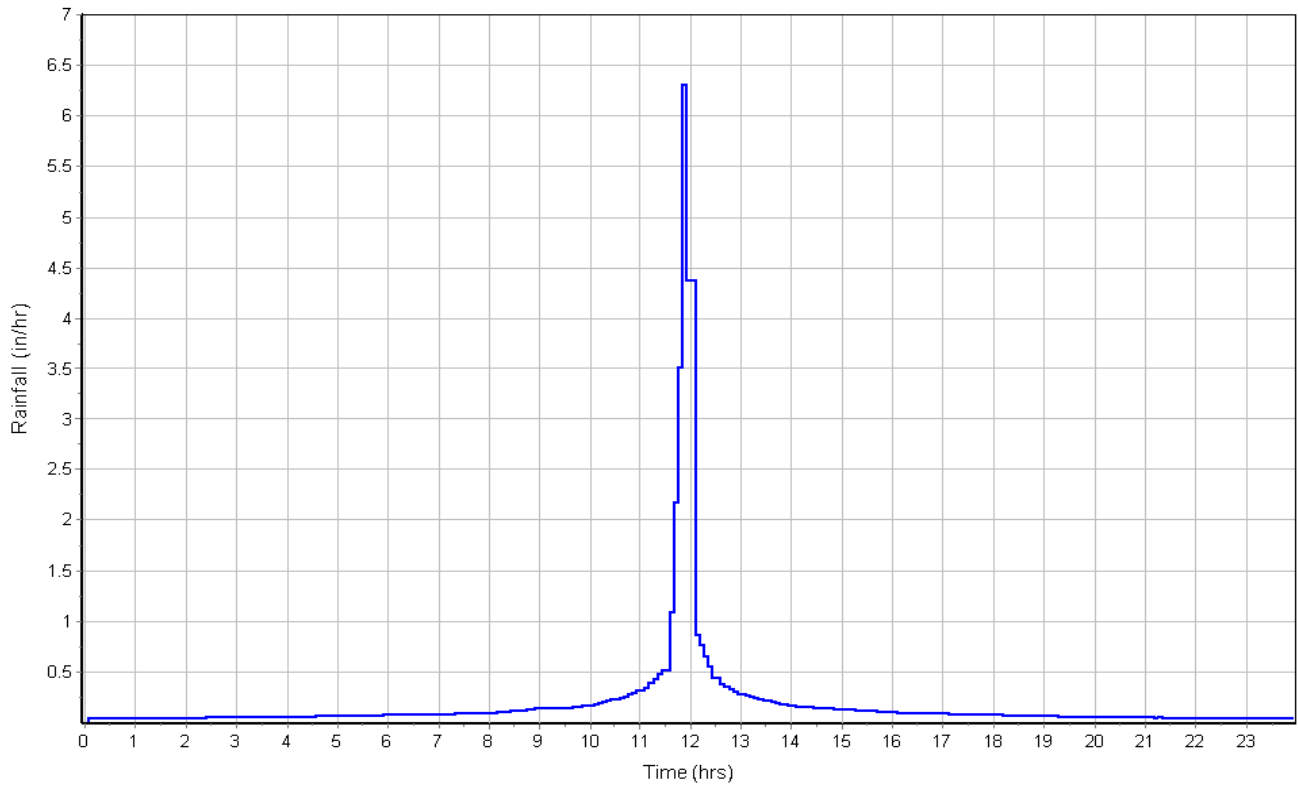
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	228	0.00	0.00
Channel Slope (%) :	2.7	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	9.72	0.00	0.00
Computed Flow Time (min) :	0.39	0.00	0.00
Total TOC (min)	35.94		

Subbasin Runoff Results

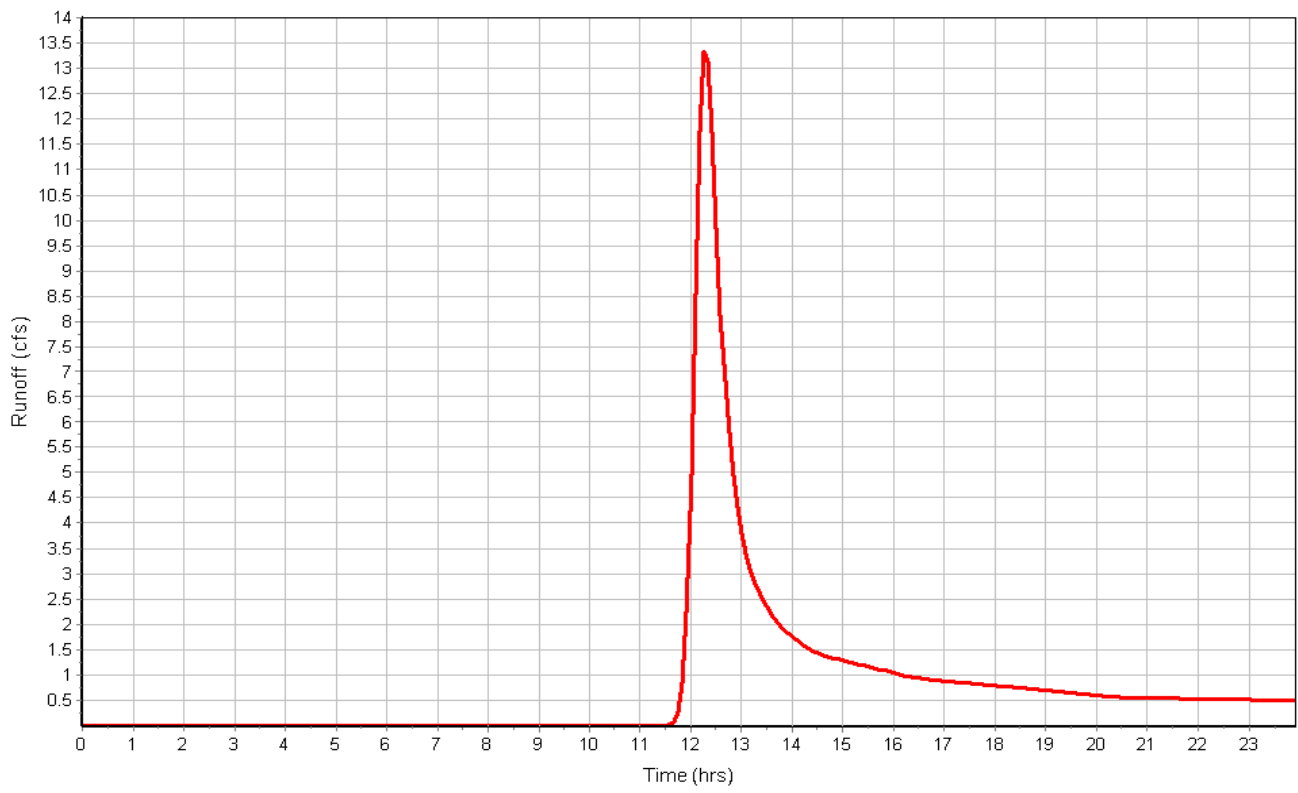
Total Rainfall (in) 4.60
 Total Runoff (in) 1.20
 Peak Runoff (cfs) 13.44
 Weighted Curve Number 62.00
 Time of Concentration (days hh:mm:ss) 0 00:35:56

Subbasin : E1.2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E2

Input Data

Area (ac) 2.60
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	2.60	B	64.00
Composite Area & Weighted CN	2.60		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	5.4	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.16	0.00	0.00
Computed Flow Time (min) :	1.44	0.00	0.00

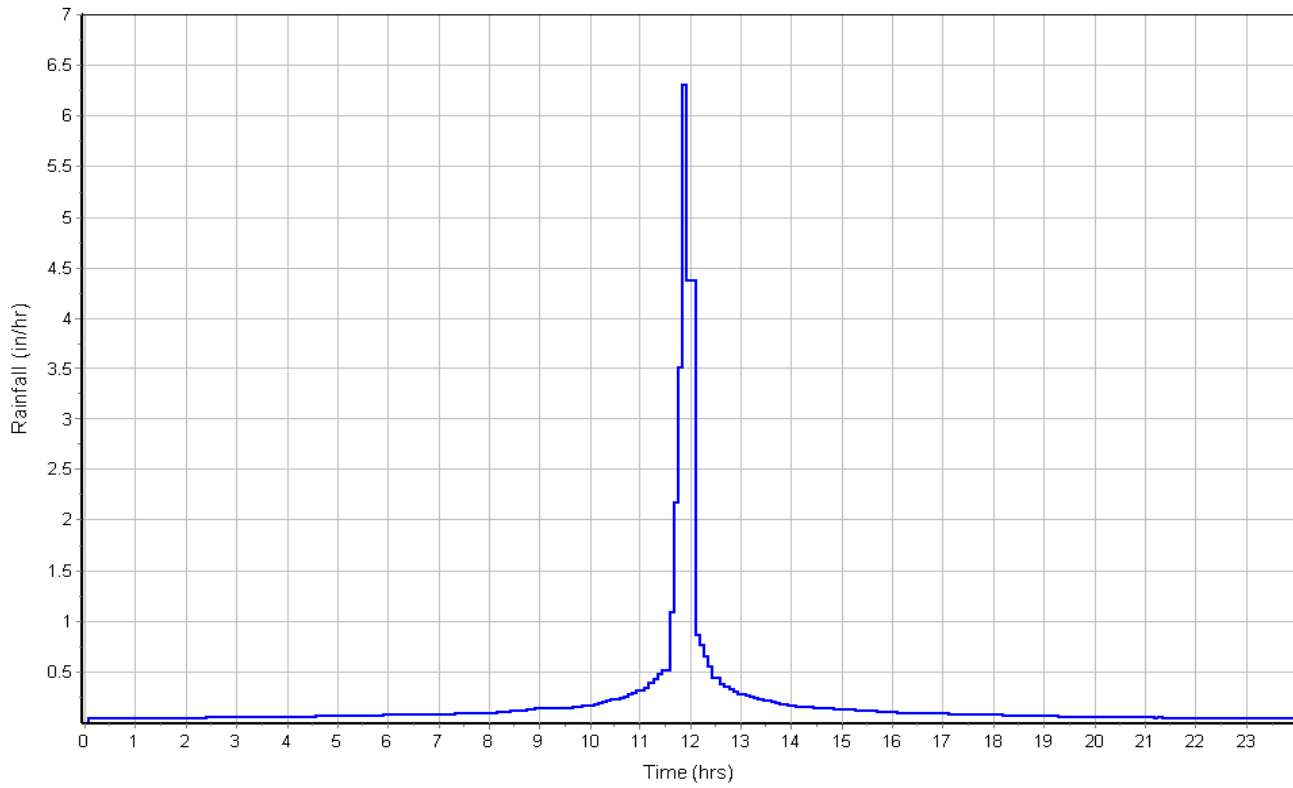
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	101	0.00	0.00
Channel Slope (%) :	5.4	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.74	0.00	0.00
Computed Flow Time (min) :	0.12	0.00	0.00
Total TOC (min)	22.62		

Subbasin Runoff Results

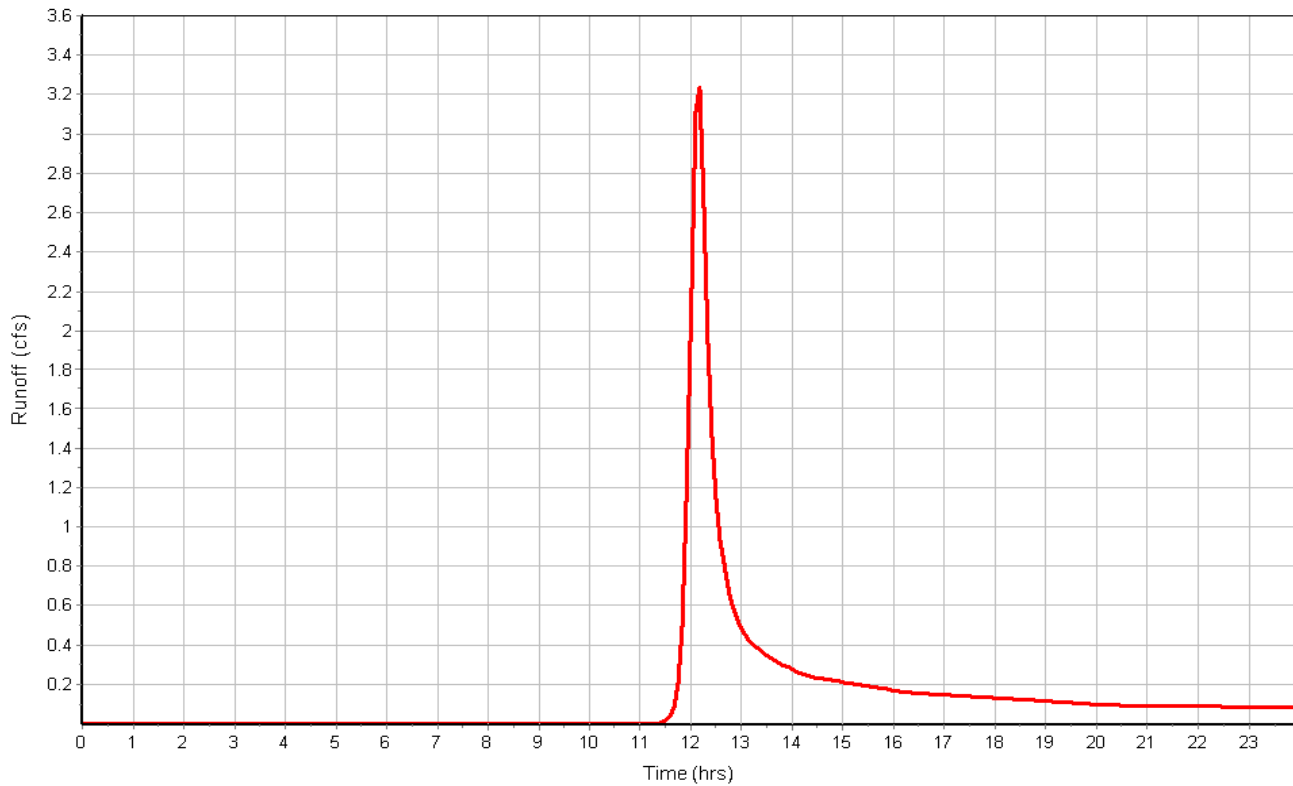
Total Rainfall (in) 4.60
 Total Runoff (in) 1.33
 Peak Runoff (cfs) 3.30
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:22:37

Subbasin : E2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E3

Input Data

Area (ac) 19.80
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	19.80	B	64.00
Composite Area & Weighted CN	19.80		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.6	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.50	0.00	0.00
Computed Flow Time (min) :	5.56	0.00	0.00

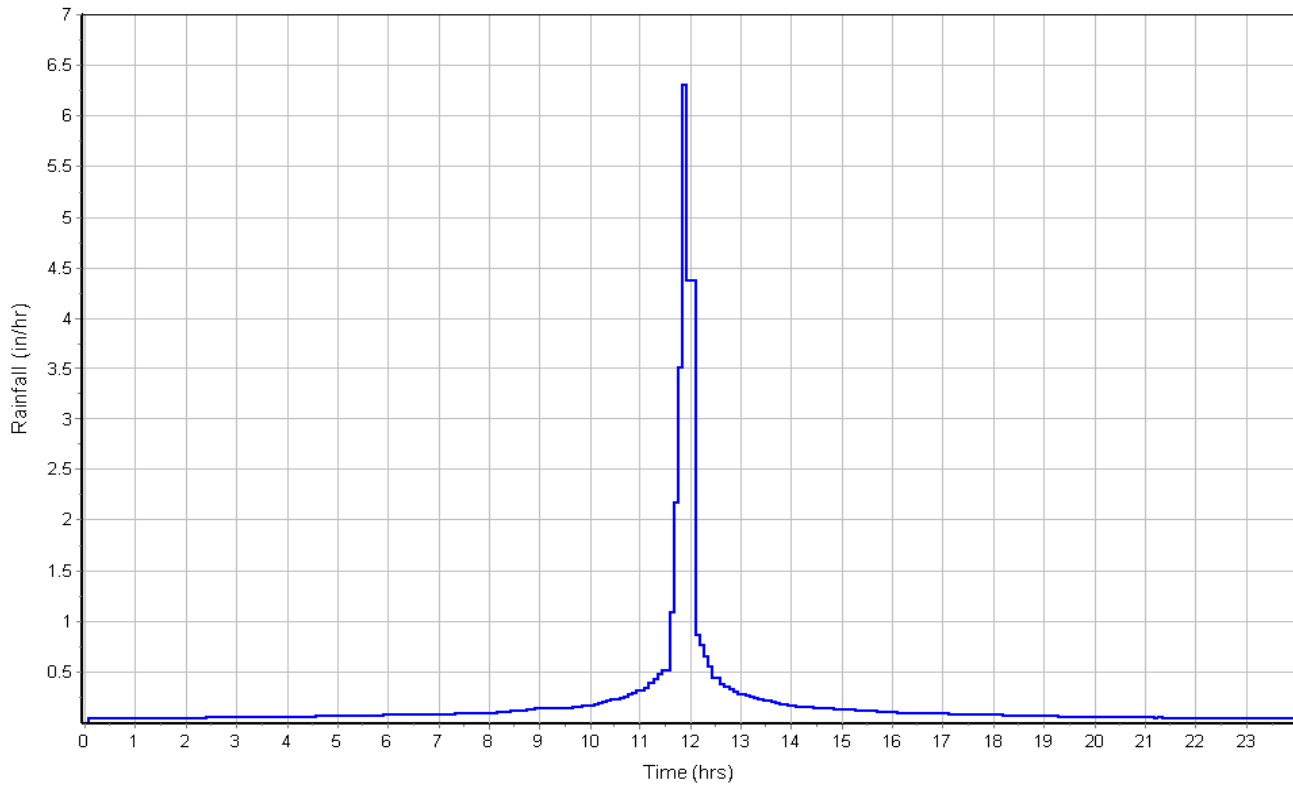
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	453	0.00	0.00
Channel Slope (%) :	4.6	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.68	0.00	0.00
Computed Flow Time (min) :	0.60	0.00	0.00
Total TOC (min)	27.21		

Subbasin Runoff Results

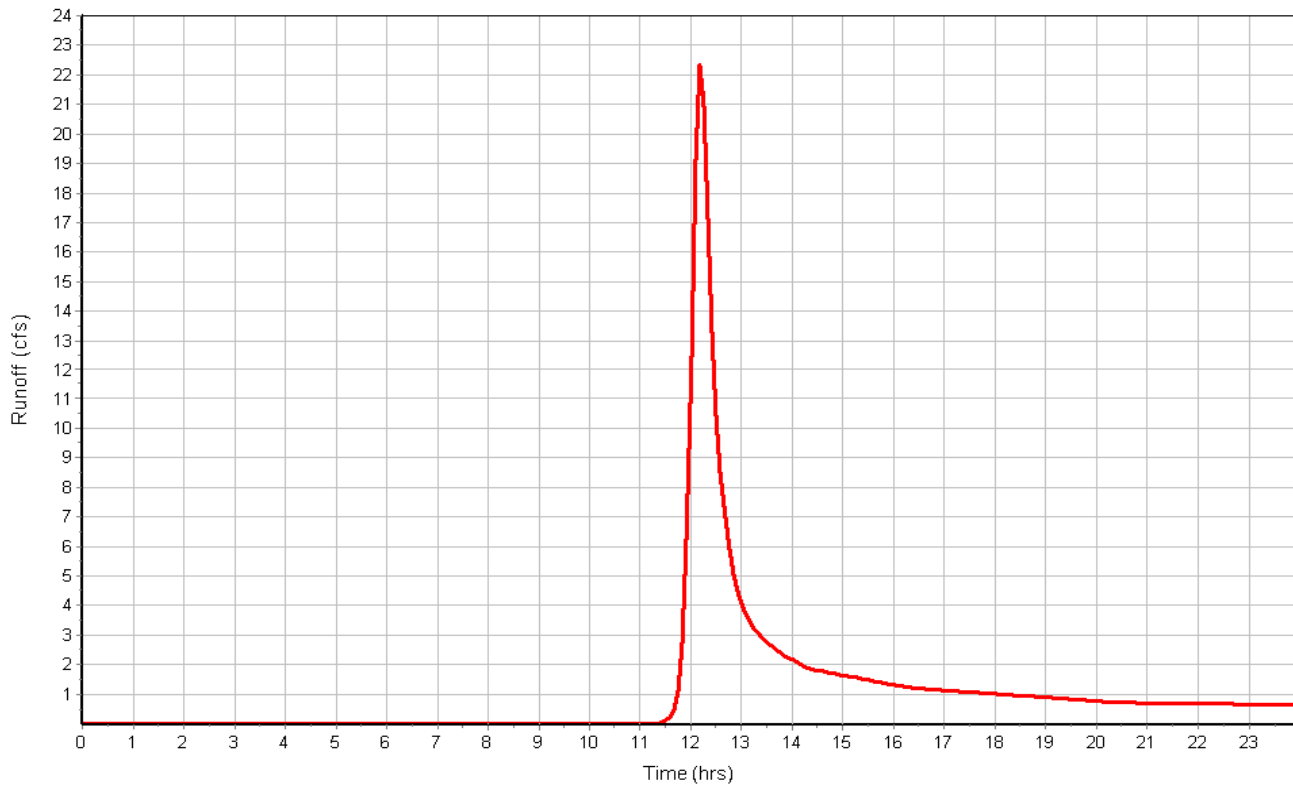
Total Rainfall (in) 4.60
 Total Runoff (in) 1.33
 Peak Runoff (cfs) 22.50
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:27:13

Subbasin : E3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E4

Input Data

Area (ac) 18.20
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	18.20	B	64.00
Composite Area & Weighted CN	18.20		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	6.13	0.00	0.00

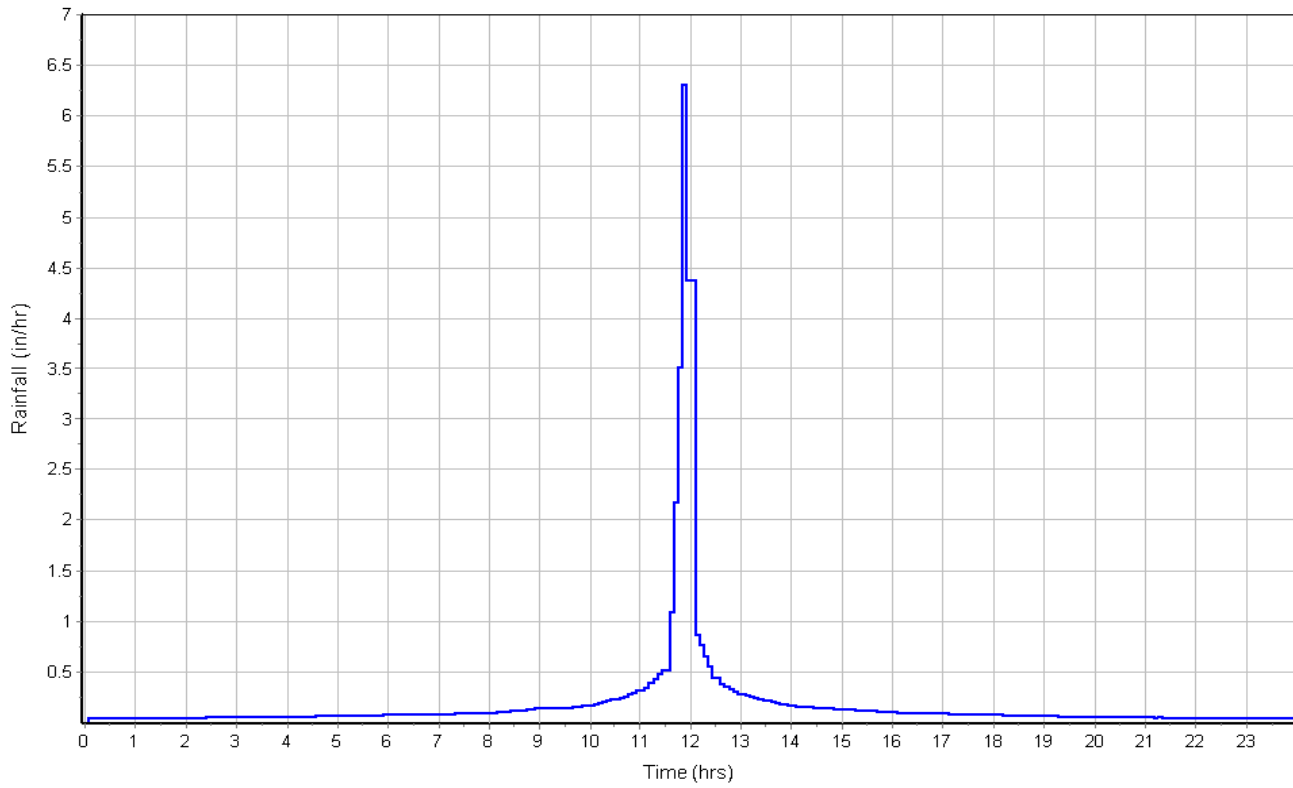
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	528	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.53	0.00	0.00
Computed Flow Time (min) :	0.76	0.00	0.00
Total TOC (min)	27.95		

Subbasin Runoff Results

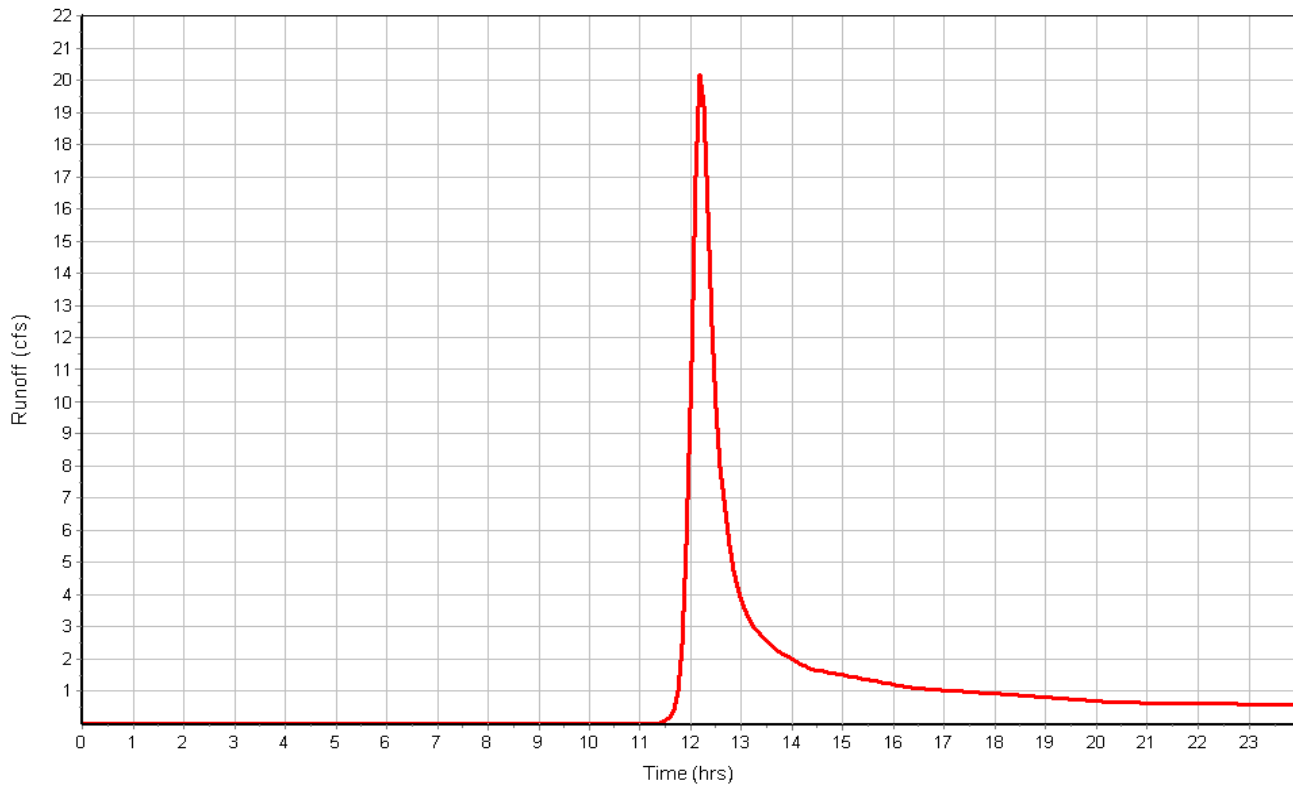
Total Rainfall (in) 4.60
 Total Runoff (in) 1.33
 Peak Runoff (cfs) 20.34
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:27:57

Subbasin : E4

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E5

Input Data

Area (ac) 13.50
 Weighted Curve Number 64.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	13.50	B	64.00
Composite Area & Weighted CN	13.50		64.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.7	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.52	0.00	0.00
Computed Flow Time (min) :	5.48	0.00	0.00

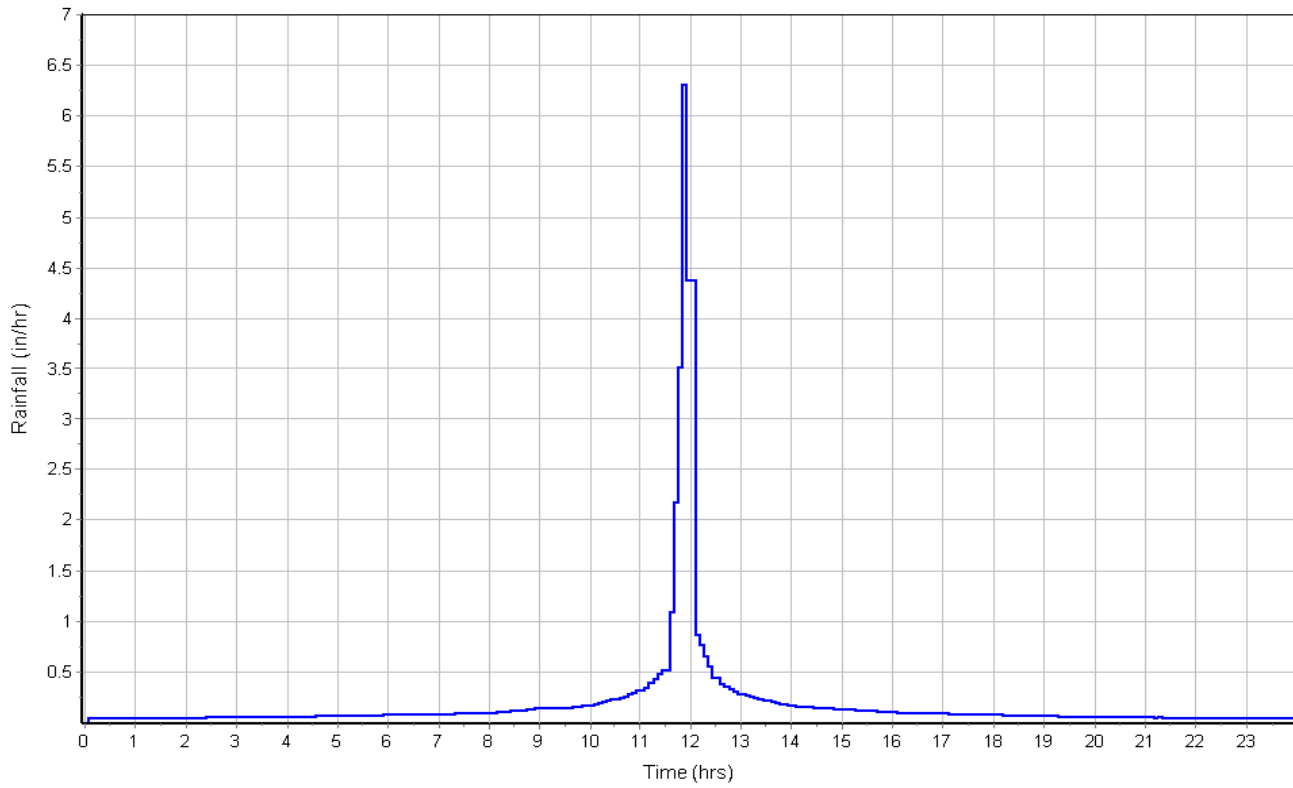
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	335	0.00	0.00
Channel Slope (%) :	4.7	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.82	0.00	0.00
Computed Flow Time (min) :	0.44	0.00	0.00
Total TOC (min)	26.98		

Subbasin Runoff Results

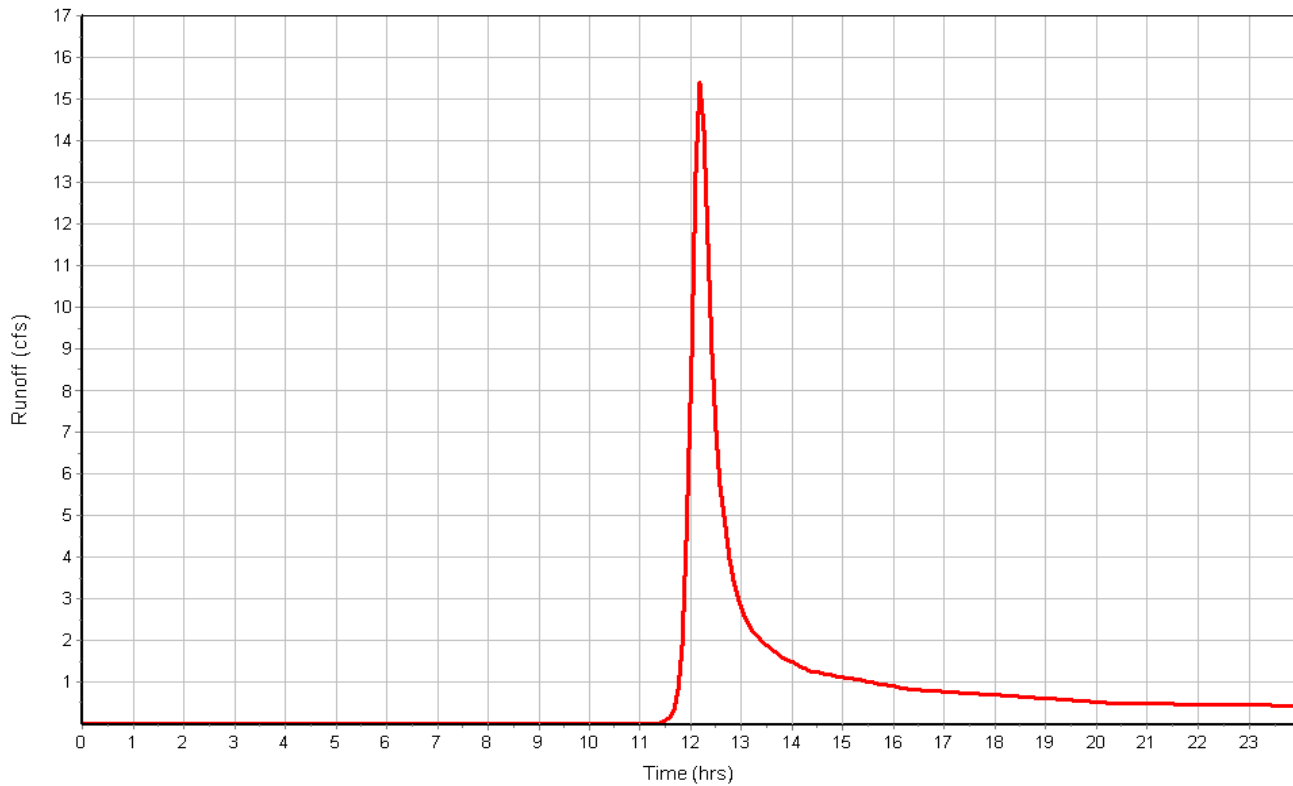
Total Rainfall (in) 4.60
 Total Runoff (in) 1.33
 Peak Runoff (cfs) 15.43
 Weighted Curve Number 64.00
 Time of Concentration (days hh:mm:ss) 0 00:26:59

Subbasin : E5

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E6

Input Data

Area (ac) 28.90
 Weighted Curve Number 62.40
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	8.67	B	64.00
5 Acre Lots, 7% Impervious	18.79	B	60.00
Pasture, grassland, or range, Fair	1.45	D	84.00
Composite Area & Weighted CN	28.91		62.40

Time of Concentration

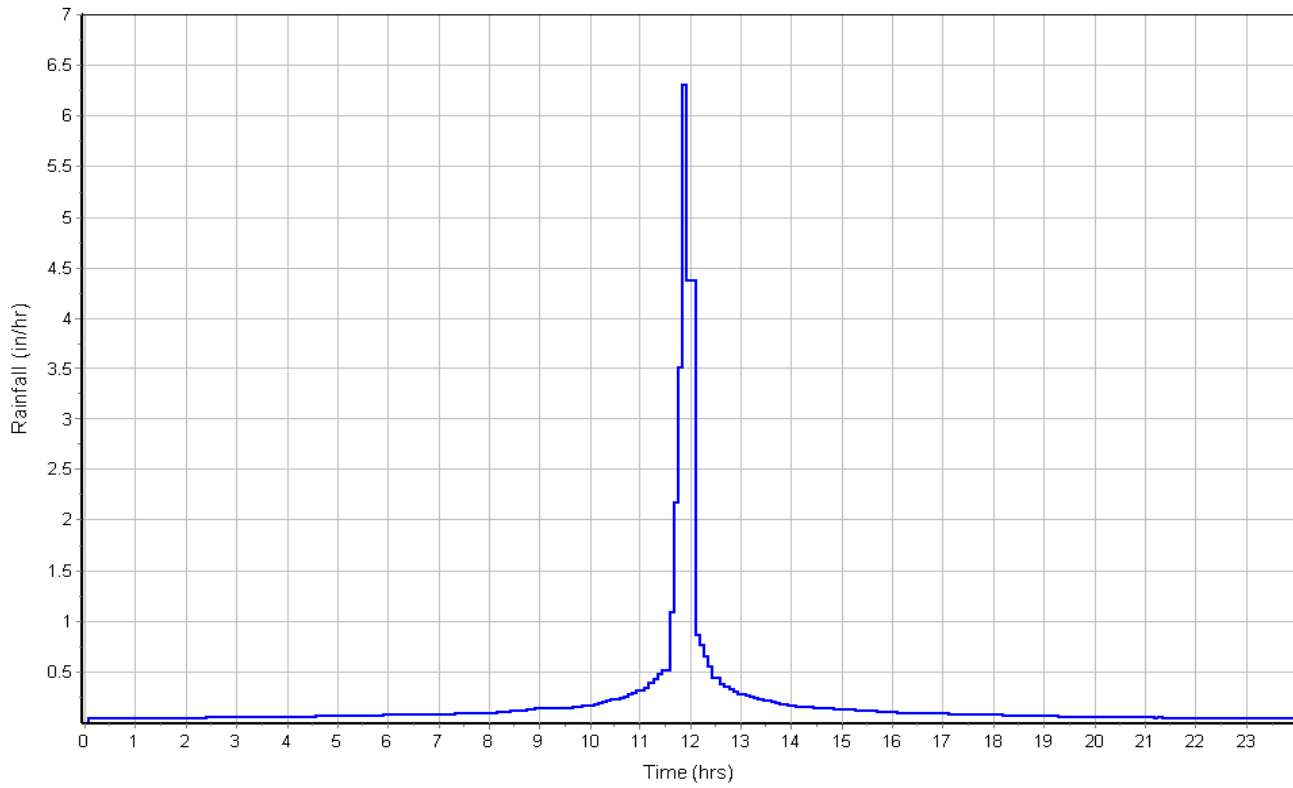
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.43	0.00	0.00
Computed Flow Time (min) :	5.83	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	859	0.00	0.00
Channel Slope (%) :	4.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.12	0.00	0.00
Computed Flow Time (min) :	1.18	0.00	0.00
Total TOC (min)28.07			

Subbasin Runoff Results

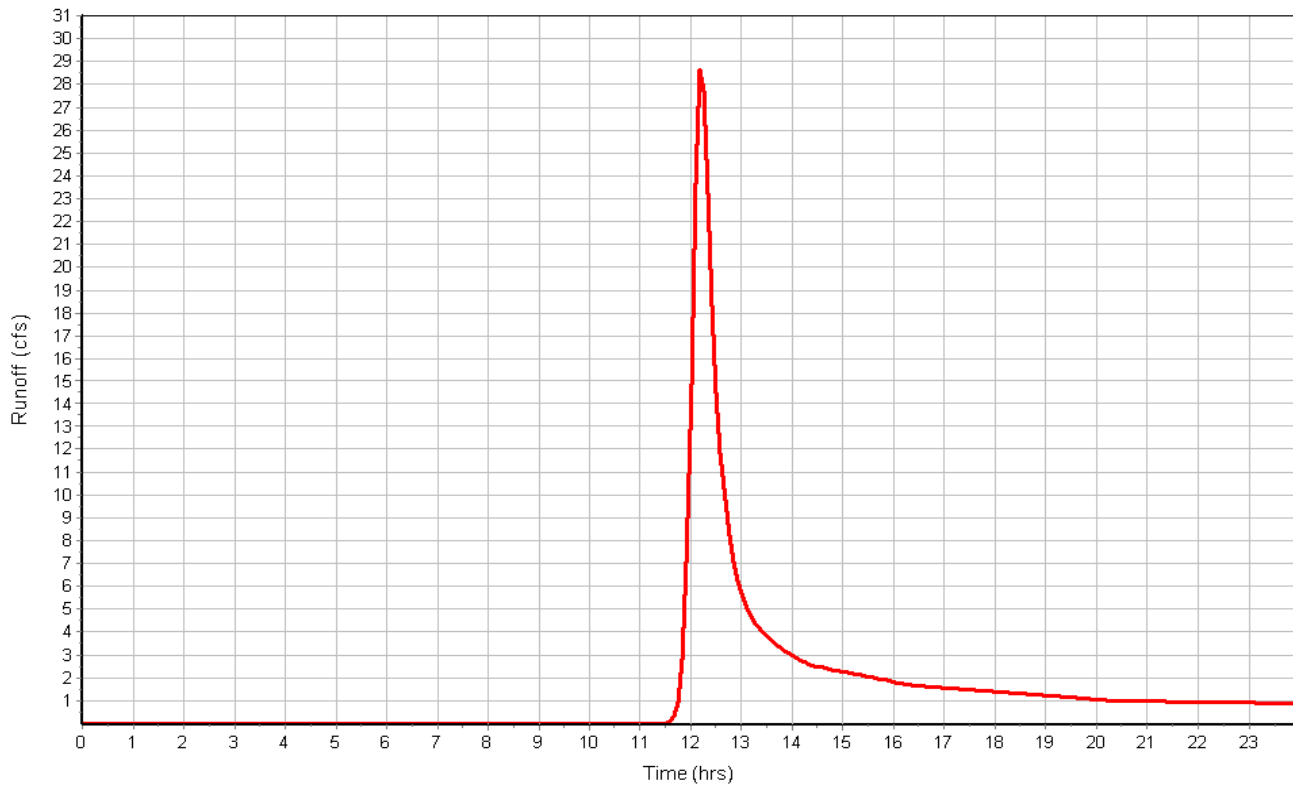
Total Rainfall (in) 4.60
 Total Runoff (in) 1.22
 Peak Runoff (cfs) 28.98
 Weighted Curve Number 62.40
 Time of Concentration (days hh:mm:ss) 0 00:28:04

Subbasin : E6

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : E7

Input Data

Area (ac) 9.80
 Weighted Curve Number 62.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	4.90	B	60.00
2.5 Acre Lots, 11% Impervious	4.90	B	64.00
Composite Area & Weighted CN	9.80		62.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	200	0.00	0.00
Slope (%) :	3.5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.31	0.00	0.00
Computed Flow Time (min) :	2.54	0.00	0.00

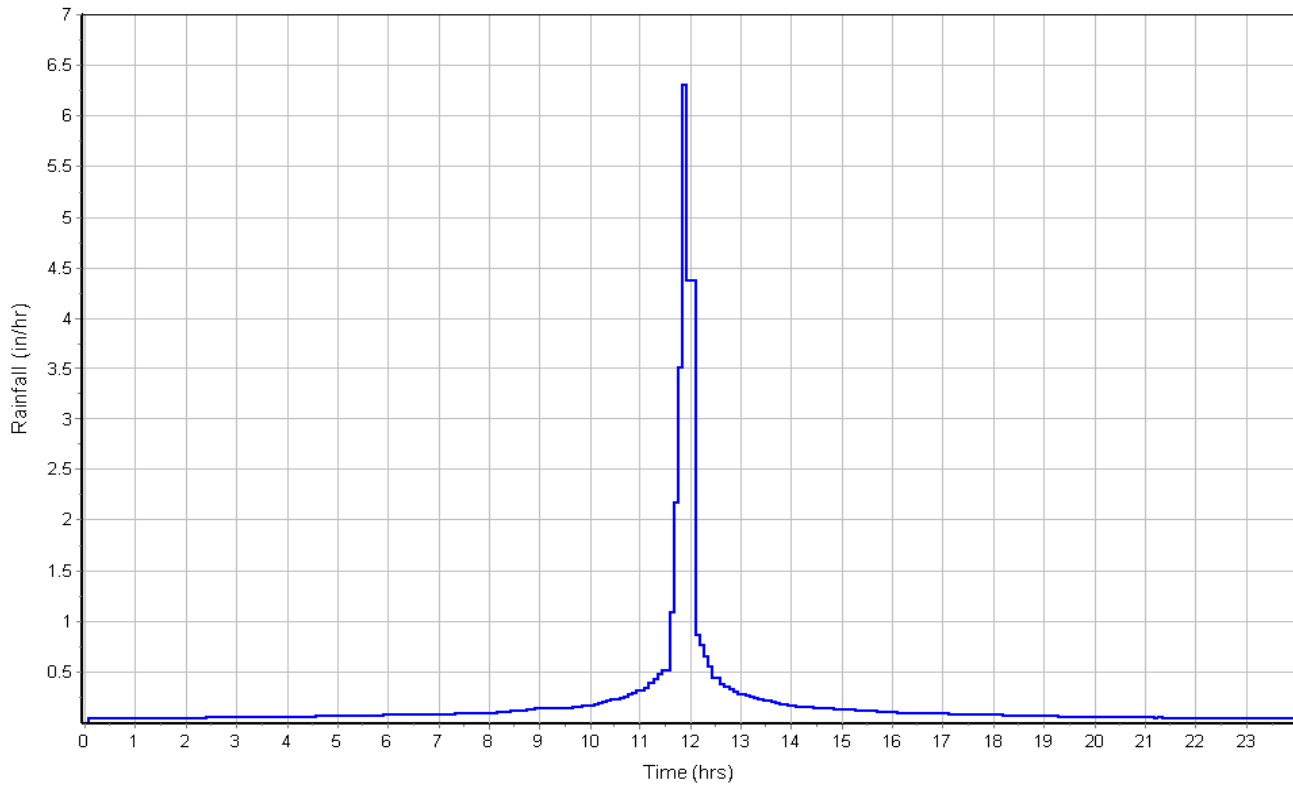
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	474	0.00	0.00
Channel Slope (%) :	3.5	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.06	0.00	0.00
Computed Flow Time (min) :	0.71	0.00	0.00
Total TOC (min)	24.32		

Subbasin Runoff Results

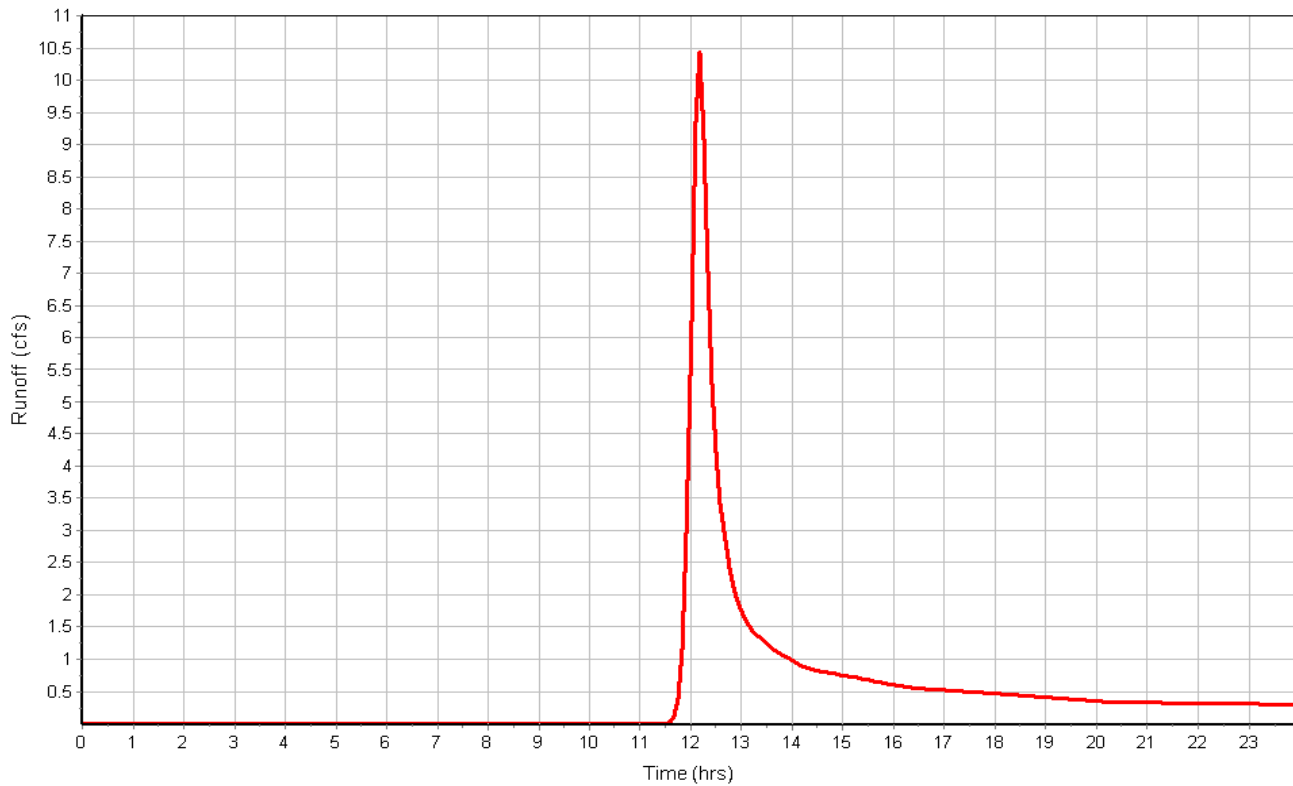
Total Rainfall (in) 4.60
 Total Runoff (in) 1.20
 Peak Runoff (cfs) 10.46
 Weighted Curve Number 62.00
 Time of Concentration (days hh:mm:ss) 0 00:24:19

Subbasin : E7

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : F1

Input Data

Area (ac) 42.90
 Weighted Curve Number 60.40
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	38.61	B	60.00
2.5 Acre Lots, 11% Impervious	4.29	B	64.00
Composite Area & Weighted CN	42.90		60.40

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	3.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0.00	0.00
Computed Flow Time (min) :	13.33	0.00	0.00

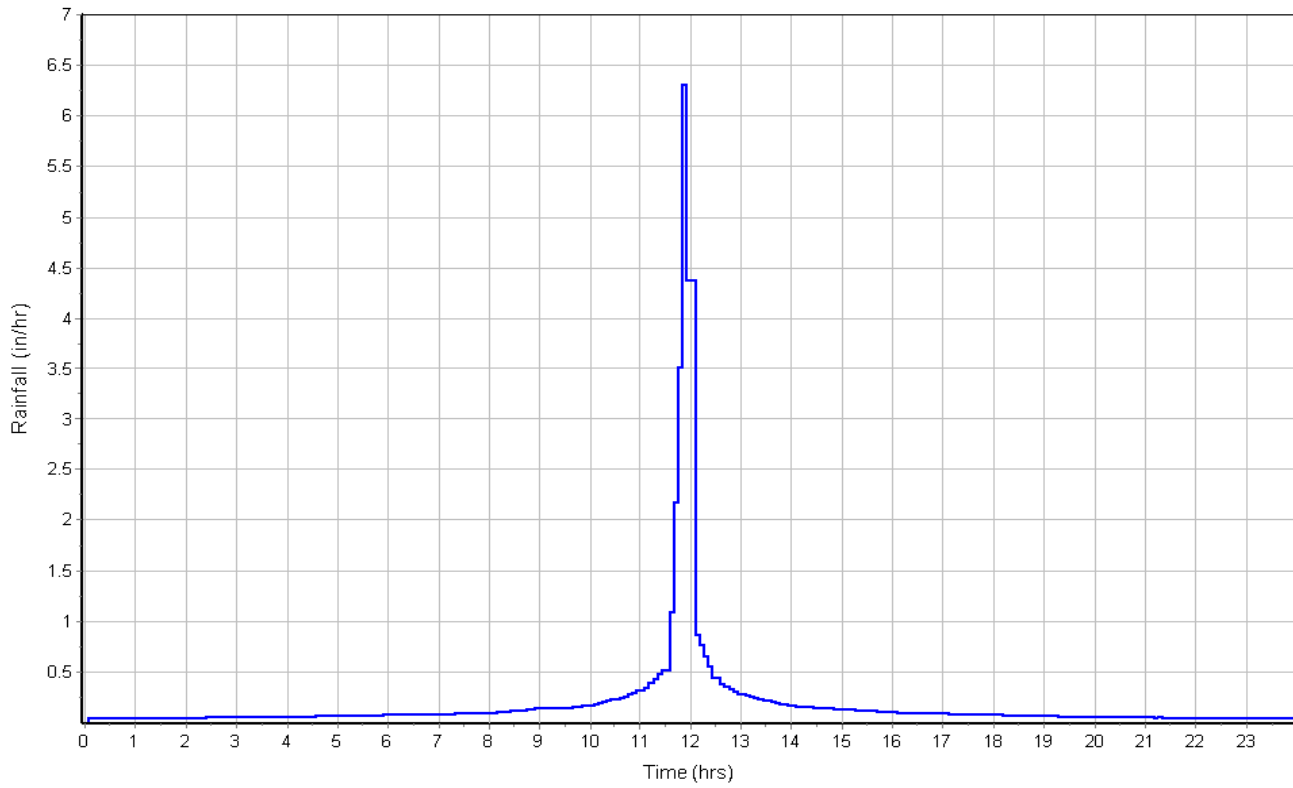
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	745	0.00	0.00
Channel Slope (%) :	3.2	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.58	0.00	0.00
Computed Flow Time (min) :	1.17	0.00	0.00
Total TOC (min)	35.57		

Subbasin Runoff Results

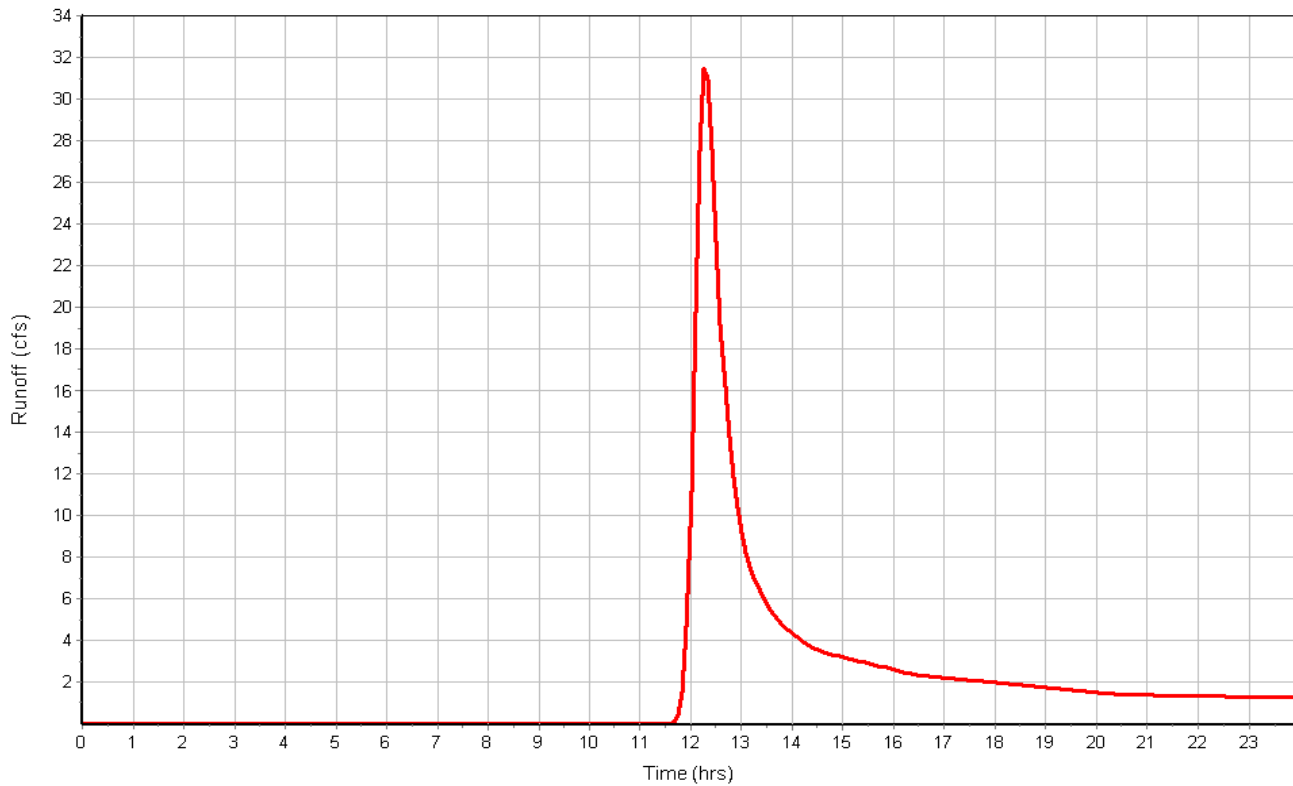
Total Rainfall (in) 4.60
 Total Runoff (in) 1.10
 Peak Runoff (cfs) 31.68
 Weighted Curve Number 60.40
 Time of Concentration (days hh:mm:ss) 0 00:35:34

Subbasin : F1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : G1

Input Data

Area (ac) 25.20
 Weighted Curve Number 66.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	12.60	C	72.00
Woods, Fair	12.60	B	60.00
Composite Area & Weighted CN	25.20		66.00

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	500	0.00
Slope (%) :	6.1	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.73	0.00	0.00
Computed Flow Time (min) :	4.82	0.00	0.00

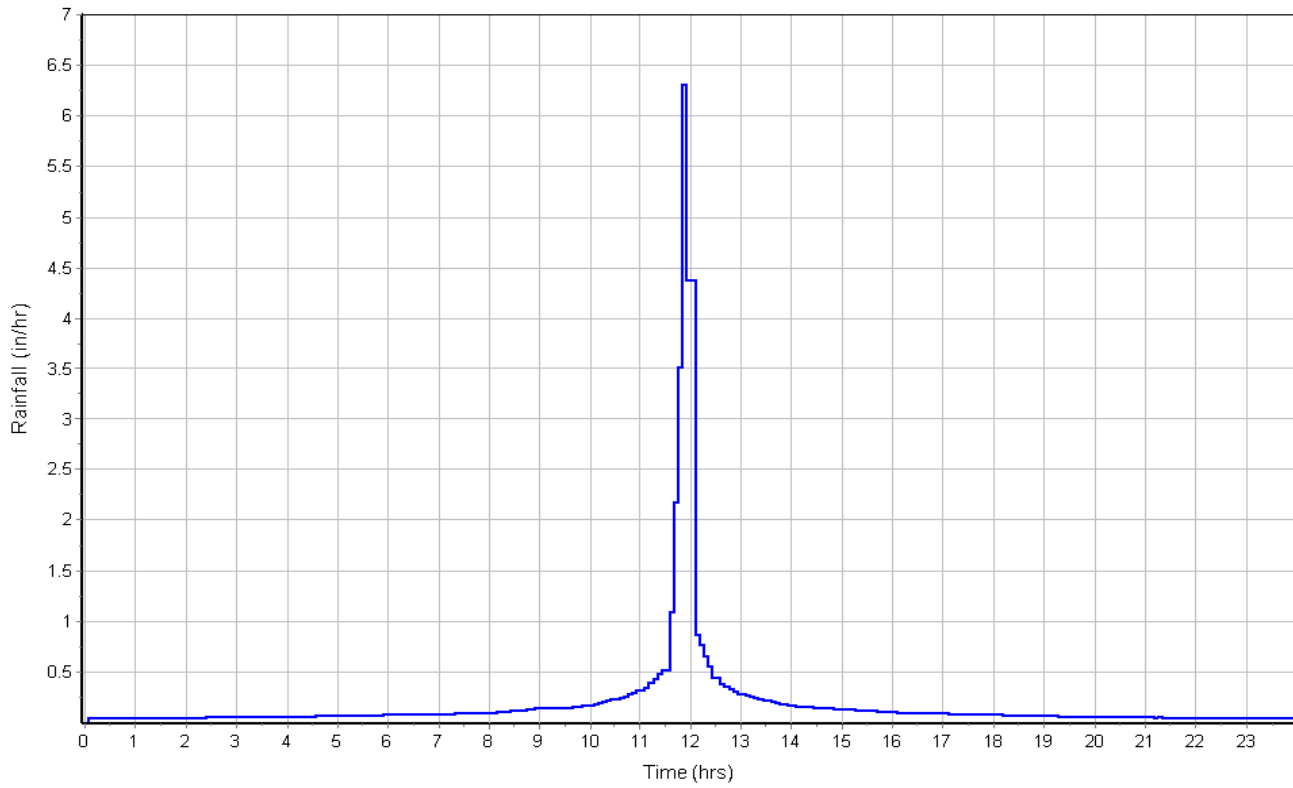
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	658	0.00	0.00
Channel Slope (%) :	6.1	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	14.60	0.00	0.00
Computed Flow Time (min) :	0.75	0.00	0.00
Total TOC (min)	26.63		

Subbasin Runoff Results

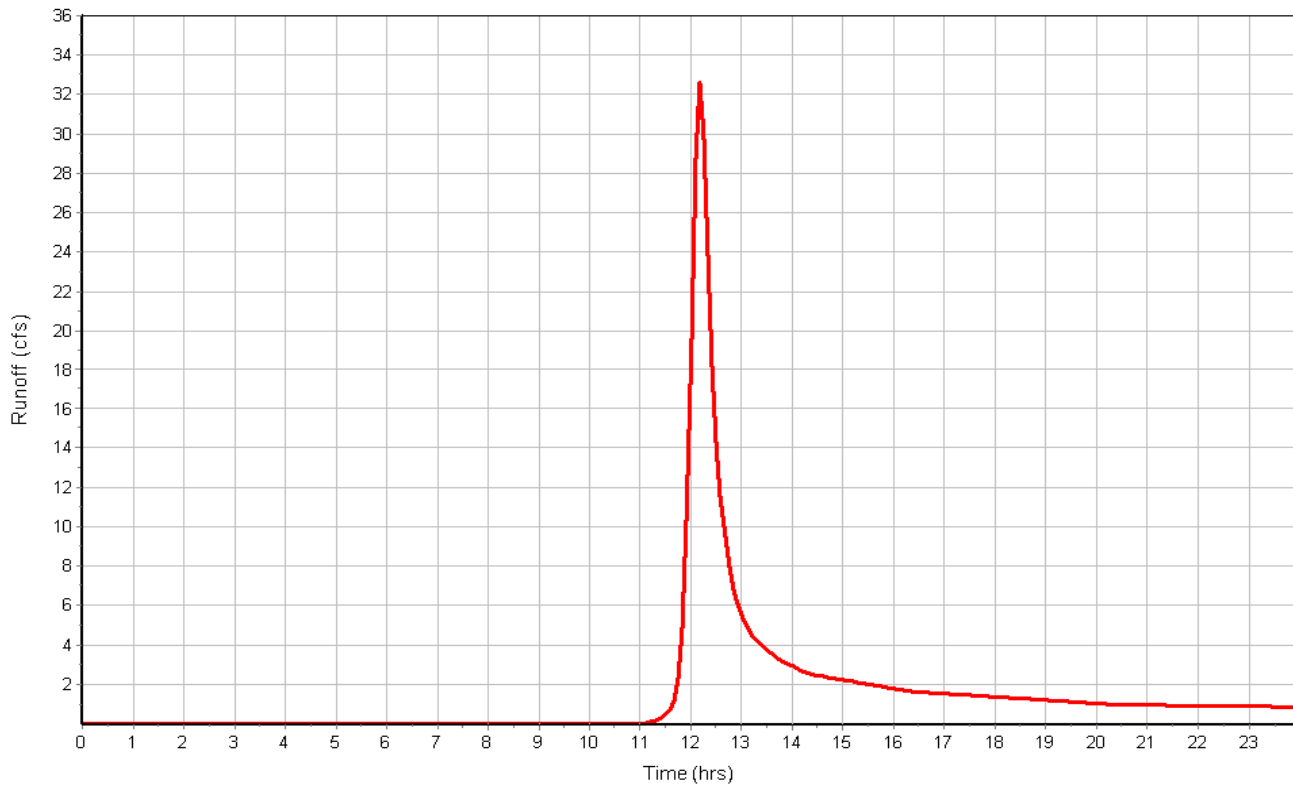
Total Rainfall (in) 4.60
 Total Runoff (in) 1.46
 Peak Runoff (cfs) 32.61
 Weighted Curve Number 66.00
 Time of Concentration (days hh:mm:ss) 0 00:26:38

Subbasin : G1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : G2

Input Data

Area (ac) 21.20
 Weighted Curve Number 72.70
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	19.08	C	72.00
Pasture, grassland, or range, Fair	2.12	C	79.00
Composite Area & Weighted CN	21.20		72.70

Time of Concentration

	Flowpath A	Flowpath B	Flowpath C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

	Flowpath A	Flowpath B	Flowpath C
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.38	0.00	0.00
Computed Flow Time (min) :	12.08	0.00	0.00

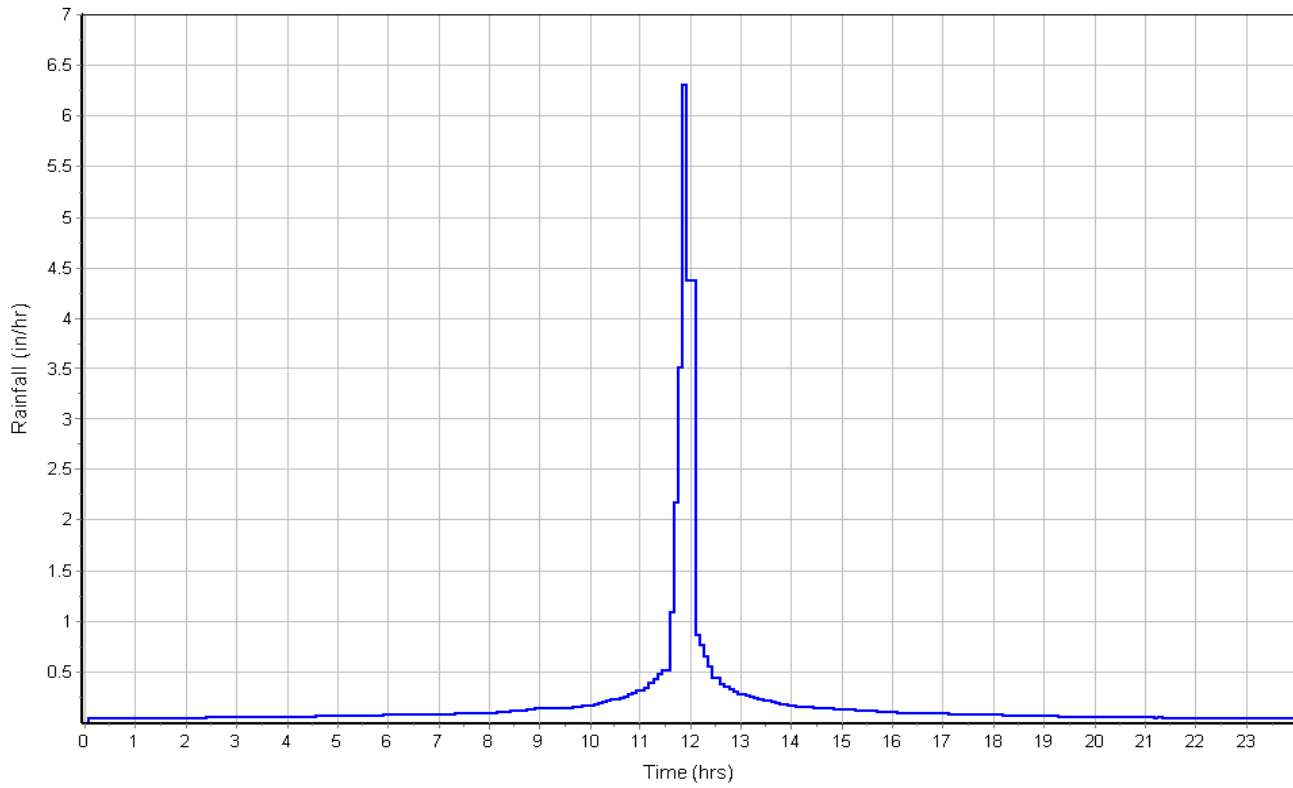
	Flowpath A	Flowpath B	Flowpath C
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	695	0.00	0.00
Channel Slope (%) :	3.9	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.68	0.00	0.00
Computed Flow Time (min) :	0.99	0.00	0.00
Total TOC (min)	34.13		

Subbasin Runoff Results

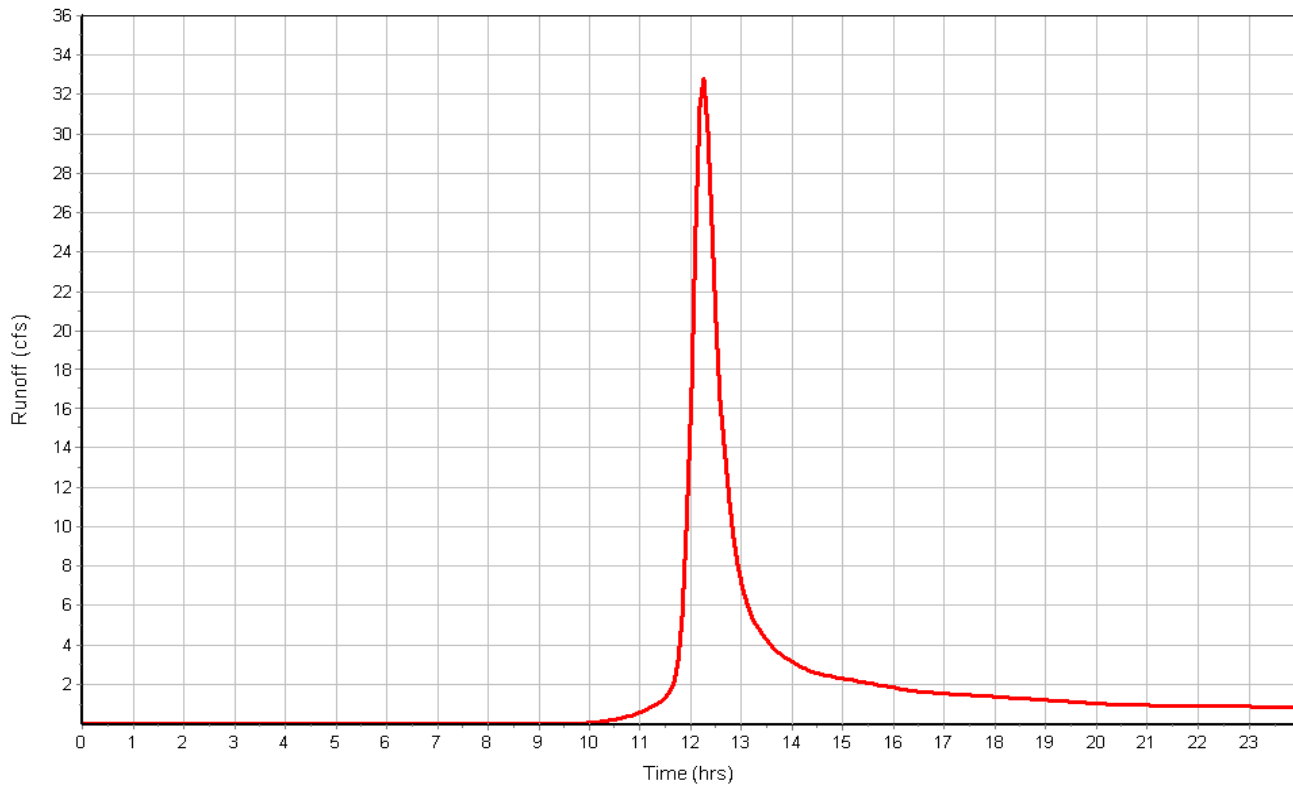
Total Rainfall (in) 4.60
 Total Runoff (in) 1.95
 Peak Runoff (cfs) 32.95
 Weighted Curve Number 72.70
 Time of Concentration (days hh:mm:ss) 0 00:34:08

Subbasin : G2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H1

Input Data

Area (ac) 13.90
 Weighted Curve Number 70.80
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	1.39	B	60.00
5 Acre Lots, 7% Impervious	12.51	C	72.00
Composite Area & Weighted CN	13.90		70.80

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.55	0.00	0.00
Computed Flow Time (min) :	5.38	0.00	0.00

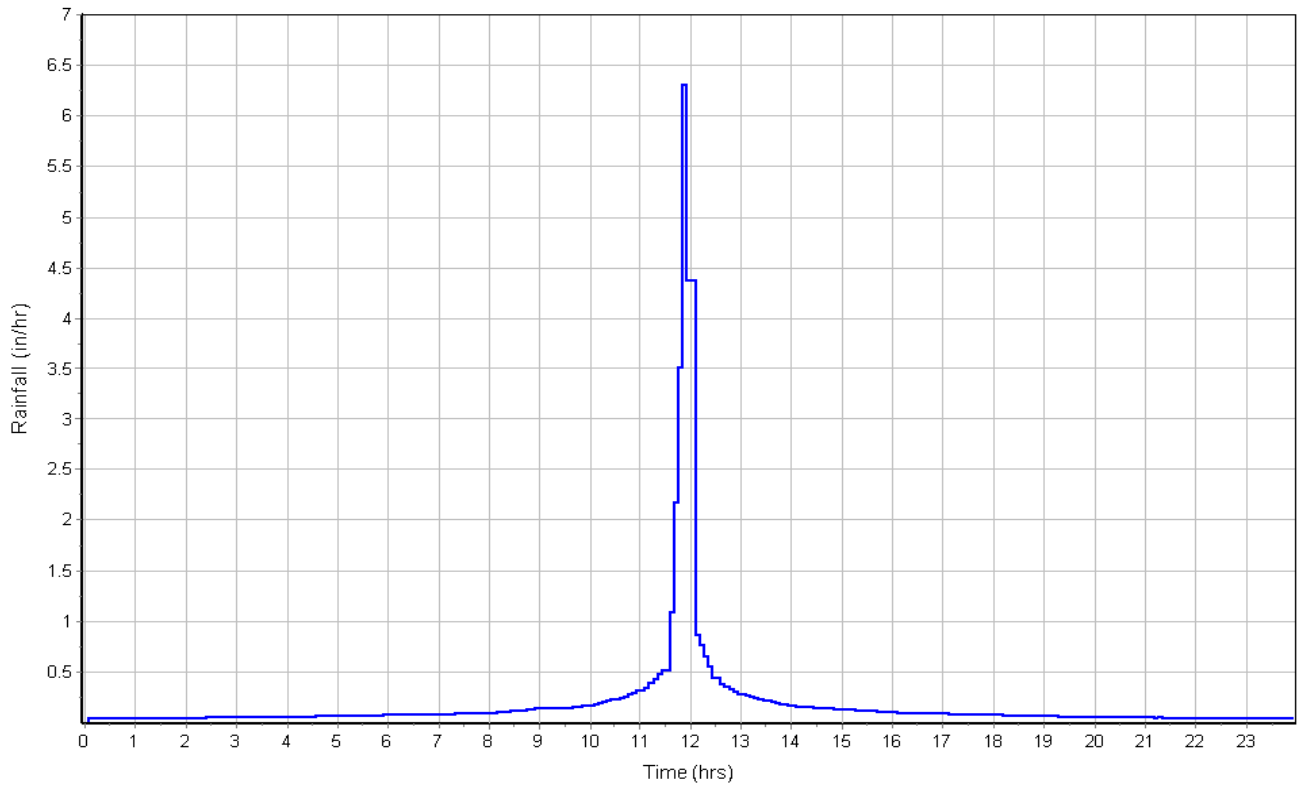
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	328	0.00	0.00
Channel Slope (%) :	4.9	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.09	0.00	0.00
Computed Flow Time (min) :	0.42	0.00	0.00
Total TOC (min)	26.85		

Subbasin Runoff Results

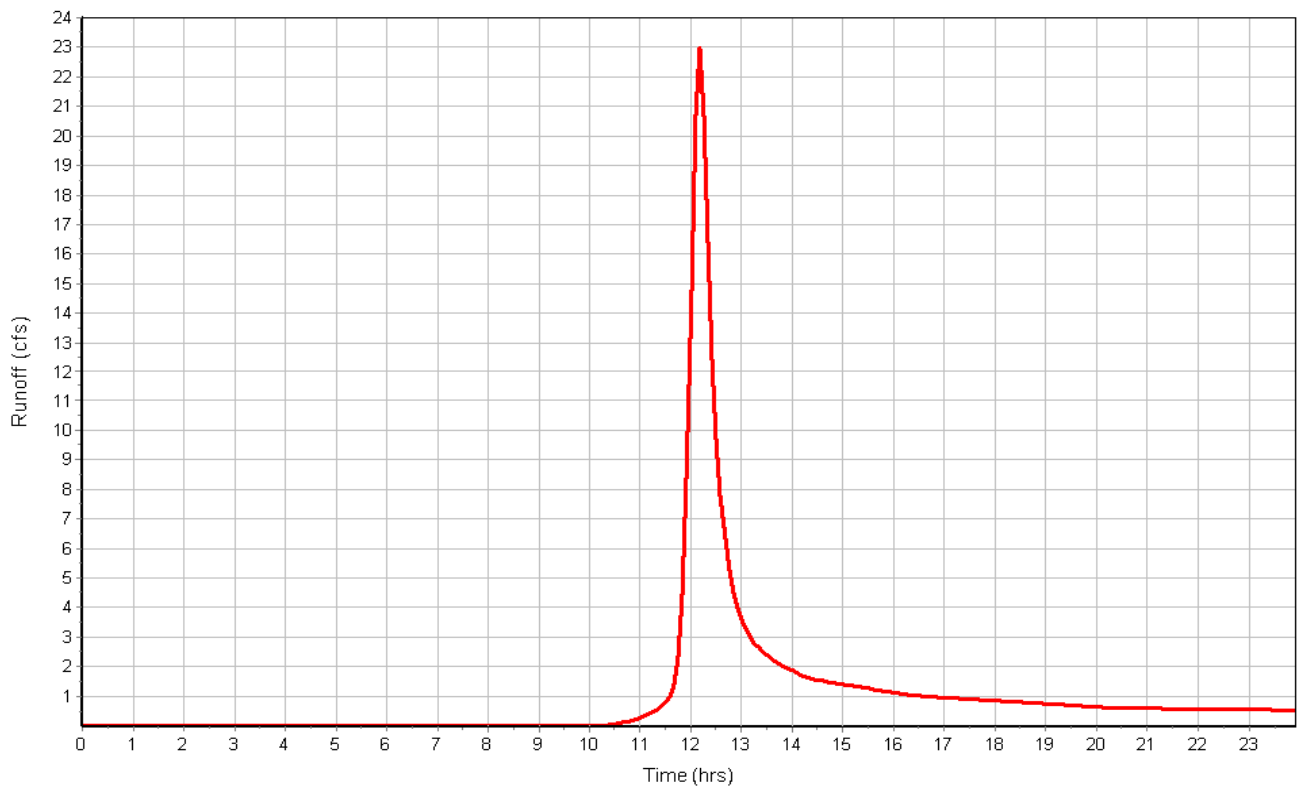
Total Rainfall (in) 4.60
 Total Runoff (in) 1.80
 Peak Runoff (cfs) 23.02
 Weighted Curve Number 70.80
 Time of Concentration (days hh:mm:ss) 0 00:26:51

Subbasin : H1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H2

Input Data

Area (ac) 39.10
 Weighted Curve Number 67.20
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	15.64	B	60.00
5 Acre Lots, 7% Impervious	23.46	C	72.00
Composite Area & Weighted CN	39.10		67.20

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	1000	0.00
Slope (%) :	5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.57	0.00	0.00
Computed Flow Time (min) :	10.62	0.00	0.00

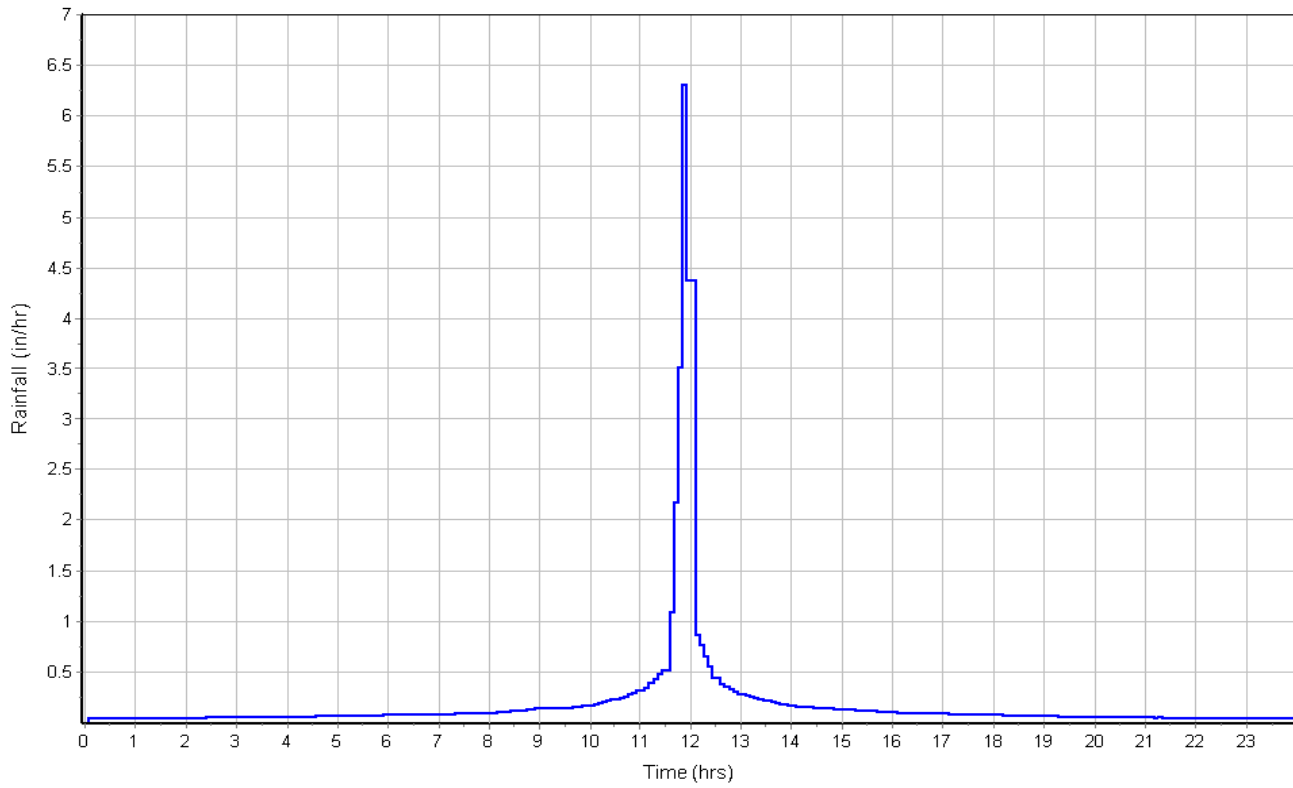
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	851	0.00	0.00
Channel Slope (%) :	5	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.22	0.00	0.00
Computed Flow Time (min) :	1.07	0.00	0.00
Total TOC (min)	32.75		

Subbasin Runoff Results

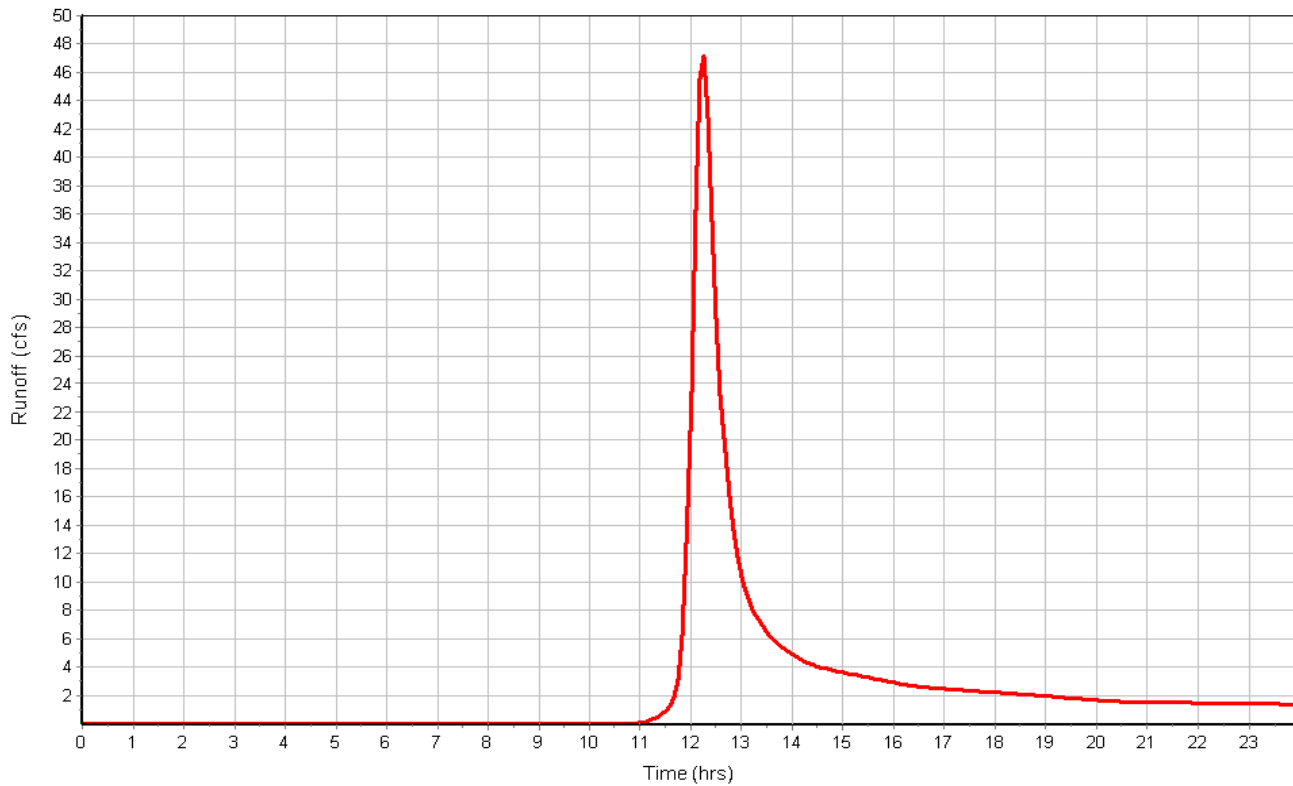
Total Rainfall (in) 4.60
 Total Runoff (in) 1.54
 Peak Runoff (cfs) 47.54
 Weighted Curve Number 67.20
 Time of Concentration (days hh:mm:ss) 0 00:32:45

Subbasin : H2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H3

Input Data

Area (ac) 5.80
 Weighted Curve Number 66.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	2.90	C	72.00
Woods, Fair	2.90	B	60.00
Composite Area & Weighted CN	5.80		66.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	200	0.00	0.00
Slope (%) :	3.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0.00	0.00
Computed Flow Time (min) :	2.67	0.00	0.00

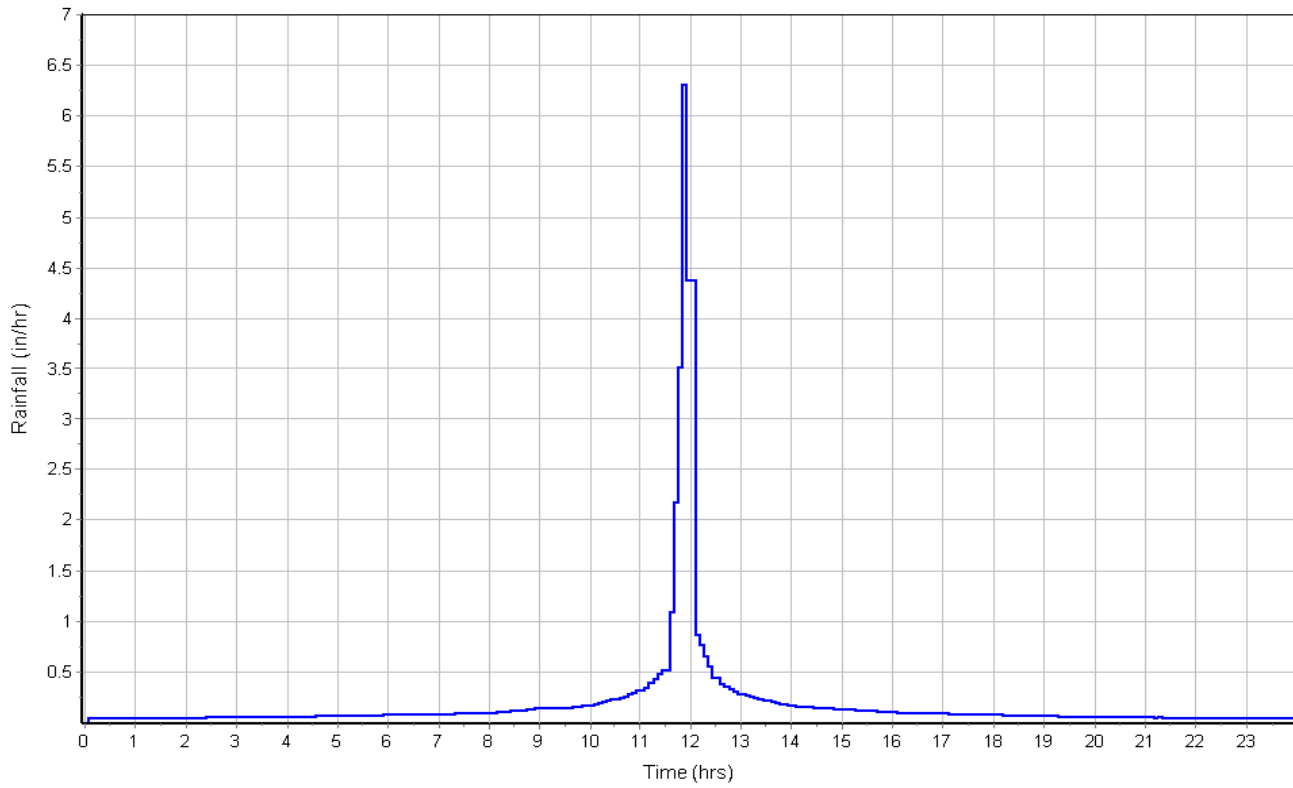
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	133	0.00	0.00
Channel Slope (%) :	3.2	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	10.58	0.00	0.00
Computed Flow Time (min) :	0.21	0.00	0.00
Total TOC (min)	23.93		

Subbasin Runoff Results

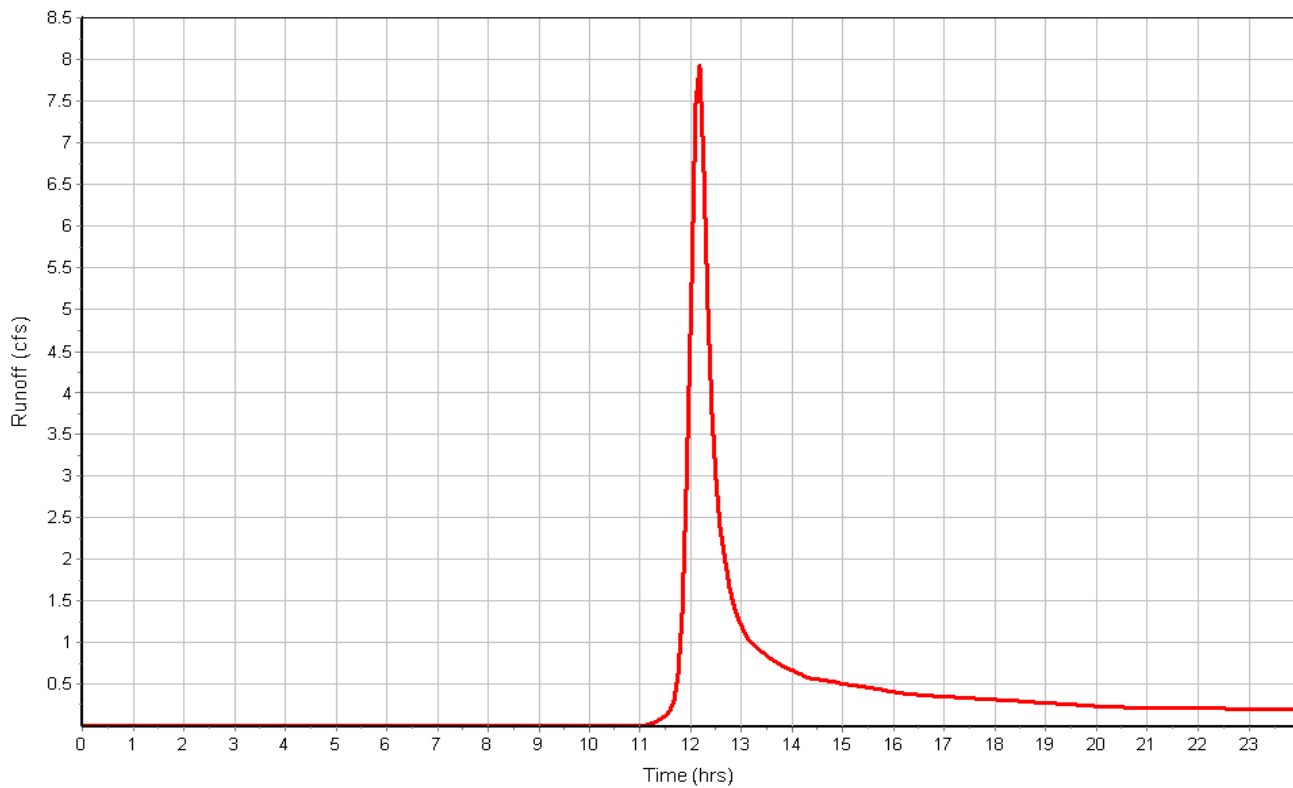
Total Rainfall (in) 4.60
 Total Runoff (in) 1.46
 Peak Runoff (cfs) 8.03
 Weighted Curve Number 66.00
 Time of Concentration (days hh:mm:ss) 0 00:23:56

Subbasin : H3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H4

Input Data

Area (ac) 27.10
 Weighted Curve Number 73.75
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	20.33	C	72.00
Pasture, grassland, or range, Fair	6.78	C	79.00
Composite Area & Weighted CN	27.11		73.75

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.48	0.00	0.00
Computed Flow Time (min) :	11.26	0.00	0.00

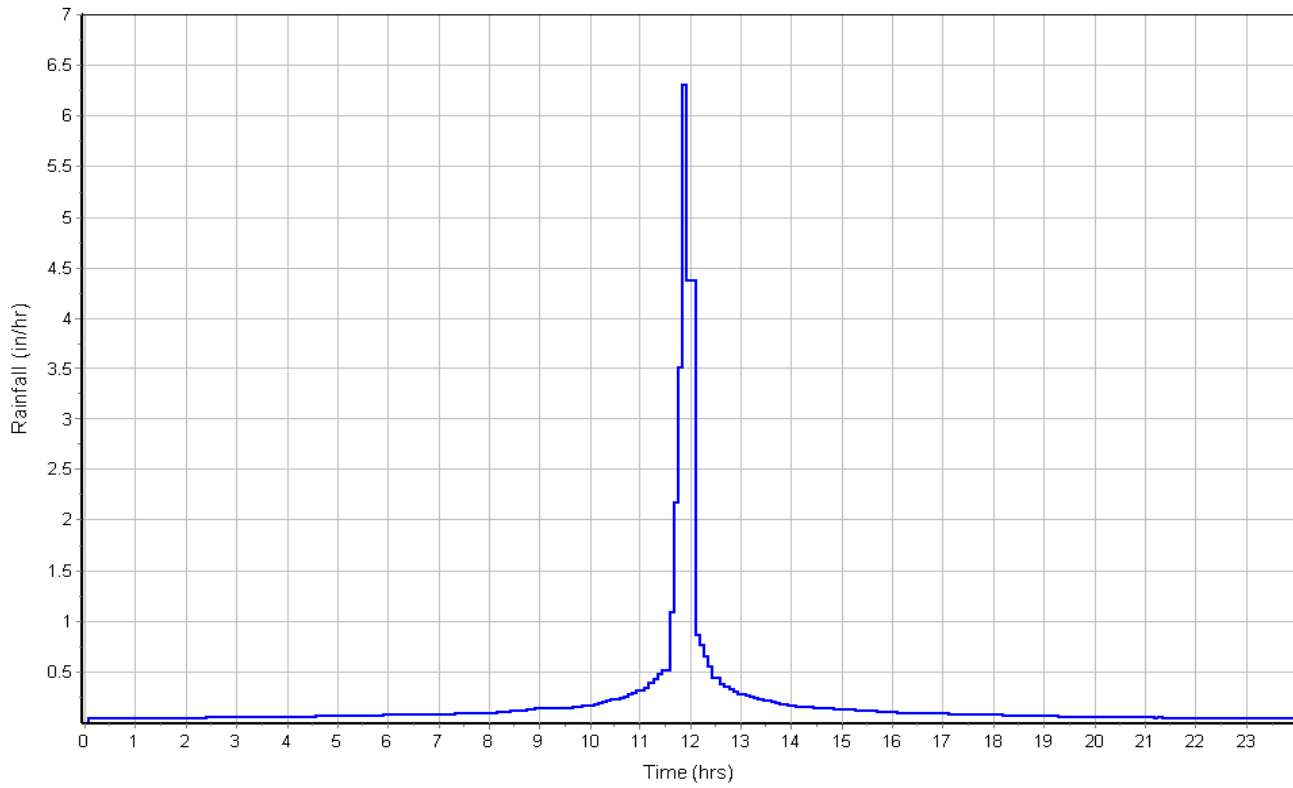
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	791	0.00	0.00
Channel Slope (%) :	4.5	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	12.54	0.00	0.00
Computed Flow Time (min) :	1.05	0.00	0.00
Total TOC (min)	33.37		

Subbasin Runoff Results

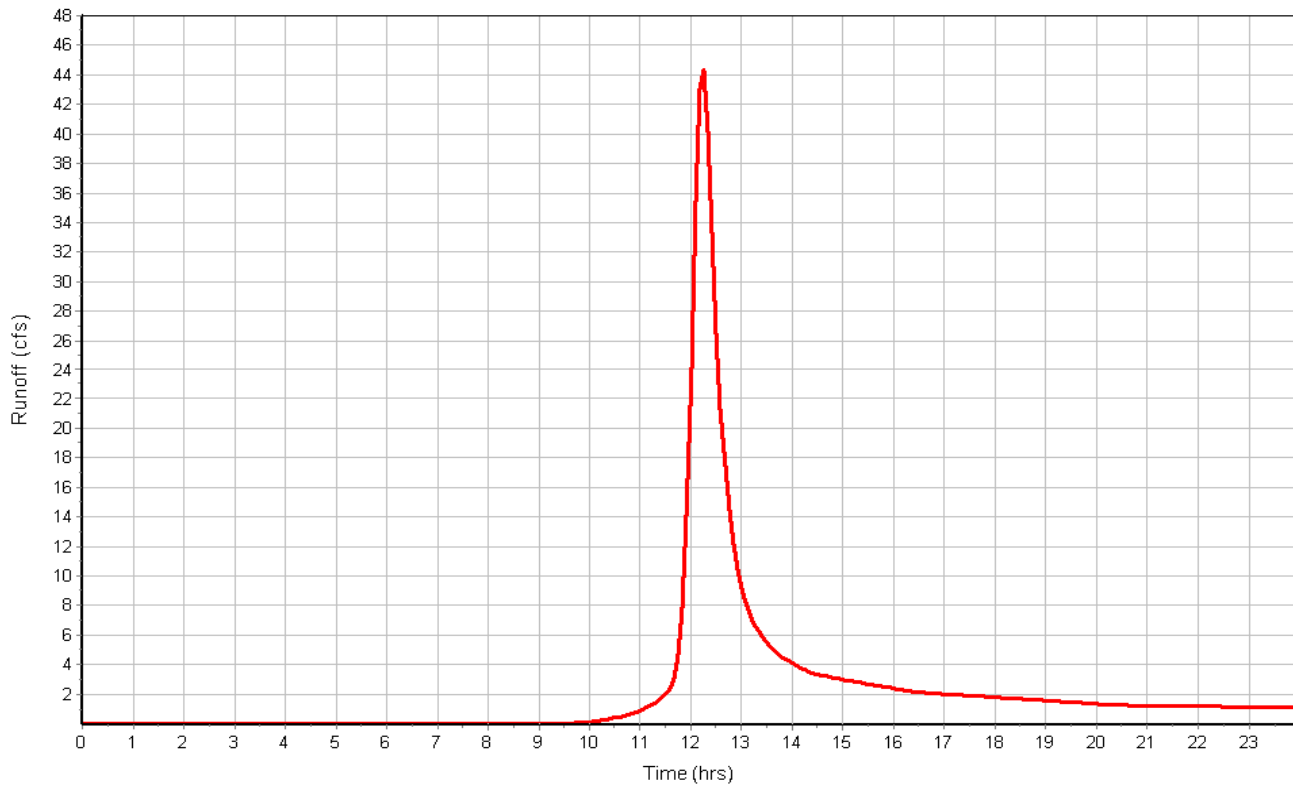
Total Rainfall (in) 4.60
 Total Runoff (in) 2.03
 Peak Runoff (cfs) 44.75
 Weighted Curve Number 73.75
 Time of Concentration (days hh:mm:ss) 0 00:33:22

Subbasin : H4

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H5

Input Data

Area (ac) 20.20
 Weighted Curve Number 74.80
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	8.08	C	79.00
5 Acre Lots, 7% Impervious	12.12	C	72.00
Composite Area & Weighted CN	20.20		74.80

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	5.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.61	0.00	0.00
Computed Flow Time (min) :	10.35	0.00	0.00

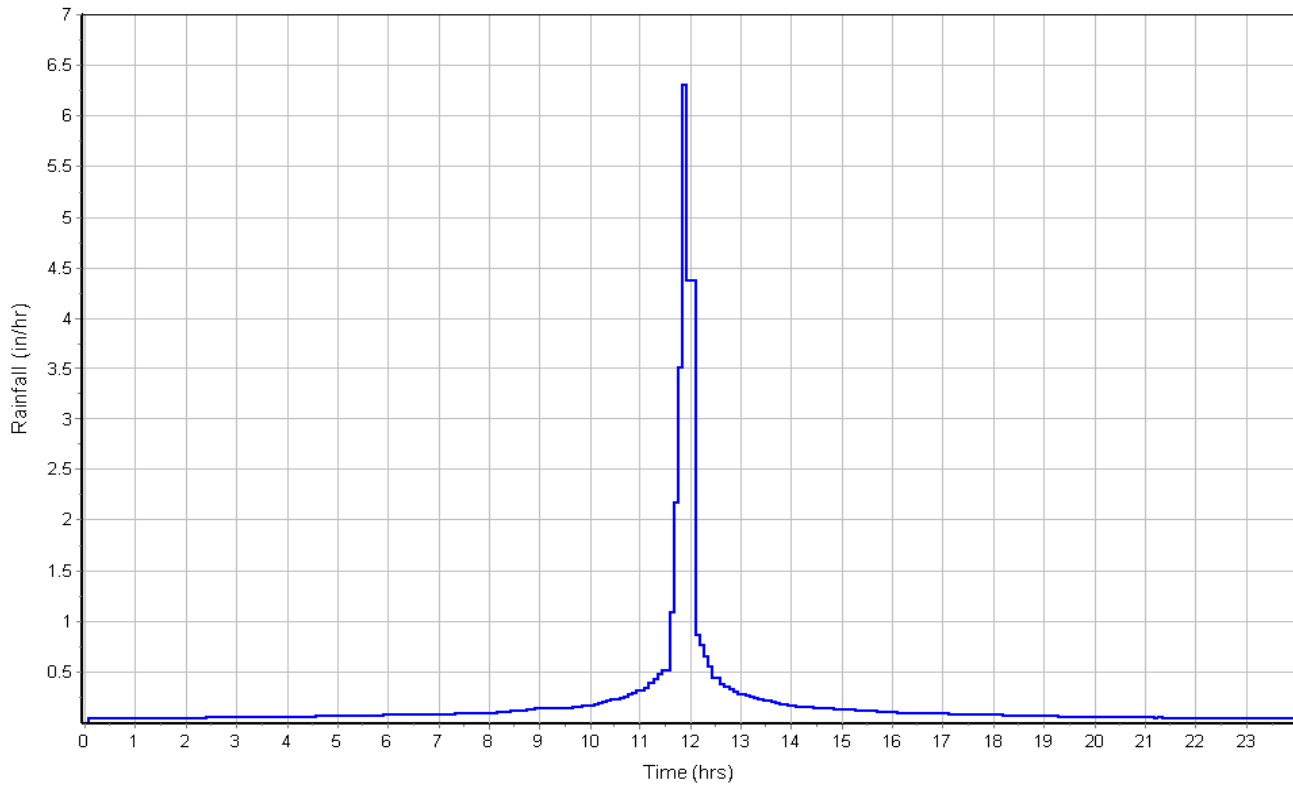
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	655	0.00	0.00
Channel Slope (%) :	5.3	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.61	0.00	0.00
Computed Flow Time (min) :	0.80	0.00	0.00
Total TOC (min)	32.21		

Subbasin Runoff Results

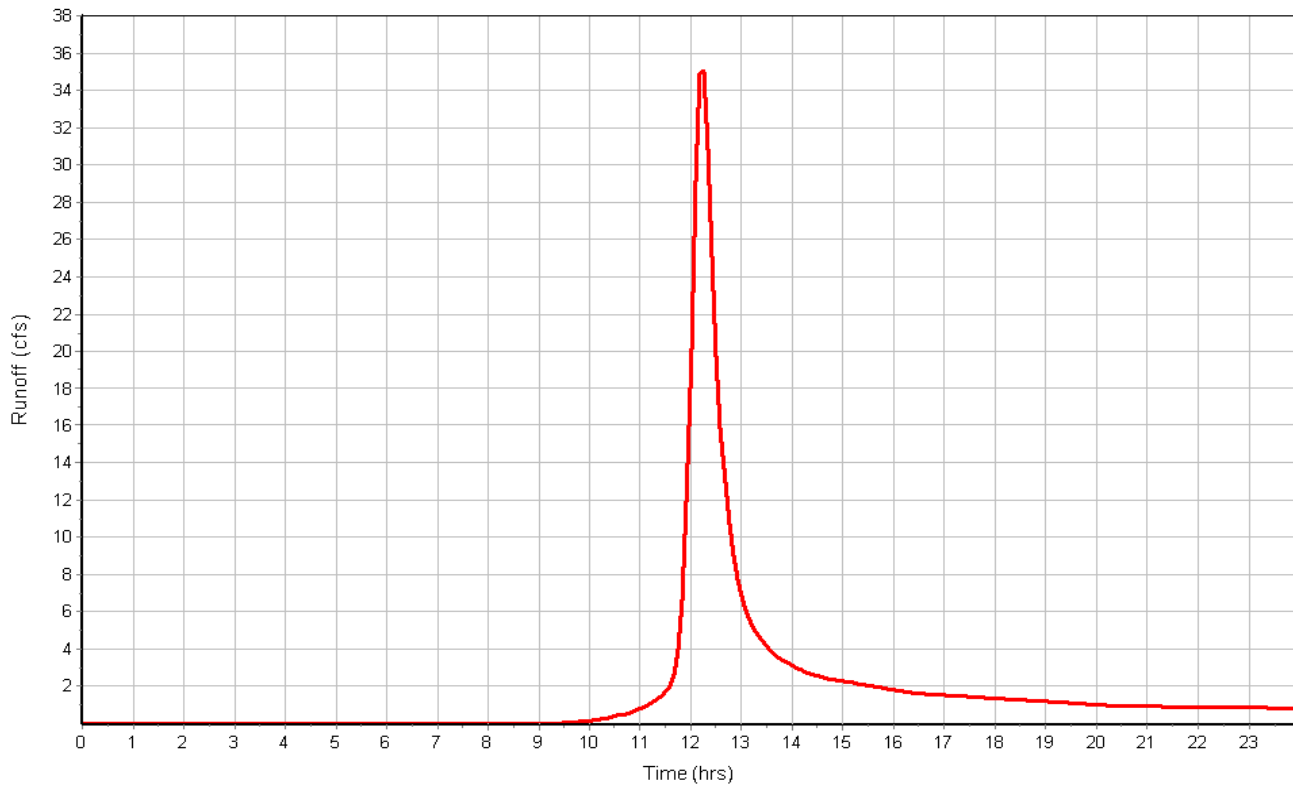
Total Rainfall (in) 4.60
 Total Runoff (in) 2.11
 Peak Runoff (cfs) 35.73
 Weighted Curve Number 74.80
 Time of Concentration (days hh:mm:ss) 0 00:32:13

Subbasin : H5

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H6

Input Data

Area (ac) 31.60
 Weighted Curve Number 66.60
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	11.06	B	60.00
Pasture, grassland, or range, Fair	18.96	B	69.00
Pasture, grassland, or range, Fair	1.58	D	84.00
Composite Area & Weighted CN	31.60		66.60

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	12.25	0.00	0.00

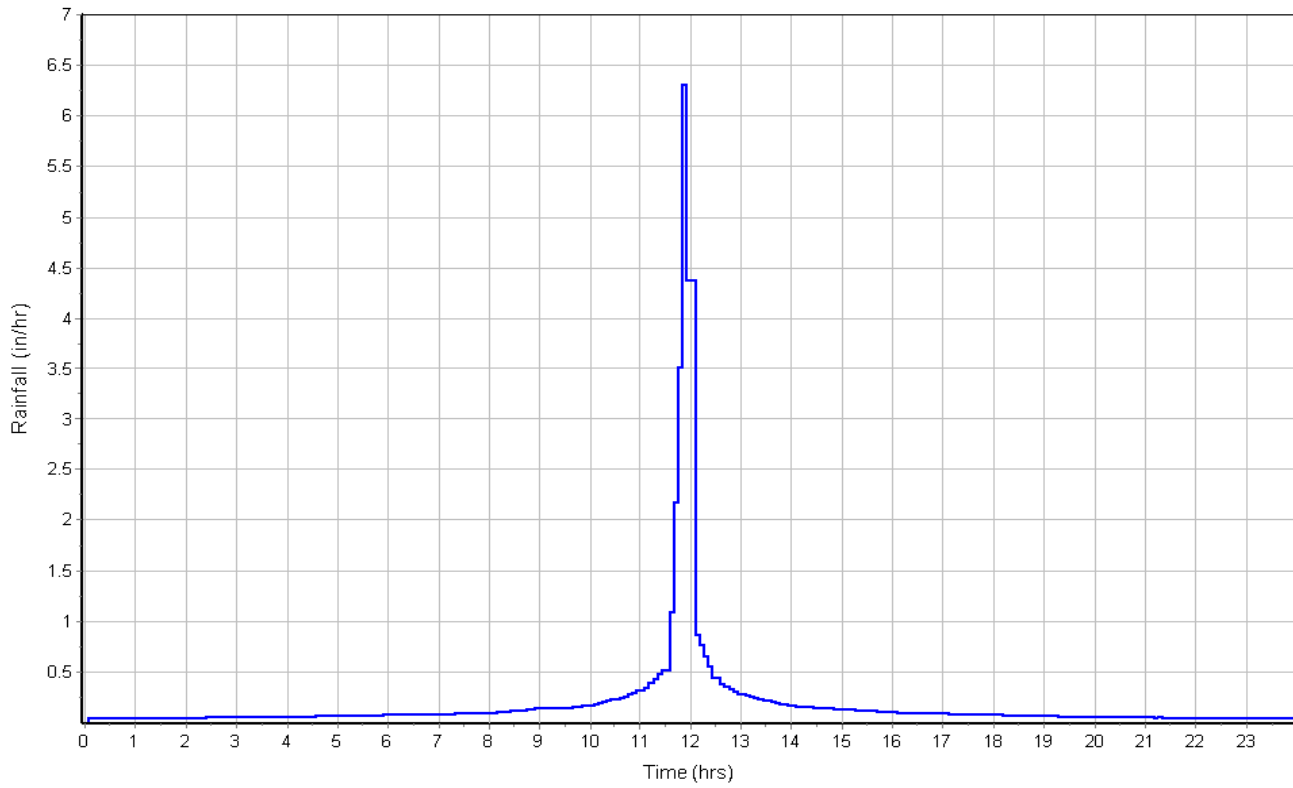
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1275	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.53	0.00	0.00
Computed Flow Time (min) :	1.84	0.00	0.00
Total TOC (min)	35.16		

Subbasin Runoff Results

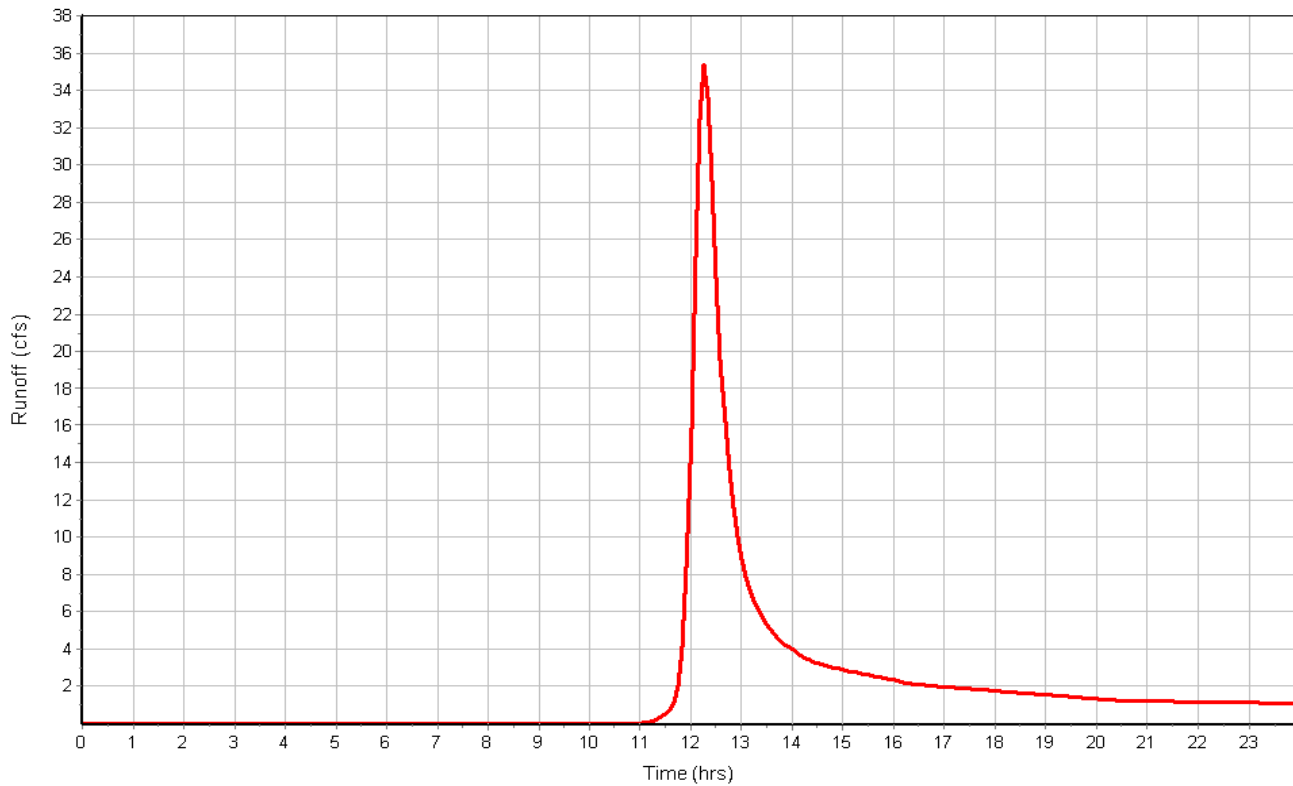
Total Rainfall (in) 4.60
 Total Runoff (in) 1.50
 Peak Runoff (cfs) 35.44
 Weighted Curve Number 66.60
 Time of Concentration (days hh:mm:ss) 0 00:35:10

Subbasin : H6

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H7

Input Data

Area (ac) 25.80
 Weighted Curve Number 70.50
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	10.32	C	72.00
Pasture, grassland, or range, Fair	7.74	C	79.00
5 Acre Lots, 7% Impervious	7.74	B	60.00
Composite Area & Weighted CN	25.80		70.50

Time of Concentration

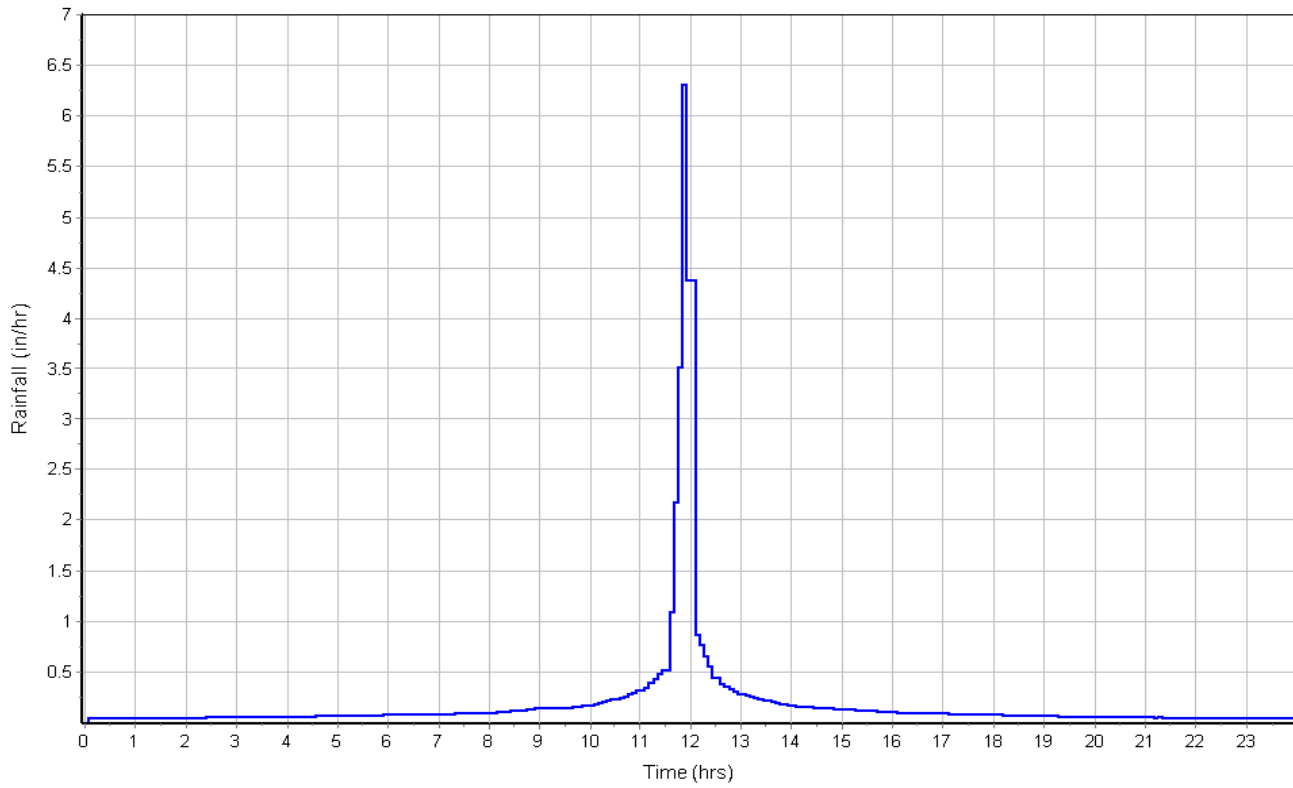
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	6.5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.78	0.00	0.00
Computed Flow Time (min) :	9.36	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	343	0.00	0.00
Channel Slope (%) :	6.5	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	15.08	0.00	0.00
Computed Flow Time (min) :	0.38	0.00	0.00
Total TOC (min)	30.80		

Subbasin Runoff Results

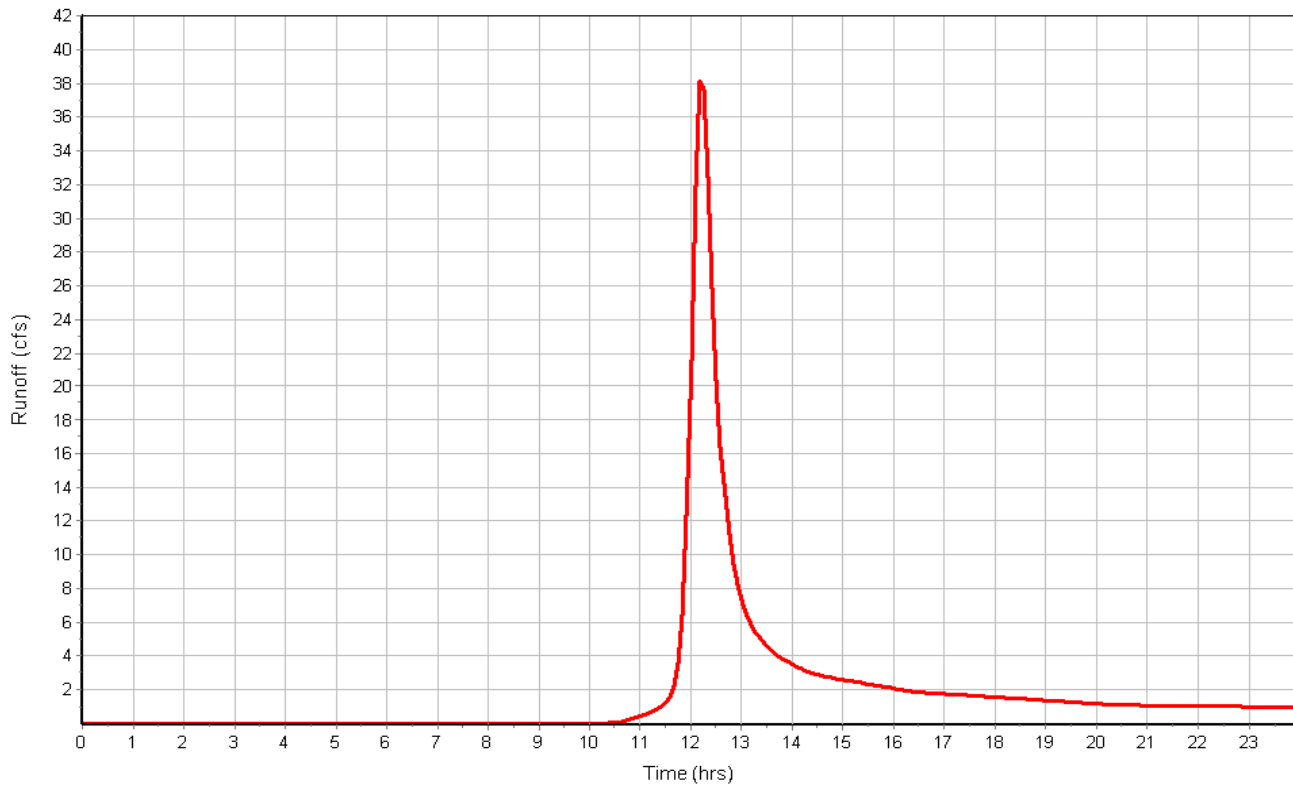
Total Rainfall (in) 4.60
 Total Runoff (in) 1.78
 Peak Runoff (cfs) 38.72
 Weighted Curve Number 70.50
 Time of Concentration (days hh:mm:ss) 0 00:30:48

Subbasin : H7

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H8

Input Data

Area (ac) 8.50
 Weighted Curve Number 74.55
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	2.55	B	60.00
Pasture, grassland, or range, Fair	2.13	D	84.00
Pasture, grassland, or range, Fair	3.83	C	79.00
Composite Area & Weighted CN	8.51		74.55

Time of Concentration

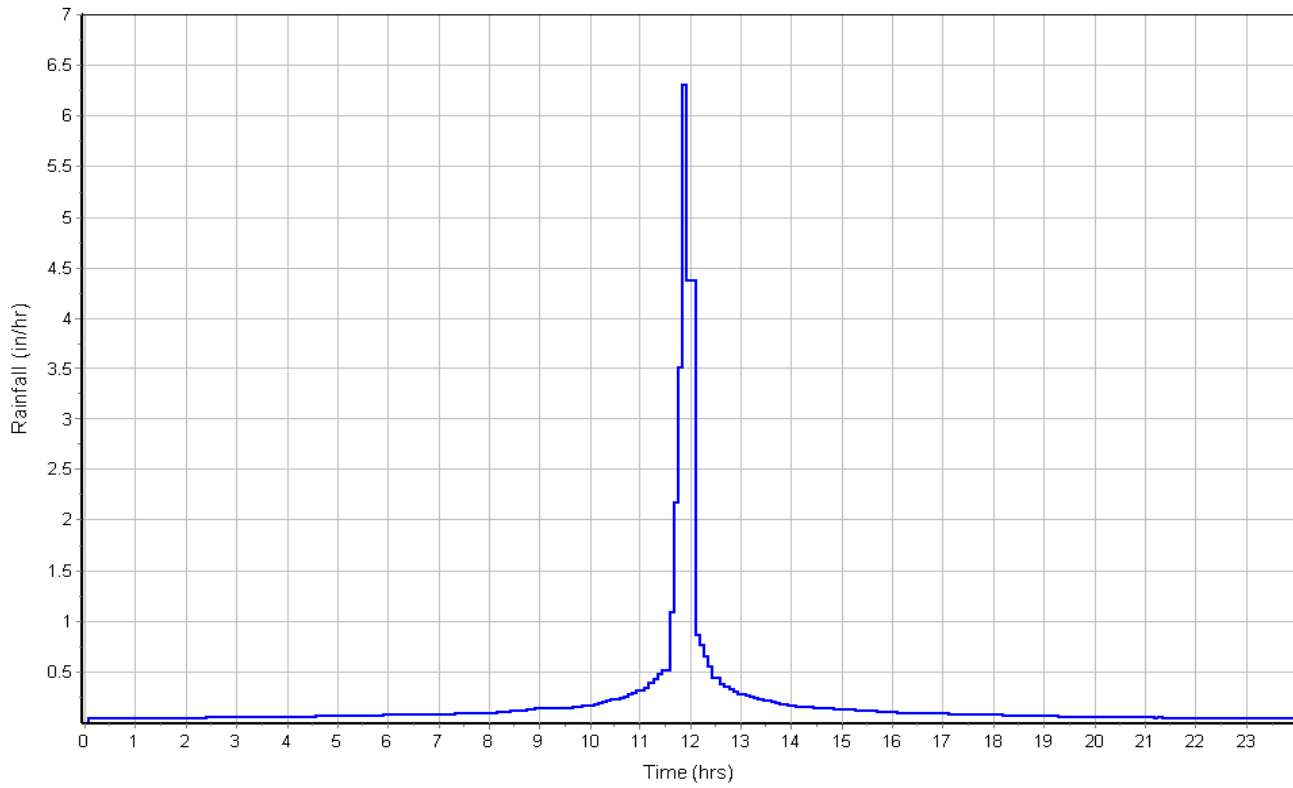
	Flowpath	Flowpath	Flowpath
	A	B	C
Sheet Flow Computations			
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	7.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.97	0.00	0.00
Computed Flow Time (min) :	4.23	0.00	0.00
Channel Flow Computations			
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	159	0.00	0.00
Channel Slope (%) :	7.9	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	16.62	0.00	0.00
Computed Flow Time (min) :	0.16	0.00	0.00
Total TOC (min)	25.45		

Subbasin Runoff Results

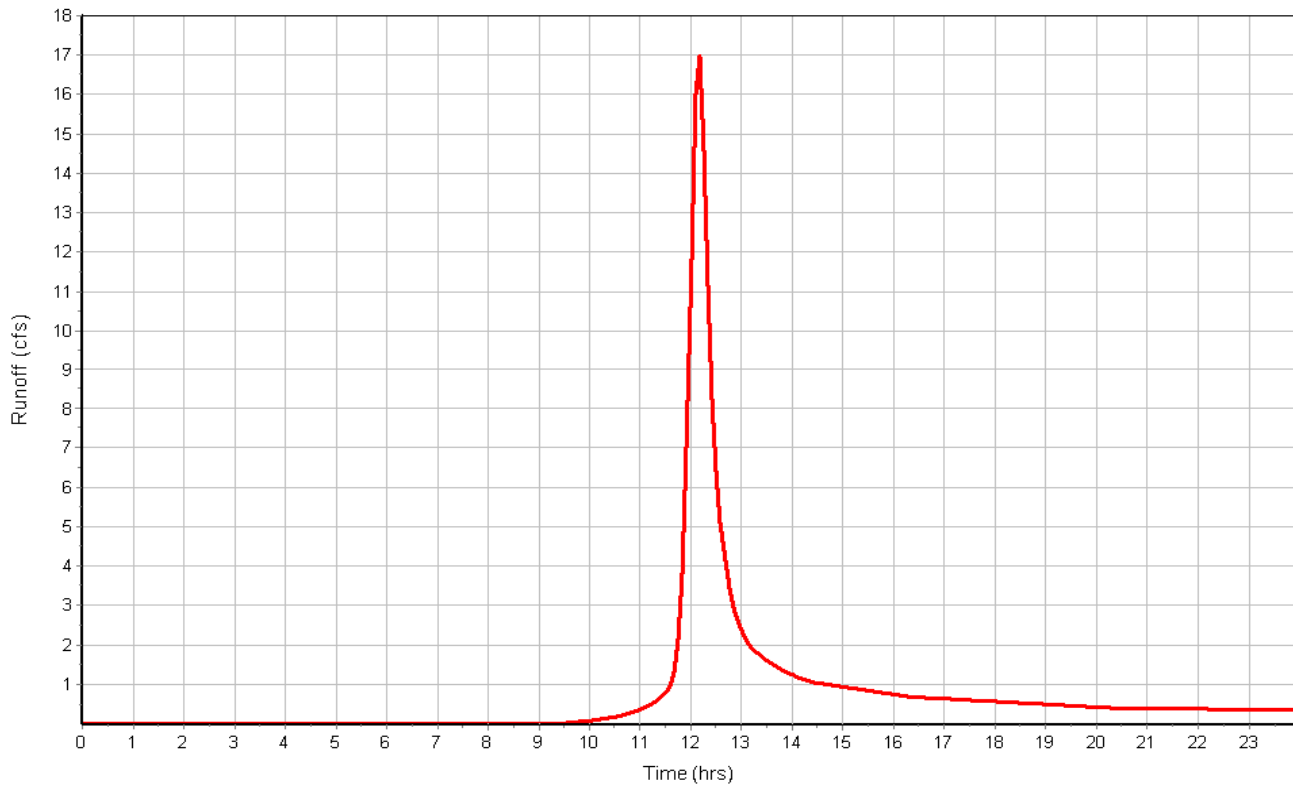
Total Rainfall (in) 4.60
 Total Runoff (in) 2.09
 Peak Runoff (cfs) 17.12
 Weighted Curve Number 74.55
 Time of Concentration (days hh:mm:ss) 0 00:25:27

Subbasin : H8

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : H9

Input Data

Area (ac) 6.90
 Weighted Curve Number 70.80
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	0.69	B	60.00
5 Acre Lots, 7% Impervious	6.21	C	72.00
Composite Area & Weighted CN	6.90		70.80

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	6.7	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.81	0.00	0.00
Computed Flow Time (min) :	2.76	0.00	0.00

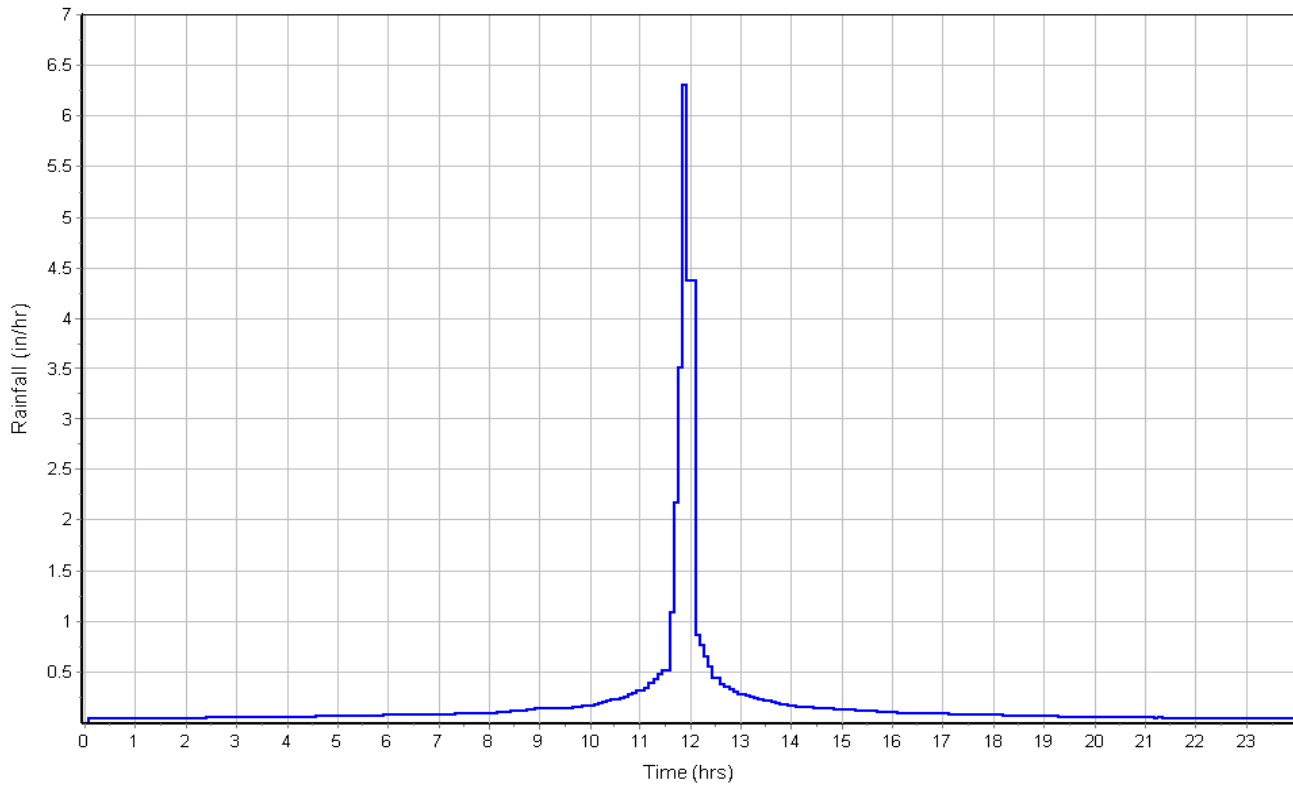
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	171	0.00	0.00
Channel Slope (%) :	6.7	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	15.31	0.00	0.00
Computed Flow Time (min) :	0.19	0.00	0.00
Total TOC (min)	24.01		

Subbasin Runoff Results

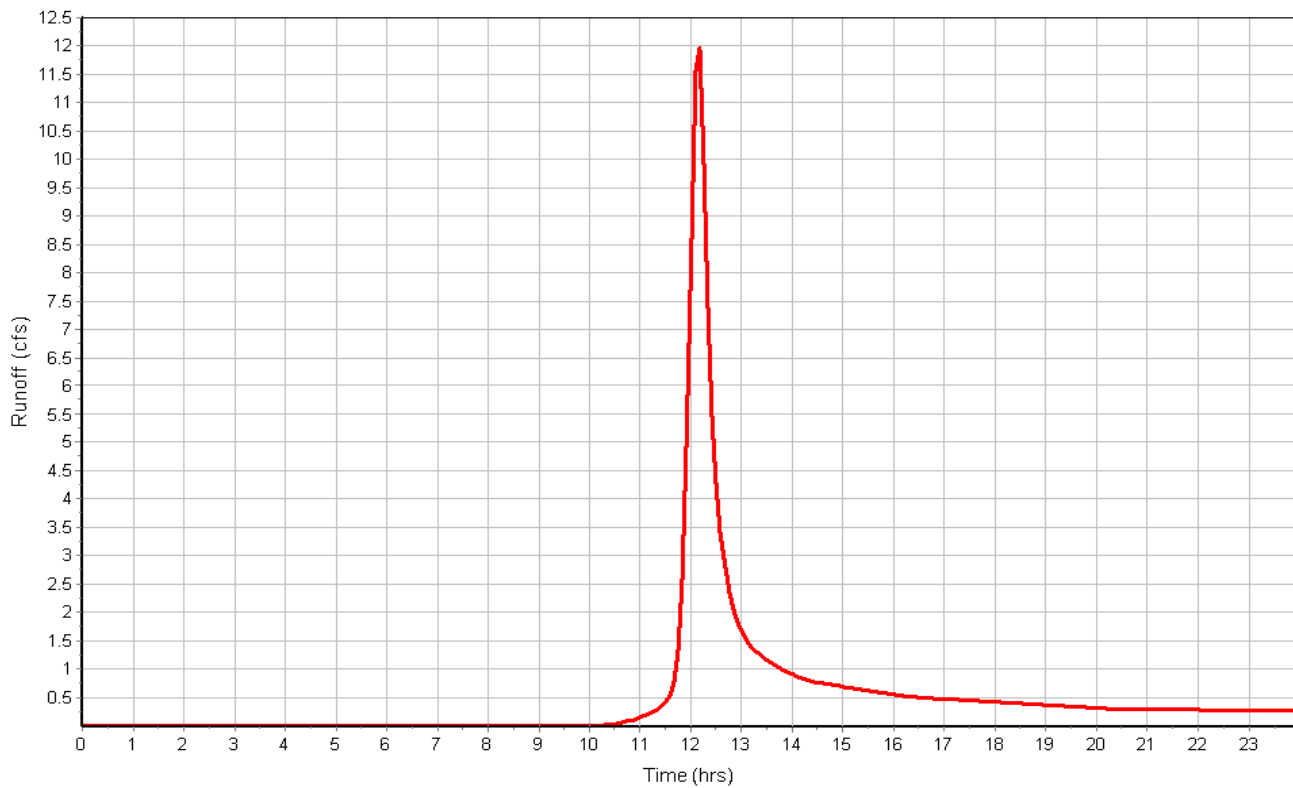
Total Rainfall (in) 4.60
 Total Runoff (in) 1.80
 Peak Runoff (cfs) 12.20
 Weighted Curve Number 70.80
 Time of Concentration (days hh:mm:ss) 0 00:24:01

Subbasin : H9

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : I1

Input Data

Area (ac) 6.80
 Weighted Curve Number 72.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	6.80	C	72.00
Composite Area & Weighted CN	6.80		72.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	200	0.00	0.00
Slope (%) :	4	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.40	0.00	0.00
Computed Flow Time (min) :	2.38	0.00	0.00

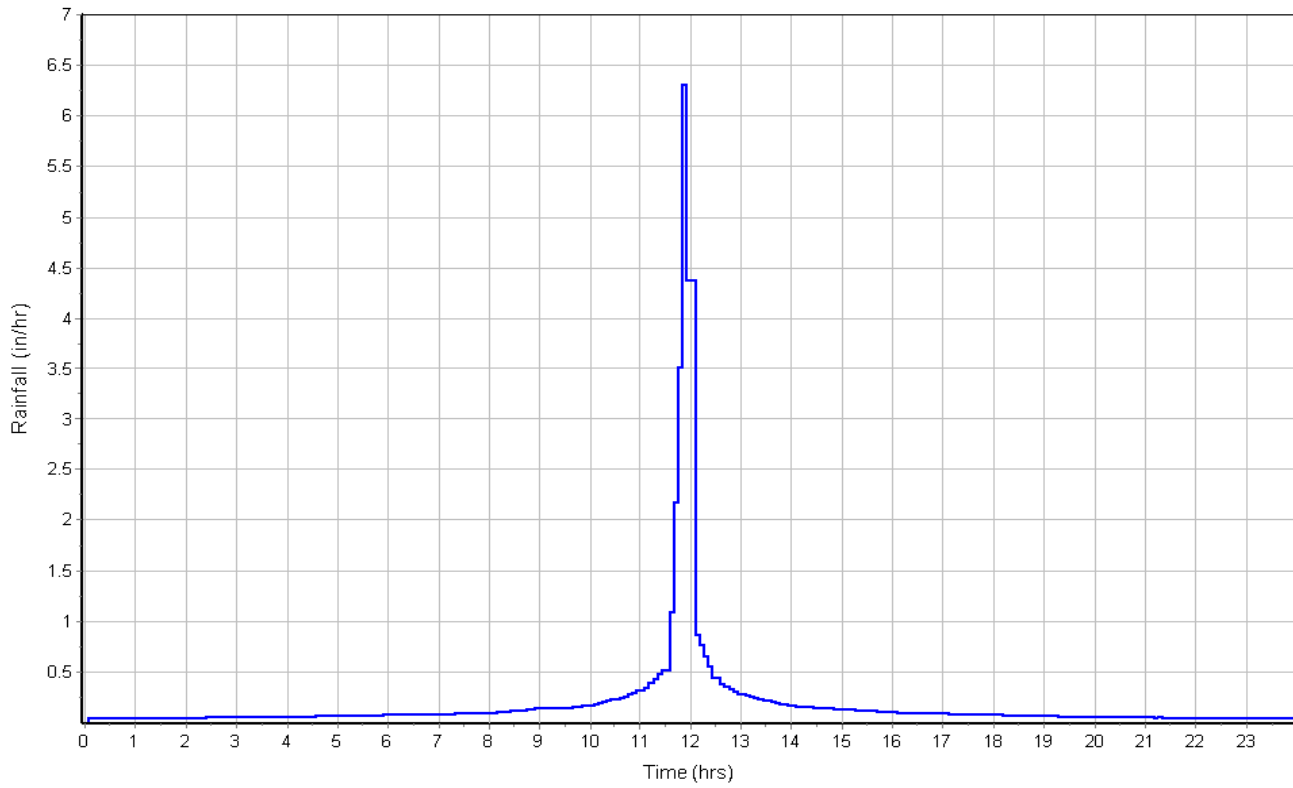
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	268	0.00	0.00
Channel Slope (%) :	4	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.83	0.00	0.00
Computed Flow Time (min) :	0.38	0.00	0.00
Total TOC (min)	23.82		

Subbasin Runoff Results

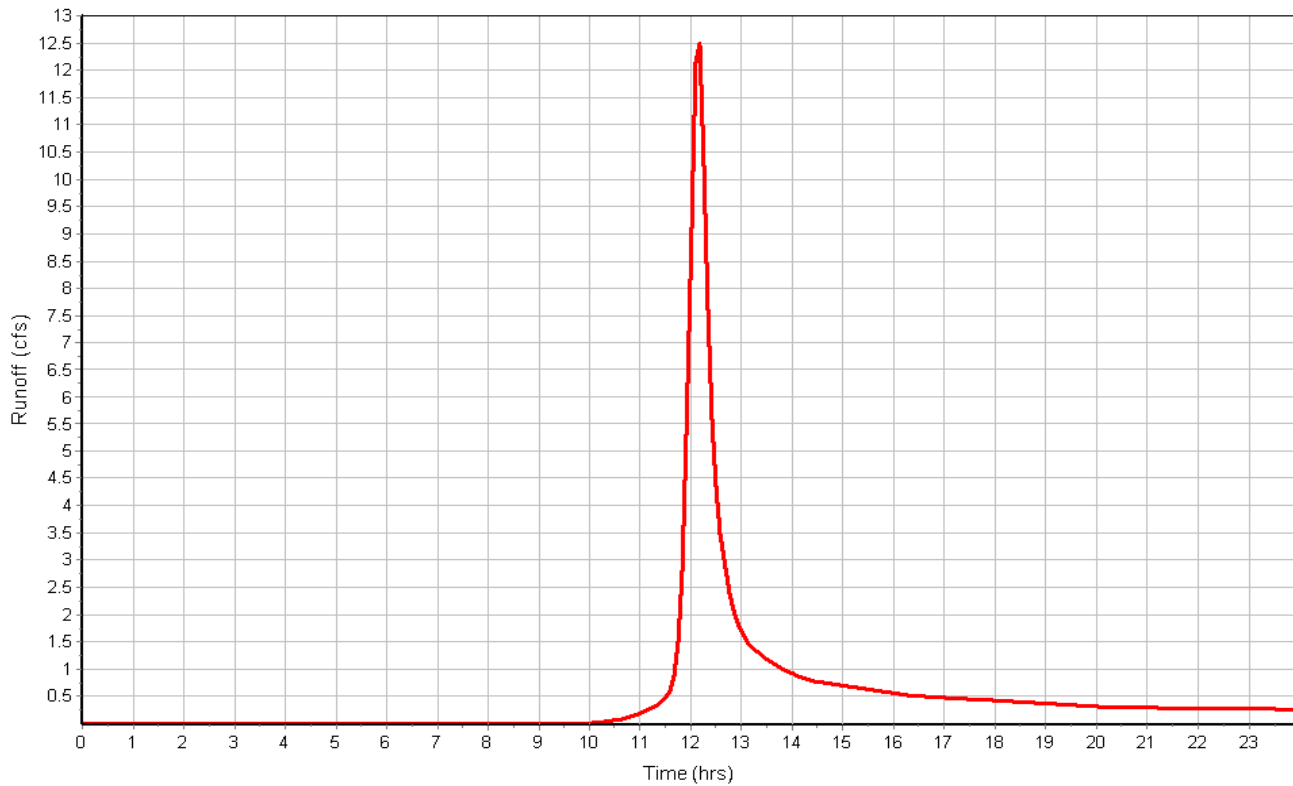
Total Rainfall (in) 4.60
 Total Runoff (in) 1.90
 Peak Runoff (cfs) 12.75
 Weighted Curve Number 72.00
 Time of Concentration (days hh:mm:ss) 0 00:23:49

Subbasin : I1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : I2

Input Data

Area (ac) 14.80
 Weighted Curve Number 72.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	14.80	C	72.00
Composite Area & Weighted CN	14.80		72.00

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.1	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Flow Length (ft) :	200	0.00
Slope (%) :	5.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.60	0.00	0.00
Computed Flow Time (min) :	2.08	0.00	0.00

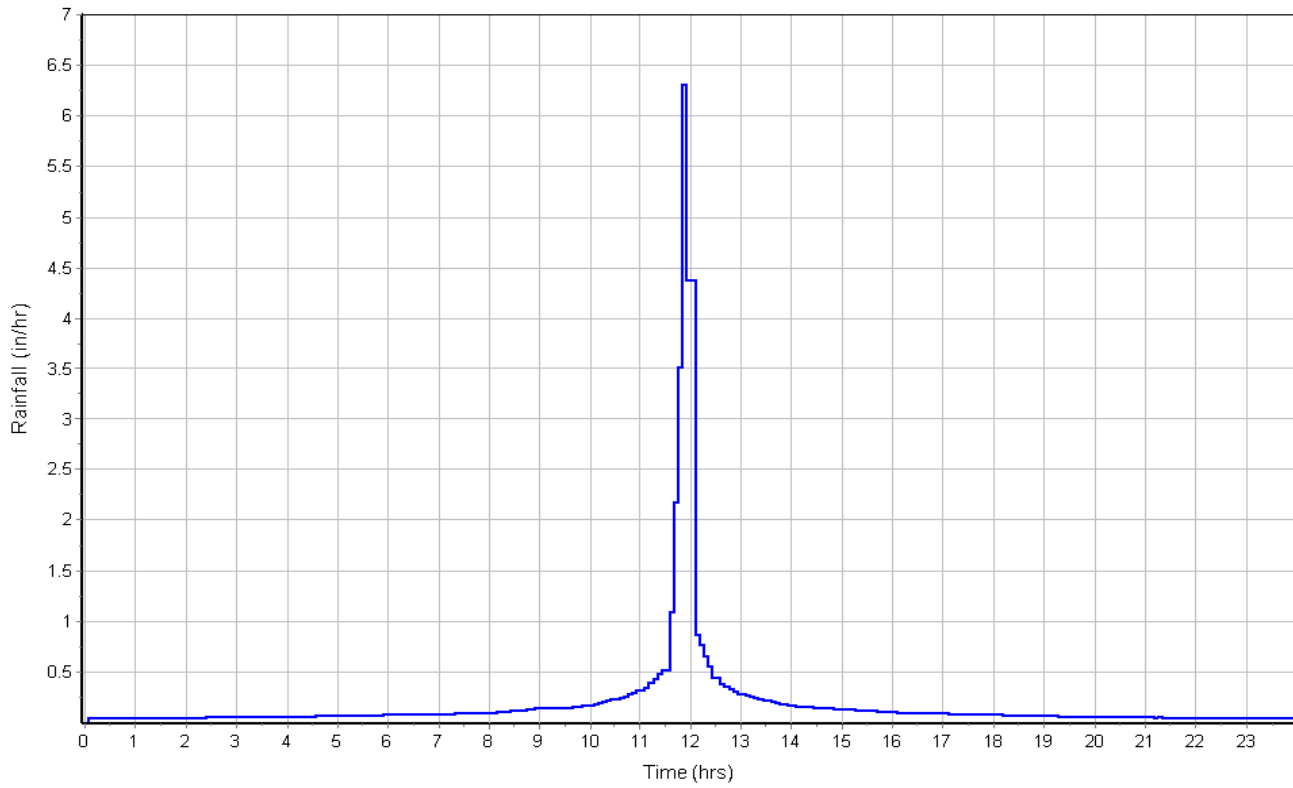
Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
	Manning's Roughness :	.04	0.00
Flow Length (ft) :	285	0.00	0.00
Channel Slope (%) :	5.2	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	13.48	0.00	0.00
Computed Flow Time (min) :	0.35	0.00	0.00
Total TOC (min)	23.49		

Subbasin Runoff Results

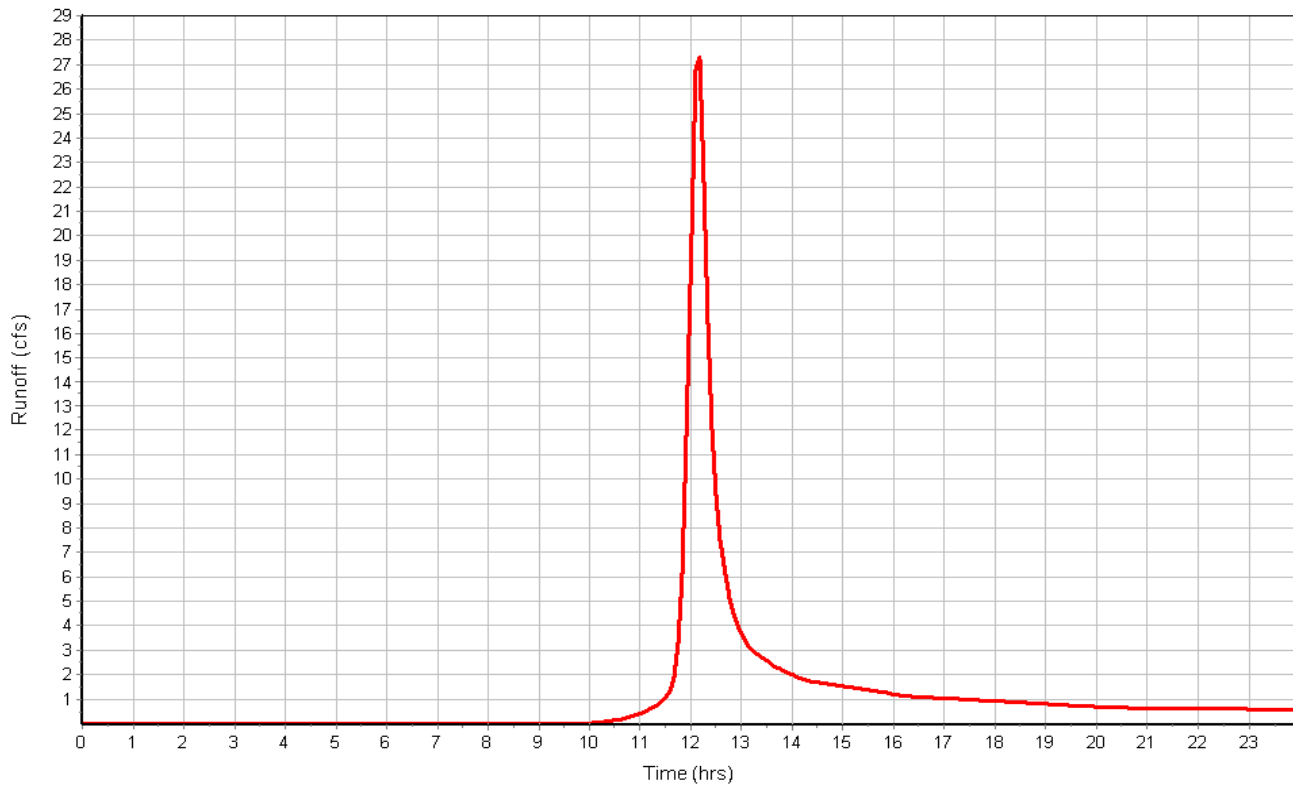
Total Rainfall (in) 4.60
 Total Runoff (in) 1.90
 Peak Runoff (cfs) 28.00
 Weighted Curve Number 72.00
 Time of Concentration (days hh:mm:ss) 0 00:23:29

Subbasin : I2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : J1

Input Data

Area (ac) 10.10
 Weighted Curve Number 60.00
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	10.10	B	60.00
Composite Area & Weighted CN	10.10		60.00

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	200	0.00	0.00
Slope (%) :	8.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	2.08	0.00	0.00
Computed Flow Time (min) :	1.60	0.00	0.00

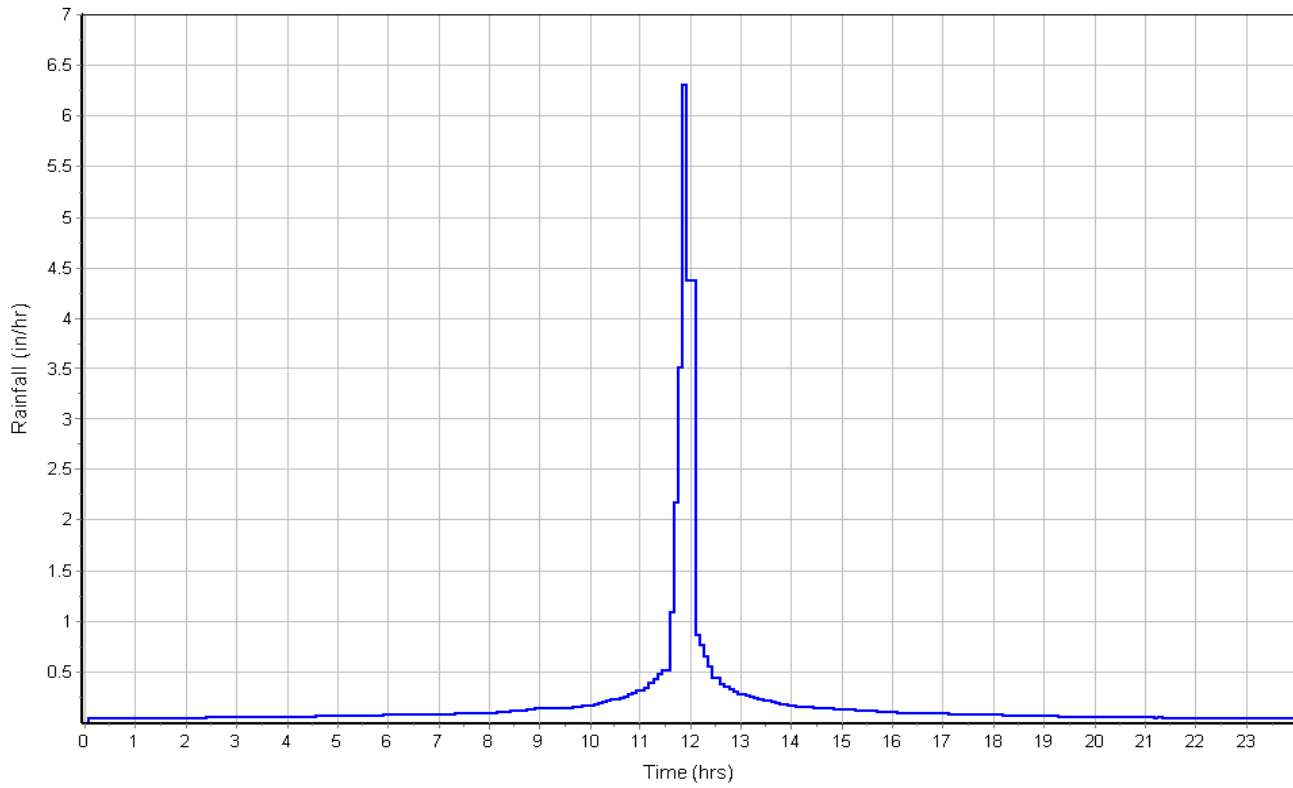
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	228	0.00	0.00
Channel Slope (%) :	8.8	0.00	0.00
Cross Section Area (ft²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	17.54	0.00	0.00
Computed Flow Time (min) :	0.22	0.00	0.00
Total TOC (min)	22.88		

Subbasin Runoff Results

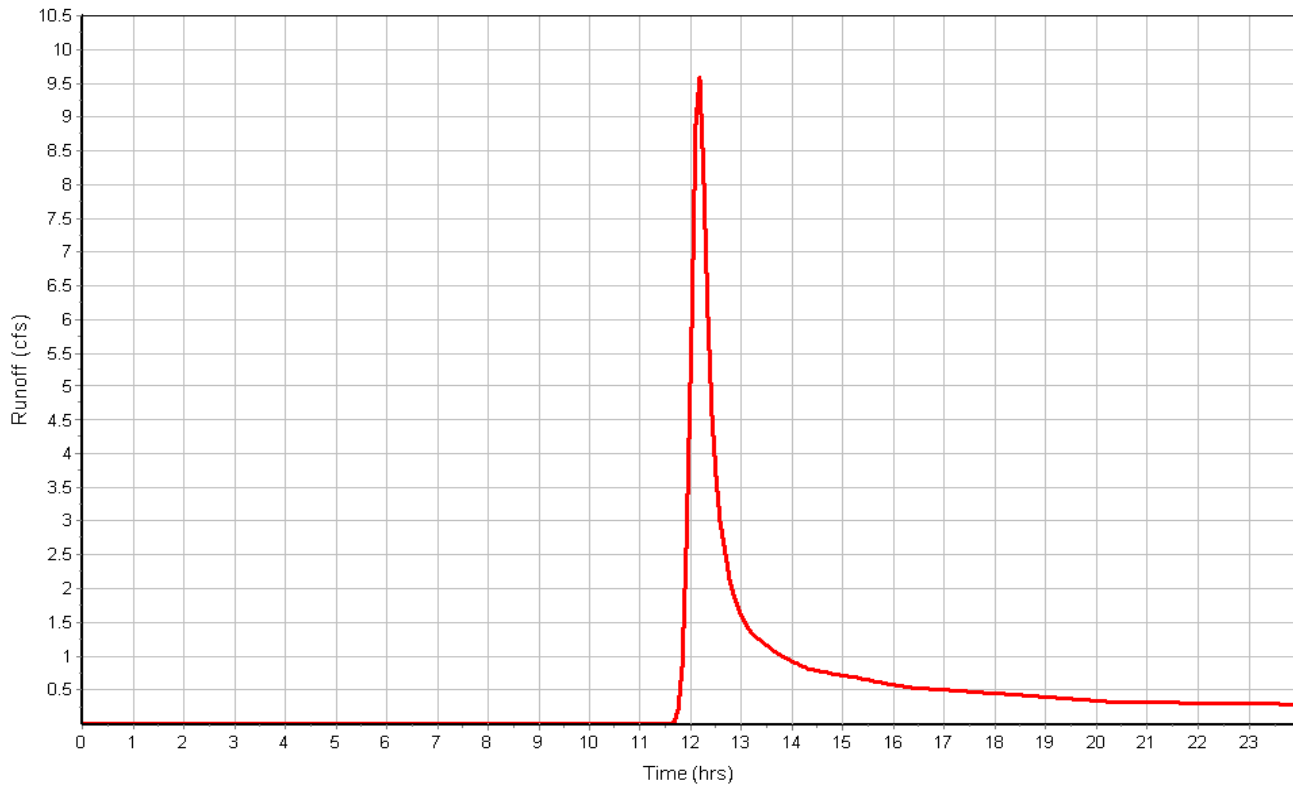
Total Rainfall (in) 4.60
 Total Runoff (in) 1.07
 Peak Runoff (cfs) 9.68
 Weighted Curve Number 60.00
 Time of Concentration (days hh:mm:ss) 0 00:22:53

Subbasin : J1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : K1

Input Data

Area (ac) 17.80
 Weighted Curve Number 69.60
 Rain Gage ID Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	3.56	B	60.00
5 Acre Lots, 7% Impervious	14.24	C	72.00
Composite Area & Weighted CN	17.80		69.60

Time of Concentration

Sheet Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Flow Length (ft) :	200	0.00	0.00
Slope (%) :	3.9	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.38	0.00	0.00
Computed Flow Time (min) :	2.42	0.00	0.00

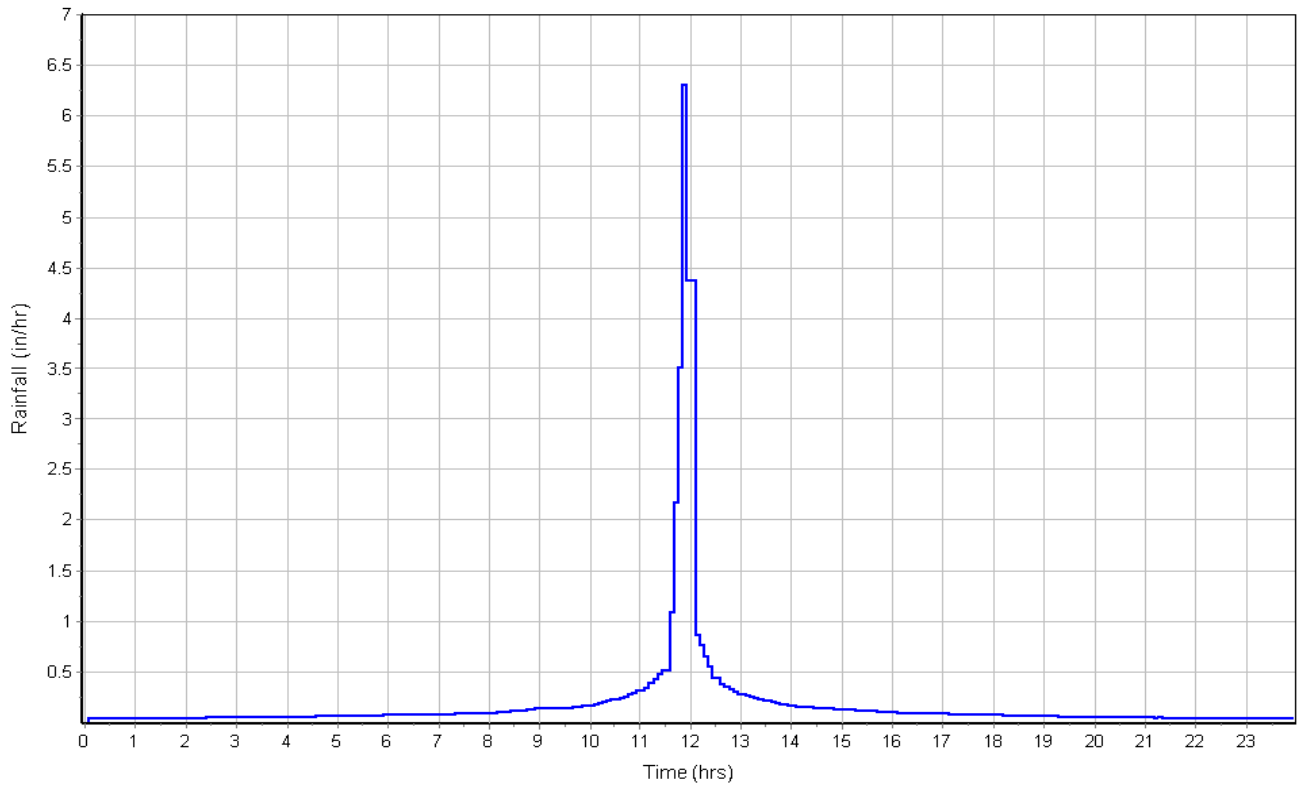
Channel Flow Computations	Flowpath	Flowpath	Flowpath
	A	B	C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	354	0.00	0.00
Channel Slope (%) :	3.9	0.00	0.00
Cross Section Area (ft ²) :	40	0.00	0.00
Wetted Perimeter (ft) :	20	0.00	0.00
Velocity (ft/sec) :	11.68	0.00	0.00
Computed Flow Time (min) :	0.51	0.00	0.00
Total TOC (min)	23.98		

Subbasin Runoff Results

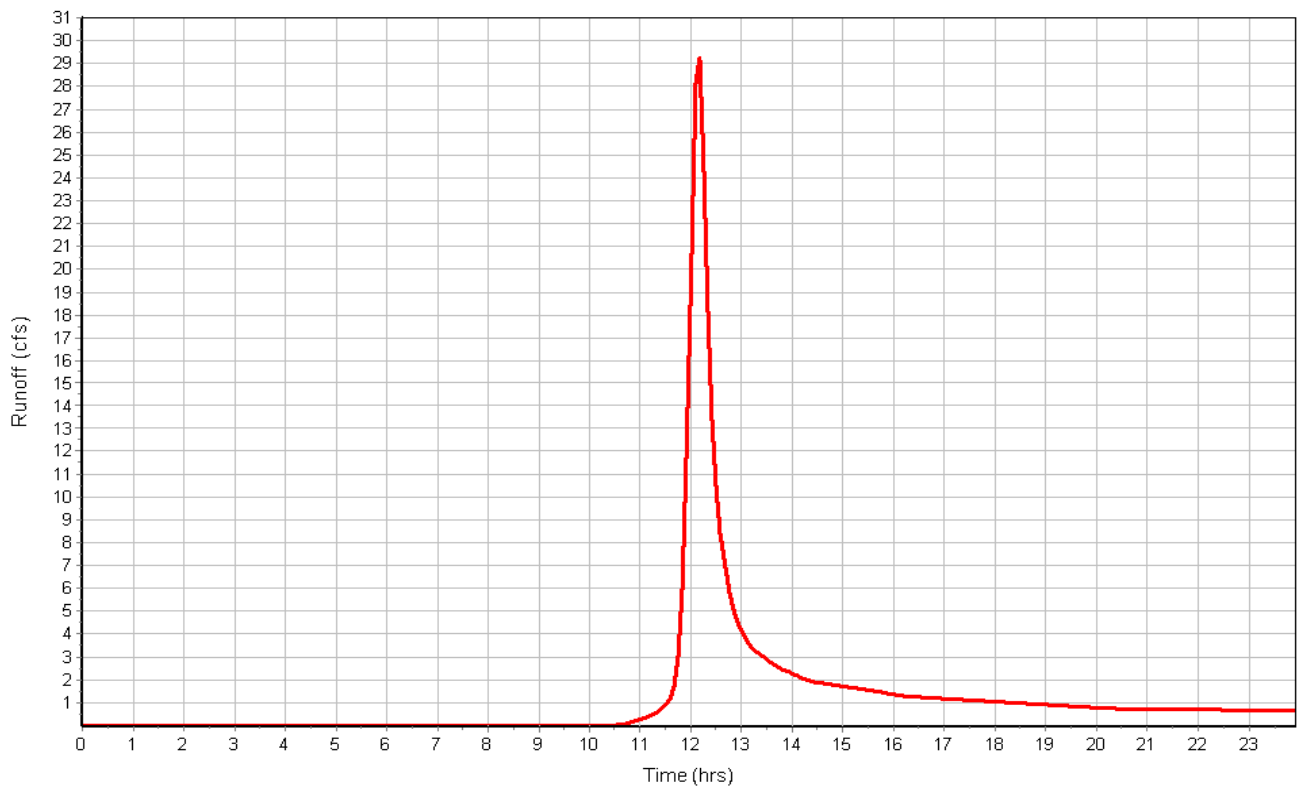
Total Rainfall (in) 4.60
 Total Runoff (in) 1.72
 Peak Runoff (cfs) 29.72
 Weighted Curve Number 69.60
 Time of Concentration (days hh:mm:ss) 0 00:23:59

Subbasin : K1

Rainfall Intensity Graph



Runoff Hydrograph



Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft ²)	Minimum Pipe Cover (ft)
1	Jun-A1	7340.00	7346.00	6.00	7340.00	0.00	7346.00	0.00	0.00	0.00
2	Jun-A2	7393.00	7399.00	6.00	7393.00	0.00	7399.00	0.00	0.00	0.00
3	Jun-B1	7385.00	7391.00	6.00	7385.00	0.00	7391.00	0.00	0.00	0.00
4	Jun-B2-1	7375.00	7381.00	6.00	7375.00	0.00	7381.00	0.00	0.00	0.00
5	Jun-B2-2	7371.00	7377.00	6.00	7371.00	0.00	7377.00	0.00	0.00	0.00
6	Jun-B3	7334.00	7340.00	6.00	7334.00	0.00	7340.00	0.00	0.00	0.00
7	Jun-BOX1-1	7318.50	7324.50	6.00	7318.50	0.00	7324.50	0.00	0.00	0.00
8	Jun-BOX1-2	7318.00	7324.00	6.00	7318.00	0.00	7324.00	0.00	0.00	0.00
9	Jun-BOX2-1	7280.00	7286.00	6.00	7280.00	0.00	7286.00	0.00	0.00	0.00
10	Jun-BOX2-2	7279.50	7285.50	6.00	7279.50	0.00	7285.50	0.00	0.00	0.00
11	Jun-C0-2	7379.00	7385.00	6.00	7379.00	0.00	7385.00	0.00	0.00	0.00
12	Jun-C1-1	7363.00	7369.00	6.00	7363.00	0.00	7369.00	0.00	0.00	0.00
13	Jun-C1-2	7360.00	7366.00	6.00	7360.00	0.00	7366.00	0.00	0.00	0.00
14	Jun-C2-1	7341.00	7347.00	6.00	7341.00	0.00	7347.00	0.00	0.00	0.00
15	Jun-C2-2	7337.00	7343.00	6.00	7337.00	0.00	7343.00	0.00	0.00	0.00
16	Jun-C4	7310.00	7316.00	6.00	7310.00	0.00	7316.00	0.00	0.00	0.00
17	Jun-D1.1-2	7385.00	7391.00	6.00	7385.00	0.00	7391.00	0.00	0.00	0.00
18	Jun-D1.2-2	7412.00	7418.00	6.00	7412.00	0.00	7418.00	0.00	0.00	0.00
19	Jun-D1-1	7329.00	7335.00	6.00	7329.00	0.00	7335.00	0.00	0.00	0.00
20	Jun-D1-2	7328.00	7334.00	6.00	7328.00	0.00	7334.00	0.00	0.00	0.00
21	Jun-D3-1	7372.00	7378.00	6.00	7372.00	0.00	7378.00	0.00	0.00	0.00
22	Jun-D3-2	7370.00	7376.00	6.00	7370.00	0.00	7376.00	0.00	0.00	0.00
23	Jun-D4-1	7337.50	7343.50	6.00	7337.50	0.00	7343.50	0.00	0.00	0.00
24	Jun-D4-2	7337.00	7343.00	6.00	7337.00	0.00	7343.00	0.00	0.00	0.00
25	Jun-D5	7300.00	7306.00	6.00	7300.00	0.00	7306.00	0.00	0.00	0.00
26	Jun-D6	7287.00	7293.00	6.00	7287.00	0.00	7293.00	0.00	0.00	0.00
27	Jun-E0-2	7417.00	7423.00	6.00	7417.00	0.00	7423.00	0.00	0.00	0.00
28	Jun-E1.1	7400.00	7406.00	6.00	7400.00	0.00	7406.00	0.00	0.00	0.00
29	Jun-E1.2-1	7381.00	7387.00	6.00	7381.00	0.00	7387.00	0.00	0.00	0.00
30	Jun-E1.2-2	7380.00	7386.00	6.00	7380.00	0.00	7386.00	0.00	0.00	0.00
31	Jun-E2-1	7401.00	7407.00	6.00	7401.00	0.00	7407.00	0.00	0.00	0.00
32	Jun-E2-2	7399.00	7405.00	6.00	7399.00	0.00	7405.00	0.00	0.00	0.00
33	Jun-E3-1	7369.00	7375.00	6.00	7369.00	0.00	7375.00	0.00	0.00	0.00
34	Jun-E3-2	7367.50	7373.50	6.00	7367.50	0.00	7373.50	0.00	0.00	0.00
35	Jun-E4-1	7337.00	7343.00	6.00	7337.00	0.00	7343.00	0.00	0.00	0.00
36	Jun-E4-2	7336.00	7342.00	6.00	7336.00	0.00	7342.00	0.00	0.00	0.00
37	Jun-E5-1	7336.50	7342.50	6.00	7336.50	0.00	7342.50	0.00	0.00	0.00
38	Jun-E5-2	7333.00	7339.00	6.00	7333.00	0.00	7339.00	0.00	0.00	0.00
39	Jun-E7	7318.00	7324.00	6.00	7318.00	0.00	7324.00	0.00	0.00	0.00
40	Jun-F1	7327.00	7333.00	6.00	7327.00	0.00	7333.00	0.00	0.00	0.00
41	Jun-G1-1	7375.50	7381.50	6.00	7375.50	0.00	7381.50	0.00	0.00	0.00
42	Jun-G1-2	7373.00	7379.00	6.00	7373.00	0.00	7379.00	0.00	0.00	0.00
43	Jun-H1-1	7391.50	7397.50	6.00	7391.50	0.00	7397.50	0.00	0.00	0.00
44	Jun-H1-2	7389.00	7395.00	6.00	7389.00	0.00	7395.00	0.00	0.00	0.00
45	Jun-H2-1	7334.00	7340.00	6.00	7334.00	0.00	7340.00	0.00	0.00	0.00
46	Jun-H2-2	7332.00	7338.00	6.00	7332.00	0.00	7338.00	0.00	0.00	0.00
47	Jun-H3-1	7379.50	7385.50	6.00	7379.50	0.00	7385.50	0.00	0.00	0.00
48	Jun-H3-2	7376.00	7382.00	6.00	7376.00	0.00	7382.00	0.00	0.00	0.00
49	Jun-H6	7292.00	7298.00	6.00	7292.00	0.00	7298.00	0.00	0.00	0.00
50	Jun-H8	7276.00	7282.00	6.00	7276.00	0.00	7282.00	0.00	0.00	0.00
51	Jun-H9	7300.00	7306.00	6.00	7300.00	0.00	7306.00	0.00	0.00	0.00
52	Jun-I1-1	7355.50	7361.50	6.00	7355.50	0.00	7361.50	0.00	0.00	0.00
53	Jun-I1-2	7354.50	7360.50	6.00	7354.50	0.00	7360.50	0.00	0.00	0.00
54	Jun-I2	7319.00	7325.00	6.00	7319.00	0.00	7325.00	0.00	0.00	0.00
55	Jun-J1	7357.00	7363.00	6.00	7357.00	0.00	7363.00	0.00	0.00	0.00
56	Jun-K1	7313.00	7319.00	6.00	7313.00	0.00	7319.00	0.00	0.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-A1	451.33	451.33	7342.41	2.41	0.00	7.59	7340.41	0.41	0 12:35	0 00:00	0.00	0.00
2	Jun-A2	38.39	38.39	7393.36	0.36	0.00	9.64	7393.04	0.04	0 12:20	0 00:00	0.00	0.00
3	Jun-B1	1527.49	1527.49	7388.90	3.90	0.00	6.10	7385.80	0.80	0 12:55	0 00:00	0.00	0.00
4	Jun-B2-1	15.83	15.83	7375.78	0.78	0.00	5.22	7375.10	0.10	0 12:15	0 00:00	0.00	0.00
5	Jun-B2-2	15.80	0.00	7371.78	0.78	0.00	9.22	7371.10	0.10	0 12:15	0 00:00	0.00	0.00
6	Jun-B3	1543.60	52.35	7339.04	5.04	0.00	4.96	7335.06	1.06	0 12:57	0 00:00	0.00	0.00
7	Jun-BOX1-1	2027.73	123.11	7323.54	5.04	0.00	4.96	7319.56	1.06	0 13:00	0 00:00	0.00	0.00
8	Jun-BOX1-2	2027.67	0.00	7323.66	5.66	0.00	4.34	7319.22	1.22	0 12:53	0 00:00	0.00	0.00
9	Jun-BOX2-1	2288.31	38.10	7285.91	5.91	0.00	4.09	7281.27	1.27	0 12:57	0 00:00	0.00	0.00
10	Jun-BOX2-2	2288.30	0.00	7285.34	5.84	0.00	4.16	7280.77	1.27	0 12:57	0 00:00	0.00	0.00
11	Jun-C0-2	111.92	0.00	7381.50	2.50	0.00	7.50	7379.48	0.48	0 12:06	0 00:00	0.00	0.00
12	Jun-C1-1	131.78	22.96	7365.06	2.06	0.00	7.94	7363.30	0.30	0 12:24	0 00:00	0.00	0.00
13	Jun-C1-2	131.79	0.00	7362.06	2.06	0.00	7.94	7360.30	0.30	0 12:24	0 00:00	0.00	0.00
14	Jun-C2-1	145.36	17.71	7342.99	1.99	0.00	8.01	7341.29	0.29	0 12:25	0 00:00	0.00	0.00
15	Jun-C2-2	145.36	0.00	7338.99	1.99	0.00	8.01	7337.29	0.29	0 12:25	0 00:00	0.00	0.00
16	Jun-C4	2089.34	21.90	7315.72	5.72	0.00	4.28	7311.23	1.23	0 12:54	0 00:00	0.00	0.00
17	Jun-D1.1-2	111.33	0.00	7387.22	2.22	0.00	7.78	7385.36	0.36	0 12:25	0 00:00	0.00	0.00
18	Jun-D1.2-2	30.54	0.00	7413.57	1.57	0.00	8.43	7412.25	0.25	0 12:30	0 00:00	0.00	0.00
19	Jun-D1-1	174.66	69.80	7331.61	2.61	0.00	7.39	7329.39	0.39	0 12:25	0 00:00	0.00	0.00
20	Jun-D1-2	174.65	0.00	7330.61	2.61	0.00	7.39	7328.39	0.39	0 12:25	0 00:00	0.00	0.00
21	Jun-D3-1	64.38	36.52	7373.48	1.48	0.00	8.52	7372.24	0.24	0 12:27	0 00:00	0.00	0.00
22	Jun-D3-2	64.38	0.00	7371.48	1.48	0.00	8.52	7370.24	0.24	0 12:27	0 00:00	0.00	0.00
23	Jun-D4-1	91.28	35.75	7339.83	2.33	0.00	7.67	7337.87	0.37	0 12:26	0 00:00	0.00	0.00
24	Jun-D4-2	91.28	0.00	7339.33	2.33	0.00	7.67	7337.37	0.37	0 12:26	0 00:00	0.00	0.00
25	Jun-D5	2184.99	51.01	7305.72	5.72	0.00	4.28	7301.24	1.24	0 12:55	0 00:00	0.00	0.00
26	Jun-D6	61.68	0.00	7287.65	0.65	0.00	9.35	7287.13	0.13	0 12:57	0 00:00	0.00	0.00
27	Jun-E0-2	26.12	0.00	7418.07	1.07	0.00	8.93	7417.17	0.17	0 12:25	0 00:00	0.00	0.00
28	Jun-E1.1	13.96	0.00	7400.91	0.91	0.00	5.09	7400.26	0.26	0 13:08	0 00:00	0.00	0.00
29	Jun-E1.2-1	17.98	13.33	7381.96	0.96	0.00	5.04	7381.27	0.27	0 12:53	0 00:00	0.00	0.00
30	Jun-E1.2-2	17.98	0.00	7380.96	0.96	0.00	9.04	7380.26	0.26	0 12:53	0 00:00	0.00	0.00
31	Jun-E2-1	3.23	3.23	7401.40	0.40	0.00	5.60	7401.05	0.05	0 12:15	0 00:00	0.00	0.00
32	Jun-E2-2	3.23	0.00	7399.40	0.40	0.00	9.60	7399.05	0.05	0 12:15	0 00:00	0.00	0.00
33	Jun-E3-1	24.75	22.35	7370.16	1.16	0.00	8.84	7369.15	0.15	0 12:15	0 00:00	0.00	0.00
34	Jun-E3-2	24.75	0.00	7368.66	1.16	0.00	8.84	7367.65	0.15	0 12:15	0 00:00	0.00	0.00
35	Jun-E4-1	43.30	20.18	7338.44	1.44	0.00	8.56	7337.20	0.20	0 12:19	0 00:00	0.00	0.00
36	Jun-E4-2	43.29	0.00	7337.44	1.44	0.00	8.56	7336.20	0.20	0 12:19	0 00:00	0.00	0.00
37	Jun-E5-1	15.39	15.39	7337.30	0.80	0.00	5.20	7336.61	0.11	0 12:15	0 00:00	0.00	0.00
38	Jun-E5-2	15.37	0.00	7333.80	0.80	0.00	9.20	7333.11	0.11	0 12:15	0 00:00	0.00	0.00
39	Jun-E7	80.51	10.43	7318.89	0.89	0.00	9.11	7318.18	0.18	0 12:27	0 00:00	0.00	0.00
40	Jun-F1	44.65	31.43	7327.89	0.89	0.00	9.11	7327.17	0.17	0 12:25	0 00:00	0.00	0.00
41	Jun-G1-1	32.61	32.61	7376.68	1.18	0.00	4.82	7375.65	0.15	0 12:15	0 00:00	0.00	0.00
42	Jun-G1-2	32.58	0.00	7374.18	1.18	0.00	8.82	7373.15	0.15	0 12:15	0 00:00	0.00	0.00
43	Jun-H1-1	22.97	22.97	7392.72	1.22	0.00	4.78	7391.64	0.14	0 12:15	0 00:00	0.00	0.00
44	Jun-H1-2	22.95	0.00	7390.21	1.21	0.00	8.79	7389.14	0.14	0 12:15	0 00:00	0.00	0.00
45	Jun-H2-1	47.20	47.20	7335.37	1.37	0.00	4.63	7334.19	0.19	0 12:20	0 00:00	0.00	0.00
46	Jun-H2-2	47.18	0.00	7333.37	1.37	0.00	8.63	7332.19	0.19	0 12:20	0 00:00	0.00	0.00
47	Jun-H3-1	7.93	7.93	7380.05	0.55	0.00	5.45	7379.57	0.07	0 12:15	0 00:00	0.00	0.00
48	Jun-H3-2	7.90	0.00	7376.55	0.55	0.00	9.45	7376.07	0.07	0 12:15	0 00:00	0.00	0.00
49	Jun-H6	2216.50	0.00	7297.91	5.91	0.00	4.09	7293.28	1.28	0 12:55	0 00:00	0.00	0.00
50	Jun-H8	2323.58	16.97	7281.84	5.84	0.00	4.16	7277.26	1.26	0 12:57	0 00:00	0.00	0.00
51	Jun-H9	27.07	0.00	7300.07	0.07	0.00	9.93	7300.01	0.01	0 12:30	0 00:00	0.00	0.00
52	Jun-I1-1	12.50	12.50	7356.56	1.06	0.00	4.94	7355.63	0.13	0 12:15	0 00:00	0.00	0.00
53	Jun-I1-2	12.50	0.00	7355.56	1.06	0.00	8.94	7354.62	0.12	0 12:15	0 00:00	0.00	0.00
54	Jun-I2	39.67	27.29	7319.49	0.49	0.00	9.51	7319.05	0.05	0 12:15	0 00:00	0.00	0.00
55	Jun-J1	9.59	9.59	7357.00	0.00	0.00	6.00	7357.00	0.00	0 00:00	0 00:00	0.00	0.00
56	Jun-K1	29.26	29.26	7313.00	0.00	0.00	6.00	7313.00	0.00	0 00:00	0 00:00	0.00	0.00

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Shape Slope (%)	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flap Flow Gate (cfs)
1	Conveyance-1	866.29	7318.00	0.00	7310.00	0.00	8.00	0.9200 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
2	Conveyance-2	1071.31	7310.00	0.00	7300.00	0.00	10.00	0.9300 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
3	Conveyance-3	736.36	7300.00	0.00	7292.00	0.00	8.00	1.0900 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
4	Conveyance-4	1308.67	7292.00	0.00	7280.00	0.00	12.00	0.9200 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
5	Conveyance-5	340.25	7279.50	0.00	7276.00	0.00	3.50	1.0300 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
6	Link-A1	1609.87	7340.00	0.00	7318.50	0.00	21.50	1.3400 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
7	Link-A2	991.55	7393.00	0.00	7318.50	0.00	74.50	7.5100 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
8	Link-B1	2137.84	7385.00	0.00	7334.00	0.00	51.00	2.3900 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
9	Link-B2	1548.66	7371.00	0.00	7318.50	0.00	52.50	3.3900 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
10	Link-B3	1801.86	7334.00	0.00	7318.50	0.00	15.50	0.8600 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
11	Link-B4-3	155.46	7337.00	0.00	7318.50	0.00	18.50	11.9000 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
12	Link-C1	799.51	7379.00	0.00	7363.00	0.00	16.00	2.0000 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
13	Link-C2	861.57	7360.00	0.00	7341.00	0.00	19.00	2.2100 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
14	Link-D1.1	1827.50	7385.00	0.00	7329.00	0.00	56.00	3.0600 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
15	Link-D3	1312.44	7412.00	0.00	7372.00	0.00	40.00	3.0500 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
16	Link-D4	1169.72	7370.00	0.00	7337.50	0.00	32.50	2.7800 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
17	Link-D5	1270.02	7328.00	0.00	7300.00	0.00	28.00	2.2000 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
18	Link-D6	1418.47	7337.00	0.00	7289.00	0.00	48.00	3.3800 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
19	Link-E1.1	1328.59	7417.00	0.00	7400.00	0.00	17.00	1.2800 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
20	Link-E1.2	791.59	7400.00	0.00	7381.00	0.00	19.00	2.4000 Trapezoidal	2.500	18.500	0.0400	0.5000	0.5000	0.0000	0.00 No
21	Link-E3	974.31	7399.00	0.00	7369.00	0.00	30.00	3.0800 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
22	Link-E4	1141.92	7367.50	0.00	7337.00	0.00	30.50	2.6700 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
23	Link-E6	858.58	7333.00	0.00	7289.00	0.00	44.00	5.1200 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
24	Link-E6-2	1915.96	7318.00	0.00	7289.00	0.00	29.00	1.5100 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
25	Link-E7	712.94	7336.00	0.00	7318.00	0.00	18.00	2.5200 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
26	Link-F1	1032.69	7380.00	0.00	7327.00	0.00	53.00	5.1300 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
27	Link-F1-2	1886.42	7327.00	0.00	7318.00	0.00	9.00	0.4800 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
28	Link-G2	1241.36	7373.00	0.00	7311.00	0.00	62.00	4.9900 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
29	Link-H4	1249.62	7389.00	0.00	7311.00	0.00	78.00	6.2400 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
30	Link-H6	586.28	7332.00	0.00	7297.00	0.00	35.00	5.9700 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
31	Link-H7-1	1205.71	7376.00	0.00	7280.00	0.00	96.00	7.9600 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
32	Link-H9	633.71	7319.00	0.00	7301.00	0.00	18.00	2.8400 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
33	Link-I2-1	461.48	7354.50	0.00	7319.00	0.00	35.50	7.6900 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
34	Link-Out-1	1089.60	7276.00	0.00	0.00	0.00	7276.00	667.7700 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
35	Link-Out-2	865.85	7300.00	0.00	0.00	0.00	7300.00	843.1000 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
36	Link-P3	264.79	7287.00	0.00	7280.00	0.00	7.00	2.6400 Trapezoidal	10.000	100.000	0.0400	0.5000	0.5000	0.0000	0.00 No
37	OverTop-C1	118.65	7382.00	0.00	7379.00	0.00	3.00	2.5300 Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00 No
38	OverTop-D1.1	192.86	7388.00	0.00	7385.00	0.00	3.00	1.5600 Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00 No
39	OverTop-D1.2	163.53	7416.00	0.00	7412.00	0.00	4.00	2.4500 Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00 No
40	OverTop-E0	115.35	7420.00	0.00	7417.00	0.00	3.00	2.6000 Trapezoidal	0.500	110.000	0.0320	0.5000	0.5000	0.0000	0.00 No

Channel Results

SN Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1 Conveyance-1	2027.00	0 12:54	6959.03	0.29	8.42	1.71	5.65	0.57	0.00		
2 Conveyance-2	2088.59	0 12:55	6996.45	0.30	8.52	2.10	5.72	0.57	0.00		
3 Conveyance-3	2184.68	0 12:55	7548.06	0.29	9.11	1.35	5.64	0.56	0.00		
4 Conveyance-4	2215.88	0 12:57	6934.43	0.32	8.60	2.54	5.91	0.59	0.00		
5 Conveyance-5	2288.22	0 12:57	7344.64	0.31	9.04	0.63	5.83	0.58	0.00		
6 Link-A1	451.32	0 12:41	8368.72	0.05	6.37	4.21	2.40	0.24	0.00		
7 Link-A2	38.05	0 12:23	19849.80	0.00	4.96	3.33	0.36	0.04	0.00		
8 Link-B1	1524.05	0 12:57	11184.92	0.14	11.03	3.23	3.89	0.39	0.00		
9 Link-B2	14.76	0 12:21	13333.28	0.00	2.85	9.06	0.25	0.03	0.00		
10 Link-B3	1541.13	0 13:00	6716.46	0.23	7.64	3.93	5.04	0.50	0.00		
11 Link-B4-3	145.34	0 12:25	24981.12	0.01	9.24	0.28	0.69	0.07	0.00		
12 Link-C1	111.86	0 12:26	10244.33	0.01	4.73	2.82	0.99	0.10	0.00		
13 Link-C2	131.77	0 12:27	10753.92	0.01	5.15	2.79	1.06	0.11	0.00		
14 Link-D1.1	110.73	0 12:27	12676.54	0.01	5.46	5.58	0.87	0.09	0.00		
15 Link-D3	30.41	0 12:32	12642.29	0.00	3.45	6.34	0.41	0.04	0.00		
16 Link-D4	64.13	0 12:31	12070.80	0.01	4.36	4.47	0.65	0.07	0.00		
17 Link-D5	174.29	0 12:27	10752.49	0.02	5.66	3.74	1.24	0.12	0.00		
18 Link-D6	90.88	0 12:29	13321.28	0.01	5.24	4.51	0.75	0.08	0.00		
19 Link-E1.1	25.44	0 12:29	8191.52	0.00	2.50	8.86	0.47	0.05	0.00		
20 Link-E1.2	13.95	0 13:11	164.41	0.08	3.64	3.62	0.91	0.37	0.00		
21 Link-E3	2.97	0 12:20	12707.13	0.00	1.52	10.68	0.10	0.01	0.00		
22 Link-E4	24.29	0 12:21	11834.98	0.00	3.09	6.16	0.37	0.04	0.00		
23 Link-E6	14.98	0 12:18	16393.49	0.00	3.13	4.57	0.23	0.02	0.00		
24 Link-E6-2	78.77	0 12:33	8909.25	0.01	3.88	8.23	0.88	0.09	0.00		
25 Link-E7	43.13	0 12:22	11506.55	0.00	3.67	3.24	0.53	0.05	0.00		
26 Link-F1	17.97	0 12:59	16405.46	0.00	3.31	5.20	0.26	0.03	0.00		
27 Link-F1-2	41.40	0 12:35	5001.93	0.01	2.16	14.56	0.84	0.08	0.00		
28 Link-G2	31.65	0 12:18	16183.87	0.00	4.12	5.02	0.36	0.04	0.00		
29 Link-H4	22.33	0 12:18	18092.30	0.00	3.88	5.37	0.27	0.03	0.00		
30 Link-H6	47.02	0 12:21	17693.63	0.00	4.97	1.97	0.44	0.04	0.00		
31 Link-H7-1	7.64	0 12:17	20433.82	0.00	2.82	7.13	0.13	0.01	0.00		
32 Link-H9	39.58	0 12:16	12204.68	0.00	3.71	2.85	0.49	0.05	0.00		
33 Link-I2-1	12.47	0 12:16	20085.06	0.00	3.29	2.34	0.18	0.02	0.00		
34 Link-Out-1	2323.54	0 12:57	187132.04	0.01	50.00	0.36	1.07	0.11	0.00		
35 Link-Out-2	27.07	0 12:30	210269.10	0.00	18.50	0.78	0.07	0.01	0.00		
36 Link-P3	61.68	0 12:58	11774.26	0.01	4.20	1.05	0.65	0.07	0.00		
37 OverTop-C1	74.98	0 12:25	236.68	0.32	2.91	0.68	0.25	0.50	0.00		
38 OverTop-D1.1	0.00	0 00:00	185.64	0.00	0.00		0.00	0.00	0.00		
39 OverTop-D1.2	0.00	0 00:00	232.79	0.00	0.00		0.00	0.00	0.00		
40 OverTop-E0	0.00	0 00:00	240.05	0.00	0.00		0.00	0.00	0.00		

Pipe Input

SN Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Pipe Slope (%)	Pipe Shape	Pipe Diameter or Height (ft)	Pipe Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1 BoxCulv-1	100.00	7318.50	0.00	7318.00	0.00	0.50	0.5000	Rectangular	6.000	16.000	0.0120	0.5000	0.5000	0.0000	0.00	No	2
2 BoxCulv-2	100.00	7280.00	0.00	7279.50	0.00	0.50	0.5000	Rectangular	6.000	16.000	0.0120	0.5000	0.5000	0.0000	0.00	No	2
3 Culv-B2	60.00	7375.00	0.00	7371.00	0.00	4.00	6.6700	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
4 Culv-C2	60.00	7363.00	0.00	7360.00	0.00	3.00	5.0000	CIRCULAR	3.000	3.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
5 Culv-C3	60.00	7341.00	0.00	7337.00	0.00	4.00	6.6700	CIRCULAR	3.000	3.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
6 Culv-D2	60.00	7329.00	0.00	7328.00	0.00	1.00	1.6700	CIRCULAR	4.500	4.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
7 Culv-D3	60.00	7372.00	0.00	7370.00	0.00	2.00	3.3300	CIRCULAR	3.000	3.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
8 Culv-D4	60.00	7337.50	0.00	7337.00	0.00	0.50	0.8300	CIRCULAR	4.000	4.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
9 Culv-E1.2	60.00	7381.00	0.00	7380.00	0.00	1.00	1.6700	CIRCULAR	2.500	2.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
10 Culv-E2	60.00	7401.00	0.00	7399.00	0.00	2.00	3.3300	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
11 Culv-E3	60.00	7369.00	0.00	7367.50	0.00	1.50	2.5000	CIRCULAR	2.000	2.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
12 Culv-E4	60.00	7337.00	0.00	7336.00	0.00	1.00	1.6700	CIRCULAR	3.000	3.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
13 Culv-E5	60.00	7336.50	0.00	7333.00	0.00	3.50	5.8300	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
14 Culv-G1	60.00	7375.50	0.00	7373.00	0.00	2.50	4.1700	CIRCULAR	2.000	2.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
15 Culv-H1	60.00	7391.50	0.00	7389.00	0.00	2.50	4.1700	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
16 Culv-H2	60.00	7334.00	0.00	7332.00	0.00	2.00	3.3300	CIRCULAR	2.500	2.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
17 Culv-H3	60.00	7379.50	0.00	7376.00	0.00	3.50	5.8300	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
18 Culv-I1	60.00	7355.50	0.00	7354.50	0.00	1.00	1.6700	CIRCULAR	1.500	1.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1
19 ExCulv-C1	100.00	7382.00	0.00	7379.00	0.00	3.00	3.0000	CIRCULAR	2.500	2.500	0.0250	0.5000	0.5000	0.0000	0.00	No	1
20 ExCulv-D1.1	100.00	7388.00	0.00	7385.00	0.00	3.00	3.0000	CIRCULAR	6.000	6.000	0.0250	0.5000	0.5000	0.0000	0.00	No	1
21 ExCulv-D1.2	100.00	7416.00	0.00	7412.00	0.00	4.00	4.0000	CIRCULAR	2.500	2.500	0.0250	0.5000	0.5000	0.0000	0.00	No	1
22 ExCulv-E0	125.00	7420.00	0.00	7417.00	0.00	3.00	2.4000	CIRCULAR	2.500	2.500	0.0120	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1 BoxCulv-1	2027.67	0 12:53	2828.15	0.72	16.52	0.10	3.83	0.64	0.00		Calculated
2 BoxCulv-2	2288.30	0 12:57	2828.15	0.81	17.15	0.10	4.17	0.69	0.00		Calculated
3 Culv-B2	15.80	0 12:15	29.38	0.54	16.91	0.06	0.78	0.52	0.00		Calculated
4 Culv-C2	131.79	0 12:24	161.57	0.82	25.48	0.04	2.06	0.69	0.00		Calculated
5 Culv-C3	145.36	0 12:25	186.57	0.78	29.18	0.03	1.99	0.66	0.00		Calculated
6 Culv-D2	174.65	0 12:25	275.03	0.64	18.30	0.05	2.61	0.58	0.00		Calculated
7 Culv-D3	64.38	0 12:27	131.92	0.49	18.54	0.05	1.47	0.49	0.00		Calculated
8 Culv-D4	91.28	0 12:26	142.06	0.64	12.00	0.08	2.33	0.58	0.00		Calculated
9 Culv-E1.2	17.98	0 12:53	57.37	0.31	10.33	0.10	0.96	0.38	0.00		Calculated
10 Culv-E2	3.23	0 12:15	20.78	0.16	8.54	0.12	0.40	0.27	0.00		Calculated
11 Culv-E3	24.75	0 12:15	38.75	0.64	13.08	0.08	1.16	0.58	0.00		Calculated
12 Culv-E4	43.29	0 12:19	93.28	0.46	12.95	0.08	1.44	0.48	0.00		Calculated
13 Culv-E5	15.37	0 12:15	27.48	0.56	15.98	0.06	0.80	0.54	0.00		Calculated
14 Culv-G1	32.58	0 12:15	50.03	0.65	16.94	0.06	1.18	0.59	0.00		Calculated
15 Culv-H1	22.95	0 12:15	23.23	0.99	14.99	0.07	1.21	0.81	0.00		Calculated
16 Culv-H2	47.18	0 12:20	81.13	0.58	17.14	0.06	1.37	0.55	0.00		Calculated
17 Culv-H3	7.90	0 12:15	27.48	0.29	13.43	0.07	0.55	0.37	0.00		Calculated
18 Culv-I1	12.50	0 12:15	14.69	0.85	9.33	0.11	1.06	0.71	0.00		Calculated
19 ExCulv-C1	39.49	0 13:01	36.94	1.07	8.68	0.19	2.50	1.00	55.00		SURCHARGED
20 ExCulv-D1.1	111.33	0 12:25	381.44	0.29	11.70	0.14	2.22	0.37	0.00		Calculated
21 ExCulv-D1.2	30.54	0 12:30	42.66	0.72	9.44	0.18	1.57	0.63	0.00		Calculated
22 ExCulv-E0	26.12	0 12:25	68.84	0.38	13.05	0.16	1.07	0.43	0.00		Calculated

Storage Nodes

Storage Node : P1

Input Data

Invert Elevation (ft) 7311.00
Max (Rim) Elevation (ft) 7317.50
Max (Rim) Offset (ft) 6.50
Initial Water Elevation (ft) 7311.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

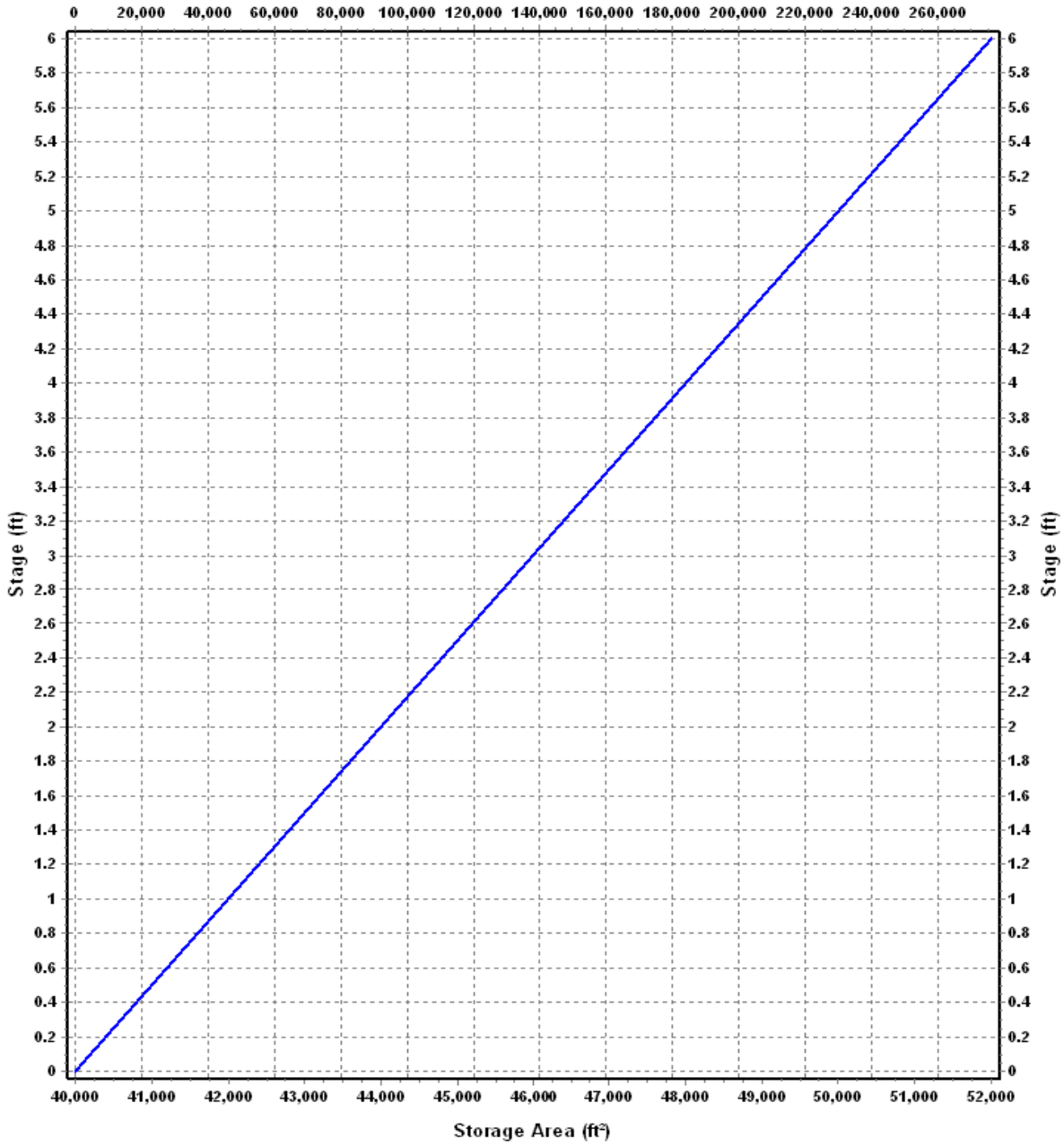
Storage Area Volume Curves

Storage Curve : P1

Stage (ft)	Storage Area (ft ²)	Storage Volume (ft ³)
0	40000	0.000
6	52000	276000.00

Storage Area Volume Curves

Storage Volume (ft³)



Storage Area Storage Volume

Storage Node : P1 (continued)

Outflow Orifices

SN Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1 P1	Side	CIRCULAR	No	3.00			7311.00	0.61

Output Summary Results

Peak Inflow (cfs)	130.34
Peak Lateral Inflow (cfs)	77.10
Peak Outflow (cfs)	54.04
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7314.91
Max HGL Depth Attained (ft)	3.91
Average HGL Elevation Attained (ft)	7311.62
Average HGL Depth Attained (ft)	0.62
Time of Max HGL Occurrence (days hh:mm)	0 12:43
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : P2

Input Data

Invert Elevation (ft) 7297.00
Max (Rim) Elevation (ft) 7303.50
Max (Rim) Offset (ft) 6.50
Initial Water Elevation (ft) 7297.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

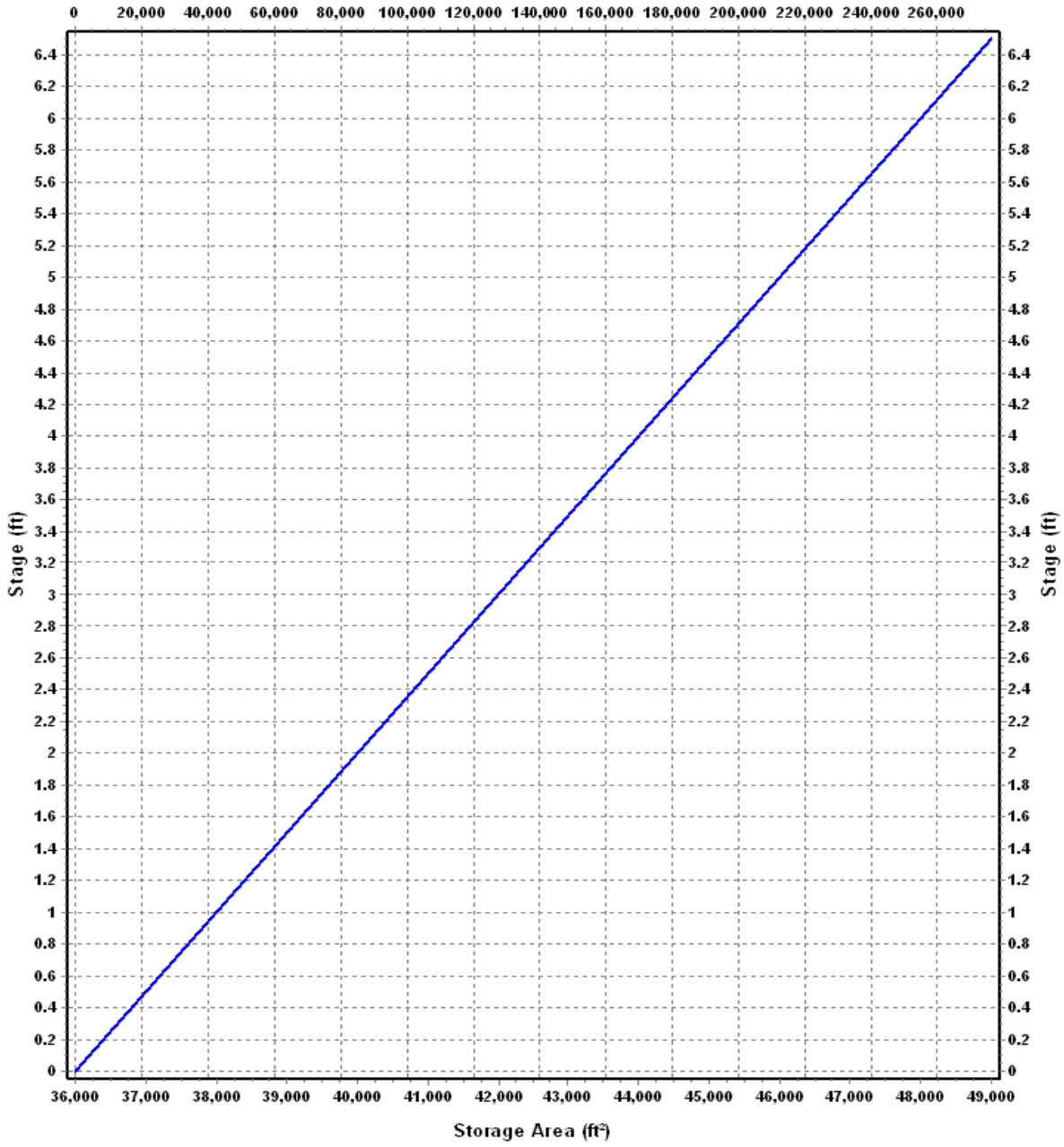
Storage Area Volume Curves

Storage Curve : P2

Stage (ft)	Storage Area (ft ²)	Storage Volume (ft ³)
0	36000	0.000
6.5	49000	276250.00

Storage Area Volume Curves

Storage Volume (ft³)



— Storage Area — Storage Volume

Storage Node : P2 (continued)

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	P2	Side	CIRCULAR	No	2.50			7297.00	0.61

Output Summary Results

Peak Inflow (cfs)	82.19
Peak Lateral Inflow (cfs)	35.34
Peak Outflow (cfs)	32.05
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7300.01
Max HGL Depth Attained (ft)	3.01
Average HGL Elevation Attained (ft)	7297.54
Average HGL Depth Attained (ft)	0.54
Time of Max HGL Occurrence (days hh:mm)	0 12:49
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : P3

Input Data

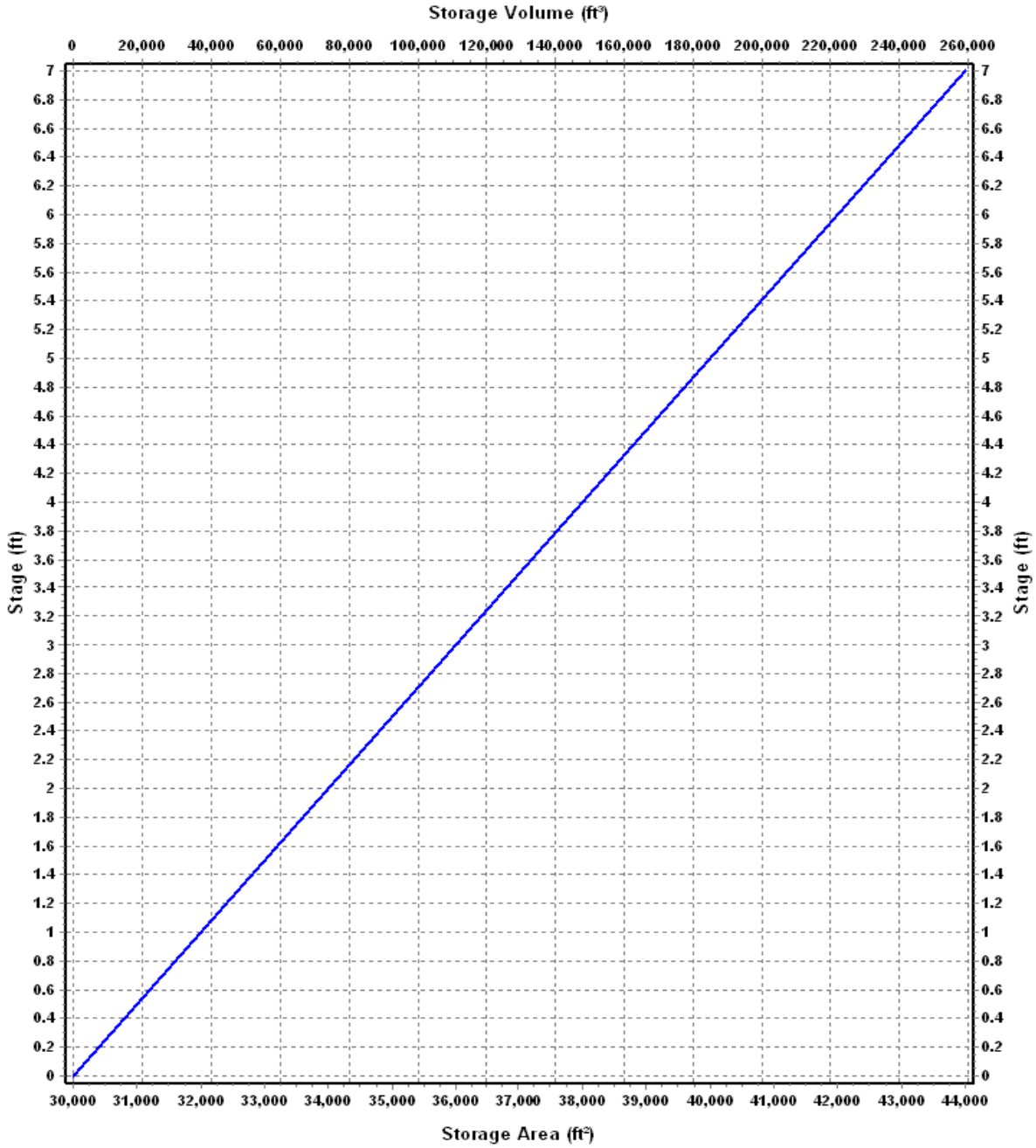
Invert Elevation (ft) 7289.00
Max (Rim) Elevation (ft) 7297.00
Max (Rim) Offset (ft) 8.00
Initial Water Elevation (ft) 7289.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

Storage Area Volume Curves

Storage Curve : P3

Stage (ft)	Storage Area (ft ²)	Storage Volume (ft ³)
0	30000	0.000
7	44000	259000.00

Storage Area Volume Curves



— Storage Area — Storage Volume

Storage Node : P3 (continued)

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	P3	Side	CIRCULAR	No	3.00			7289.00	0.61

Output Summary Results

Peak Inflow (cfs)	120.97
Peak Lateral Inflow (cfs)	31.65
Peak Outflow (cfs)	61.68
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7293.64
Max HGL Depth Attained (ft)	4.64
Average HGL Elevation Attained (ft)	7289.75
Average HGL Depth Attained (ft)	0.75
Time of Max HGL Occurrence (days hh:mm)	0 12:57
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : P4

Input Data

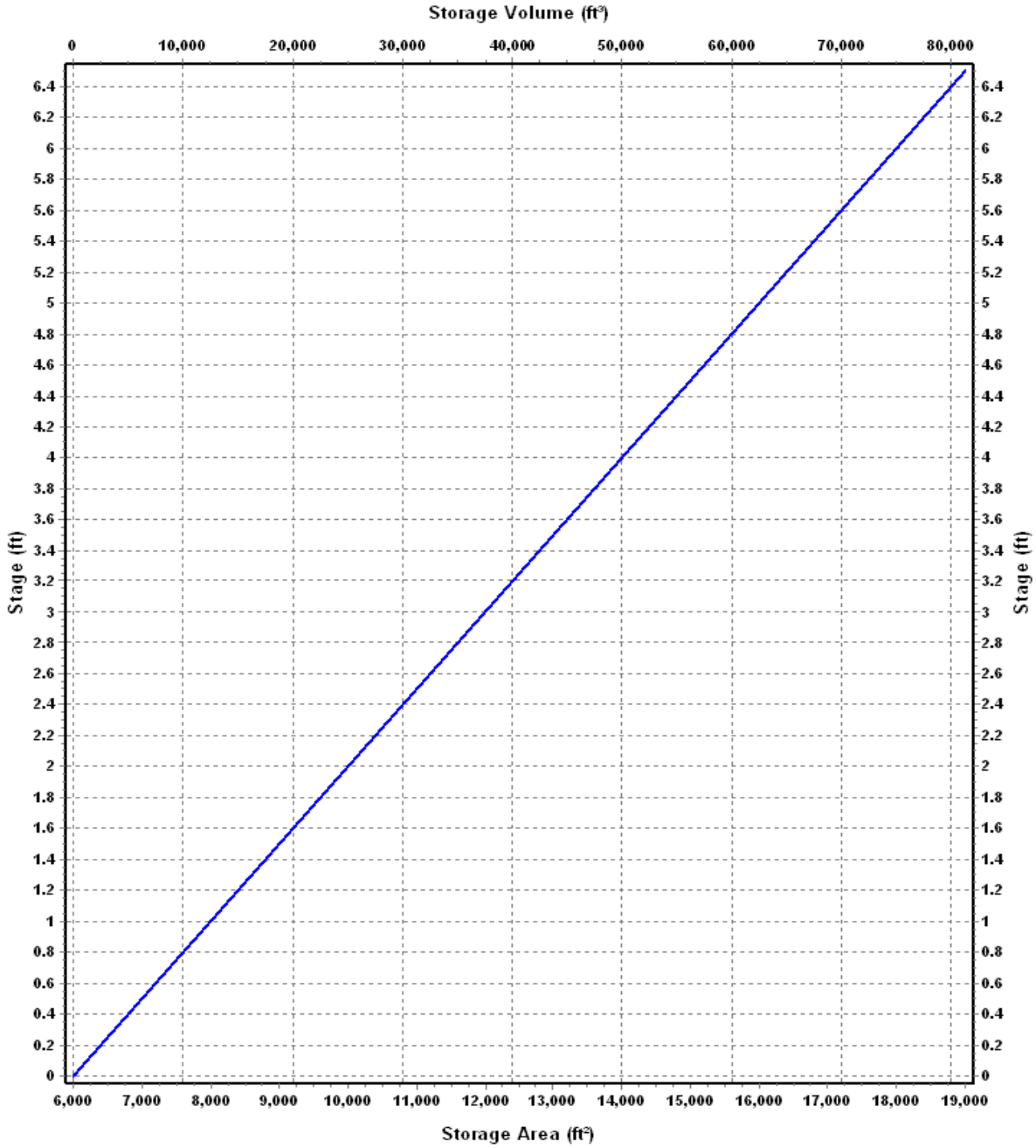
Invert Elevation (ft) 7301.00
Max (Rim) Elevation (ft) 7306.50
Max (Rim) Offset (ft) 5.50
Initial Water Elevation (ft) 7301.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

Storage Area Volume Curves

Storage Curve : P5

Stage	Storage Area	Storage Volume
(ft)	(ft ²)	(ft ³)
0	6000	0.000
6.5	19000	81250.00

Storage Area Volume Curves



Storage Area Storage Volume

Storage Node : P4 (continued)

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	P5	Side	CIRCULAR	No	2.00			7301.00	0.61

Output Summary Results

Peak Inflow (cfs)	51.28
Peak Lateral Inflow (cfs)	11.97
Peak Outflow (cfs)	27.07
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7305.06
Max HGL Depth Attained (ft)	4.06
Average HGL Elevation Attained (ft)	7301.41
Average HGL Depth Attained (ft)	0.41
Time of Max HGL Occurrence (days hh:mm)	0 12:30
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : P5

Input Data

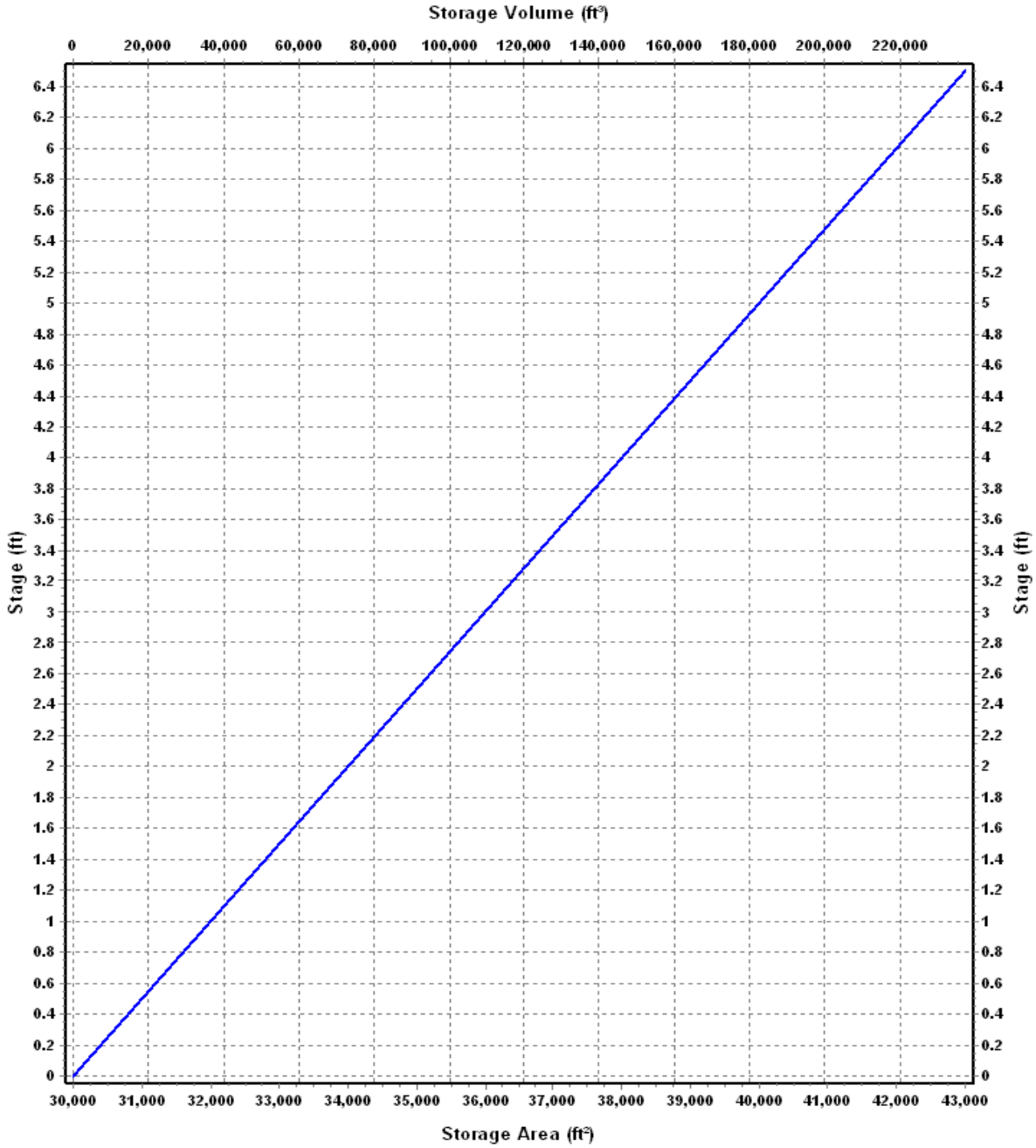
Invert Elevation (ft) 7289.00
Max (Rim) Elevation (ft) 7296.00
Max (Rim) Offset (ft) 7.00
Initial Water Elevation (ft) 7289.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

Storage Area Volume Curves

Storage Curve : P6

Stage (ft)	Storage Area (ft ²)	Storage Volume (ft ³)
0	30000	0.000
6.5	43000	237250.00

Storage Area Volume Curves



— Storage Area — Storage Volume

Storage Node : P5 (continued)

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	P6	Side	CIRCULAR	No	2.00			7289.00	0.61

Output Summary Results

Peak Inflow (cfs)	106.25
Peak Lateral Inflow (cfs)	28.62
Peak Outflow (cfs)	35.32
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7295.21
Max HGL Depth Attained (ft)	6.21
Average HGL Elevation Attained (ft)	7290.48
Average HGL Depth Attained (ft)	1.48
Time of Max HGL Occurrence (days hh:mm)	0 13:46
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : P6

Input Data

Invert Elevation (ft) 7400.00
Max (Rim) Elevation (ft) 7406.00
Max (Rim) Offset (ft) 6.00
Initial Water Elevation (ft) 7400.00
Initial Water Depth (ft) 0.00
Ponded Area (ft²) 0.00
Evaporation Loss 0.00

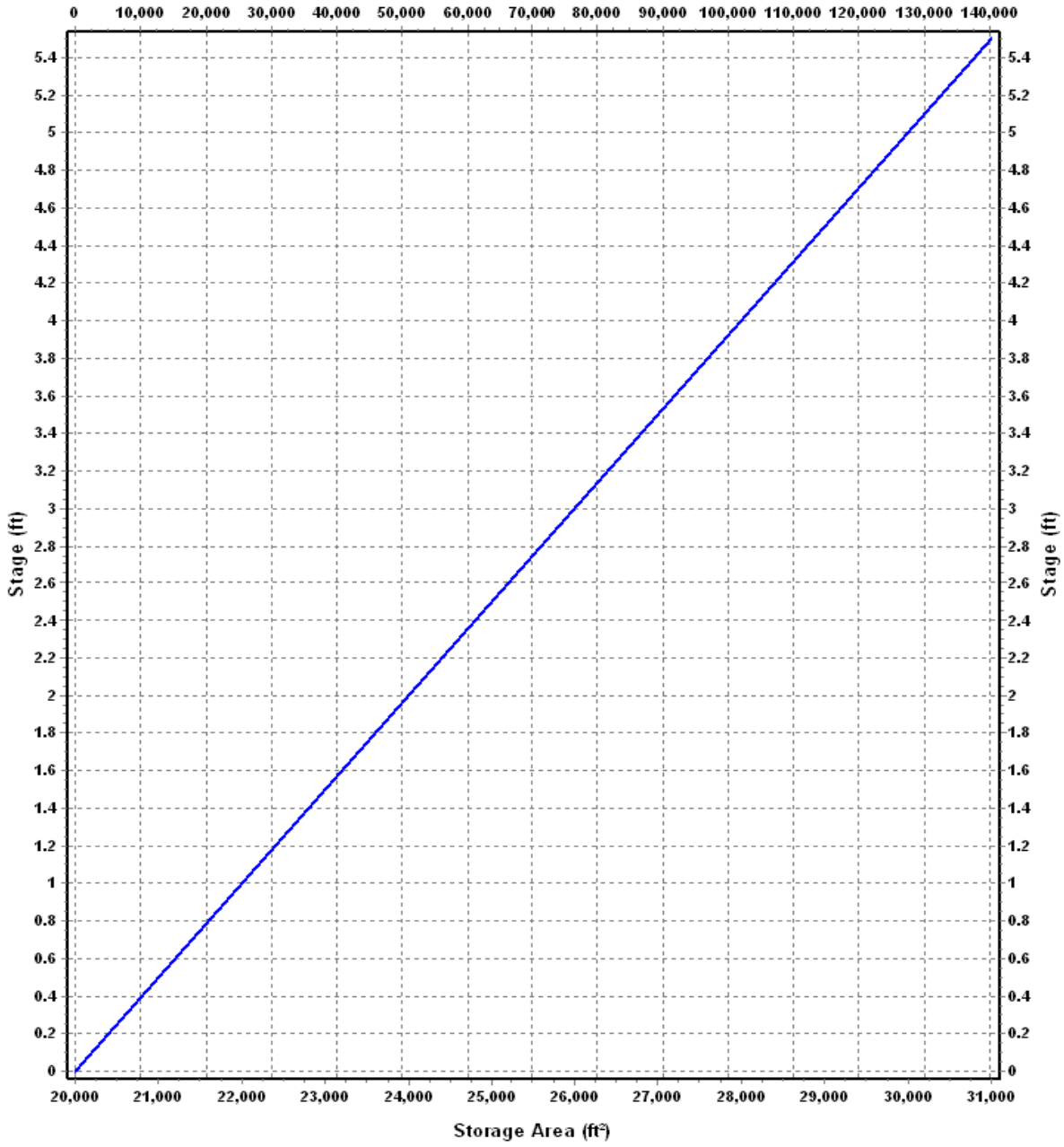
Storage Area Volume Curves

Storage Curve : P7

Stage (ft)	Storage Area (ft ²)	Storage Volume (ft ³)
0	20000	0.000
5.5	31000	140250.00

Storage Area Volume Curves

Storage Volume (ft³)



Storage Area Storage Volume

Storage Node : P6 (continued)

Outflow Orifices

SN Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (ft)	Rectangular Orifice Height (ft)	Rectangular Orifice Width (ft)	Orifice Invert Elevation (ft)	Orifice Coefficient
1 P7	Side	CIRCULAR	No	2.00			7400.00	0.61

Output Summary Results

Peak Inflow (cfs)	27.27
Peak Lateral Inflow (cfs)	4.93
Peak Outflow (cfs)	13.96
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	7401.87
Max HGL Depth Attained (ft)	1.87
Average HGL Elevation Attained (ft)	7400.41
Average HGL Depth Attained (ft)	0.41
Time of Max HGL Occurrence (days hh:mm)	0 13:08
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

6. DETENTION POND SIZING CALCULATIONS



DETENTION POND WORKSHEET

CALCULATED BY: JP
CHECKED BY:

PROJECT: Winsome Subdivision
MAJOR BASIN: West Kiowa Creek

JOB NO: 48157
LOCATION: Monument, CO

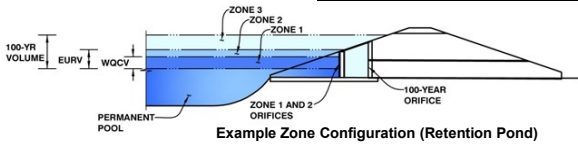
LOCATION	DESIGN POINT	BASIN	AREA (Acres)	IMPERVIOUS FACTOR						SOIL				WATERSHED				CALCULATIONS	
				5 ACRE LOT (7%)	2.5 ACRE LOT (11%)	OPEN SPACE (2%)	COMMERCIAL (85%)	TOTAL % CHECK	WEIGHTED IMPERVIOUSNESS	SOIL GROUP A %	SOIL GROUP B %	SOIL GROUP C/D %	TOTAL % CHECK	WATERSHED LENGTH	WATERSHED HIGH POINT	WATERSHED LOW POINT	WATERSHED SLOPE	100-YEAR DETENTION VOLUME (AC-FT)	SPILLWAY VOLUME (AC-FT)
POND 1	P1	G1	25.2	70%	0%	30%	0%	100%	6%	0%	0%	100%	100%						
		G2	21.2	90%	0%	10%	0%	100%	7%	0%	0%	100%	100%						
		H1	13.9	100%	0%	0%	0%	100%	7%	0%	10%	90%	100%						
		H4	27.1	70%	0%	30%	0%	100%	6%	0%	0%	100%	100%						
			87.4							6.0%	0.0%	1.6%	98.4%	100%	3,246	7,465	7,317	0.046	2,557
POND 2	P2	H2	31.9	100%	0%	0%	0%	100%	7%	0%	70%	30%	100%						
		H5	20.2	70%	0%	30%	0%	100%	6%	0%	0%	100%	100%						
		H6	31.6	35%	0%	65%	0%	100%	4%	0%	0%	100%	100%						
			83.7							5.4%	0%	27%	73%	100%	2,628	7,444	7,305	0.053	2,341
POND 3	P3	D1.2	49.9	100%	0%	0%	0%	100%	7%	0.0%	100.0%	0.0%	100%						
		D3	41.2	0%	10%	90%	0%	100%	3%	0.0%	100.0%	0.0%	100%						
		D4	34.3	0%	100%	0%	0%	100%	11%	0.0%	100.0%	0.0%	100%						
		D6	41.8	80%	0%	20%	0%	100%	6%	0.0%	90.0%	10.0%	100%						
			167.2							6.6%	0.0%	97.5%	2.5%	100%	6,480	7,480	7,292	0.029	3,850
POND 4	P4	I1	6.8	100%	0%	0%	0%	100%	7%	0%	0%	100%	100%						
		I2	14.8	100%	0%	0%	0%	100%	7%	0%	0%	100%	100%						
		H9	6.9	100%	0%	0%	0%	100%	7%	0%	20%	80%	100%						
			28.5							7.0%	0.0%	4.8%	95.2%	100%	1,895	7,388	7,322	0.035	0,892
POND 5	P5	E0	37.9	100%	0%	0%	0%	100%	7%	0%	100%	0%	100%						
		E1.1	7.9	0%	0%	50%	50%	100%	50%	0%	100%	0%	100%						
		E1.2	16.3	50%	50%	0%	0%	100%	9%	0%	100%	0%	100%						
		E2	2.6	0%	100%	0%	0%	100%	11%	0%	100%	0%	100%						
		E3	19.8	0%	100%	0%	0%	100%	11%	0%	100%	0%	100%						
		E4	18.2	0%	100%	0%	0%	100%	11%	0%	100%	0%	100%						
		E5	13.5	0%	100%	0%	0%	100%	11%	0%	100%	0%	100%						
		E6	28.9	70%	20%	10%	0%	100%	7%	0%	90%	10%	100%						
		E7	9.8	0%	100%	0%	0%	100%	11%	0%	100%	0%	100%						
		F1	42.9	100%	0%	0%	0%	100%	7%	0%	100%	0%	100%						
	197.8							10.2%	0.0%	98.5%	1.5%	100%	4,755	7,427	7,295	0.028	3,016	5,447	
POND 6	P6	E0	37.9	100%	0%	0%	0%	100%	7%	0%	100%	0%	100%						
		E1.1	7.9	0%	0%	50%	50%	100%	50%	0%	100%	0%	100%						
			45.8							14.5%	0.0%	100%	0%	100%	2,615	7,480	7,404	0.029	2,026

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: Pond 1



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.34	0.311	Orifice Plate
Zone 2 (EURV)	0.46	0.108	Circular Orifice
Zone 3 (100-year)	2.62	2.137	Weir&Pipe (Circular)
		2.557	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft ²
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	0.34	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	3.00	inches
Orifice Plate: Orifice Area per Row =	6.50	sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row =	4.514E-02	ft ²
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft ²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.11	0.23					
Orifice Area (sq. inches)	6.50	6.50	6.50					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	0.34	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	0.46	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	10.00	N/A	inches

Calculated Parameters for Vertical Orifice

	Zone 2 Circular	Not Selected	
Vertical Orifice Area =	0.55	N/A	ft ²
Vertical Orifice Centroid =	0.42	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	3.00	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	8.00	N/A	feet
Overflow Weir Slope =	3.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Open Area % =	85%	N/A	%, grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H ₁ =	4.33	N/A	feet
Over Flow Weir Slope Length =	4.22	N/A	feet
Grate Open Area / 100-yr Orifice Area =	4.06	N/A	should be ≥ 4
Overflow Grate Open Area w/o Debris =	28.67	N/A	ft ²
Overflow Grate Open Area w/ Debris =	14.34	N/A	ft ²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	36.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	7.07	N/A	ft ²
Outlet Orifice Centroid =	1.50	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	6.00	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	58.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

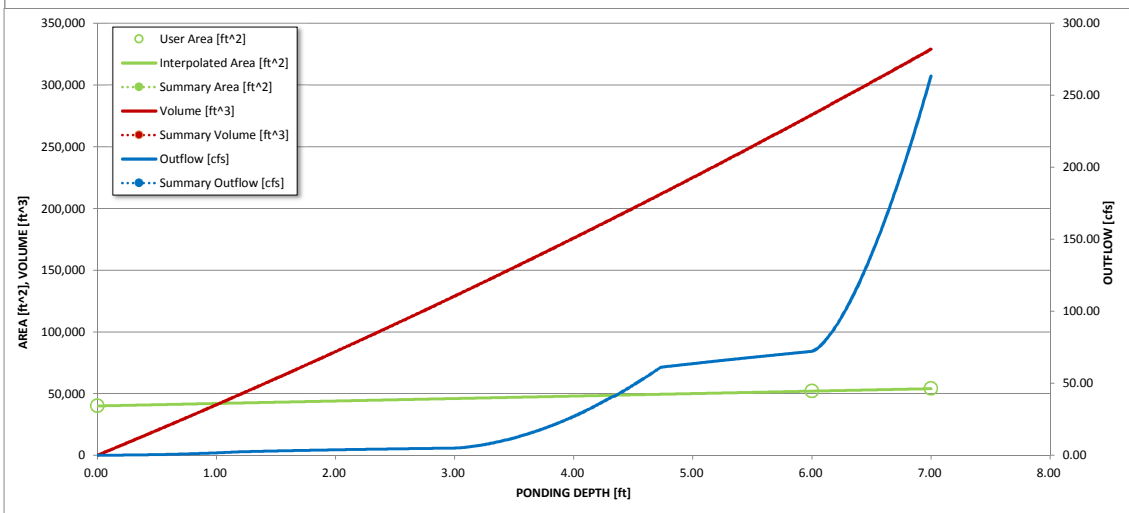
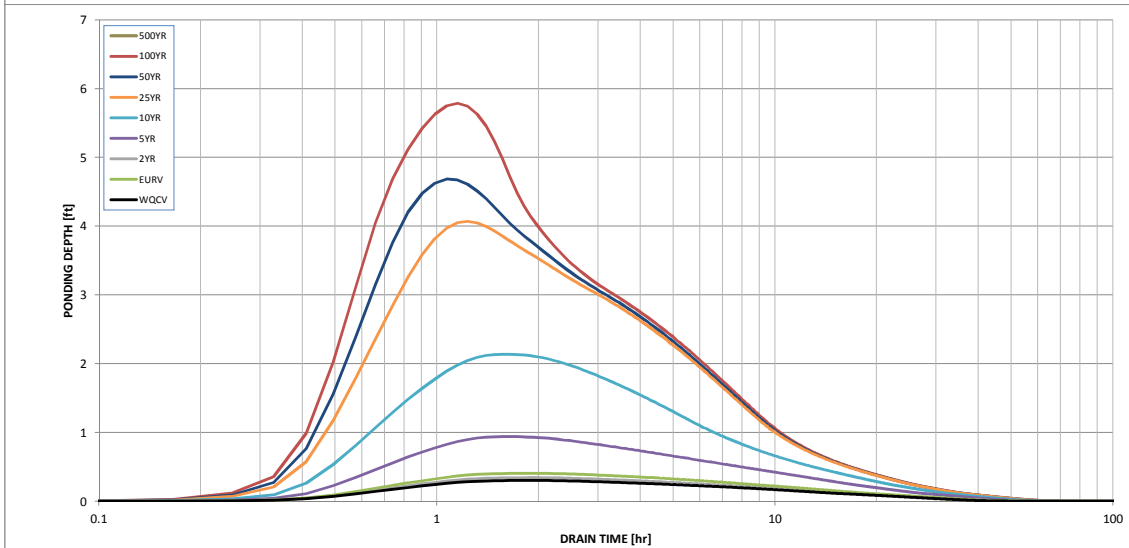
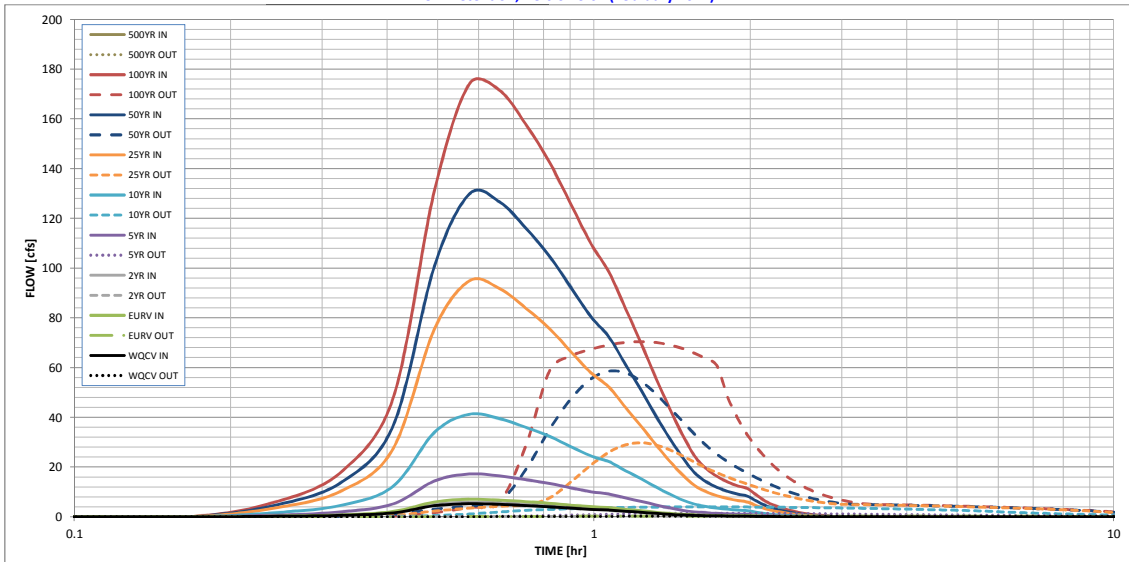
Spillway Design Flow Depth =	0.96	feet
Stage at Top of Freeboard =	7.96	feet
Basin Area at Top of Freeboard =	1.24	acres

Routed Hydrograph Results

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =									
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	0.00
Calculated Runoff Volume (acre-ft) =	0.311	0.420	0.352	1.030	2.489	5.816	8.021	10.860	0.000
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.311	0.419	0.352	1.030	2.491	5.816	8.024	10.861	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.12	0.34	0.79	1.04	1.35	0.00
Predevelopment Peak Q (cfs) =	0.0	0.0	1.3	10.6	29.3	68.6	90.6	118.3	0.0
Peak Inflow Q (cfs) =	5.3	7.1	6.0	17.3	41.3	94.9	129.8	174.1	#N/A
Peak Outflow Q (cfs) =	0.3	0.4	0.3	1.5	4.0	29.8	58.6	70.5	#N/A
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.1	0.1	0.4	0.6	0.6	#N/A
Structure Controlling Flow =	Plate	Vertical Orifice 1	Plate	Vertical Orifice 1	Vertical Orifice 1	Overflow Grate 1	Overflow Grate 1	Outlet Plate 1	#N/A
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.8	1.8	2.2	#N/A
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#N/A
Time to Drain 97% of Inflow Volume (hours) =	40	42	40	43	38	29	25	21	#N/A
Time to Drain 99% of Inflow Volume (hours) =	45	47	46	51	50	45	40	36	#N/A
Maximum Ponding Depth (ft) =	0.30	0.41	0.34	0.94	2.14	4.07	4.69	5.79	#N/A
Area at Maximum Ponding Depth (acres) =	0.93	0.94	0.93	0.96	1.02	1.11	1.13	1.18	#N/A
Maximum Volume Stored (acre-ft) =	0.278	0.371	0.315	0.874	2.060	4.118	4.800	6.075	#N/A

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)



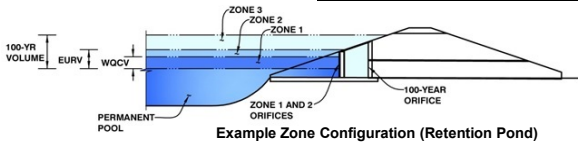
S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: Pond 2



	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.33	0.271	Orifice Plate
Zone 2 (EURV)	0.45	0.100	Circular Orifice
Zone 3 (100-year)	2.64	1.970	Weir&Pipe (Circular)
		2.341	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft ²
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	0.33	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	2.90	inches
Orifice Plate: Orifice Area per Row =	6.00	sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row =	4.167E-02	ft ²
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft ²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.11	0.22					
Orifice Area (sq. inches)	6.00	6.00	6.00					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	0.33	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	0.45	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	10.00	N/A	inches

Calculated Parameters for Vertical Orifice

	Zone 2 Circular	Not Selected	
Vertical Orifice Area =	0.55	N/A	ft ²
Vertical Orifice Centroid =	0.42	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	2.00	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	4.00	N/A	feet
Overflow Weir Slope =	3.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	8.00	N/A	feet
Overflow Grate Open Area % =	85%	N/A	% grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H ₁ =	4.67	N/A	feet
Over Flow Weir Slope Length =	8.43	N/A	feet
Grate Open Area / 100-yr Orifice Area =	5.84	N/A	should be ≥ 4
Overflow Grate Open Area w/o Debris =	28.67	N/A	ft ²
Overflow Grate Open Area w/ Debris =	14.34	N/A	ft ²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	30.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	4.91	N/A	ft ²
Outlet Orifice Centroid =	1.25	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	6.50	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	61.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

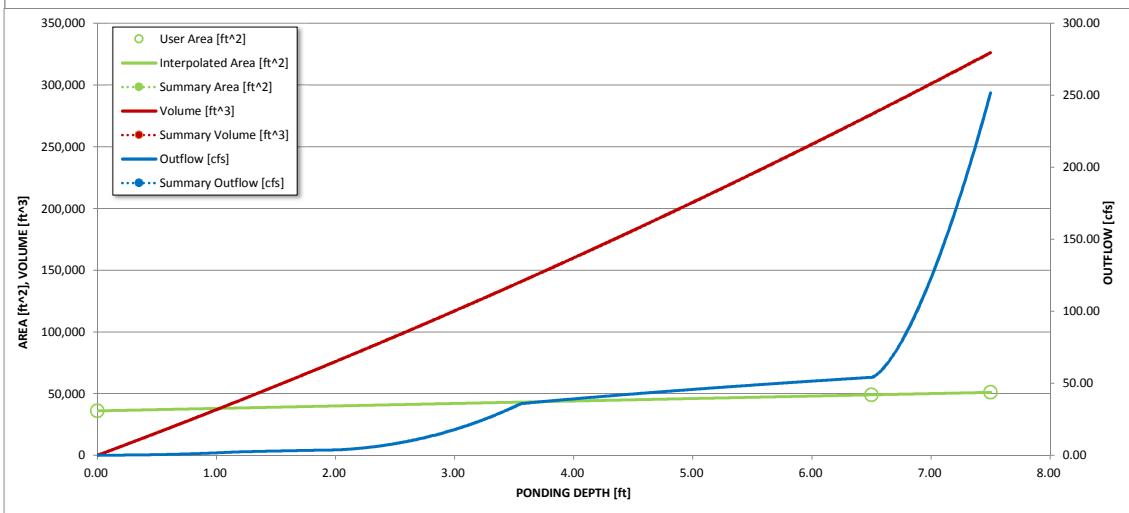
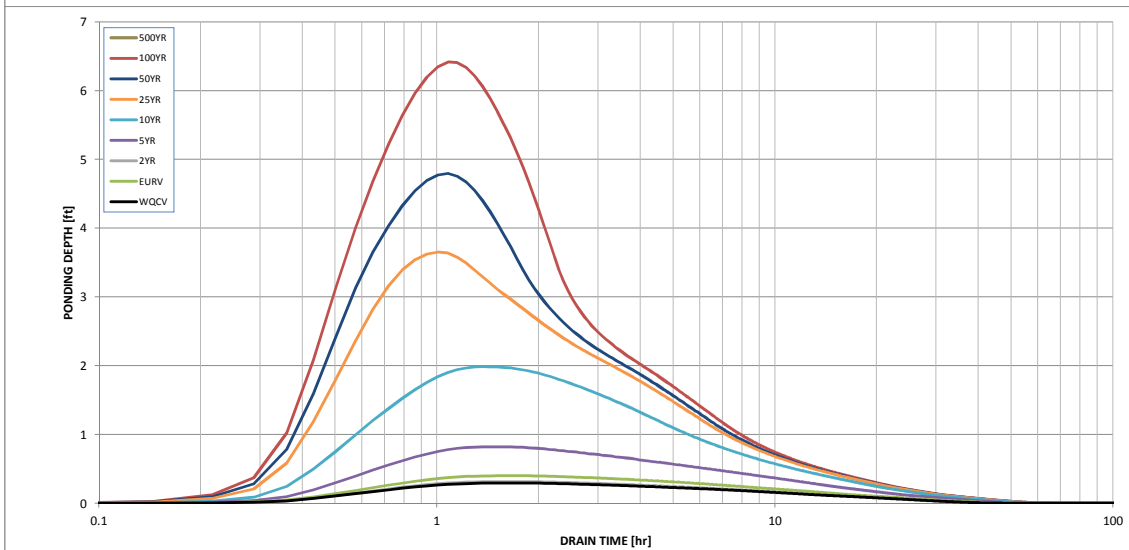
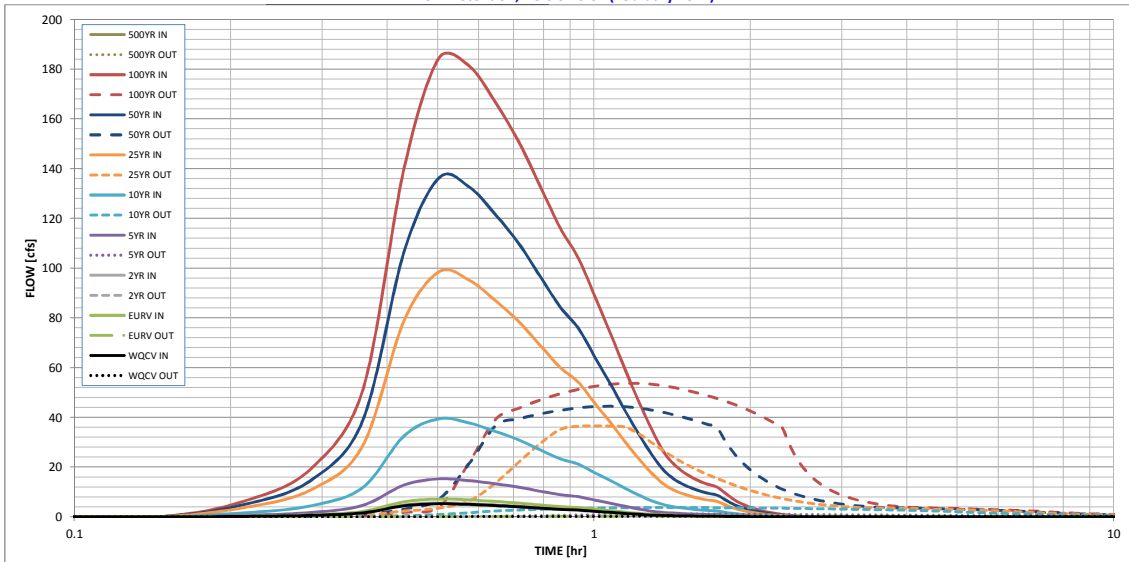
Spillway Design Flow Depth =	0.97	feet
Stage at Top of Freeboard =	8.47	feet
Basin Area at Top of Freeboard =	1.17	acres

Routed Hydrograph Results

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =									
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	0.00
Calculated Runoff Volume (acre-ft) =	0.271	0.370	0.290	0.796	2.075	5.274	7.356	10.046	0.000
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.270	0.369	0.289	0.796	2.075	5.270	7.349	10.037	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.02	0.11	0.35	0.87	1.16	1.51	0.00
Predevelopment Peak Q (cfs) =	0.0	0.0	1.4	9.4	29.4	72.5	96.8	126.5	0.0
Peak Inflow Q (cfs) =	5.3	7.2	5.6	15.3	39.4	98.6	136.3	184.5	#N/A
Peak Outflow Q (cfs) =	0.2	0.3	0.3	1.2	3.7	36.6	44.5	53.7	#N/A
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.1	0.1	0.5	0.5	0.4	#N/A
Structure Controlling Flow =	Plate	Vertical Orifice 1	Plate	Vertical Orifice 1	Vertical Orifice 1	Outlet Plate 1	Outlet Plate 1	Outlet Plate 1	#N/A
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	1.1	1.3	1.6	#N/A
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#N/A
Time to Drain 97% of Inflow Volume (hours) =	38	40	39	42	36	25	21	18	#N/A
Time to Drain 99% of Inflow Volume (hours) =	44	46	44	49	48	40	36	32	#N/A
Maximum Ponding Depth (ft) =	0.29	0.40	0.31	0.82	1.98	3.65	4.80	6.41	#N/A
Area at Maximum Ponding Depth (acres) =	0.84	0.84	0.84	0.86	0.92	0.99	1.05	1.12	#N/A
Maximum Volume Stored (acre-ft) =	0.242	0.326	0.258	0.693	1.726	3.322	4.485	6.241	#N/A

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)



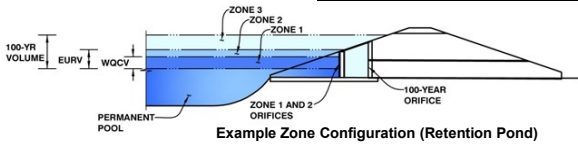
S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: Pond 3



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.70	0.489	Orifice Plate
Zone 2 (EURV)	1.06	0.265	Circular Orifice
Zone 3 (100-year)	4.82	3.097	Weir&Pipe (Circular)
		3.850	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft ²
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	0.70	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	N/A	inches
Orifice Plate: Orifice Area per Row =	7.00	sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row =	4.861E-02	ft ²
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft ²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.23	0.50					
Orifice Area (sq. inches)	7.00	7.00	7.00					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	0.70	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	1.06	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	8.00	N/A	inches

Calculated Parameters for Vertical Orifice

	Zone 2 Circular	Not Selected	
Vertical Orifice Area =	0.35	N/A	ft ²
Vertical Orifice Centroid =	0.33	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	2.00	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	8.00	N/A	feet
Overflow Weir Slope =	3.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Open Area % =	85%	N/A	%, grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H ₁ =	3.33	N/A	feet
Over Flow Weir Slope Length =	4.22	N/A	feet
Grate Open Area / 100-yr Orifice Area =	4.06	N/A	should be ≥ 4
Overflow Grate Open Area w/o Debris =	28.67	N/A	ft ²
Overflow Grate Open Area w/ Debris =	14.34	N/A	ft ²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	36.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	7.07	N/A	ft ²
Outlet Orifice Centroid =	1.50	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	7.00	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	51.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

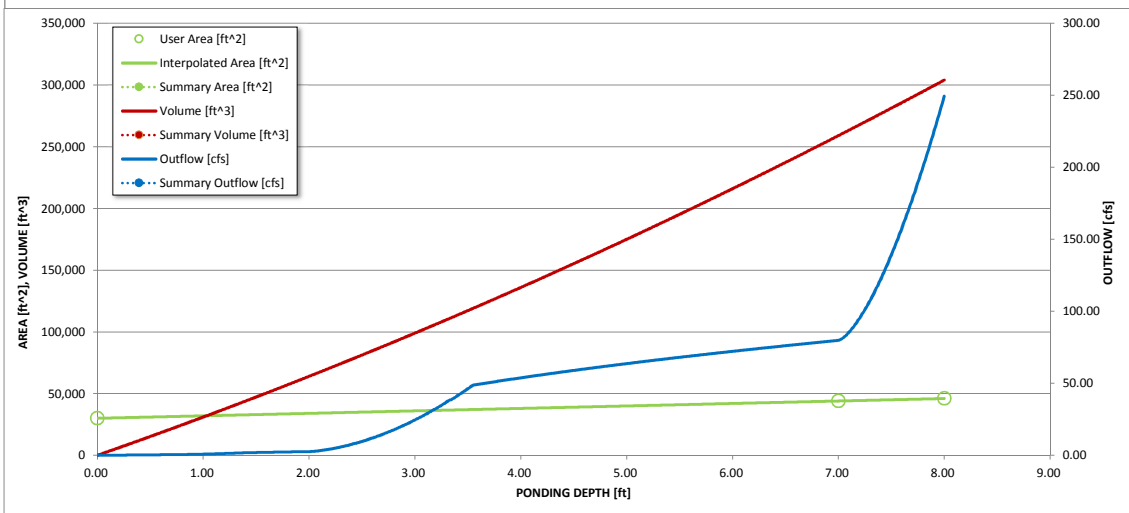
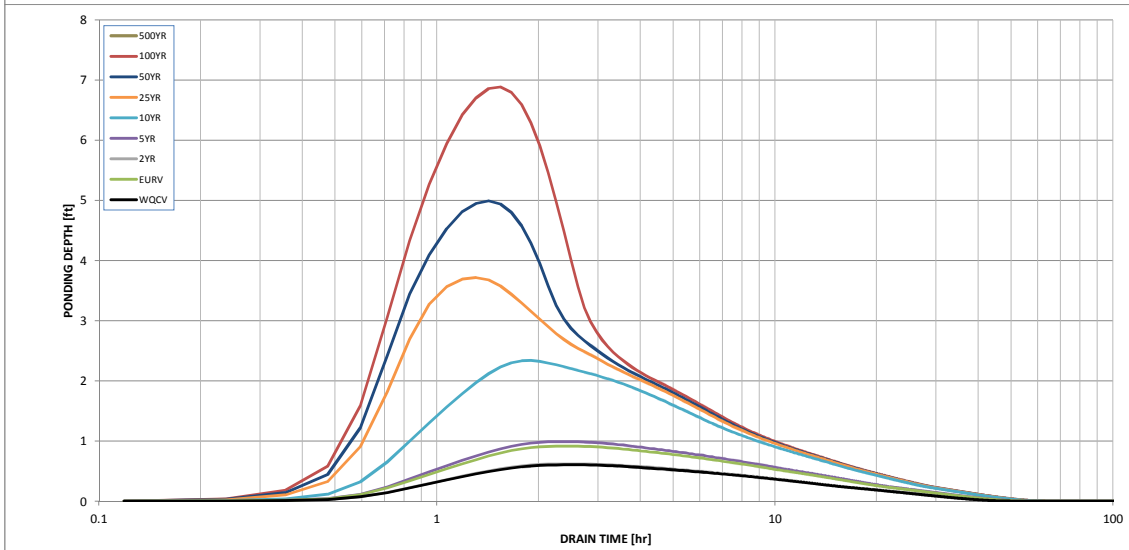
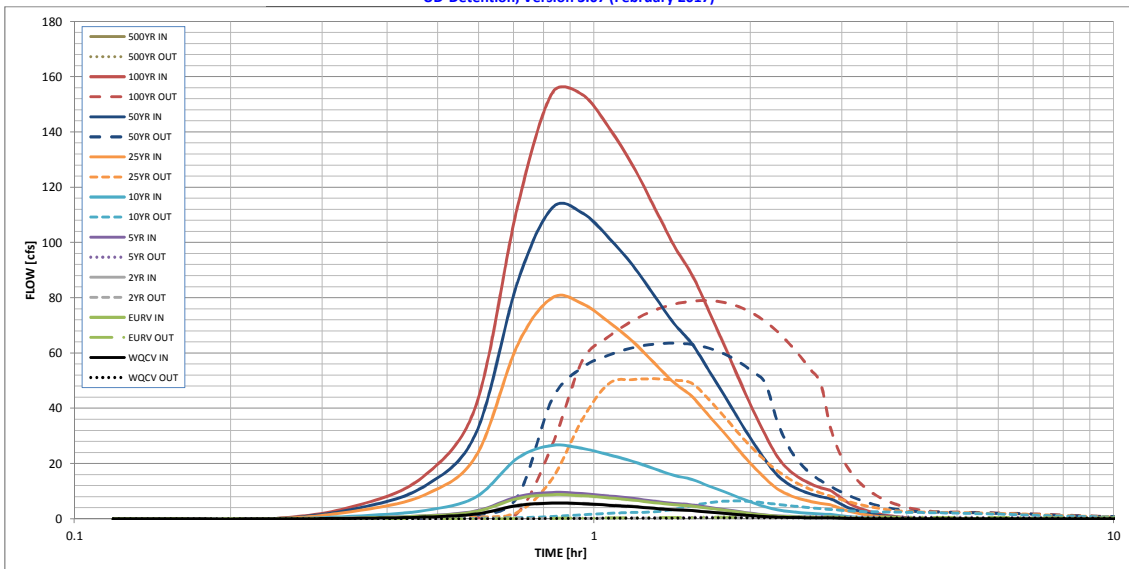
Spillway Design Flow Depth =	0.96	feet
Stage at Top of Freeboard =	8.96	feet
Basin Area at Top of Freeboard =	1.06	acres

Routed Hydrograph Results

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period									
One-Hour Rainfall Depth (in)	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	0.00
Calculated Runoff Volume (acre-ft)	0.489	0.754	0.501	0.822	2.317	7.131	10.122	14.027	0.000
OPTIONAL Override Runoff Volume (acre-ft)									
Inflow Hydrograph Volume (acre-ft)	0.488	0.753	0.500	0.822	2.316	7.123	10.121	14.024	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre)	0.00	0.00	0.01	0.02	0.14	0.47	0.66	0.89	0.00
Predevelopment Peak Q (cfs)	0.0	0.0	1.1	2.0	17.1	59.6	82.6	112.7	0.0
Peak Inflow Q (cfs)	5.7	8.8	5.8	9.6	26.6	80.0	112.6	154.1	#N/A
Peak Outflow Q (cfs)	0.4	0.7	0.4	0.8	6.5	50.7	63.6	79.0	#N/A
Ratio Peak Outflow to Predevelopment Q	N/A	N/A	N/A	0.4	0.4	0.9	0.8	0.7	#N/A
Structure Controlling Flow	Plate	Vertical Orifice 1	Plate	Vertical Orifice 1	Overflow Grate 1	Outlet Plate 1	Outlet Plate 1	Outlet Plate 1	#N/A
Max Velocity through Grate 1 (fps)	N/A	N/A	N/A	N/A	0.1	1.6	2.0	2.6	#N/A
Max Velocity through Grate 2 (fps)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#N/A
Time to Drain 97% of Inflow Volume (hours)	41	43	41	44	41	25	21	17	#N/A
Time to Drain 99% of Inflow Volume (hours)	45	49	45	49	50	41	37	32	#N/A
Maximum Ponding Depth (ft)	0.60	0.91	0.62	0.99	2.34	3.72	4.99	6.89	#N/A
Area at Maximum Ponding Depth (acres)	0.72	0.73	0.72	0.73	0.80	0.86	0.92	1.00	#N/A
Maximum Volume Stored (acre-ft)	0.421	0.646	0.429	0.697	1.737	2.871	4.008	5.825	#N/A

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)



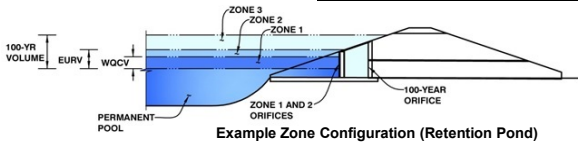
S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: Pond 4



	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.76	0.117	Orifice Plate
Zone 2 (EURV)	1.01	0.046	Circular Orifice
Zone 3 (100-year)	3.92	0.730	Weir&Pipe (Circular)
		0.892	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft ²
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	0.76	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	3.20	inches
Orifice Plate: Orifice Area per Row =	1.60	sq. inches (diameter = 1-7/16 inches)

Calculated Parameters for Plate

WQ Orifice Area per Row =	1.111E-02	ft ²
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft ²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.25	0.51					
Orifice Area (sq. inches)	1.60	1.60	1.60					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	1.01	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	1.01	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	20.00	N/A	inches

Calculated Parameters for Vertical Orifice

	Zone 2 Circular	Not Selected	
Vertical Orifice Area =	2.18	N/A	ft ²
Vertical Orifice Centroid =	0.83	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	2.00	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	4.00	N/A	feet
Overflow Weir Slope =	3.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Open Area % =	85%	N/A	% grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H ₁ =	3.33	N/A	feet
Over Flow Weir Slope Length =	4.22	N/A	feet
Grate Open Area / 100-yr Orifice Area =	4.56	N/A	should be ≥ 4
Overflow Grate Open Area w/o Debris =	14.34	N/A	ft ²
Overflow Grate Open Area w/ Debris =	7.17	N/A	ft ²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	24.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	3.14	N/A	ft ²
Outlet Orifice Centroid =	1.00	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	5.50	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	19.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

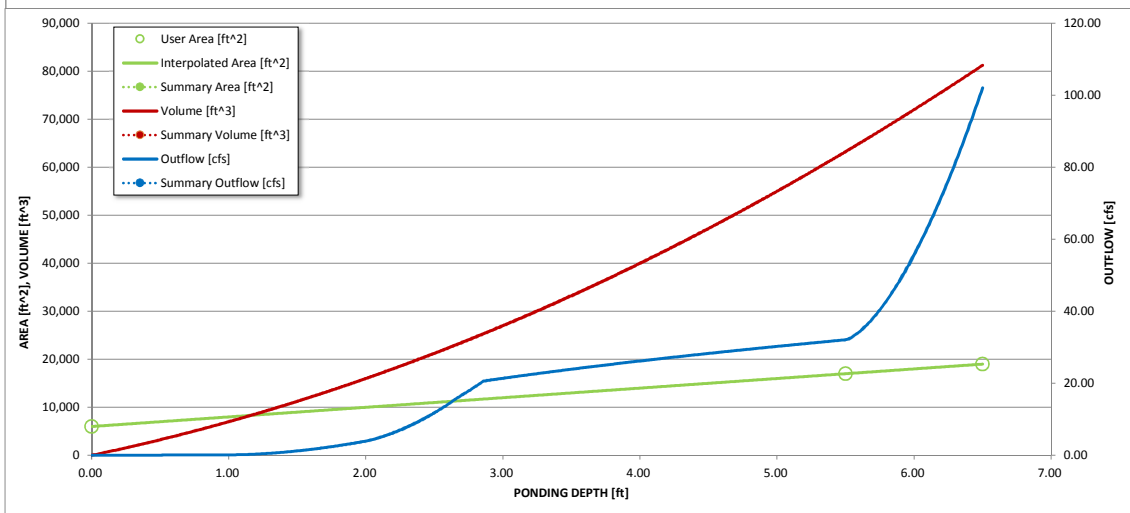
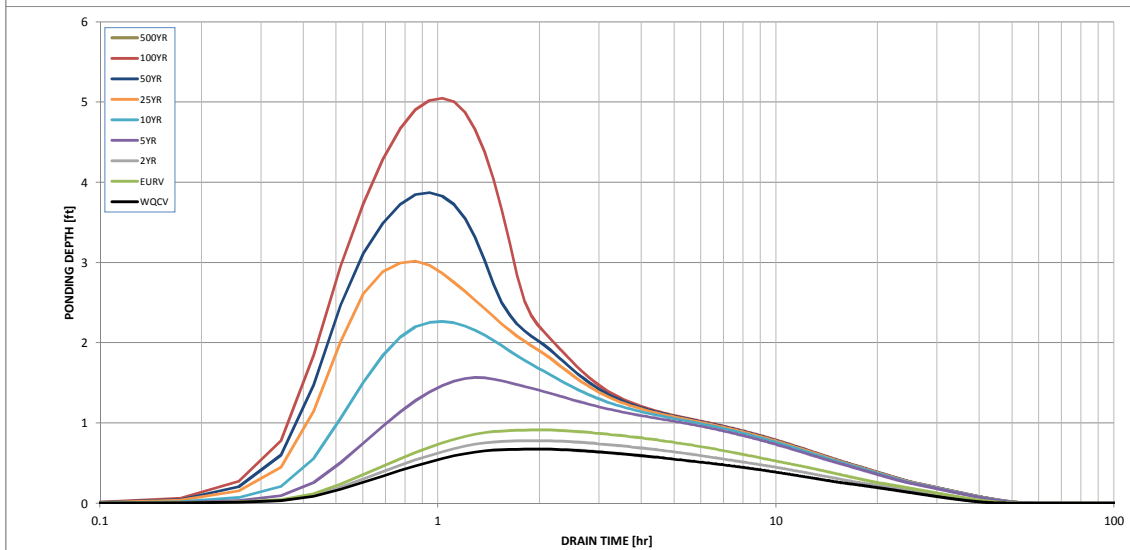
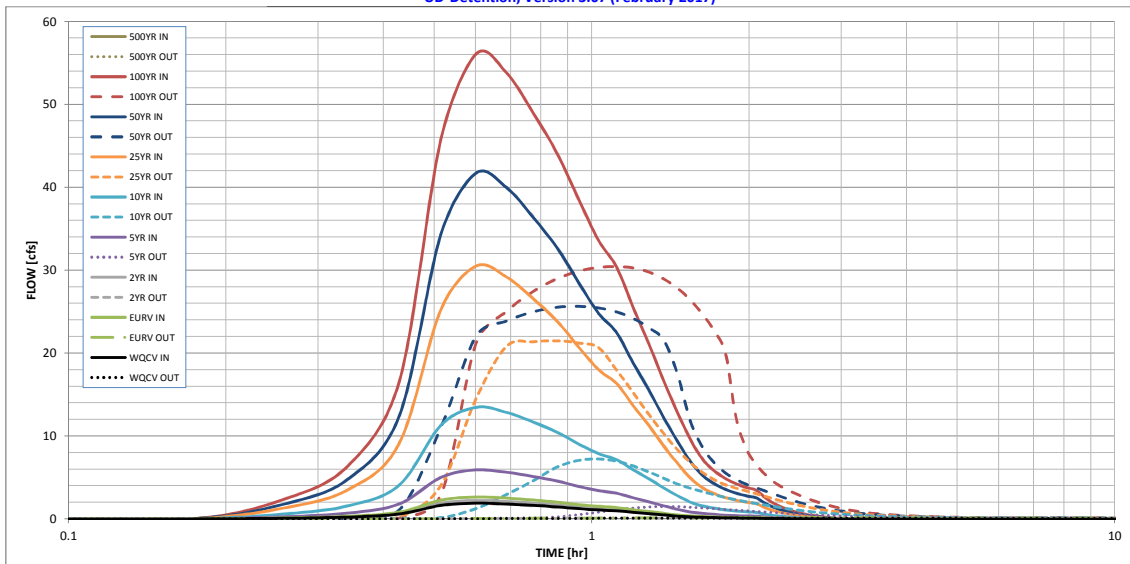
Spillway Design Flow Depth =	0.90	feet
Stage at Top of Freeboard =	7.40	feet
Basin Area at Top of Freeboard =	0.44	acres

Routed Hydrograph Results

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =									
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	0.00
Calculated Runoff Volume (acre-ft) =	0.117	0.162	0.136	0.365	0.838	1.918	2.635	3.557	0.000
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.116	0.161	0.136	0.364	0.837	1.916	2.633	3.554	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.11	0.32	0.75	0.99	1.30	0.00
Predevelopment Peak Q (cfs) =	0.0	0.0	0.4	3.2	9.0	21.4	28.3	37.0	0.0
Peak Inflow Q (cfs) =	1.9	2.6	2.2	5.9	13.5	30.5	41.7	56.1	#N/A
Peak Outflow Q (cfs) =	0.1	0.1	0.1	1.5	7.2	21.5	25.6	30.4	#N/A
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.5	0.8	1.0	0.9	0.8	#N/A
Structure Controlling Flow =	Plate	Plate	Plate	Vertical Orifice 1	Overflow Grate 1	Outlet Plate 1	Outlet Plate 1	Outlet Plate 1	#N/A
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.1	0.7	0.7	0.8	#N/A
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#N/A
Time to Drain 97% of Inflow Volume (hours) =	38	41	39	39	31	20	16	12	#N/A
Time to Drain 99% of Inflow Volume (hours) =	42	46	44	47	42	35	31	26	#N/A
Maximum Ponding Depth (ft) =	0.67	0.91	0.78	1.57	2.26	3.02	3.87	5.05	#N/A
Area at Maximum Ponding Depth (acres) =	0.17	0.18	0.17	0.21	0.24	0.28	0.32	0.37	#N/A
Maximum Volume Stored (acre-ft) =	0.103	0.144	0.120	0.271	0.429	0.623	0.877	1.281	#N/A

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)



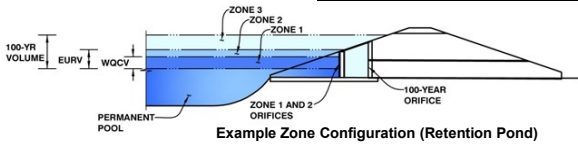
S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: Pond 5



	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.66	0.460	Orifice Plate
Zone 2 (EURV)	1.09	0.316	Circular Orifice
Zone 3 (100-year)	3.88	2.240	Weir&Pipe (Circular)
		3.016	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft ²
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	0.66	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	3.20	inches
Orifice Plate: Orifice Area per Row =	7.00	sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row =	4.861E-02	ft ²
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft ²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.22	0.44					
Orifice Area (sq. inches)	7.00	7.00	7.00					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	0.66	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	1.09	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	10.00	N/A	inches

Calculated Parameters for Vertical Orifice

	Zone 2 Circular	Not Selected	
Vertical Orifice Area =	0.55	N/A	ft ²
Vertical Orifice Centroid =	0.42	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	2.00	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	4.00	N/A	feet
Overflow Weir Slope =	3.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Open Area % =	85%	N/A	%, grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H ₁ =	3.33	N/A	feet
Over Flow Weir Slope Length =	4.22	N/A	feet
Grate Open Area / 100-yr Orifice Area =	4.56	N/A	should be ≥ 4
Overflow Grate Open Area w/o Debris =	14.34	N/A	ft ²
Overflow Grate Open Area w/ Debris =	7.17	N/A	ft ²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	24.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	3.14	N/A	ft ²
Outlet Orifice Centroid =	1.00	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	6.50	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	36.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

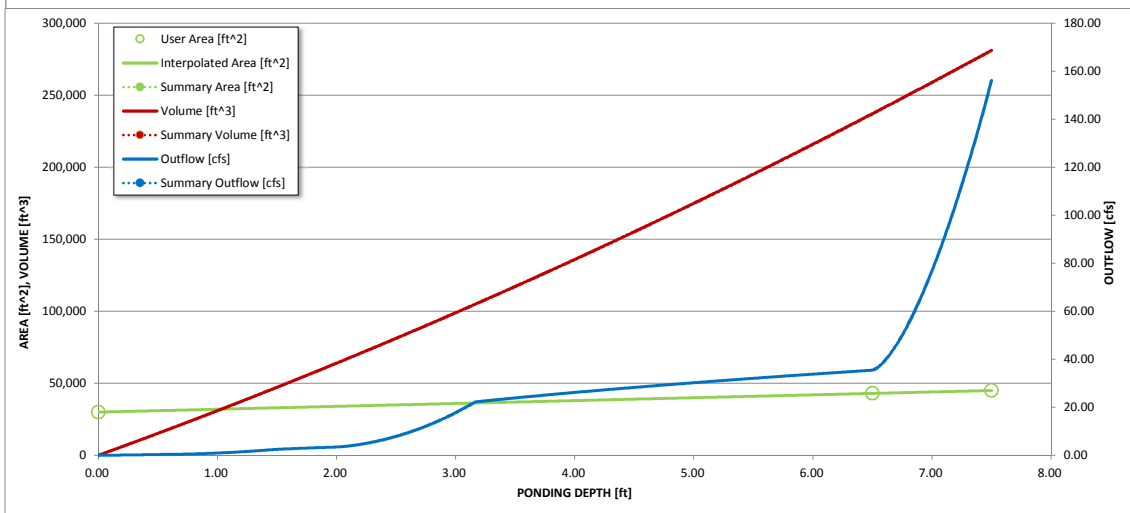
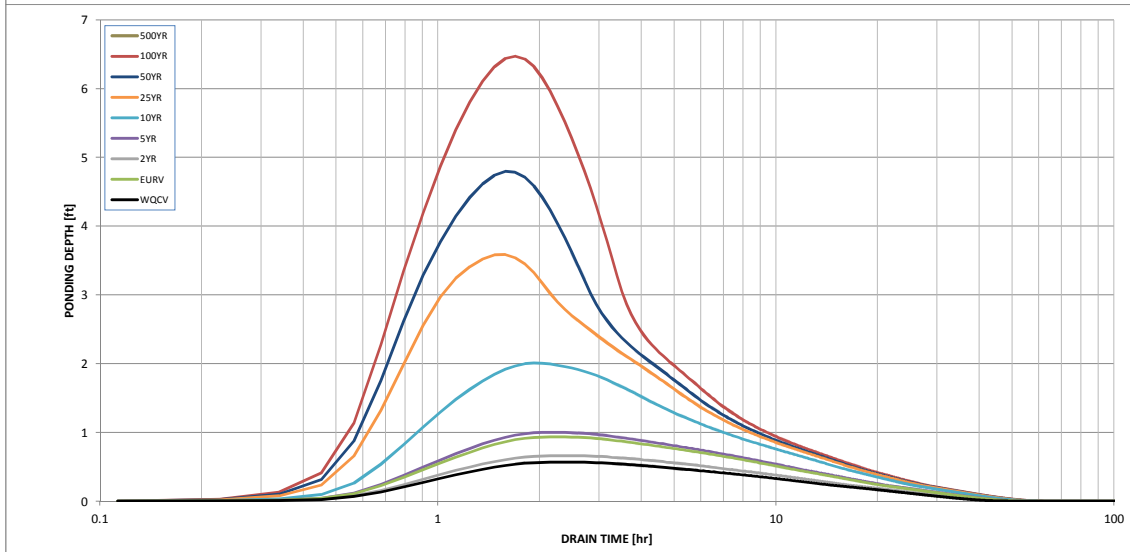
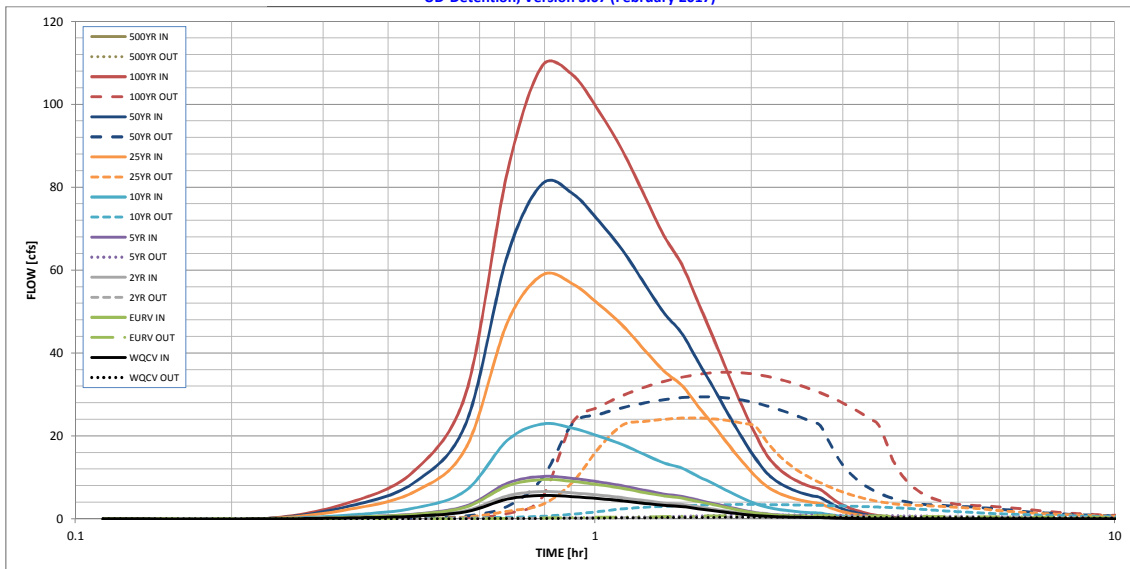
Spillway Design Flow Depth =	0.95	feet
Stage at Top of Freeboard =	8.45	feet
Basin Area at Top of Freeboard =	1.03	acres

Routed Hydrograph Results

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period									
One-Hour Rainfall Depth (in)	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	0.00
Calculated Runoff Volume (acre-ft)	0.460	0.776	0.537	0.841	1.893	4.942	6.851	9.343	0.000
OPTIONAL Override Runoff Volume (acre-ft)									
Inflow Hydrograph Volume (acre-ft)	0.459	0.776	0.537	0.840	1.893	4.941	6.842	9.334	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre)	0.00	0.00	0.01	0.02	0.13	0.47	0.65	0.89	0.00
Predevelopment Peak Q (cfs)	0.0	0.0	0.7	1.2	10.8	38.0	52.7	71.9	0.0
Peak Inflow Q (cfs)	5.6	9.5	6.6	10.3	22.9	58.8	80.8	109.3	#N/A
Peak Outflow Q (cfs)	0.4	0.8	0.5	1.0	3.5	24.3	29.5	35.4	#N/A
Ratio Peak Outflow to Predevelopment Q	N/A	N/A	N/A	0.8	0.3	0.6	0.6	0.5	#N/A
Structure Controlling Flow	Plate	Vertical Orifice 1	Plate	Vertical Orifice 1	Overflow Grate 1	Outlet Plate 1	Outlet Plate 1	Outlet Plate 1	#N/A
Max Velocity through Grate 1 (fps)	N/A	N/A	N/A	N/A	0.0	1.3	1.6	1.9	#N/A
Max Velocity through Grate 2 (fps)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#N/A
Time to Drain 97% of Inflow Volume (hours)	39	42	40	42	39	28	24	21	#N/A
Time to Drain 99% of Inflow Volume (hours)	44	48	45	48	48	42	39	36	#N/A
Maximum Ponding Depth (ft)	0.57	0.93	0.66	1.00	2.01	3.59	4.80	6.47	#N/A
Area at Maximum Ponding Depth (acres)	0.71	0.73	0.72	0.73	0.78	0.85	0.91	0.99	#N/A
Maximum Volume Stored (acre-ft)	0.393	0.660	0.465	0.712	1.469	2.760	3.826	5.417	#N/A

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)



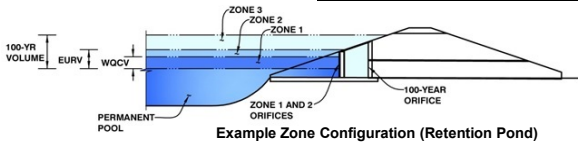
S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: Pond 6



	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.73	0.347	Orifice Plate
Zone 2 (EURV)	1.32	0.296	Circular Orifice
Zone 3 (100-year)	3.73	1.383	Weir&Pipe (Circular)
		2.026	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft ²
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	0.73	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	3.20	inches
Orifice Plate: Orifice Area per Row =	5.00	sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row =	3.472E-02	ft ²
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft ²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.24	0.49					
Orifice Area (sq. inches)	5.00	5.00	5.00					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	0.73	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	1.32	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	5.00	N/A	inches

Calculated Parameters for Vertical Orifice

	Zone 2 Circular	Not Selected	
Vertical Orifice Area =	0.14	N/A	ft ²
Vertical Orifice Centroid =	0.21	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	2.00	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	4.00	N/A	feet
Overflow Weir Slope =	3.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Open Area % =	85%	N/A	%, grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H ₁ =	3.33	N/A	feet
Over Flow Weir Slope Length =	4.22	N/A	feet
Grate Open Area / 100-yr Orifice Area =	4.56	N/A	should be ≥ 4
Overflow Grate Open Area w/o Debris =	14.34	N/A	ft ²
Overflow Grate Open Area w/ Debris =	7.17	N/A	ft ²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	24.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	3.14	N/A	ft ²
Outlet Orifice Centroid =	1.00	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	5.50	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	26.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

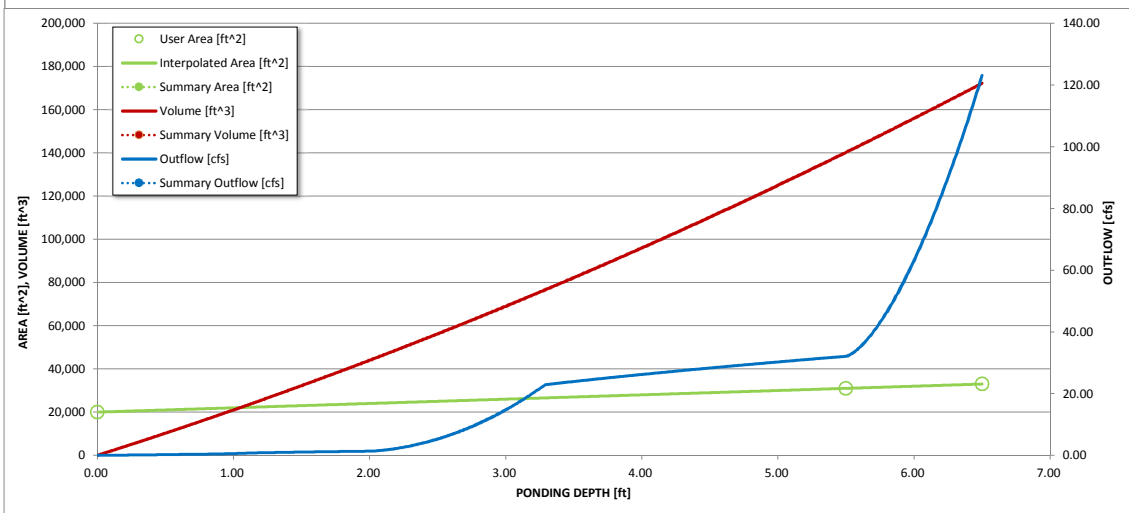
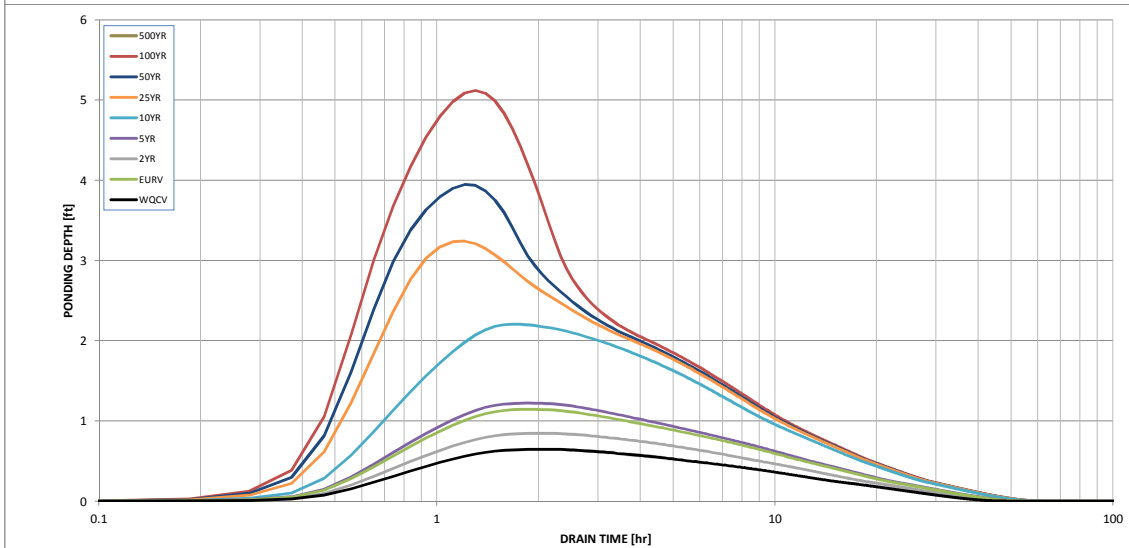
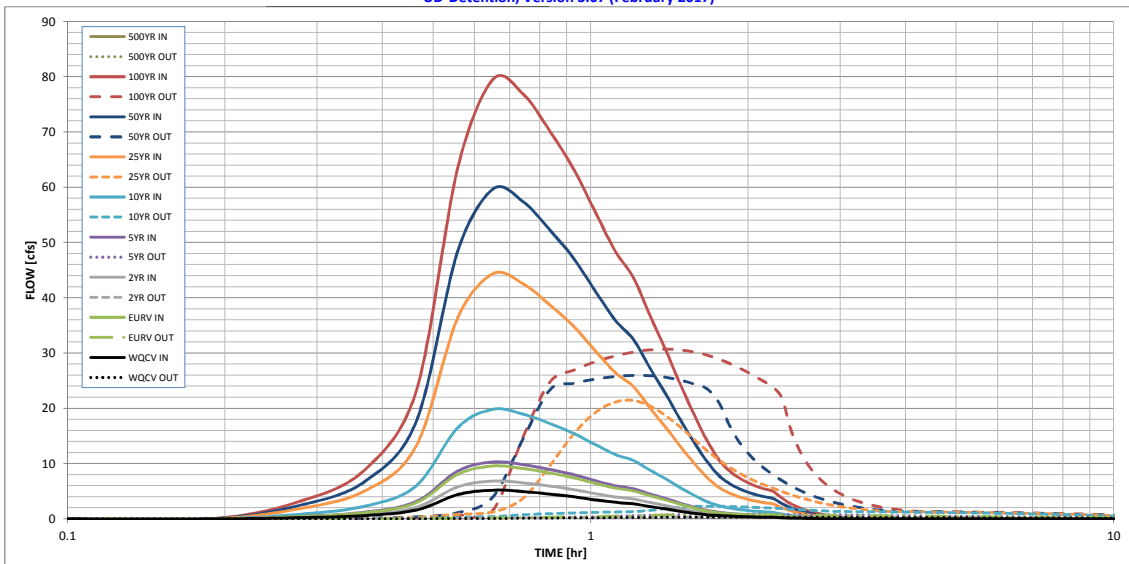
Spillway Design Flow Depth =	0.94	feet
Stage at Top of Freeboard =	7.44	feet
Basin Area at Top of Freeboard =	0.76	acres

Routed Hydrograph Results

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =									
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	0.00
Calculated Runoff Volume (acre-ft) =	0.347	0.643	0.459	0.692	1.342	3.035	4.104	5.502	0.000
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.346	0.642	0.458	0.691	1.341	3.033	4.102	5.499	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.02	0.17	0.58	0.80	1.09	0.00
Predevelopment Peak Q (cfs) =	0.0	0.0	0.5	0.8	7.8	26.6	36.8	49.8	0.0
Peak Inflow Q (cfs) =	5.2	9.6	6.9	10.3	19.8	44.3	59.7	79.5	#N/A
Peak Outflow Q (cfs) =	0.3	0.8	0.4	0.8	2.3	21.4	26.0	30.7	#N/A
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	1.0	0.3	0.8	0.7	0.6	#N/A
Structure Controlling Flow =	Plate	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Grate 1	Overflow Grate 1	Outlet Plate 1	Outlet Plate 1	#N/A
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.1	1.4	1.7	2.0	#N/A
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#N/A
Time to Drain 97% of Inflow Volume (hours) =	38	41	40	41	41	32	28	24	#N/A
Time to Drain 99% of Inflow Volume (hours) =	43	47	45	47	50	45	42	39	#N/A
Maximum Ponding Depth (ft) =	0.65	1.14	0.85	1.22	2.21	3.24	3.95	5.12	#N/A
Area at Maximum Ponding Depth (acres) =	0.49	0.51	0.50	0.52	0.56	0.61	0.64	0.69	#N/A
Maximum Volume Stored (acre-ft) =	0.303	0.553	0.402	0.594	1.121	1.729	2.172	2.953	#N/A

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)



S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

7. PRUDENT LINE ANALYSIS



Prudent Line Calculations

Date: 1/3/2019
 Project: McCune Ranch
 By: BJJ

Storm Return Period (Years)	Stream Flowrate (cfs)	Carrying Capacity (cubic feet)	Sediment Deficit (cubic feet)
2	76.0	10944.0	2736.0
5	320.0	46080.0	11520.0
10	660.0	95040.0	23760.0
25	1208.0	173952.0	43488.0
50	1647.0	237168.0	59292.0
100	2133.0	307152.0	76788.0

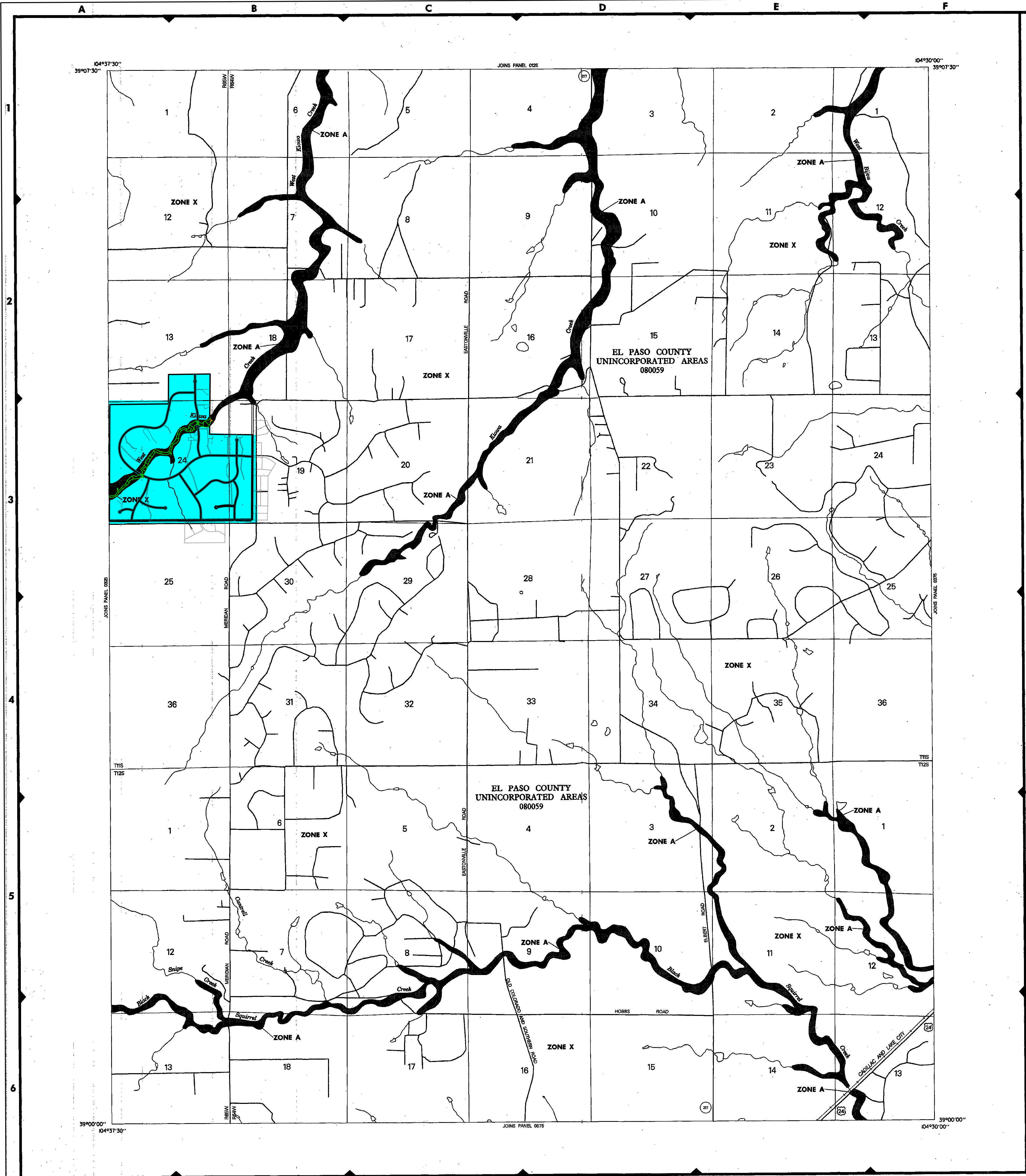
Bank Slope (X:1 (H:V))
10

Average Annual Sediment (cubic feet)	9079.9
30-Year Sediment Deficit (cubic feet)	272397.6
30-Year Average Prudent Line Setback (feet)	104.4

100-Year Prudent Line Setback (feet)	110.8
--------------------------------------	-------

Tabulate the offset from the long-term and short term along the channel reach. The larger of the two would be used. Based on the topo, some sections of the channel are more triangular swale while others appear to be a more defined bankline (rectangular computation). Provide an exhibit for the corresponding channel station on the tabulated calculation or include the channel station in the drainage map.

8. FIRM AND FEMA FLOODPLAIN EXHIBIT



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- ZONE A** No base flood elevations determined.
- ZONE AE** Base flood elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined; 100-year of annual ice flooding; velocities not determined.
- ZONE APP** To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
- ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- ZONE D** Areas determined to be outside 500-year floodplain.
- ZONE D** Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

- Identified 1999
- Observed 1999

Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

Flood Boundary
Floodway Boundary
Zone D Boundary
Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones

Base Flood Elevation Line; Elevation in Feet. See Map Index for Elevation Datum.
Cross Section Line
Base Flood Elevation in Feet Where Unknown Within Zone. See Map Index for Elevation Datum.
Elevation Reference Mark

EL 9877
RM77
M2

97°01'30", 32°22'30"

NOTES

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all potential features outside Special Flood Hazard Areas.

Coastal base flood elevations apply only to areas of 0.2 NAD, and include the effect of wave action; base elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of Special Flood Hazard (100-year flood) include Zones A, AE, AH, AO, APP, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

This map may incorporate approximate boundaries of Coastal Barrier Resources System Units and/or Other Areas Protected Areas established under the Coastal Barrier Improvement Act of 1990 (PL 101-651).

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

For community map revision history prior to countywide mapping, see Section 5.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP:
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE DATE shown on this map to determine when actual rates apply to structures in zones where elevations or depths have been established.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6625.

APPROXIMATE SCALE IN FEET
2000 0 2000

Submit a legible copy. Update to FIRM Map 08041C0350G, eff. 12/7/2018

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 350 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COUNTY NUMBER PANEL SUITE
EL PASO COUNTY, UNINCORPORATED AREAS 080059 0350 F

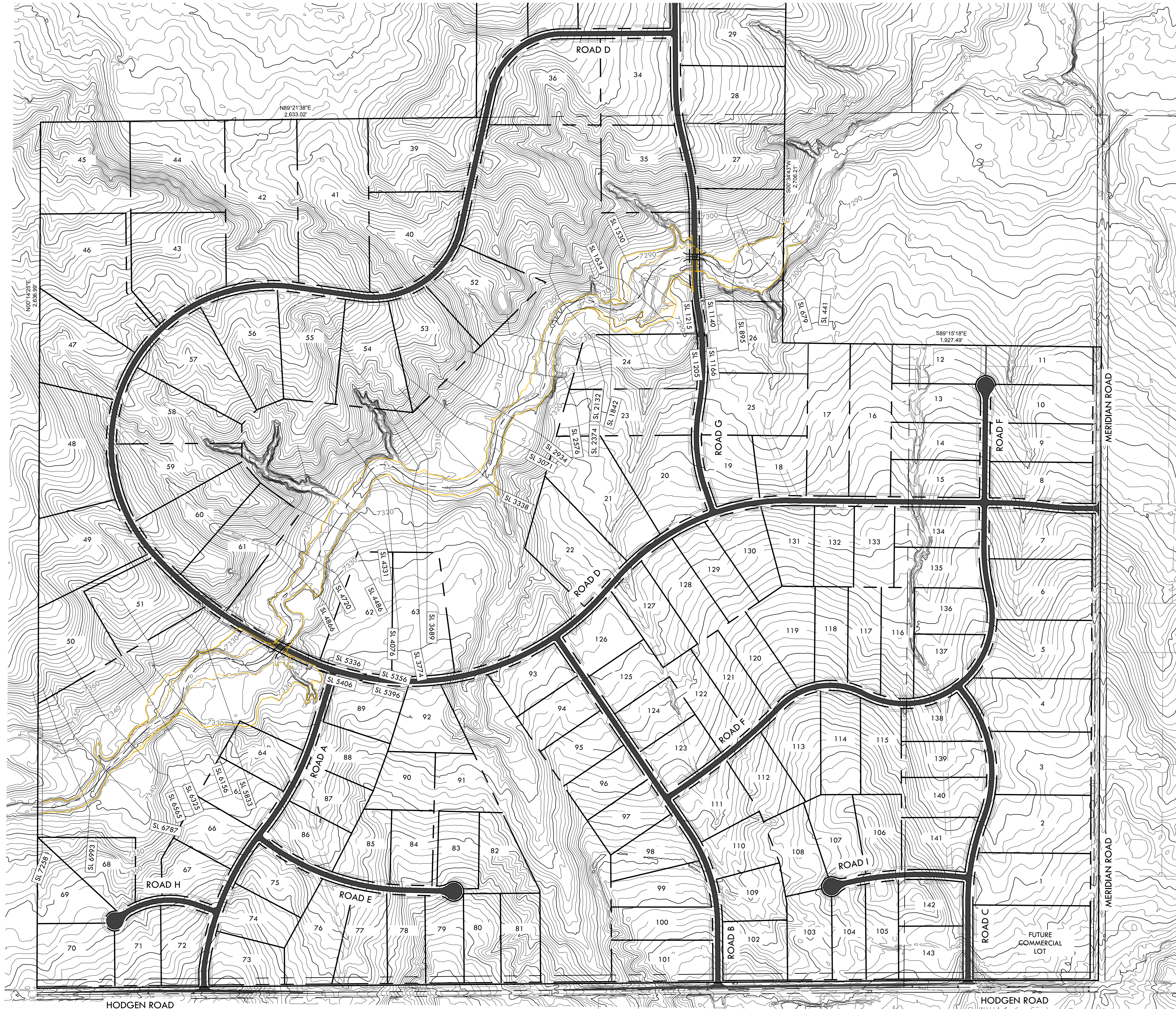
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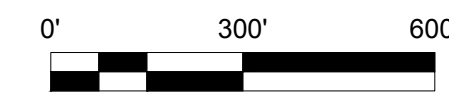
Federal Emergency Management Agency

FEMA CLOMR SUBMITTAL MCCUNE RANCH SUBDIVISION

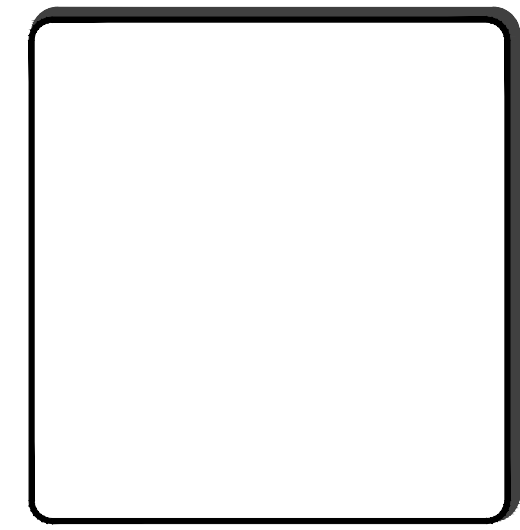
A PARCEL OF PROPERTY LOCATED IN SECTIONS 13 & 24, TOWNSHIP 11 SOUTH, RANGE 65 WEST OF THE 6TH P.M. AND IN THE WEST HALF OF THE WEST HALF OF SECTION 19, TOWNSHIP 11 SOUTH, RANGE 64 WEST OF THE 6TH P.M., COUNTY OF EL PASO, STATE OF COLORADO



100Y FLOODPLAIN PC ————
100Y FLOODPLAIN EC - - - - -



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ELBERT, COLORADO 80106
FOR: PT MCCUNE, LLC
1864 WOODMORE DR, SUITE 100
MONUMENT, COLORADO 80132

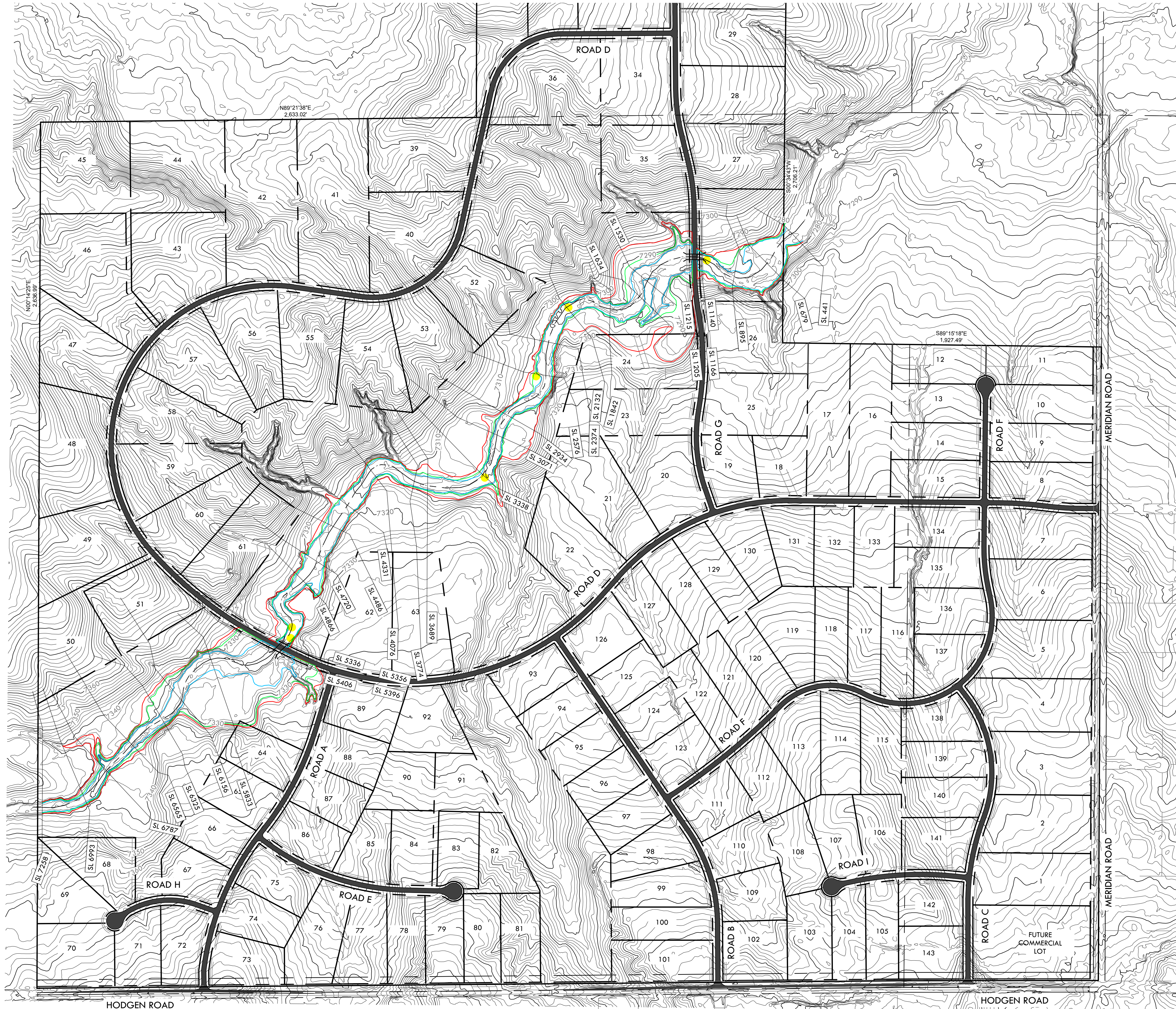
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DATE: 11/16/18
DRAWN BY: JCP
CHECKED BY: LPV
JOB #: 49388

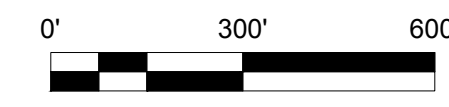
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Tuesday, November 20, 2018 4:48:29 PM
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- 500Y FLOODPLAIN PC —
- 50Y FLOODPLAIN PC —
- 10Y FLOODPLAIN PC —



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500Y, 50Y, 10Y FLOODPLAINS PC
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 FOR: PT MCCUNE, LLC
 1864 WOODMORE DR, SUITE 100
 MONUMENT, COLORADO 80132

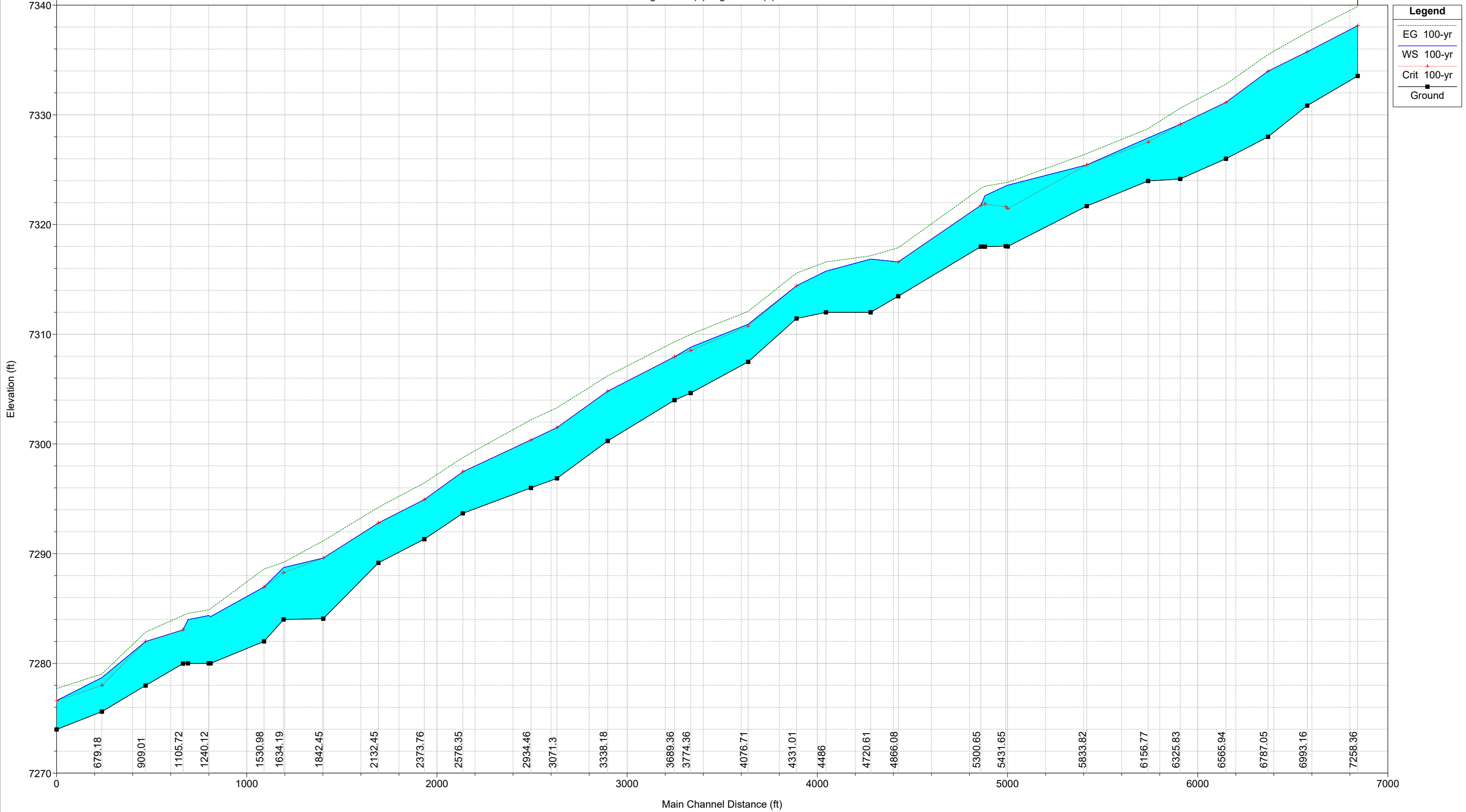
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DATE: 11/16/18
 DRAWN BY: JCP
 CHECKED BY: LPV
 JOB #: 49388

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 Tuesday, November 20, 2018 4:50:35 PM
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McCune EC Fnl Existing Conditions 100-year Floodplain Profile

Alignment - (1) Alignment - (1)



McCune PC Fnl West Kiowa Creek Proposed Conditions 100-Year Floodplain Profile

Alignment - (1) Alignment - (1)

Since the 100yr flow is greater than 1500 cfs, then it must meet the criteria in section 6.4.2 for freeboard below the ceiling of the box culvert. See the attached snippet.

Legend	
EG 100-yr	(Green dashed line)
WS 100-yr	(Red line with '+' markers)
Crit 100-yr	(Red line with '+' markers)
Ground	(Black line with '■' markers)

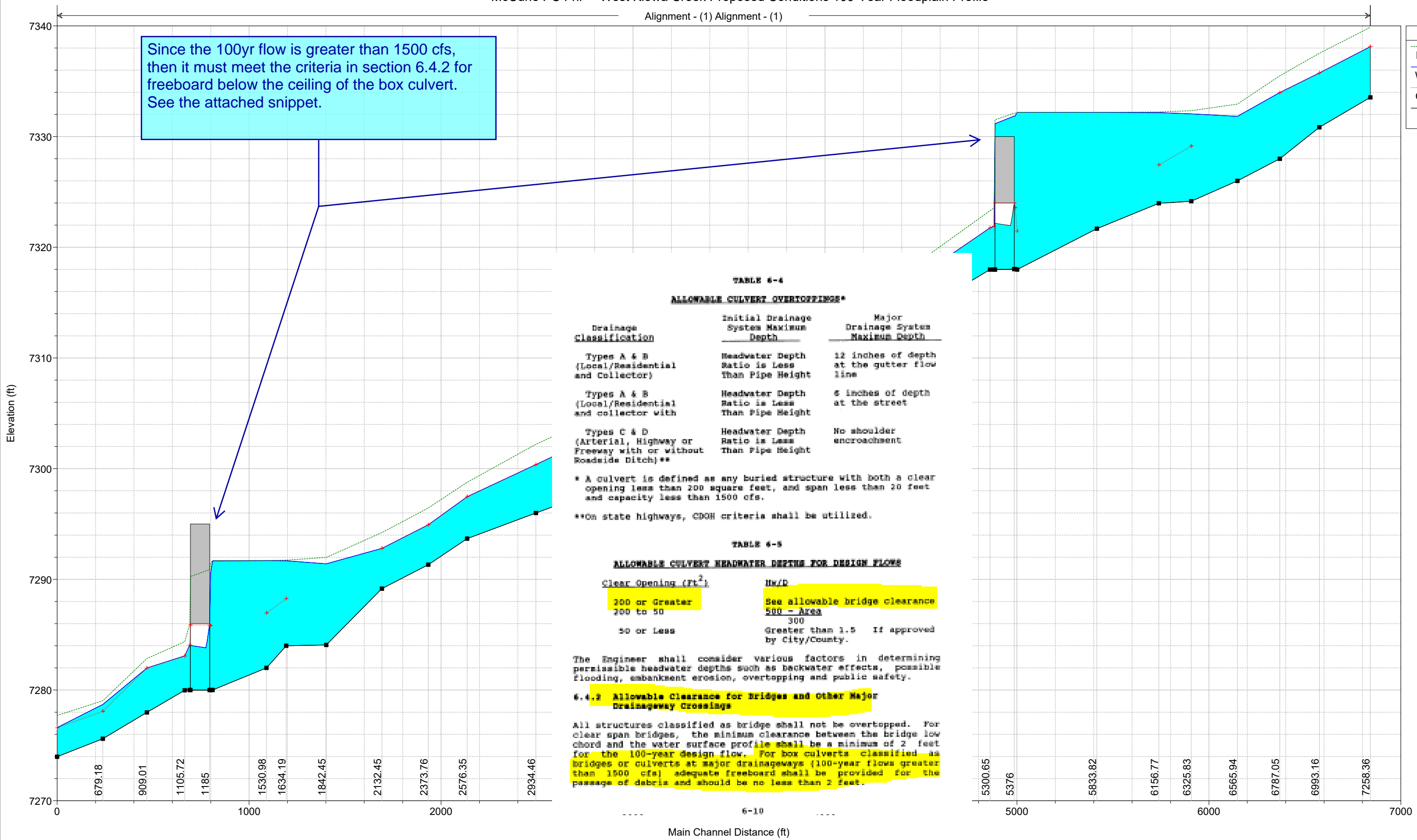


TABLE 6-4
ALLOWABLE CULVERT OVERTOPPINGS*

Drainage Classification	Initial Drainage System Maximum Depth	Major Drainage System Maximum Depth
Types A & B (Local/Residential and Collector)	Headwater Depth Ratio is Less Than Pipe Height	12 inches of depth at the gutter flow line
Types A & B (Local/Residential and collector with	Headwater Depth Ratio is Less Than Pipe Height	6 inches of depth at the street
Types C & D (Arterial, Highway or Freeway with or without Roadside Ditch)**	Headwater Depth Ratio is Less Than Pipe Height	No shoulder encroachment

* A culvert is defined as any buried structure with both a clear opening less than 200 square feet, and span less than 20 feet and capacity less than 1500 cfs.

**On state highways, CDOT criteria shall be utilized.

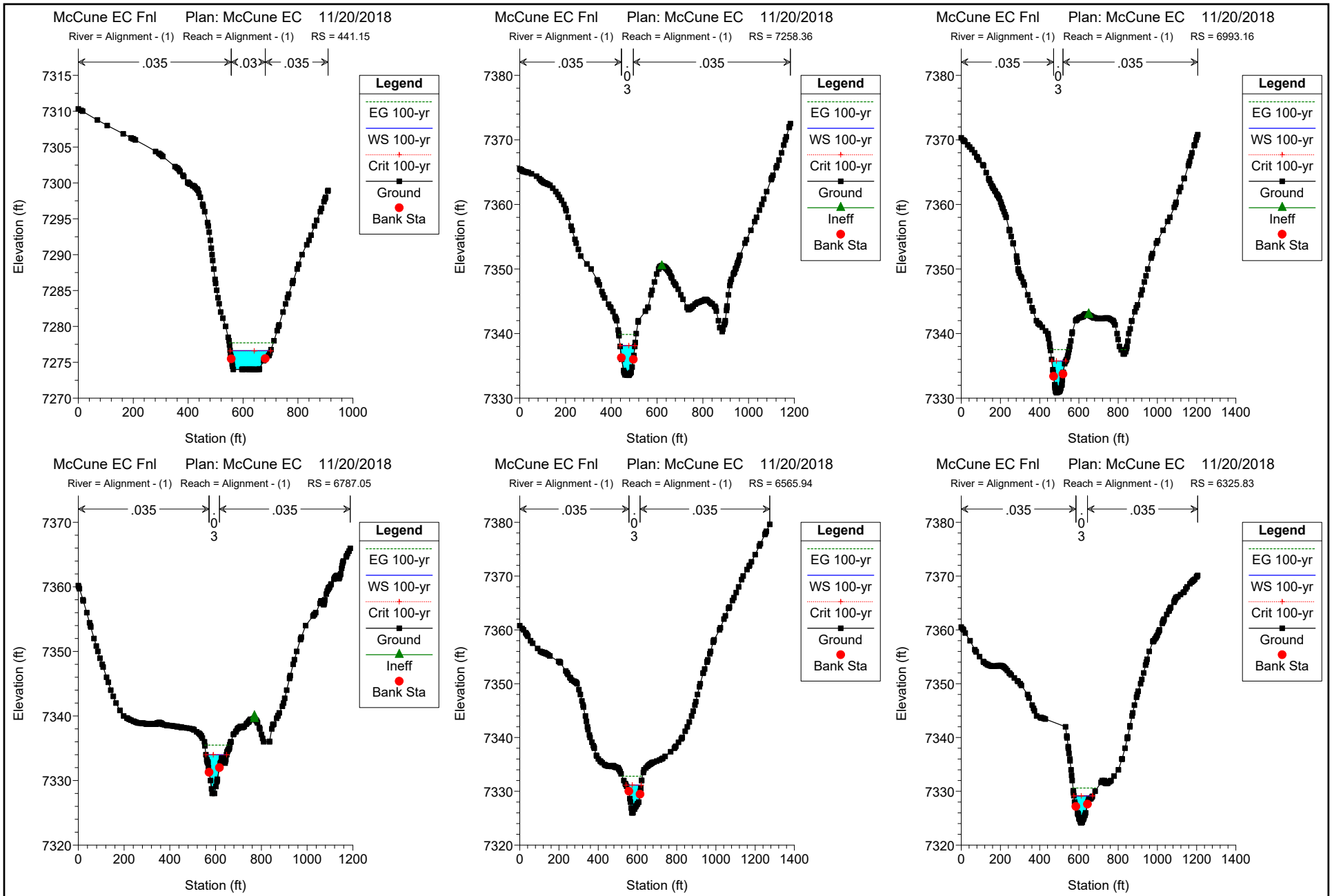
TABLE 6-5
ALLOWABLE CULVERT HEADWATER DEPTHS FOR DESIGN FLOWS

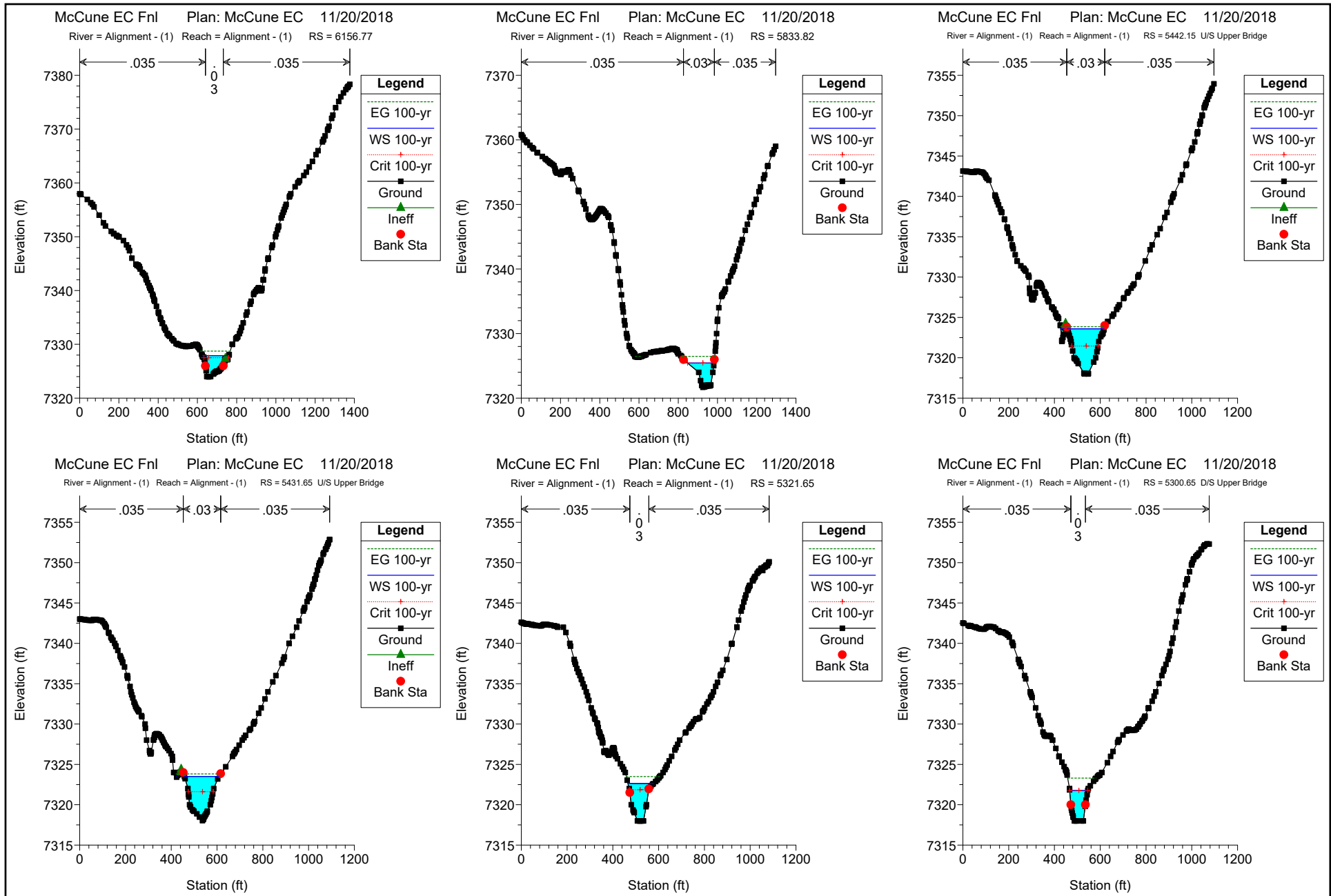
Clear Opening (Ft ²)	Hw/D
300 or Greater	See allowable bridge clearance
100 to 300	500 - Area
50 or Less	300
	Greater than 1.5 If approved by City/County.

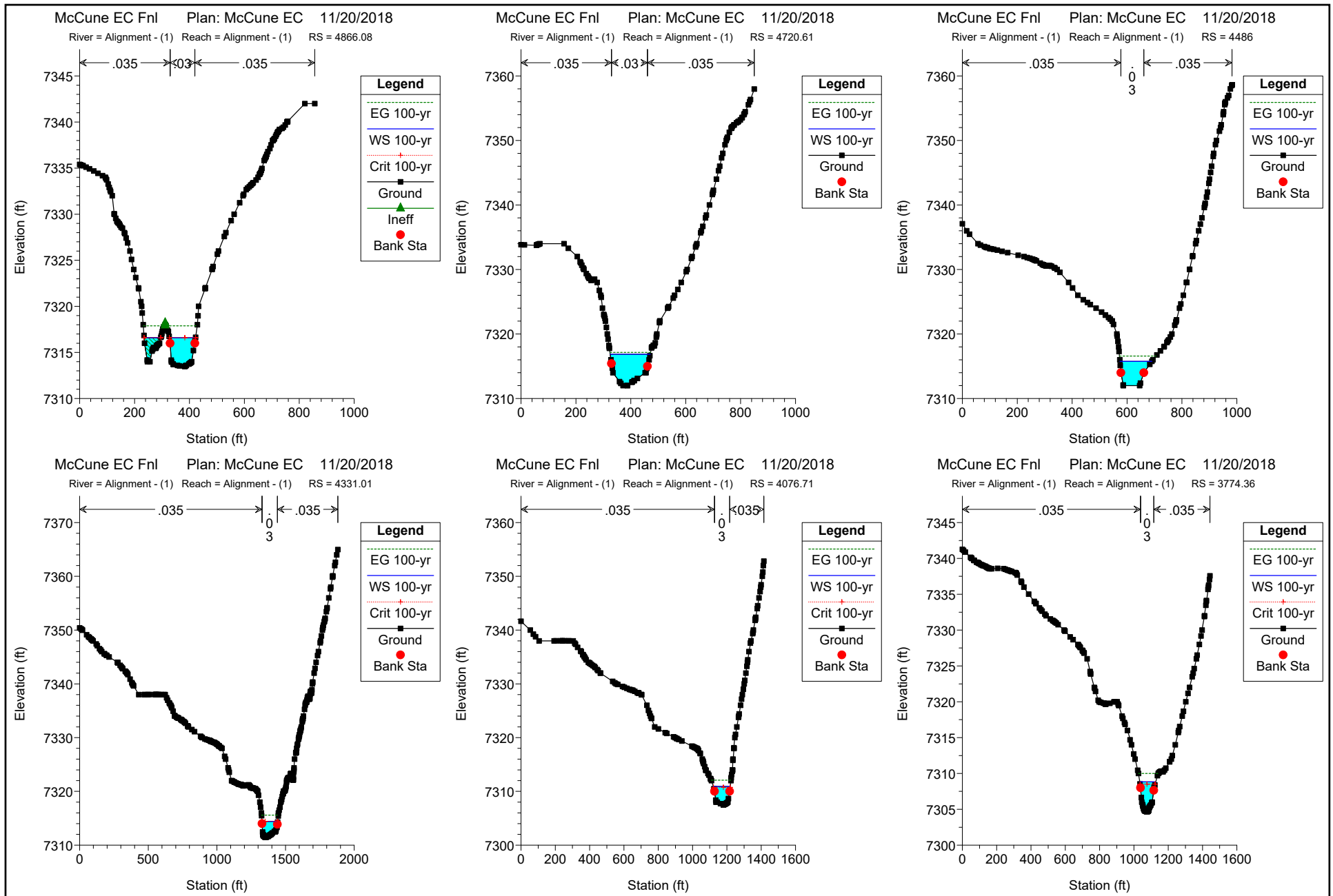
The Engineer shall consider various factors in determining permissible headwater depths such as backwater effects, possible flooding, embankment erosion, overtopping and public safety.

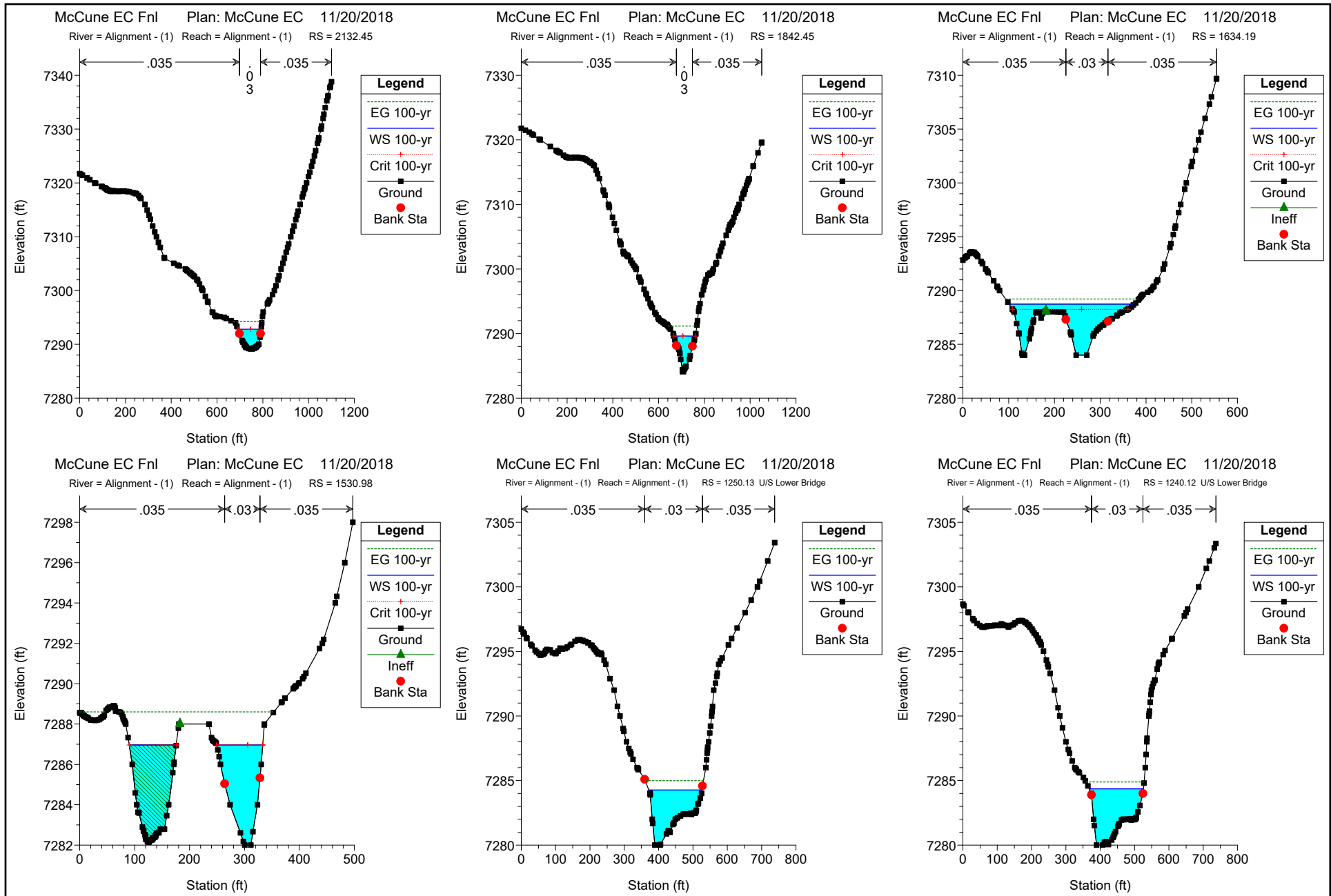
6.4.2 Allowable Clearance for Bridges and Other Major Drainageway Crossings

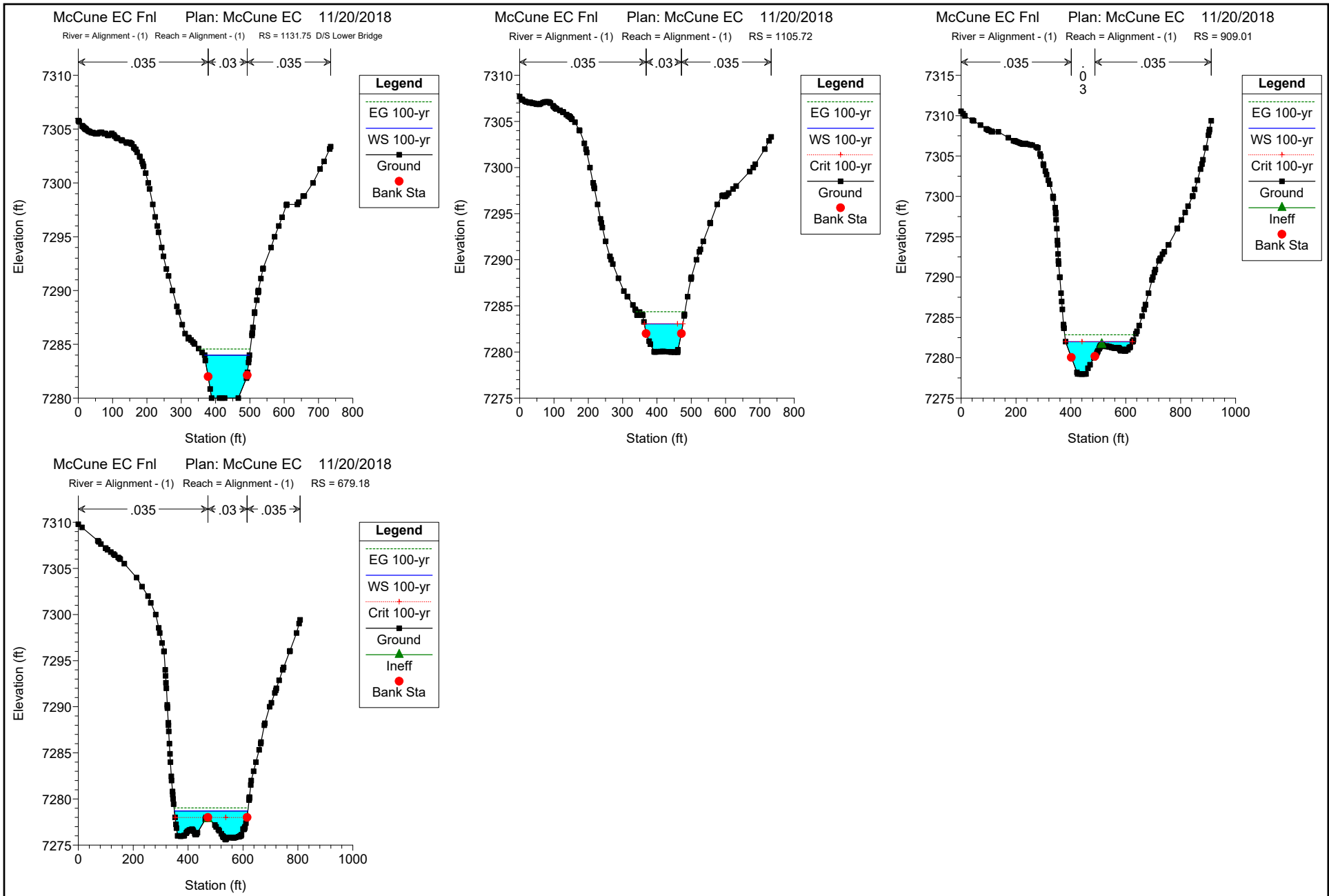
All structures classified as bridge shall not be overtopped. For clear span bridges, the minimum clearance between the bridge low chord and the water surface profile shall be a minimum of 2 feet for the 100-year design flow. For box culverts classified as bridges or culverts at major drainageways (100-year flows greater than 1500 cfs) adequate freeboard shall be provided for the passage of debris and should be no less than 2 feet.

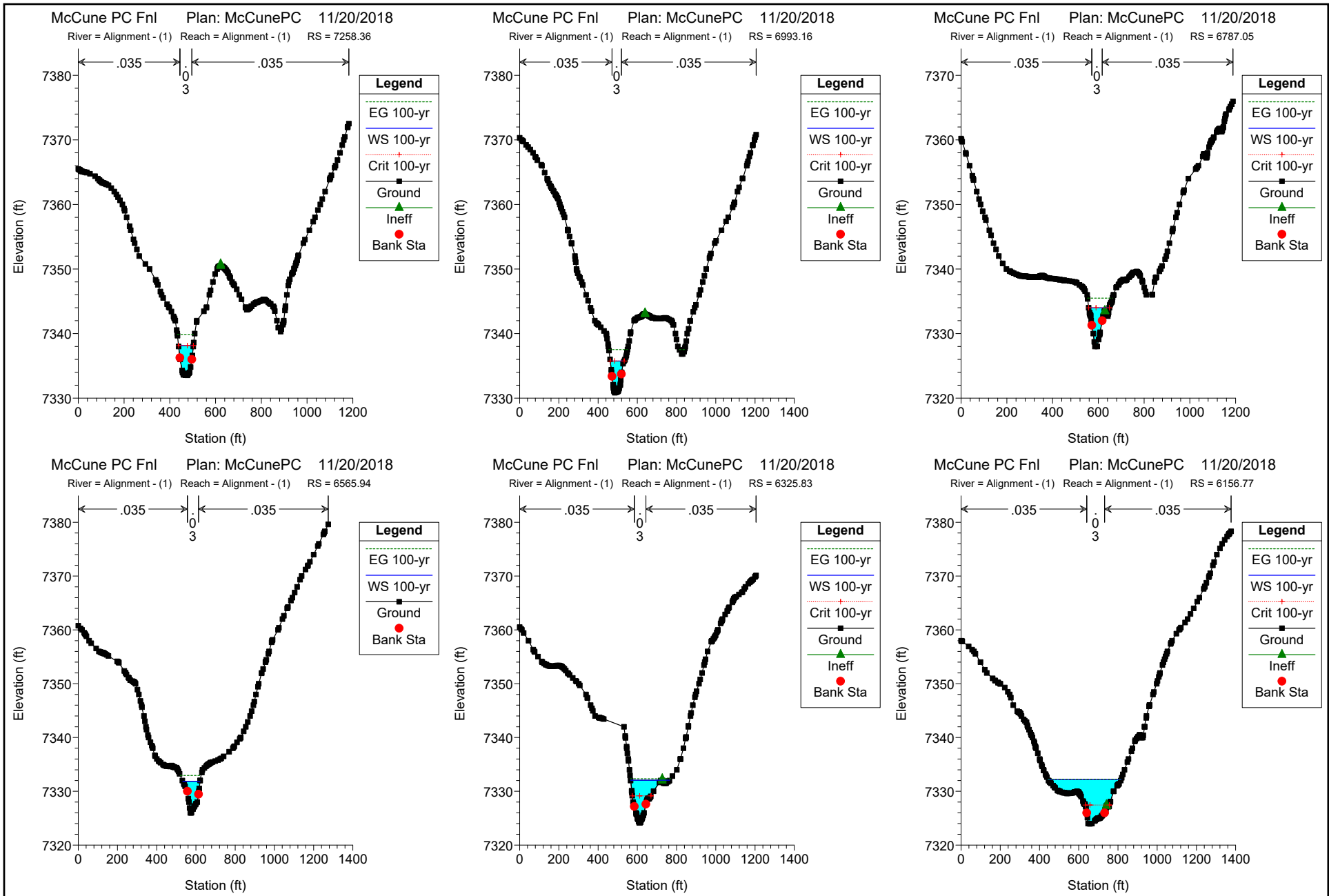


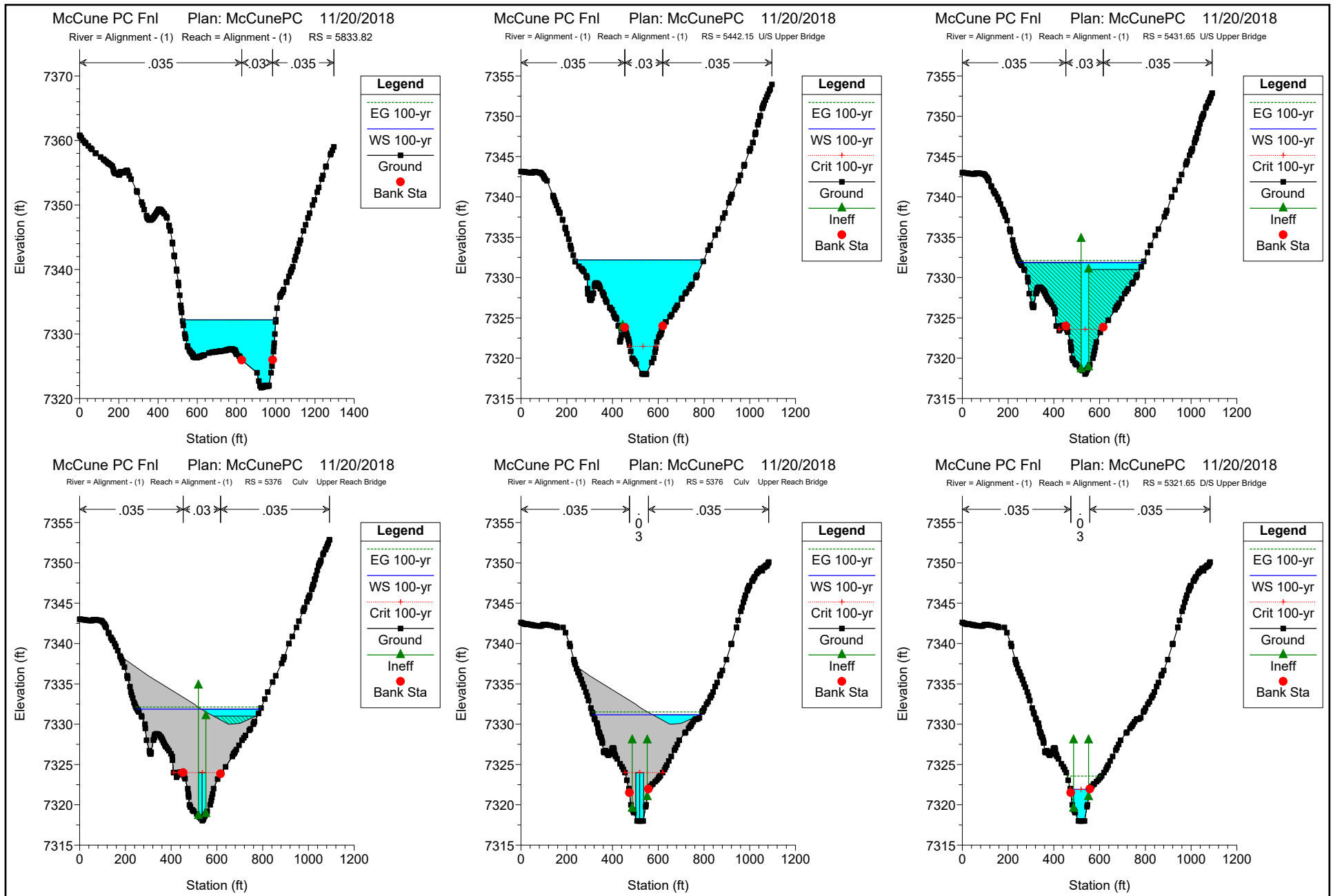


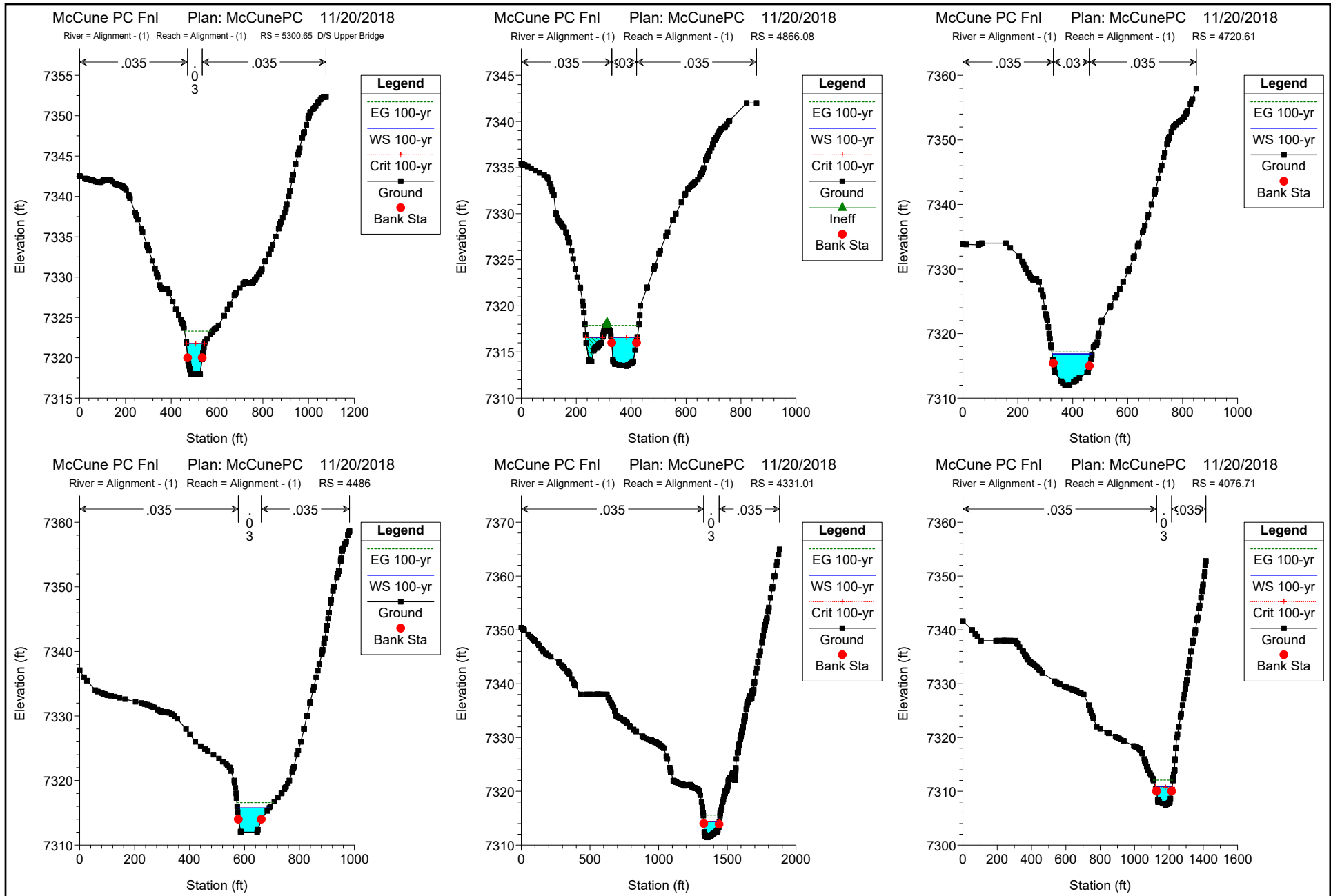


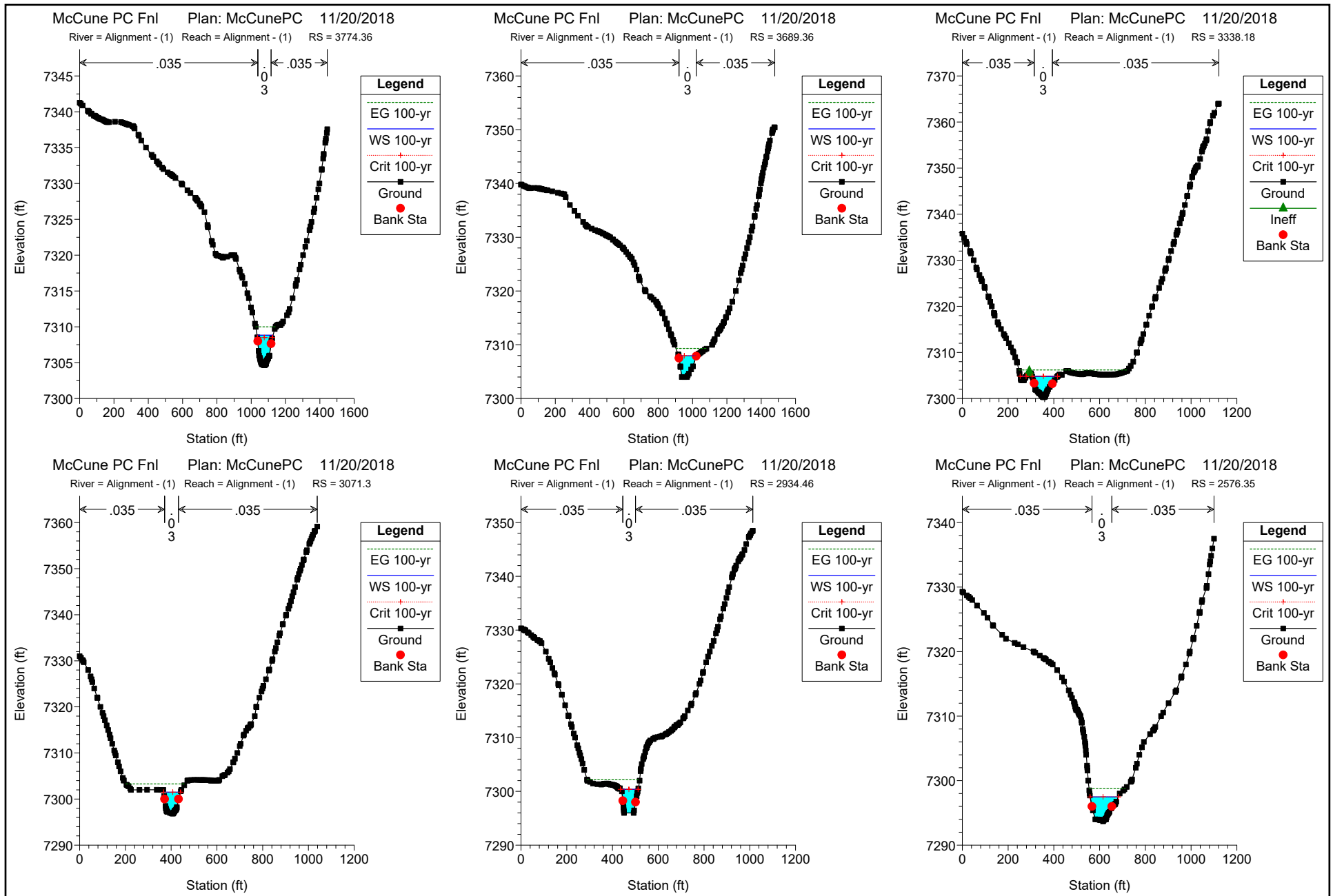


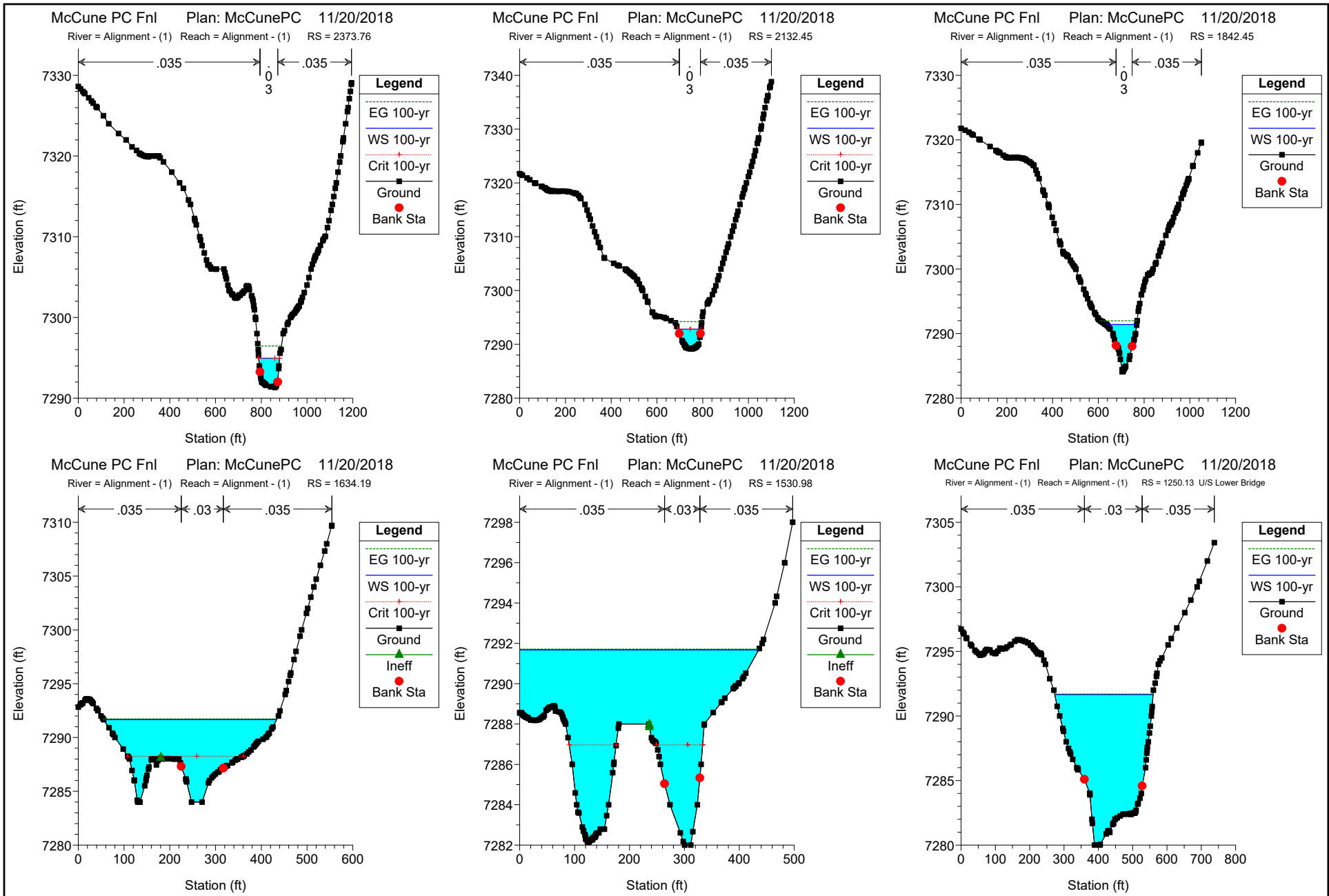


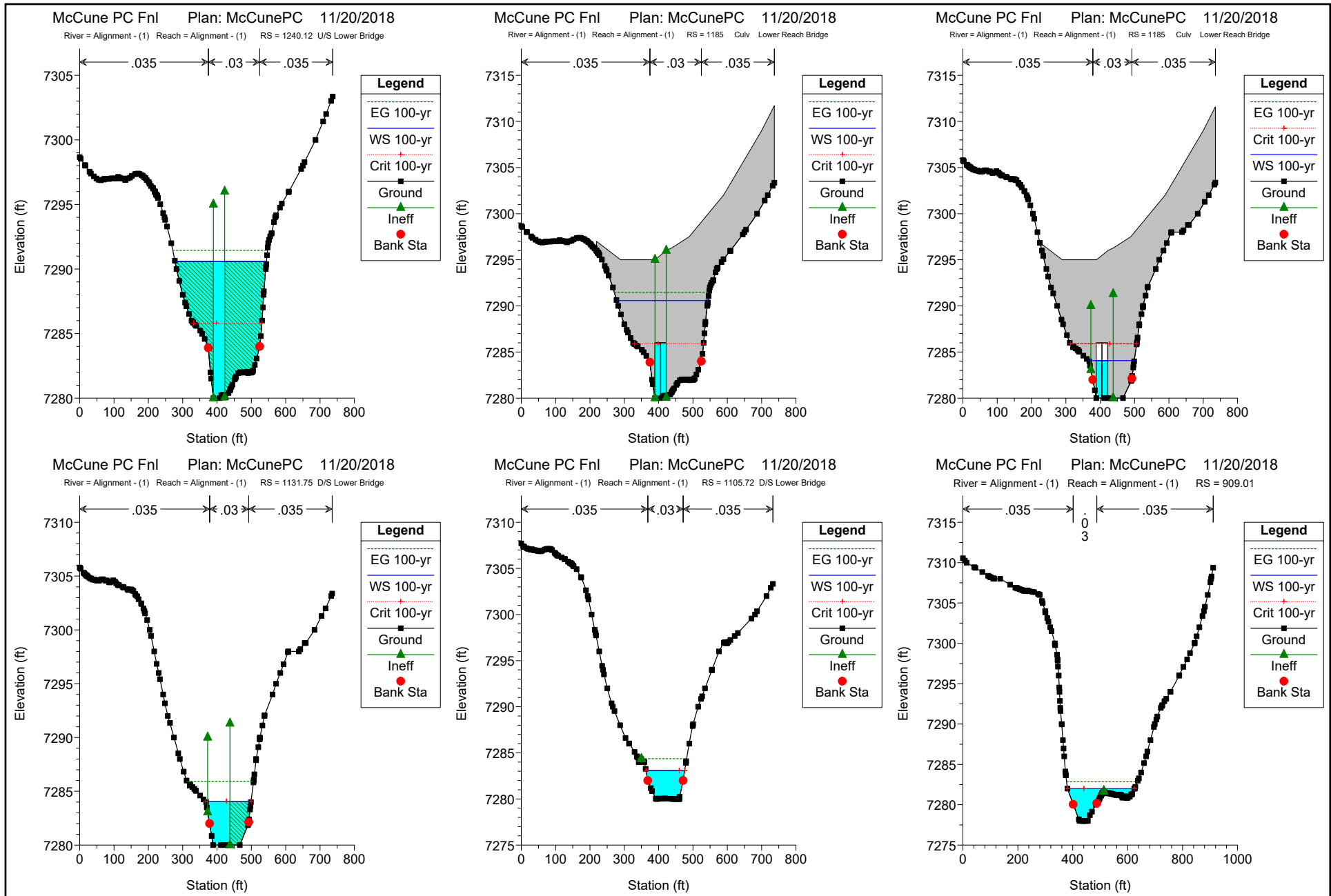




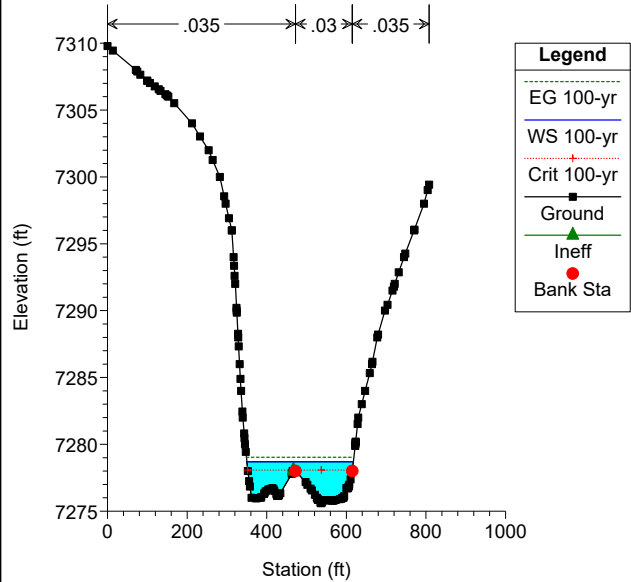




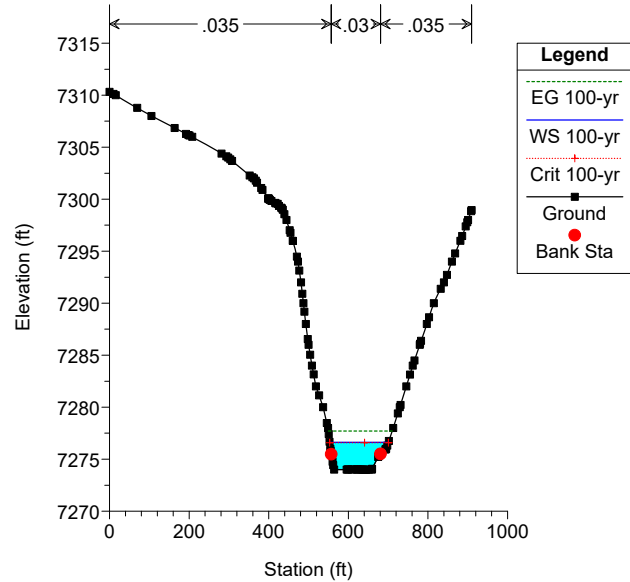




McCune PC Fnl Plan: McCunePC 11/20/2018
River = Alignment - (1) Reach = Alignment - (1) RS = 679.18



McCune PC Fnl Plan: McCunePC 11/20/2018
River = Alignment - (1) Reach = Alignment - (1) RS = 441.15



9. DAM FAILURE RISK ASSESSMENT

Attach the letter from the State Dam Safety Engineer dated January 22, 2019.

Jason Priddy -- Vertex

From: Jason Priddy -- Vertex
Sent: Wednesday, January 09, 2019 2:22 PM
To: Hunyadi - DNR, John
Cc: Joe DesJardin
Subject: RE: El Paso County Flood Control Ponds
Attachments: Winsome-DamFailureAnalysis-HEC.txt; Dam Break X-Sec.pdf; 49388-EXHIBIT-DamnFailure-1.pdf

John –

As we have discussed, attached is the floodplain analysis for the proposed Winsome Subdivision in El Paso County. With your input, we have modeled the largest of the three tributary reservoirs in our drainage basin. The reservoir is identified as 1-P-10 in the Kiowa Creek Watershed and your calculations gave us a dam failure flow rate of 9500 CFS.

The 9500 CFS surge was modeled with HEC RES at 32 sections points across the reach of this project. Attached is:

1. The HEC RAS output file with all of the model information.
2. Section cut data at each of our cross sections.
3. A site plan showing the subject floodplain area (shaded in blue), and the location of our section lines.

The represented area is the wetted perimeter of the floodplain, not the 2' allowable depth limit. It is our intent to stay completely out of this wetted area and avoid any dam risk reclassification. To achieve this, easements have been placed on the corner of lots 24 & 64 creating no-build areas. No other lots were impacted.

Please let me know if you have any questions, or if I can provide you with additional information. After your review and acceptance, if you could please provide an approval letter we will make that part of our submittal to the County.

Thank you,

Jason Priddy

Jason Priddy MArch, LEED AP

ENGINEER II – CIVIL ENGINEERING

O: 303.623.9116 | D: 720.458.1575 | C: 303.601.0147 | VERTEXENG.COM

THE VERTEX COMPANIES, INC.
2420 W. 26TH AVE., SUITE 100-D
DENVER, CO 80211

From: Hunyadi - DNR, John <john.hunyadi@state.co.us>
Sent: Tuesday, January 08, 2019 7:00 AM
To: Jason Priddy -- Vertex <jpriddy@vertexeng.com>
Cc: Joe DesJardin <JDesJardin@proterraco.com>
Subject: Re: El Paso County Flood Control Ponds

Good Morning Jason,

Good news! I really appreciate your foresight in contacting me in this matter, I think this was a clean solution for all involved well down the road. I would accept all items you mentioned including the large HEC-RAS export as we do most everything digitally anyhow, so it is good to have the documentation. I don't think there is a specific need for the documents to be stamped in this case.

Thanks again. Good luck with your project.

John H.

John Hunyadi, PE | Dam Safety Engineer

State of Colorado | 4255 Sinton Road, CO Springs, CO

T: 719.227.5294 | C: 719.258.0859

john.hunyadi@state.co.us

On Fri, Jan 4, 2019 at 11:43 AM Jason Priddy -- Vertex <jpriddy@vertexeng.com> wrote:

John –

I left you a voice mail yesterday and just following up here. We have completed the model for the largest of the 3 reservoirs (9500 cfs) having a “sunny day” damn breach. It is less impactful than I would have expected and is almost completely handled within the dedicated open space of the development. Our client is comfortable adding “no build” easements to the 2 impacted lots that would be touched in the model, preserving the low risk hazard level of the dams.

I want to provide you with all the information you need without overloading you in paperwork. I have a site plan with the flood plain line, and sections from the HEC RAS hydraulic model at intervals down the reach of the project. Please let me know if you would like to see the full HEC RAS export (100+ pages), and also if you need the plan to be signed and stamped.

Appreciate your help on this. Regards,

Jason Priddy

Jason Priddy MArch, LEED AP

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THE VERTEX COMPANIES, INC.

2420 W. 26TH AVE., SUITE 100-D

DENVER, CO 80211

From: Hunyadi - DNR, John <john.hunyadi@state.co.us>

Sent: Friday, December 28, 2018 1:27 PM

To: Jason Priddy -- Vertex <jpriddy@vertexeng.com>

Subject: Re: El Paso County Flood Control Ponds

Hi Jason,

Thanks for the information. Couple things.

1. I was incorrect on the ownership of these structures earlier. These are owned by the Kiowa Creek Soil Conservation District. I will have to find out the latest contact information for that group as they should be aware of this discussion in addition to El Paso County.
2. I just ran some quick calculations based on the size of these structures and developed the following peak breach discharges at each dam. I did not complete any routing in these areas as I have not obtained any kind of quality DEM information. I am not certain how these peaks compare to the 100 year discharges you developed in this area.
3. Depending on if they are near or above your 100 year and more importantly if they affect any of your planned lot/home development, then yes, these dam are at risk of hazard creep. It would be beneficial if the County, developer, yourself, dam owner Kiowa Conservation rep, and myself had a meeting/call to be aware of the risks and requirements of this and use this as a planning effort to try and plan lot development to negate potential hazard creep.

Rough Estimated values for peak breach dam discharges at the following dams.

1-N-10 - 5,300 cfs

1-P-10 - 9,500 cfs

1-P-20 - 2,500 cfs

Thanks for the call. Let me know how these values compare to what you know about the channel capacity. I have attached the drawings for the 3 structures.

Thanks,

JEH

John Hunyadi, PE | Dam Safety Engineer

State of Colorado | 4255 Sinton Road, CO Springs, CO

T: 719.227.5294 | C: 719.258.0859

john.hunyadi@state.co.us

On Fri, Dec 28, 2018 at 12:57 PM Jason Priddy -- Vertex <jpriddy@vertexeng.com> wrote:

John –

Thank you for taking the time to speak with me earlier. As we discussed, we have a proposed development in El Paso County that is downstream from 3 ponds notated with state ID numbers. They are listed as 1:N:10, 1:P:10, and 1:P:20. You mentioned that they are likely jurisdictional, put in by NRCS after the 1965 floods in that area. Further, the ponds are currently jointly owned by El Paso County and the County Soil Conservation District. I understand these ponds likely have a current low hazard classification.

As we discussed, I am attaching some information to give you an overview of the project, but if you need additional drainage model information just let me know. We have modeled the 100Y floodplain and have that linework on the plans. The floodplain line would be conservative as it is not taking into account these upstream ponds. The floodplain area in the proposed development is in dedicated open space and being left in a natural condition.

For our submittal, we need your determination if:

- 1.The risk hazard needs to be adjusted due to “hazard creep”.
- 2.A breach analysis is going to be required for any of these ponds.

Appreciate your help. Regards,

Jason Priddy

Jason Priddy MArch, LEED AP

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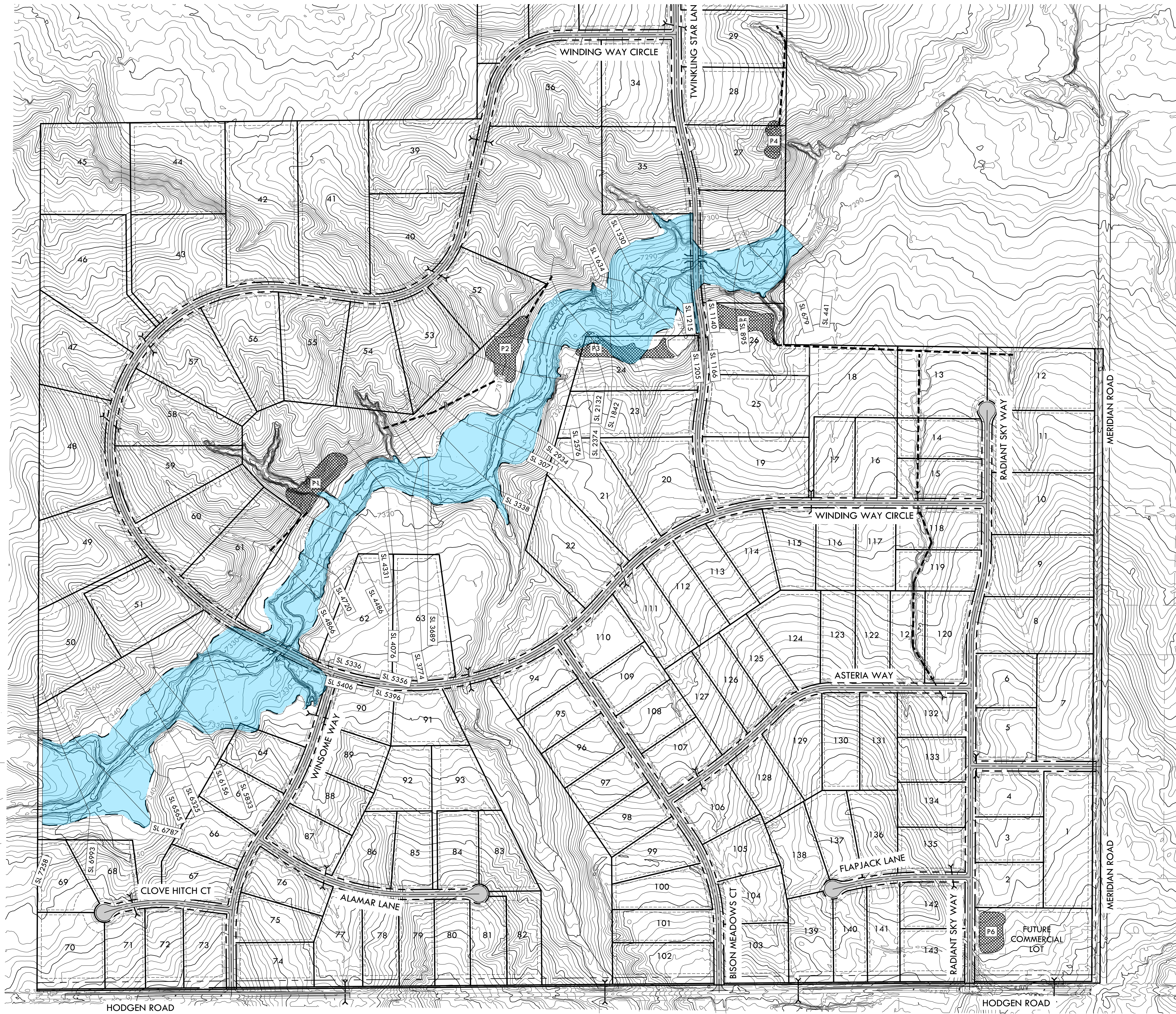
DENVER, CO 80211

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DAM RISK ASSESSMENT WINSOME SUBDIVISION

A PARCEL OF PROPERTY LOCATED IN SECTIONS 13 & 24, TOWNSHIP 11 SOUTH, RANGE 65 WEST OF THE 6TH P.M. AND IN THE WEST HALF OF THE WEST HALF OF SECTION 19, TOWNSHIP 11 SOUTH, RANGE 64 WEST OF THE 6TH P.M., COUNTY OF EL PASO, STATE OF COLORADO



P:\Projects_49000_49999_49388_49388\49388-EXHIBIT-DamRiskAssessment.dwg
 Wednesday, January 09, 2019 1:51:34 PM
 Copyright © 2019 The Vertx Companies, Inc.

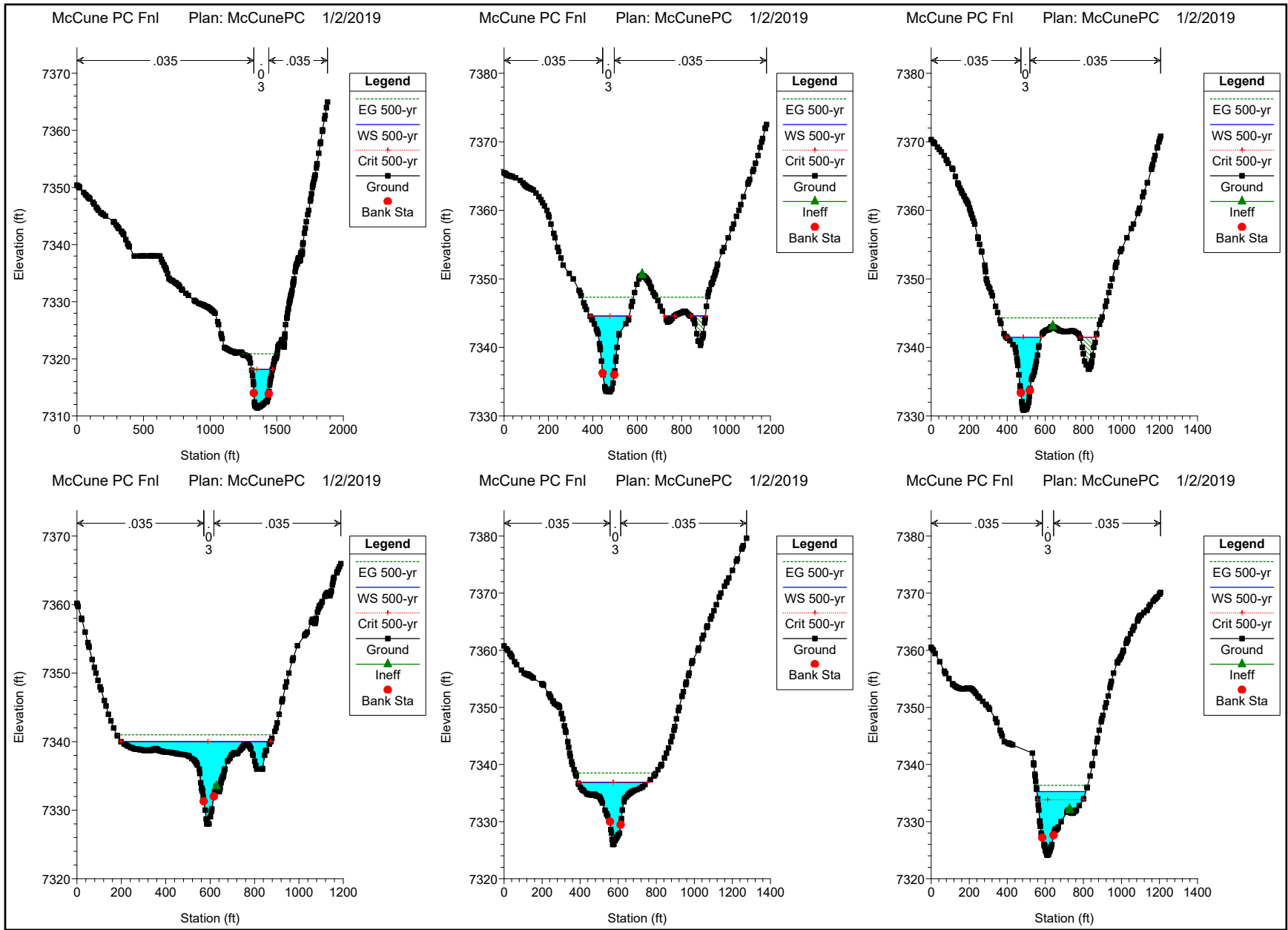
VERTIX[®]
 2420 W. 26th Avenue, Suite 100-D | Denver, CO 80211
 Main: 303.623.9116 | VERTEXENG.COM

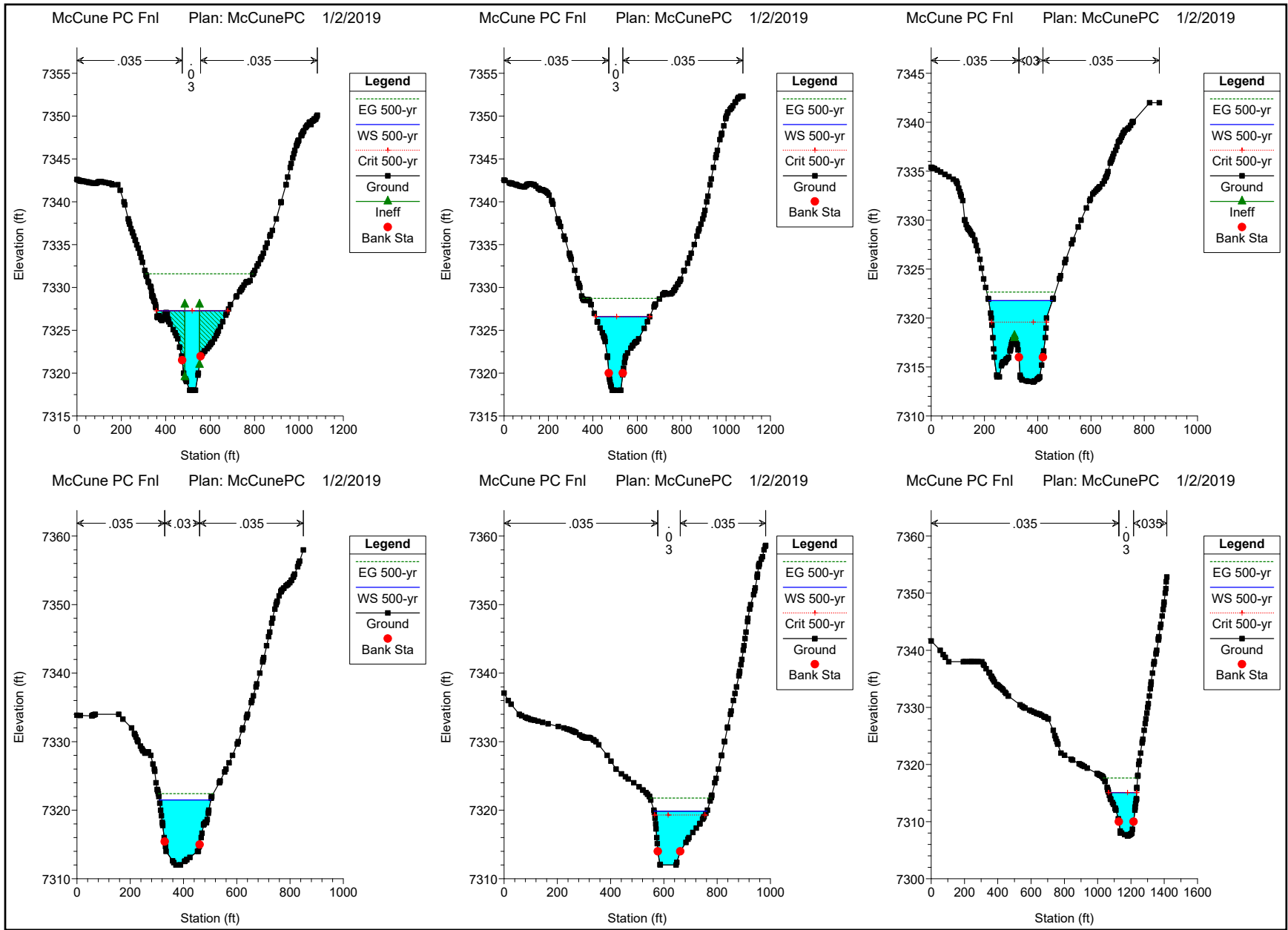
9500 CFS DAM FAILURE FLOODPLAIN
 SITE: 17480 MERIDIAN ROAD
 ELBERT, COLORADO 80106
 FOR: PT MCCUNE, LLC
 1864 WOODMORE DR, SUITE 100
 MONUMENT, COLORADO 80132

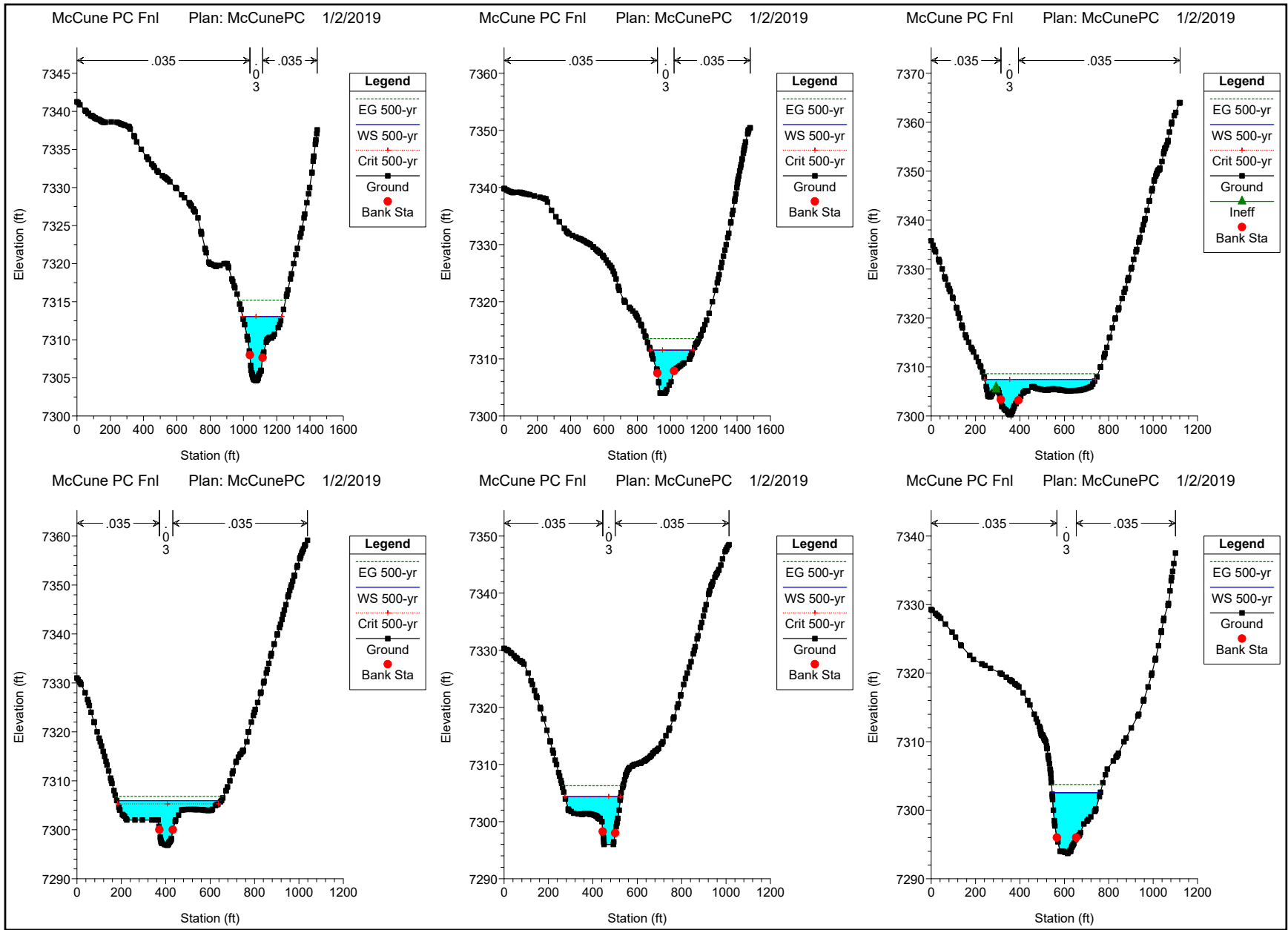
NO.	REVISIONS
1	
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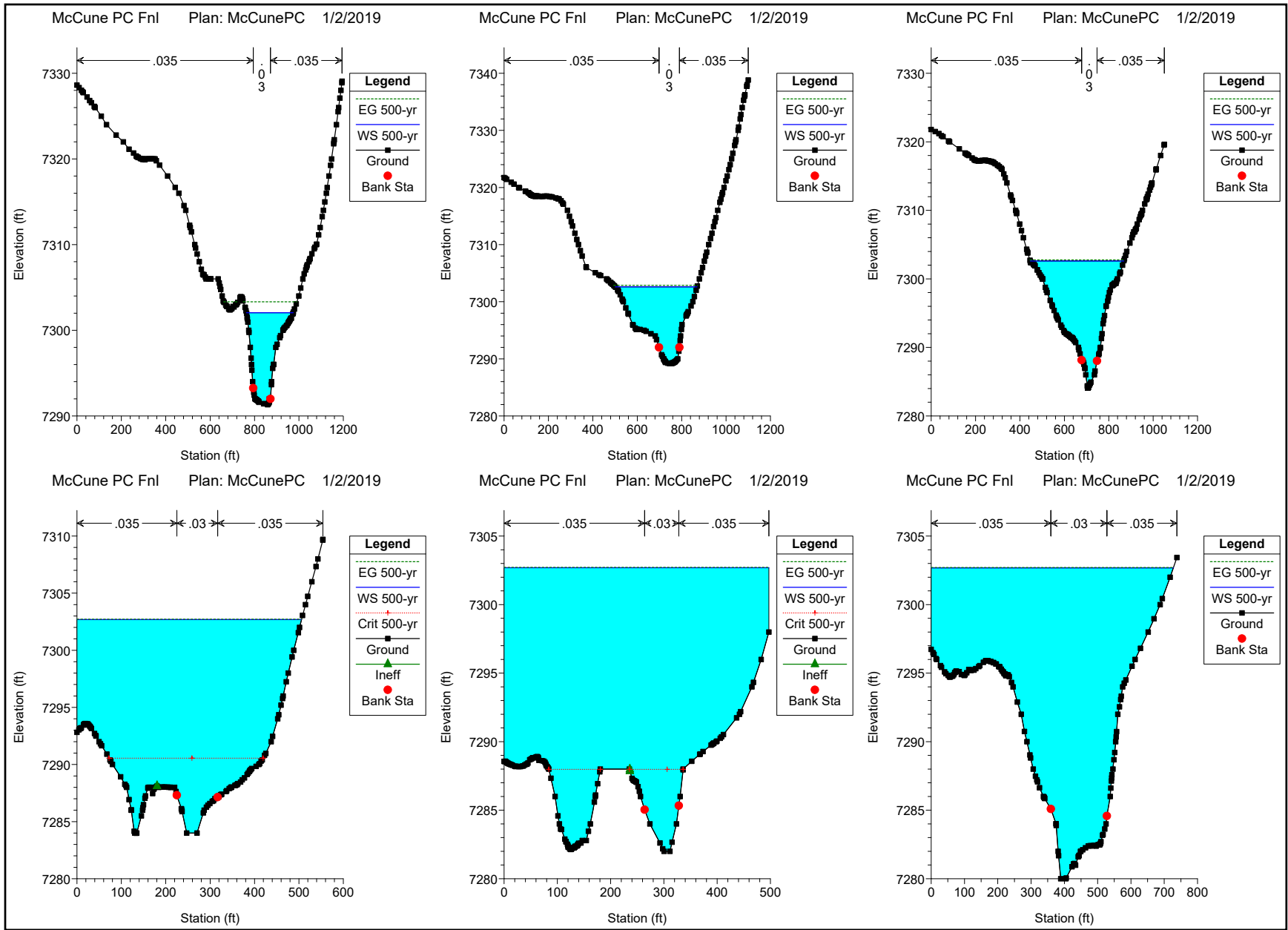
DATE: 1/4/19
 DRAWN BY: JCP
 CHECKED BY: LPV
 JOB #: 49388

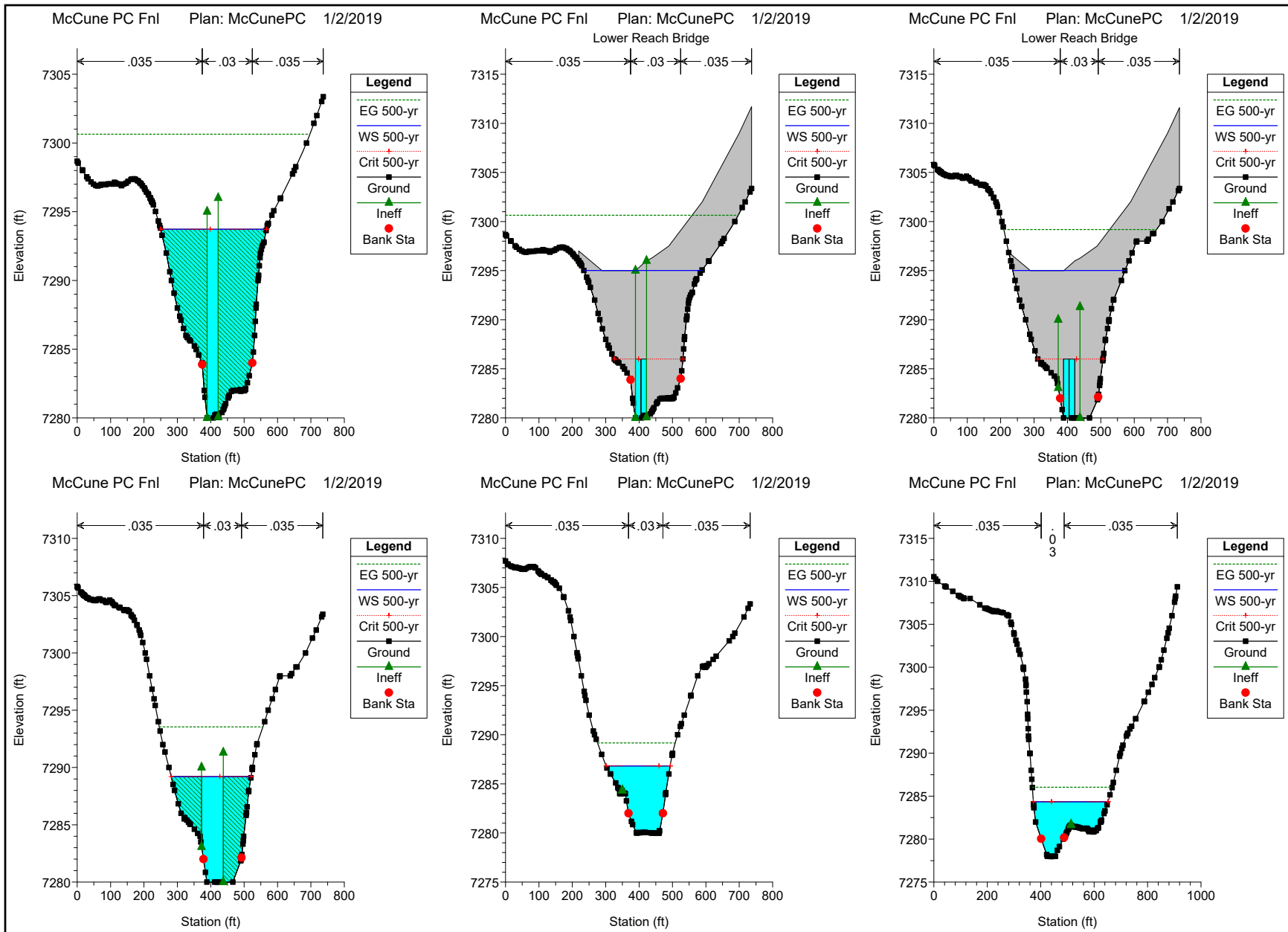


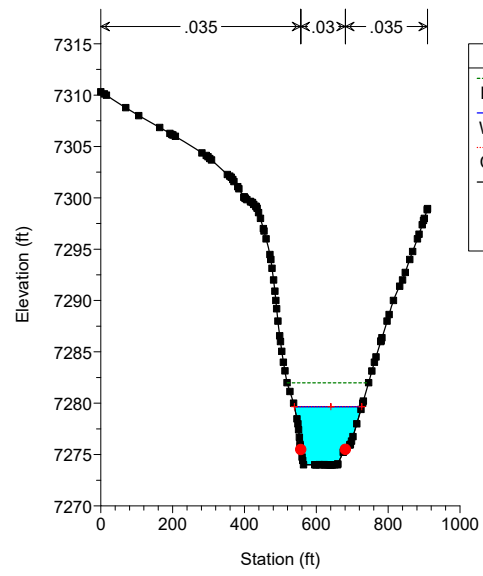
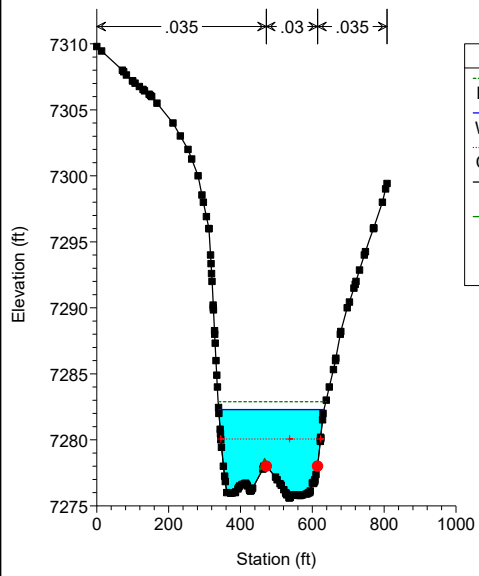












10. SITE PHOTOGRAPHS







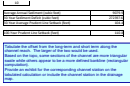




11. DRAINAGE PLANS

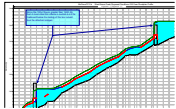
Markup Summary

dsdlaforce (71)



Subject: Text Box
Page Label: 7.0 - 49388-Prudent Line Calcs
Author: dsdlaforce
Date: 2/11/2019 10:03:17 AM
Color: ■

Tabulate the offset from the long-term and short term along the channel reach. The larger of the two would be used.
Based on the topo, some sections of the channel are more triangular swale while others appear to be a more defined bankline (rectangular computation).
Provide an exhibit for the corresponding channel station on the tabulated calculation or include the channel station in the drainage map.



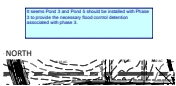
Subject: Callout
Page Label: 8.3 - 49388 - PC 100YR Profile
Author: dsdlaforce
Date: 2/11/2019 10:50:43 AM
Color: ■

Since the 100yr flow is greater than 1500 cfs, then it must meet the criteria in section 6.4.2 for freeboard below the ceiling of the box culvert. See the attached snippet.

Predeveloped Flowrate (cfs)	Peak Outflow (cfs)	Ratio of Peak Outflow to Predeveloped Flowrate
1500	2000	1.33
1500	2500	1.67
1500	3000	2.00
1500	3500	2.33

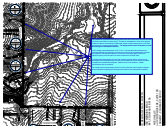
Subject: Callout
Page Label: 0.02 - 49388_Drainage Report 26
Author: dsdlaforce
Date: 2/11/2019 11:01:16 AM
Color: ■

Since the report noted over-detention, place a column identifying the ratio of Peak Outflow to predeveloped flowrate.



Subject: Text Box
Page Label: 49388-PD-Drainage_Proposed - ZOOM-SOUTH
Author: dsdlaforce
Date: 2/11/2019 11:04:25 AM
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It seems Pond 3 and Pond 5 should be installed with Phase 3 to provide the necessary flood control detention associated with phase 3.



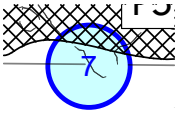
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Page Label: 49388-PD-Drainage_Proposed - ZOOM-NORTH
Author: dsdlaforce
Date: 2/11/2019 12:40:18 PM
Color: ■

The response to comments noted design points have been removed for the PDR and will be included in the FDR for culvert sizing. This will be acceptable for some of the internal locations. However the following locations will need to include design points in the PDR and provide the corresponding narrative. The design points must correspond on both the existing and developed condition.

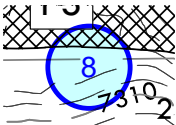
For the design points downstream of E7, F1 & I2. The narrative should discuss the proposed drainage plan (diversion of flows) and its impact to the downstream property. Also address in the narrative whether or not there is any water rights issue to the adjacent property since the plan is to divert runoff from its historic path.

For design point downstream of I2 and H9, hydraulic analysis will be required in the subsequent Final Drainage Report from the pond outfall to the creek ensure the offsite conveyance is hydraulically adequate. State as such in the narrative. (Offsite improvements may be required)

The overall intent for these design points is so the report has a direct apples to apples visual comparison regarding the developments impact to the downstream properties.



Subject: Engineer
Page Label: 49388-PD-Drainage_Proposed - ZOOM-NORTH 7
Author: dsdlaforce
Date: 2/11/2019 12:41:43 PM
Color: ■

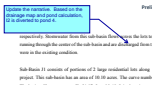


Subject: Engineer
Page Label: 49388-PD-Drainage_Proposed - ZOOM-NORTH 8
Author: dsdlaforce
Date: 2/11/2019 12:41:44 PM
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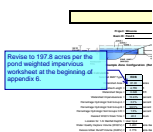
Subject: Callout
Page Label: 0.02 - 49388_Drainage Report 21
Author: dsdlaforce
Date: 2/11/2019 9:06:33 AM
Color: ■

Topography does not show a natural drainage channel running through the center of the subbasins H8 & I1.



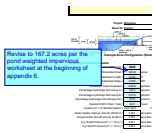
Subject: Callout
Page Label: 0.02 - 49388_Drainage Report 22
Author: dsdlaforce
Date: 2/11/2019 9:07:40 AM
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Update the narrative. Based on the drainage map and pond calculation, I2 is diverted to pond 4.



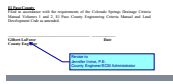
Subject: Callout
Page Label: 6.9 - UD-Detention - P5-1
Author: dsdlaforce
Date: 2/11/2019 9:28:33 AM
Color: ■

Revise to 197.8 acres per the pond weighted impervious worksheet at the beginning of appendix 6.



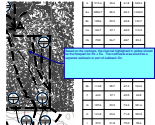
Subject: Callout
Page Label: 6.5 - UD-Detention - P3-1
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Date: 2/11/2019 9:28:46 AM
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Revise to 167.2 acres per the pond weighted impervious worksheet at the beginning of appendix 6.



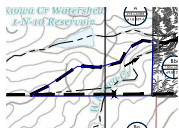
Subject: Callout
Page Label: 2
Author: dsdlaforce
Date: 2/5/2019 2:36:49 PM
Color: ■

Revise to
 Jennifer Irvine, P.E.
 County Engineer/ECM Administrator

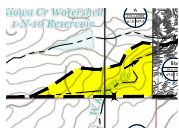


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 EXISTING DRAINAGE PLAN - OVERALL
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Date: 2/6/2019 10:21:30 AM
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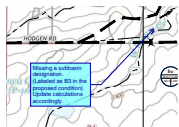
Based on the contours, the channel highlighted in yellow should be the flowpath for Eb + Ea. The northwest area would be a separate subbasin or part of subbasin Dc.



Subject: PolyLine
Page Label: 49388_Winsome - DrainagePlans [1] C1.1
 EXISTING DRAINAGE PLAN - OVERALL
Author: dsdlaforce
Date: 2/6/2019 10:33:03 AM
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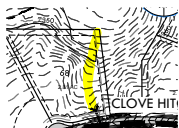


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Author: dsdlaforce
Date: 2/6/2019 10:33:41 AM
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Subject: Callout
Page Label: 49388_Winsome - DrainagePlans [1] C1.1
 EXISTING DRAINAGE PLAN - OVERALL
Author: dsdlaforce
Date: 2/6/2019 10:34:38 AM
Color: ■

Missing a subbasin designation. (Labeled as B3 in the proposed condition)
 Update calculations accordingly.



Subject: Highlight
Page Label: 49388-PD-Drainage_Proposed - ZOOM-SOUTH
Author: dsdlaforce
Date: 2/6/2019 10:37:38 AM
Color: ■

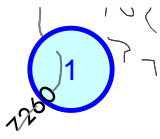


Subject: Callout
Page Label: 49388-PD-Drainage_Proposed - ZOOM-SOUTH
Author: dsdlaforce
Date: 2/6/2019 10:38:05 AM
Color: ■

Provide a drainage easement.



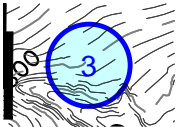
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Author: dsdlaforce
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Subject: Engineer
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Author: dsdlaforce
Date: 2/6/2019 11:10:42 AM
Color: ■



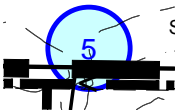
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Author: dsdlaforce
Date: 2/6/2019 11:10:44 AM
Color: ■



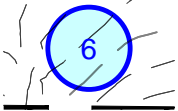
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Date: 2/6/2019 11:10:45 AM
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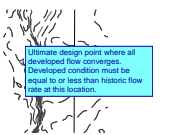
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Author: dsdlaforce
Date: 2/6/2019 11:10:46 AM
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Author: dsdlaforce
Date: 2/6/2019 11:10:47 AM
Color: ■

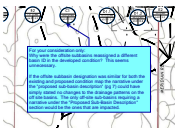


Subject: Engineer
Page Label: 49388-PD-Drainage_Proposed - ZOOM-NORTH 6
Author: dsdlaforce
Date: 2/6/2019 11:10:49 AM
Color: ■



Subject: Text Box
Page Label: 49388-PD-Drainage_Proposed - ZOOM-NORTH
Author: dsdlaforce
Date: 2/6/2019 11:12:42 AM
Color: ■

Ultimate design point where all developed flow converges. Developed condition must be equal to or less than historic flow rate at this location.



Subject: Callout
Page Label: 49388-PD-Drainage_Proposed-PROPOSED DRAINAGE
Author: dsdlaforce
Date: 2/6/2019 5:02:00 PM
Color: ■

For your consideration only:
Why were the offsite subbasins reassigned a different basin ID in the developed condition? This seems unnecessary.

If the offsite subbasin designation was similar for both the existing and proposed condition map the narrative under the "proposed sub-basin description" (pg 7) could have simply stated no changes to the drainage patterns on the off site basins. The only off-site sub-basins requiring a narrative under the "Proposed Sub-Basin Description" section would be the ones that are impacted.

Add the G1 subbasin symbol

and offsite residential lot