

July 20, 2023

TO:

Joanna Bowes, Town of Perth Glen McDonald, Rideau Valley Conservation Authority Terry McCann, County of Lanark, Public Works Department Stephen Kapusta, Ministry of Transportation

RE: Re-submission of a Draft Plan of Subdivision

Part Southwest Half and Part Northeast Half Lot 3, Concession 2, Geographic Township of Drummond, being Part 1 on 27R-7125 and Part 1 on 27R-8420 except PL88, 27M-3, 27M-14, 27M-16, 27M-21, 27M-55 and Parts 3, 4 on 27R-7540, now in the Town of Perth, County of Lanark

County of Lanark File No. 09-T-21001 Perthmore Phase 6

The County of Lanark received a re-submission of a Draft Plan of Subdivision for Perthmore Phase 6.

The following provides a summary of the proposed revised application as included within the Planning Rationale Report, dated June 20, 2023:

- Updated draft plan now includes a 30m setback from the PSW;
- Draft plan reduced in scope with respect to land and road development (previously proposed municipal arterial roadway is no longer shown or referenced);
- Proposed development now includes a medium density apartment dwelling on Block 54;
- Preliminary overall concept plan has been prepared that shows the current proposal within the context of previous and future phases of the Perthmore development;
- Lands to the northeast of the subject lands, and to the rear of lots 34 to 48, are no longer considered for development; and
- Proposed parkland on Block 57 has been enlarged to ensure that parkland dedication requirements have been satisfied

The following reports have been included in the re-submission and are provided for your review:

- Status Letter from the County of Lanark, dated February 22, 2023.
- Comment Response Letter from McIntosh Perry, dated June 23, 2023.
- Draft Plan of Subdivision, dated May 10, 2023.
- Planning Rationale Report, prepared by McIntosh Perry, dated June 20, 2023.
- Zoning Bylaw Amendment Sketch, prepared by McIntosh Perry, dated May 18, 2023.
- Environmental Impact Statement, prepared by McIntosh Perry, dated June 22, 2023.
- Preliminary Servicing & Stormwater Management Report, prepared by McIntosh Perry, dated June 23, 2023.
- Overall Concept Plan, prepared by McIntosh Perry, dated March 2023.

Should you have any questions or concerns, do not hesitate to contact me at 1-613-267-4200 Ext 1502 or realph@lanarkcounty.ca.

Yours truly,

Jasmin Ralph, MPA Clerk

cc: Maurice Decaria, owner Perthmore Enterprises Inc.
Vithulan Vivekanandan, McIntosh Perry
Benjamin Clare, McIntosh Perry
Grant Machan, Town of Perth
Michael Touw, CAO, Town of Perth
Kurt Greaves, CAO, County of Lanark
Algonquins of Ontario

June 23, 2023

Kristy Warwick Clerical Assistant Planning Lanark County 99 Christie Rd. K7H 3C6

Dear Ms. Warwick:

Re: Perthmore Subdivision Phase 6
Draft Plan of Subdivision (File No. 09-T-21001)
Zoning Amendment Application (File D14-PE-12-20)
Part Lot 3, Concession 2, Geographic Township of Drummond (Now Town of Perth)

This letter addresses the following comments received in response to the August 5, 2022 resubmission package in support of the Draft Plan of Subdivision application, received February 23, 2023.

- Rideau Valley Conservation Authority
 - Natural Hazards, O.Reg 174-06, Source Protection Comments dated February 23, 2023.
 - Stormwater Management Comments dated December 20, 2022, revised February 14, 2023.
 - Planning and Engineering Technical Review Memorandum, dated February 10, 2023.
- Town of Perth
 - Environmental Services Comments dated October 7, 2022.
 - Development Services Comments, undated.
- Agency Comments
 - Hydro One, dated September 22, 2022.
 - Enbridge, dated April 5, 2021.
 - Ministry of Transportation, dated September 28, 2022
- Compiled Public Comments, dated October 6, 2022.

Please note that this comment response is also intended to address comments related to the Zoning By-law Amendment application provided by the Town of Perth and others. Accordingly, Town staff have been circulated on this resubmission.

The following plans and reports, which have been prepared or updated in order to address comments received, are submitted together with this comment-response letter.

- Comment Response Letter
- Revised Planning Rationale
- Revised Stormwater Management Report
- Revised Environmental Impact Study
- Overall Concept Plan
- Revised Draft Plan
- Revised Zoning By-law Amendment Sketch

Our office's responses to comments received are provided within the paragraphs below.

RIDEAU VALLEY CONSERVATION AUTHORITY

Natural Hazards, O.Reg 174-06, Source Protection Comments dated February 23, 2023

Ontario Regulation 174/06

1. As addressed in previous comments the majority of the subject property is located within areas regulated by RVCA in accordance with Ontario Regulation 174/06. This regulation is titled "Development, Interference with Wetlands, Alterations to Shoreline and Watercourses" and is made under Section 28 of the Conservation Authorities Act. In considering development within the 120-metre adjacent lands of a regulated wetland RVCA's policies state that development may be permitted if "it has been determined that there is no interference with the hydrologic functions of the wetland or that the impacts to hydrologic function are mitigated in a manner acceptable to the RVCA."

It is understood approval of a revised wetland boundary by MNRF is pending. Our office would recommend that before any application is approved by either the subdivision or zoning approval authority that there be clarification of the status of the boundary and confirmation of the regulatory boundaries of both the PSW and floodplain and their respective setbacks. This will provide confirmation of the floodplain and wetland boundaries within which development is not permitted, and which lots may require development permits from the Conservation Authority due to encroachment into the 120 metre adjacent lands.

MP Response: Further to October 20, 2022 correspondence from the MNRF, the Provincially Significant Wetland boundary has been updated. Accordingly, the draft plan has been revised to show the updated boundary. The 1:100-year regulatory floodplain obtained from the RVCA is also now shown on the plans.

Planning Rationale

1. The report indicates that zoning will go from R1 and EP to R3 and R4, it is noted that the lots indicated on the zoning schedule (Appendix B) are not consistent with those indicated with the draft plan of subdivision, specifically blocks 59 and 58.

MP Response: The Zoning By-law Amendment sketch has been revised to correspond with the latest iteration of the Draft Plan of Subdivision.

2. The rationale provides that an updated Preliminary Servicing and Stormwater Management Report includes a water balance analysis to address 1.6.6.7 of the PPS. A review from technical staff indicated that it is not demonstrated how the water balance has been utilized to develop the stormwater management plan, it is also noted that low-impact development methods shou; d be integrated within the stormwater management plan. Clarification is required within both the EIS and water balance to address cumulative impacts on the wetland.

MP Response: The EIS has been updated to address impacts on the wetland.

3. With respect to Section 5.3 of the Town's Official Plan, it is not clear that natural hydrological characteristics have been maintained as targets within the water balance to ensure that hydrologic functions/linkages are maintained.

MP Response: Site-specific water balance targets has been identified and Low Impact Developments are incorporated into Stormwater Management plan to meet those targets.

Draft Plan of Subdivision

1. The boundary of the current and proposed boundary of the Perth Long Swamp PSW should be plotted on the draft plan as should the 120-metre adjacent lands.

MP Response: The setback on the draft plan has been revised so that it is consistent with the recommendations of the EIS. Specifically, the 30 metre setback is shown where development is proposed within 120 metres of the PSW.

2. The boundary of the 1:100-year regulatory floodplain and its 15 m regulatory setback should also be plotted on this plan.

MP Response: The 1:100-year regulatory floodplain is now shown on the draft plan.

3. The schedule of areas on the draft plan indicates Block 57 as a future street and Block 58 as parkland. However, Block 57 is also identified as parkland within the portion of the plan indicating the subdivision of lots. This should be updated for clarity.

MP Response: As shown on the revised Draft Plan of Subdivision, the Parkland will be located on Block 57. It should be noted that the current Draft Plan no longer contains Block 58.

4. It is understood that the arterial road indicated in the draft plan is no longer being pursued by the Town of Perth. The proposed road should be removed from the draft plan for clarity.

MP Response: The arterial road has been removed.

Discussion

In reviewing the submitted Draft plan of subdivision, Environmental Impact Statement and Preliminary Servicing and Stormwater Management Report the use of the "other lands owed by applicants" specifically the lands east of lots 34-48 and west of lots 49-54 is unclear and raises questions regarding future use.

MP Response: Additional lands owned by the proponent to the northwest will be subject to separate Planning Act applications and additional studies for future development. It should be noted that development is no longer proposed on the lands to the northeast.

A clear understanding of the use of these lands is required to address any cumulative impacts on the hydrologic function of the PSW and lands within the regulated area. Furthermore, without a clear understanding of the use of these lands, it is uncertain if potential hydrologic impacts, such as flooding, and erosion have been appropriately addressed with respect to section 1.6.6.7 of the PPS.

MP Response: Lands northeast of lots 34-48 are not being considered for future development. The lands northwest of lots 49-54 will be developed in the future and can be addressed generally in the cumulative impacts of the EIS however exact details are unknown at this time and should be addressed as part of future development. It is not expected that this development will impact the hydrologic function of the PSW.

Our office would reiterate that geotechnical information will be required to confirm that there are no risks associated with proposed future development or confirm that hazardous soils are not present or can be mitigated in accordance with provincial standards.

MP Response: Comment noted. A geotechnical investigation will be provided at the appropriate juncture.

Recommendations and Considerations

A discussion regarding the lands between the PSW and proposed lots, specifically lots 34-48 is
recommended and should consider the cumulative impact of any future development of the PSW and its
hydrologic function, the proposed wetland setback should be assessed with regard to any additional
impacts.

MP Response: Lands northeast of lots 34-48 are not being considered for future development. The lands northwest of lots 49-54 will be developed in the future and have been addressed generally in the cumulative impacts of the EIS however exact details are unknown at this time and should be addressed as part of future development. It is not expected that this development (lots 49-54) will impact the hydrologic function of the PSW. Consideration is being given as part of the subdivision plan to retain as

much of the rear yard vegetation as possible within lots 34 - 48. The subdivision has been redesigned so that no drainage features are required at the rear of these lots.

2. Identification of specific targets within the water balance to ensure hydrological functions are maintained, these targets should be addressed by the stormwater management plan. Low-impact development features should be integrated within the stormwater management design to achieve these targets. Additional details are provided within a technical review of the stormwater management report. Our office is available to discuss these details prior to any future revision.

MP Response: Site-specific water balance targets has been identified and an integrated Stormwater Management plan was developed incorporating Low Impact Developments to meet the identified water balance targets.

Preliminary Servicing and Stormwater Management Report

 The water budget assessment does not but should provide specific targets for the stormwater management plan. See related items from the April 2021 memo, including those about the preservation of wetland hydrology etc.

MP Response: Impacts of the proposed development on the wetland have been evaluated and mitigation measures are provided in form of Low Impact Developments.

Low impact development (LID) measures have not been but should be included directly in the stormwater management plan and design as per long-term direction from the province and current professional engineering standards. The current stormwater plan, which relies only on an end-of-pipe solution, is therefore insufficient.

- a. The referenced best practices (roof leaders and swales) are also insufficient to address the provinces requirements for a treatment-train approach. Additional LID should be included and they should not be considered separate best practices but integral to SWM.
- b. Water budget targets from above and types of LID would likely pertain to distributed infiltration, the preservation or creation and protection of specific types and sizes of pervious and vegetated areas, amended top-soils etc.

MP Response: A treatment train approach was implemented to incorporate the Low Impact Development designs into the overall Stormwater Management Strategy and Site-specific Water Balance.

2. There appears to be or may be conflict between the proposals for tree retention etc. and the location / design of LID. Further, easements will likely be required to maintain LID features.

MP Response: The Stormwater Management Plan has been revised to reflect the comment.

Additional Servicing and Stormwater Management Comments

 Many of the comments from RVCA's April 2021, memorandum remain valid and these should be considered once the water budget assessment is fully integrated into the stormwater management plan. This memorandum should therefore be considered in direction reference to RVCA's 2021 technical comments.

MP Response: The comments received from the Rideau Valley Conservation Authority in April 2021 were largely concerned with the proximity of development to the Provincially Significant Wetlands, and mapped floodplain. The current resubmission has considered and addressed previous comments received.

2. Given that the available water budget has not been used in the stormwater management plan, it has not been reviewed in any significant way at this time.

MP Response: The site-specific water balance targets has been identified and implemented into the overall SWM strategy.

3. It is noted that pages from another report (for a project in Metcalfe) were mistakenly included in the submission, so a full review could also not be completed for that reason.

MP Response: The report has been revised.

Planning and Engineering – Technical Review Memorandum

1. The bulk of the information contained in the revised EIS remains essentially the same as that in the original submission for the Perthmore Estates Subdivision Phase 6 (Dec. 18, 2020).

MP Response: Acknowledged.

2. This reviewer can accept this general conclusion but wishes to advise that this is dependent upon the applicant and his agents providing additional mitigation measures to minimize the effect of the reported loss upon the identified significant wildlife habitat/woodland; for example, retention of as much existing vegetation as is feasible within the rear yards of lots 34 through 48. Additionally, it is advised that any unavoidable loss of tree/vegetation cover should be compensated for, as noted in the revised EIS Section 5.3.1 (p.31) where, for example, it states that "It is proposed to off-set most or all of the loss of vegetation by planting within any under-vegetated areas within the proposed 30m-buffer adjacent to the Perth Long Swamp (for those areas within the revised plan of subdivision) and within non-functional areas of the Stormwater Pond block as wildlife habitat, where access is not required. Enhancing the RVCA File No. 21-PER-SUB-004 23 February 2023 Page 2 of 3 wetland buffers and creating habitat associated with the stormwater pond is expected to off-set the loss of primarily fringe habitat proposed for removal." It is further advised that all of the above is to be properly documented in a Tree-Vegetation Compensation/Saving Plan in keeping with the intent of the Town of Perth O.P. Policy 8.6.4.h.3.v. requiring identification of mitigation measures for the loss of natural heritage features.

MP Response: The EIS has been updated to include more specific wording. Plans to mitigate any unavoidable loss of tree/vegetation will be sought as a condition of draft plan approval.

3. The other important planning matter remaining unresolved is the revised EIS's silence about any future plans the applicant may have for those lands located between the proposed 30 m wetland buffer and Blocks 56, 57, 58 and Lots 34 through 48 shown on the revised draft plan of subdivision and labelled as "Other Lands Owned by the Applicant." This omission should be addressed now through an analysis of the cumulative impacts of the revised subdivision proposal along with any future development planned within this area identified as Significant Wildlife Habitat on EIS Figure 5.

MP Response: The subdivision has been redesigned to remove any development within the remainder of the significant woodlands/wildlife habitat.

4. Why propose and show a 30-metre wetland buffer on the revised draft plan of subdivision that will only provide protection to those areas located between Blocks 56 and 58, Street A and the provincially significant Perth Long Swamp? This would suggest that the applicant is intending to development this area and have pre-approval granted for a 30 meter buffer for subsequent development without such an analysis having been completed in advance of that occurring; this is considered to be a premature recommendation until such time that this matter has been addressed and prior to approval of the current draft plan of subdivision.

MP Response: The setback on the draft plan has been revised in response to the comment, and so that it is consistent with the recommendations of the EIS. Specifically, the 30 metre setback is shown where development is proposed within 120 metres of the PSW.

5. It is this reviewer's opinion that any decision regarding a wetland buffer/setback should be withheld until such time that there is more certainty about these two outstanding major planning issues. As such, it is advised that the 30 metre wetland protective zone be removed from the revised plan, except for that part touching upon Block 56 and the most southerly extent of Street A.

MP Response: Pursuant to this and other comments, the setback on the draft plan has been revised and clarity regarding the lands in question has been provided.

- 6. Assuming that all the above can be amicably addressed by the applicant and his agents, this reviewer will be in a position to advise the planning authority that the revised draft plan can be approved with regards to meeting the applicable natural heritage policies contained in the Town of Perth Official Plan, which is conditional upon the applicant satisfying the following conditions of draft plan approval.
 - Construction of rear yard fencing that is wildlife friendly for those lots backing onto significant wildlife habitat/woodland.
 - Please note that as previously stated, no comments have been provided regarding impacts to Species at Risk as this is a delegated responsibility of the province of Ontario.

MP Response: We believe the EIS and subdivision redesign has addressed the above concerns. Maintaining vegetation at the rear of lots 34 - 48 is being considered. Installation of fencing may affect retention of vegetation. Please confirm the desire to implement rear yard fencing with the retention of woodland vegetation. The applicant is open to recommendations for this concern.

TOWN OF PERTH

Environmental Services

1. Comprehensive Development Plan: As the Perthmore Development has matured into a nearly a 40-year development, staff have approved development in a piecemeal format to support advancement of the subdivision. As the subdivision nears a completion horizon, a number of considerations have surfaced and caused staff and approval agencies challenges since the larger picture remained unresolved (stormwater, pedestrian movements, street logistics, etc). I submit that an overall plan of the remaining developable area was requested and required for future approvals. The current submission is limited to Phase 6 and lacks the overall conceptual plan of the remaining area. Perth staff met with the developer and two (2) engineering/planning representatives working on the Perthmore subdivision and relayed at that meeting that a comprehensive conceptual plan was required for any future submission. Perth Council has been firm with seeking a comprehensive plan from developers to gauge the overall logistical considerations involved in all development.

MP Response: An overall/comprehensive conceptual development plan has been provided to Staff, and revisions have been made pursuant to Town Staff input provided during an April 18, 2023 meeting and otherwise.

2. Tertiary Entrance/Arterial Road: In the discussion with the developer referenced above , it was also conveyed that an additional entrance is required prior to any additional development. Though the developer continues to overlook this requirement, previous Perth approval staff have identified the requirement for the tertiary entrance for several years leading to this next phase. The traffic loading, especially from construction traffic has put an undue strain on the residential streets and has also increased the community concern about trucks, noise, and debris on the roadway.

MP Response: A Sensitivity Analysis prepared by Mcintosh Perry (dated March 12, 2020), and previously accepted by the Town, confirms that a tertiary entrance is not required for the proposed development. MP Traffic Engineering Staff re-confirmed this finding in relation to the adjusted development proposal as communicated to Staff by way of an October 12 e-mail. It has recently been communicated by Staff that primary purpose of the tertiary entrance in the near term would be to serve as a construction access, to divert traffic away from existing local roads, particularly Perthmore Street. McIntosh Perry suggests that a Construction Management Plan would be a conventional and appropriate tool to address subdivision construction concerns, and that this could be identified as a condition of draft plan approval.

3. Stormwater review documents: The information in the package references a catchment that is not in the Perth area. I have asked Jason Sharp from MCIP to review the information, and a resubmission may be required.

MP Response: The report has been revised.

4. I request that Items 1 and 2 get rectified prior to advancing with a comprehensive review of the current submission. There are a number of interconnections (traffic evaluation, catchment areas, future capacity) that need to be addressed with a fulsome submission package for the remaining development lands.

MP Response: Items 1 and 2 have been addressed in the resubmission. We respectfully ask that the Town finalize their review and move forward with recommending conditions of draft plan approval.

Development Services

With respect to the Environmental Impact Statement updated August 5, 2022, further revision is required.
It continues to make mention of the future development of the arterial road in several locations and comes
to conclusions about habitat significant based on this road. The intention of re-submission was to explore
and assess what impacts, if any would occur when the arterial road is removed and to consider impacts
when a tertiary entrance is added.

MP Response: The arterial road has not been used in the assessment of the impacts of Phase 6. It has been considered in the cumulative impacts as potential future development.

2. The Town of Perth respectfully submits that the location of parkland being located in a preservation area for wildlife/woodland habitat is inappropriate. Additionally, we would like to see a more comprehensive plan to see other submissions for density, parkland, servicing, etc.

MP Response: The proposed park has been adjusted. Furthermore, initial support for a park 'hub' has been expressed adjacent to the proposed 30 metre buffer from the Long Swamp Provincially Significant Wetland (PSW). It is expected that parkland serving future subdivision approvals (i.e. Phase 7) will also be proposed in this area.

3. The EIS notes that re-assessment is required for areas 50m around butternut species. We have not seen the re-assessment. Has it been submitted?

MP Response: The butternuts noted on the map are not in close proximity to Phase 6. However, a butternut review should be completed prior to any construction activities in undisturbed areas. The re-assessment should occur in advance of the construction works and following draft plan approval. No butternuts were observed in the area to be cleared in 2022.

4. With respect to the Planning Rationale, no discussion of the tertiary entrance has been provided. The town is not currently in a position to circulate the zoning submission as it does not reflect the current changes to the revised draft plan submission. The changes to the EIS have not been reflected or discussed in the planning rationale report. The report further notes Block 58 as parkland, but also indicate4s preservation of habitat. Rezoning stormwater block 55 from EP to R3? Why does storm pond need and R3 zone. Please revise and explain in more detail.

MP Response: The Planning Rationale has been revised in order to address the items noted above. Block 55 will be developed with a Stormwater Management pond and, as part of the proposed Plan of Subdivision, it is typical in our experience for such lands to be zoned the same as the rest of the development. The

parkland has been located adjacent to the 30 metre setback from the Perth Long Swamp intentionally. The following is recommended in Section 6.1 of the EIS:

Educational signs and other materials are to be provided for the future park lands (Block 58) which are within and adjacent to natural features.

5. The draft plan still indicates the arterial road. As the developer is aware the Town of Perth has removed this from its strategic plan and all related by-laws. As such the draft plan should be revised to indicate this.

MP Response: The arterial road has been removed from the draft plan.

6. Additionally, the draft plan is required to indicate a tertiary entrance as discussed at length during preconsultation meetings with the developer and both of their consultants recently and in many past renditions of various phases. The tertiary entrance is a requirement for this phase particularly in consideration of access to provincial highway. Traffic loading especially from construction traffic has put an undue strain on residential streets and has caused public concern about trucks, noise and debris on the roadways.

MP Response: Please refer to the above response to Environmental Services Comment 2.

7. Blocks 55 and 56 and lots 29-48 are directly in significant wildlife habitat. Until the EIS is revised appropriately, these blocks should not be included in the draft plan.

MP Response: The EIS addresses significant wildlife habitat. A TPP will be provided as per RVCA comments.

8. It appears as though the developer is intended to move the existing stormpond to Block 55. What is the plan for the existing stormpond lands, they do not have road access. The Town has no interest in rezoning from EP to 3 without an understanding of what is to occur. Again, a more fulsome overall plan needs to be provided.

MP Response: The SWM plan has now been revised.

As previously noted, it is typical for stormwater management ponds to share the same zone category as the remainder of the development / neighbourhood.

9. It is noted by Environmental Services that in review of the Stormwater documents that the package references a catchment that is not in the Perth area. A re-submission may be required.

MP Response: The report has been revised.

10. A comprehensive concept plan of full build out is required zto help better understand stormwater, pedestrian movements, street logistics, parkland, etc.

MP Response: An overall conceptual plan that situates the current phase of development within the wider context of the Perthmore development has been provided to and discussed with Staff.

11. No major review of these items or others has been completed against the Official Plan or Zoning By-law as it is of the opinion of the planner and the engineer that the submission is ont ready for continued review or additional circulation without the above information being provided. Updates to drawings and studies are required. This is not a formal and complete comment on this application.

MP Response: McIntosh Perry has responded to the comments provided by the Town of Perth by way of both the Comment Response Document and revised drawings and studies. As such, we look forward to receiving the conditions of draft plan approval at the appropriate juncture.

OTHER AGENCY COMMENTS

Hydro One

1. Hydro One has no comments at this time.

MP Response: Acknowledged. Could the appropriate staff/person at the Town of Perth or County obtain conditions of draft plan approval from Hydro One?

Enbridge

1. Enbridge Gas Inc. does not object to the proposed application(s) however, we reserve the right to amend or remove development conditions. This response does not constitute a pipe locate, clearance for construction or availability of gas.

MP Response: Acknowledged. Could the appropriate staff/person at the Town of Perth or County obtain conditions of draft plan approval from Enbridge?

2. In the event that easement(s) are required to service this development, and any future adjacent developments, the applicant will provide the easement(s) to Enbridge Gas Inc. at no cost.

MP Response: Acknowledged.

Ministry of Transportation

1. When are they proposing in connecting the future road to Highway 7? The developer would need to do a pre-consultation with the Ministry of Transportation.

MP Response: A connection to Highway 7 will be pursued in the future whenever it is determined to be necessary to support development by transportation engineers. It is acknowledged that Pre-Consultation with the MTO will be required at that juncture.

PUBLIC COMMENTS

Perthmore Community Association

1. There seems to be some confusion in McIntosh Perry's submission between the location of block 58 int June 29th Zoning plan and the zoning bylaw amendment drawing.

MP Response: Block 58 has been removed in the revised Draft Plan of Subdivision and the Zoning By-law Amendment Sketch.

2. The proposed park assuming Block 58 is the park only represents under half of the remaining greenfield site of 15.8 hectares. The PCA would advocate for 1 new large park more centrally located to service the entire Phase VI (the 93 households + future as of yet unidentified).

MP Response: Following a review, it is noted by MP that the proposed park satisfies the minimum parkland requirements as required by relevant municipal and provincial policy.

3. As this submission is only for half of the remaining greenfield site in Perthmore. Is there a road / utility layout that would show a complete view? Is there still the possibility for the 3rd exit to connect to hwy 7? Is there a need for a future pumphouse for the high density that would be built in the future towards hwy 7?

MP Response: Further to discussions with staff, and as previously noted, an overall conceptual plan that situates the current phase of development within the wider context the Perthmore development has been prepared.

4. What would be the next process steps? Is there a deadline schedule? When does the town comment on the zoning? When would public input be appropriate? And finally as a community association is there anything that we can do to help in the process.

MP Response: We defer to Town Staff for a response to this comment.

Stewart and Linda Bates

1. R1 to R3 – Are these classes only bungalows and semi's as MacIntosh Perry state? We're ok if that is the case. If R3 allows for more dense development i.e. so called stackedtown houses such as constructed on Senators Gate Dr, then restrictions should betighter i.e R1. This would restrict inappropriate increases in density, and a repeat of past mistakes.

MP Response: The proposed Residential Third Density (R3) zone will permit the single and semi detached dwellings as shown on the Draft Plan of Subdivision.

2. We believe the Developer has 29.7 hectares in total. We understand the Province requires 5% of land for parks. We understand part of the land is wetland and trees. These should be protected, and the Developer should not be allowed to cut down any further trees!

MP Response: An Environmental Impact Statement (EIS) has been completed in support of the proposed development. The EIS provides recommendations and mitigation measures to ensure that the intent of applicable natural heritage policies is upheld.

3. Rather than requiring the Developer to provide 5% for parks in each section to be developed, why not make it a condition that they provide 5% of the total development now? They give up no more land in total! The Developer should level and grass the land so it could be used for soccer, and an outdoor rink in the wintertime. They should also provide a children playpark. These do not have to be of an Olympic standard.

MP Response: As provided by applicable policy, the required parkland is calculated in accordance with the total area affected by the current Draft Plan of Subdivision application.

4. Sidewalks should be provided on all streets. There should also be a higher standard of street lighting than what was provided on Senators Gate Dr.

MP Response: Sidewalks and lighting will be provided pursuant to the Town of Perth requirements as required in applicable planning policies.

5. We agree with MacIntosh Perry that the existing streets can take the additional traffic generated by 93 new units. We agree there is no need for a third road access at present.

MP Response: Comment acknowledged.

6. We believe that the current Town Plan allows the Developer to build a further 226 units. Are the County and the Town going to hold them to this number? We wouldn't object over the life of the Plan for this number to increase by say 10%. We would object if say the unit numbers exceed 250. We are sure you appreciate if they carry on with the same density as this proposal is, then there will be many more than 226. The Developer should be required to provide much more open space. There is plenty of land here!

MP Response: We defer to Town Staff for a response to this comment.

7. The Developers block 57 is obviously to provide a road access to the land between the cancelled bypass road and the housing on Street A. The Developer must see this as land for future development. If this requires further tree felling we would like this rejected. We have no objection to increasing the number of bungalows proposed, so their total number of units becomes 94, if access to this area is restricted to pedestrians only.

MP Response: Block 57 as shown on the previous site plan has been removed.

8. If 4 of the semis are to have 8 dwellings, referred to as apartments, we would have no objection. If each of the 4 semis is to have 4 units each, then we would also have no objection, but the extra numbers should then come out of the 93 they are applying for.

MP Response: Semi-detached dwellings with basement apartments are proposed on Lots 50, 51, 52, and 53. Each semi-detached dwelling contains two units, resulting in a total number of 16 units on the lots in

question. The total number of dwelling units is acknowledged accordingly within relevant application materials.

9. The park shown as Block 58 is much less than 5% and is pathetically small. Our earlier suggestion should be pursued so there would be a much larger park Deeded to the Town. Otherwise, a much larger park than shown as Block 58 should be required. Our proposal could be located on the un-developed land behind the apartments and houses on Street A. A new access to this park could be constructed off Senators Gate adjacent to the existing apartments. We would have no objection to Block 58 being developed as residential if this larger park was provided.

MP Response: The proposed park as indicated on the Draft Plan of Subdivision satisfies applicable parkland requirements. The lands behind Lots 34-48 are constrained as they are considered significant wildlife habitat and the lands behind Lots 49 to 53 and Block 54 are subject to future development plans.

- 10. We don't see any land being allocated by the Developer for affordable housing. We believe this is now Policy. We hope they are not being relieved of this duty.
 - **MP Response:** Eight basement dwelling units and fourteen apartment dwelling units have been incorporated as a result of discussions with Town Staff regarding the promotion of affordable housing units within the municipality.
- 11. We do not think that the Developer should be allowed to make a capital contribution in lieu of parks. There is little open space in the subdivision and additional public space should be a must!
 - **MP Response:** As previously noted, the proposed park on the Draft Plan of Subdivision satisfies the minimum parkland requirements. As such, no cash-in-lieu of parkland is required.
- 12. We note that Block 55 is for storm water management. Are the 2 areas of land marked vacant which adjoin Block 55 also part of the storm water management system?

MP Response: While the adjacent lands have been considered as part of the wider SWM strategy, there is no direct flow to these lands.

CONCLUSION

We trust that the responses provided above, and the enclosed resubmission items adequately address the comments provided by Agency Staff and that upon review of the documents provided, County Staff will be in a position to compile conditions of Draft Plan approval, and Town Staff will be in a position to advance the Zoning By-law Amendment application. Please do not hesitate to contact our office if any additional information is required.

Sincerely,

Vithulan Vivekanandan, MES Pl.

Planner

PLANNING RATIONALE REPORT PERTHMORE ENTERPRISES INC.



Project No.: CCO-13-9668-02

June 20, 2023

Prepared for:

Perthmore Enterprises Inc. 80 Dufferin St. P.O. Box 20054 Perth, ON K7H 3M6

Prepared by:

McIntosh Perry Consulting Engineers Ltd. 3240 Drummond Conc. 5A Perth, Ontario K7H 3C9



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APPENDICES

Appendix A: Draft Plan of Subdivision

Appendix B: Zoning Schedule

1.0 INTRODUCTION

McIntosh Perry Consulting Engineers Limited (McIntosh Perry) has been retained as the agent for Perthmore Enterprises Inc. with respect to a proposed residential subdivision on lands legally described as PT SW1/2 AND PT NE1/2 LOT 3 CON2 DRUMMOND BEING PART 1 ON 27R7125 AND PT 1 ON 27R8420 EXCEPT PL88,27M3,27M14,27M16,27M21,27M55 AND PARTS 3,4 ON 27R7540 TOWN OF PERTH (the "subject lands"). The subject lands are located within the Urban Development Boundary in the Town of Perth, County of Lanark.

The subject lands and subdivision area are a 5.5 hectare portion of the broader 29.7 hectare land holding and are identified within Figure 1.

This Planning Rationale Report, initially provided to Lanark County by way of a December 23, 2020 Draft Plan of Subdivision submission, has previously been revised in response to changes in the draft plan of subdivision and feedback and comments received from the Town of Perth and the Rideau Valley Conservation Authority (RVCA). The latest revisions reflect comments received on February 23, 2023 in response to the August 5, 2022 resubmission package in support of the Zoning By-law Amendment and Draft Plan of Subdivision applications.

2.0 PROPOSED DEVELOPMENT

As shown on the Draft Plan of Subdivision at Appendix A, the proposed development is comprised of 34 lots that will be developed with single detached dwellings and 19 lots that will be developed with semi-detached dwellings, for a combined total of 53 proposed residential lots. In addition to the lots for single and semidetached dwellings, Block 54 on the Draft Plan will be comprised of a medium density apartment building of three and a half storeys containing 14 units. Further, four semi-detached dwellings will contain basement apartment units. The proposed development will have a combined total of 94 dwelling units in total. The proposed lots for single detached dwellings range in area from 429 m² to 703 m², with frontages ranging from 12.25 m to 20.00 m. The proposed lots for semi-detached dwellings range in area from 649 m² to 685 m², with frontages ranging from 18.5 m to 21.32 m. The proposed lots will have frontages on newly created internal streets and on extensions of Perthmore Street and Senators Gate Drive. A proposed internal street ("Street A") will extend from the western end of Senator's Gate Drive and terminate at the north-easterly corner of the subdivision. Block 55 on the Draft Plan will be used for stormwater management purposes and Block 57 will be provided as parkland. Block 56 will be used as a turning circle situated at the north-easterly end of Street "A." In addition to a Plan of Subdivision application, a concurrent Zoning By-law Amendment application seeks to rezone the subject lands from Residential First Density (R1h) and Environmental Protection Area (EP) to Residential Third Density (R3), Residential Fourth Density (R4), and Open Space (OS).

The subject lands are located in the northeast corner of the Town of Perth in the Perthmore Glen community. The subject lands are adjacent to Perth Long Swamp to the east, which is designated a Natural Heritage Feature and Provincially Significant Wetland in the Town of Perth Official Plan. The updated draft plan now includes a 30 m setback from the Provincially Significant Wetland in order to maintain and protect surrounding natural heritage features. The subject lands are bordered to the north by remnant lands, Highway 7 and the Township of Drummond/ North Elmsley. The proposed development is bordered to the south and west by existing and similar residential subdivisions, comprising of previous phases of the Perthmore development. While the

original draft plan (dated December 10, 2020) submission included a proposed arterial road and an increased number of lots, subsequent iterations have resulted in a draft plan that is significantly reduced in scope with regards to land and road development. The previously proposed municipal arterial roadway is no longer shown or referenced. The proposed development also now includes a medium density apartment dwelling, on Block 54.

Following discussions with Town Staff, the most recent revisions to the draft plan coincide with the submission of a preliminary overall development concept that places the current proposal within the context of previous and future phases of the Perthmore development. As shown on these plans, the lands to the northeast of the subject lands, and to the rear of lots 34 to 48, are no longer considered for development. Furthermore, the proposed parkland on Block 57 has been enlarged to ensure that parkland dedication requirements have been satisfied. A future phase of development is proposed to the northwest of the subject lands and, depending on traffic engineering requirements, may involve a connection to Highway 7. Development approvals for future phases will be addressed separately from the current Draft Plan of Subdivision and Zoning By-law Amendment approvals processes.

PERTHMORE ENTERPRISES INC.

PROJECT:

PERTHMORE SUBDIVISION

TITLE:

SUBJECT LANDS

McINTOSH PERRY 115 Walgreen Road, RR3, Carp, ON K0A1L0 Tel: 613-836-2184 Fax: 613-836-3742 www.mcintoshperry.com

Jun., 05, 2023 GIS Checked By AG

PROJECT NO:PP-13-9668

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FIGURE:

REFERENCE

GIS data provided by the Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry, 2023.

3.0 PRE-CONSULTATION & INITIAL APPLICATIONS

A pre-consultation meeting was held with Lanark County, Town of Perth and Rideau Valley Conservation Authority (RVCA) staff on January 23, 2019. The following technical studies were requested as part of the submission package for the Plan of Subdivision application.

- Planning Rationale;
- Preliminary Servicing and Stormwater Management Report;
- Traffic Impact Report; and
- Environmental Impact Statement (EIS)

Since the initial pre-consultation meeting, meetings have continued with Town of Perth staff, both in advance of and following the December 2020 submissions.

The updated draft plan responds to the above discussions as well as the comments provided by the Rideau Valley Conservation Authority. Comments were mainly concerned with potential impacts of the proposed development, future arterial road, and stormwater management strategies, and associated conformity with Town, County, and Provincial policies.

4.0 PLANNING POLICY & REGULATORY FRAMEWORK

4.1 Provincial Policy Statement, 2020

The 2020 Provincial Policy Statement (PPS) provides policy direction on land use planning matters of provincial interest. Table 1 below provides a summary of how the proposed development has been designed in accordance with the policy direction provided within the PPS.

	PROVINCIAL POLICY STATEMENT, 2020	
Policy Section	Policy Description	Comments
1.1.1	 Healthy, liveable and safe communities are sustained by: a) Promoting efficient development and land use patterns which sustain the financial well-being of the Province and municipalities over the long term; b) Accommodating an appropriate affordable and market-based range and mix of residential types; c) Avoiding development and land use patterns which may cause environmental or public health and safety concerns; h) promoting development and land use patterns that conserve biodiversity; 	 The proposed development is located within the Urban Settlement Boundary as indicated on Schedule A of the Town's Official Plan. The proposed development contributes single detached, semi-detached, secondary, and apartment dwellings to the mix of residential types in the Town. An updated Environmental Impact Statement (EIS) has been prepared by McIntosh Perry and submitted in support of the proposed development in order to address the Provincially Significant Wetland and Natural Heritage features.

	PROVINCIAL POLICY STATEMENT, 2020		
Policy Section	Policy Description	Comments	
1.1.3	 Promote efficient development patterns, protect resources, promote green spaces, ensure effective use of infrastructure and public service facilities and minimize unnecessary public expenditures. Settlement Areas shall be the focus of growth and development Land use patterns within settlement areas shall be based on and densities and a mix of land uses which: a) Efficiently use land and resources; b) Are appropriate for, and efficiently use, the infrastructure and public facilities which are planned or available, and avoid the need for their unjustified and/or uneconomic expansion; 	 The proposed development is located adjacent to an existing built-up area in the Urban Settlement Boundary. The proposed development will contribute additional single and semidetached dwellings, along with secondary and apartment dwellings, to the mix of residential uses in the Town. The density of the development has been designed for the efficient use of land and infrastructure. The development represents a logical extension of municipal infrastructure and will be serviced by municipal water and wastewater services. 	
1.4.3	 Planning authorities shall provide for an appropriate range and mix of housing options and densities to meet projected market-based and affordable housing needs of current and future residents of the regional market by: b) permitting and facilitating: 1) all housing options required to meet the social, health, economic and well-being requirements of current and future residents; c) directing the development of new housing towards locations where appropriate levels of infrastructure and public service facilities are or will be available to support current and projected needs. 	 The proposed development provides single-detached and semi-detached dwellings, along with secondary and apartment dwellings, to the mix of housing options in the Town. The density of the development has been designed for the efficient use of land and infrastructure. The development represents a logical extension of municipal infrastructure and will be serviced by municipal water and wastewater services. A Preliminary Servicing and Stormwater Management Report has been submitted in support of the proposed development. The Report provides preliminary servicing options for the proposed subdivision and recommends that Best Management Practices (BMPs) be employed wherever possible. 	
1.5.1	 Healthy, active communities should be promoted by: b) planning and providing for a full range and equitable distribution of publicly-accessible built and natural settings for recreation, including facilities, parklands, public spaces, open space areas, trails and linkages, and, where practical, water based resources; d) recognizing provincial parks, conversation reserves, and other protected areas, and minimizing negative impacts on these areas. 	 An updated Environmental Impact Statement (EIS) has been prepared by McIntosh Perry and submitted in support of the proposed development in order to address the Provincially Significant Wetland and Natural Heritage features. The proposed development includes Block 57 to be used as parkland dedication accessible to the community. 	

	PROVINCIAL POLICY STATEMENT, 2020		
Policy Section	Policy Description	Comments	
1.6.6.2	 Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas to support protection of the environment and minimize potential risks to human health and safety. Within settlement areas with existing municipal sewage services and municipal water services, intensification and redevelopment shall be promoted wherever feasible to optimize the use of the services. 	 The proposed development is located within the Urban Settlement Boundary and will be fully serviced by municipal water and wastewater services. A Preliminary Servicing and Stormwater Management Report has been submitted in support of the proposed development. The Report provides preliminary servicing options for the proposed subdivision and recommends that Best Management Practices (BMPs) be employed wherever possible. 	
1.6.6.6	Planning authorities may allow lot creation only if there is confirmation of sufficient reserve sewage system capacity and reserve water system capacity within municipal sewage services and municipal water services.	- A Preliminary Servicing and Stormwater Management Report has been submitted in support of the proposed development. The Report provides preliminary servicing options for the proposed subdivision and recommends that Best Management Practices (BMPs) be employed wherever possible.	
1.6.6.7	 Planning for stormwater management shall: a) be integrated with planning for sewage and water services and ensure that systems are optimized, feasible and financially viable over the long term; b) minimize, or, where possible, prevent increases in contaminant loads; c) minimize erosion and changes in water balance, and prepare for the impacts of a changing climate through the effective management of stormwater, including the use of green infrastructure; d) mitigate risks to human health, safety, property and the environment; e) maximize the extent and function of vegetative and pervious surfaces; and f) promote stormwater management best practices, including stormwater attenuation and re-use, water conservation and efficiency, and low impact development. 	 A Preliminary Servicing and Stormwater Management Report, that includes a water balance analysis, has been submitted in support of the proposed development. The Report provides preliminary servicing options for the proposed subdivision and recommends that Best Management Practices (BMPs) be employed wherever possible. The updated Environmental Impact Statement also addresses impact on the Environment including the adjacent Provincially Significant Wetland, from which a minimum 30 metre buffer is proposed. 	
2.1.1	Natural features and areas shall be protected for the long term.	- An updated Environmental Impact Statement (EIS) has been prepared by McIntosh Perry and submitted in support of the proposed development in order to address the Provincially Significant Wetland and Natural	

	PROVINCIAL POLICY STATEMENT, 2020		
Policy Section	Policy Description	Comments	
		Heritage features to ensure their long term protection.	
2.1.4	 Development and site alteration shall not be permitted in: a) Significant wetlands in Ecoregions 5E, 6E, and 7E; and 	- The updated EIS addresses and evaluates any impacts on significant wetlands, significant woodlands, and other natural features including Species-	
2.1.5	 Development and site alteration shall not be permitted in: b) Significant woodlands in Ecoregions 6E and 7E 	at-Risk (SAR) and recommends appropriate mitigation measures.	
2.1.7	Development and site alteration shall not be permitted in the habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.		
2.1.8	Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.		
2.2.1	 Planning authorities shall protect, improve or restore the quality and quantity of water by: I) Ensuring stormwater management practices minimize stormwater volumes and contaminant loads, and maintain or increase the extent of vegetative and pervious surfaces. 	- A Preliminary Servicing and Stormwater Management Report has been submitted in support of the proposed development. The Report provides preliminary servicing options for the proposed subdivision and recommends that Best Management Practices (BMPs) be employed wherever possible.	

Table 1: Provincial Policy Statement (2020) – Policy Summary

Overall, the development, as proposed, is consistent with matters of Provincial interest, as expressed in the 2020 Provincial Policy Statement.

4.2 Lanark County Sustainable Communities Official Plan

The subject lands are designated as Settlement Area, as per the Lanark County Sustainable Communities Official Plan (SCOP). The SCOP provides that 70% of future development is anticipated to take place in designated settlement areas.

The SCOP contains policies that direct the Official Plans of the lower-tier municipalities, such as the Town of Perth, to designate Settlement Areas and to provide policies and direction that will allow for the efficient development of the designated Settlement Areas. Accordingly, the Town of Perth has incorporated these policies and the subject lands are within the Perth Urban Settlement Boundary. The overall objective of the

Settlement Area designation in terms of residential land use is to "ensure the provision of an adequate supply of residential land" and to "provide for a range and mix of low, medium and high density housing types in accordance with servicing capacities" (Section 2.3.1).

Based on the forgoing, the proposed development of Phase 6 of the Perthmore Subdivision is in conformity with the goals and objectives of the Settlement Area designation of the Lanark County Sustainable Communities Official Plan.

4.3 Town of Perth Official Plan

The subject lands are designated *Residential Area* and *Environmental Protection Area* within the Town Official Plan, as illustrated on Figure 2.

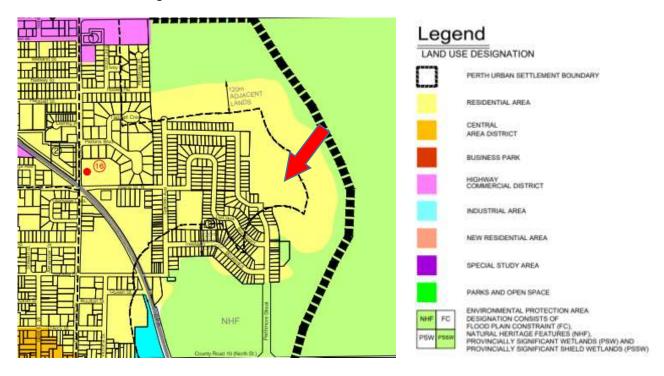


Figure 2: Extract from Schedule A, Land Use Plan

Key Official Plan policies that apply to the proposed subdivision are summarized and responded to in the table below:

TOWN OF PERTH OFFICIAL PLAN POLICIES		
Policy Section	Policy Description	Comments
3.2 Housing	 The land supply for housing will be met through a combination of intensification, redevelopment and green-field development 	- The proposed development constitutes greenfield development, and is an acceptable form of development required to meet land supply for housing.

TOWN OF PERTH OFFICIAL PLAN POLICIES		
Policy Section	Policy Description	Comments
	Green-field housing will be directed to the future extension of Perthmore Glen to the east	- The proposed development is an extension of and complements the existing residential development in the Perthmore Glen Community.
5.2 Sewage and Water	(a) All development or redevelopment within the Town to be serviced by municipal water and sewer services and that sufficient water and sewage plant capacity is available to accommodate the new development and will not create environmental or surcharging problems	- The updated Preliminary Servicing and Stormwater Management Report provides preliminary municipal servicing options for the proposed subdivision, including water and sewer infrastructure.
5.3 Stormwater Management and Drainage	 Stormwater management shall be required for all urban development as a preventative approach Principles which council intends to utilize in its approach to stormwater management are as follows: That natural hydrogeological characteristics are maintained, and where possible, enhanced That the natural infiltration of water on lands which are developed is maximized That proposed development will not result in increased downstream flooding or erosion or cause adverse effects on receiving waters by appropriate management of stormwater volumes and contaminant loading To ensure that alterations to natural drainage systems are prohibited or at least minimized by maximizing the retention of natural vegetation and by leaving stream channels in their natural form That sanitary and stormwater sewers are separated That a sustainable environmental approach is utilized in protecting water resources 	- The updated Preliminary Servicing and Stormwater Management Report recommends best practices and notes that enhanced stormwater quantity and quality control will be achieved.
5.5 Transportation	 The scale and design of sidewalks, road, and street networks should support a variety of transportation modes such as walking, cycling and motorized vehicles Local road are intended to: 	- Proposed internal streets will provide access to multiple transportation modes, including cycling, walking and motorized vehicles, and the width of the road allowance is 20 m.

TOWN OF PERTH OFFICIAL PLAN POLICIES		
Policy Section	Policy Description	Comments
	 Have a corridor/allowance width of 18.5 to 20 m which may increase to 22 m or more at intersections; Carry low volumes of traffic at low speeds (40-50 km/hr); Provide direct access to abutting property as their primary function; and Include on-street parking Sidewalks may be constructed on one side for any local road or collector and on two sides for any arterial road The Town may require a traffic impact study to assess the impacts of any potential development on traffic and related facilities 	 Proposed internal streets will accommodate traffic at low speeds and provide access to the proposed residential lots. The road allowance width within the proposed development is sufficient to permit sidewalks to accommodate pedestrian flows. Detailed roads cross sections will be provided at the detailed design phase of development following Draft Plan approval. A Traffic Impact Study has been prepared by McIntosh Perry in support of the proposed development. The Report concludes that the proposed development is expected to have minimal impact on the traffic operations of the adjacent road network and provides mitigation measures with respect to intersection control and optimization of signal timings.
8.1.1 Residential Areas	 New neighbourhoods with a mix of housing types designed to meet a range of housing needs Lotting patterns will be designed to ensure convenient vehicular and pedestrian flows and access to schools, parks and commercial areas Forms of development shall be compact, energy efficient and fully serviced Efforts will be made to maintain existing natural features and/or beautify residential areas with trees and landscaped open space areas 	 The proposed development consists of single detached, semidetached, secondary, and apartment residential dwellings and will contribute to a mix of housing types. Proposed internal streets will provide access to vehicular and pedestrian flows. The proposed development will be fully serviced by municipal water and wastewater services. Block 57 of the proposed development is provided as parkland, accessible for use by the public and surrounding community.
8.1.3 Residential Area Designation	 To provide for an appropriate range and mix of housing types and densities to meet the projected requirements of current and future residents To provide for compact, energy efficient development that is fully serviced 	 The proposed development incorporates a range of dwelling types that will contribute to a mix of housing types. The proposed development will be fully serviced by municipal water and wastewater services.

	TOWN OF PERTH OFFICIAL PLAN POLICIES		
Policy Section	Policy Description	Comments	
	To maintain generally ground-oriented housing form (e.g. 4 storeys' or less) To ensure that the built form, massing and profile of new and redevelopment housing is well integrated and compatible in design with existing house and that a compatible transition between existing housing and new residential or non-residential sues is achieved	 The proposed single, semidetached, secondary and apartment residential units will be largely ground oriented. All dwellings will be fewer than 4 storeys in height. The proposed development will be well integrated and compatible with previous phases of the subdivision. 	
8.1.3.1 Range of Permitted uses	1. To provide for an appropriate range and mix of housing types and densities to meet the projected requirements of current and future residents	- The proposed development provides single-detached and semi-detached dwellings to the mix of housing options presently available in the Town.	
8.1.3.5 Housing Mix	 Recognizing that it is in the Town's interest to create a sustainable community where public infrastructure is used in an efficient manner, neighbourhoods are functional, and an adequate range and mix of housing types are available to meet the current and projected needs of all citizens The housing mix targes are intended for the community as a whole and are not intended to be inflexibly applied Neighbourhoods are intended to feature a variety of housing types, values and occupancies and will be designed to ensure compatible transition between housing types New medium and high density residential developments should be located so that densities increase gradually from lower-density residential environments 	 The development which is proposed to be serviced by public infrastructure provides a mix of housing. It is noted that basement dwelling units and an apartment dwelling containing fourteen units have been incorporated, as a result of discussions with Town Staff regarding the promotion of affordable housing units within the municipality. The various dwelling types are proposed in appropriate locations within the subdivision and as it concerns neighboring development. 	
8.1.3.10 Residential Design Principles	Maintain visual landmarks, energy conservation, human scale, pedestrian access, adequate lighting, parking within short walking distance of destination, barrier free access, fire protection, noise attenuation, landscaping and open space, regard for microclimate conditions and building compatibility	- The development will continue to be reviewed as the approvals processes continue, including subdivision registration and building permitting. It is anticipated that associated requirements will be satisfied by way of detailed engineering design / clearance of Draft Plan conditions and by way of the building permitting process.	
8.1.3.20	Parks, open space and natural areas are intended to serve a variety of purposes in the community, including:	- The proposed development includes Block 57 as parkland and it is noted that the updated	

TOWN OF PERTH OFFICIAL PLAN POLICIES		
Policy Section	Policy Description	Comments
Parks, Open Space and Natural Areas	 Natural areas and urban wilderness; Areas which may be subject to environmental constraints, e.g. significant wetlands wildlife corridors and flood plains Heritage sites and landscapes Neighbourhood Parks shall be primarily dedicated to neighbourhood level facilities. It is the intent to further develop Perthmore Park during the life of this Plan to serve Perthmore residential area. No other new neighbourhood parks are 	Environmental Impact Statement speaks to the preservation of habitat within Block 57 as well as educational signage associated with the Perth Long Swamp.
8.6.4 Natural Heritage Features Policies	 Natural heritage features are intended to be protected over the long term as a legacy to future generations Development and site alteration shall not be permitted in the Perth Long Swamp, the Blue Berry Creek Wetland, and the Grant's creek Wetland. Development and site alteration will not be permitted in adjacent lands to these significant wetlands unless it has been demonstrated, through the preparation of an Environmental Impact Study (EIS) as required in Section 8.5.4 e. EIS of this Plan, that there will be no negative impacts on the natural features or on the ecological functions for which a specific wetland area is identified. Development and site alteration shall not be permitted in significant wildlife habitat. Development and site alteration shall not be permitted on adjacent lands to these natural heritage features unless it has been demonstrated through the preparation of an EIS as required in Section 8.5.4 e. – EIS of this Plan, that there will be no negative impacts on the natural features or on their ecological functions. 	- Section 8.6.4 of the Perth Official Plan is referred to and addressed throughout the updated Environmental Impact Statement (EIS), which provides recommendations including mitigation measures intended to uphold associated policies The recommendations and mitigation measures include incorporating a minimum 30 metre setback from the Perth Long Swamp PSW, planting of additional forest edge habitat, preservation of vegetation within the proposed park, and habitat enhancement within the proposed stormwater management pond block.
9.12.15.1 Plans of Subdivision	 Land development shall take place primarily by plan of subdivision where three or more lots or blocks are proposed Regard shall be given to the requirements for an impact assessment for subdivisions proposed in the vicinity of identified natural heritage features (designated wetlands), archeological or cultural heritage resources or natural or human-made hazards 	 The proposed development will occur by a plan of subdivision. An updated Environmental Impact Statement (EIS) has been prepared by McIntosh Perry and submitted in support of the proposed development. The updated EIS aligns with the protection of the

TOWN OF PERTH OFFICIAL PLAN POLICIES		
Policy Section	Policy Description	Comments
	There are adequate municipal services and utilities available to support the proposed development, and more specifically, but without limiting the preceding, the Town has adequate residual sanitary sewage treatment, sanitary sewage collection and water supply capacity available to dedicate to the full extent of development proposed	Provincially Significant Wetland and Natural Heritage features. The proposed development will be fully serviced by municipal water and wastewater services, as communicated within the updated Preliminary Servicing and Stormwater Management Report; the Report provides preliminary servicing options and recommends that Best Management Practices (BMPs) be employed wherever possible.

Table 2: Town of Perth Official Plan Policies

Based on the forgoing, the proposed development conforms to and is consistent with applicable polices of the Town of Perth Official Plan.

5.0 REGULATORY CONTROLS

5.1 Town of Perth Zoning By-law No. 3358

The subject lands are zoned Residential First Density (R1h) and Environmental Protection Area (EP), as per the Town of Perth Zoning By-law 3358. A Zoning By-law Amendment application was previously submitted, and by way of the updated development proposal now proposes to rezone residential lots 1-53 to Residential Third Density (R3) and Block 54 to Residential Fourth Density (R4).

As per the zoning requirements provided in Sections 8 and 9 of the Zoning By-law, single-detached dwelling and semi-detached dwelling are permitted uses in the R3 Zone, and apartment dwellings are permitted uses in the R4 Zone. The proposal meets all other known zone requirements within the Zoning By-law. The majority of the Stormwater Management Pond (Block 55) will be rezoned from Residential First Density (R1h) to Residential Third Density (R3), while the remaining portions of Block 55 will be rezoned from Environmental Protection (EP) to Residential Third Density (R3). The proposed park (Block 57) will be rezoned from Residential First Density (R1h) to Open Space (OS).

A Zoning Schedule is provided at Appendix B.

6.0 SUMMARY OF TECHNICAL STUDIES

6.1 Environmental Impact Statement

An Environmental Impact Statement (EIS) was prepared by McIntosh Perry Consulting Engineers Ltd. (dated August 5, 2022) in support of the proposed development. The EIS assesses the existing land use to determine

the potential impacts to natural heritage features from the proposed development, including SAR and SAR habitat. The EIS provides recommendations and mitigation measures to minimize or eliminate environmental impacts and to help achieve ecological and environmental improvements, and concludes that adherence to the proposed measures will ensure that the intent of applicable natural heritage policies are satisfied. The proposed development acknowledges the proximity of the Provincially Significant Wetland and has been adjusted accordingly. The draft plan includes a new lot configuration and a Stormwater Management facility that has a 30 m setback from the Provincially Significant Wetland.

6.2 Preliminary Servicing and Stormwater Management Report

A Conceptual Stormwater Management and Servicing Options Report (Report) was completed by McIntosh Perry Consulting Engineers Ltd. (dated August 3, 2022) in support of the proposed development. The Report provides preliminary servicing options for the development in accordance with the recommendations and guidelines provided by the Rideau Valley Conservation Authority (RVCA), the Ministry of the Environment, Conservation and Parks (MECP), and the Town of Perth. The Report presents an overall servicing scheme for the entire development to ensure that existing and available services will adequately service the proposed development.

The Report provides that a proposed Stormwater Management pond will be installed in Block 55 of the draft plan. The facility will be designed as a wet pond and will provide enhanced stormwater quantity and quality control. The report further provides that watermains will be installed throughout the subdivision and will have multiple connection points to existing infrastructure. A proposed sanitary sewer will also be installed throughout the subdivision and will gravity drain throughout the existing subdivision infrastructure through multiple connections. The report also notes that sediment and erosion protection measures will be installed as soon as ground conditions warrant and permit and shall remain in place until construction is complete and vegetation is re-established. The report provides that the entire subdivision will employ Best Management Practices (BMPs) wherever possible and recommends that the Town approve the Preliminary Servicing and Stormwater management Report in support of the Draft Plan of Subdivision.

6.3 Traffic Impact Study

A Traffic Impact Study was completed by McIntosh Perry in support of the proposed development (dated August 2022). The Report evaluates anticipated traffic impacts of the development to the surrounding traffic network. The Report notes that the existing road network within the study is currently operating well, and expects the proposed development to generate 62 new vehicle trips during the AM Peak Hour, and 82 new vehicle trips in the PM Peak Hour at full buildout. In comparing the 2035 horizon scenario for the total traffic to the background traffic scenario, the Report concludes that the proposed development is expected to have minimal impact on the traffic operations of the adjacent road network and that the existing traffic network operates at satisfactory conditions. The report provides mitigation measures with respect to intersection control and optimization of signal timings, and recommends that traffic operations continue to be monitored and appropriate changes be made to the network throughout the buildout year of 2035.

7.0 CONCLUSION

The proposed development is consistent with the Provincial Policy Statement and conforms to the applicable policies, goals and objectives of the Lanark County Sustainable Communities Official Plan and the Town of Perth Official Plan. The proposed lots and blocks illustrated on the Draft Plan of Subdivision will comply with the requirements of the Town of Perth Zoning By-law No. 3358 once the Zoning By-law Amendment application is approved.

Respectfully submitted,

Prepared By:

Vithulan Vivekanandan, MES Pl.

Planner

Reviewed By:

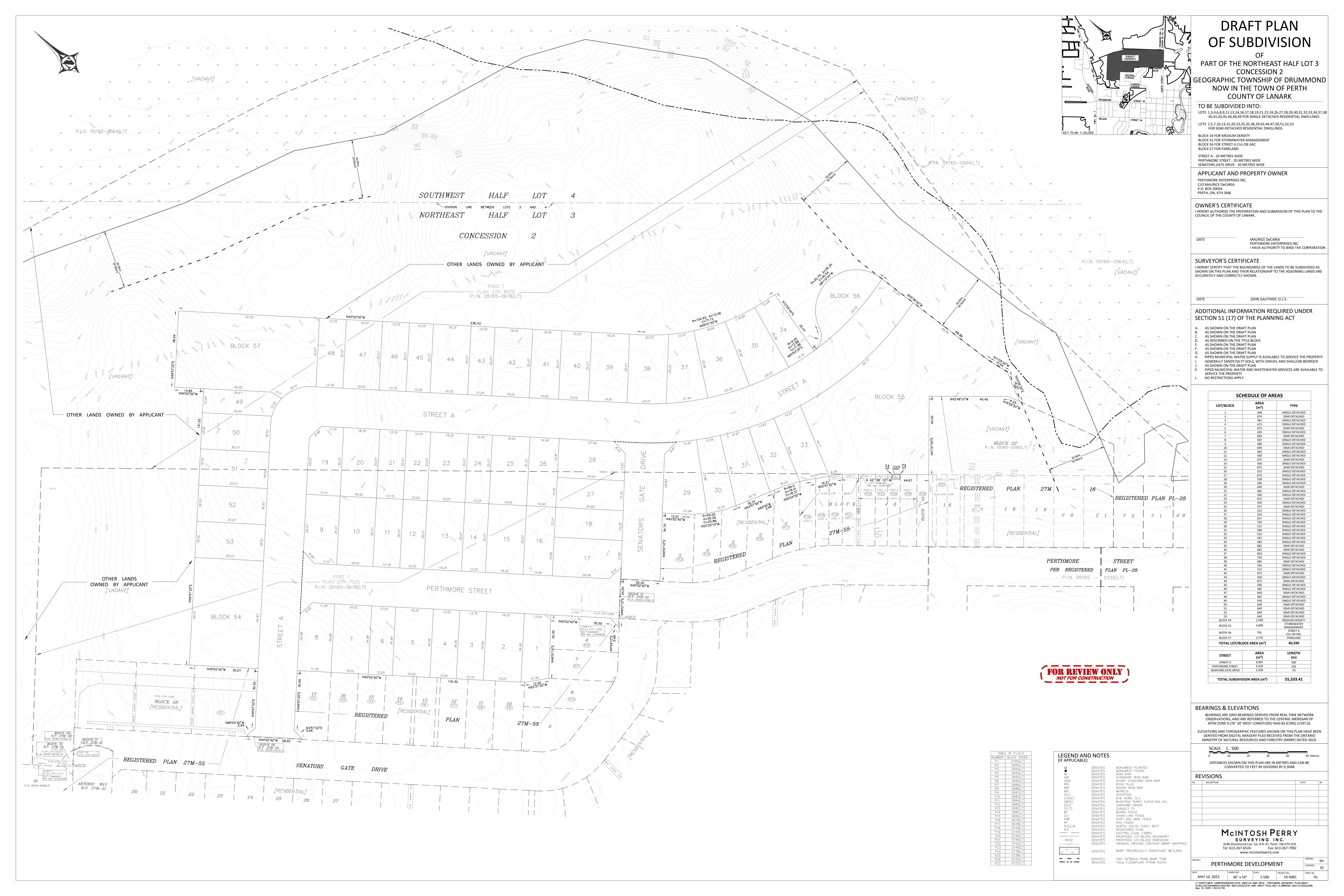
Benjamin Clare, MCIP RPP

Practice Area Lead, Planning Services

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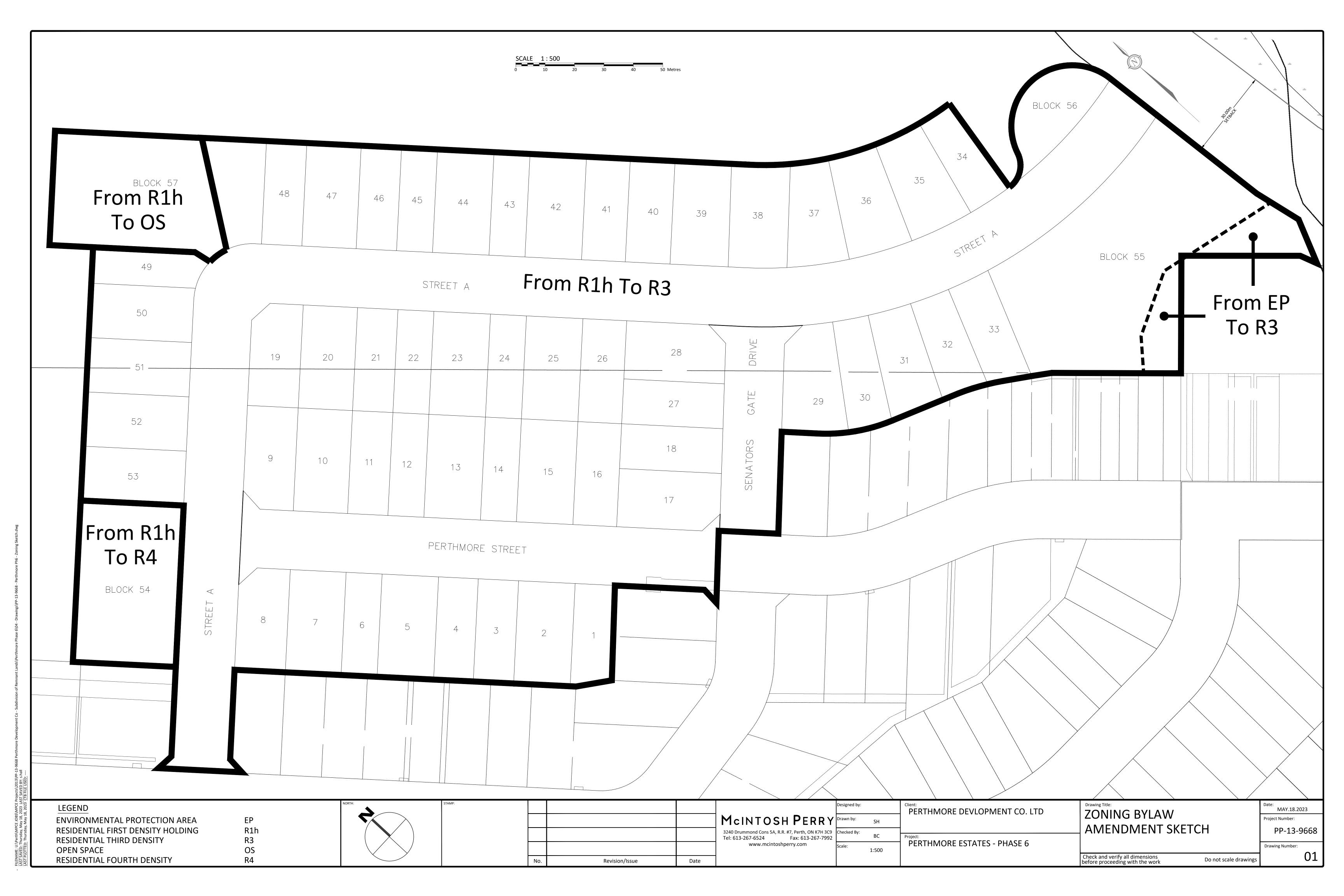
APPENDIX A

Draft Plan of Subdivision



APPENDIX B

Zoning Schedule



PRELIMINARY SERVICING AND STORMWATER MANAGEMENT REPORT PERTHMORE SUBDIVISION - PHASE 6



Project No.: 0PP-13-9668-01

June 23, 2023

Prepared for:

Perthmore Development Co. P.O. Box 20054 80 Dufferin Street Perth, ON K7H 0B5

Prepared by:

McIntosh Perry Consulting Engineers Ltd. 115 Walgreen Road Carp, Ontario K0A 1L0

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1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by Perthmore Developments Co. to prepare this Preliminary Servicing and Stormwater Management Report in support of the Draft Plan of Subdivision Application for Phase 6 of the Perthmore Subdivision in Perth, Ontario.

The main purpose of this report is to present preliminary servicing options for the development in accordance with the recommendations and guidelines provided by the Ministry of the Environment, Conservation and Parks (MECP), Rideau Valley Conservation Authority (RVCA) and the Town of Perth (Town). This report will address the servicing for the entire development so that an overall servicing scheme can be presented, ensuring that existing and available services will adequately service the proposed development.

1.2 Site Description

The subject property is generally located within the northeastern quadrant of the Town of Perth and south of Provincial Highway 7. The property is legally described as Part of the northeast and southwest halves of Lot 3 and the southwest half of Lot 4, Concession 2, within the geographic Township of Drummond now in the Town of Perth and part of Block 15 registered plan 27M-21. This phase of development encompasses approximately 5.40 hectares and is bound by vacant land to the north and east, and by the existing phases of the subdivision immediately to the south and west. Refer to the Draft Plan of Subdivision in Appendix 'A' for more details.

The topography of the site varies with a ridge generally bisecting the property near the western limit and splitting the drainage in easterly and westerly directions. The elevation generally slopes off near the eastern limit at the proposed cul-de-sac of Street A. The land is generally overgrown with a variety of grass, shrubs and bush along with some trees located at the northeast portion of the site. At the time of writing of this report, portions of the property have been cleared or are in the process of being cleared.

Phase 6 is made up of 53 lots with 34 single family homes, 38 semi-detached units (18 lots) and 1 apartment block with 14 units. There is also approximately 725 meters of associated municipal roadway and municipal services. The Town and the RVCA will be reviewing and approving this report as part of the Draft Plan of Subdivision Application.

2.0 BACKGROUND INFORMATION

Background studies that have been completed for the site include review of as-built drawings, a topographical survey of the site, along with servicing and stormwater reports from previous phases of the development.

Various as-built drawings, design drawings and design calculations for the existing subdivision services were reviewed in order to determine proper servicing schemes for the site.

A topographic survey of the site was completed by MPSI dated August 2020 and was used to identify the existing drainage characteristics and to delineate catchment areas.

The following reports have previously been completed and are available under separate cover:

- Drainage Design Report Perthmore Subdivision Phase 3 prepared by McIntosh Hill dated March 1998.
- Sanitary Sewer Report Perthmore Subdivision Phase 3 prepared by McIntosh Hill dated February 1998.
- Stormwater Management Report Perthmore Subdivision Phase 4 prepared by McIntosh Perry dated
 September 12, 2002
- Preliminary Stormwater Management Report Perthmore Subdivision Phase 5 prepared by McIntosh Perry dated February 17, 2004

3.0 EXISTING SERVICES

Phase 6 of the Perthmore Subdivision will be serviced partially via existing services and infrastructure within the existing phases of the development. The majority of the proposed development will be serviced by the newly proposed storm sewers and an associated stormwater management facility.

Existing services within Senators Gate Drive include a 200mm sanitary sewer, a 200mm watermain and a 450mm storm sewer. Existing services within Perthmore Street include a 200mm sanitary sewer, a 300mm watermain and a 525mm storm sewer. Stubs have been left at the intersection of Senators Gate Drive and Perthmore Street. There are stubs extending in both the northeast and northwest directions. Stubs have also been left at the intersection of Senators Gate Drive and Street B. The storm sewer at this intersection is a 300mm and the sanitary and water are both 200mm in diameter.

A newly proposed stormwater management pond will be constructed to service Phase 6. Previous discussions of reconstructing the Phase 5 pond have been eliminated due to sizing constraints that push the pond too close to the existing wetland. The proposed facility is located outside of the wetland setback.

Gas, hydro, cable and telephone utilities are available nearby and locations will be confirmed from respective utility companies during detailed design process.

4.0 SERVICING PLAN

4.1 Proposed Servicing Overview

The overall servicing of Phase 6 of the subdivision will be accomplished through multiple connections to the existing stubs as detailed below. See below for more details pertaining to each specific service.

4.2 Watermain Design

Water servicing for the proposed development will be accomplished through connections at three locations: to the existing 200mm stub at the intersection of Senators Gate Drive and Street A and to the existing 300mm and 200mm stubs at the intersection of Senators Gate Drive and Perthmore Street. The watermain will be 200mm in diameter throughout Phase 6. Flow control valves will be installed as required. See *Drawing 100 – General Plan of Services* for details pertaining to the layout of the watermain.

Fire hydrants will be located on-site as required. The fire hydrants will be spaced 90m to 180m apart in order to meet municipal firefighting requirements. The fire hydrants will be owned and operated by the Town. Individual water services will be installed and will be Pex conforming to AWWA C904. Curb stops will be installed on all water services on the property line, away from driveways and any aboveground utilities. All watermains and associated structures will be designed and constructed per the design criteria detailed in the Design Guidelines for Drinking-Water Systems 2008 by the MECP and constructed per the Ontario Provincial Standard Details (OPSD's).

The watermain is designed to have a minimum of 2.4m cover and when crossing over or under utilities the watermain will have a minimum 0.3m clearance. A minimum horizontal separation of 2.5m (from pipe wall to pipe wall) will be maintained between the proposed watermain and storm/sanitary mains.

Water demands have been calculated per MECP Design Guidelines for Drinking-Water Systems 2008. The population for Phase 6 is calculated as 243.4 people creating the following demands:

- Average Day Flow = 47.33 L/min
- Max. Day Flow = 130.15 L/min
- Peak Hourly Flow = 195.46 L/min

Water demands which account for the anticipated population from the future development areas have also been completed using a population of 570.4 people creating the following demands:

- Average Day Flow = 110.91 L/min
- Max. Day Flow = 305.01 L/min
- Peak Hourly Flow = 458.06 L/min

See Water Demands Sheets 1 and 2 in Appendix 'B' of this report for more details.

Prior to connecting to the municipal water distribution system, it is essential to determine whether the system has adequate capacity and that the overall impact to the existing system is minimal. A WaterCAD model will be generated at the detailed design stage to confirm the capacity, pressure and size of pipes required to service the proposed site.

4.3 Sanitary Sewer Design

The sanitary sewers for the proposed development will flow by gravity to the existing sanitary sewers. Sanitary connections will be made to the stubs at the intersection of Senators Gate Drive and Perthmore Street. See *Drawing 100 – General Plan of Services* for details pertaining to the layout of the sanitary sewers.

The sanitary sewers within the new phase of development are 200mm diameter will be installed throughout with a minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a full flow velocity of not more than 3.0 m/s. All sewers and associated structures will be designed and constructed per the design criteria detailed in the Design Guidelines for Sewage Works 2008 by the MECP and constructed per the Ontario Provincial Standard Details (OPSD's).

Design parameters for Phase 6 include an extraneous infiltration rate of 0.33 L/s/ha. Daily per capita flow rates of 280 L/p/d and residential densities of 3.4 persons per single unit, 2.7 persons per semi-detached units, 1.8 persons per apartment unit and 60 persons per net hectare of futured development blocks were used in the design of this development. The residential peaking factor used is based on the Harmon Equation, with a maximum of 4.0 and a minimum of 2.0.

Phase 6 of the subdivision has been accounted for in the design of sanitary sewers of previous phases. As noted above the new phase of the subdivision will have multiple sanitary outlets. Ultimately the flows will be directed towards the Treelawn Boulevard and to Garden Avenue sewer outlets. Within the *Perthmore Development Phase III – Sanitary Sewer Report*, dated February 1998 by McIntosh Hill, the Treelawn Boulevard and Garden Avenue Sewers have been sized to accommodate the full buildout of the Perthmore Subdivision.

It was assumed the total number of lots being serviced by the Treelawn Boulevard sewer would be 258 lots with a total flow of 17.6 L/s for the full build-out of the development. According to the previous report, the existing 200mm sanitary sewer within Treelawn Boulevard is sloped at 0.40%, therefore the total capacity of the pipe is approximately 21.6 L/s. Phase 6 of the development will generate a total flow of 5.07 L/s to be captured by the Treelawn Boulevard sanitary sewer.

See Sanitary Sewer Design Sheet and PP-13-9668-01 – Sanitary Drainage Areas - SAN in Appendix 'C' of this report for more details.

4.4 Storm Sewer Design

Stormwater runoff will be conveyed through curb and gutter and rear-yard swale networks towards catch basins, where it will be captured and conveyed into the new storm sewer network. The storm sewers are designed with a minimum of 1.5m cover. The storm sewer network within the subdivision is designed to

accommodate a storm event with a 5-year return period. Storms in excess of this event will result in surcharging at catch basin and road sag locations. Stormwater runoff during these major events will be conveyed via overland flow routes within rear-yard swales and along the roadway, as is typical in subdivisions of this nature. A detailed lot grading and drainage plan will be prepared during the detailed design stage outlining the proposed drainage pattern within the subdivision.

The storm sewers within Phase 6 will flow via gravity to a newly proposed stormwater management facility located to the south of the Street A cul-de-sac at the eastern boundary of the property. Storm sewers stubs will be provided in support of the future medium/high-density residential development areas which have been detailed in Section 5.5. Future development areas will require additional design to be carried out during their respective designs. See Drawing 100 – General Plan of Services for details pertaining to the layout of the storm sewers.

The storm sewers within this phase of development range in diameter from 250mm to 975mm and are designed with a minimum full flow target velocity (cleansing velocity) of 0.8 m/s (cleansing velocity) and a full flow velocity of not more than 3.0 m/s. No storm sewer will have a slope less than 0.1%. Appropriately sized maintenance holes will be installed at every change in pipe size or direction and will be spaced no more than 120m apart in order to facilitate cleaning and maintenance. All sewers and associated structures will be designed and constructed per the design criteria detailed in the Design Guidelines for Sewage Works 2008 by the MECP and constructed per the Ontario Provincial Standard Details (OPSD's).

A preliminary storm sewer design sheet was created using the rational method, which allows for the proper sizing of the storm pipes within the development. Drainage area information, along with respective pipe slopes and other necessary information was utilized to evaluate the performance of the storm sewer network. The time of concentration calculated for the storm sewer system is based on a 20-minute inlet time. Rainfall intensities were obtained from Intensity-Duration-Frequency (IDF) curves for the Town of Perth from the Ministry of Transportation (MTO).

The preliminary storm sewer design sheet identifies the 5-year flow that is conveyed through each pipe section of the storm sewer network. The peak flow and peak velocity are the maximum results based on gravity flow. Included in the sheet is the full flow capacity of the pipe and the associated full flow velocity when the pipe is under gravity flow condition. The peak flow was checked against the full flow capacity to ensure that each storm sewer pipe can convey the 5-year flow unrestricted.

The proposed storm sewer layout and approach is further detailed in Section 5.0 *Proposed Stormwater Management*.

See *Storm Sewer Design Sheet* and *PP-13-9668-01 - Storm Drainage Areas - STM* in Appendix D of this report for more details regarding pipe sizing.

4.5 Site Utilities

All relevant utility companies will be contacted prior to construction in order to confirm adequate utility servicing for the site. Existing utilities are present in prior phases of the development and will be extended to provide service for this phase.

4.6 Service Locations/Cover

The minimum cover for the sanitary, storm and water mains will be as follows:

Service	Minimum Cover
Sanitary Sewer	1.8m
Storm Sewer	1.5m
Watermain	2.4m

All minimum cover requirements are as per municipal standards. Separation distances between the storm, water and sanitary will be maintained as per the MECP requirements.

5.0 PROPOSED STORMWATER MANAGEMENT

5.1 Design Criteria and Methodology

In the absence of a subwatershed plan for this area, the MECP Stormwater Management Planning and Design Manual (March 2003) is used to govern the management of stormwater. This methodology promotes stormwater management from an environmentally sustainable perspective. The intent of the stormwater management plan is to provide adequate stormwater treatment for both quantity and quality control.

Stormwater Best Management Practices (BMPs) will be implemented at the "lot level" and "conveyance" locations. These concepts are explained further in Section 5.7.1. To summarize, roof water will be directed to grass surfaces that in turn will be collected in grassed swales or in rear yard/roadway catchbasins prior to entering into the proposed storm sewer network.

An existing stormwater management (SWM) pond is located on the northeast side of Perthmore Street as shown on Figure 1, below. As part of development of this subsequent phase, this SWM facility will remain intact and a standalone SWM pond will be constructed to address the water quality and quantity control requirements for this tributary drainage area.

5.2 Overall SWM Strategy

As the existing stormwater pond will continue to serve Phase 5, this new phase will look to direct all runoff towards an end of pipe facility. The ultimate outlet for this site will remain consistent in being the Perth Long Swamp. However, previous submissions for the Perthmore Subdivision Phase 6 Stormwater Management Plan encountered challenges due to the need for the reconstruction of the existing Phase 5 pond. The required surficial area to accommodate a stormwater management (SWM) facility capable of adequately handling the volume of runoff from Phase 5 was extensive, leading to an expansion towards the wetland boundary.

Unfortunately, this expansion was deemed unacceptable by the Rideau Valley Conservation Authority (RVCA). In response to this, a new strategy has been devised to locate the new pond outside of the wetland boundary while ensuring it possesses the necessary capabilities to handle the stormwater management requirements of Phase 6 in isolation.

A Visual OTTHMO Version 5 (VO5) model was assembled for the analysis. The VO5 hydrologic model requires various measured and calculated input parameters. The calculations of these input parameters area detailed below.

5.3 Pre-Development Drainage

5.3.1 General

Since the pre-development land use was rural, the NASHYD command was employed in the VO5 model to calculate the runoff flows. NASHYD is used to simulate runoff flows with NASH instantaneous unit hydrograph. This hydrograph is made of a cascade of "n" linear reservoirs. The n (number of linear reservoirs) parameter was set at 3, in the model, and the rainfall losses were computed by the SCS CN procedure.

5.3.2 Time of Concentration/Time to Peak

The Time of Concentration (Tc), for the pre-development drainage basins, was calculated using the Airport Formula.

$$T_c = 3.26 * (1.1 - C) *L^{0.5} * S_w^{-0.33}$$

Where:

Tc = time of concentration in minutes

C = runoff coefficient

L = watershed length in metres

S_w = watershed slope in percentage

From the Tc value, the Time to Peak (Tp) value was calculated as 0.67 times Tc. The parameters employed in the calculation of Tc and Tp for the single drainage basins is shown in **Table 1**.

Table 1 - Time of Concentration and Time to Peak

Sub- Catchment	Area	Flow Length	Fall	Slope	Tc ¹	Tp²
	ha	m	m	%	min	hrs
Area 1	12.20	435	7	1.61	54.6	0.61

Notes:

- Airport Formula
- 2. 0.67×Tc

5.3.3 SCS Curve Number

The Curve Number (CN) is the most important parameter in determining surface runoff when the SCS equation is used. **Table 2** shows the parameters and the resulting CN value for Area 1.

Land Use / Land Use / Land Use / Land Use / Sub-CN² Runoff la **Soil Type** Soil Type Soil Type Soil Type Catchment Pasture B **Pasture C Forest B Forest C** Coefficient¹ (AMC II) mm (ha) (ha) (ha) (ha) 3.20 0.16 64.0 6.9 Area 1 5.45 1.76 1.56

Table 2 - Hydrologic Parameters

Notes:

- 3. MTO Drainage Management Manual Design Chart 1.07
- 4. MTO Drainage Management Manual Design Chart 1.09

5.3.4 Rainfall

For the rainfall input to the VO5 model, the 12-hour SCS rainfall distribution, representing a high volume lower intensity storm, and a 4 hour Chicago rainfall distribution, representing a high intensity "thunder storm" type of rainfall event were used ion the analysis. The Intensity-Duration-Frequency (IDF) curve was obtained from the Ministry of Transportation (MTO) IDF Curve Lookup tool with the location centred over the property.

5.4 Pre-Development Results

Employing the above noted parameters and the VO5 hydrologic model, **Table 3** shows the calculated predevelopment flow values for the 12-hour SCS and 4-hour Chicago rainfall hyetographs. These flow values will be used for the water quantity control assessment of the proposed SWM facility.

Return Period (Yrs)	12 hour SCS (m³/s)	4 hour Chicago (m³/s)				
2	0.114	0.053				
5	0.211	0.105				
10	0.278	0.149				
25	0.383	0.210				
50	0.463	0.262				
100	0.560	0.317				

Table 3 – Pre-Development Calculated Peak Flows

5.5 Post-Development Drainage

As discussed in Section 5.2, the proposed stormwater management (SWM) facility will serve the entirety of the Phase 6 development. The proposed SWM facility will receive runoff from future medium and high-density areas accounted for which will require their own site-specific stormwater management design, as the development of those blocks undergoes site plan control. Runoff from these controlled areas will still be

directed to the ponds and therefore, undergo a further reduction of peak flow rates. These areas have been broken down into three distinct blocks given the location of current proposed roadway connections.

They are labelled:

- West Block, located at the west portion of the site along the rear of Lots 49 to 53 (includes Block 54);
- Central Block, located at the north central portion of the site along the rear of Lots 38 to 48; and
- East Block, located at the northeastern portion of the site along the rear of Lots 34 to 37.

It is important to note that Phase 7 of the Perthmore development is planned for the west block, and it will have its own stormwater management (SWM) facility to handle its drainage needs before discharging into the Phase 6 SWM facility. No development is being proposed for the Centre and east blocks, and they will continue to drain towards the proposed SWM facility following the existing conditions. Therefore, the SWM facility has been appropriately sized to accommodate the flows from all these blocks, ensuring comprehensive stormwater management for the entire Perthmore Subdivision.

5.5.1 Post-Development Parameters

For the post-development hydrologic analysis, since the proposed development is fully urban with full municipal services, the STANHYD command was used in the VO5 model. **Table 4** shows the post-development input parameters for the VO5 model. The three blocks (West, Central and East) are slated for high density residential development and therefore the total imperviousness and directly connected parameters were set accordingly. The previous phases and the remaining sub-catchments, in the proposed additional phase, are slated or have been constructed as single-family residential development. The total imperviousness and directly connected parameters were calculated based on a typical lot in the existing development area. The flow lengths for the pervious area were assumed to be 10 m and the flow lengths for the impervious area were calculated by the standard equation in the VO5 model as shown in the notes below the **Table 4**. Lastly, the slopes used in the model for pervious and impervious areas were assumed to be 2.0% and 1.0% respectively.

Table 4 – Post-Development Hydrologic Model Parameters

						Pervio	us Area		Impervious Area					
Sub- Catchment	Area	Total Imp.	Directly Connected	CN	Slope	Flow Length	Manning n	la	Slope	Flow Length ¹	Manning n	Depression Storage		
	ha	%	%		%	m		mm	%			mm		
West Block ⁴	3.43	70.0	60.0	59.0	2.0	10.0	0.25	5.0	1.0	150.0	151.2	0.013		
Central Block ⁴	1.56	70.0	60.0	59.0	2.0	10.0	0.25	5.0	1.0	150.0	102.0	0.013		
East Block ⁴	0.65	70.0	60.0	75.0	2.0	10.0	0.25	5.0	1.0	100.0	65.8	0.013		
Block 70	0.83	0.0	0.0	75.0	2.0	10.0	0.25	10.0	1.0	75.0	74.4	0.013		
SWM Block ^{2,4}	0.41	0.0	0.0	75.0	2.0	10.0	0.25	5.0	1.0	50.0	52.3	0.013		
Developed Portions ^{3,4}	5.32	50.0	35.0	59.0	2.0	10.0	0.25	5.0	1.0	350.0	188.3	0.013		

Notes:

- 1. Flow Length=SquareRoot (Area/1.5)-(Area m2)
- 2. Block 71
- 3. 604(1) 0.56ha, 604(2) 0.23ha, 606 1.07ha, 608 0.79ha, 609 0.16ha, 612 1.21ha, 614 0.25ha, 617 0.48ha, RY1 0.32ha and RY2 0.25ha
- 4. To Pond

5.6 Quantity Control

The quantity control for the site will mainly be provided by the proposed end of pipe facility. For the three blocks the hydrologic modelling assumes that the peak flows, up to and including the 100-year storm event, from the blocks will flow through the Phase 6 SWM facility. It is also noted, the west block outflow from future phases has to be restricted to existing levels through on-site SWM quantity controls within the block. The preliminary calculation of the required on-site detention storage is 1,100 m³ for the West Block. The imperviousness value for the SWM block was assumed to be high, since and rainfall on the block would be converted to direct runoff.

Tables 5 and **6** show the calculated post-development (uncontrolled) and controlled flow values outletting from the proposed SWM facility. As the 12hr SCS storm resulted in higher outflows and more storage requirements, the results are shown below, however, the 4-year Chicago storm data can be found in **Appendix F**.

Table 5 – Post-Development Calculated Flows – Uncontrolled

	12-hour SCS Uncontrolled													
Return Period	West Block	Central Block	East Block	Block 70	SWM Block	Developed Portions	Total	Pre-dev						
Yrs.	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s						
2	0.215	0.035	0.019	0.022	0.011	0.184	0.284	0.114						
5	0.306	0.068	0.037	0.043	0.020	0.278	0.456	0.211						
10	0.384	0.090	0.049	0.056	0.027	0.355	0.611	0.278						
25	0.481	0.124	0.067	0.077	0.037	0.447	0.794	0.383						
50	0.551	0.150	0.081	0.092	0.044	0.542	0.953	0.463						
100	0.634	0.181	0.098	0.110	0.053	0.631	1.121	0.560						

Table 6 – Post-Development Calculated Flows – Controlled

	12-hour SCS Controlled													
Return Period	West Block ¹	Central Block	East Block	Block 70	SWM Block	Developed Portions	Outflow From Pond	Outflow From Site	Pre-dev					
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s					
2	0.029	0.035	6.250	0.022	0.011	0.184	0.084	0.087	0.114					
5	0.042	0.068	6.250	0.043	0.020	0.278	0.191	0.198	0.211					
10	0.050	0.090	6.250	0.056	0.027	0.355	0.264	0.279	0.278					
25	0.063	0.124	6.250	0.077	0.037	0.447	0.336	0.356	0.383					
50	0.072	0.150	6.250	0.092	0.044	0.542	0.386	0.411	0.463					
100	0.083	0.181	6.250	0.110	0.053	0.631	0.436	0.467	0.560					

Notes:

1. Restricted flow from the West Block SWM facility.

The proposed stormwater management facility has been designed to have sufficient storage to attenuate the post-development peak flows leaving the site. The estimate of the active storage requirements based on the proposed SWM facility has been performed in VO6 and the results are provided in the Table 7 below. To provide the quantity control as shown in the table would require a total of 1,614 m3 of detention storage. Further details of the SWM facility are available within Appendix F, which were used to ensure the conceptual pond met all MECP design criteria. Further pond details will be developed and confirmed during detailed design.

5-Year 5-Year Required 100-Year 100-Year Catchment ID **Restricted Flow Active Storage** Restricted **Required Active** (m³/s)Flow (m³/s) (m^3) Storage (m³) Phase 6, Centre, East and West Blocks, and SWM 0.436 0.191 849 1,614 Block

Table 7 – Quantity Control Storage Requirements

5.6.1 Major Drainage Route

The pipe network within the subdivision will be designed to accommodate the 5-year storm. Storm events greater that 5-year will make use the roadway as the major drainage route, and this will be incorporated into the grading plan design. The roadway will direct these flows to the proposed SWM pond. Rear yard drainage swales and easements will be incorporated to provide additional overflow capacity.

Peak Flow Comparison Summary

The stormwater pond to be constructed on-site will be equipped with a permanent multi-stage outlet flow control structure designed to restrict the outflow rates to meet the quantity control objectives. Based on the available storage and the discharge through the control structure, the peak flow rates to the respective outlets were modelled in VO6 and are summarized below.

Table 8 – Peak Flowrates Comparison Summary

	12-hour SCS Storm Event												
	POST	PRE											
Return Period	Outflow From Site	Outflow from Site	Post to Pre	Post to Pre									
Yrs.	m³/s	m³/s	Δ	%									
2	0.087	0.114	-0.027	23.7%									
5	0.198	0.211	-0.013	6.2%									
10	0.279	0.278	0.001	-0.4%									
25	0.356	0.383	-0.027	7.0%									
50	0.411	0.463	-0.052	11.2%									
100	0.467	0.560	-0.093	16.6%									

The **Table 8** confirms that the proposed SWM facility will restrict the post-development flow rates to existing levels. The elevation and sizing details of the flow controls can be finalized during the detailed design phase of the development.

5.7 Quality Control

Water quality control will be provided by the proposed SWM facility. The facility will be designed as a wet pond to provide an enhanced level of water quality control (80% T.S.S. removal). Table 3.2 in the *Stormwater Management Planning and Design Manual* was used to calculate the required storage volume. The weighted impervious level for the total tributary drainage area is 46%. Therefore, interpreting between the specific storage volumes shown in Table 3.2, a total 165 m³/ha of storage volume is required to provide an enhanced level of treatment. Given the upstream individual storage requirements for West Block, the MECP Manual notes (Section 3.3.2) that when upstream storage facilities exist, the extended detention can be increased from 40m^3 /ha to 80m^3 /ha to ensure that the flooding of downstream ponds does not occur. This increase to the extended detention reduces the permanent pool volume, as the majority of the runoff reaching the site has already achieved the 80% TSS removal from the upstream facilities. With that, the permanent pool for this site is required to be 966 m³ with an extended detention volume (458 m³) can be combined with the water quantity volume detailed.

Therefore, the total storage volume required for the proposed SWM facility would be approximately 3,700 m³. As noted, conceptual pond details are included in Appendix F, which include forebay calculations, 25mm event and extended detention drawdown, pond cleanout, emergency spillway, outlet control device sizing and stage storage discharge tables that were used in modelling the site in VO5. All these features meet MECP requirements and will be further vetted and refined through the detailed design. The total permanent pool volume to be provided will exceed the minimum volume requirement for quality control.

Extended Detention
Volume Accounted

80 m³/ha
458 m³
Permanent Pool
Volume Required
Volume Provided

165 m³/ha
1048 m³
1048 m³

Table 9 - MECP Table 3.2 Quality Control Storage Requirements

5.7.1 Best Management Practices

The entire subdivision will employ Best Management Practices (BMPs) wherever possible. The intent of implementing stormwater BMPs throughout the entire development is to ensure that water quality and quantity concerns are addressed at all stages of the development. Stormwater BMPs will be implemented at lot, conveyance and end of pipe levels.

Lot level BMPs include the directing of roof leaders onto grassed areas, minimizing ground slopes and maintaining as much of the lot as possible in a natural state. Roof leaders will flow to grass areas, which will provide an opportunity for initial filtration of any sediment and provide an opportunity for absorption and ground water recharge. Recent recommendations by a number of Conservation Authorities and the MECP

suggest that yard grading as flat as 0.5% be implemented to promote infiltration. The target range for finished ground slopes will be 1% - 5% where possible. This range of slope will still provide an opportunity for the absorption and filtration process.

The conveyance system to be employed within the subdivision is a combination of side/rear swales and road catchbasins. All swales will be constructed at minimal gradient where possible, thus promoting absorption and infiltration, as well as providing some opportunity for particle filtration. The gradient of the system will be enough to ensure the continuous flow of stormwater, limiting any standing water. Rip-rap will be placed at erosion-prone areas and all disturbed areas shall be landscaped as soon as possible.

6.0 LOW IMPACT DEVELOPMENT

As the practice of SWM has evolved, increasing emphasis has been placed on treating the runoff as close as possible to the source using a sequence of treatment methods called "treatment train approach". As a result, Low Impact Development approaches were established to mimic the existing natural hydrologic environment and to allow the rainwater to infiltrate, filter and evaporate close to the source.

Typical LID practices include Rainwater harvesting, green roofs, downspout disconnection, soak away pits, infiltration trenches and chambers, bio-retention, vegetated filter strips, enhanced grass swales and permeable pavements.

6.1 Treatment Train

Based on the type of the proposed development and the available geotechnical information, downspout disconnections, enhanced grass swales and infiltration basins are the most suitable LID features for the site.

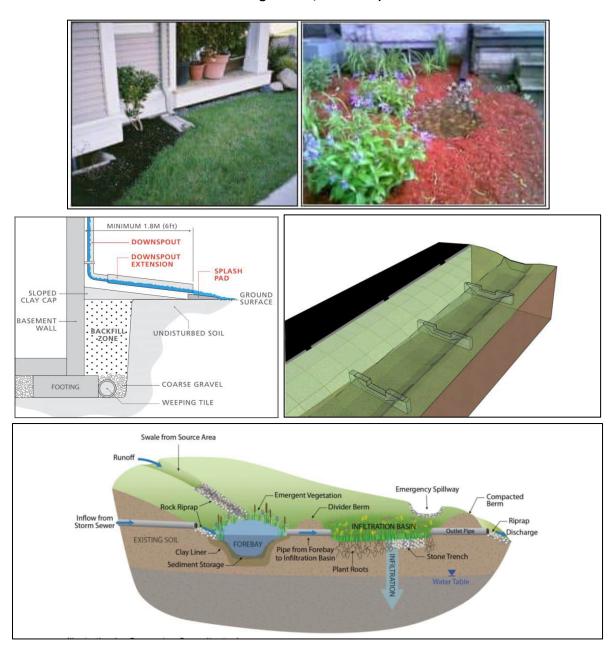
Alternative LID features, such as rainfall harvesting, green roofs, or soak away pits, may not be suitable for the site due to the inability of the municipality to maintain or mandate them when installed on private property. Additionally, LID features on roadways, including permeable pavement or bioswales, may also present a challenge if they go unmaintained and can in turn be detrimental to the overall submission. The soils in the area are not conducive to accepting stormwater runoff due to the high drawdown timing requirement and are thus likely to remain full at the next storm event, which will render them inefficient.

Lot Level - Downspout disconnection involves directing the runoff from roof leader downspouts to a pervious area, which drains away from the building. This gives an opportunity for the runoff to infiltrate before it reaches the typical curb and gutter system on the street. This also prevents the stormwater runoff from directly entering the storm sewer system or flowing across a "connected" impervious surface such as driveways.

Conveyance Level - Enhanced Grass Swales are designed as vegetated open channels that serve multiple functions in stormwater management. Traditionally, simple grass channels or ditches have been utilized for stormwater conveyance, especially for road drainage. However, enhanced grass swales go beyond the basic design by incorporating modified geometry and check dams to enhance their performance in terms of contaminant removal and runoff reduction. These design features improve the functionality of simple grass channels and roadside ditches, providing more effective treatment of storm sewer runoff.

End-of-pipe Level - To promote infiltration and enhance the stormwater management facility, an **infiltration basin** will be integrated into the wet cell. It is advisable to position the infiltration trench within the wet cell area to mitigate the risk of sedimentation and clogging. By locating the trench within the wet cell, the potential for sediment accumulation and blockage is minimized, allowing for better functioning of the infiltration basin. This strategic placement ensures that the stormwater runoff is efficiently managed and encourages the natural process of infiltration, thereby facilitating groundwater recharge and reducing the volume of runoff leaving the proposed development.

Figure 1 – Typical Downspout Disconnection, Enhanced Grass Swale and Infiltration Basin (LID Planning and Design Guide, CVC 2011)



It is important to acknowledge that the recommendations for Low Impact Developments (LIDs) are made based on the available information. However, it is recognized that the design and recommendations may need to be revaluated and potentially adjusted during the detailed design phase, considering the geotechnical information and the maintenance requirements imposed by the Town of Perth. A conceptual LID treatment train plan illustrating the proposed LID features is included in **Appendix F**.

7.0 WATER BALANCE

7.1 Purpose

The RVCA through their review comments have requested that a water balance be reviewed for the site to ensure that the site did not reduce the overall infiltration volumes given that this area is a sensitive groundwater aquifer. As such, the following provides a review of the conceptual water balance, complete with mitigation measures for the site which were reviewed and broken into the requirements for the developed portion of the land as well as the individual blocks to provide guidance to the designers when they proceed through their site plan control process.

7.2 Land Use



Figure 2 - Land Use

The current vacant land is predominantly a mixture of pasture sections (generally the western, southern and central portions of this phase) and treed areas (generally the northern and eastern extremities of this phase). Perthmore subdivision is directly adjacent to the Perth Long Swamp wetland which surrounds the site to the north, east and west. It is acknowledged that the Provincially Significant Wetlands are a significant natural

heritage feature therefore, tree removal and other disturbances will be limited as much as possible. The entire undeveloped site is sloped toward the above-noted wetland. Elevations range from 134 m at the northeast corner of the site to 141 m at the highpoint of the property.

7.3 Soil Conditions

A detailed Geotechnical Report is not available at the conceptual design stage. Therefore, MP used the publicly available documents on AgMaps to review the soils for the site. The area is primarily comprised of Hydrological Soil Group B and C soils through the developed portion of land. The surrounding wetland is Hydrological Soils Group D. Based on the previous phase, McIntosh Perry has assumed that here is approximately 2' or 0.6m of soil overlaying bedrock. This relatively thin soils has been accounted for within the calculations to determine the soil moisture retention capacities of the soils. It is anticipated that during the detailed design stage, a geotechnical report will be completed at which time, these values can be updated if required.

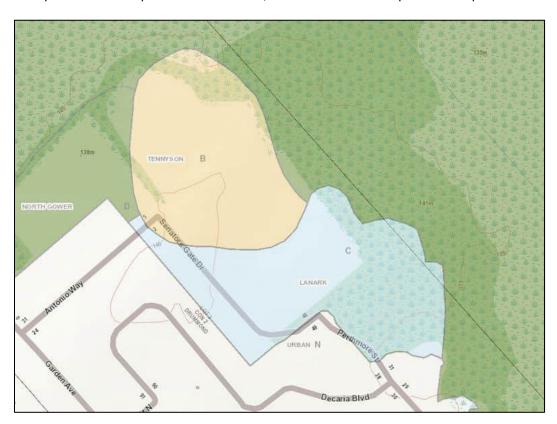


Figure 3 - AgMaps - Site Soils

7.4 Stormwater Management

As part of this assignment and to satisfy both RVCA and the Town, a servicing and stormwater management report has been prepared to ensure that the design criteria from both review agencies along with recommendations from the MNRF, MTO and MECP are adhered to. Site-specific stormwater management facilities will be located in the future high-density west block, which will be required to meet site-specific stormwater management criteria in order to be developed.

The stormwater management (SWM) strategy implemented for the Perthmore Subdivision Phase 6 adopts a treatment train approach, integrating a sequence of controls at various stages to effectively manage stormwater runoff. This comprehensive approach encompasses lot-level controls, conveyance controls, and end-of-pipe controls to address stormwater management requirements. Lot-level controls include measures such as downspout disconnection, which redirect roof runoff away from impervious surfaces and promote infiltration or reuse. Conveyance controls, such as enhanced grass swales, are incorporated to efficiently convey stormwater runoff while enhancing pollutant removal and runoff reduction capabilities. Lastly, end-of-pipe controls, such as infiltration basins, are implemented to facilitate the final treatment and infiltration of stormwater before it is discharged into the receiving environment. With the combination of these facilities, the mitigation measures that will be discussed below and the ultimate end of pipe facility, will ensure that runoff reaching the wetland is controlled to pre-development rates and meets an **enhanced** level of quality control (80% Total Suspended Solids (TSS) removal).

7.5 Water Balance Calculations

7.5.1 Data

Potential impacts to the existing wetland were reviewed through the use of standard water balance calculations. Data from Environment Canada for the Ottawa International Airport was used to calculate the runoff surplus and total precipitation for the site. Environment Canada data was limited to the precipitation and temperature data, while the remaining information was calculated using the Thornthwaite-Mather water balance methodology as described in the "Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance, C.W. Thornthwaite and J.R. Mather, 1957". Please see sample typical calculations within Appendix D. The pre- and post-development conditions were subdivided for the water balance as follows:

Soils:

- Sandy loam, noted to be HSG B; and
- Silt / clay loam, noted to be HSG C.

Pervious Land uses:

- Pasture overtopping sandy loam;
- Pasture overtopping silt/clay loam;
- Forest overtopping sandy loam; and
- Forest overtopping silt/clay loam.

Impervious Land Uses:

Dwellings and asphalt.

The infiltration factors were chosen based on the following data:

Table 10 - Infiltration Factors from the "Tier 1 Water Budget and Water Quantity Stress Assessment" prepared by the Mississippi-Rideau Source Protection Region, August 2009

Description of Area / Development Site	Value of Infiltration Factor
Topography	
Flat Land (<1.5 slope range)	0.172
Rolling land (1.5 – 3% slope range)	0.120
Hilly land (>3% slope range)	0.073
Soil	
Low (clay, silt)	0.10
Low-Medium (till, sand-silt)	0.15
Medium (till, silty sand)	0.20
Medium-High (sands)	0.30
High (gravel, sands, organic deposits)	0.40
Variable (till)	0.20
Variable (fill)	0.40
Variable (sand)	0.35
Variable (bedrock)	
Precambrian Bedrock	0.20
Paleozoic Bedrock	0.05
Land Cover	
Low Infiltration – urban, aggregate	0.05
Medium Infiltration – agriculture, pasture,	0.10
abandoned fields, wetland	
High Infiltration – forest and plantation	0.20

For pre-development, the site has slopes generally under 1.5%, and as such was assigned a topographic infiltration factor of 0.172.

The soil classification was predominately sandy loam (infiltration rate of 0.2) for the HSG B soils and 0.15 for the HSG C soils.

The site is comprised of open vegetated areas which will results in a value of 0.10 being used and in forested areas, a land cover infiltration factor of 0.20 was used.

The soil classification for each area will not be changed for the pervious surfaces. This will be confirmed when the detailed grading design is advanced.

7.6 Sensitivity Analysis

Each of the land use and soil type was reviewed based on Table 10 of the Thornthwaite – Mather literature to obtain the applicable soil moisture retention of the underlying soils. The soil moisture retention used in our calculations is provided as "mm/m", therefore once the average on-site soil depth above the groundwater (is estimated to be 0.6 m) was applied, a corresponding site-specific soil moisture retention value was obtained for each category above. These soil moisture retention values are used to determine the soil moisture storage,

given the accumulated water losses which are calculated based on the climatic data (temperature and precipitation) for the site. These tables are only noted in specific depths (25 mm and 50 mm intervals), therefore in some instances, the closest possible table was used. **Table 11** below illustrates an example at a soil moisture retention value of 75 mm. Located in **Appendix G**, calculations for 75 mm, 100 mm, 125 mm, 150 mm, 200 mm, 250 mm, 350 mm and 400 mm were completed as part of a bulk sensitivity analysis for the surplus data. Results of this analysis, as calculated for each soil moisture value noted above, indicate that changing moisture retention values by 25 mm to 50 mm yields approximately 1% change in water surplus. This would indicate that regardless of whether the soils had 150 mm or 200 mm of moisture retention, the difference in surplus will be minor.

Table 11 – Monthly Water Balance Example - 75mm - Climate Data per Environment Canada data for Ottawa International Airport (1981 - 2010)

Month	Temp	Heat Index	PET	Р	ΔP = P - PET	WL	ST	ΔS	AET	D	S	RO	SMRO	TR	DT
January	-10.3	0	0	65	65		217	0	0	0	0	11	0	11	228
February	-8.1	0	0	54	54		271	0	0	0	0	5	0	5	276
March	-2.3	0	0	64	64		336	0	0	0	0	2	0	2	338
April	6.3	1.4	32	75	43		75	0	32	0	43	22	26	48	166
May	13.3	4.4	79	80	2		75	0	79	0	2	12	117	129	206
June	18.5	7.2	112	93	-19	-19	57	-18	111	1	0	6	59	65	122
July	21	8.8	133	92	-41	-60	33	-24	116	17	0	3	29	32	65
August	19.8	8.0	114	86	-29	-88	22	-11	97	18	0	2	15	17	39
September	15	5.3	73	90	17		39	17	73	0	0	1	7	8	47
October	8	2.0	34	86	52		75	36	34	0	17	9	4	13	105
November	1.5	0.2	5	82	77		75	0	5	0	77	43	2	45	197
December	-6.2	0	0	76	76		151	0	0	0	0	22	1	23	174
Total		37.4	580	944				0	545	35	138	138	260	398	

PET = Potential Evapotranspiration, P = Total Precipitation, $\Delta P = P-PET$, WL = Accumulated Water Loss, ST= Storage, $\Delta S = Soil Moisture Storage$, $\Delta S = Soil Moisture Storage$, $\Delta S = Soil Moisture Deficit$, S = Soil Moisture Surplus, S = Soil Moisture Deficit, S = Soil Moisture Surplus, S = Soil Moisture Deficit, S = Soil Moisture

Note: Shaded cells taken from Thornwaite-Mather Tables. See sample calculation in Appendix D for cell by cell calculations. Total Surplus for example above is 398mm.

Monthly T from Environment Canada:

Heat Index (I) = 37.4, a: 1.06

Sample Calculations:

Calculated Potential Evapotranspiration (PET)

Thornthwaite Equation:

$$PET = 16 \left(\frac{L}{12}\right) \left(\frac{N}{30}\right) \left(\frac{10Ta}{I}\right)^{\alpha}$$

L = Average Daylight (hours)

N = Number of Days per Month

Ta = Average Temperature (°C)

 $I = \sum_{i=1}^{12} \left(\frac{Tai}{5}\right)^{1.514}$

 $\alpha = (6.75 \times 10^{-7}) I^3 - (7.71 \times 10^{-5}) I^2 + (1.792 \times 10^{-2}) I + 0.492$

Example April

Temperature (Ta) = 6.3°C

I = (Tai/5)^1.514 = (6.3/5)^1.514 = 1.4

Sum of all months I = 37.4

 $\alpha = (6.75 \times 10^{-7}) 37.4^3 - (7.71 \times 10^{-5}) 37.4^2 + (1.792 \times 10^{-2}) 37.4 + 0.49239 = 1.06$

L = 13.6 hours, N = 30 days

PET = $16 \times (13.6/12) \times (30/30) \times ((10\times6.3)/37.4)^{1.06} = 32 \text{mm}$

Change between Precipitation and Potential Evapotranspiration ($\Delta P = P-PET$)

Example April

P = 75mm

PET = 32mm

 $\Delta P = P - APET = 75mm - 32mm = 43mm$

Accumulated Water Loss

All Values where the ΔP are negative are brought forward and accumulated on a monthly basis

Example July

 ΔP June = -19mm

 ΔP July = -41mm

WL July = -19mm + -41mm = -60mm

Soil Moisture Storage

Starting Values Taken from Table 10 of Thornthwaite Mather's Water Balance 1957 for individual soil type.

For sample calculations below, assumed soil moisture storage maximum of 75mm. Start in first month with positive temperature (April), carry (75mm) to next month where ΔP is positive. When ΔP becomes negative, accumulated water loss (WL) is reviewed and the reduced soil moisture storage is inserted into the spreadsheet based on the Tables within the Thornthwaite Mather's Water Balance 1957. For the example, Table 25 is used for 75mm soil water retention. The values are then inserted into the ST table based on the corresponding WL for the given month.

WL July = -60mm

Table 25 is used and a ST of 33mm is obtained

Upon positive ΔP values, the ΔP and ST_{i-1} are added together for that months ST value until the maximum soil moisture storage is achieved.

ST September = ΔP September + ST_{i-1} (August) = 17mm + 22mm = 39mm

Upon achieving the maximum soil moisture storage, no additional storage is available until the temperature falls below -1°C, when snow is said to be able to be stored above the ground. At that time the P is added to the previous months ST (ST_{i-1}) until the temporary is above -1°C and snow melt occurs.

Change in Soil Moisture Storage

Change in Soil Moisture Storage = Soil Moisture Storage - Soil Moisture Storage of the previous month

 $(\Delta S = ST - ST_{i-1})$

Example June

Storage (ST - May) = 75mm

ST June (Table 25, Thornthwaite Mather, 1957) = 57mm

 $\Delta S = 57 \text{mm} - 75 \text{mm} = -18 \text{mm}$

Actual Evapotranspiration (AET)

Three Situations Exist:

- 1) No PET therefore, AET = 0 if, PET = 0;
- 2) WL > 0. AET = PET if, Soil Moisture Storage Capacity is positive; and
- 3) WL < 0. AET = Soil Moisture Storage Capacity + Total Precipitation (AET = Δ S + P_T).

1) Example January

AET = 0 as PET = 0

2) Example April

WL = 0mm

ST = 75mm

PET = 32mm = AET

3) Example July

```
WL = -41 mm \Delta S = -18 mm \text{ (June)} P (June) = 93mm AET \text{ (June)} = 18 mm + 93 mm = 111 mm *Note disregard $\Delta S$ sign.
```

Monthly Soil Moisture Deficit or Surplus

Three Situations Exist:

- 1) Where Accumulated Potential Water Loss is lower than 0mm, a deficit exists;
- 2) Where Soil Moisture Capacity is above its maximum, a surplus exist; and
- 3) Where Soil Moisture Capacity is less than the maximum but there is no Accumulated Potential Water Loss, the runoff is being absorbed by the soil (soil is either wetting or drying).

1) Example Deficit (July):

```
WL = -41mm 
ST (July) = 33mm 
\DeltaS (July) = -24mm 
PET = 133mm 
AET = 116mm 
Soil Moisture Deficit (July) = PET – AET = 133mm – 116mm = 17mm
```

2) Example Wetting (September)

```
WL = 0mm
ST (August) = 22mm
\Delta P = 17mm
```

ST (September) = ΔP + ST (August) = 17mm + 22mm = 39mm, less than 75mm therefore wetting, no surplus, S = 0

3) Example Surplus (October):

```
WL = 0mm
S (September) = 39mm
\Delta P = 52mm
```

Soil Moisture Surplus (October) = ΔP + S(September) = 39mm + 52mm = 91mm, as it is over 75mm, 75 is carried and the additional volume is a surplus of 91mm – 75mm = 16mm

Water Runoff

Thornthwaite Mather (1957) noted that the surplus water runoff values in no month can cause a runoff higher than 50% of the its total surplus volume, therefore, 50% is attributed to the month with the initial surplus, then carried forward at a 50% per month value until it is dissipated (i.e.: reaches 0mm).

For this example (rounded to the nearest mm), start at October;

```
S_{\text{oct}} = 17 \text{mm},
```

 $RO_{Oct} = 17mm/2 = 9mm$

November

 $S_{Nov} = 77$ mm,

 $RO_{Nov} = (Remaining RO_{Oct} + S_{Nov})/2 = (9mm + 77mm)/2 = 43mm$

December

 $RO = (Remaining RO_{Nov} + S)/2 = (43mm + 0mm)/2 = 22mm.$

This continues until 0mm is reached.

Snow Melt Runoff (SMRO)

Thornthwaite Mather (1957) noted that in areas with an elevation under 500m above sea level, that in the first month with temperatures above -1°C, only 10% of snow melt runoff occurs. A maximum of 50% melt will occur in each successive month until it is dissipated (i.e.: reaches 0mm).

For this example (rounded to the nearest mm), start at April (first positive average temperature, total snow fall is 260mm, note: 260mm = precipitation accumulated in months with negative temperatures (December through to March);

April

SMRO = 10% = 26mm, remaining 90% (234mm) brought forward to May;

May, 234mm x 50% = 117mm, carry remaining 117mm to June;

June, 117mm x 50% = 59mm.

This continues until 0mm is reached and all snow melt has been accounted for.

Total Runoff

Total runoff is the sum of the water runoff and snow runoff for each month.

TR (April) =
$$RO_{April}$$
 + $SMRO_{April}$ = $22mm + 26mm = 48mm$

7.6.1 Sensitivity Analysis Conclusion -For Soil Moisture Maximum Capacity

McIntosh Perry completed a sensitivity analysis on the soil moisture capacity and found that for soil depths above 100mm, the annual surplus volume in millimetres diminished at a rate of less than 1%/year per 25mm of available soil. Therefore, as the depths of soils have been averaged across the site and a conservative approach has been pushed forward, it is not expected that in concentrated areas where the soil is less than the indicated depth that the soils will function materially different.

7.7 Pre-Development, Post-Development and Post-Development with Mitigation

Under pre-development, post-development and post-development with mitigation, precipitation, drainage, and infiltration conditions were reviewed. In pre-development, one consolidated area was used, whereas in post-development and post-development with mitigation, the site was broken into each block (west, central, and east) as well as the remaining roadways, residential lots, SWM block and Block 70. The purpose of this breakdown is to provide each of those block's guidance when it comes to the site plan control to achieve

approval in order to meet the site-specific stormwater management criteria. If they were not separated from the "main" area, it would be difficult to break out their individual contributions for the future. The summary, however, combines all together to ensure that the site meets the requirements of pre-development as desired by the RVCA. The results have been summarized below:

Change (Pre- to Post-Pre-Post-Change (Pre Characteristic **Development** Post- with Development Development – to Post) with Mitigation Mitigation Developed Lands to Perth Long Swamp Pre = Post Areas Input (Volumes) Precipitation (m³/year) 115168 115168 0% 115168 0% Output (Volumes) Total Infiltration (m³/year) 23051 12320 -47% 23095 0% Total Runoff (m³/year) 23876 65413 174% 47360 98%

Table 12 - Summary Water Balance Table

Table 12, above, illustrates that the pre-and post-development areas for the entire development remain relatively similar. The total infiltration is illustrated to indicate that in all instances, the development on-site (i.e.: when comparing post- to pre-development) results in a reduction in infiltration. To address the deficiency, infiltration-promoting measures will be required to ensure runoff is intercepted and permitted to recharge the groundwater aquifer.

Finally, the total runoff illustrated confirms that the wetland will see an increase in total volume as a result of the development. This will result in additional volume within the wetland temporarily until it is permitted to flow downstream. This information is critical for the natural sciences consultant to confirm that the vegetation communities are capable of withstanding the additional volume of runoff over the short term. The evaluation of the potential increase in runoff and its associated impacts on Perth Long Swamp is evaluated in **Section 8.0.** Please see **Appendix G** for the water balance tables broken out for each catchment.

7.8 Mitigation Measures

As a result of the lack of recharge when comparing post- to pre-development, the project will require infiltration trenches to ensure that the volume of runoff required enters the ground, providing groundwater recharge and continuing to ensure that the aquifer is maintained.

In order to design the trenches, the 5 mm event was reviewed. Environment Canada data as shown in **Table 13** below, indicates that there are 25.2 days with rain over 10 mm, 46.5 days with rain over 5 mm and 118.4 days of rain over 0.2 mm. Therefore, at a minimum there is:

- (46.5 25.2) days = 21.3 days x 5 mm = 107 mm; +
- (118.4 46.5) days = 71.9 days x 0.2 mm = 14 mm;
- Summing these volumes = 107 mm + 14 mm = 121 mm of minimum total volume that would be anticipated to be captured if the trenches are designed to accept the entire 5mm storm event.

Table 13 - Environment Canada - Days with Precipitation

1981 to 2010 Canadian Climate Normals station data														
Days with Rainfall														
	Jan	Feb	Mar	Apr	May	Jun	<u>Jul</u>	Aug	Sep	Oct	Nov	Dec	Year	Code
>= 0.2 mm	4.4	3.9	6.7	10.9	13.4	13.2	11.9	11	12.3	13.7	11	6	118.4	A
>= 5 mm	1.6	1.2	2.1	4	4.9	5.8	5.4	4.8	5.1	5	4.2	2.3	46.5	A
>= 10 mm	0.87	0.57	1	2	2.7	2.9	3.1	2.8	3.2	2.7	2.1	1.2	25.2	A
>= 25 mm	0.13	0.07	0.10	0.33	0.47	0.73	0.77	0.67	0.60	0.47	0.43	0.13	4.9	<u>A</u>

As described above, the mitigation measures were reviewed for each catchment. The exact geometry and location within the catchment have been completed by the civil engineering team during the detailed design of the development. Based on the volume to be infiltrated, mitigation measures meet or exceed the required infiltration volume required to balance the site.

Table 14 - Mitigation Measure Sizing - Development Lands to Perth Long Swamp

Description	(Bk 70, SWM Bk, Residential Lots and Roadway)	West Block
Area of Asphalt (m²)	26600	24010
Asphalt Runoff Coefficient	0.9	0.9
Volume of Runoff in 5 mm Event (m³) to be infiltrated	120	108
Mitigation Required (m³/yr)	2873	2593
Annual Volume to be infiltrated by designing for 5 mm Event (m³)	2897	2615

Based on the analysis conducted, it is recommended to provide an infiltration storage volume of 120 cubic meters for the Phase 6 developments to meet the annual water balance infiltration targets. Additionally, a volume of 108 cubic meters should be allocated for the future west block to meet the annual water balance infiltration targets. To determine the rough sizing of the infiltration trench, typical depths of 0.5 meters and 0.75 meters were assumed. The resulting footprint area requirements are summarized in the following table, which helps estimate the necessary surface area for the implementation of the infiltration trench and ensure sufficient storage capacity for infiltration purposes. Detailed calculations are included in **Appendix G**.

Table 15 – Infiltration Trench Footprint Requirements

Description	Infiltration Target (m³)	Assumed depth (m)	Footprint (m²)
Phase & Davidenments	36600	0.50	600
Phase 6 Developments	26600	0.75	400
Mast Block	0.0	0.50	540
West Block	0.9	0.75	360

7.8.1 Drawdown Of Infiltration Trenches

As detailed above, the trenches were sized to fully capture the 5 mm storm. The design criteria typical for a site draining to a wetland is that the trenches must be able to drawdown fully between 5 mm storm events. It is acknowledged that in larger events, the trenches will be overtopped and the grading on site will provide conveyance measures to direct the overtopped runoff towards the stormwater management facilities. With the assumed infiltration rates noted below, the drawdown values were reviewed to verify that the trenches were empty between 48-72 hrs as recommended by the TRCA.

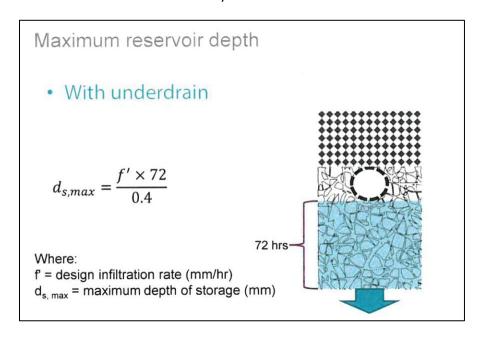


Figure 4 - Maximum Reservoir Depth (TRCA, 2018)

Table 16 - Drawdown Calculations

	Phase 6 Developments	West Block
Infiltration Rate (mm/hr)	25	25
Factor of Safety	4.5	4.5
Design Infiltration Rate (mm/hr) *assumed	5.5	5.5
Maximum Depth of Storage – 72 hrs (mm)	990	990
Maximum Depth of Storage – 48 hrs (mm)	660	660
Depths of Trenches Provided On Site (mm)	500 / 750	500 / 750
Meets Infiltration Drawdown Criteria	Yes	Yes

As indicated above, the infiltration trench is anticipated to empty between 48 - 72 hrs and therefore, is assumed to meet the drawdown criteria and is anticipated to function as intended by being empty within 2 to 3 days of a 5 mm storm event.

8.0 ANALYSIS OF IMPACTS TO THE WETLAND

Drainage will be directed from the site to the underground storm sewer network prior to reaching the stormwater management pond and ultimately outlet towards the wetland. Riprap and other flow spreaders will be used at the pond outlet to disperse surface flows and dissipate the associated energy of the flows directed to the wetland. This will ensure that any concentrated flows are spread out to reduce the potential for downstream erosion. The discharge from this pond is expected to be reduced through infiltration and evaporation between the outlet of the stormwater management feature and the edge of the wetland.

To assess the water quantity impact of the uncontrolled post-development flows, the water depths in the wetlands were calculated for the pre-development and post-development conditions. To complete this analysis the runoff depth, from the VO6 model results, was multiplied by the tributary drainage area to obtain the runoff volume. Then this volume was divided by the surface area of the wetland to obtain the depth in the wetland. This is a conservative approach since it assumes "vertical walls" around the wetland were as the surface area of the wetland would increase and thus the water depths were lower than those shown in Table below.

Pre and Post Development Runoff from the site to Perth Long Swamp Post-Pre-Pre-Pre-Post-Post-Return development development development development development development Difference Period Depth in Depth in Runoff Runoff Runoff Runoff (mm) (yrs) Wetland Wetland Volume (m³) Volume (m³) Depth (mm) Depth (mm) (mm) (mm) 2 7.35 897 17.23 2102 0.16 0.37 -0.21 5 1620 25.94 3165 0.28 -0.27 13.28 0.56 10 17.29 2110 31.45 3837 0.37 0.67 -0.30 25 23.63 2882 39.77 4851 0.51 0.85 -0.3550 28.42 3467 45.85 5594 0.61 0.98 -0.37 4175 53.03 6470 0.73 100 34.22 1.14 -0.40

Table 17 - Water Depths in Perth Long Swamp

As shown in **Table 17**, the maximum increase in water depth in the wetlands is approximately 0.4 mm for the 100-year storm event. This increase in water elevation will have negligible impact on the wetlands or the downstream systems.

In conclusion, the overall area of the Perth Long Swamp wetland is immense when compared to the size of this site. Any additional volume, in excess of pre-development volume, once the pond and mitigation measures are in place will not make a measurable difference to the quality, function and operation of the wetland.

9.0 ENVIRONMENTAL COMPLIANCE APPROVAL

In compliance with Ontario's 2021 mandatory stormwater management (SWM) criteria for consolidated linear infrastructure, an environmental compliance approval will be necessary. As part of the approval process, a detailed application will be prepared and submitted during the detailed design phase. This application will

include comprehensive information on the storm sewer infrastructure, the proposed design and function of the SWM facility, and other relevant details.

10.0 SEDIMENT EROSION CONTROL

10.1 Temporary Measures

Before construction begins, temporary silt fence, straw bales or rock flow check dams will need to be installed at all-natural runoff outlets from the property. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

The Contractor, at their discretion or at the instruction of the Town of Perth, RVCA or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way into the storm sewer network on site. The straw bales and silt fences shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment from the fences and check dams as required.

Work through winter months shall be closely monitored for erosion along sloped areas. Should erosion be noted, the Contractor shall be alerted and shall take all necessary steps to rectify the situation. Should the Contractor's efforts fail at remediating the eroded areas, the Contractor shall contact the Conservation Authority to review the site conditions and determine the appropriate course of action.

As each lot is developed, proper sediment and erosion controls will need to be installed and maintained. Sediment controls shall consist of, at minimum, straw bales at the down gradient property line. Grass shall be established as soon as possible, and excess fill shall be removed or leveled promptly. All manholes, catch basins and other drainage structures shall be covered in geosock when installed.

10.2 Permanent Measures

Rip-rap will be placed at all locations that have the potential for concentrated flow. It is crucial that the Contractor ensure that the geotextile is keyed in properly to ensure runoff does not undermine the rip-rapped area. Additional rip-rap is to be placed at erosion prone locations as identified by the Contractor / Contract Administrator / Town of Perth or RVCA.

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed/sod and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon as possible and must be located a sufficient distance from any watercourse to ensure that no sediment is washed out into the watercourse. As the vegetation growth within the site provides a key component to the control of sediment for the site, it must be properly maintained once established. Once the construction is complete, it will be up to the landowner to maintain the vegetation and ensure that the vegetation is not overgrown or impeded by foreign objects.

11.0 SUMMARY

- A new subdivision with 34 single family homes, 38 semi-detached homes and 14 apartment units will be constructed in Phase 6 of the Perthmore Subdivision.
- Proposed watermains ranging in diameter from 200mm to 300mm will be installed throughout the subdivision and will have multiple connection points to existing infrastructure.
- The proposed sanitary sewer will be 200 mm in diameter, will be installed throughout the subdivision and will gravity drain through the existing subdivision infrastructure though multiple connections.
- The proposed storm sewer, ranging in diameter from 250 mm to 900 mm, will be installed throughout the subdivision and will drain to a newly proposed stormwater management facility.
- Stormwater quantity and quality control will be provided by the proposed SWM facility. The facility will be designed as a wet pond to provide an enhanced level of water quality control (80% T.S.S. removal). A treatment train approach has been enacted using infiltration trenches, conveyance measures in rear yard swales and the end of pipe facility.
- Water balance criteria was reviewed, and mitigation measures will be required to meet the predevelopment infiltration volumes. Infiltration trenches have been proposed, volume sizing has been completed with further design details such as placement to be confirmed with the detailed grading and drainage plan in detailed design.
- Through ensuring that the stormwater management and water balance criteria are not exceed in postdevelopment from pre-development rates and volumes, and by locating the pond upstream of the wetland, no adverse impacts are anticipated to the Perth Long Swamp.
- Sediment and erosion protection measures will be installed as soon as ground conditions warrant and permit and shall remain in place until construction is complete, and vegetation is re-established.

12.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that the Town approve this Preliminary Servicing and Stormwater Management Report in support of the Draft Plan of Subdivision Application for Phase 6 of the Perthmore Subdivision.

Please feel free to contact the personnel below if you have any questions or concerns.

Regards,

McIntosh Perry Consulting Engineers Ltd.



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McIntosh Perry Consulting Engineers
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Design Lead | Water Resources McIntosh Perry Consulting Engineers

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E: r.rajachockalingam@mcintoshperry.com

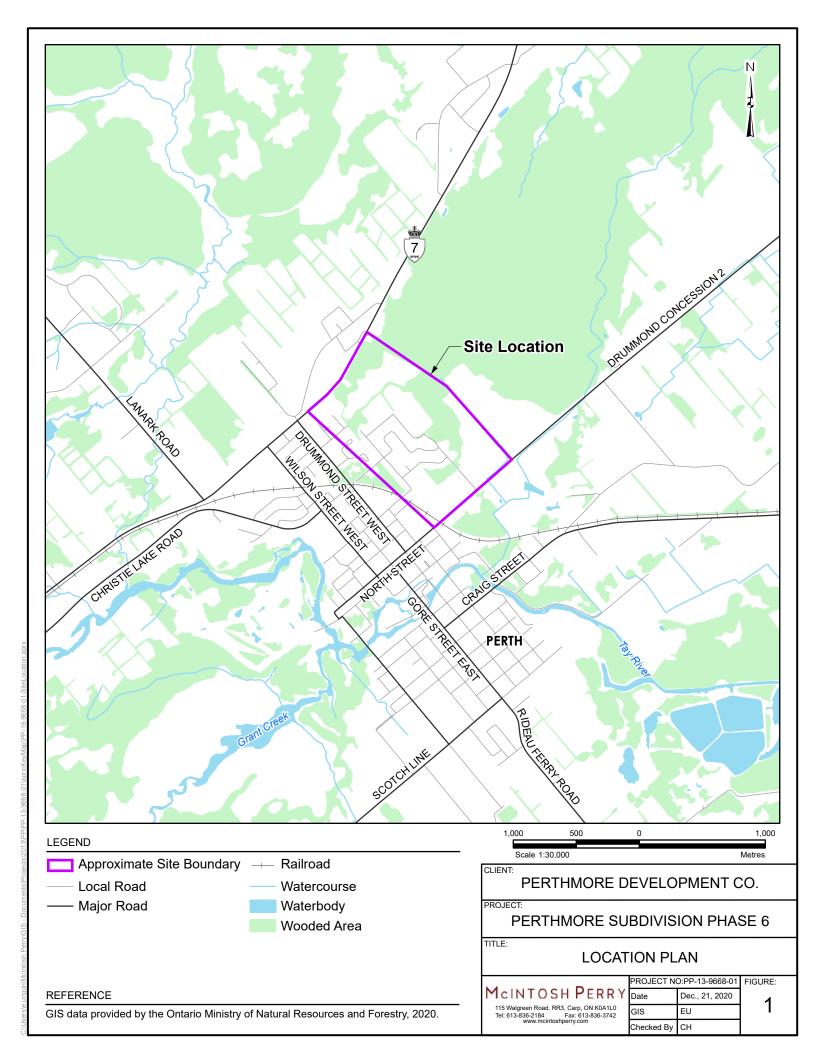
13.0 STATEMENT OF LIMITATIONS

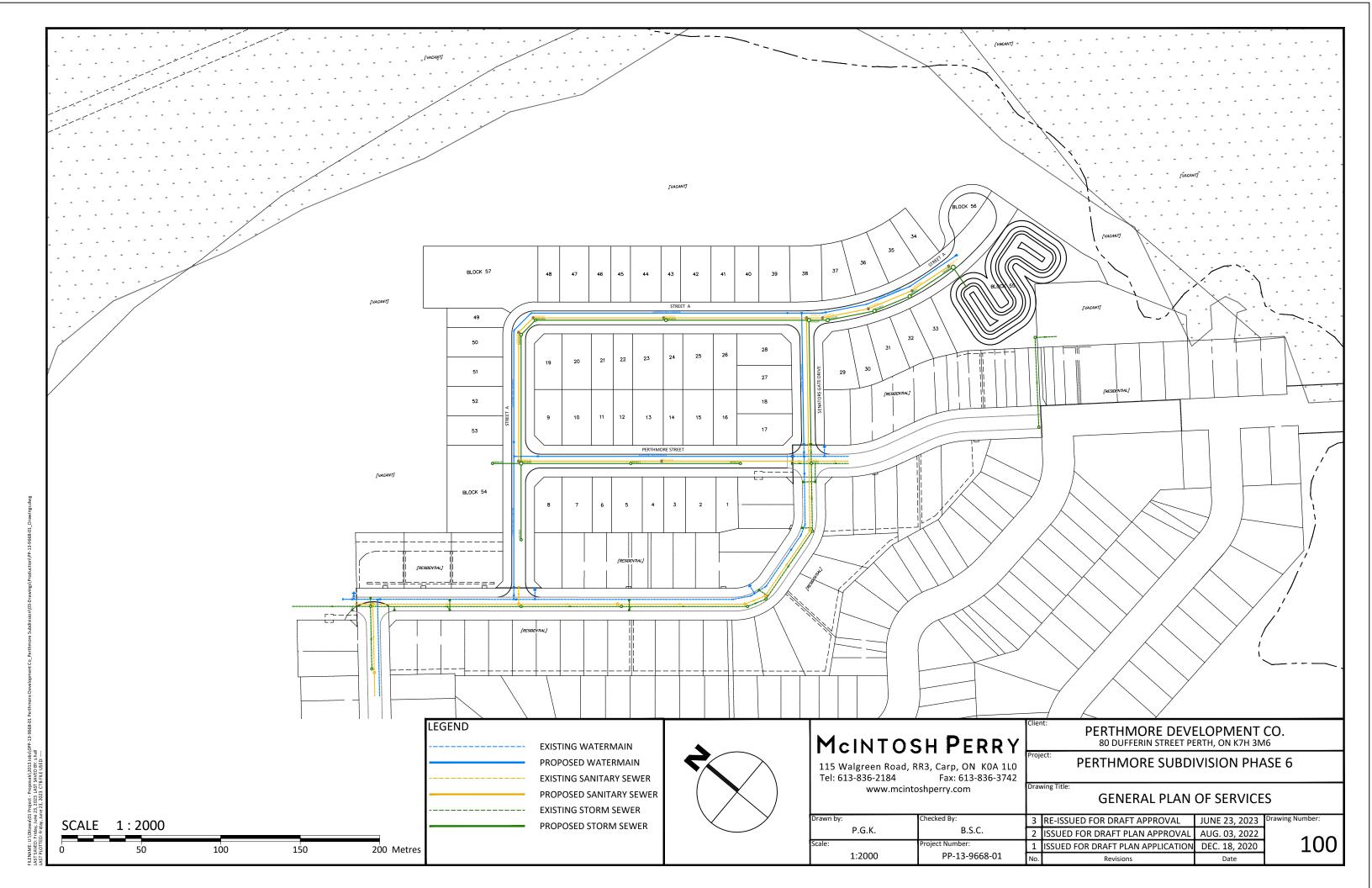
This report was produced for the exclusive use of Perthmore Developments Co. The purpose of the report is to assess the existing servicing infrastructure and to provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, Town of Perth and local approval agencies. McIntosh Perry reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by McIntosh Perry and site visits were performed, no field verification/measures of any information were conducted.

Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. McIntosh Perry accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, McIntosh Perry should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

APPENDIX A LOCATION PLAN





APPENDIX B WATERMAIN DESIGN

PP-13-9668-01 - Perthmore Subdivision Phase 6 - Water Demands 1

Peaking Factors:

Table 3-1: Peaking Factors

POPULATION	MINIMUM RATE FACTOR (MINIMUM HOUR)	MAXIMUM DAY FACTOR	PEAK RATE FACTOR (PEAK HOUR)
500 - 1,000	0.40	2.75	4.13
1,001 - 2,000	0.45	2.50	3.75
2,001 -3,000	0.45	2.25	3.38
3,001 - 10,000	0.50	2.00	3.00
10,001 - 25,000	0.60	1.90	2.85
25,001 - 50,000	0.65	1.80	2.70
50,001 - 75,000	0.65	1.75	2.62
75,001 - 150,000	0.70	1.65	2.48
greater than 150,000	0.80	1.50	2.25

Note: Domestic water demand peaking factors are per Section 3.4.2 of the Design Guidelines for Drinking-Water Systems 2008.

Population Density:

Unit Type	Persons Per Unit (ppu)
Single Family	3.4
Semi-detached	2.7
Townhouse	2.7
Apartment	1.8
Unknown	60/ha

Calculations:

Phase 6 - Consists of 34 single family, 38 Semi-detached units, 14 Apartment units Population = 243.40 people

*Average	Day Flow	Max. D	ay Flow	Peak Hourly Flow						
(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)					
0.79	47.33	2.17	130.15	3.26	195.46					
0.79	47.33	2.17	130.15	3.26	195.46					

^{*}Domestic flow was assumed to be 280L/(cap-day)

PP-13-9668-01 - Perthmore Subdivision Phase 6 - Water Demands 2

Peaking Factors:

Table 3-1: Peaking Factors

POPULATION	MINIMUM RATE FACTOR (MINIMUM HOUR)	MAXIMUM DAY FACTOR	PEAK RATE FACTOR (PEAK HOUR)
500 - 1,000	0.40	2.75	4.13
1,001 - 2,000	0.45	2.50	3.75
2,001 -3,000	0.45	2.25	3.38
3,001 - 10,000	0.50	2.00	3.00
10,001 - 25,000	0.60	1.90	2.85
25,001 - 50,000	0.65	1.80	2.70
50,001 - 75,000	0.65	1.75	2.62
75,001 - 150,000	0.70	1.65	2.48
greater than 150,000	0.80	1.50	2.25

Note: Domestic water demand peaking factors are per Section 3.4.2 of the Design Guidelines for Drinking-Water Systems 2008.

Population Density:

Unit Type	Persons Per Unit (ppu)
Single Family	3.4
Semi-detached	2.7
Townhouse	2.7
Apartment	1.8
Unknown	60/ha

Calculations:

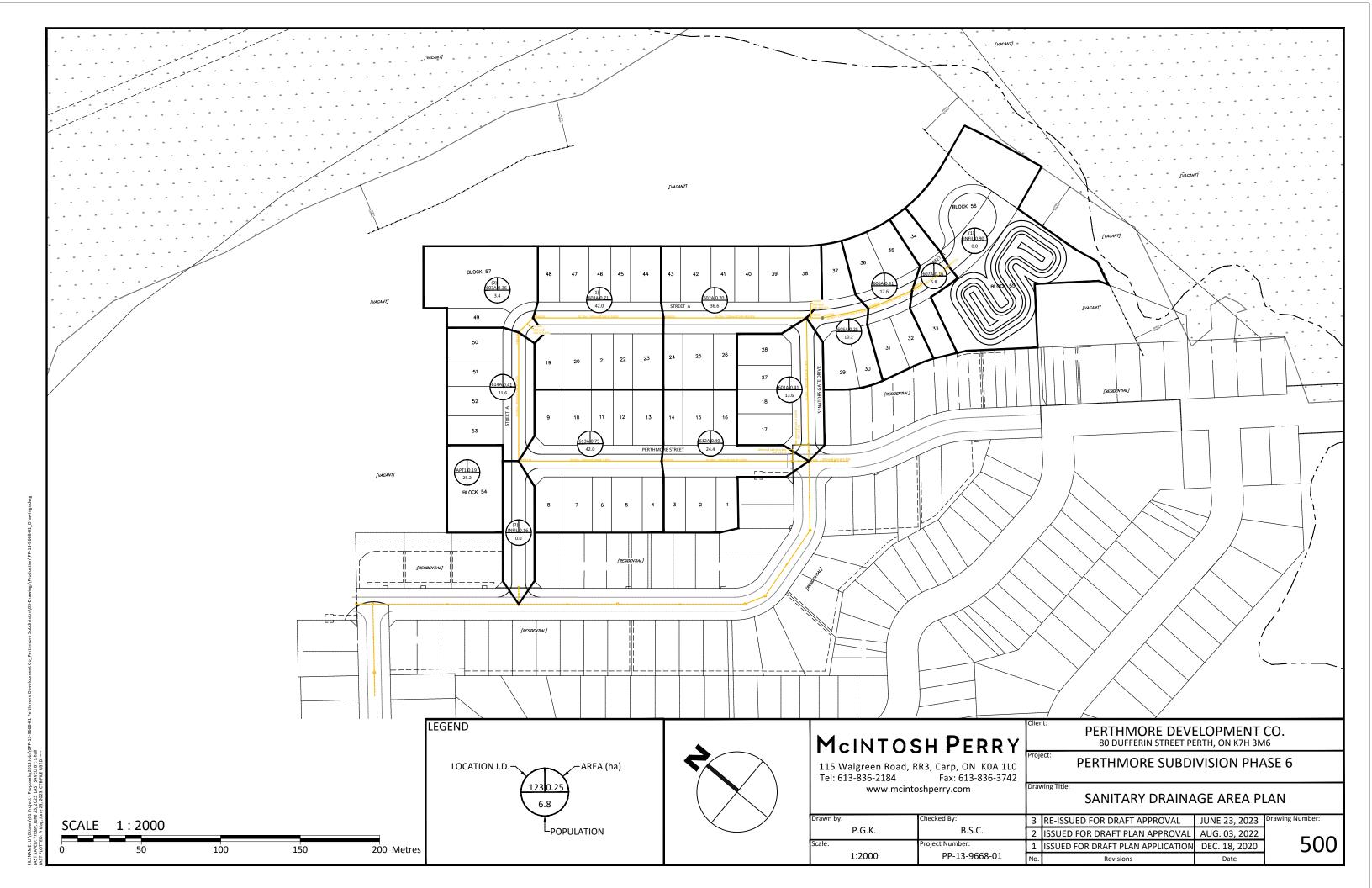
Phase 6 - Consists of 34 single family, 38 Semi-detached units and 14 Apartment units **Future Development** - Consists of 5.45 ha development area

Population = 570.40 people

*Average	Day Flow	Max. D	ay Flow	Peak Hourly Flow						
(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)					
1.85	110.91	5.08	305.01	7.63	458.06					
1.85	110.91	5.08	305.01	7.63	458.06	То				

^{*}Domestic flow was assumed to be 280L/(cap-day)

APPENDIX C SANITARY SEWER DESIGN



SANITARY SEWER DESIGN SHEET

McINTOSH PERRY

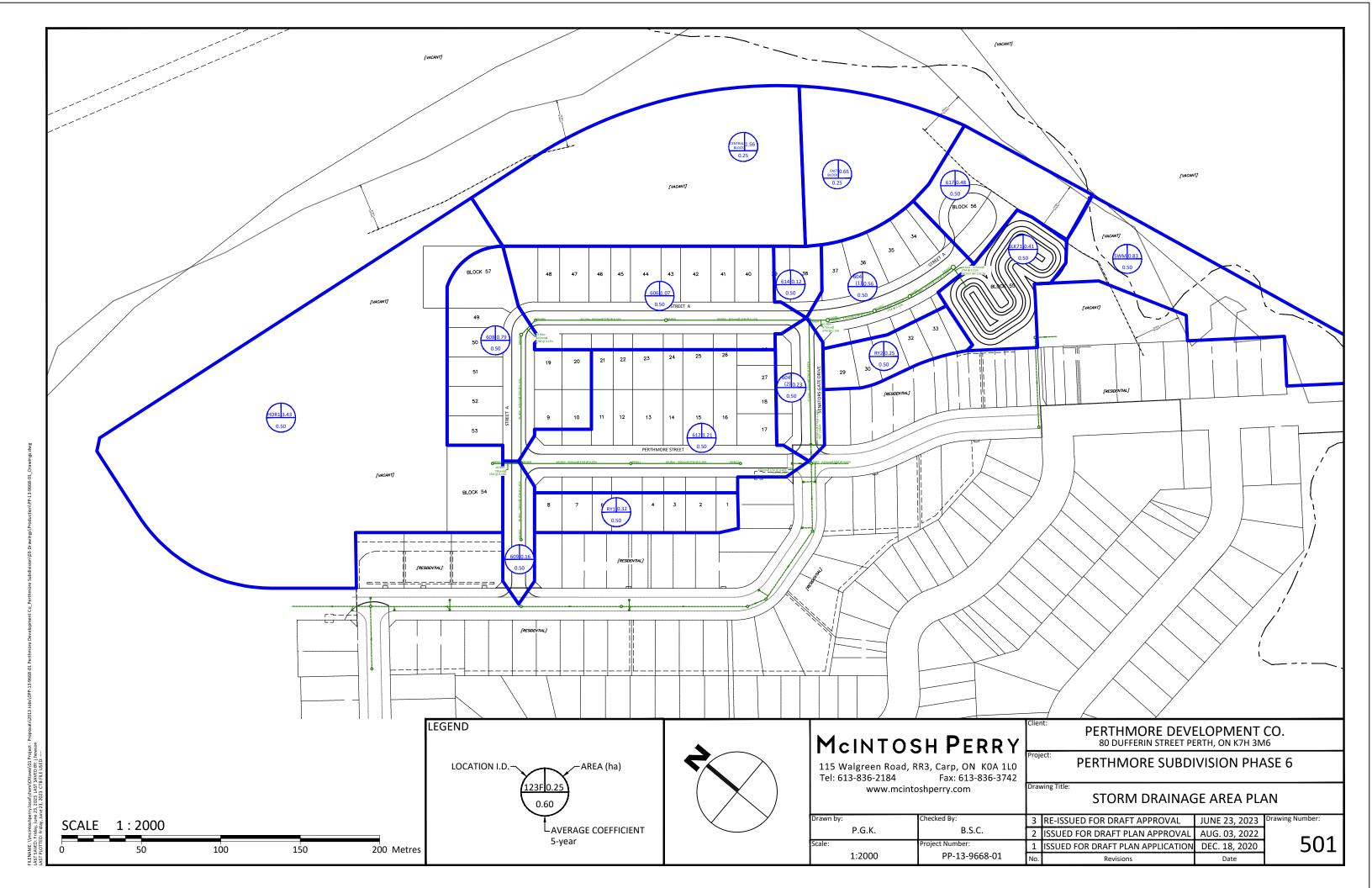
PROJECT: PERTHMORE SUBDIVISION PHASE 6

LOCATION: PERTH, ON

CLIENT: PERTHMORE DEVELOPMENT CO.

	LOCATION						RESIDENTIA	L.						ı	CI AREAS				INFILTR	ATION ALLO	DWANCE	FLOW					SEWER DATA	١			
1	2	3	4	5	6 7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	30	31
					UNIT TYPES		AREA	POPU	LATION		PEAK			AREA ((ha)			PEAK	ARE/	(ha)	FLOW	DESIGN	CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	FLOW	VELOCITY	AVAI	ILABLE
STREET	AREA ID	FROM	то	SE	60 -		1			PEAK	FLOW	INSTITU	JTIONAL	COMME	RCIAL	INDUS	TRIAL	FLOW			11.1.	FLOW				(0/)	(full)	DEPTH	(actual)	CAP	ACITY
		MH	МН	SF.	SD TI	I APT	(ha)	IND	CUM	FACTOR	(L/s)	IND	CUM	IND	CUM	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(L/S)	(m)	(mm)	(%)	(m/s)	(mm)	(m/s)	L/s	(%)
STREET A	603A(1)	603A	602A	6	8		0.71	42.0	42.0	4.00	0.54		0.00		0.00		0.00	0.00	0.71	0.71	0.23	0.78	27.59	82.10	200	0.65	0.851	24.7	0.378	26.81	97.18
	602A	602A	601A	6	6		0.70	36.6	78.6	4.00	1.02		0.00		0.00		0.00	0.00	0.70	1.41	0.47	1.48	21.64	90.00	200	0.40	0.667	37.5	0.387	20.16	93.14
																															<u> </u>
STREET A	INFIL(1), 607A	607A	606A	2			1.06	6.8	6.8	4.00	0.09		0.00		0.00		0.00	0.00	1.06	1.06	0.35	0.44	27.59		200	0.65	0.851	18.9	0.317	27.15	98.41
	606A	606A	605A	2	4		0.31	17.6	24.4	4.00	0.32		0.00		0.00		0.00	0.00	0.31	1.37	0.45	0.77	27.59	29.81	200	0.65	0.851	24.6	0.376	26.82	97.21
	605A	605A	604A	3			0.25	10.2	34.6	4.00	0.45		0.00		0.00		0.00	0.00	0.25	1.62	0.53	0.98	27.59	29.40	200	0.65	0.851	27.6	0.405	26.60	96.44
		604A	601A				-	0.0	34.6	4.00	0.45		0.00		0.00		0.00	0.00	0.00	1.62	0.53	0.98	27.59	10.08	200	0.65	0.851	27.6	0.405	26.60	96.44
SENATORS GATE DRIVE	601A	601A	CAP				0.41	13.6	126.8	4.00	1.64		0.00		0.00		0.00	0.00	0.41	3.44	111	2.78	21.64	79.13	200	0.40	0.667	50.4	0.465	10.00	07.16
SENATORS GATE DRIVE	601A	CAP-1	<u> </u>	4			0.41		126.8		1.64 1.64				0.00			0.00		3.44	1.14	2.78	21.64	79.13 11.00	200 200	0.40	0.667	50.4	0.465	18.86	87.16 87.16
		CAP-1	S106				0.00	0.0	126.8	4.00	1.64		0.00		0.00		0.00	0.00	0.00	3.44	1.14	2.78	21.64	11.00	200	0.40	0.667	50.4	0.465	18.86	87.16
																															\vdash
STREET A	603A(2)	603A	614A	1			0.36	3.4	3.4	4.00	0.04		0.00		0.00		0.00	0.00	0.36	0.36	0.12	0.16	27.59	12.90	200	0.65	0.851	11.9	0.234	27.42	99.41
U.M.E.L. / N	614A	614A	613A	-	8		0.41	21.6	25.0	4.00	0.32		0.00		0.00		0.00	0.00	0.41	0.77	0.25	0.58	27.59	81.00	200	0.65	0.851	21.5	0.345	27.01	97.90
PERTHMORE STREET	APT1, INFIL(2), 613A	613A	612A	6	8	14	1.10	67.2	92.2	4.00	1.20		0.00		0.00		0.00	0.00	1.10	1.87	0.62	1.81	21.64	90.00	200	0.40	0.667	41.2	0.410	19.83	91.63
	612A	612A	CAP	4	4		0.49	24.4	116.6	4.00	1.51		0.00		0.00		0.00	0.00	0.49	2.36	0.78	2.29	21.64	81.68	200	0.40	0.667	46.0	0.439	19.35	89.42
		CAP-2	S106				0.00	0.0	116.6	4.00	1.51		0.00		0.00		0.00	0.00	0.00	2.36	0.78	2.29	21.64	11.00	200	0.40	0.667	46.0	0.439	19.35	89.42
esign Parameters:				Notes:						Designed:					No.					Revision								Date			
					gs coefficient (n) =		0.013					P.G.K.		_		ISSUED FOR												EC. 18, 202			
Residential		ICI Areas		4	(per capita):) L/day			ISSUED FOR DRAFT PLAN APPROVAL								AUG.3, 202													
SF 3.4 p/p/u			Peak Factor		on allowance:	0.3	3 L/s/Ha			Checked: 3. ISSUED FOR DRAFT PLAN APPROVAL							JI	UN. 23, 202	!3												
SD 2.7 p/p/u		L/Ha/day	1.5		tial Peaking Factor:	1./14//4.040	-11			B.S.C.					1																
TH 2.7 p/p/u		L/Ha/day	1.5		Harmon Formula :					Desired May					ļ																
APT 1.8 p/p/u	IND 35,000	L/Ha/day	MOE Chart		where P = populat	on in thousand	5			Project No	.:	DD 42 0666	. 04															Cl			
Other 60 p/p/Ha				I						1		PP-13-9668	5-01															Sheet No: 1 of 1			

APPENDIX D STORM SEWER DESIGN



STORM SEWER DESIGN SHEET

PROJECT: PERTHMORE SUBDIVISION PHASE 6

LOCATION: PERTH, ON

CLIENT: PERTHMORE DEVELOPMENT CO.

	LOCATION					CONTRIB	LITING ADD	A /I==\							DATI	ONIAL DECICAL	F1 0111					1			CELLIED DATA				
1	LOCATION 2	3	4	5	6 7		SUTING ARE	A (na)	11	12	13	14	15	16	17	ONAL DESIGN 18	19	20	21	22	23	24	25	26 27	SEWER DATA 28	29	30	31	32
CTREET	ADEAID	FROM	TO			ALUE			INDIV	CUMUL	INLET	TIME	TOTAL	i (5)	i (10)	i (100)	5yr PEAK	10yr PEAK			DESIGN	CAPACITY	LENGTH	PIPE SIZE (mn		SLOPE	VELOCITY		AP (5yr)
STREET	AREA ID	МН	MH	0.20	0.40 0.50	0.60	0.80	1.00	AC	AC	(min)	IN PIPE	(min)	(mm/hr)	(mm/hr)	(mm/hr)	FLOW (L/s)	FLOW (L/s)	FLOW (L/s)	FLOW (L/s)	FLOW (L/s)	(L/s)	(m)	DIA W	Н	(%)	(m/s)	(L/s)	(%)
			500			2.20			4.0=	4.0=	20.00	2.22	20.20			07.40	240.56				240 50	440.04	40.00				2.000	400.00	20.05
	HDR2	610	608	+		3.28			1.97	1.97	20.00	0.30	20.30	58.41	67.89	97.42	319.56				319.56	449.81	18.00	750		0.15	0.986	130.26	28.96
STREET A	609	609	608		0.16				0.08	0.08	20.00	0.97	20.97	58.41	67.89	97.42	12.99				12.99	41.62	48.00	250		0.45	0.821	28.63	68.79
PERTHMORE STREET	612	612	611		1.21				0.61	0.61	20.00	1.42	21.42	58.41	67.89	97.42	98.24				98.24	133.02	69.00	450		0.20	0.810	34.78	26.15
		611	608						0.00	0.61	21.42	1.42	22.84	55.68	64.71	92.86	93.64				93.64	133.02	69.00	450		0.20	0.810	39.38	29.60
STREET A	608	608	607		0.94				0.47	3.12	22.84	1.28	24.12	53.23	61.88	88.79	462.17				462.17	579.98	81.00	825		0.15	1.051	117.81	20.31
J.H.E.F.F.		607	606		0.5.				0.00	3.12	24.12	0.20	24.33	51.24	59.55	85.46	444.83				444.83	579.98	12.90	825		0.15	1.051	135.15	23.30
	606	606	605		1.11				0.56	3.68	24.33	1.30	25.63	50.93	59.20	84.95	520.80				520.80	579.98	82.10	825		0.15	1.051	59.18	10.20
		605	604						0.00	3.68	25.63	1.43	27.06	49.11	57.09	81.91	502.16				502.16	579.98	90.00	825		0.15	1.051	77.82	13.42
SENATORS GATE DRIVE	614, HDR1	BULKHEAD	604		0.07	2.34			1.44	1.44	20.00	0.33	20.33	58.41	67.89	97.42	233.66				233.66	339.63	18.00	675	 	0.15	0.919	105.98	31.20
SENATORS GATE DRIVE	014, HDK1	BOLKHEAD	004		0.07	2.34			1.44	1.44	20.00	0.55	20.33	36.41	67.83	37.42	233.00				233.00	333.03	18.00	6/3	 	0.13	0.919	105.56	31.20
STREET A	604(1)	604	603		0.68				0.34	5.46	27.06	0.17	27.22	47.29	54.96	78.87	717.35				717.35	905.48	11.80	975		0.15	1.175	188.13	20.78
		603	602						0.00	5.46	27.22	0.43	27.65	47.08	54.73	78.53	714.27				714.27	905.48	30.00	975		0.15	1.175	191.22	21.12
		602	601						0.00	5.46	27.65	0.34	27.99	46.58	54.14	77.68	706.57				706.57	905.48	24.00	975	ļ	0.15	1.175	198.92	21.97
+		601 600	600 POND	+			+	-	0.00	5.46 5.46	27.99 28.46	0.47 0.21	28.46 28.66	46.18 45.65	53.68 53.06	77.02 76.14	700.55 692.50		1		700.55 692.50	905.48 905.48	32.90 14.61	975 975	+ +	0.15 0.15	1.175 1.175	204.94 212.99	22.63 23.52
		300	, SIND	 					0.00	3.70	20.70	0.21	23.00	-5.05	33.00	, 5.17	032.30		†		032.30	202.40	17.01	3,3	† †	0.13	1.1/3	-12.33	25.52
SENATORS GATE DRIVE	604(2)	604	BULKHEAD	-	0.23	1			0.12	0.12	20.00	1.13	21.13	58.41	67.89	97.42	18.67		-		18.67	188.11	77.63	450		0.40	1.146	169.44	90.07
1		BULKHEAD	D207	+			 		0.00	0.12	21.13	0.18	21.31	56.21	65.33	93.75	17.97		+		17.97	188.11	12.50	450	+ -	0.40	1.146	170.14	90.45
PERTHMORE STREET		BULKHEAD	D207						0.00	0.00	20.00	0.18	20.18	58.41	67.89	97.42	0.00				0.00	188.11	12.50	450		0.40	1.146	188.11	100.00
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Definitions: Q = 2.78CiA, where:				Notes: 1 Mannin	gs coefficient (n) =					0.013	Designed:		P.G.K.			No. 1.	ISSUED FOR I	DRAFT PLAN A	PPLICATION		Revision						Date DEC. 18, 2020		
Q = Peak Flow in Litres p	er Second (L/s)			1. IVIGITITI	92 cocinicient (II) =					0.013						2.		DRAFT PLAN A							1		AUG. 3, 2022		
A = Area in Hectares (ha											Checked:							DRAFT PLAN A									JUN. 23, 2023		
i = Rainfall intensity in m	nillimeters per hour (mi	m/hr)		I									B.S.C.								_	-						-	
[i = 27.1 * Tc^-0.699]											Design 1														ļ				
[i = 31.5 * Tc^-0.699] [i = 45.2 * Tc^-0.699]											Project No.:		PP-13-9668-	n1			L										Sheet No:		
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APPENDIX E EXISTING CONDITIONS MEMO

MEMORANDUM

To: Ryan Kennedy, P. Eng., Practice Lead, Land Development

Adam O'Connor, P.Eng., Assistant Vice President, Land Development

From: John Price, P. Eng., Senior Water Resource Engineer

Cc: Jason Sharp, P. Eng. Manager, Water Resources

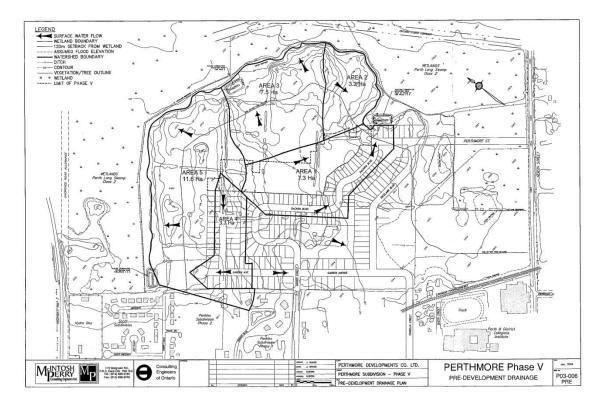
Date: December 2, 2020

Re: Perthmore Subdivision

1.0 BACKGROUND

The Perthmore subdivision is located northwest of North Street in the Town of Perth. Various phases of the subdivision have been under development since the 1990s and the draft plan for a subsequent phase is now under consideration. The drainage and stormwater management infrastructure has also been constructed in phases over many years. The original pre-development flow values were first calculated in 1990s using the Rational Equation.

An existing stormwater management (SWM) pond is located on the northeast side of Perthmore Street as shown on the figure below. As part of development of this subsequent phase, this SWM facility will be reconstructed and expanded to address the water quality and quantity control requirements for the tributary drainage area. For the SWM design the predevelopment flows, to be used as the target flows for the quantity control, were reassessed.



2.0 ANALYSIS

A Visual OTTHMO Version 5 (VO5) model was assembled for the analysis. As shown in the figure above, the predevelopment tributary area to the SWM facility consists of Areas 1 and 2 and the total tributary pre-development drainage area is 10.5 ha. The VO5 hydrologic model requires various measured and calculated input parameters. The calculations of these input parameters area detailed below.

2.1 Parameters

2.1.1 General

Since the pre-development land use was rural the NASHYD command was employed in the VO5 model to calculate the runoff flows. NASHYD is used to simulate runoff flows with NASH instantaneous unit hydrograph. This hydrograph is made of a cascade of "n" linear reservoirs. The n (number of linear reservoirs) parameter was set at 3, in the model, and the rainfall losses were computed by the SCS CN procedure.

2.1.2 Time of Concentration/Time to Peak

The Time of Concentration (Tc), for the pre-development drainage basins, was calculated using the Airport Formula.

$$T_c = 3.26 * (1.1 - C) * L^{0.5} * S_w^{-0.33}$$

Where:

Tc = time of concentration in minutes

C = runoff coefficient

L = watershed length in metres

S_w = watershed slope in percentage

From the Tc value, the Time to Peak (Tp) value was calculated as 0.67 times Tc. The parameters employed in the calculation of Tc and Tp for the two drainage basins are show in Table 1.

Table 1 – Time to Peak

Catchment	Area	Flow Length	Fall	Slope	Tc ¹	Tp ²
	ha	m	m	%	min	hrs
Area 1	7.3	435	7	1.61	58.1	0.65
Area 2	3.2	165	7	4.24	26.0	0.29

Notes: 1 – Airport Formula

2 – 0.67*Tc

2.1.3 SCS Curve Number

The Curve Number (CN) is the most important parameter in determining surface runoff when the SCS equation is used. Table 2 shows the parameters and the resulting CN value for Areas 1 and 2.

Table 2 - Curve Number

Catchment	Soil Type	Hydrologic	Land Use	Runoff	CN ³	la
		Soil Group ¹	(0-5% Slope)	Coefficient ²	(AMC II)	mm
Area 1	Sandy Loam	AB	Pasture	0.10	59	5
Area 2	Sandy Loam	AB	Pasture	0.10	59	5

Notes: 1 – MTO Drainage Management Manual – Design Chart 1.08

2 - MTO Drainage Management Manual - Design Chart 1.07

3 - MTO Drainage Management Manual - Design Chart 1.09 (Pasture, fair condition - average of A and B Hydrologic Soil Groups)

2.1.4 Rainfall

For the rainfall input to the VO5 model, the 12 hour SCS rainfall distribution, representing a high volume lower intensity storm, and a 4 hour Chicago rainfall distribution, representing a high intensity "thunder storm" type of rainfall event were used ion the analysis. The Intensity-Duration-Frequency (IDF) curve was obtained from the Ministry of Transportation (MTO) IDF Curve Lookup tool with the location centred over the property.

3.0 RESULTS

Employing the above noted parameters and the VO5 hydrologic model, Table 3 shows the calculated pre-development flow values for the 12 hour SCS and 4 hour Chicago rainfall hyetographs. It is recommended that these flow values be used for the water quantity control assessment of the reconstructed SWM facility. The redesign of the end of pipe facility will also include water quality control for the post-development tributary drainage area.

Table 3 – Calculated Flows

		12 hour SCS			4 hour Chicago	
Return Period	Area 1	Area 2	Total	Area 1	Area 2	Total
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s
2	0.061	0.047	0.093	0.030	0.022	0.045
5	0.110	0.085	0.168	0.057	0.041	0.085
10	0.143	0.111	0.220	0.080	0.058	0.119
25	0.197	0.152	0.303	0.111	0.083	0.166
50	0.238	0.184	0.367	0.137	0.101	0.206
100	0.288	0.223	0.444	0.165	0.122	0.248

This memorandum is respectfully submitted by, McIntosh Perry Consulting Engineers Ltd.

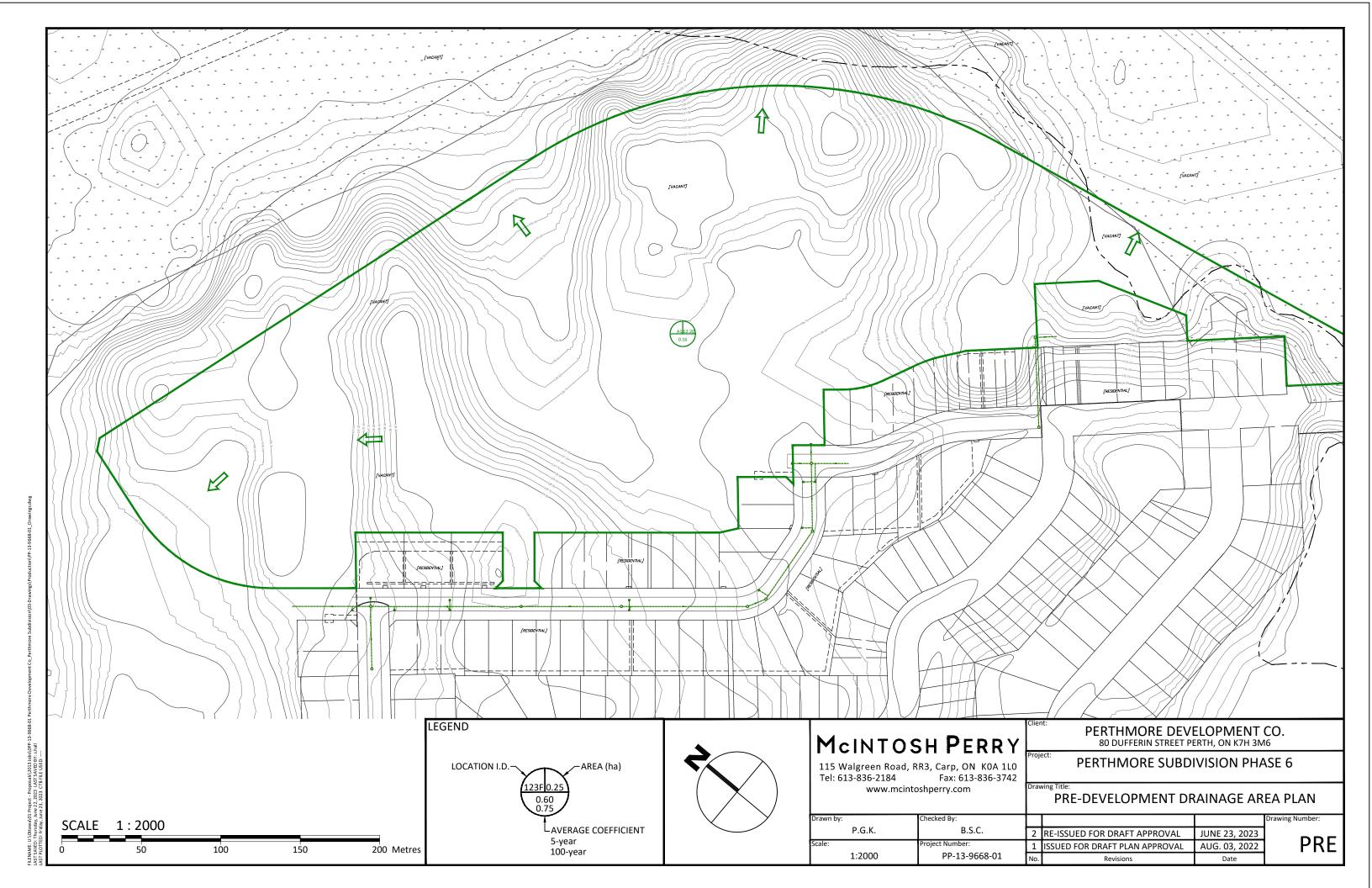
John Price, P. Eng.

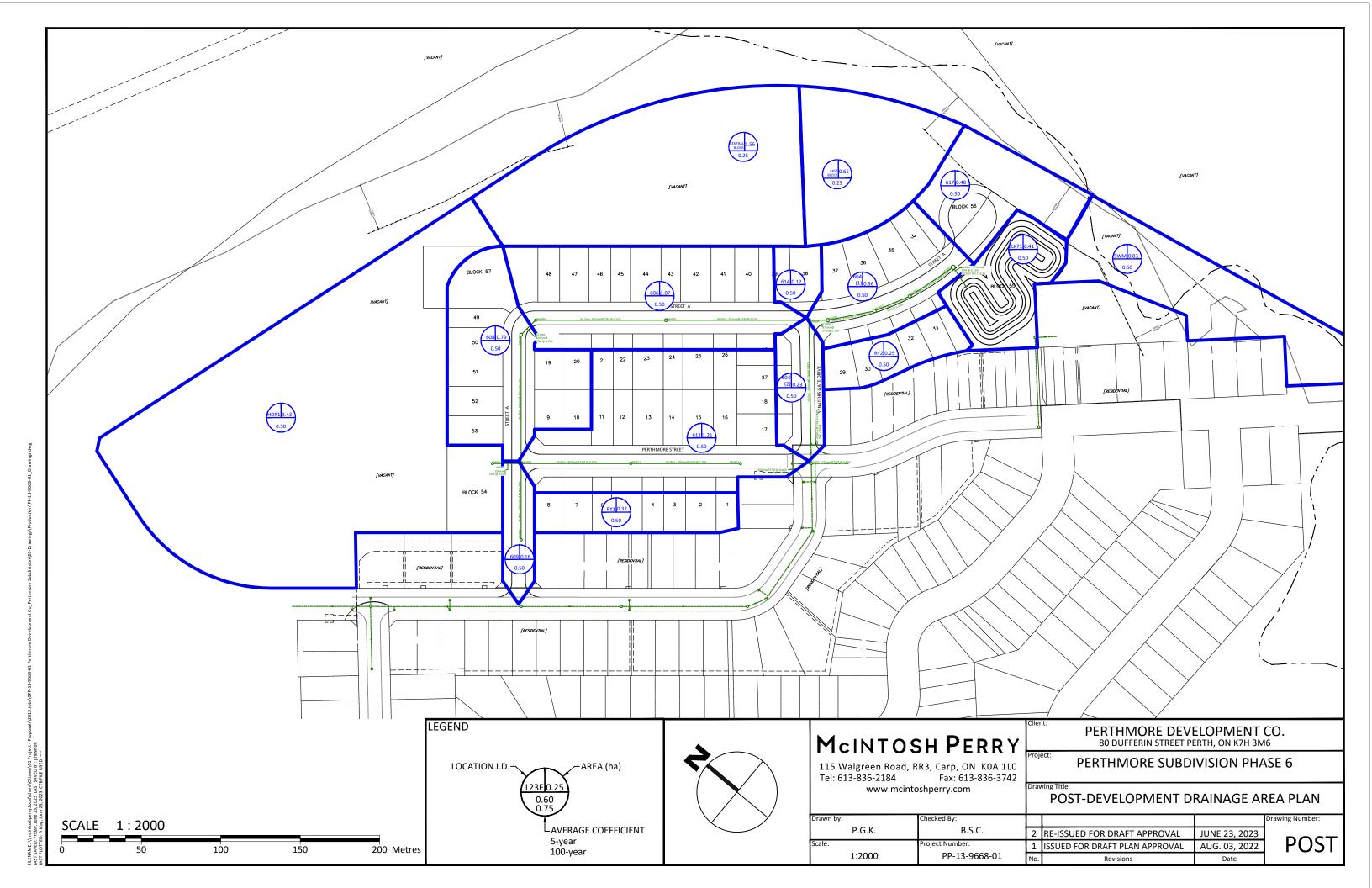
Senior Water Resource Engineer

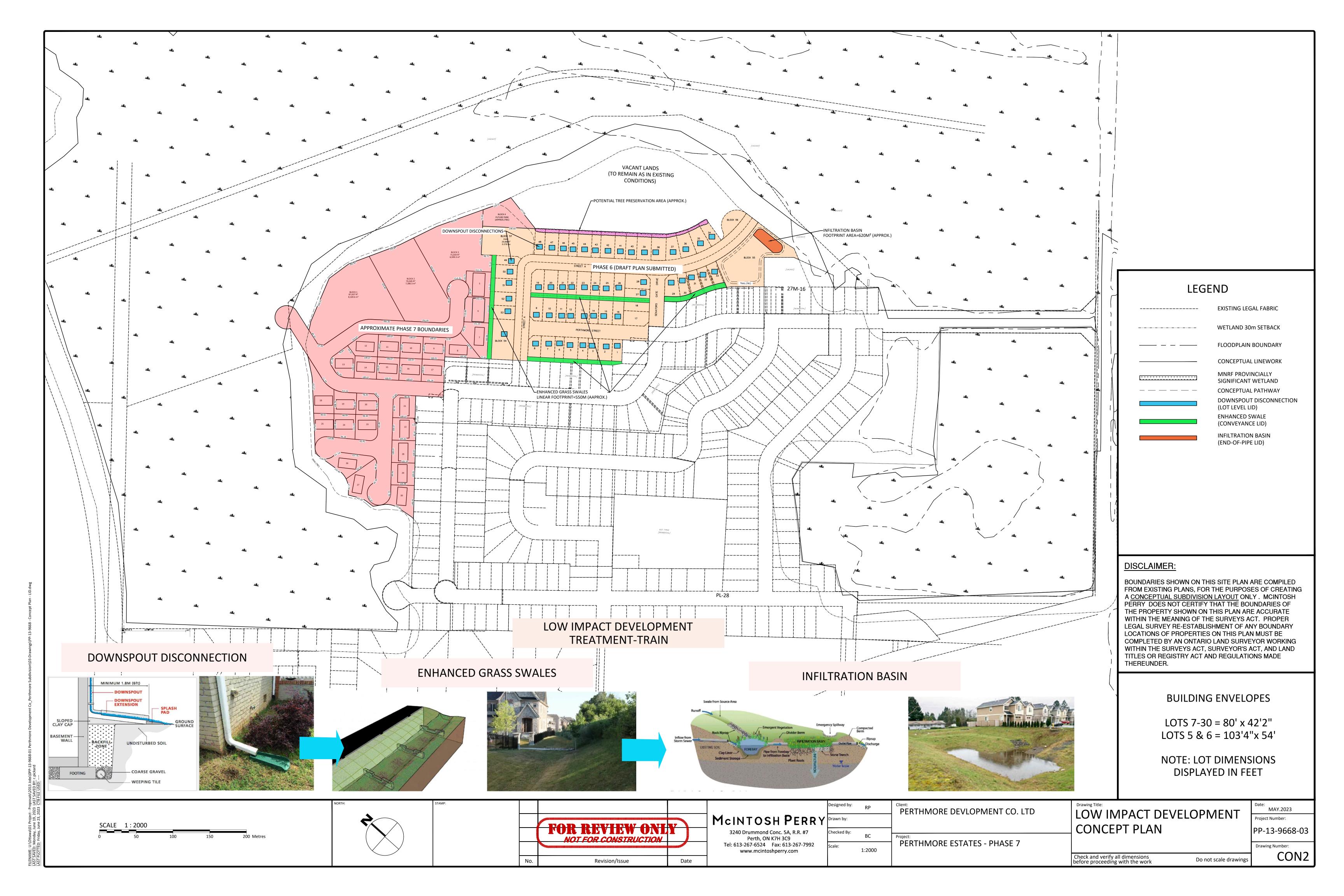
PH No. 613 714 5906

Email. J.Price@McIntoshPerry.com

APPENDIX F STORMWATER MANAGEMENT DESIGN







CCO-13-9668-01 - PERTHMORE SUBDIVISION - PRE-DEVELOPMENT

Values

Land Use	Pasture	Pasture	Forest	Forest
Hydrologic Soil Group	В	С	В	С
Runoff Coefficients*	0.1	0.28	0.08	0.25
CN Values**	59	75	60	73
IA (mm)	5	5	10	10

^{*} Design Chart 1.07 MTO Drainage Management Manual

Land Use

Drainage Area ID Tota		Pasture	Pasture	Forest	Forest			
	Total Area (ha)	В	С	В	С	Weighted CN	Weighted C	Weighted IA
Dialilage Alea ID	Drainage Area ID Total Area (ha		Sub-Area (ha)	Sub-Area (ha)	Sub-Area (ha)	Value	Value	Value
A1	12.2	5.45	1.76	1.56	3.2	64.0	0.16	6.9

Airport Formula

For use when the runoff coefficient is less than 0.4

$$t_c$$
 = 3.26 * (1.1 - C) *L $^{0.5}$ * S_w $^{-0.33}$

Where

tc = time of concentration in minutes

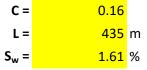
C = runoff coefficient

L = watershed length in metres

S_w = watershed slope in %

Source: MTO Drainage Manual 1997 - Chapter 8, page 28

Α1







^{**} Design Chart 1.09 MTO Drainage Management Manual

CCO-13-9668-01 - PERTHMORE SUBDIVISION - PRE-DEVELOPMENT RESULTS

	12 hour SCS	4 hour Chicago
Return Period	Area 1	Area 1
Yrs	m³/s	m ³ /s
2	0.114	0.053
5	0.211	0.105
10	0.278	0.149
25	0.383	0.210
50	0.463	0.262
100	0.560	0.317



CCO-13-9668-01 - PERTHMORE SUBDIVISION - POST-DEVELOPMENT

Values

Land Use	Pasture	Pasture	Forest	Forest
Hydrologic Soil Group	В	С	В	С
Runoff Coefficients*	0.1	0.28	0.08	0.25
CN Values**	59	75	60	73
IA (mm)	5	5	10	10

^{*} Design Chart 1.07 MTO Drainage Management Manual

Land Use

		Pasture	Pasture	Forest	Forest				
Drainago Aroa ID	Total Area (ha)	В	С	В	С	Weighted CN	Weighted C	Weighted IA Value	
Drainage Area ID	Total Area (IIa)	Sub-Area (ha)	Sub-Area (ha)	Sub-Area (ha)	Sub-Area (ha)	Value	Value		
Central Block	1.56	0	0	0.00	1.56	73.0	0.25	10.0	
East Block	0.65	0	0	0.00	0.65	73.0	0.25	10.0	

Airport Formula

For use when the runoff coefficient is less than 0.4

$t_c = 3.26 * (1.1 - C) *L^{0.5} * S_w^{-0.33}$	<u>Central Block:</u>		
	C=	0.25	Tc=
Where	L=	80.00	Tp=

tc = time of concentration in minutes

Sw= 2.00

C = runoff coefficient

East Block:

L = watershed length in metres C= 0.25 Tc= 12.6 min S_w = watershed slope in % L= 60.00 Tp= 0.14 hr

19.7

0.22

min

hr

Source: MTO Drainage Manual 1997 - Chapter 8, page 28 Sw= 5.00

						Pervious Area				Impervious Area			
Sub-Catchment	Area	Total Imperviousnes s	Directly Connected	CN	Slope	Flow Length	Manning's n	la	Slope	Flow Length (measured)	Flow Length ³	Manning's n	Depression Storage
	ha	%	%		%	m		mm	%	m			mm
West Block ⁶	3.43	70.0	60.0	59.0	2.0	10.0	0.25	5.0	1.0	150.0	151.2	0.013	1.0
Central Block ⁶	1.56	70.0	60.0	59.0	2.0	10.0	0.25	5.0	1.0	150.0	102.0	0.013	1.0
East Block ⁶	0.65	70.0	60.0	75.0	2.0	10.0	0.25	5.0	1.0	100.0	65.8	0.013	1.0
Block 70	0.83	0.0	0.0	75.0	2.0	10.0	0.25	10.0	1.0	75.0	74.4	0.013	1.0
SWM Block ^{4,6}	0.41	0.0	0.0	75.0	2.0	10.0	0.25	5.0	1.0	50.0	52.3	0.013	1.0
Developed Portions ^{5,6}	5.32	50.0	35.0	59.0	2.0	10.0	0.25	5.0	1.0	350.0	188.3	0.013	1.0

Notes 1 -Airport Formula

2 - 0.67* Tc

3 - Flow Length = SquareRoot (Area/1.5) - (Area in square metres)

4 - Block 71

5 - 604(1) - 0.56ha, 604(2) - 0.23ha, 606 - 1.07ha, 608 - 0.79ha, 609 - 0.16ha, 612 - 1.21ha, 614 - 0.25ha, 617 - 0.48ha, RY1 - 0.32ha and RY2 - 0.25ha

6 - To Pond

^{**} Design Chart 1.09 MTO Drainage Management Manual

Storage Requirements

Facility Type:	Wet Pond
Level of Protection:	Enhanced

%Imperviousness

46%

Req'd Permanent Pool Storage Volume

 $Vs = 85 m^3/ha$ $Vs = 966 m^3$ (Table 3.2, p. 3-10, SWMP Manual - 165m3/ha - 80m3/ha)

Req'd Extended Detention Volume

Ved = 80 m³/ha Ved = 458 m³

Given the upstream individual storage requirements from Blocks 67, 68 and 69, the MECP SWMP Manual notes that the extended detention is increased to account for upstream storage)

MECP SWMP Manual - Section 3.3.2.

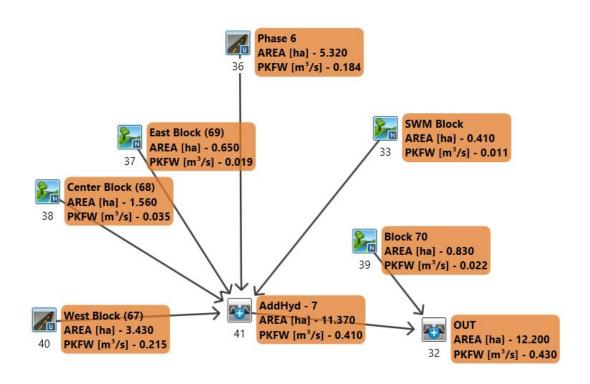
It should be noted that

CCO-13-9668-01 - PERTHMORE SUBDIVISION - POST-DEVELOPMENT - RESULTS - UNCONTROLLED

	12 hour SCS										
Return Period	West Block	Central Block	East Block	Block 70	SWM Block	Developed Portions	Total				
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s				
2	0.215	0.035	0.019	0.022	0.011	0.184	0.284				
5	0.306	0.068	0.037	0.043	0.020	0.278	0.456				
10	0.384	0.090	0.049	0.056	0.027	0.355	0.611				
25	0.481	0.124	0.067	0.077	0.037	0.447	0.794				
50	0.551	0.150	0.081	0.092	0.044	0.542	0.953				
100	0.634	0.181	0.098	0.110	0.053	0.631	1.121				

	4 hour Chicago										
Return Period	West Block	Central Block	East Block	Block 70	SWM Block	Developed Portions	Total				
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s				
2	0.228	0.012	0.006	0.007	0.004	0.153	0.198				
5	0.315	0.027	0.014	0.017	0.008	0.223	0.311				
10	0.374	0.041	0.022	0.026	0.012	0.292	0.417				
25	0.461	0.059	0.033	0.038	0.018	0.368	0.546				
50	0.523	0.076	0.042	0.048	0.023	0.423	0.646				
100	0.587	0.094	0.051	0.059	0.028	0.481	0.751				

Post-Development Uncontrolled - VO5 Model



CCO-13-9668-01 - PERTHMORE SUBDIVISION - POST-DEVELOPMENT - RESULTS - CONTROLLED

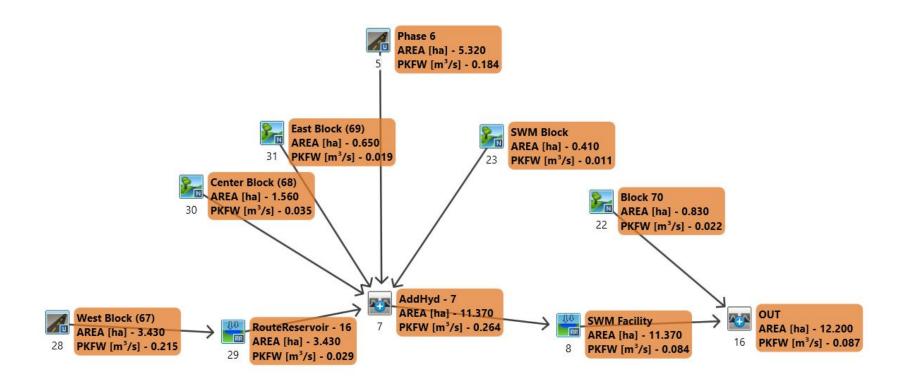
	12 hour SCS										
Return Period	West Block ¹	Central Block	East Block	Block 70	SWM Block	Developed Portions	Outflow From Pond	Outflow From Site			
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m ³ /s	m³/s	m³/s			
2	0.029	0.035	6.250	0.022	0.011	0.184	0.084	0.087			
5	0.042	0.068	6.250	0.043	0.020	0.278	0.191	0.198			
10	0.050	0.090	6.250	0.056	0.027	0.355	0.264	0.279			
25	0.063	0.124	6.250	0.077	0.037	0.447	0.336	0.356			
50	0.072	0.150	6.250	0.092	0.044	0.542	0.386	0.411			
100	0.083	0.181	6.250	0.110	0.053	0.631	0.436	0.467			

	4 hour Chicago										
Return Period	West Block ¹	Central Block	East Block	Block 70	SWM Block	Developed Portions	Outflow From Pond	Outflow From Site			
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m ³ /s	m³/s	m³/s			
2	0.021	0.012	1.500	0.007	0.004	0.153	0.070	0.073			
5	0.030	0.027	1.417	0.017	0.008	0.223	0.089	0.093			
10	0.037	0.041	1.417	0.026	0.012	0.292	0.147	0.154			
25	0.046	0.059	1.417	0.038	0.018	0.368	0.230	0.243			
50	0.053	0.076	1.417	0.048	0.023	0.423	0.275	0.291			
100	0.060	0.094	1.417	0.059	0.028	0.481	0.317	0.336			

Notes

1. West Block to be restricted.

Post-Development Controlled - VO5 Model



CCO-13-9668-01 - PERTHMORE SUBDIVISION - POST-DEVELOPMENT - RESULTS - CONTROLLED

12 hour SCS										
	POST	PRE								
Return Period	Outflow From Site	Outflow from Site	Post to Pre	Post to Pre						
Yrs	m³/s	m³/s	Δ	%						
2	0.087	0.114	-0.027	23.7%						
5	0.198	0.211	-0.013	6.2%						
10	0.279	0.278	0.001	-0.4%						
25	0.356	0.383	-0.027	7.0%						
50	0.411	0.463	-0.052	11.2%						
100	0.467	0.560	-0.093	16.6%						

4 hour Chicago								
	POST	PRE						
Return Period	Outflow From Site	Outflow from Site	Post to Pre	Post to Pre				
Yrs	m³/s	m³/s	Δ	Δ				
2	0.073	0.053	0.020	-37.7%				
5	0.093	0.105	-0.012	11.4%				
10	0.154	0.149	0.005	-3.4%				
25	0.240	0.210	0.030	-14.3%				
50	0.290	0.262	0.028	-10.7%				
100	0.330	0.317	0.013	-4.1%				

CCO-13-9668-01 - PERTHMORE SUBDIVISION - STAGE / STORAGE / DISCHARGE TABLE

VO6 Route Reservoir Input - Rating Curve

	Storage (m³)	Storage (ha.m)	Discharge (m³/s)	Stage (m)
	0	0.0000	0	133.36
	120	0.0120	0.041	133.46
	253	0.0253	0.058	133.56
25mm - 259 m³	399	0.0399	0.071	133.66
	559	0.0559	0.083	133.76
	732	0.0732	0.092	133.86
5year - 849 m³	918	0.0918	0.250	133.96
	1116	0.1116	0.320	134.06
	1321	0.1321	0.375	134.16
	1535	0.1535	0.422	134.26
100year-1614 m³	1758	0.1758	0.463	134.36
	1989	0.1989	0.651	134.46
	2228	0.2228	0.748	134.56
	2476	0.2476	0.828	134.66
	2733	0.2733	0.899	134.76
	2998	0.2998	0.964	134.86
	3263	0.3263	1.024	134.96
	3528	0.3528	1.080	135.06

For Orifice Flow, C =	0.60
For Weir Flow, C =	1.84

	Orifice 1	Orifice 2	Orifice 3
Invert Elevation	133.36	133.86	134.36
Center of Crest Elevation			
Orifice Width/Weir Length	250 mm	475 mm	475 mm
Orifice Height			
Orifice Area (m ²)	0.049	0.177	0.177

Elevation	Orific	Orifice 1		ice 2	Orifi	ce 3	Total
Lievation	H [m]	Q [I/s]	H [m]	Q [I/s]	H [m]	Q [l/s]	Q [I/s]
133.36	0.00	0					0
133.46	0.10	41					41
133.56	0.20	58					58
133.66	0.30	71					71
133.76	0.40	83					83
133.86	0.50	92					92
133.96	0.60	101	0.10	149			250
134.06	0.70	109	0.20	211			320
134.16	0.80	117	0.30	258			375
134.26	0.90	124	0.40	298			422
134.36	1.00	130	0.50	333			463
134.46	1.10	137	0.60	365	0.10	149	651
134.56	1.20	143	0.70	394	0.20	211	748
134.66	1.30	149	0.80	421	0.30	258	828
134.76	1.40	154	0.90	447	0.40	298	899
134.86	1.50	160	1.00	471	0.50	333	964
134.96	1.60	165	1.10	494	0.60	365	1024
135.06	1.70	170	1.20	516	0.70	394	1080

Notes: 1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.

2. Orifice Equation: Q = cA(2gh)^{1/2} (m³/s *1000 = l/s)

3. Weir Equation: Q = CLH³² (m³/s *1000 = l/s)

4. These Computations Do Not Account for Submergence Effects

5. H for orifice equations is depth of water above the centroide of the orifice.

6. H for weir equations is depth of water above the weir crest.

Reference: Urban Hydrology, Hydraulics and Stormwater Quality: engineering application and computer modeling / A. Akan, Robert J. Houghtalen, 2003.

CCO-13-9668-01 - PERTHMORE SUBDIVISION - EXTENDED DETENSION AND DRAWDOWN

Table E-3

As per the Section 4.6.2 (Wet Ponds) of the MECP Stormwater Management Planning and Design Manual, March 2003, a detention time of 24 hours should be targeted in all instances. The detention time can be easily solved if the relationship between pond surface area and pond depth is approximated using a linear regression equation as follows:

where, t = Drawdown time in seconds

C₂ = Slope coefficient from the area-depth linear regression

 C_3 = Intercept from the area-depth linear regression h = Maximum water elevation above the orifice (m)

 $A_o =$ Cross-sectional area of the orifice (m²)

The relationship between A and h using Linear Regression (i.e., $A = C_2 h + C_3$)

Orifice Details:

Α1

Orifice Diameter =	75 mm	150 mm
Orifice Invert Elevation =	133.36 m	133.86 m

Active Storage Pond Details:

Active Storage Elevation (m)	Max Water Elevation Above Orifice (m)	Surface area of the Pond (m²)	
133.36	0.00	1,374.00	Permanent Pool Level
133.46	0.10	1,452.00	
133.76	0.40	1,691.00	Extended Detention
133.86	0.50	1,772.00	150mm orifice
133.96	0.60	1,852.00	25mm event

Drawdown Time Results (During				
Construction):	Extended Detention	25mm Event		
Orifices	75 mm	75 mm	150 mm	
Slope (C_2) =	793	793	800	
Intercept (C ₃) =	1,373	1,373	1,372	
Maximum Water Elevation Above Orifice (h) =	0.40 m	0.40 m	0.20 m	
Therefore, A =	1,691	1,691	1,532	
Cross-sectional area of the orifice (A _o) =	0.004 m2	0.004 m2	0.018 m2	
Drawdown time	153,899 s	153,899 s	26,224 s	
Drawdown Time	43 hrs	43 hrs	8 hrs	
Diawdown Time	451115	51 hrs		

CCO-13-9668-01 - PERTHMORE SUBDIVISION - STORMWATER MANAGEMENT POND FOREBAY AND PERMANENT POOL STORAGE VOLUME

Ce	ell 1		Ce	II 2		Coml	bined
Elevation (m)	Total Storage (m³)		Elevation (m)	Total Storage (m ³)		Elevation (m)	Total Storage (m³)
131.76	0		131.26	0		131.26	0
131.86	9		131.36	6		131.36	6
131.96	20		131.46	14		131.46	14
132.06	32		131.56	23		131.56	23
132.16	47		131.66	34	ľ	131.66	34
132.26	64		131.76	46	ľ	131.76	46
132.36	82		131.86	60	ľ	131.86	60
132.46	103		131.96	76	ľ	131.96	76
132.56	127	1	132.06	93	ľ	132.06	93
132.66	153	1	132.16	113	ľ	132.16	113
132.76	181	Top of forebay	132.26	134		132.26	134
	_	_	132.36	158		132.36	158
			132.46	183		132.46	183
			132.56	211		132.56	211
			132.66	241		132.66	241
			132.76	274		132.76	454
			132.86	353		132.86	534
			132.96	441		132.96	621
			133.06	535		133.06	716
			133.16	638		133.16	818
			133.26	747		133.26	928
			133.36	867		133.36	1048

1. Forebay Storage Volumes

A conservative estimate for forebay volume is equal to or greater than ten (10) years of sediment accumulation.

The conservative estimate for minimum forebay volume based on ten (10) times the sediment accumulation is 143 m3.

The total forebay volume is 181 m3.

Therefore, the forebay volume meets the conservative minimum requirements for total volume.

2. Permanent Pool Storage Volumes

Total Permanent Pool Volume Required = 966 m³
Total Permanent Pool Volume Provided = 1048 m³

Therefore, the permanent pool volume provided is greater than the required volume.

3. Settling Length

Distance = \underline{rQ}_p Equation 4.5 : Settling Length, MECP SMPDM, March 2003

Length-to-Width Ratio ---> r = 2 (recommended)

Peak Flow Rate ---> $Q_p = 0.18 \text{ m}^3/\text{s}$ (quality storm outflow --- 25mm storm event)

Settling Velocity ---> $V_s = 0.0003 \text{ m/s}$ (recommended)

Distance = 35 m Settling Length (based on settling particles of approx. 0.15mm diameter)

4. Dispersion Length

Distance = (8Q) Equation 4.6 : Dispersion Length, MECP SMPDM March 2003

 dV_{f}

Inlet Flow Rate ---> $Q = 0.44 \text{ m}^3/\text{s}$ (5 year Post)

Depth of Permanent Pool ---> d = 1.00 m (in Forebay)

Settling Velocity ---> $V_f = 0.5 \text{ m/s}$ (recommended)

Distance = 7 m Length of dispersion (based on pipe full flow capacity)

The forebay should be 35 m long to settle particles and for pipe full flow dispersion.

The forebay length provided in the proposed pond design is 40 m long for particle settlement and dispersion.

Therefore, the forebay length meets the minimum requirements for particle settlement and dispersion

q

5. Forebay Width

Width = <u>Dist.</u> Equation 4.7 : Minimum Forebay Bottom Width

8

 $Width = \underline{35} = 4 \text{ m}$

8

The forebay deep zone should be at least 4 m wide.

The forebay deep zone width provided in the proposed pond design is 4 m wide.

Therefore, the forebay deep zone provided meets the minimum requirements for bottom width.

<u>6. Forebay Surface Area</u>

In all instances the forebay surface area should not exceed one-third (33.3 %) of the total permanent pool area:

Forebay surface area = 344 m^2 Permanent Pool surface area = 1374 m^2

The forebay surface area is 25.0% of the pond surface area

Therefore, the pond surface area meets the MECP requirements.

7. Forebay Volume

In all instances the forebay volume should not exceed 20% of the total permanent pool volume:

Forebay volume = 181 m^3 Total Permanent Pool Volume = 1048 m^3

The forebay volume is ---> 17% of the total permanent pool volume

Therefore, the pond volume meets the MECP requirements.

CCO-13-9668-01 - PERTHMORE SUBDIVISION - STORMWATER MANAGEMENT POND CLEANOUT FREQUENCY

Catchment Imperviousness	Annual Loading (kg/ha)	Wet Density (kg/m³)	Annual Loading (m³/ha)
35%	770	1,230	0.6
55%	2,300	1,230	1.9
70%	3,495	1,230	2.8
85%	4,680	1,230	3.8

Requirements		Pond 1	Units
Catchment Imperviousness	=	50%	
Sediment Loading Per 1-Year	=	1.6	m³/ha
Total Area to Pond	=	11.4	ha
Yearly Sediment to Pond	=	17.9	m ³
Initial Removal Efficiency	=	80%	
Yearly Accumulation in Pond	=	14.3	m ³
Required Quality Volume	=	140	m³/ha
Required Permanent Pool Volume [(140 - 80 Extended Detention) x Total Area]	=	682	m³
Permanent Pool Volume Provided	=	1,048	m ³
Required Quality Volume @ 5% less Efficient	=	133	m³/ha
Required Permanent Pool Volume @ 5% less Efficient [(133 - 80 Extended Detention) x Total Area]	=	603	m³
Total Sediment Accumlation Allowed Before Removal Required (Provided - Max Allowed 5% Reduction)	=	446	m³
Total Approximate Number of Years Before Sediment Removal is Required	=	32	years

See Extended Detention and Permanent Pool Volumes

McINTOSH PERRY

CCO-13-9668-01 - PERTHMORE SUBDIVISION - STORMWATER MANAGEMENT POND EMERGENCY SPILLWAY

Outlet Control Device - Outlet Control Structure

For Orifice Flow, C =	0.60
For Weir Flow, C =	1.70

	Emergency Weir
Invert Elevation	134.76
Weir Length	7.50 m

Elevation	We	Total	
Elevation	H [m]	Q [I/s]	Q [l/s]
134.76	х	х	0
134.86	0.10	403	403
134.96	0.20	1140	1140
135.06	0.30	2095	2095

Notes: 1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.

2. Orifice Equation: $Q = cA(2gh)^{1/2} (m^3/s *1000 = 1/s)$

3. Weir Equation: $Q = CLH^{3/2}$ (m³/s *1000 = l/s)

4. These Computations Do Not Account for Submergence Effects Within the Pond Riser.

Reference: Urban Hydrology, Hydraulics and Stormwater Quality: engineering application and computer modeling

_____ V I SSSSS U U A L
V I SS U U A A L
I SS U U AAAAA L
I SS U U AAAAA L
I SS U U A A A L
I SSSS UUUUU A A LLLLL (v 6.2.2011) ***** DETAILED OUTPUT ***** Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat C: \Users\r. raj achockal i ngam\AppData\Local \Ci vi ca\VH5\98a3b801-fe45-439a-999a-909776 C. Users St. 1 aj achtokari mjamikuppata ktokal ktivi Ca Vvii (1883860) - 1645-4378-7978-7977 / 178866 v 1714 c 0 2-8110-411f - 84d6 - 8608f 2 Summary filename: C: Users St. 1 aj achtokal ingam\AppData\Local \Civi ca\VH5\98a3b801-fe45-439a-999a-909776 f 7886e v 171a c 0 2-8110-411f - 84d6 - 8608f 2 DATE: 06-15-2023 TIME: 02:15:48 USER: COMMENTS: _ ************************ READ STORM Filename: C:\Users\r.rajachockalingam\AppD ata\Local\Temp\ 073789e9-0d0b-43a3-ada4-078b0c00e084\82441fcb Comments: created from IDF Group New IDFGroup - 2 Ptotal = 43.20 mm

Max. Eff. Inten. (mm/hr)=	57. 02	18. 93	
over (min)	5. 00	10.00	
Storage Coeff. (min)=	4.75 (ii)	9.19 (ii)	
Unit Hyd. Tpeak (min)=	5. 00	10.00	
Unit Hyd. peak (cms)=	0. 22	0. 12	
			TOTALS
PEAK FLOW (cms)=	0. 30	0. 10	0.406 (iii)
TIME TO PEAK (hrs)=	6. 25	6. 33	6.25
RUNOFF VOLUME (mm) =	42. 20	8. 84	20.52
TOTAL RAINFALL (mm) =	43. 20	43. 20	43.20
RUNOFF COEFFICIENT =	0. 98	0. 20	0.47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 59.0 | Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0022)	Area (ha)=	0.83	Curve Number (CN) = 75.0
ID= 1 DT= 5.0 min	la (mm)=	10.00	# of Linear Res. (N) = 3.00
<u></u>	U.H. Tp(hrs)=	0.19	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	1.73	6. 50	7.78	9. 75	1. 51
0.25	1.08	3.50	1.73	6. 75	3. 46	10.00	1. 51
0.50	1.08	3.75	1.73	7.00	3. 46	10. 25	0.86
0.75	1.08	4.00	1.73	7. 25	2. 59	10.50	0.86
1.00	1.08	4.25	2.59	7. 50	2. 59	10.75	0.86
1. 25	1.08	4.50	2.59	7. 75	2. 59	11.00	0.86
1.50	1.08	4.75	3.46	8.00	2. 59	11. 25	0.86
1.75	1.08	5.00	3.46	8. 25	1. 51	11.50	0.86
2.00	1.08	5.25	5.18	8. 50	1. 51	11. 75	0.86
2.25	1.30	5.50	5.18	8. 75	1. 51	12.00	0.86
2.50	1.30	5.75	20.74	9.00	1. 51		
2.75	1.30	6.00	57.02	9. 25	1. 51		
3.00	1.30	6.25	7.78	9. 50	1. 51		

CALIB STANDHYD (0006) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	5. 62 50. 00	Dir.	Conn. (%) =	35. 00
		IMPERVI	OUS	PERVI O	JS (i)	
Surface Area	(ha)=	2. 8	1	2. 8	1	
Dep. Storage	(mm) =	1. 0	0	5.00)	
Average Slope	(%)=	1. 0	0	2. 00)	
Length	(m) =	193. 5		10.00		
Manni ngs n	=	0.01	3	0.250)	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.30	6.250	57.02	9. 33	1. 51
0. 167	0.00	3. 250	1.30	6.333	7. 78	9. 42	1. 51
0.250	0.00	3. 333	1.73	6.417	7. 78	9. 50	1. 51
0. 333	1.08	3. 417	1.73	6.500	7. 78	9. 58	1. 51
0.417	1.08	3. 500	1.73	6.583	7. 78	9. 67	1. 51
0.500	1.08	3. 583	1.73	6.667	7. 78	9. 75	1. 51
0. 583	1.08	3. 667	1.73	6.750	7. 78	9. 83	1. 51
0.667	1.08	3. 750	1.73	6.833	3. 46	9. 92	1. 51
0.750	1.08	3. 833	1.73	6.917	3. 46	10.00	1. 51
0.833	1.08	3. 917	1.73	7.000	3. 46	10.08	1. 51
0. 917	1.08	4.000	1.73	7.083	3. 46	10. 17	1. 51
1.000	1.08	4. 083	1.73	7.167	3. 46	10. 25	1. 51
1.083	1.08	4. 167	1.73	7.250	3. 46	10. 33	0.86
1. 167	1.08	4. 250	1.73	7.333	2. 59	10. 42	0.86
1. 250	1.08	4. 333	2.59	7.417	2. 59	10. 50	0.86

				HYETOGR			
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0. 083	0.00	3. 167	1.30	6.250	57. 02	9. 33	1. 51
0. 167	0.00	3. 250	1.30	6.333	7. 78	9. 42	1. 51
0. 250	0.00	3. 333	1.73	6.417	7. 78	9.50	1. 51
0. 333	1.08	3. 417	1.73	6.500	7. 78	9. 58	1. 51
0. 417	1.08	3.500	1.73	6.583	7. 78	9.67	1. 51
0. 500	1.08	3. 583	1.73	6.667	7. 78	9.75	1. 51
0. 583	1.08	3. 667	1.73	6.750	7. 78	9.83	1. 51
0. 667	1.08	3. 750	1.73	6.833	3. 46	9. 92	1. 51
0. 750	1.08	3.833	1. 73 1. 73	6.917	3. 46	10.00 10.08	1. 51 1. 51
0. 833 0. 917	1.08 1.08	3. 917 4. 000	1.73	7.000 7.083	3. 46 3. 46	10.08	1. 51
	1.08	4.000	1. 73		3, 46	10.17	1. 51
1. 000 1. 083	1.08	4. 063	1. 73	7.167 7.250	3, 46	10. 25	0. 86
1. 167	1.08	4. 167	1.73	7.230	2, 59	10. 33	0. 86
1. 250	1.08	4. 230	2.59	1.333	2. 59	10.42	0. 86
1. 333	1.08	4. 333	2.59	7.417	2. 59	10.50	0. 86
1. 417	1.08	4. 500	2.59	7.583	2. 59	10. 56	0. 86
1. 500	1.08	4. 583	2.59	7.563 7.667	2. 59	10. 67	0. 86
1. 583	1.08	4. 667	2.59	7.750	2. 59	10.73	0. 86
1. 667	1.08	4. 750	2.59	7.833	2. 59	10. 03	0. 86
1. 750	1.08	4. 833	3.46	7.917	2. 59	11.00	0. 86
1. 833	1.08	4. 917	3.46	8.000	2. 59	11.08	0. 86
1. 917	1.08	5. 000	3.46	8.083	2. 59	11. 17	0. 86
2. 000	1.08	5. 083	3.46	8. 167	2. 59	11. 25	0. 86
2. 083	1.08	5. 167	3.46	8. 250	2. 59	11. 33	0. 86
2. 167	1.08	5. 250	3.46	8.333	1. 51	11. 42	0. 86
2. 250	1.08	5. 333	5. 18	8.417	1. 51	11.50	0.86
2, 333	1.30	5. 417	5. 18	8.500	1, 51	11.58	0.86
2. 417	1.30	5. 500	5.18	8.583	1. 51	11. 67	0.86
2. 500	1.30	5. 583	5.18	8.667	1. 51	11. 75	0.86
2. 583	1.30	5. 667	5.18	8.750	1. 51	11.83	0.86
2.667	1.30	5. 750	5.18	8.833	1. 51	11. 92	0.86
2. 750	1.30	5. 833	20.74	8.917	1. 51	12.00	0.86
2.833	1.30	5. 917	20.74	9.000	1. 51	12.08	0.86
2. 917	1.30	6. 000	20.74	9.083	1. 51	12. 17	0.86
3.000	1.30	6. 083	57.02	9.167	1. 51	12. 25	0.86
3. 083	1.30	6. 167	57.02	9.250	1. 51		

PEAK FLOW (cms)= 0.022 (i) TIME TO PEAK (hrs) = 0.022
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 9.330
TOTAL RAINFALL (mm) = 43.200
RUNOFF COEFFICIENT = 0.216

Uni t Hyd Opeak (cms) = 0.167

| CALIB | NASHYD (0023) | Area (ha)= 0.41 Curve Number (CN)= 75.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.20

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH RAIN | TIME TIME RAIN | TIME RAIN | TIME mm/hr | hrs mm/hr | hrs RAIN hrs 0.083 3. 167 6.250 9. 33 0.00 57.02 1.51 1.30 6. 333 0 167 0 00 3 250 1 30 7. 78 9 42 1 51 3. 333 9.58 0.333 1.08 3.417 1.73 6.500 7.78 1.51 0.417 1 08 3 500 1.73 6.583 7. 78 9.67 1 51 0. 500 3. 583 1.73 6.667 7. 78 1.08 6. 750 6. 833 6. 917 7. 000 0.583 1.08 3.667 1.73 7.78 9.83 1.51 0. 667 0. 750 1.08 3. 750 1.73 3. 46 3. 46 9 92 1 51 1.08 3. 833 10.00 1. 73 1. 73 1. 73 0.833 1 08 3 917 3 46 10 08 1 51 7. 083 7. 167 . 917 1.08 4. 000 3. 46 1.08 4.083 3.46 1.000 10.25 1.51 1. 73 1. 73 1. 73 2. 59 2. 59 2. 59 2. 59 4. 167 4. 250 7. 250 7. 333 10. 33 10. 42 1.083 1 08 3.46 0.86 7. 417 7. 500 7. 583 7. 667 1. 250 1.08 4. 333 4. 417 2.59 10.50 0.86 . 333 I. 417 1.08 2. 59 2. 59 10.58 4. 500 4. 583 2.59 1.500 1.08 10.75 0.86 1. 583 1. 667 4. 667 4. 750 2.59 2.59 7. 750 7. 833 2. 59 2. 59 10. 83 10. 92 1.750 1.08 4.833 3.46 7.917 2.59 11.00 0.86 . 833 . 917 1.08 4. 917 5. 000 3. 46 3. 46 8. 000 8. 083 2. 59 0.86 2 000 1 08 5 083 3 46 8 167 2 59 11 25 0.86 3. 46 3. 46 8. 250 8. 333 2. 59 1. 51 2. 083 2. 167 1.08 5. 167 5. 250 0.86 5. 18 5. 18 5. 18 1. 51 1. 51 1. 51 1.08 1.30 5. 333 5. 417 2 250 8.417 11.50 0.86 8.500 8.583 2. 333 2.417 1.30 5.500 11.67 0.86 1.30 1.30 5. 583 5. 667 5. 18 5. 18 8.667 8.750 1. 51 1. 51 2 500 0.86 2.667 1.30 5. 750 5.18 8.833 1.51 11.92 0.86 2. 750 2. 833 1.30 1.30 5. 833 5. 917 20. 74 20. 74 8. 917 9. 000 1. 51 1. 51 12. 00 12. 08 0. 86 0. 86 1. 30 | 6. 000 1. 30 | 6. 083 1. 30 | 6. 167 2.917 20.74 9.083 1.51 12.17 0.86 57. 02 | 9. 167 57. 02 | 9. 250 1. 51 1. 51 12. 25 3.083

Unit Hyd Qpeak (cms) = 0.078

```
1.30 | 5.667
1.30 | 5.750
                                                       5. 18 |
5. 18 |
20. 74 |
20. 74 |
                                                                                               1. 51
1. 51
1. 51
1. 51
2 583
                                                                          8. 833
8. 917
9. 000
                                                                                                                11. 92
12. 00
12. 08
12. 17
2. 667
2. 750
                                                                                                                                     0. 86
                    1.30 | 5.833
1.30 | 5.917
1.30 | 6.000
                                                                                                                                     0.86
2.833
                                                                                                                                     0.86
                                                       20.74 | 9.000
20.74 | 9.083
57.02 | 9.167
57.02 | 9.250
                  1.30 | 6.083
1.30 | 6.167
3.000
                                                                                               1. 51
1. 51
                                                                                                                12. 25
                                                                                                                                     0.86
3. 083
```

Uni t Hyd Qpeak (cms) = 0.271

PEAK FLOW (cms)= 0.035 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 8.657
TOTAL RAI NFALL (mm)= 43.200
RUNOFF COEFFICI ENT = 0.200

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH							
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.30	6.250	57.02	9. 33	1. 51
0. 167	0.00	3. 250	1.30	6.333	7. 78	9. 42	1. 51
0. 250	0.00	3. 333	1.73	6.417	7. 78	9. 50	1. 51
0. 333	1.08	3. 417	1.73	6.500	7. 78	9. 58	1. 51
0. 417	1.08	3.500	1.73	6.583	7. 78	9. 67	1. 51
0.500	1.08	3. 583	1.73	6.667	7. 78	9. 75	1. 51
0. 583	1.08	3.667	1.73	6.750	7. 78	9. 83	1. 51
0.667	1.08	3. 750	1.73	6.833	3. 46	9. 92	1. 51
0. 750	1.08	3.833	1.73	6.917	3. 46	10.00	1. 51
0.833	1.08	3. 917	1.73	7.000	3. 46	10. 08	1. 51
0. 917	1.08	4.000	1.73	7.083	3. 46	10. 17	1. 51
1.000	1.08	4.083	1.73	7.167	3. 46	10. 25	1. 51
1. 083	1.08	4. 167	1.73	7.250	3. 46	10. 33	0.86
1. 167	1.08	4. 250	1.73	7.333	2. 59	10. 42	0.86
1. 250	1.08	4. 333	2.59	7.417	2. 59	10.50	0.86
1. 333	1.08	4. 417	2.59	7.500	2. 59	10. 58	0.86
1. 417	1.08	4.500	2.59	7.583	2. 59	10. 67	0.86
1.500	1.08	4. 583	2.59	7.667	2. 59	10. 75	0.86
1. 583	1.08	4. 667	2.59		2. 59	10.83	0.86
1. 667	1.08	4. 750	2.59	7.833	2. 59	10. 92	0.86
1. 750	1.08	4.833	3.46	7.917	2. 59	11.00	0.86

PEAK FLOW (cms) = 0.011 (1)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 9.333
TOTAL RAI NFALL (mm) = 43.200
RUNOFF COEFFICIENT = 0.216

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH								
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN	
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr	
0.083	0.00	3. 167	1.30	6.250	57.02	9. 33	1. 51	
0. 167	0.00	3. 250	1.30	6.333	7. 78	9. 42	1. 51	
0. 250	0.00	3. 333	1.73	6.417	7. 78	9. 50	1. 51	
0. 333	1.08	3. 417	1.73	6.500	7. 78	9. 58	1. 51	
0. 417	1.08	3.500	1.73	6.583	7. 78	9. 67	1. 51	
0.500	1.08	3. 583	1.73	6.667	7. 78	9. 75	1. 51	
0. 583	1.08	3. 667	1.73	6.750	7. 78	9. 83	1. 51	
0. 667	1.08	3. 750	1.73	6.833	3. 46	9. 92	1. 51	
0. 750	1.08	3. 833	1.73	6.917	3. 46	10.00	1. 51	
0. 833	1.08	3. 917	1.73	7.000	3. 46	10.08	1. 51	
0. 917	1.08	4.000	1.73	7.083	3. 46	10.17	1. 51	
1.000	1.08	4. 083	1.73	7.167	3. 46	10. 25	1. 51	
1. 083	1.08	4. 167	1.73	7.250	3. 46	10.33	0. 86	
1. 167	1.08	4. 250	1.73	7.333	2. 59	10.42	0. 86	
1. 250	1.08	4. 333	2.59	7.417	2. 59	10.50	0. 86	
1. 333 1. 417	1.08 1.08	4. 417 4. 500	2.59 2.59	7.500 7.583	2. 59 2. 59	10. 58 10. 67	0. 86 0. 86	
1. 500	1.08	4. 500	2.59	7.563 7.667	2. 59	10.67	0. 86	
1. 583	1.08	4. 667	2.59	7.750	2. 59	10.73	0. 86	
1. 667	1.08	4. 750	2.59	7.833	2. 59	10.03	0. 86	
1. 750	1.08	4. 833	3.46	7. 917	2. 59	11.00	0. 86	
1. 833	1.08	4. 917	3.46	8.000	2. 59	11. 08	0. 86	
1. 917	1.08	5.000	3.46	8.083	2. 59	11. 17	0. 86	
2. 000	1.08	5. 083	3.46	8.167	2. 59	11. 25	0. 86	
2. 083	1.08	5. 167	3.46	8. 250	2. 59	11. 33	0. 86	
2. 167	1.08	5. 250	3.46	8.333	1, 51	11. 42	0.86	
2. 250	1.08	5. 333	5.18	8.417	1. 51	11. 50	0.86	
2. 333	1.30	5. 417	5.18	8.500	1. 51	11. 58	0.86	
2. 417	1.30	5. 500	5.18	8.583	1. 51	11. 67	0.86	
2. 500	1.30	5. 583	5.18	8.667	1. 51	11. 75	0.86	

1.08 | 1.08 | 4. 917 5. 000 3.46 | 8.000 2. 59 2. 59 2. 59 2. 59 8. 083 8. 167 8. 250 1. 917 3.46 0.86 5. 083 5. 167 2.000 1.08 3.46 11. 25 11. 33 0.86 2.083 1.08 3.46 5. 333 5. 417 5. 500 5. 18 5. 18 5. 18 2.250 1.08 8.417 1. 51 1. 51 11. 50 11. 58 0.86 2. 333 1.30 8.500 0.86 1.30 8.583 0.86 5. 583 5. 667 5. 750 8. 667 8. 750 8. 833 5. 18 5. 18 11. 75 11. 83 2.500 1.30 1. 51 1. 51 0.86 2. 583 2. 667 1.30 0. 86 0. 86 1.30 5.18 1.51 11. 92 1.30 | 5.730 1.30 | 5.833 1.30 | 5.917 1.30 | 6.000 1.30 | 6.083 1.30 | 6.167 20. 74 20. 74 20. 74 8. 917 9. 000 9. 083 12. 00 12. 08 0. 86 0. 86 2.750 1.51 2. 833 2.917 1.51 12, 17 0.86 3 000 57 02 9 167 1 51 12 25 0.86 3. 083 57.02 | 9.250

Unit Hyd Opeak (cms)= 0.177

PEAK FLOW (cms) = 0.019 (i)
TIME TO PEAK (hrs) = 6.250
RUNOFF VOLUME (mm) = 8.604
TOTAL RAINFALL (mm) = 43.200
RUNOFF COEFFICIENT = 0.199

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

STANDHYD (0005) (ha)= 5.32 Area || D= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00 IMPERVIOUS PERVIOUS (i) Surface Area Dep. Storage (ha) = (mm) = 2. 66 1. 00 2. 66 5. 00 Average Slope (%) = (m) = 1.00 1 00 Length Mannings n 0.130 0.250

		TR	ANSFORME	D HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.30	6.250	57. 02	9. 33	1. 51
0. 167	0.00	3. 250	1.30	6.333	7. 78	9. 42	1.51
0. 250	0.00	3. 333	1.73	6.417	7. 78	9.50	1.51
0.333	1.08	3. 417	1.73	6.500	7. 78	9. 58	1.51
0.417	1.08	3. 500	1.73	6.583	7. 78	9. 67	1.51
0.500	1.08	3. 583	1.73	6.667	7. 78	9. 75	1. 51

```
6.750
6.833
6.917
7.000
                               1.08
                                          3. 667
3. 750
                                                         1. 73
1. 73
1. 73
1. 73
                                                                                  7. 78
3. 46
                                                                                              9. 83
9. 92
                 0.583
                 0. 667
                                1.08
                 0.750
                                                                                              10.00
                                1.08
                                          3.833
                                                                                  3.46
                                                                                                            1. 51
1. 51
                                                                                  3. 46
                 0.833
                                1.08
                                          3.917
                                                                                              10.08
                                                                    7.083
                                                         1. 73
1. 73
1. 73
                  1.000
                                1.08
                                          4. 083
                                                                    7.167
                                                                                  3. 46
3. 46
                                                                                              10. 25
                                                                                                            1.51
                                          4. 167
4. 250
                   . 083
                                1.08
                                                                                              10. 33
                                                                                                           0.86
                     167
                                1.08
                                                                    7.333
                                                                                              10. 42
                                                                                                            0.86
                                                         2.59
2.59
2.59
                    250
                                1.08
                                          4.333
                                                                    7.417
                                                                                  2.59
                                                                                              10.50
                                                                                                           0.86
                  1. 333
1. 417
                                          4. 417
4. 500
                                                                    7.500
7.583
                                                                                  2. 59
                                                                                  2. 59
                                1.08
                                                                                              10.67
                                                                                                           0.86
                    . 500
                                1.08
                                          4.583
                                                         2.59
                                                                    7.667
7.750
                                                                                  2.59
                                                                                              10.75
                                                         2.59
                     583
                                                                                  2. 59
                                                                    7.833
7.917
                                                                                  2.59
                    667
                                1.08
                                          4.750
                                                                                             10.92
                                                                                                           0.86
                    750
                                1 08
                                          4 833
                                                         3 46
                                                                                  2 59
                                                                                                           0.86
                                                                    8.000
                  1.917
                                1.08
                                          5.000
                                                         3.46
                                                                    8.083
                                                                                  2.59
                                                                                                           0.86
                                                                    8. 167
8. 250
                 2 000
                                1 08
                                          5.083
                                                         3.46
                                                                                  2 59
                                                                                                           0.86
                                          5. 167
                                                         3.46
                  2. 083
                                1.08
                                                                                                           0.86
                 2. 167
                                1.08
                                          5. 250
                                                         3.46
                                                                    8.333
                                                                                  1.51
                                                                                             11, 42
                                                                                                           0.86
                 2. 250
                                          5. 333
                                                         5. 18
5. 18
                                                                   8. 417
8. 500
                                                                                                           0.86
                 2. 333
                                          5. 417
                                1.30
                                                                                                           0.86
                                                                                  1. 51
1. 51
1. 51
                 2 417
                                1 30
                                          5 500
                                                         5 18
                                                                    8 583
                 2. 500
2. 583
                                                        5. 18
5. 18
                                                                    8. 667
8. 750
                                          5. 583
                                1.30
                                          5. 667
                                                                                             11.83
                                                                                                           0.86
                                          5. 750
5. 833
                                                       5. 18
20. 74
                                                                    8.833
8.917
                                                                                  1. 51
1. 51
                 2 667
                                1.30
                                                                                                           0.86
                                          5. 917
6. 000
6. 083
                                                       20. 74
20. 74
57. 02
                                                                   9.000
9.083
9.167
                                                                                  1. 51
1. 51
1. 51
                 2.833
                                1.30
                                                                                             12.08
                                                                                                           0.86
                 2. 917
                               1.30
                                                                                             12. 17
12. 25
                                                                                                            0. 86
                 3.083
                               1.30
                                          6. 167
                                                       57.02
                                                                    9.250
                                                                                  1.51
                                            47. 95
Max.Eff.Inten.(mm/hr)=
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
                                            20.00
                                                                 40.00
                                            19. 95 (ii)
20. 00
                                                                39. 10 (ii)
40. 00
Unit Hyd. peak (cms)=
                                             0.06
                                                                 0.03
                                                                                      *TOTALS*
0.184 (iii)
PEAK FLOW
                         (cms)=
                                             0. 16
                                                                  0. 04
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
                                            6. 42
42. 20
                                                                  6. 83
8. 84
                                                                                          6 42
                                            43.20
                                                                 43.20
                                                                                         43.20
RUNOFF COEFFICIENT
                                              0.98
(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 59.0 | Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

1.30 | 6.000 1.30 | 6.083

1.30 | 6.167

57. 02

0. 24

0. 19

6. 25 42. 20

43, 20

0. 98

5. 00 4. 10 (ii) 5. 00

2 917

3.083

Max. Eff. Inten. (mm/hr)= over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=

Unit Hyd. peak (cms)=

TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =

(cms)=

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 59.0 Ia = Dep. Storage (Above (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(cms) 0.0000

OVERFLOW IS OFF OUTFLOW

> AREA (ha) 3. 430 3. 430

AREA

(ha)

0.41

3.84 0.034

PEAK FLOW

RESERVOIR(0029) | IN= 2---> OUT= 1 | DT= 5.0 min |

ADD HYD (0007) | 1 + 2 = 3 |

ID1= 1 (0023): + ID2= 2 (0029):

ID = 3 (0007):

INFLOW: ID= 2 (0028) OUTFLOW: ID= 1 (0029)

20.74 | 9.083 57.02 | 9.167 57.02 | 9.250

20.00 18.38 (ii)

0.06

6. 42 8. 84

43. 20

STORAGE | OUTFLOW

QPEAK

(cms) 0. 215 0. 029

(hrs)

6.33 7.08

6.42

QPEAK (cms)

0.011

(cms) 0.0900

TPEAK

(hrs) 6.25 7.08

R. V. (mm)

9.33

19. 23

(ha. m.) 0. 0000

1. 51 | 1. 51 |

TOTALS

6.25

43.20

STORAGE

0.1200

(mm)

20. 52 20. 42

0. 215 (iii)

1.51

1. 73 1. 73 1. 73 9. 67 9. 75 9. 83 0. 500 0. 583 6. 667 6. 750 3.667 1.51 1.08 7.78 6. 833 6. 917 7. 000 7. 083 7. 167 7. 250 0. 667 0. 750 3. 750 3. 833 1. 73 1. 73 1 08 3, 46 9 92 1. 51 1. 73 1. 73 1. 73 10. 08 10. 17 10. 25 10. 33 0.833 1.08 3. 917 3.46 1.51 0. 917 . 08 4. 000 4. 083 3. 46 3. 46 . 51 . 000 1.083 4. 167 1.73 1.08 3.46 0.86 1. 167 1. 250 4. 250 4. 333 7. 333 7. 417 4. 417 1.333 1.08 2.59 7.500 2.59 10.58 0.86 7.583 7.667 7.750 417 500 1.08 1.08 4. 500 4. 583 2.59 2.59 0. 86 0. 86 1 583 1 08 4 667 2 59 2 59 10 83 0.86 1. 667 1. 750 4. 750 4. 833 2.59 7. 833 7. 917 2. 59 0. 86 0. 86 1.08 8. 000 8. 083 8. 167 3. 46 3. 46 1 833 1 08 4 917 2.59 0.86 5. 000 2.000 1.08 5.083 3.46 2.59 11.25 0.86 2. 083 2. 167 5. 167 5. 250 3. 46 3. 46 8. 250 8. 333 1.08 2. 250 1.08 5. 333 5.18 8.417 1.51 11.50 0.86 2. 333 2. 417 1.30 1.30 5. 417 5. 500 5. 18 5. 18 8.500 8.583 0. 86 0. 86 5. 583 5. 667 5. 750 8. 667 8. 750 8. 833 2.500 1.30 5.18 1.51 11.75 0.86 2.667 1.30 5.18 1.51 0.86 11. 92 12.00 2. 750 1.30 5. 833 5. 917 20.74 8.917 1.51 0.86 20.74 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0007) | 3 + 2 = 1 | ARFA OPFAK TPFAK (ha) 3.84 (cms) 0.034 (hrs) 6.42 (mm) 19. 23 ID1= 3 (0007): + ID2= 2 (0030): 1.56 0.035 6.33 8.66 ID = 1 (0007): 5.40 0.068 6.33 16. 18 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0007) | 1 + 2 = 3 | ARFA OPFAK TPFAK R V (mm) (ha) (cms) (hrs) ID1= 1 (0007): + ID2= 2 (0031): 5.40 0.068 6.33 16, 18 0.65 0. 019 8. 60 ID = 3 (0007): 6.05 0.086 6.33 15 37 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0007) | 3 + 2 = 1 | AREA QPEAK **TPEAK** (ha) (cms) (hrs) (mm) 0. 086 6.33 15. 37 20. 51 ID = 1 (0007): 11.37 0.264 17.77 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. RESERVOIR(0008) | IN= 2---> OUT= 1 | DT= 5.0 min | OVERFLOW IS OFF OUTFLOW STORAGE OUTFLOW STORAGE (cms) 0.0000 (ha.m.) 0.0000 (cms) 0.4220 (ha.m.) 0.1535 0.1758 0.0410 0.0120 0.4630 0. 0580 0. 0710 0.0253 0.0399 0. 6510 0. 7480 0. 1989 0. 2228 0.0830 0.0559 0.8280 0.2476 0. 0920 0. 2500 0.0732 0.8990 0.9640 0. 2733 0. 2998 0.3200 0.1116 1.0240 0.3263

Area (ha)= 3.43Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00

PERVIOUS (i)

5. 00

2.00

40.00

0.250

TRANSFORMED HYETOGRAPH

RAIN | TIME

6. 250

6.333

6. 417 6. 500

6 583

mm/hr 1.30

1.30

1.73

RAIN I

mm/hr

57. 02

7.78

7. 78 7. 78

7 78

TIME

hrs 9. 33

9.42

9. 50 9. 58

RAIN

mm/hr 1.51

1.51

1. 51

1. 51

1.51

. 51

IMPERVIOUS

1. 00 151. 22

0.013

hrs 3. 167

3, 250

3. 333 3. 417

3, 500

3. 583

RAIN | TIME

mm/hr 0.00

0.00

0.00

1 08

1.08

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

(mm) =

(%) = (m) =

TIME

hrs 0. 083

0.167

0. 250 0. 333

0 417

1. 71 1. 00

CALIB STANDHYD (0028)

ID= 1 DT= 5.0 min

Surface Area Dep. Storage

Average Slope Length

Mannings n

```
2. 59
2. 59
                                                                                                                                                                       1.08 | 4.583
1.08 | 4.667
                                                                                                                                                                                            2.59 | 7.667
2.59 | 7.750
                                                                                                                                                            1 500
                                          AREA
                                                                                                                                                                                             2.59
                                                                                                                                                                                                                            10. 83
                                                                                                                                                                                                                                       0.86
                                                     (cms) (hrs)
0.264 6.42
0.084 7.50
                                                                                                                                                                                 4.750
                                                                                                                                                                                                      7.833
7.917
                                        (ha)
11. 370
                                                                                  (mm)
                                                                                                                                                            1.667
1.750
                                                                                                                                                                        1.08
                                                                                                                                                                                                                  2. 59
2. 59
                                                                                                                                                                                                                            10.92
                                                                                                                                                                                                                                       0.86
   INFLOW: ID= 2 ( 0007)
OUTFLOW: ID= 1 ( 0008)
                                                                                                                                                                        1.08
                                                                                                                                                                                 4.833
                                                                                                                                                                                             3.46
                                                                                                                                                                                                                            11.00
                                                                                                                                                                                                                                       0.86
                                                                                                                                                                                                      8.000
                                                                                                                                                            1.917
                                                                                                                                                                        1.08
                                                                                                                                                                                 5,000
                                                                                                                                                                                             3.46
                                                                                                                                                                                                      8.083
                                                                                                                                                                                                                  2.59
                                                                                                                                                                                                                            11.17
                                                                                                                                                                                                                                       0.86
                      PEAK FLOW REDUCTION [Out/Qin] (%) = 31.99
TIME SHIFT OF PEAK FLOW (min) = 65.00
MAXIMUM STORAGE USED (ha.m.) = 0.0588
                                                                                                                                                                                                      8. 167
8. 250
                                                                                                                                                            2 000
                                                                                                                                                                        1 08
                                                                                                                                                                                 5. 083
                                                                                                                                                                                             3.46
                                                                                                                                                                                                                  2 59
                                                                                                                                                                                                                                       0.86
                                                                                                                                                            2. 083
                                                                                                                                                                                 5. 167
                                                                                                                                                                                                     8. 333
8. 417
8. 500
                                                                                                                                                            2.167
                                                                                                                                                                        1.08
                                                                                                                                                                                 5. 250
                                                                                                                                                                                             3.46
                                                                                                                                                                                                                  1. 51
1. 51
                                                                                                                                                                                                                            11.42
                                                                                                                                                                                                                                       0.86
                                                                                                                                                                                5. 333
5. 417
                                                                                                                                                            2.333
                                                                                                                                                                                                                           11.58
                                                                                                                                                                                                                                       0.86
                                                                                                                                                                        1.30
                                                                                                                                                                                             5.18
                                                                                                                                                            2.417
                                                                                                                                                                        1.30
                                                                                                                                                                                 5.500
                                                                                                                                                                                             5.18
                                                                                                                                                                                                      8.583
                                                                                                                                                                                                                                       0.86
                                                                                                                                                                                                      8. 667
8. 750
                                                                                                                                                                                 5. 583
 ADD HYD ( 0016) |
1 + 2 = 3 |
                                                                                                                                                            2.583
                                                                                                                                                                                 5. 667
                                                                                                                                                                        1.30
                                                                                                                                                                                             5.18
                                                                                                                                                                                                                           11.83
                                                                                                                                                                                                                                       0.86
                                                            TPEAK R. V. (hrs) (mm) 6.33 9.33 7.50 17.77
                                    AREA QPEAK
(ha) (cms)
                                                           TPFAK
                                                                                                                                                            2 667
                                                                                                                                                                        1 30
                                                                                                                                                                                 5 750
                                                                                                                                                                                             5 18
                                                                                                                                                                                                      8 833
                                                                                                                                                                                                                           11 92
                                                                                                                                                                                                                                       0.86
                                                                                                                                                                                5. 750
5. 833
5. 917
6. 000
6. 083
                                              (cms)
0. 022
      ID1= 1 ( 0022): 0.83 0.022
+ ID2= 2 ( 0008): 11.37 0.084
                                                                                                                                                                                                     9.000
                                                                                                                                                            2.833
                                                                                                                                                                        1.30
                                                                                                                                                                                           20.74
                                                                                                                                                                                                                  1.51
                                                                                                                                                                                                                           12.08
                                                                                                                                                                                                                                       0.86
                                                                                                                                                            2 917
                                                                                                                                                                       1.30
                                                                                                                                                                                           20.74 9.083
                                                                                                                                                                                                                  1 51
                                                                                                                                                                                                                           12 17
                                                                                                                                                                                                                                       0.86
                                                                                                                                                                       1.30
                                                                                                                                                                                           57.02
                                                                                                                                                                                                      9. 167
                                                                                                                                                                                                                           12. 25
        ID = 3 ( 0016): 12.20 0.087 7.33 17.19
                                                                                                                                                            3.083
                                                                                                                                                                      1.30 | 6.167
                                                                                                                                                                                           57.02 | 9.250
                                                                                                                                                                                                                  1.51
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                             Unit Hyd Opeak (cms) = 0.764
                                                                                                                                             PEAK FLOW (Cms) = 0.114
TIME TO PEAK (hrs) = 6.833
RUNOFF VOLUME (mm) = 7.354
TOTAL RAI NFALL (mm) = 43.200
RUNOFF COEFFICIENT = 0.170
                                                                                                                                                                  (cms) = 0.114 (i)
NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                                                                             (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                               TRANSFORMED HYETOGRAPH
                                                                                                                                       | CALLB | | Area (ha)= 0.83 Curve Number (CN)= 75.0 | | D= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.19
                                                     RAIN | TIME RAIN | TIME
mm/hr | hrs mm/hr | hrs
1.30 | 6.250 | 57.02 | 9.33
                     TIME
                               RAIN | TIME
                                                                                               RAIN
                    hrs
0.083
                                         hrs
3. 167
                                                                                                mm/hr
1.51
                    0 167
                                0.00
                                         3 250
                                                      1 30
                                                               6.333
                                                                           7. 78
                                                                                     9 42
                                                                                                1 51
                    0. 250
0. 333
                                         3. 333
3. 417
                                                      1. 73 | 6. 417
1. 73 | 6. 500
                                                                                     9. 50
9. 58
                                                                                                                                                  NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                 1.08
                                                                           7. 78
                    0 417
                                 1 08
                                         3 500
                                                               6.583
                                                                           7. 78
                                                                                                1 51
                                          3. 583
                                                                                                                                                                                      TRANSFORMED HYETOGRAPH -
                    0.583
                                 1.08
                                         3.667
                                                      1.73
                                                               6.750
                                                                           7. 78
                                                                                     9.83
                                                                                                1.51
                    0. 667
0. 750
                                                               6.833
6.917
                                                                                                                                                                                            RAIN | TIME
mm/hr | hrs
                                                                                                                                                                                                                  RAIN | TIME
mm/hr | hrs
                                 1 08
                                         3 750
                                                                                                                                                             TIME
                                                                                                                                                                       RAIN | TIME
                                                                                                                                                                                                                                        RAIN
                                                                                                                                                                                           mm/hr
                                                                                                                                                                                             1. 30 | 6. 250
1. 30 | 6. 333
1. 73 | 6. 417
                                                                                                                                                                                                                             9. 33
                                                               7.000
                                                                                                                                                            0.083
                                                                                                                                                                                3. 167
                     0.833
                                 1.08
                                         3. 917
                                                      1.73
                                                                           3.46
                                                                                    10.08
                                                                                                1.51
                                                                                                                                                                       0.00
                                                                                                                                                                                                               57.02
                                                                                                                                                                                                                                       1.51
                     0. 917
1. 000
                                          4. 000
4. 083
                                                      1. 73
1. 73
                                                               7. 083
7. 167
                                                                           3. 46
3. 46
                                                                                                                                                            0. 167
0. 250
                                                                                                                                                                       0.00
                                                                                                                                                                                3. 250
3. 333
                                                                                                                                                                                                                  7. 78
7. 78
                                                                                                                                                                                                                                       1. 51
1. 51
                                                                                                                                                                                             1.73 | 6.500
1.73 | 6.583
1.73 | 6.667
                     1.083
                                 1.08
                                          4. 167
                                                      1.73
                                                               7.250
                                                                           3.46
                                                                                    10.33
                                                                                                0.86
                                                                                                                                                            0.333
                                                                                                                                                                        1.08
                                                                                                                                                                                3. 417
                                                                                                                                                                                                                  7. 78 İ
                                                                                                                                                                                                                             9. 58
                                                                                                                                                                                                                                        1.51
                                         4. 250
4. 333
                                                     1. 73 | 7. 333
2. 59 | 7. 417
                                                                           2. 59
                                                                                                                                                                                3. 500
3. 583
                                                                                                                                                                                                                  7. 78 |
7. 78 |
                                                                                                                                                                                                                            9. 67
9. 75
                                 1.08
                                                                                    10.50
                                                                                                                                                            0.500
                                                                                                                                                                        1.08
                     1.250
                                                                                                0.86
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                                         5.833
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                                                               9.083
                              1.30 | 6.083
1.30 | 6.167
                                                    57. 02 | 9. 167
57. 02 | 9. 250
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                     3.000
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0. 86
                    3. 083
                                                                                                                                                                                 5. 500
      Unit Hyd Opeak (cms)= 0.167
                                                                                                                                                            2,500
                                                                                                                                                                        1.30
                                                                                                                                                                                 5. 583
                                                                                                                                                                                             5.18
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2. 667
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5. 750
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8. 833
                                                                                                                                                                                                                                       0. 86
0. 86
     TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 9.330
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.216
                                                                                                                                                            2.750
                                                                                                                                                                        1.30 I
                                                                                                                                                                                5.833
                                                                                                                                                                                           20.74 | 8.917
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6. 000
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9. 083
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                                                                                                                                                                                                      9 167
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                                                                                                                                                                                                                                       0.86
                                                                                                                                                            3. 083 1. 30 | 6. 167
                                                                                                                                                                                           57.02 | 9.250
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                             Unit Hyd Qpeak (cms) = 0.078
                                                                                                                                             PEAK FLOW
                                                                                                                                                                  (cms)=
                                                                                                                                                                              0.011 (i)
| CALIB | | NASHYD ( 0033) | Area (ha)= 0.41 Curve Number (CN)= 75.0 | | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.20
                                                                                                                                             TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 9.333
TOTAL RAI NFALL (mm) = 43.200
                                                                                                                                             TOTAL RAINFALL (mm) = 43.200
RUNOFF COEFFICIENT = 0.216
           NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                                                                             (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                     ---- TRANSFORMED HYETOGRAPH ----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
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| STANDHYD ( 0036)|
|ID= 1 DT= 5.0 min |
                                         Area (ha)= 5.32
Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00
                                                       I MPERVI OUS
                                                                                PERVIOUS (i)
                                                           2. 66
1. 00
1. 00
188. 33
                                        (ha) =
(mm) =
(%) =
(m) =
                                                                                     2. 66
5. 00
1. 00
40. 00
        Dep. Storage
Average Slope
Length
```

Manni ngs n

0.130 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH										
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN				
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr				
0.083	0.00	3. 167	1.30	6.250	57. 02	9. 33	1. 51				
0. 167	0.00	3. 250	1.30	6.333	7. 78	9. 42	1. 51				
0. 250	0.00	3. 333	1.73	6.417	7. 78	9. 50	1. 51				
0. 333	1.08	3. 417	1.73	6.500	7. 78	9. 58	1. 51				
0. 417	1.08	3.500	1.73	6.583	7. 78	9. 67	1. 51				
0. 500	1.08	3. 583	1.73	6.667	7. 78	9. 75	1. 51				
0. 583	1.08	3. 667	1.73	6.750	7. 78	9. 83	1. 51				
0. 667	1.08	3. 750	1.73	6.833	3. 46	9. 92	1. 51				
0. 750	1.08	3. 833	1.73	6.917	3. 46	10.00	1. 51				
0. 833	1.08	3. 917	1.73	7.000	3. 46	10.08	1. 51				
0. 917	1.08	4.000	1.73	7.083	3. 46	10.17	1. 51				
1.000	1.08	4. 083	1.73	7.167	3. 46	10. 25	1. 51				
1. 083	1.08	4. 167	1.73	7.250	3. 46	10. 33	0. 86				
1. 167	1.08	4. 250	1.73	7.333	2. 59	10.42	0. 86				
1. 250	1.08	4. 333	2.59	7.417	2. 59	10.50	0. 86				
1. 333	1.08 1.08	4. 417 4. 500	2.59	7.500 7.583	2. 59 2. 59	10. 58 10. 67	0. 86 0. 86				
1. 417			2.59			10.67					
1.500	1.08	4. 583	2.59 2.59	7.667	2. 59		0. 86				
1. 583 1. 667	1.08 1.08	4. 667 4. 750	2.59	7.750 7.833	2. 59 2. 59	10. 83 10. 92	0. 86 0. 86				
1. 750	1.08	4. 750	3, 46	7.633 7.917	2. 59	10. 92	0. 86				
1. 833	1.08	4. 633 4. 917	3.46	8.000	2. 59	11.00	0. 86				
1. 633	1.08	5.000	3.46	8.083	2. 59	11.08	0. 86				
2.000	1.08	5.083	3.46	8.167	2. 59	11. 17	0. 86				
2. 083	1.08	5. 167	3.46	8.250	2. 59	11. 23	0. 86				
2. 167	1.08	5. 250	3.46	8.333	1. 51	11. 42	0. 86				
2. 250	1.08	5. 333	5. 18	8.417	1. 51	11. 50	0. 86				
2. 333	1.30	5. 417	5. 18	8.500	1. 51	11. 58	0. 86				
2. 417	1.30	5. 500	5. 18	8.583	1. 51	11. 67	0. 86				
2. 500	1.30	5. 583	5. 18	8.667	1. 51	11. 75	0. 86				
2. 583	1.30	5. 667	5. 18	8.750	1. 51	11. 83	0. 86				
2. 667	1.30	5. 750	5. 18	8.833	1. 51	11. 92	0. 86				
2. 750	1.30	5. 833	20.74	8.917	1. 51	12.00	0. 86				
2. 833	1.30	5. 917	20.74	9.000	1. 51	12.08	0. 86				
2. 917	1.30	6.000	20.74	9.083	1. 51	12. 17	0. 86				
3. 000	1.30	6.083	57.02	9.167	1. 51	12. 25	0. 86				
5. 555		3.000	37.02	, ,, ,,,,	01		5. 00				

0.250

1. 583	1.08	4. 667	2.59	7.750	2. 59	10.83	0. 86
1. 667	1.08	4. 750	2.59	7.833	2. 59	10. 92	0. 86
1.750	1.08	4.833	3.46	7.917	2. 59	11.00	0.86
1.833	1.08	4. 917	3.46	8.000	2. 59	11.08	0.86
1. 917	1.08	5.000	3.46	8.083	2. 59	11. 17	0.86
2.000	1.08	5. 083	3.46	8.167	2. 59	11. 25	0.86
2.083	1.08	5. 167	3.46	8.250	2. 59	11. 33	0.86
2. 167	1.08	5. 250	3.46	8.333	1. 51	11. 42	0.86
2. 250	1.08	5. 333	5.18	8.417	1. 51	11. 50	0.86
2. 333	1.30	5. 417	5.18	8.500	1. 51	11. 58	0.86
2.417	1.30	5.500	5.18	8.583	1. 51	11. 67	0.86
2.500	1.30	5. 583	5.18	8.667	1. 51	11. 75	0.86
2.583	1.30	5. 667	5.18	8.750	1. 51	11.83	0.86
2.667	1.30	5. 750	5.18	8.833	1. 51	11. 92	0.86
2.750	1.30	5.833	20.74	8.917	1. 51	12.00	0.86
2.833	1.30	5. 917	20.74	9.000	1. 51	12.08	0.86
2. 917	1.30	6.000	20.74	9.083	1. 51	12. 17	0.86
3.000	1.30	6. 083	57.02	9.167	1. 51	12. 25	0.86
3.083	1.30	6. 167	57.02	9.250	1. 51	ĺ	

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms) = 0.019 (i)
TIME TO PEAK (hrs) = 6.250
RUNOFF VOLUME (mm) = 8.604
TOTAL RAI NFALL (mm) = 43.200
RUNOFF COEFFICIENT = 0.199

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0038)	Area	(ha)=	1.56	Curve Number (CN) = 73.0
ID= 1 DT= 5.0 min	Ιa	(mm)=	10.00	# of Linear Res. (N) = 3.00
·	U. H. 1	Tp(hrs)=	0. 22	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH								
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	0.00	3. 167	1.30	6.250	57. 02	9. 33	1. 51		
0. 167	0.00	3. 250	1.30	6.333	7. 78	9. 42	1. 51		
0. 250	0.00	3. 333	1.73	6.417	7. 78	9. 50	1. 51		
0.333	1.08	3. 417	1.73	6.500	7. 78	9. 58	1. 51		
0.417	1.08	3.500	1.73	6.583	7. 78	9. 67	1. 51		
0.500	1.08	3. 583	1.73	6.667	7. 78	9. 75	1. 51		
0.583	1.08	3. 667	1.73	6.750	7. 78	9. 83	1. 51		
0.667	1.08	3. 750	1.73	6.833	3. 46	9. 92	1. 51		
0.750	1.08	3. 833	1.73	6.917	3. 46	10.00	1. 51		

Max. Eff. Inten. (mm/hr)=	47. 95	13. 86	
over (min)	20.00	40.00	
Storage Coeff. (min)=	19.95 (ii)	39.10 (ii)	
Unit Hyd. Tpeak (min)=	20.00	40.00	
Unit Hyd. peak (cms)=	0.06	0. 03	
			TOTALS
PEAK FLOW (cms)=	0. 16	0. 04	0.184 (iii)
TIME TO PEAK (hrs)=	6. 42	6. 83	6.42
RUNOFF VOLUME (mm) =	42. 20	8. 84	20.51
TOTAL RAINFALL (mm)=	43. 20	43. 20	43.20
RUNOFF COEFFICIENT =	0. 98	0. 20	0.47

CALIB				
NASHYD (0037)	Area	(ha)=	0.65	Curve Number (CN) = 73.0
				# of Linear Res. (N) = 3.00
				# 01 Liffedi Res. (N) = 3.00
	U. H.	Tn(hrs)=	0.14	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH								
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	0.00	3. 167	1.30	6.250	57.02	9. 33	1. 51		
0. 167	0.00	3. 250	1.30	6.333	7. 78	9. 42	1. 51		
0. 250	0.00	3. 333	1.73	6.417	7. 78	9. 50	1. 51		
0. 333	1.08	3. 417	1.73	6.500	7. 78	9. 58	1. 51		
0. 417	1.08	3. 500	1.73	6.583	7. 78	9. 67	1. 51		
0. 500	1.08	3. 583	1.73	6.667	7. 78	9. 75	1. 51		
0. 583	1.08	3. 667	1.73	6.750	7. 78	9. 83	1. 51		
0.667	1.08	3. 750	1.73	6.833	3. 46	9. 92	1. 51		
0.750	1.08	3. 833	1.73	6.917	3.46	10.00	1. 51		
0. 833	1.08	3. 917	1.73	7.000	3. 46	10.08	1. 51		
0. 917	1.08	4. 000	1.73	7.083	3.46	10. 17	1. 51		
1.000	1.08	4. 083	1.73	7.167	3.46	10. 25	1. 51		
1. 083	1.08	4. 167	1.73	7.250	3. 46	10. 33	0.86		
1. 167	1.08	4. 250	1.73	7.333	2. 59	10. 42	0.86		
1. 250	1.08	4. 333	2.59	7.417	2. 59	10.50	0.86		
1. 333	1.08	4. 417	2.59	7.500	2. 59	10. 58	0.86		
1. 417	1.08	4. 500	2.59	7.583	2. 59	10. 67	0.86		
1. 500	1.08	4. 583	2.59	7.667	2. 59	10. 75	0.86		

0. 833	1.08	3. 917	1.73	7.000	3. 46	10. 08	1. 51
0. 917	1.08	4.000	1.73	7.083	3. 46	10. 17	1. 51
1.000	1.08	4. 083	1.73	7.167	3. 46	10. 25	1.51
1.083	1.08	4. 167	1.73	7.250	3. 46	10. 33	0.86
1. 167	1.08	4. 250	1.73	7.333	2. 59	10. 42	0.86
1. 250	1.08	4. 333	2.59	7.417	2. 59	10.50	0.86
1. 333	1.08	4. 417	2.59	7.500	2. 59	10. 58	0.86
1. 417	1.08	4. 500	2.59	7.583	2. 59	10. 67	0.86
1.500	1.08	4. 583	2.59	7.667	2. 59	10. 75	0.86
1. 583	1.08	4. 667	2.59	7.750	2. 59	10. 83	0.86
1. 667	1.08	4. 750	2.59	7.833	2. 59	10. 92	0.86
1. 750	1.08	4. 833	3.46	7.917	2. 59	11. 00	0.86
1. 833	1.08	4. 917	3.46	8.000	2. 59	11. 08	0.86
1. 917	1.08	5.000	3.46	8.083	2. 59	11. 17	0.86
2. 000	1.08	5. 083	3.46	8.167	2. 59	11. 25	0.86
2. 083	1.08	5. 167	3.46	8.250	2. 59	11. 33	0.86
2. 167	1.08	5. 250	3.46	8.333	1. 51	11. 42	0.86
2. 250	1.08	5. 333	5. 18	8.417	1. 51	11. 50	0.86
2. 333	1.30	5. 417	5.18	8.500	1. 51	11. 58	0.86
2. 417	1.30	5. 500	5.18	8.583	1. 51	11. 67	0.86
2.500	1.30	5. 583	5.18	8.667	1. 51	11. 75	0.86
2. 583	1.30	5. 667	5.18	8.750	1. 51	11. 83	0.86
2. 667	1.30	5. 750	5.18	8.833	1. 51	11. 92	0.86
2. 750	1.30	5. 833	20.74	8.917	1. 51	12.00	0.86
2. 833	1.30	5. 917	20.74	9.000	1. 51	12. 08	0.86
2. 917	1.30	6.000	20.74	9.083	1. 51	12. 17	0.86
3. 000	1.30	6. 083	57.02	9.167	1. 51	12. 25	0. 86
3.083	1.30	6. 167	57.02	9.250	1. 51		

Unit Hyd Opeak (cms) = 0.271

PEAK FLOW (cms)= 0.035 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 8.657
TOTAL RAI NFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.200

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	(ha)= 3. Imp(%)= 50.	43 00 Dir. Conn. (%) =	35. 00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1, 71	1. 71	
			** * * *	
Dep. Storage	(mm) =	1. 00	5. 00	
Average Slope	(%)=	1.00	2. 00	
Length	(m) =	151. 22	40.00	
Mannings n		0.013	0.250	

NOTE:	RAIN	FALL WAS I	RANSFORME	-D 10	5.0 MIN.	IIME SIE	EP.	
					ED HYETOGR			
	TIM			RAIN		RAIN		RAI
	hr		hrs	mm/hr	' hrs	mm/hr	hrs	mm/h
	0. 08		3. 167	1.30	6.250	57. 02		1. 51
	0. 16		3. 250	1.30 1.73		7. 78 7. 78	9. 42 9. 50	1. 51 1. 51
	0. 23		3. 417	1.73		7. 78	9.58	1. 51
	0. 41		3. 500	1.73		7. 78	9.67	1. 51
	0. 50		3. 583	1.73	6.667	7. 78	9. 75	1. 51
	0. 58		3. 667	1.73		7. 78	9. 83	1. 51
	0.66		3. 750	1.73		3. 46	9. 92	1. 51
	0. 75	0 1.08	3. 833	1.73	6.917	3.46	10.00	1. 51
	0.83		3. 917	1.73		3. 46		1. 51
	0. 91		4.000	1.73		3. 46	10. 17	1. 51
	1. 00		4. 083	1.73		3. 46		1. 51
	1. 08		4. 167	1.73		3. 46	10. 33	0. 86
	1. 16		4. 250	1.73	7.333	2. 59	10. 42	0.86
	1. 25		4. 333	2.59 2.59		2. 59 2. 59	10.50 10.58	0.86
	1. 33		4.417	2.59		2. 59	10.56	0. 86 0. 86
	1. 50		4. 583	2.59		2. 59	10. 75	0. 86
	1. 58		4. 667	2.59		2. 59	10. 73	0. 86
	1. 66		4. 750	2.59		2. 59	10. 92	0. 86
	1. 75		4. 833	3.46		2. 59	11.00	0. 86
	1. 83		4. 917	3.46		2. 59	11. 08	0.86
	1. 91	7 1.08	5. 000	3.46	8.083	2. 59	11. 17	0.86
	2. 00	0 1.08	5. 083	3.46	8.167	2. 59	11. 25	0.86
	2. 08		5. 167	3.46		2. 59	11. 33	0.86
	2. 16		5. 250	3.46		1. 51	11. 42	0.86
	2. 25		5. 333	5. 18		1. 51	11. 50	0. 86
	2. 33		5. 417	5. 18		1. 51		0.86
	2. 41		5. 500 5. 583	5. 18 5. 18		1. 51 1. 51		0. 86 0. 86
	2. 58		5. 667	5. 18		1. 51		0. 86
	2. 66		5. 750	5. 18		1. 51	11. 03	0. 86
	2. 75		5. 833	20.74		1. 51		0. 86
	2. 83		5. 917	20.74		1. 51	12. 08	0. 86
	2. 91		6.000	20.74		1. 51	12. 17	0. 86
	3.00		6. 083	57.02	9.167	1. 51	12. 25	0.86
	3. 08	3 1.30	6. 167	57.02	9.250	1. 51	j	
			F7 00		47.41			
Max. Eff. Ir			57. 02		17. 16			
Storago Co		(min)	5. 00 4. 10	(11)	20.00	`		
Storage Co		(mi n) =	5. 00	(11)	18. 38 (iii) 20. 00)		
Uni t Hyd. Uni t Hyd.			0. 24		0.06			
on thyu.	hear	(GIIIS) -	0. 24		5. 00	*T0	TALS*	
PEAK FLOW		(cms)=	0. 19		0. 04		215 (111))
TIME TO PE	AK	(hrs)=	6. 25		6. 42		5. 25	

3		(0041): 0040):	(ł 7.	na) 94	(cms 0.239)	(hrs) 6.42	(mm) 16.63	
			======= 0041):							=
		`								
	NOTE: PE	AK F	LOWS DO N	0T I	NCL	.UDE BAS	EFLO	OWS IF AN	IY.	
ADI	D HYD (1 + 2 =	3	İ	(H	na)	(cms	.)	(hrs)	(mm	
			0041): ======							_
			0032):							_
	NOTE: PE	AK F	LOWS DO N	OT 1	NCL	.UDE BAS	EFLO	OWS IF AN	IY.	
	V V	- 1	SSSSS SS SS	U	U	A A	L		(v	6. 2. 2011)

I SS U U A A L I SSSSS UUUUU A A LLLLL VV 000 0 0 0 0 000 Developed and Distributed by Smart City Water Inc Copyright 2007 - 2021 Smart City Water Inc All rights reserved.

***** DETAILED OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

Output filename:

C: \Users\r. raj achockal i ngam\AppData\Local \Ci vi ca\VH5\98a3b801-fe45-439a-999a-909776 f7886e\b7e8d506-c5f4-4dd3-a1a5-9c15a5

Summary filename:
C: \Users\r. raj achockal i ngam\AppData\Local \Ci vi ca\VH5\98a3b801-fe45-439a-999a-909776
f7886e\b7e8d506-c5f4-4dd3-a1a5-9c15a5

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 59.0 | 1a = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

42. 20 43. 20 0. 98

43.20

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

RUNOFF VOLUME (mm) = TOTAL RAI NFALL (mm) = RUNOFF COEFFI CI ENT =

0. 20

ADD HYD (0041)| 1 + 2 = 3 | ID1= 1 (0033): + ID2= 2 (0036): AREA QPEAK TPEAK (ha) 0.41 (cms) 0. 011 5.32 0.184 6.42 20. 51 ID = 3 (0041): 5.73 0.193 6.42 19. 71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041) | 3 + 2 = 1 | AREA (ha) 5.73 R.V. (mm) 19.71 OPFAK TPFAK (cms) 0. 193 (hrs) 6.42 ID1= 3 (0041): + ID2= 2 (0037): 0.019 ID = 1 (0041): 6.38 0.206 6.42 18.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041) | 1 + 2 = 3 | AREA QPEAK TPEAK (ha) (cms) (hrs) (mm) ID1= 1 (0041): + ID2= 2 (0038): 0. 206 0. 035 6.42 18. 58 8. 66 ID = 3 (0041): 7.94 0. 239

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0041)|

DATE: 06-15-2023

Manni ngs n

TIME: 02:15:48

USER:

COMMENTS:

READ STORM Filename: C:\Users\r.rajachockalingam\AppD ata\Local\Temp\ 073789e9-0d0b-43a3-ada4-078b0c00e084\e8698180

Ptotal = 57.60 mm Comments: created from IDF Group New IDFGroup - 2

TIME	RAIN	TIME	RAIN	' TIME	RAI N	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	2.30	6.50	10. 37	9. 75	2. 02
0.25	1.44	3.50	2.30	6. 75	4. 61	10.00	2. 02
0.50	1.44	3.75	2.30	7.00	4. 61	10. 25	1. 15
0.75	1.44	4.00	2.30	7. 25	3.46	10.50	1. 15
1.00	1.44	4.25	3.46	7.50	3.46	10.75	1. 15
1.25	1.44	4.50	3.46	7.75	3.46	11.00	1. 15
1.50	1.44	4.75	4.61	8.00	3.46	11. 25	1. 15
1.75	1.44	5.00	4.61	8. 25	2.02	11.50	1. 15
2.00	1.44	5.25	6.91	8. 50	2.02	11. 75	1. 15
2.25	1.73	5.50	6.91	8. 75	2.02	12.00	1. 15
2.50	1.73	5.75	27.65	9.00	2.02	İ	
2.75	1.73	6.00	76.03	9. 25	2.02	İ	
3.00	1.73	6. 25	10.37	9. 50	2. 02	İ	

0.250

CALIB | STANDHYD (0006)| |ID= 1 DT= 5.0 min | Area (ha)= 5.62Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00I MPERVI OUS PERVIOUS (i) 2. 81 1. 00 1. 00 193. 56 Surface Area (ha)= 2. 81 5. 00 2. 00 10. 00 (mm) = (%) = (m) = Dep. Storage Average Slope Length

0.013

	TRANS	FORME	D	HYETOGRAPI	1	
TIM	IF.	RAIN	ŀ.	TIME	RAI	N

		TR/	ANSFORME) HYETOGR	APH	=	
TIME	RAIN	TIME	RAIN	' TIME	RAI N	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs		hrs	mm/hr
0.083	0.00	3. 167		6.250		9. 33	2. 02
0. 167	0.00	3. 250	1.73	6.333	10. 37	9. 42	2.02
0. 250	0.00	3. 333	2.30	6.417	10. 37	9.50	2. 02
0. 333	1.44	3. 417	2.30		10. 37	9. 58	2.02
0.417	1.44	3.500	2.30		10. 37	9. 67	2.02
0.500	1.44	3. 583	2.30		10. 37	9. 75	2. 02
0. 583	1.44	3. 667	2.30	6.750	10. 37	9. 83	2.02
0.667		3. 750	2.30	6.833	4. 61	9. 92	2.02
0. 750	1.44	3.833	2.30	6.917	4. 61	10.00	2. 02
	1.44		2.30		4. 61	10.08	2.02
	1.44		2.30			10.17	2.02
1.000	1.44	4. 083	2.30		4. 61	10. 25	2.02
1.083	1.44	4. 167	2.30		4. 61	10. 33	1. 15
1. 167		4. 250	2.30		3.46	10. 42	1. 15
1. 250	1.44	4. 333	3.46		3.46	10.50	1. 15
1. 333		4. 417	3.46	7.500		10.58	1. 15
1. 417		4. 500	3.46			10.67	1. 15
		4. 583	3.46				1. 15
1. 583	1.44	4. 667	3.46				1. 15
1. 667	1.44	4. 750	3.46		3.46		1. 15
1. 750	1.44	4. 833	4.61	7.917	3.46		1. 15
1.833		4. 917		8.000		11.08	1. 15
1. 917	1.44	5.000		8.083		11. 17	1. 15
	1.44			8.167		11. 25	1. 15
	1.44			8.250			1. 15
2. 167	1.44	5. 250		8.333			1. 15
2. 250	1.44	5. 333		8.417	2. 02		1. 15
2. 333	1.73	5. 417		8.500	2. 02	11. 58	1. 15
2. 417	1.73	5. 500		8.583	2. 02	11. 67	1. 15
2.500	1.73	5. 583	6. 91	8.667	2. 02	11. 75	1. 15
2. 583	1.73	5. 667	6. 91		2. 02	11.83	1. 15
2. 667	1.73	5. 750		8.833	2. 02		1. 15
2. 750	1.73	5.833	27.65				1. 15
2.833	1.73	5. 917	27.65		2. 02		1. 15
2. 917	1.73	6.000	27.65		2. 02		1. 15
3.000		6. 083		9.167	2. 02	12. 25	1. 15
3.083	1.73	6. 167	76.03	9.250	2. 02		

max. ETT. Inten. (r	nm/nr)=	76.03	32. 55	
over	(mi n)	5. 00	10.00	
Storage Coeff.	(mi n) =	4.24 (ii)	8.19 (ii)	
Uni t Hyd. Tpeak	(mi n) =	5. 00	10.00	
Unit Hyd. peak	(cms)=	0. 24	0. 13	
				TOTALS
PEAK FLOW	(cms)=	0. 41	0. 19	0.595 (iii)
TIME TO PEAK	(hrs)=	6. 25	6. 25	6.25

```
1.73 | 5.417
1.73 | 5.500
1.73 | 5.583
1.73 | 5.667
1.73 | 5.750
1.73 | 5.833
1.73 | 5.917
1.73 | 6.000
1.73 | 6.083
1.73 | 6.167
                                                                                                                       6. 91 | 8. 500
6. 91 | 8. 583
6. 91 | 8. 667
6. 91 | 8. 667
6. 91 | 8. 833
27. 65 | 8. 917
27. 65 | 9. 083
76. 03 | 9. 167
76. 03 | 9. 250
2. 333
2. 417
2. 500
2. 583
2. 667
2. 750
2. 833
2. 917
                                                                                                                                                                                                                                                    11. 58
11. 67
11. 75
11. 83
11. 92
                                                                                                                                                                                                                2. 02
2. 02
2. 02
2. 02
                                                                                                                                                                                                                                                                                                   1. 15
1. 15
1. 15
1. 15
                                                                                                                                                                                                                2. 02
2. 02
2. 02
                                                                                                                                                                                                                                                    12. 00
12. 08
12. 17
                                                                                                                                                                                                                                                                                                     1. 15
1. 15
1. 15
                                                                                                                                                                                                                 2. 02
2. 02
3.000
                                                                                                                                                                                                                                                      12. 25
                                                                                                                                                                                                                                                                                                     1.15
```

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms) = 0.043 (i)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 17.090
TOTAL RAINFALL (mm) = 57.600
RUNOFF COEFFICIENT = 0.297

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NASHYD (0023)

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME	HYETOGR	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.73	6.250	76.03	9. 33	2.02
0. 167	0.00	3. 250	1.73	6.333	10. 37	9. 42	2.02
0. 250	0.00	3. 333	2.30	6.417	10. 37	9. 50	2.02
0.333	1.44	3. 417	2.30	6.500	10. 37	9. 58	2.02
0.417	1.44	3.500	2.30	6.583	10. 37	9. 67	2.02
0.500	1.44	3. 583	2.30	6.667	10. 37	9. 75	2.02
0. 583	1.44	3.667	2.30	6.750	10. 37	9. 83	2. 02
0.667	1.44	3.750	2.30	6.833	4. 61	9. 92	2.02
0.750	1.44	3. 833	2.30	6.917	4. 61	10.00	2.02
0.833	1.44	3. 917	2.30	7.000	4. 61	10.08	2. 02
0. 917	1.44	4.000	2.30	7.083	4. 61	10. 17	2.02
1.000	1.44	4. 083	2.30	7.167	4. 61	10. 25	2.02
1.083	1.44	4. 167	2.30	7.250	4. 61	10. 33	1. 15
1. 167	1.44	4. 250	2.30	7.333	3.46	10. 42	1. 15
1. 250	1.44	4. 333	3.46	7.417	3.46	10.50	1. 15
1. 333	1.44	4. 417	3.46	7.500	3. 46	10. 58	1. 15
1. 417	1.44	4. 500	3.46	7.583	3.46	10. 67	1. 15
1.500	1.44	4. 583	3.46	7.667	3.46	10. 75	1. 15

RUNOFF VOLUME (mm) = 56.60 TOTAL RAI NFALL (mm) = 57.60 RUNOFF COEFFICIENT = 0.98 0. 26 0.52

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

| CALIB | NASHYD (0022) | Area (ha)= 0.83 Curve Number (CN)= 75.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.19

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

) HYETOGR			
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr		mm/hr
0.083	0.00	3. 167	1.73	6.250	76. 03	9. 33	2. 02
0. 167	0.00	3. 250	1.73	6.333	10. 37	9. 42	2. 02
0. 250	0.00	3. 333	2.30	6.417	10. 37	9. 50	2. 02
0. 333	1.44	3. 417	2.30	6.500	10. 37	9. 58	2. 02
0. 417	1.44	3. 500	2.30	6.583	10. 37	9. 67	2. 02
0. 500	1.44	3. 583	2.30	6.667	10. 37	9. 75	2. 02
0. 583	1.44	3. 667	2.30	6.750	10. 37	9. 83	2. 02
0. 667	1.44	3. 750	2.30	6.833	4. 61	9. 92	2. 02
0. 750	1.44	3. 833	2.30	6.917	4. 61	10.00	2. 02
0.833	1.44	3. 917	2.30	7.000	4. 61	10.08	2. 02
0. 917	1.44	4. 000	2.30	7.083	4. 61	10. 17	2. 02
1.000	1.44	4. 083	2.30	7.167	4. 61	10. 25	2. 02
1. 083	1.44	4. 167	2.30	7.250	4. 61	10. 33	1. 15
1. 167	1.44	4. 250	2.30	7.333	3.46	10. 42	1. 15
1. 250	1.44	4. 333	3.46	7.417	3. 46	10.50	1. 15
1. 333	1.44	4. 417	3.46	7.500	3.46	10. 58	1. 15
1. 417	1.44	4. 500	3.46	7.583	3.46	10. 67	1. 15
1. 500	1.44	4. 583	3.46	7.667	3.46	10.75	1. 15
1. 583	1.44	4. 667	3.46	7.750	3.46	10.83	1. 15
1. 667	1.44	4. 750	3.46	7.833	3.46	10. 92	1. 15
1. 750	1.44	4. 833	4.61	7.917	3.46	11.00	1. 15
1. 833	1.44	4. 917	4.61	8.000	3.46	11.08	1. 15
1. 917	1.44	5.000	4.61	8.083	3. 46	11. 17	1. 15
2.000	1.44	5. 083	4.61	8.167	3.46	11. 25	1. 15
2. 083	1.44	5. 167	4.61	8.250	3.46	11. 33	1. 15
2. 167	1.44	5. 250	4.61	8.333	2. 02	11.42	1. 15
2. 250	1.44	5. 333	6. 91	8.417	2. 02	11.50	1. 15

1. 583	1.44	4. 667	3.46	7.750	3.46	10.83	1. 15
1.667	1.44	4. 750	3.46	7.833	3.46	10. 92	1. 15
1. 750	1.44	4. 833	4.61	7.917	3.46	11.00	1. 15
1.833	1.44	4. 917	4.61	8.000	3.46	11. 08	1. 15
1. 917	1.44	5.000	4.61	8.083	3.46	11. 17	1. 15
2.000	1.44	5. 083	4.61	8.167	3.46	11. 25	1. 15
2.083	1.44	5. 167	4.61	8.250	3.46	11. 33	1. 15
2. 167	1.44	5. 250	4.61	8.333	2.02	11. 42	1. 15
2. 250	1.44	5. 333	6.91	8.417	2.02	11.50	1. 15
2. 333	1.73	5. 417	6.91	8.500	2. 02	11. 58	1. 15
2. 417	1.73	5. 500	6.91	8.583	2. 02	11. 67	1. 15
2.500	1.73	5. 583	6.91	8.667	2.02	11. 75	1. 15
2. 583	1.73	5. 667	6.91	8.750	2. 02	11.83	1. 15
2. 667	1.73	5. 750	6.91	8.833	2. 02	11. 92	1. 15
2. 750	1.73	5. 833	27.65	8.917	2. 02	12.00	1. 15
2.833	1.73	5. 917	27.65	9.000	2. 02	12.08	1. 15
2. 917	1.73	6.000	27.65	9.083	2. 02	12. 17	1. 15
3.000	1.73	6. 083	76.03	9.167	2. 02	12. 25	1. 15
3. 083	1.73	6. 167	76.03	9.250	2. 02		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (Cms) = 0.020
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 17.097
TOTAL RAI NFALL (mm) = 57.600
RUNOFF COEFFICIENT = 0.297 PEAK FLOW 0.020 (i)

CALIB			
NASHYD (0030)	Area (ha)=	1.56	Curve Number (CN) = 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res. (N) = 3.00
	U.H. Tp(hrs)=	0. 22	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.73	6.250	76.03	9. 33	2.02
0. 167	0.00	3. 250	1.73	6.333	10. 37	9. 42	2.02
0. 250	0.00	3. 333	2.30	6.417	10. 37	9. 50	2. 02
0. 333	1.44	3. 417	2.30	6.500	10. 37	9. 58	2.02
0.417	1.44	3. 500	2.30	6.583	10. 37	9. 67	2.02
0.500	1.44	3. 583	2.30	6.667	10. 37	9. 75	2. 02
0.583	1.44	3. 667	2.30	6.750	10. 37	9.83	2.02
0.667	1.44	3. 750	2.30	6.833	4. 61	9. 92	2.02
0.750	1.44	3. 833	2.30	6.917	4. 61	10.00	2. 02

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1.44 | 3.917
1.44 | 4.000
                                  2.30
2.30
                                            7.000
7.083
0.833
                                                                   10 08
                                                                                2 02
0. 917
                                                                                2. 02
             1.44
                                             7.167
7.250
1.000
                      4.083
                                   2.30
                                                         4.61
                                                                    10.25
                                                                                2. 02
1. 15
 . 083
             1.44
                      4. 167
                                                         4.61
                                                                    10.33
 1. 250
             1.44
                      4. 333
4. 417
                                   3.46
                                             7.417
                                                         3. 46
3. 46
                                                                   10.50
                                                                                1. 15
1. 15
  . 333
                                   3.46
                                                                    10. 58
                                   3.46
                                             7.583
                                                         3. 46
                                                                    10. 67
                                  3. 46
3. 46
3. 46
                                                         3. 46
3. 46
3. 46
 1.500
             1.44
                     4. 583
4. 667
                                             7.667
7.750
                                                                   10.75
                                                                                1. 15
1. 15
                                                                    10. 83
                      4. 750
                                             7.833
 1.667
                                                                   10.92
                                                                                1.15
 1.750
             1.44
                      4.833
                                   4.61
4.61
                                             7.917
                                                         3. 46
3. 46
                                                                   11.00
                                                                                1.15
  833
                                             8.000
 1. 917
             1.44
                                   4.61
                                             8.083
                                                         3.46
                                                                   11, 17
                      5.000
                                                                                1.15
2 000
             1 44
                      5 083
                                   4 61
                                             8 167
                                                         3 46
                                                                   11 25
                                                                                1 15
2.167
             1.44
                      5. 250
                                   4.61
                                             8.333
                                                         2.02
                                                                   11, 42
                                                                                1.15
2 250
             1 44
                      5. 333
                                   6.91
                                             8.417
                                                         2 02
                                                                   11 50
                                                                                1 15
2. 333
             1.73
                      5. 417
                                   6. 91
                                             8.500
                                                         2. 02
2.417
             1.73
                      5.500
                                   6.91
                                             8.583
                                                         2.02
                                                                   11.67
                                                                                1.15
2 500
            1.73
                     5. 583
5. 667
                                  6. 91
6. 91
                                            8. 667
8. 750
                                                         2. 02
2. 583
                                                         2. 02
                     5. 667
5. 750
5. 833
5. 917
6. 000
6. 083
           1. 73 |
1. 73 |
1. 73 |
1. 73 |
                                 6. 91
27. 65
27. 65
2 667
                                             8 833
                                                         2 02
                                                                   11 92
                                                                                  15
                                            8. 917
9. 000
                                                         2. 02
                                                                   12. 00
12. 08
  . 750
2.833
                                                                                1.15
           1.73
                                 27. 65 | 9. 083
76. 03 | 9. 167
76. 03 | 9. 250
                                                                  12. 17
12. 25
2 917
                                                         2.02
                                                                                1 15
          1. 73 | 6. 167
3. 083
                                                         2.02
```

Unit Hyd Opeak (cms) = 0.271

PEAK FLOW (cms)= 0.068 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 15.986
TOTAL RAINFALL (mm)= 57.600
RUNOFF COEFFICIENT = 0.278

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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( 0031)
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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH -TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr | hrs mm/hr | hrs mm/hr hrs mm/hr

```
|ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00
                                  IMPERVIOUS
                                                  PERVIOUS (i)
                                      2. 66
1. 00
     Surface Area
                         (ha)=
                                                      2.66
                         (mm) =
(%) =
(m) =
     Dep. Storage
Average Slope
Length
                                                     5. 00
                                       1.00
                                                      1.00
                                   188 33
                                                    40.00
     Manni ngs n
                                    0.130
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME	HYETOGR	APH	_	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.73	6.250	76.03	9. 33	2. 02
0. 167	0.00	3. 250	1.73	6.333	10.37	9. 42	2. 02
0. 250	0.00	3. 333	2.30	6.417	10. 37	9. 50	2. 02
0. 333	1.44	3. 417	2.30	6.500	10.37	9. 58	2. 02
0.417	1.44	3.500	2.30	6.583	10. 37	9. 67	2. 02
0.500	1.44	3. 583	2.30	6.667	10. 37	9. 75	2. 02
0.583	1.44	3. 667	2.30	6.750	10.37	9. 83	2. 02
0.667	1.44	3. 750	2.30	6.833	4, 61	9, 92	2. 02
0.750	1.44	3. 833	2.30	6.917	4. 61	10.00	2. 02
0.833	1.44	3. 917	2.30	7.000	4, 61	10.08	2. 02
0. 917	1.44	4.000	2.30	7.083	4. 61	10. 17	2. 02
1.000	1.44	4. 083	2.30	7.167	4. 61	10. 25	2. 02
1.083	1.44	4. 167	2.30	7.250	4, 61	10. 33	1. 15
1. 167	1.44	4. 250	2.30	7.333	3. 46	10. 42	1. 15
1. 250	1.44	4. 333	3.46	7.417	3.46	10. 50	1. 15
1. 333	1.44	4. 417	3.46	7.500	3.46	10. 58	1. 15
1.417	1.44	4. 500	3.46	7.583	3.46	10. 67	1. 15
1.500	1.44	4. 583	3.46	7.667	3.46	10. 75	1. 15
1.583	1.44	4. 667	3.46	7.750	3.46	10. 83	1. 15
1.667	1.44	4. 750	3.46	7.833	3.46	10. 92	1. 15
1.750	1.44	4. 833	4.61	7.917	3.46	11.00	1. 15
1.833	1.44	4. 917	4.61	8.000	3.46	11.08	1. 15
1. 917	1.44	5.000	4.61	8.083	3.46	11. 17	1. 15
2.000	1.44	5. 083	4.61	8.167	3.46	11. 25	1. 15
2.083	1.44	5. 167	4.61	8.250	3.46	11. 33	1. 15
2. 167	1.44	5. 250	4.61	8.333	2. 02	11. 42	1. 15
2. 250	1.44	5. 333	6. 91	8.417	2.02	11.50	1. 15
2. 333	1.73	5. 417	6.91	8.500	2.02	11. 58	1. 15
2. 417	1.73	5. 500	6.91	8.583	2. 02	11. 67	1. 15
2.500	1.73	5. 583	6. 91	8.667	2.02	11. 75	1. 15
2.583	1.73	5. 667	6.91	8.750	2.02	11.83	1. 15
2.667	1.73	5. 750	6.91	8.833	2. 02	11. 92	1. 15
2.750	1.73	5. 833	27.65	8.917	2. 02	12.00	1. 15
2.833	1.73	5. 917	27.65	9.000	2. 02	12.08	1. 15
2. 917	1.73	6.000	27.65	9.083	2. 02	12. 17	1. 15
3.000	1.73	6.083	76.03	9.167	2. 02	12. 25	1. 15
3.083	1.73	6. 167	76.03	9.250	2. 02		

```
0.00 | 3.167
0.00 | 3.250
0.00 | 3.333
                                         1. 73 | 6. 250
1. 73 | 6. 333
2. 30 | 6. 417
                                                                                  9. 33
9. 42
9. 50
                                                                   76. 03 |
10. 37 |
0.083
0. 167
                                                                                                2. 02
0.250
                                          2.30
                                                                    10. 37
10. 37
                                                                                                2.02
0.333
               1.44
                          3. 417
                                                     6.500
                                                                                   9.58
                                                                                                2.02
                           3. 500
                                                     6.583
                                                     6. 667
6. 750
6. 833
0.500
               1.44
                          3, 583
                                          2.30
2.30
                                                                    10.37
                                                                                   9.75
                                                                                                2.02
                          3. 667
3. 750
0. 583
                                                                    10.37
                                                                                   9. 83
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0. 667
                                          2.30
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                          3. 833
3. 917
4. 000
                                                     6. 917
7. 000
7. 083
0.750
               1.44
1.44
                                          2.30
2.30
                                                                     4.61
                                                                                 10.00
                                                                                                2.02
0. 833
0. 917
                                                                                 10. 08
10. 17
                                                                                                2. 02
                                                                     4.61
                                          2.30
1.000
               1.44
                          4. 083
4. 167
                                         2.30
2.30
                                                     7.167
7.250
                                                                     4.61
                                                                                 10. 25
10. 33
                                                                                                2.02
  . 083
                          4. 250
4. 333
                                                      7.333
                                                                                 10, 42
1.167
                                          2.30
                                                                     3.46
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                                                     7.500
7.583
                          4. 500
4. 583
1.417
               1.44
                                          3.46
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                                                                                 10.67
                                                                                                 1.15
                                                     7.667
7.750
                                                                                 10. 75
10. 83
1 500
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                                          3.46
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1. 583
                           4. 667
                                          3.46
                                                                     3. 46
                                                                                                 1. 15
                          4. 750
4. 833
4. 917
1.667
               1.44
                                          3.46
                                                      7.833
                                                                     3, 46
                                                                                 10.92
                                                                                                 1. 15
1. 750
               1.44
                                          4.61
                                                     7 917
                                                                     3. 46
3. 46
                                                                                11. 00
11. 08
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                                          4.61
                          5. 000
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8. 167
8. 250
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11. 25
11. 33
1 917
               1 44
                                          4 61
                                                                     3 46
                                                                                                 1. 15
2. 000
2. 083
               1.44
                                          4.61
                                                                     3. 46
                                                                                                 1. 15
                                                                     3.46
                                                                                                1.15
                                          4.61
                                                    8. 250
8. 333
8. 417
8. 500
8. 583
8. 667
8. 750
2. 167
2. 250
                          5. 250
5. 333
                                                                                11. 42
11. 50
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1. 15
               1 44
                                          4.61
                                                                     2.02
              1. 73
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1. 73
                          5. 417
5. 500
5. 583
5. 667
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1. 15
1. 15
                                          6.91
2.333
                                                                     2.02
                                                                                 11.58
2. 417
                                          6. 91
6. 91
                                                                     2. 02
2. 500
2.583
               1.73
                                          6.91
                                                                     2.02
                                                                                 11.83
                                                                                                1.15
              1. 73 | 5. 667

1. 73 | 5. 750

1. 73 | 5. 833

1. 73 | 5. 917

1. 73 | 6. 000

1. 73 | 6. 083
2. 667
2. 750
                                        6. 91
27. 65
                                                     8. 833
8. 917
                                                                     2. 02
2. 02
                                                                                                    15
15
                                       27. 65 | 9. 000
27. 65 | 9. 083
76. 03 | 9. 167
2.833
                                                                     2.02
                                                                                12.08
                                                                                                1.15
2. 917
3. 000
                                                                     2. 02
                                                                                12. 17
12. 25
                                                                                                1. 15
1. 15
             1.73 | 6.167
3.083
                                       76.03 | 9.250
                                                                     2 02
```

Unit Hyd Opeak (cms) = 0.177

PEAK FLOW (Cms) = 0.037 TIME TO PEAK (hrs) = 6.250 RUNOFF VOLUME (mm) = 15.887 TOTAL RAI NFALL (mm) = 57.600 RUNOFF COEFFICIENT = 0.276 (cms)= 0.037 (i)

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
Max.Eff.Inten.(mm/hr)=
                                         20. 00
17. 78 (ii)
over (min)
Storage Coeff. (min) =
Unit Hyd. Tpeak (min) =
Unit Hyd. peak (cms) =
                                                            35.00
31.88 (ii)
                                          0.06
                                                             0. 03
                                                                                *TOTAL S*
                                                                                  0. 278 (iii)
                        (cms)=
6. 42
56. 60
57. 60
                                                            6. 75
15. 25
57. 60
                                                                                   6.42
29.72
                                                                                   57.60
                                          0. 98
                                                             0. 26
                                                                                    0.52
```

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ la = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY

CALIB STANDHYD (0028) ID= 1 DT= 5.0 min	Area Total	(ha)= 3.4 Imp(%)= 50.0	13 00 Dir. Conn.(%)=	35. 00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1, 71	1. 71	
Dep. Storage	(mm) =	1. 00	5. 00	
Average Slope	(%)=	1. 00	2. 00	
Length	(m) =	151, 22	40.00	
Manni ngs n	=	0.013	0. 250	

		TR	ANSFORME	HYETOGR	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.73	6.250	76.03	9. 33	2.02
0. 167	0.00	3. 250	1.73	6.333	10. 37	9. 42	2.02
0. 250	0.00	3. 333	2.30	6.417	10. 37	9. 50	2.02
0. 333	1.44	3. 417	2.30	6.500	10. 37	9. 58	2.02
0. 417	1.44	3. 500	2.30	6.583	10. 37	9. 67	2.02
0.500	1.44	3. 583	2.30	6.667	10. 37	9. 75	2.02
0.583	1.44	3. 667	2.30	6.750	10. 37	9. 83	2.02
0.667	1.44	3. 750	2.30	6.833	4. 61	9. 92	2.02
0.750	1.44	3. 833	2.30	6.917	4. 61	10.00	2.02
0.833	1.44	3. 917	2.30	7.000	4. 61	10.08	2.02
0. 917	1.44	4.000	2.30	7.083	4. 61	10. 17	2.02
1.000	1.44	4. 083	2.30	7.167	4. 61	10. 25	2.02
1. 083	1.44	4. 167	2.30	7. 250	4. 61	10. 33	1. 15

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1. 15
1. 15
1. 15
1. 15
1. 15
                                                                                                                    1.44
1.44
1.44
1.44
                                                                                                                                                     4. 250
4. 333
4. 417
                                                                                                                                                                                                                                  7. 333
7. 417
7. 500
7. 583
                                                                                                                                                                                               2.30
3.46
                                                                                                                                                                                                                                                                            3. 46
3. 46
                                                                            1, 167
                                                                                                                                                                                                                                                                                                                10. 42
10. 50
10. 58
10. 67
10. 75
                                                                              1. 250
1. 333
1. 417
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3. 46
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3. 46
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                                                                            1. 500
                                                                                                                                                                                                                                   7.667
                                                                                                                       1. 44
1. 44
1. 44
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3. 46
4. 61
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7. 833
7. 917
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3. 46
3. 46
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1. 15
1. 15
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4. 750
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                                                                              1. 667
1. 750
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11. 00
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1. 15
1. 15
1. 15
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1. 917
2. 000
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1. 44
1. 44
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5. 000
5. 083
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4. 61
4. 61
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8. 083
8. 167
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3. 46
3. 46
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11. 17
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4. 61
6. 91
6. 91
6. 91
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5. 250
5. 333
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8. 333
8. 417
8. 500
                                                                           2. 083
2. 167
                                                                                                                   1. 44 | 1. 44 | 1. 44 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 | 1. 73 
                                                                                                                                                                                                                                                                             3. 46
2. 02
                                                                                                                                                                                                                                                                                                                11. 33
11. 42
                                                                                                                                                                                                                                                                                                                                                          1. 15
1. 15
                                                                                                                                                                                                                                                                             2. 02
                                                                                                                                                                                                                                                                                                                                                          1. 15
1. 15
                                                                                                                                                                                                                                                                                                                11.50
                                                                            2.250
                                                                                                                                                                                                                                                                                                                11. 58
11. 67
                                                                           2 333
                                                                                                                                                      5. 417
                                                                                                                                                     5. 500
5. 583
                                                                            2. 417
                                                                                                                                                                                                                                   8.583
                                                                           2.500
                                                                                                                                                                                                                                  8.667
                                                                                                                                                                                                                                                                              2.02
                                                                                                                                                                                                                                                                                                                11.75
                                                                                                                                                                                                                                                                                                                                                          1.15
                                                                                                                                                                                         6. 91 | 8. 667
6. 91 | 8. 750
6. 91 | 8. 833
27. 65 | 8. 917
27. 65 | 9. 000
27. 65 | 9. 167
76. 03 | 9. 167
                                                                                                                                                     5. 667
5. 750
                                                                                                                                                                                                                                                                             2. 02
                                                                                                                                                                                                                                                                                                                11. 83
11. 92
                                                                                                                                                                                                                                                                                                                                                          1. 15
1. 15
                                                                           2.583
                                                                            2. 667
                                                                                                                                                     5. 833
5. 917
6. 000
                                                                                                                                                                                                                                                                                                              12. 00
12. 08
12. 17
                                                                           2.750
                                                                                                                                                                                                                                                                             2.02
                                                                                                                                                                                                                                                                                                                                                          1. 15
                                                                           2. 833
2. 917
                                                                                                                                                                                                                                                                            2. 02
                                                                                                                                                                                                                                                                                                                                                          1. 15
1. 15
                                                                                                                                                     6. 083
6. 167
                                                                           3 000
                                                                                                                                                                                                                                                                              2 02
                                                                                                                                                                                                                                                                                                              12. 25
                                                                                                                                                                                                                                                                                                                                                          1. 15
                     Max.Eff.Inten.(mm/hr)=
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                                                                                                                         76. 03
5. 00
3. 65 (ii)
5. 00
0. 25
                                                                                                                                                                                                                       29. 81
20. 00
15. 11 (ii)
20. 00
0. 07
                                                                                                                                                                                                                                                                                         *TOTALS*
                     PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                                                                                                                          0. 25
6. 25
56. 60
                                                                                                                                                                                                                        0. 08
6. 42
15. 25
                                                                                                                                                                                                                                                                                                0. 306 (iii)
6. 25
                                                                                                                                                                                                                                                                                                29.72
                                                                                                                                                                                                                        57. 60
0. 26
                                                                                                                                                                                                                                                                                                57.60
0.52
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
                      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
     RESERVOIR( 0029)|
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
                                                                                                                   OVERFLOW IS OFF
                                                                                                                                                                         STORAGE | OUTFLOW
                                                                                                                    OUTFLOW
                                                                                                                                                                                                                                                                                          STORAGE
                                                                                                                         (cms)
0.0000
                                                                                                                                                                           (ha.m.)
0.0000
                                                                                                                                                                                                                       (cms)
0.0900
                                    ID1= 3 ( 0007):
                                                                                                                                         6.05 0.154
                                                                                                                                                                                                                        6.33 23.78
```

+ ID2= 2 (
			0. 419			
NOTE: PEAK	FLOWS DO N	OT INCL	UDE BASEFL	OWS IF AN	IY.	
RESERVOIR(000 IN= 2> OUT= DT= 5.0 min	1			OUTF	-LOW	STORAGE
	0 0 0 0 0	. 0000 . 0410 . 0580 . 0710 . 0830 . 0920 . 2500	STORAGE (ha. m.) 0.0000 0.0120 0.0253 0.0399 0.0559 0.0732 0.0918 0.1116 0.1321	0.4 0.4 0.6 0.7 0.8 0.8	1220 1630 5510 7480 3280 3990 9640	0. 1535 0. 1758 0. 17989 0. 2228 0. 2476 0. 2733 0. 2998 0. 3263
INFLOW: ID= 2 OUTFLOW: ID= 1	(0007) (0008) PEAK F	ARI (h: 11.: 11.:	0.1321 EA OPE. a) (cm 370 0 370 0 EDUCTION [I EAK FLOW E USED	AK TF s) (h . 419 . 191 Qout/Qin]	PEAK nrs) 6.42 7.08	R. V. (mm) 26. 56 26. 55
ADD HYD (001 1 + 2 = 3 ID1= 1 (+ ID2= 2 (6) 0022): 0008):	11.37	QPEAK (cms) 0. 043 0. 191	7.08	26. 55	
			0. 198			
NOTE: PEAK	FLOWS DO N	OT INCL	UDE BASEFL	OWS IF AN	IY.	
CALIB NASHYD (001 ID= 1 DT= 5.0 mi	 9) Area n Ia U.H.	(ha (mm Tp(hrs)= 12. 20)= 6. 90)= 0. 61	Curve N # of Li	lumber near Re	(CN) = 64.0 es. (N) = 3.00
NOTE: R	AINFALL WA	S TRANS	FORMED TO	5.0 MIN	I. TIME	STEP.

INFLOW : ID= 2 OUTFLOW: ID= 1	(0028) (0029)	ARI (ha 3. 4 3. 4	EA QPE a) (cm 430 C	(AK Tins) (1 0.306 0.042	PEAK hrs) 6.25 7.08	R. V. (mm) 29. 72 29. 62
	TIME SHII	FT OF PE	EDUCTION [EAK FLOW E USED	(1	min)= 50.	00
ADD HYD (0007	 7)					
1 + 2 = 3		AREA (ba)	QPEAK (cms)	TPEAK (brs)	R.V.	
ID1= 1 (+ ID2= 2 (0023):	0.41	0. 020	6.33	17. 10	
			0. 053			
ID = 3 (0007):	3.04				
NOTE: PEAK F	,					
NOTE: PEAK F ADD HYD (0007 3 + 2 = 1 ID1= 3 (+ ID2= 2 (FLOWS DO NO	AREA (ha) 3.84 1.56	QPEAK (cms) 0. 053 0. 068	TPEAK (hrs) 6.42 6.33	R. V. (mm) 28. 28 15. 99	
ADD HYD (0000 3 + 2 = 1 ID1= 3 (+ ID2= 2 (FLOWS DO NO	AREA (ha) 3.84 1.56	QPEAK (cms) 0.053 0.068	TPEAK (hrs) 6.42 6.33	R. V. (mm) 28. 28 15. 99	
NOTE: PEAK F ADD HYD (0007 3 + 2 = 1 ID1= 3 (+ ID2= 2 (FLOWS DO NO	AREA (ha) 3.84 1.565.40	OPEAK (cms) 0. 053 0. 068	TPEAK (hrs) 6.42 6.33	R. V. (mm) 28. 28 15. 99 24. 73	
NOTE: PEAK F ADD HYD (0000 3 + 2 = 1 ID1= 3 (+ ID2= 2 (ID = 1 (NOTE: PEAK F	FLOWS DO NO	AREA (ha) 3.84 1.565.40	OPEAK (cms) 0. 053 0. 068	TPEAK (hrs) 6.42 6.33	R. V. (mm) 28. 28 15. 99 24. 73	
NOTE: PEAK f ADD HYD (0000 3 + 2 = 1 ID1= 3 (+ ID2= 2 (ID = 1 (NOTE: PEAK f	FLOWS DO NO	AREA (ha) 3.84 1.56 5.40 DT INCLU	OPEAK (CMS) 0.068 0.121 DDE BASEFL	TPEAK (hrs) 6.42 6.33 6.33 OWS IF AI	R. V. (mm) 28. 28 15. 99 24. 73	
NOTE: PEAK f ADD HYD (0000 3 + 2 = 1 ID1= 3 (+ ID2= 2 (ID = 1 (NOTE: PEAK f	FLOWS DO NO	AREA (ha) 3.84 1.56 5.40 DT INCLU	OPEAK (CMS) 0.068 0.121 DDE BASEFL	TPEAK (hrs) 6.42 6.33 6.33 OWS IF AI	R. V. (mm) 28. 28 15. 99 24. 73	
NOTE: PEAK F ADD HYD (0000 3 + 2 = 1 ID1= 3 (+ ID2= 2 (NOTE: PEAK F ADD HYD (0000 1 + 2 = 3 ID1= 1 (+ ID2= 2 (FLOWS DO NO	AREA (ha) 3.84 1.56 40 DT INCLU	OPEAK (Cms) 0. 121 UDE BASEFL OPEAK (Cms) 0. 121 OPEAK (Cms) 0. 121 OPEAK (Cms) 0. 0. 037	TPEAK (hrs) 6. 42 6. 33 6. 33	R. V. (mm) 28. 28 15. 99 24. 73 R. V. (mm) 24. 73 15. 89	

ARFA

(ha)

OPFAK

(cms)

TPFAK

(hrs)

R. V.

(mm)

			ANSFORME			-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.73	6.250	76. 03	9. 33	2. 02
0. 167	0.00	3. 250	1.73	6.333	10. 37	9. 42	2. 02
0. 250	0.00	3. 333	2.30	6.417	10. 37	9. 50	2. 02
0. 333	1.44	3. 417	2.30	6.500	10. 37	9. 58	2. 02
0.417	1.44	3. 500	2.30	6.583	10. 37	9. 67	2. 02
0.500	1.44	3. 583	2.30	6.667	10. 37	9. 75	2. 02
0. 583	1.44	3. 667	2.30	6.750	10. 37	9. 83	2. 02
0.667	1.44	3. 750	2.30	6.833	4. 61	9. 92	2. 02
0.750	1.44	3. 833	2.30	6.917	4. 61	10.00	2. 02
0.833	1.44	3. 917	2.30	7.000	4. 61	10.08	2. 02
0. 917	1.44	4. 000	2.30	7.083	4. 61	10. 17	2. 02
1.000	1.44	4. 083	2.30	7.167	4. 61	10. 25	2. 02
1. 083	1.44	4. 167	2.30	7.250	4. 61	10. 33	1. 15
1. 167	1.44	4. 250	2.30	7.333	3. 46	10. 42	1. 15
1. 250	1.44	4. 333	3.46	7.417	3. 46	10.50	1. 15
1. 333	1.44	4. 417	3.46	7.500	3. 46	10. 58	1. 15
1. 417	1.44	4. 500	3.46	7.583	3. 46	10. 67	1. 15
1. 500	1.44	4. 583	3.46	7.667	3. 46	10. 75	1. 15
1. 583	1.44	4. 667	3.46	7.750	3. 46	10.83	1. 15
1. 667	1.44	4. 750	3.46	7.833	3. 46	10. 92	1. 15
1. 750	1.44	4. 833	4.61	7.917	3. 46	11.00	1. 15
1. 833	1.44	4. 917	4.61	8.000	3. 46	11.08	1. 15
1. 917	1.44	5.000	4.61	8.083	3. 46	11. 17	1. 15
2.000	1.44	5. 083	4.61	8.167	3. 46	11. 25	1. 15
2. 083	1.44	5. 167	4.61	8.250	3. 46	11. 33	1. 15
2. 167	1.44	5. 250	4.61	8.333	2. 02	11. 42	1. 15
2. 250	1.44	5. 333	6. 91	8.417	2. 02	11.50	1. 15
2. 333	1.73	5. 417	6.91	8.500	2. 02	11.58	1. 15
2. 417	1.73	5. 500	6.91	8.583	2. 02	11. 67	1. 15
2. 500	1.73	5. 583	6.91	8.667	2. 02	11. 75	1. 15
2. 583	1.73	5. 667	6.91	8.750	2. 02	11.83	1. 15
2. 667	1.73	5. 750	6. 91	8.833	2. 02	11. 92	1. 15
2. 750	1.73	5. 833	27.65	8.917	2. 02	12.00	1. 15
2. 833	1.73	5. 917	27.65	9.000	2. 02	12.08	1. 15
2. 917	1.73	6.000	27.65	9.083	2. 02	12.17	1. 15
3. 000	1.73 1.73	6. 083	76.03	9.167 9.250	2. 02 2. 02	12. 25	1. 15
3. 083	1.73	6. 167	76.03	7.200	2. 02		

Unit Hyd Opeak (cms) = 0.764

| ADD HYD (0007)| | 3 + 2 = 1 |

0. 211 (i) PEAK FLOW (cms)= TIME TO PEAK (hrs) = 0. 211

TIME TO PEAK (hrs) = 6. 833

RUNOFF VOLUME (mm) = 13. 279

TOTAL RAINFALL (mm) = 57. 600

RUNOFF COEFFICIENT = 0. 231

CALI B | CALLB | NASHYD (0039) | Area (ha) = 0.83 Curve Number (CN) = 75.0 | ID = 1 DT = 5.0 min | Ia (mm) = 10.00 # of Linear Res. (N) = 3.00 | U. H. Tp(hrs) = 0.19

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH RAIN | TIME TIME RAIN | TIME RAIN | TIME mm/hr | hrs mm/hr | hrs RAIN hrs 3. 167 hrs 0.083 hrs 9. 33 6.250 0.00 1.73 1.73 2.02 76. 03 6. 333 6. 417 0 167 0 00 3 250 10 37 9 42 2 02 3. 333 9.58 0.333 1.44 3.417 2.30 6.500 10.37 2.02 6.583 9. 67 9. 75 0.417 1 44 3 500 2.30 10.37 2 02 0. 500 3. 583 2.30 10. 37 2. 02 6. 750 6. 833 6. 917 7. 000 7. 083 7. 167 0.583 1.44 3.667 2.30 10.37 9.83 2.02 0. 667 0. 750 1.44 3. 750 3. 833 2.30 4. 61 4. 61 9. 92 2. 02 1.44 10.00 2. 02 1. 44 1. 44 1. 44 2. 30 2. 30 2. 30 0.833 3 917 4.61 10.08 2 02 . 917 4. 000 1.000 4.083 10.25 4.61 2.02 1. 083 1. 167 4. 167 4. 250 2.30 7. 250 7. 333 4. 61 3. 46 10. 33 10. 42 1. 15 1. 15 1 44 1.44 1.44 1.44 1.44 4. 333 4. 417 4. 500 7. 417 7. 500 7. 583 7. 667 3. 46 3. 46 3. 46 1. 15 1. 15 1. 15 1. 250 3.46 10.50 3. 46 3. 46 3. 46 . 333 I. 417 4. 583 3, 46 10.75 1.500 1.15 7. 750 7. 833 7. 917 1. 583 1. 667 1. 44 1. 44 3. 46 3. 46 3. 46 3. 46 10. 83 10. 92 1.750 1.44 4.833 4.61 3.46 11.00 1.15 . 833 . 917 4. 917 5. 000 4. 61 4. 61 8. 000 8. 083 3. 46 3. 46 2 000 1 44 5 083 4.61 8 167 3 46 11 25 1 15 2. 083 2. 167 1. 44 1. 44 5. 167 5. 250 4. 61 4. 61 8. 250 8. 333 3. 46 2. 02 11. 33 11. 42 1. 15 1. 15 1. 15 1. 44 1. 73 1. 73 6. 91 6. 91 6. 91 8. 417 8. 500 8. 583 5. 333 5. 417 1. 15 1. 15 2 250 2.02 11.50 2. 333 2.417 5.500 2.02 11.67 1.15 6. 91 6. 91 6. 91 1.73 1.73 5. 583 5. 667 8.667 8.750 2. 02 2. 02 2 500 1.73 2.667 5. 750 8.833 2.02 11.92 1.15 2. 750 2. 833 1.73 1.73 5. 833 5. 917 27. 65 27. 65 8. 917 9. 000 2. 02 12. 00 12. 08 1. 15 1. 15 1. 73 | 6. 000 1. 73 | 6. 083 1. 73 | 6. 167 27.65 | 9.083 76.03 | 9.167 76.03 | 9.250 2.917 2.02 12.17 1.15 2. 02 12. 25 3.083

Unit Hyd Opeak (cms) = 0.167

```
1.73 | 5.667
1.73 | 5.750
1.73 | 5.833
1.73 | 5.917
1.73 | 6.000
                                                              6. 91
6. 91
27. 65
27. 65
                                                                                                          2. 02
2. 02
2. 02
2. 02
2 583
                                                                                  8. 833
8. 917
9. 000
                                                                                                                            11. 92
12. 00
12. 08
12. 17
                                                                                                                                                    1. 15
1. 15
1. 15
1. 15
2. 667
2. 750
2.833
                                                              27.65 | 9.083
76.03 | 9.167
76.03 | 9.250
                      1. 73 | 6. 083
1. 73 | 6. 167
3.000
                                                                                                           2.02
                                                                                                                             12. 25
                                                                                                                                                    1.15
3. 083
                                                                                                           2. 02
```

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.020 (i) TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 17.097
TOTAL RAINFALL (mm) = 57.600
RUNOFF COEFFICIENT = 0.297 TIME TO PEAK

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0036) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	5. 32 50. 00	Dir. Conn.(%)=	35. 00
		IMPERVI	OUS	PERVIOUS (i)	
Surface Area	(ha)=	2. 6	6	2. 66	
Dep. Storage	(mm) =	1. 0	0	5. 00	
Average Slope	(%)=	1. 0		1. 00	
		188. 3			
Length	(m) =			40. 00	
Manni ngs n	=	0.13	0	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH									
TIME	RAIN	TIME	RAIN	' TIME	RAI N	TIME	RAIN			
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr			
0.083	0.00	3. 167	1.73	6.250	76.03	9. 33	2.02			
0. 167	0.00	3. 250	1.73	6.333	10. 37	9. 42	2. 02			
0. 250	0.00	3. 333	2.30	6.417	10. 37	9. 50	2. 02			
0. 333	1.44	3. 417	2.30	6.500	10. 37	9. 58	2. 02			
0.417	1.44	3.500	2.30	6.583	10. 37	9. 67	2. 02			
0.500	1.44	3. 583	2.30	6.667	10. 37	9. 75	2. 02			
0.583	1.44	3. 667	2.30	6.750	10. 37	9. 83	2. 02			
0.667	1.44	3. 750	2.30	6.833	4. 61	9. 92	2. 02			
0.750	1.44	3. 833	2.30	6.917	4. 61	10.00	2.02			
0.833	1.44	3. 917	2.30	7.000	4. 61	10.08	2. 02			
0. 917	1.44	4.000	2.30	7.083	4. 61	10. 17	2. 02			
1.000	1.44	4. 083	2.30	7.167	4. 61	10. 25	2.02			
1.083	1.44	4. 167	2.30	7.250	4. 61	10. 33	1. 15			
1. 167	1.44	4. 250	2.30	7.333	3.46	10. 42	1. 15			
1. 250	1.44	4. 333	3.46	7.417	3.46	10.50	1. 15			

PEAK FLOW (Cms) = 0.043
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 17.090
TOTAL RAI NFALL (mm) = 57.600
RUNOFF COEFFICI ENT = 0.297 0.043 (i)

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | NASHYD (0033)| Area (ha)= 0.41 Curve Number (CN)= 75.0 Ia (mm)= 10.00 # of Li near Res. (N)= 3.00 U.H. Tp(hrs)= 0.20 |ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH										
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN				
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr				
0.083	0.00	3. 167	1.73	6.250	76.03	9. 33	2.02				
0. 167	0.00	3. 250	1.73	6.333	10.37	9. 42	2.02				
0. 250	0.00	3. 333	2.30	6.417	10.37	9. 50	2.02				
0. 333	1.44	3. 417	2.30	6.500	10.37	9. 58	2.02				
0. 417	1.44	3. 500	2.30	6.583	10. 37	9. 67	2.02				
0.500	1.44	3. 583	2.30	6.667	10. 37	9.75	2.02				
0. 583	1.44	3. 667	2.30	6.750	10. 37	9.83	2. 02				
0. 667	1.44	3. 750	2.30	6.833	4. 61	9. 92	2. 02				
0. 750	1.44	3. 833	2.30	6.917	4. 61	10.00	2. 02				
0.833	1.44	3. 917	2.30	7.000	4. 61	10.08	2. 02				
0. 917	1.44	4. 000	2.30	7.083	4. 61	10. 17	2. 02				
1. 000	1.44	4. 083	2.30	7.167	4. 61	10. 25	2. 02				
1. 083	1.44	4. 167	2.30	7. 250	4. 61	10. 33	1. 15				
1. 167	1.44	4. 250	2.30	7.333	3. 46	10. 42	1. 15				
1. 250	1.44	4. 333	3.46	7.417	3. 46	10.50	1. 15				
1. 333	1.44	4. 417	3.46	7.500	3. 46	10.58	1. 15				
1. 417	1.44	4. 500	3.46	7.583	3. 46	10.67	1. 15				
1. 500	1.44	4. 583	3.46	7.667	3. 46	10.75	1. 15				
1. 583	1.44	4. 667	3.46	7.750	3. 46	10.83	1. 15				
1. 667	1.44	4. 750	3.46	7.833	3. 46	10.92	1. 15				
1. 750	1.44	4. 833	4.61	7.917	3. 46	11.00	1. 15				
1. 833 1. 917	1.44 1.44	4. 917	4.61	8.000 8.083	3. 46 3. 46	11. 08 11. 17	1. 15 1. 15				
2. 000	1.44	5.083	4.61 4.61	8.167	3. 46	11. 17	1. 15				
2. 000	1.44	5. 167	4.61	8. 250	3, 46	11. 25	1. 15				
2. 167	1.44	5. 250	4.61	8.333	2. 02	11. 33	1. 15				
2. 250	1.44	5. 333	6. 91	8.417	2. 02	11. 42	1. 15				
2. 333	1.73	5. 417	6. 91	8.500	2. 02	11. 58	1. 15				
2. 417	1.73	5. 500	6. 91	8.583	2. 02	11.67	1. 15				
2. 500	1.73	5. 583	6. 91	8.667	2. 02	11. 75	1. 15				
2. 300	/ 3	0.000	3. 71	0.507	2.02	75	15				

1. 333	1.44	4, 417	3, 46	7.500	3, 46	10.58	1, 15
1. 417	1.44	4. 500	3.46	7.583	3. 46	10. 67	1. 15
1.500	1.44	4. 583	3.46	7.667	3, 46	10.75	1. 15
1. 583	1.44	4. 667	3.46	7.750	3. 46	10. 83	1. 15
1. 667	1.44	4. 750	3.46	7.833	3. 46	10. 92	1. 15
1. 750	1.44	4. 833	4.61	7.917	3. 46	11.00	1. 15
1.833	1.44	4. 917	4.61	8.000	3. 46	11. 08	1. 15
1. 917	1.44	5.000	4.61	8.083	3. 46	11. 17	1. 15
2.000	1.44	5. 083	4.61	8.167	3. 46	11. 25	1. 15
2.083	1.44	5. 167	4.61	8.250	3. 46	11. 33	1. 15
2. 167	1.44	5. 250	4.61	8.333	2. 02	11. 42	1. 15
2. 250	1.44	5. 333	6.91	8.417	2. 02	11.50	1. 15
2. 333	1.73	5. 417	6.91	8.500	2. 02	11. 58	1. 15
2. 417	1.73	5. 500	6.91	8.583	2. 02	11. 67	1. 15
2.500	1.73	5. 583	6.91	8.667	2. 02	11. 75	1. 15
2. 583	1.73	5. 667	6.91	8.750	2. 02	11.83	1. 15
2.667	1.73	5. 750	6.91	8.833	2. 02	11. 92	1. 15
2.750	1.73	5. 833	27.65	8.917	2. 02	12.00	1. 15
2.833	1.73	5. 917	27.65	9.000	2. 02	12.08	1. 15
2. 917	1.73	6.000	27.65	9.083	2. 02	12. 17	1. 15
3.000	1.73	6. 083	76.03	9.167	2. 02	12. 25	1. 15
3.083	1.73	6. 167	76.03	9.250	2. 02		

Max. Eff. Inten. (mm/hr)= 29. 81 over (min)
Storage Coeff. (min) =
Unit Hyd. Tpeak (min) =
Unit Hyd. peak (cms) = 20.00 35.00 17. 78 (ii) 20. 00 31. 88 (ii) 35. 00 0.06 0.03 *TOTALS* PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT = 0. 22 6. 42 0.08 0. 278 (iii) 6.75 6.42 56. 60 57. 60 15. 25 57. 60 29. 72 57. 60 0.98 0.26 0.52

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 59.0 | 1a = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

TIME			TR/	ANSFORME	HYETOGR	APH	-	
0.083 0.00 3.167 1.73 6.250 76.03 9.33 2.02 0.167 0.00 3.250 1.73 6.333 10.37 9.42 2.02 0.250 0.00 3.333 2.30 6.500 10.37 9.50 2.02 0.333 1.44 3.417 2.30 6.500 10.37 9.58 2.02 0.500 1.44 3.583 2.30 6.667 10.37 9.58 2.02 0.583 1.44 3.667 2.30 6.667 10.37 9.53 2.02 0.590 1.44 3.583 2.30 6.667 10.37 9.53 2.02 0.583 1.44 3.833 2.30 6.750 10.37 9.83 2.02 0.750 1.44 3.833 2.30 7.500 4.61 10.00 2.02 0.750 1.44 4.000 2.30 7.503 4.61 10.00 2.02 0.750 1.44	TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
0. 167 0. 00 3. 250 1. 73 6. 333 10. 37 9. 42 2. 02 0. 250 0. 00 3. 333 2. 30 6. 417 10. 37 9. 50 2. 02 0. 333 1. 44 3. 417 2. 30 6. 580 10. 37 9. 58 2. 02 0. 417 1. 44 3. 500 2. 30 6. 583 10. 37 9. 58 2. 02 0. 500 1. 44 3. 583 2. 30 6. 657 10. 37 9. 58 2. 02 0. 583 1. 44 3. 667 2. 30 6. 653 10. 37 9. 83 2. 02 0. 667 1. 44 3. 675 2. 30 6. 750 10. 37 9. 83 2. 02 0. 667 1. 44 3. 717 2. 30 6. 833 4. 61 10. 00 2. 02 0. 667 1. 44 3. 917 2. 30 7. 000 4. 61 10. 08 2. 02 0. 833 1. 44 4. 683 2. 30 7. 167 4. 61 10. 25	hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.250 0.00 3.333 2.30 6.417 10.37 9.58 2.02 0.333 1.44 3.417 2.30 6.500 10.37 9.58 2.02 0.500 1.44 3.500 2.30 6.583 10.37 9.67 2.02 0.500 1.44 3.583 2.30 6.667 10.37 9.67 2.02 0.667 1.44 3.750 2.30 6.750 10.37 9.83 2.02 0.667 1.44 3.833 2.30 6.833 4.61 9.92 2.02 0.750 1.44 3.833 2.30 7.000 4.61 10.08 2.02 0.917 1.44 4.000 2.30 7.083 4.61 10.17 2.02 1.900 1.44 4.083 2.30 7.167 4.61 10.17 2.02 1.083 1.44 4.167 2.30 7.250 4.61 10.37 9.5 2.02 1.501	0.083	0.00	3. 167	1.73	6.250	76.03	9. 33	2.02
0. 333 1. 44 3. 417 2. 30 6. 500 10. 37 9. 58 2. 02 0. 417 1. 44 3. 583 2. 30 6. 583 10. 37 9. 67 2. 02 0. 550 1. 44 3. 583 2. 30 6. 750 10. 37 9. 75 2. 02 0. 553 1. 44 3. 583 2. 30 6. 667 10. 37 9. 83 2. 02 0. 657 1. 44 3. 833 2. 30 6. 817 4. 61 10. 00 2. 02 0. 750 1. 44 3. 833 2. 30 6. 917 4. 61 10. 00 2. 02 0. 833 1. 44 4. 000 2. 30 7. 083 4. 61 10. 00 2. 02 1. 000 1. 44 4. 000 2. 30 7. 083 4. 61 10. 08 2. 02 1. 000 1. 44 4. 083 2. 30 7. 167 4. 61 10. 25 2. 02 1. 000 1. 44 4. 250 2. 30 7. 250 3. 46 10. 42	0. 167	0.00	3. 250	1.73	6.333	10. 37	9. 42	2.02
0. 417 1. 44 3. 500 2. 30 6. 583 10. 37 9. 67 2. 02 0. 500 1. 44 3. 583 2. 30 6. 667 10. 37 9. 75 2. 02 0. 667 1. 44 3. 667 2. 30 6. 683 1. 46 1. 9. 92 2. 02 0. 667 1. 44 3. 333 2. 30 6. 833 4. 61 1.0. 00 2. 02 0. 833 1. 44 3. 333 2. 30 6. 917 4. 61 10. 00 2. 02 0. 917 1. 44 4. 000 2. 30 7. 083 4. 61 10. 08 2. 02 1. 000 1. 44 4. 083 2. 30 7. 083 4. 61 10. 08 2. 02 1. 033 1. 44 4. 4. 167 2. 30 7. 250 4. 61 10. 03 1. 15 1. 167 1. 44 4. 4. 177 3. 46 7. 533 3. 46 10. 58 1. 15 1. 50 1. 44 4. 4. 177 3. 46 7. 533 3. 46 10. 58 </td <td>0. 250</td> <td>0.00</td> <td>3. 333</td> <td>2.30</td> <td>6.417</td> <td>10.37</td> <td>9. 50</td> <td>2. 02</td>	0. 250	0.00	3. 333	2.30	6.417	10.37	9. 50	2. 02
0.500 1. 44 3.583 2.30 6.667 10.37 9.75 2.02 0.583 1.44 3.667 2.30 6.750 10.37 9.83 2.02 0.570 1.44 3.750 2.30 6.750 10.37 9.83 2.02 0.750 1.44 3.833 2.30 6.917 4.61 10.00 2.02 0.833 1.44 4.900 2.30 7.003 4.61 10.08 2.02 0.917 1.44 4.003 2.30 7.083 4.61 10.17 2.02 1.000 1.44 4.083 2.30 7.750 4.61 10.17 2.02 1.083 1.44 4.167 2.30 7.750 4.61 10.25 2.02 1.167 1.44 4.250 2.30 7.333 3.46 10.42 1.15 1.250 1.44 4.317 3.46 7.503 3.46 10.50 1.15 1.533 1.44	0.333	1.44	3. 417	2.30	6.500	10. 37	9. 58	2.02
0. 583 1. 44 3. 667 2. 30 6. 750 10. 37 9. 83 2. 02 0. 667 1. 44 3. 750 2. 30 6. 833 4. 61 9. 92 2. 02 0. 633 1. 44 3. 833 2. 30 7. 000 4. 61 10. 00 2. 02 0. 833 1. 44 3. 917 2. 30 7. 000 4. 61 10. 08 2. 02 1. 000 1. 44 4. 083 2. 30 7. 167 4. 61 10. 25 2. 02 1. 083 1. 44 4. 618 2. 30 7. 250 4. 61 10. 25 2. 02 1. 083 1. 44 4. 617 2. 30 7. 250 4. 61 10. 25 2. 02 1. 083 1. 44 4. 333 3. 46 7. 4. 61 10. 25 2. 02 1. 150 1. 44 4. 350 2. 30 7. 250 4. 61 10. 50 1. 15 1. 250 1. 44 4. 550 3. 46 7. 567 3. 46 10. 50 1. 15 </td <td>0.417</td> <td>1.44</td> <td>3. 500</td> <td>2.30</td> <td>6.583</td> <td>10. 37</td> <td>9. 67</td> <td>2.02</td>	0.417	1.44	3. 500	2.30	6.583	10. 37	9. 67	2.02
0.667 1. 44 3.750 2.30 6.833 4.61 9.92 2.02 0.750 1.44 3.833 2.30 6.917 4.61 10.00 2.02 0.833 1.44 3.833 2.30 7.000 4.61 10.08 2.02 0.917 1.44 4.000 2.30 7.083 4.61 10.17 2.02 1.000 1.44 4.083 2.30 7.250 4.61 10.33 1.15 1.167 1.44 4.250 2.30 7.250 4.61 10.33 1.15 1.250 1.44 4.373 3.46 7.417 3.46 10.50 1.15 1.333 1.44 4.450 2.30 7.533 3.46 10.50 1.15 1.333 1.44 4.417 3.46 7.500 3.46 10.58 1.15 1.417 1.44 4.583 3.46 7.583 3.46 10.57 1.15 1.550 1.44	0.500	1.44	3. 583	2.30	6.667	10. 37	9. 75	2.02
0.750 1.44 3.833 2.30 6.917 4.61 10.00 2.02 0.833 1.44 3.917 2.30 7.000 4.61 10.08 2.02 0.000 1.44 4.000 2.30 7.083 4.61 10.17 2.02 1.000 1.44 4.083 2.30 7.167 4.61 10.25 2.02 1.083 1.44 4.67 2.30 7.500 4.61 10.33 1.15 1.167 1.44 4.250 2.30 7.333 3.46 10.42 1.15 1.250 1.44 4.437 3.46 7.500 3.46 10.50 1.15 1.333 1.44 4.470 3.46 7.500 3.46 10.50 1.15 1.500 1.44 4.500 3.46 7.503 3.46 10.67 1.15 1.583 1.44 4.667 3.46 7.750 3.46 10.75 1.15 1.583 1.44	0. 583	1.44	3. 667	2.30	6.750	10. 37	9. 83	2. 02
0. 833 1. 44 3. 917 2. 30 7. 000 4. 61 10. 08 2. 02 0. 917 1. 44 4. 000 2. 30 7. 083 4. 61 10. 17 2. 02 1. 000 1. 44 4. 083 2. 30 7. 250 4. 61 10. 25 2. 02 1. 083 1. 44 4. 167 2. 30 7. 250 4. 61 10. 33 1. 15 1. 167 1. 44 4. 250 2. 30 7. 250 4. 61 10. 33 1. 15 1. 250 1. 44 4. 333 3. 46 7. 417 3. 46 10. 50 1. 15 1. 333 1. 44 4. 417 3. 46 7. 500 3. 46 10. 58 1. 15 1. 500 1. 44 4. 583 3. 46 7. 500 3. 46 10. 67 1. 15 1. 500 1. 44 4. 583 3. 46 7. 750 3. 46 10. 75 1. 15 1. 533 1. 44 4. 667 3. 46 7. 873 3. 46 10. 75	0.667	1.44	3. 750	2.30	6.833	4. 61	9. 92	2.02
0.917 1. 44 4.000 2.30 7.083 4.61 10.17 2.02 1.000 1.44 4.083 2.30 7.167 4.61 10.25 2.02 1.083 1.44 4.167 2.30 7.250 4.61 10.35 1.15 1.167 1.44 4.250 2.30 7.333 3.46 10.42 1.15 1.250 1.44 4.333 3.46 7.500 3.46 10.50 1.15 1.333 1.44 4.417 3.46 7.500 3.46 10.58 1.15 1.500 1.44 4.583 3.46 7.583 3.46 10.75 1.15 1.583 1.44 4.675 3.46 7.590 3.46 10.75 1.15 1.590 1.44 4.583 3.46 7.750 3.46 10.75 1.15 1.583 1.44 4.677 3.46 17.917 3.46 11.00 1.15 1.500 1.44 <td>0.750</td> <td>1.44</td> <td>3. 833</td> <td>2.30</td> <td>6.917</td> <td>4. 61</td> <td>10.00</td> <td>2.02</td>	0.750	1.44	3. 833	2.30	6.917	4. 61	10.00	2.02
1. 000 1. 44 4. 083 2. 30 7. 167 4. 61 10. 25 2. 02 1. 083 1. 44 4. 167 2. 30 7. 250 4. 61 10. 25 2. 02 1. 167 1. 44 4. 250 2. 30 7. 250 4. 61 10. 25 1. 15 1. 250 1. 44 4. 333 3. 46 7. 500 3. 46 10. 50 1. 15 1. 333 1. 44 4. 417 3. 46 7. 503 3. 46 10. 58 1. 15 1. 417 1. 44 4. 550 3. 46 7. 667 3. 46 10. 67 1. 15 1. 500 1. 44 4. 550 3. 46 7. 667 3. 46 10. 67 1. 15 1. 500 1. 44 4. 550 3. 46 7. 667 3. 46 10. 67 1. 15 1. 500 1. 44 4. 667 3. 46 7. 750 3. 46 10. 67 1. 15 1. 560 1. 44 4. 917 4. 61 8. 000 3. 46 10. 92	0.833		3. 917		7.000	4. 61	10.08	
1. 083 1. 44 4. 167 2. 30 7. 250 4. 61 10. 33 1. 15 1. 167 1. 44 4. 250 2. 30 7. 333 3. 46 10. 50 1. 15 1. 250 1. 44 4. 333 3. 46 7. 417 3. 46 10. 50 1. 15 1. 333 1. 44 4. 417 3. 46 7. 500 3. 46 10. 58 1. 15 1. 407 1. 44 4. 583 3. 46 7. 667 3. 46 10. 67 1. 15 1. 583 1. 44 4. 667 3. 46 7. 667 3. 46 10. 75 1. 15 1. 583 1. 44 4. 667 3. 46 7. 6750 3. 46 10. 75 1. 15 1. 500 1. 44 4. 675 3. 46 7. 6750 3. 46 10. 75 1. 15 1. 551 1. 57 3. 46 10. 75 1. 15 1. 5 1. 5 1. 57 1. 44 4. 675 3. 46 7. 667 3. 46 110. 92 1. 15	0. 917	1.44	4. 000	2.30	7.083	4. 61	10. 17	2.02
1. 167 1. 44 4. 250 2. 30 7. 333 3. 46 10. 42 1. 15 1. 250 1. 44 4. 333 3. 46 7. 417 3. 46 10. 50 1. 15 1. 333 1. 44 4. 417 3. 46 7. 500 3. 46 10. 58 1. 15 1. 417 1. 44 4. 500 3. 46 7. 500 3. 46 10. 58 1. 15 1. 500 1. 44 4. 583 3. 46 7. 503 3. 46 10. 75 1. 15 1. 583 1. 44 4. 667 3. 46 7. 750 3. 46 10. 83 1. 15 1. 560 1. 44 4. 677 3. 46 7. 833 3. 46 11. 08 1. 15 1. 560 1. 44 4. 677 3. 46 7. 833 3. 46 110. 83 1. 15 1. 560 1. 44 4. 833 4. 61 7. 833 3. 46 111. 00 1. 15 1. 833 1. 44 4. 917 4. 61 8. 000 3. 46 111. 08	1.000	1.44				4. 61		
1. 250 1. 44 4. 333 3. 46 7. 500 3. 46 10. 50 1. 15 1. 333 1. 44 4. 417 3. 46 7. 500 3. 46 10. 58 1. 15 1. 333 1. 44 4. 4. 500 3. 46 7. 583 3. 46 10. 67 1. 15 1. 500 1. 44 4. 583 3. 46 7. 750 3. 46 10. 75 1. 15 1. 583 1. 44 4. 667 3. 46 7. 750 3. 46 10. 92 1. 15 1. 570 1. 44 4. 833 4. 61 7. 833 3. 46 11. 08 1. 15 1. 750 1. 44 4. 833 4. 61 8. 083 3. 46 11. 08 1. 15 1. 833 1. 44 1. 917 4. 61 8. 083 3. 46 11. 08 1. 15 1. 917 1. 44 5. 000 4. 61 8. 263 3. 46 11. 08 1. 15 2. 083 1. 44 5. 503 4. 61 8. 253 2. 02 11. 42	1.083	1.44	4. 167	2.30	7.250	4. 61	10. 33	1. 15
1. 333 1. 44 4. 417 3. 46 7. 500 3. 46 10. 58 1. 15 1. 417 1. 44 4. 503 3. 46 7. 583 3. 46 10. 75 1. 15 1. 500 1. 44 4. 583 3. 46 7. 667 3. 46 10. 75 1. 15 1. 583 1. 44 4. 667 3. 46 7. 675 3. 46 10. 75 1. 15 1. 667 1. 44 4. 675 3. 46 7. 833 3. 46 10. 92 1. 15 1. 750 1. 44 4. 833 4. 61 7. 917 3. 46 11. 00 1. 15 1. 833 1. 44 4. 917 4. 61 8. 000 3. 46 11. 00 1. 15 1. 917 1. 44 5. 000 4. 61 8. 000 3. 46 11. 00 1. 15 2. 083 1. 44 5. 083 4. 61 8. 250 3. 46 11. 25 1. 15 2. 083 1. 44 5. 167 4. 61 8. 250 3. 46 11. 25	1. 167	1.44	4. 250	2.30	7.333	3.46	10. 42	1. 15
1. 417 1. 44 4. 500 3. 46 7. 583 3. 46 10. 67 1. 15 1. 500 1. 44 4. 583 3. 46 7. 667 3. 46 10. 67 1. 15 1. 583 1. 44 4. 667 3. 46 7. 667 3. 46 10. 83 1. 15 1. 667 1. 44 4. 667 3. 46 7. 750 3. 46 10. 83 1. 15 1. 750 1. 44 4. 833 4. 61 7. 913 3. 46 11. 00 1. 15 1. 833 1. 44 4. 917 4. 61 8. 000 3. 46 11. 08 1. 15 1. 917 1. 44 5. 083 4. 61 8. 033 3. 46 11. 08 1. 15 1. 917 1. 44 5. 083 4. 61 8. 803 3. 46 11. 25 1. 15 2. 000 1. 44 5. 503 4. 61 8. 250 3. 46 11. 25 1. 15 2. 167 1. 44 5. 550 4. 61 8. 250 3. 46 11. 33	1. 250	1.44	4. 333	3.46	7.417	3.46	10.50	1. 15
1. 500 1. 44 4. 583 3. 46 7. 750 3. 46 10. 75 1. 15 1. 583 1. 44 4. 667 3. 346 7. 750 3. 46 10. 92 1. 15 1. 667 1. 44 4. 750 3. 46 7. 833 3. 46 10. 92 1. 15 1. 750 1. 44 4. 833 4. 61 7. 917 3. 46 11. 00 1. 15 1. 833 1. 44 4. 917 4. 61 8. 083 3. 46 11. 08 1. 15 2. 000 1. 44 5. 000 4. 61 8. 263 3. 46 11. 25 1. 15 2. 083 1. 44 5. 167 4. 61 8. 250 3. 46 11. 23 1. 15 2. 167 1. 44 5. 250 4. 61 8. 250 2. 02 11. 42 1. 15 2. 250 1. 44 5. 53 6. 91 8. 583 2. 02 11. 50 1. 15 2. 333 1. 73 5. 500 6. 91 8. 563 2. 02 11. 67	1. 333	1.44	4. 417	3.46	7.500	3.46	10. 58	1. 15
1. 583 1. 44 4. 667 3. 46 7. 750 3. 46 10. 83 1. 15 1. 667 1. 44 4. 750 3. 46 7. 833 3. 46 10. 92 1. 15 1. 750 1. 44 4. 833 4. 61 7. 813 3. 46 11. 00 1. 15 1. 833 1. 44 4. 917 4. 61 8. 000 3. 46 111. 08 1. 15 1. 917 1. 44 5. 000 4. 61 8. 083 3. 46 111. 17 1. 15 2. 000 1. 44 5. 083 4. 61 8. 150 3. 46 111. 25 1. 15 2. 083 1. 44 5. 167 4. 61 8. 250 3. 46 111. 25 1. 15 2. 167 1. 44 5. 550 4. 61 8. 333 2. 02 111. 50 1. 15 2. 2333 1. 73 5. 417 6. 91 8. 503 2. 02 111. 50 1. 15 2. 417 1. 73 5. 500 6. 91 8. 583 2. 02 111. 50	1. 417	1.44	4. 500	3.46	7.583	3.46	10. 67	
1. 667 1. 44 4. 750 3. 46 7. 833 3. 46 10. 92 1. 15 1. 750 1. 44 4. 833 4. 61 7. 917 3. 46 11. 00 1. 15 1. 833 1. 44 4. 917 4. 61 8. 003 3. 46 11. 08 1. 15 1. 917 1. 44 5. 000 4. 61 8. 083 3. 46 11. 17 1. 15 2. 000 1. 44 5. 000 4. 61 8. 167 3. 46 11. 17 1. 15 2. 083 1. 44 5. 250 4. 61 8. 250 3. 46 11. 33 1. 15 2. 167 1. 44 5. 250 4. 61 8. 333 2. 02 11. 42 1. 15 2. 250 1. 44 5. 250 4. 61 8. 500 2. 02 11. 50 1. 15 2. 333 1. 73 5. 417 6. 91 8. 583 2. 02 11. 50 1. 15 2. 500 1. 73 5. 583 6. 91 8. 693 2. 02 11. 75	1.500	1.44	4. 583	3.46	7.667	3.46	10. 75	1. 15
1.750 1.44 4.833 4.61 7.917 3.46 11.00 1.15 1.833 1.44 4.917 4.61 8.000 3.46 11.08 1.15 1.917 1.44 5.000 4.61 8.083 3.46 11.17 1.15 2.000 1.44 5.083 4.61 8.167 3.46 11.25 1.15 2.083 1.44 5.167 4.61 8.250 3.46 11.33 1.15 2.167 1.44 5.333 6.91 8.502 2.02 11.42 1.15 2.333 1.73 5.517 6.91 8.583 2.02 11.50 1.15 2.417 1.73 5.500 6.91 8.583 2.02 11.67 1.15 2.500 1.73 5.560 6.91 8.667 2.02 11.67 1.15 2.500 1.73 5.567 6.91 8.633 2.02 11.67 1.15 2.500 1.73	1.583	1.44	4. 667	3.46	7.750	3.46	10.83	1. 15
1. 833 1. 44 4. 917 4. 61 8. 000 3. 46 11. 08 1. 15 1. 917 1. 44 5. 000 4. 61 8. 083 3. 46 11. 17 1. 15 2. 000 1. 44 5. 083 4. 61 8. 250 3. 46 11. 25 1. 15 2. 083 1. 44 5. 550 4. 61 8. 250 3. 46 11. 33 1. 15 2. 167 1. 44 5. 550 4. 61 8. 332 2. 02 11. 50 1. 15 2. 233 1. 73 5. 500 6. 91 8. 500 2. 02 11. 50 1. 15 2. 417 1. 73 5. 500 6. 91 8. 583 2. 02 11. 50 1. 15 2. 500 1. 73 5. 500 6. 91 8. 583 2. 02 11. 60 1. 15 2. 1750 1. 73 5. 500 6. 91 8. 583 2. 02 11. 75 1. 15 2. 563 1. 73 5. 750 6. 91 8. 760 2. 02 11. 92	1.667	1.44	4. 750	3.46	7.833	3.46	10. 92	1. 15
1. 917 1. 44 5. 000 4. 61 8. 083 3. 46 11. 17 1. 15 2. 000 1. 44 5. 083 4. 61 8. 167 3. 46 11. 25 1. 15 2. 083 1. 44 5. 167 4. 61 8. 250 3. 46 11. 33 1. 15 2. 167 1. 44 5. 250 4. 61 8. 333 2. 02 11. 42 1. 15 2. 250 1. 44 5. 333 6. 91 8. 417 2. 02 11. 50 1. 15 2. 333 1. 73 5. 500 6. 91 8. 583 2. 02 11. 67 1. 15 2. 500 1. 73 5. 583 6. 91 8. 683 2. 02 11. 75 1. 15 2. 500 1. 73 5. 583 6. 91 8. 675 2. 02 11. 75 1. 15 2. 583 1. 73 5. 567 6. 91 8. 750 2. 02 11. 83 1. 15 2. 750 1. 73 5. 533 27. 65 8. 917 2. 02 11. 83	1. 750	1.44	4. 833	4.61	7.917	3.46	11.00	1. 15
2. 000 1, 44 5. 083 4. 61 8. 167 3. 46 11, 25 1. 15 2. 083 1. 44 5. 167 4. 61 8. 253 3. 46 11, 25 1. 15 2. 167 1. 44 5. 250 4. 61 8. 333 2. 02 11, 42 1. 15 2. 250 1. 44 5. 333 6. 91 8. 502 2. 02 11, 50 1. 15 2. 333 1. 73 5. 500 6. 91 8. 563 2. 02 11, 67 1. 15 2. 500 1. 73 5. 500 6. 91 8. 667 2. 02 11, 67 1. 15 2. 500 1. 73 5. 500 6. 91 8. 667 2. 02 11, 67 1. 15 2. 500 1. 73 5. 567 6. 91 8. 750 2. 02 11, 75 1. 15 2. 667 1. 73 5. 750 6. 91 8. 833 2. 02 11, 92 1. 15 2. 750 1. 73 5. 750 6. 91 8. 833 2. 02 11, 92	1.833	1.44	4. 917	4.61	8.000	3.46	11.08	1. 15
2.083 1.44 5.167 4.61 8.250 3.46 11.33 1.15 2.167 1.44 5.253 4.61 8.333 2.02 11.42 1.15 2.250 1.44 5.253 6.91 8.417 2.02 11.50 1.15 2.333 1.73 5.417 6.91 8.500 2.02 11.58 1.15 2.417 1.73 5.583 6.91 8.583 2.02 11.76 1.15 2.500 1.73 5.583 6.91 8.67 2.02 11.83 1.15 2.583 1.73 5.667 6.91 8.750 2.02 11.83 1.15 2.667 1.73 5.833 27.65 8.917 2.02 11.92 1.15 2.750 1.73 5.833 27.65 8.917 2.02 12.08 1.15 2.833 1.73 5.917 27.65 9.000 2.02 12.08 1.15 2.917 1.73 <td>1. 917</td> <td>1.44</td> <td>5.000</td> <td>4.61</td> <td>8.083</td> <td>3.46</td> <td>11. 17</td> <td>1. 15</td>	1. 917	1.44	5.000	4.61	8.083	3.46	11. 17	1. 15
2. 167 1, 44 5, 250 4, 61 8, 333 2, 02 11, 42 1, 15 2. 250 1, 44 5, 233 6, 91 8, 417 2, 02 11, 50 1, 15 2. 333 1, 73 5, 5417 6, 91 8, 563 2, 02 11, 58 1, 15 2. 417 1, 73 5, 583 6, 91 8, 563 2, 02 11, 67 1, 15 2. 500 1, 73 5, 583 6, 91 8, 675 2, 02 11, 75 1, 15 2. 583 1, 73 5, 567 6, 91 8, 750 2, 02 11, 83 1, 15 2. 667 1, 73 5, 750 6, 91 8, 833 2, 02 11, 83 1, 15 2. 750 1, 73 5, 750 6, 91 8, 833 2, 02 11, 83 1, 15 2. 750 1, 73 5, 833 27, 65 8, 917 2, 02 12, 08 1, 15 2. 833 1, 73 5, 8917 27, 65 9, 000 2, 02 12, 08	2.000	1.44	5. 083	4.61		3.46		
2. 250 1. 44 5. 333 6. 91 8. 417 2. 02 11. 50 1. 15 2. 333 1. 73 5. 417 6. 91 8. 550 2. 02 11. 58 1. 15 2. 417 1. 73 5. 500 6. 91 8. 583 2. 02 11. 67 1. 15 2. 500 1. 73 5. 583 6. 91 8. 667 2. 02 11. 75 1. 15 2. 583 1. 73 5. 667 6. 91 8. 750 2. 02 11. 83 1. 15 2. 667 1. 73 5. 833 27. 65 8. 917 2. 02 12. 00 1. 15 2. 833 1. 73 5. 917 27. 65 9. 000 2. 02 12. 08 1. 15 2. 917 1. 73 6. 000 27. 65 9. 083 2. 02 12. 17 1. 15 3. 000 1. 73 6. 083 76. 03 9. 167 2. 02 12. 25 1. 15								
2. 333 1. 73 5. 417 6. 91 8. 500 2. 02 11. 58 1. 15 2. 417 1. 73 5. 500 6. 91 8. 583 2. 02 11. 67 1. 15 2. 500 1. 73 5. 583 6. 91 8. 667 2. 02 11. 75 1. 15 2. 583 1. 73 5. 667 6. 91 8. 750 2. 02 11. 83 1. 15 2. 667 1. 73 5. 750 6. 91 8. 833 2. 02 11. 92 1. 15 2. 750 1. 73 5. 833 27. 65 8. 917 2. 02 12. 00 1. 15 2. 833 1. 73 5. 917 27. 65 9. 000 2. 02 12. 08 1. 15 2. 917 1. 73 6. 000 27. 65 9. 083 2. 02 12. 17 1. 15 3. 000 1. 73 6. 083 76. 03 9. 167 2. 02 12. 25 1. 15								
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$								
2. 500 1. 73 5. 583 6. 91 8. 667 2. 02 11. 75 1. 15 2. 583 1. 73 5. 667 6. 91 8. 750 2. 02 11. 83 1. 15 2. 667 1. 73 5. 750 6. 91 8. 833 2. 02 11. 92 1. 15 2. 750 1. 73 5. 833 27. 65 8. 917 2. 02 12. 00 1. 15 2. 833 1. 73 5. 917 27. 65 9. 000 2. 02 12. 08 1. 15 2. 917 1. 73 6. 000 27. 65 9. 083 2. 02 12. 17 1. 15 3. 000 1. 73 6. 083 76. 03 9. 167 2. 02 12. 25 1. 15								
2. 583 1. 73 5. 667 6. 91 8. 750 2. 02 11. 83 1. 15 2. 667 1. 73 5. 750 6. 91 8. 833 2. 02 11. 93 1. 15 2. 750 1. 73 5. 833 27. 65 8. 917 2. 02 12. 00 1. 15 2. 833 1. 73 5. 917 27. 65 9. 000 2. 02 12. 08 1. 15 2. 917 1. 73 6. 000 27. 65 9. 083 2. 02 12. 17 1. 15 3. 000 1. 73 6. 083 76. 03 9. 167 2. 02 12. 25 1. 15								
2. 667 1. 73 5. 750 6. 91 8. 833 2. 02 11. 92 1. 15 2. 750 1. 73 5. 833 27. 65 8. 917 2. 02 12. 00 1. 15 2. 833 1. 73 5. 917 27. 65 9. 000 2. 02 12. 08 1. 15 2. 917 1. 73 6. 000 27. 65 9. 083 2. 02 12. 17 1. 15 3. 000 1. 73 6. 083 76. 03 9. 167 2. 02 12. 25 1. 15								
2. 750 1. 73 5. 833 27. 65 8. 917 2. 02 12. 00 1. 15 2. 833 1. 73 5. 917 27. 65 9. 000 2. 02 12. 08 1. 15 2. 917 1. 73 6. 000 27. 65 9. 083 2. 02 12. 17 1. 15 3. 000 1. 73 6. 083 76. 03 9. 167 2. 02 12. 25 1. 15	2. 583	1.73	5. 667	6. 91	8.750		11.83	
2. 833 1. 73 5. 917 27. 65 9.000 2. 02 12. 08 1. 15 2. 917 1. 73 6. 000 27. 65 9. 083 2. 02 12. 17 1. 15 3. 000 1. 73 6. 083 76. 03 9. 167 2. 02 12. 25 1. 15				6. 91				
2. 917 1. 73 6. 000 27. 65 9. 083 2. 02 12. 17 1. 15 3. 000 1. 73 6. 083 76. 03 9. 167 2. 02 12. 25 1. 15								
3. 000								
3. 083							12. 25	1. 15
	3. 083	1.73	6. 167	76.03	9.250	2. 02		

Unit Hyd Qpeak (cms) = 0.177

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

PEAK FLOW (cms)= 0.068 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 15.986
TOTAL RAI NFALL (mm)= 57.600
RUNOFF COEFFICIENT = 0.278

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | STANDHYD (0040)| |ID= 1 DT= 5.0 min | Area (ha)= 3.43
Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00 IMPERVIOUS PERVIOUS (i) (ha) = (mm) = (%) = (m) = 1. 71 5. 00 Surface Area 1. 71 1. 00 Dep. Storage Average Slope Length 1.00 2 00 151. 22 Manni ngs n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH -TIME RAIN |' mm/hr |' TIME RAIN | mm/hr | TIME RAIN RAIN 0.083 3. 167 1.73 1.73 2.30 2.30 6.250 9. 33 0.00 76.03 2.02 0. 167 0. 250 0.00 3. 250 3. 333 6. 333 6. 417 10. 37 10. 37 9. 42 9. 50 2. 02 6.500 9.58 0.333 1.44 3.417 10.37 2.02 0. 417 0. 500 0. 583 1. 44 1. 44 3. 500 3. 583 2.30 2.30 6. 583 6. 667 2. 02 2. 02 1.44 3.667 2.30 6.750 10.37 9.83 2.02 6. 833 6. 917 7. 000 0. 667 0. 750 3. 750 3. 833 2.30 4. 61 4. 61 2. 02 0.833 1 44 3 917 2 30 4 61 10 08 2 02 0. 917 1. 000 1. 44 1. 44 4. 000 4. 083 2.30 7. 083 7. 167 4. 61 4. 61 2. 02 2. 02 10.25 7. 250 7. 333 7. 417 1 083 1.44 4. 167 4. 250 2.30 1. 15 1. 15 1. 250 1.44 4. 333 3.46 3.46 10.50 1.15 . 333 4. 417 4. 500 3. 46 3. 46 7.500 7.583 3. 46 3. 46 1.500 1.44 4.583 3.46 7.667 3.46 10.75 1.15 . 583 . 667 4. 667 4. 750 3. 46 3. 46 7. 750 7. 833 3. 46 3. 46 10. 83 10. 92 4. 61 4. 61 4. 61 7.917 11. 00 11. 08 1.750 1.44 4.833 3.46 1.15 1. 833 1. 917 1.44 4. 917 5. 000 8.000 8.083 3. 46 3. 46 11. 17 1.15 2.000 1.44 5. 083 4.61 8.167 8.250 3. 46 3. 46 11. 25 1. 15

CALIB (0038) Area (ha)= 1.56 Ia (mm)= 10.00 U.H. Tp(hrs)= 0.22 NASHYD Curve Number (CN) = 73.0ID= 1 DT= 5.0 min # of Linear Res. (N) = 3.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

			TRA	ANSFORMFI) HYETOGR	ΔРН	_	
7	TIME	RAIN	I TIME	RAIN	l' TIME	RAIN	TIME	RAIN
	hrs	mm/hr	hrs	mm/hr	l' hrs	mm/hr	hrs	mm/hr
0.	083	0.00	3. 167	1.73	6. 250	76. 03	9.33	2. 02
0.	167	0.00	3, 250	1.73	6.333	10. 37	9. 42	2. 02
0.	250	0.00	3. 333	2.30	6.417	10.37	9. 50	2.02
0.	333	1.44	3. 417	2.30	6.500	10.37	9. 58	2.02
0.	417	1.44	3. 500	2.30	6.583	10.37	9. 67	2.02
0.	500	1.44	3. 583	2.30	6.667	10. 37	9. 75	2.02
0.	583	1.44	3. 667	2.30	6.750	10. 37	9. 83	2.02
	667	1.44	3. 750	2.30	6.833	4. 61	9. 92	2.02
	750	1.44	3.833	2.30	6.917	4. 61	10.00	2. 02
	833	1.44	3. 917	2.30	7.000	4. 61	10.08	2.02
	917	1.44	4. 000	2.30	7.083	4. 61	10. 17	2.02
	000	1.44	4. 083	2.30	7.167	4. 61	10. 25	2.02
	083	1.44	4. 167	2.30	7.250	4. 61	10. 33	1. 15
	167	1.44	4. 250	2.30	7.333	3.46	10.42	1. 15
	250	1.44	4. 333	3.46	7.417	3. 46	10.50	1. 15
	333	1.44	4. 417	3.46	7.500	3. 46	10.58	1. 15
	417	1.44	4. 500	3.46	7.583	3. 46	10.67	1. 15
	500	1.44	4. 583	3.46	7.667	3. 46	10.75	1. 15
	583	1.44	4. 667	3.46	7.750	3. 46	10.83	1. 15
	667	1.44	4. 750	3.46	7.833	3. 46	10. 92	1. 15
	750	1.44	4. 833	4.61	7.917	3. 46	11.00	1. 15
	833	1.44	4. 917	4.61	8.000	3. 46	11.08	1. 15
	917	1.44 1.44	5.000	4.61 4.61	8.083 8.167	3. 46 3. 46	11. 17 11. 25	1. 15 1. 15
	. 083	1.44	5. 167	4.61	8.250	3. 46	11. 25	1. 15
	167	1.44	5. 250	4.61	8.333	2. 02	11. 33	1. 15
	250	1.44	5. 333	6. 91	8.417	2. 02	11. 42	1. 15
	333	1.73	5. 417	6. 91	8.500	2. 02	11. 58	1. 15
	417	1.73	5. 500	6. 91	8.583	2. 02	11. 67	1. 15
	500	1.73	5. 583	6. 91	8.667	2. 02	11.75	1. 15
	583	1.73	5. 667	6. 91	8.750	2. 02	11.83	1. 15
	667	1.73	5. 750	6. 91	8.833	2. 02	11. 92	1. 15
	750	1.73	5. 833	27.65	8.917	2. 02	12.00	1. 15
	833	1.73	5. 917	27.65	9.000	2. 02	12.08	1. 15
	917	1.73	6. 000	27.65	9.083	2. 02	12. 17	1. 15
	000	1.73	6. 083	76.03	9. 167	2. 02	12. 25	1. 15
	083	1.73	6. 167	76.03	9. 250	2. 02		

Unit Hyd Opeak (cms) = 0.271

```
5. 250
5. 333
5. 417
5. 500
5. 583
                                      1.44
1.44
1.73
1.73
                                                                              8.333
8.417
                                                                                                   2. 02
2. 02
                                                                    6. 91
6. 91
6. 91
                     2. 250
2. 333
                                                                                                                                  1. 15
1. 15
                                                                                  8.500
8.583
                                                                                                    2.02
                                                                                                                11.58
                     2.417
                                                                                                    2.02
                                      1. 73
1. 73
1. 73
                                                   5. 667
5. 750
5. 833
                                                                  6. 91
6. 91
27. 65
                                                                                                                                  1. 15
1. 15
1. 15
                     2.583
                                                                                 8.750
                                                                                                    2.02
                                                                                                                 11.83
                     2. 667
2. 750
                                                                                 8. 833
8. 917
                                                                                                    2. 02
                                                                                                                 11. 92
                                                                                                    2. 02
                                                                                                                12.00
                                                                  27.65 |
27.65 |
27.65 |
76.03 |
                                                                                 9. 000
9. 083
9. 167
                                      1. 73
1. 73
1. 73
                                                   5. 917
6. 000
6. 083
                                                                                                   2. 02
2. 02
2. 02
                                                                                                                12. 08
12. 17
                                                                                                                                  1. 15
1. 15
                     2.833
                     2. 917
                     3. 000
                                                                                                                12. 25
                                                                                                                                  1.15
                     3.083
                                                   6. 167
                                                                  76.03 | 9.250
                                                                                                   2.02
Max. Eff. Inten. (mm/hr)=
                                                      76. 03
                                                       5. 00
3. 65 (ii)
                                                                              20. 00
15. 11 (ii)
```

over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 20.00 0. 25 PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT = 0. 25 0.08 0.306 (iii) 6. 25 56. 60 6. 42 15. 25 6. 25 29. 72 57.60 57 60 57.60

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0041)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.
·	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0033):	0.41	0. 020	6.33	17. 10
+ ID2= 2 (0036):	5.32	0. 278	6.42	29. 72
==============	======			
ID = 3 (0041):	5.73	0. 297	6.42	28. 81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS LE ANY.

ADD HYD (0041)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0041):	5.73	0. 297	6.42	28. 81

```
+ ID2= 2 ( 0037):
                            0.65 0.037
                                               6 25
                                                        15 89
      ID = 1 (0041):
                                                        27. 50
                             6.38 0.320
                                               6.42
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
ADD HYD ( 0041) |
1 + 2 = 3 |
                                                           R. V.
(mm)
                              ARFA
                                      QPEAK
                                                 TPEAK
                              (ha)
                                       (cms)
                                                 (hrs)
    ID1= 1 ( 0041):
+ ID2= 2 ( 0038):
                             6. 38
1. 56
                                      0.320
                                                6. 42
6. 33
                                                         27.50
                                      0. 068
```

| ADD HYD (0041)| | 3 + 2 = 1 | AREA QPEAK TPEAK (ha) 7.94 (cms) 0.384 (hrs) 6.42 (mm) 25. 23 ID1= 3 (0041): + ID2= 2 (0040): 29.72 3.43 0.306 6.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

7. 94 0. 384

0. 627

6.42

25 23

(v 6.2.2011)

ID = 3 (0041):

ID = 1 (0041):

11.37 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)| 1 + 2 = 3 | ID1= 1 (0039): + ID2= 2 (0041): AREA QPEAK TPEAK R. V. (cms) 0.043 (hrs) 6.33 11.37 0.627 6 25 26 59 ID = 3 (0032): 12.20 0.666 6. 25 25. 94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

SSSSS U U A A L SS U U A A L SS U U AAAAA L SSSS SS SS V SS U U A A L
SSSSS UUUUU A A LLLLL vv

TTTTT TTTTT H H Y Y M M 000

1.75	1.65	5.00	5.28	8. 25	2. 31	11.50	1. 32
2.00	1.65	5.25	7.92	8.50	2. 31	11. 75	1. 32
2.25	1.98	5.50	7.92	8. 75	2. 31	12.00	1. 32
2.50	1.98	5.75	31.68	9.00	2. 31		
2.75	1.98	6.00	87.12	9. 25	2. 31		
3.00	1.98	6.25	11.88	9.50	2. 31		

| STANDHYD (0006)| |ID= 1 DT= 5.0 min | Area (ha)= 5.62Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00

IMPERVIOUS PERVIOUS (i) Surface Area 2. 81 1. 00 (mm) = (%) = (m) = Dep. Storage Average Slope 5.00 1 00 2 00 Length Manni ngs n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH RAIN | RAIN |' mm/hr |' TIME TIME RAIN TIME TIME RAIN 0.083 3. 167 6.250 9. 33 0.00 1.98 1.98 87. 12 2.31 0. 167 0. 250 0.00 3. 250 3. 333 6. 333 6. 417 11. 88 11. 88 9. 42 9. 50 2. 31 2.64 0.333 1.65 3.417 6.500 11.88 9.58 2.31 0. 417 0. 500 3. 500 3. 583 2.64 2.64 6. 583 6. 667 2. 31 2. 31 0.583 1.65 3.667 2.64 6.750 11.88 9.83 2.31 6. 833 6. 917 7. 000 0. 667 0. 750 1.65 1.65 3. 750 3. 833 2.64 5. 28 5. 28 0.833 1 65 3 917 2 64 5 28 10 08 2 31 0. 917 1. 000 4. 000 4. 083 7. 083 7. 167 1.65 1.65 2.64 5. 28 5. 28 2. 31 10.25 7. 250 7. 333 7. 417 1 083 1.65 1.65 4. 167 4. 250 2.64 5. 28 . 250 1.65 4. 333 3.96 3.96 10.50 1.32 . 333 4. 417 4. 500 3.96 3.96 7.500 7.583 10. 58 10. 67 1.500 1.65 4.583 3.96 7.667 3.96 10.75 1.32 . 583 . 667 1. 65 1. 65 4. 667 4. 750 3. 96 3. 96 7. 750 7. 833 3. 96 3. 96 10. 83 10. 92 1. 32 1. 32 1.750 1.65 4.833 5.28 7.917 3.96 11.00 1.32 1. 833 1. 917 4. 917 5. 000 5. 28 5. 28 8.000 8.083 3. 96 3. 96 1.65 1.32 11. 17 2.000 1.65 5. 083 5. 28 8. 167 8. 250 3. 96 11. 25 1.32

000

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***** DETAILED OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

Output filename:

C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776 f7886e\dc0b50a8-bc98-4087-bb05-526673

Summary filename: C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776 f7886e\dc0b50a8-bc98-4087-bb05-526673

DATE: 06-15-2023

TIME: 02:15:49

USER:

COMMENTS:

** SIMULATION : 010yr 12hr 15min SCS **

1.65

1.65

1.25

READ STORM Filename: C:\Users\r.rajachockalingam\AppD ata\Local\Temp\
073789e9-0d0b-43a3-ada4-078b0c00e084\ed4b58ae Ptotal = 66.00 mm Comments: created from IDF Group New IDFGroup - 2 TIME TIME RAIN | hrs mm/hr hrs mm/hr hrs mm/hr i hrs mm/hr 0.00 0.00 3. 25 3. 50 2. 64 2. 64 6. 50 6. 75 7. 00 9. 75 10. 00 2. 31 11. 88 5. 28 3.75 0.50 1.65 2.64 5. 28 10.25 1.32 0.75 4.00 4.25 2.64 7. 25 7. 50 3. 96 3. 96 10. 50 10. 75 1. 32 1. 32

3.96

7. 75

3.96

11.00

1. 32

4.50

2. 167	1.65	5. 250	5.28	8.333	2. 31	11. 42	1. 32
2. 250	1.65	5. 333	7.92	8.417	2. 31	11.50	1. 32
2. 333	1.98	5. 417	7.92	8.500	2. 31	11.58	1. 32
2. 417	1.98	5. 500	7.92	8.583	2. 31	11. 67	1. 32
2.500	1.98	5. 583	7.92	8.667	2. 31	11.75	1. 32
2. 583	1.98	5. 667	7.92	8.750	2. 31	11.83	1. 32
2. 667	1.98	5. 750	7.92	8.833	2. 31	11. 92	1. 32
2. 750	1.98	5. 833	31.68	8.917	2. 31	12.00	1. 32
2.833	1.98	5. 917	31.68	9.000	2. 31	12.08	1. 32
2. 917	1.98	6.000	31.68	9.083	2. 31	12. 17	1. 32
3.000	1.98	6. 083	87.12	9.167	2. 31	12. 25	1. 32
3.083	1.98	6. 167	87.12	9.250	2. 31		

Max. Eff. Inten. (mm/hr)=	87. 12	41. 61	
over (min)	5. 00	10.00	
Storage Coeff. (min)=	4.01 (ii)	7.76 (11)	
Unit Hyd. Tpeak (min)=	5. 00	10.00	
Unit Hyd. peak (cms)=	0. 24	0. 13	
			TOTALS
PEAK FLOW (cms)=	0. 47	0. 25	0.715 (iii)
TIME TO PEAK (hrs)=	6. 25	6. 25	6. 25
RUNOFF VOLUME (mm) =	65.00	19. 52	35.44
TOTAL RAINFALL (mm) =	66.00	66.00	66.00
RUNOFF COEFFICIENT =	0. 98	0. 30	0.54

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0022)	Area	(ha)-	U 83	Curve Number (CN) = 75.0
ID= 1 DT= 5.0 min	Ιa	(mm)=	10.00	# of Linear Res. (N) = 3.00
	U.H.	Tp(hrs)=	0.19	

		TR	ANSFORME	D HYETOGR	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.98	6.250	87. 12	9. 33	2. 31
0. 167	0.00	3. 250	1.98	6.333	11.88	9. 42	2. 31
0. 250	0.00	3. 333	2.64	6.417	11.88	9. 50	2. 31
0.333	1.65	3. 417	2.64	6.500	11.88	9. 58	2. 31
0.417	1.65	3. 500	2.64	6.583	11.88	9. 67	2. 31
0.500	1.65	3. 583	2.64	6.667	11.88	9. 75	2. 31

0. 583	1.65	3. 667	2.64	6.750	11. 88	9, 83	2. 31
0.667	1.65	3. 750	2.64	6.833	5. 28	9. 92	2. 31
0.750	1.65	3. 833	2.64	6.917	5. 28	10.00	2, 31
0.833	1.65	3. 917	2.64	7.000	5. 28	10.08	2. 31
0. 917	1.65	4. 000	2.64	7.083	5. 28	10. 17	2. 31
1.000	1.65	4. 083	2.64	7.167	5. 28	10. 25	2. 31
1.083	1.65	4. 167	2.64	7.250	5. 28	10. 33	1. 32
1. 167	1.65	4. 250	2.64	7.333	3. 96	10. 42	1. 32
1. 250	1.65	4. 333	3.96	7.417	3. 96	10.50	1. 32
1. 333	1.65	4. 417	3.96	7.500	3. 96	10. 58	1. 32
1. 417	1.65	4. 500	3.96	7.583	3. 96	10. 67	1. 32
1.500	1.65	4. 583	3.96	7.667	3. 96	10. 75	1. 32
1.583	1.65	4. 667	3.96	7.750	3. 96	10. 83	1. 32
1.667	1.65	4. 750	3.96	7.833	3. 96	10. 92	1. 32
1.750	1.65	4. 833	5.28	7.917	3. 96	11.00	1. 32
1.833	1.65	4. 917	5.28	8.000	3. 96	11. 08	1. 32
1. 917	1.65	5.000	5.28	8.083	3. 96	11. 17	1. 32
2.000	1.65	5. 083	5.28	8.167	3. 96	11. 25	1. 32
2.083	1.65	5. 167	5.28	8.250	3. 96	11. 33	1. 32
2. 167	1.65	5. 250	5.28	8.333	2. 31	11. 42	1. 32
2. 250	1.65	5. 333	7.92	8.417	2. 31	11. 50	1. 32
2. 333	1.98	5. 417	7.92	8.500	2. 31	11. 58	1. 32
2.417	1.98	5. 500	7.92	8.583	2. 31	11. 67	1. 32
2.500	1.98	5. 583	7.92	8.667	2. 31	11. 75	1. 32
2. 583	1.98	5. 667	7.92	8.750	2. 31	11.83	1. 32
2.667	1.98	5. 750	7.92	8.833	2. 31	11. 92	1. 32
2.750	1.98	5. 833	31.68	8.917	2. 31	12.00	1. 32
2.833	1.98	5. 917	31.68	9.000	2. 31	12.08	1. 32
2. 917	1.98	6.000	31.68	9.083	2. 31	12. 17	1. 32
3.000	1.98	6. 083	87.12	9.167	2. 31	12. 25	1. 32
3.083	1.98	6. 167	87.12	9.250	2. 31		

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.056 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 22.242
TOTAL RAINFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.337

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

| CALIB | NASHYD (0030) | Area (ha)= 1.56 Curve Number (CN)= 73.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

- TRANSFORMED HYETOGRAPH -RAIN | TIME mm/hr | hrs 87.12 | 9.33 TIME RAIN | TIME RAIN hrs 6. 250 6. 333 6. 417 6. 500 6. 583 hrs 0. 083 0. 167 mm/hr 1.98 1.98 hrs 9. 33 9. 42 9. 50 mm/hr 0.00 hrs 3. 167 mm/hr 2.31 0.00 3. 250 11.88 2.31 0 250 0.00 3 333 2.64 11 88 2 31 0. 333 2.64 0.417 1.65 3.500 2.64 11.88 9.67 2.31 2.64 6.667 6.750 9. 75 9. 83 0.500 1.65 3.583 11 88 2 31 0. 583 1.65 3. 667 11.88 2. 31 0.667 1.65 3.750 2.64 6.833 5. 28 9. 92 2. 31 0. 750 0. 833 1.65 3. 833 3. 917 2.64 6. 917 7. 000 5. 28 5. 28 10. 00 10. 08 2. 31 2. 31 1.65 2. 64 2. 64 2. 64 1. 65 1. 65 0 917 4 000 7.083 5. 28 10 17 2 31 7. 167 7. 250 10. 25 10. 33 . 000 4. 083 5. 28 1.083 4. 167 5. 28 1.65 1.32 1.65 1.65 4. 250 4. 333 2. 64 3. 96 7.333 7.417 10. 42 10. 50 1. 167 3.96 1 32 3. 96 3. 96 3. 96 3. 96 7.500 1.333 1.65 4.417 3.96 10.58 1.32 7.583 7.667 7.750 1. 65 1. 65 4. 500 4. 583 3. 96 3. 96 417 . 32 1. 583 3.96 1.65 4.667 10.83 1.32 1.65 1.65 4. 750 4. 833 3. 96 5. 28 7.833 7.917 3. 96 3. 96 10. 92 11. 00 1. 32 1. 32 1.833 1.65 4.917 5.28 8.000 3.96 11.08 1.32 1. 917 2. 000 1.65 1.65 5. 000 5. 083 5. 28 5. 28 8. 083 8. 167 3. 96 3. 96 1. 32 1. 32 2 083 1 65 5. 167 5 28 8.250 3 96 11.33 1 32 5. 250 5. 333 5. 28 7. 92 8. 333 8. 417 2. 31 2. 31 11. 42 11. 50 1.65 1.65 1. 32 1. 32 2. 250 7. 92 7. 92 7. 92 2 333 1.98 5 417 8.500 8.583 2. 31 1 32 417 2.500 1.98 5. 583 8.667 2.31 11.75 1.32 2. 583 2. 667 1. 98 1. 98 5. 667 5. 750 7. 92 7. 92 8. 750 8. 833 2. 31 32 8.917 2.750 1.98 5.833 31.68 2.31 12.00 1.32 2. 833 2. 917 1. 98 1. 98 5. 917 6. 000 31.68 31.68 9.000 9.083 2. 31 12. 08 12. 17 1. 32 1. 32 87. 12 | 9. 167 87. 12 | 9. 250 1. 98 | 6. 083 1. 98 | 6. 167 3.000 2.31 12. 25 1.32

Unit Hyd Qpeak (cms) = 0.271

TRANSFORMED HYETOGRAPH							
TIME	RAIN	TIME	RAIN		RAIN		RAIN
hrs	mm/hr	hrs			mm/hr		mm/hr
0.083	0.00			6.250		9. 33	2. 31
0. 167	0.00	3. 250	1.98	6.333	11.88	9. 42	2. 31
0. 250	0.00			6.417			2. 31
0. 333	1.65	3. 417		6.500	11.88	9. 58	2. 31
0.417	1.65	3. 500	2.64	6.583	11.88	9. 67	2. 31
0.500		3. 583	2.64	6.667	11.88		2. 31
0. 583		3. 667		6.750	11.88	9. 83	2. 31
0.667	1.65	3. 750	2.64	6.833	5. 28	9. 92	2. 31
0.750	1.65	3. 833	2.64	6.917			
0.833		3. 917	2.64	7.000			
0. 917		4.000	2.64	7.083			2. 31
1.000		4. 083	2.64	7.167	5. 28		2. 31
1.083		4. 167	2.64		5. 28		1. 32
1. 167		4. 250	2.64	7.333	3. 96		1. 32
1. 250			3.96	7.417			
1. 333			3.96		3. 96		
1. 417			3.96	7.583			
1.500		4. 583	3.96	7.667	3. 96		1. 32
1. 583		4. 667	3.96	7.750	3. 96		1. 32
1. 667		4. 750	3.96		3. 96		1. 32
1. 750		4. 833	5.28				
1.833		4. 917					
1. 917		5.000	5.28				
2.000		5. 083	5.28	8.167	3. 96		
2.083		5. 167	5.28	8.250	3. 96		1. 32
2. 167	1.65	5. 250	5.28	8.333	2. 31		1. 32
2. 250	1.65	5. 333	7.92	8.417	2. 31		1. 32
2. 333			7.92		2. 31		
2. 417			7.92	8.583	2. 31		
2. 500	1.98		7.92	8.667	2. 31	11. 75	1. 32
2. 583	1.98	5. 667	7.92	8.750	2. 31	11. 83	1. 32
2. 667	1.98	5. 750	7.92	8.833	2. 31	11. 92	1. 32
2. 750		5. 833	31.68		2. 31		1. 32
2. 833		5. 917	31.68		2. 31		
2. 917		6.000	31.68				
3.000			87.12			12. 25	1. 32
3. 083	1. 98	6. 167	87.12	9.250	2. 31		

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms)= 0.027 (1)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 22.250
TOTAL RAI NFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.337

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

PEAK FLOW (cms)= 0.090 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 20.887
TOTAL RAI NFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.316

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

TRANSFORMED HYFTOGRAPH							
TIME	RAIN	TIME	ANSFURMEI RAIN	I' TIME	RAIN	l TIME	RAIN
hrs	mm/hr	hrs	mm/hr	l' hrs	mm/hr	hrs	mm/hr
0. 083	0.00	3. 167	1. 98	6.250	87. 12	9.33	2. 31
0. 167	0.00	3. 250	1. 98	6.333	11. 88	9. 33	2. 31
0. 167	0.00	3. 333	2.64	6.417	11. 88	9.42	2. 31
0. 333	1.65	3. 417	2.64	6.500	11. 88	9.58	2. 31
0. 333	1.65	3. 500	2.64	6.583	11. 88	9.67	2. 31
0. 500	1.65	3. 583	2.64	6.667	11. 88	9.75	2. 31
0. 583	1.65	3. 667	2.64	6.750	11. 88	9.83	2. 31
0. 667	1.65	3. 750	2.64	6.833	5. 28	9. 92	2. 31
0. 750	1.65	3. 833	2.64	6.917	5. 28	10.00	2. 31
0. 833	1.65	3. 917	2.64	7.000	5. 28	10.08	2. 31
0. 917	1.65	4.000	2.64	7.083	5. 28	10.17	2. 31
1. 000	1.65	4. 083	2.64	7. 167	5. 28	10. 25	2. 31
1. 083	1.65	4, 167	2.64	7. 250	5. 28	10. 33	1. 32
1. 167	1.65	4, 250	2.64	7.333	3, 96	10, 42	1. 32
1. 250	1.65	4. 333	3.96	7.417	3. 96	10.50	1. 32
1. 333	1.65	4. 417	3.96	7.500	3.96	10. 58	1. 32
1. 417	1.65	4. 500	3.96	7.583	3.96	10. 67	1. 32
1.500	1.65	4. 583	3.96	7.667	3. 96	10. 75	1. 32
1. 583	1.65	4. 667	3.96	7.750	3. 96	10. 83	1. 32
1. 667	1.65	4. 750	3.96	7.833	3.96	10. 92	1. 32
1. 750	1.65	4. 833	5.28	7.917	3.96	11.00	1. 32
1.833	1.65	4. 917	5.28	8.000	3.96	11.08	1. 32
1. 917	1.65	5.000	5.28	8.083	3. 96	11. 17	1. 32
2.000	1.65	5. 083	5.28	8.167	3. 96	11. 25	1. 32
2. 083	1.65	5. 167	5.28	8.250	3. 96	11. 33	1. 32
2. 167	1.65	5. 250	5.28	8.333	2. 31	11. 42	1. 32
2. 250	1.65	5. 333	7.92	8.417	2. 31	11.50	1. 32
2. 333	1.98	5. 417	7.92	8.500	2. 31	11. 58	1. 32
2. 417	1.98	5. 500	7.92	8.583	2. 31	11. 67	1. 32
2. 500	1.98	5. 583	7. 92	8.667	2. 31	11. 75	1. 32
2. 583	1.98	5. 667	7.92	8.750	2. 31	11.83	1. 32

```
5. 750
5. 833
5. 917
6. 000
6. 083
                           1. 98 |
1. 98 |
1. 98 |
1. 98 |
                                                                                                                                  2. 31
2. 31
2. 31
2. 31
2. 667
2. 750
                                                                                                                                                                                        1. 32
1. 32
1. 32
1. 32
                                                                               7 92
                                                                                                       8 833
                                                                           7. 92 | 8. 833
31. 68 | 8. 917
31. 68 | 9. 000
31. 68 | 9. 083
87. 12 | 9. 167
87. 12 | 9. 250
                                                                                                                                                           12. 00
12. 08
12. 17
2. 833
2. 917
3.083
                          1. 98 | 6. 167
```

Unit Hyd Opeak (cms) = 0.177

PEAK FLOW (cms) = 0.049 (1)
TIME TO PEAK (hrs) = 6.250
RUNOFF VOLUME (mm) = 20.757
TOTAL RAINFALL (mm) = 66.000
RUNOFF COEFFICI ENT = 0.314

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| STANDHYD (0005)| |ID= 1 DT= 5.0 min | Area (ha)= 5.32 Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 2. 66 1. 00 1. 00 2.66 Dep. Storage Average Slope (mm) = (%) = (m) = 5. 00 188. 33 40.00 Lenath Manni ngs n 0. 250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME) HYETOGR	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAI N
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.98	6.250	87. 12	9. 33	2. 31
0. 167	0.00	3. 250	1.98	6.333	11.88	9. 42	2. 31
0. 250	0.00	3. 333	2.64	6.417	11.88	9. 50	2. 31
0.333	1.65	3.417	2.64	6.500	11.88	9. 58	2. 31
0.417	1.65	3. 500	2.64	6.583	11.88	9. 67	2. 31
0.500	1.65	3. 583	2.64	6.667	11.88	9. 75	2. 31
0.583	1.65	3.667	2.64	6.750	11.88	9. 83	2. 31
0.667	1.65	3. 750	2.64	6.833	5. 28	9. 92	2. 31
0.750	1.65	3. 833	2.64	6.917	5. 28	10.00	2. 31
0.833	1.65	3. 917	2.64	7.000	5. 28	10.08	2. 31
0. 917	1.65	4.000	2.64	7.083	5. 28	10. 17	2. 31
1.000	1.65	4. 083	2.64	7.167	5. 28	10. 25	2. 31
1.083	1.65	4. 167	2.64	7.250	5. 28	10. 33	1. 32
1. 167	1.65	4. 250	2.64	7.333	3. 96	10. 42	1. 32
1. 250	1.65	4. 333	3.96	7.417	3. 96	10.50	1. 32
1. 333	1.65	i 4. 417	3.96	7.500	3. 96	10.58	1. 32

Manni ngs n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYFTOGRAPH TIME RAIN TIME RAIN mm/hr TIME RAIN | TIME RAIN mm/hr mm/hr hrs mm/hr hrs hrs 9. 33 9. 42 9. 50 1. 98 1. 98 2. 64 6. 250 6. 333 6. 417 0.00 0.00 0.083 3. 167 87. 12 2. 31 2. 31 0. 167 0. 250 3. 250 3. 333 0.00 11.88 2.31 2. 64 2. 64 2. 64 2. 64 0. 333 0. 417 6.500 6.583 3.417 11.88 9.58 2.31 3. 500 0.500 1.65 3.583 6.667 11.88 2.31 0.583 1 65 3.667 6.750 11 88 2 31 0.750 1.65 3.833 2.64 6.917 5. 28 10.00 2.31 2.64 0.833 1.65 3 917 7 000 5 28 10.08 2 31 1.65 7.083 1. 000 1.65 4.083 2.64 7.167 5. 28 10. 25 2.31 1. 083 1. 167 4. 167 4. 250 2.64 7. 250 7. 333 1.65 1. 65 1. 65 4 333 3 96 7 417 3 96 1 32 . 333 . 417 3. 96 3. 96 7.500 7.583 4.500 3.96 10.67 1.32 1.65 7.667 7.750 4. 583 1.667 1.65 4.750 3.96 7.833 3.96 10.92 1.32 5. 28 5. 28 7. 917 . 917 5.28 8.083 11, 17 1.65 5.000 3.96 1.32 5. 083 5. 167 8. 167 8. 250 2.167 1.65 5. 250 5.28 8.333 2.31 1.32 2. 250 2. 333 2 417 1 98 5 500 7 92 8 583 2 31 11. 67 11. 75 1 32 5. 583 5. 667 8. 667 8. 750 2. 500 2. 583 1. 98 1. 98 1. 32 1. 32 2 667 1. 98 1. 98 5, 750 7 92 8.833 1 32 8. 917 9. 000 2.833 1.98 5. 917 31.68 2. 31 12.08 1.32 31.68 | 9.083 87.12 | 9.167 87.12 | 9.250 2 917 1. 98 1. 98 6. 000 6. 083 3.083 6. 167

Max. Eff. Inten. (mm/hr)= over (mi n)
Storage Coeff. (mi n)=
Unit Hyd. Tpeak (mi n)=
Unit Hyd. peak (cms)= 5. 00 3. 46 (ii) 5. 00 15.00 13.82 (ii) 15.00 0. 26 0.08

1, 583 1, 65 1, 667 1, 65 1, 750 1, 65 1, 833 1, 65 1, 917 1, 65 2, 000 1, 65 2, 083 1, 65 2, 167 1, 65 2, 250 1, 65 2, 333 1, 98 2, 417 1, 98 2, 500 1, 98 2, 583 1, 98	4.750 3.96 4.833 5.28 4.917 5.28 5.000 5.28 5.083 5.28 5.167 5.28 5.250 5.28 5.333 7.92 5.417 7.92 5.500 7.92 5.583 7.92 5.667 7.92	7. 750 7. 833 7. 917 8. 000 8. 083 8. 167 8. 250 8. 333 8. 417 8. 500 8. 583 8. 667 8. 750	3. 96 10. 83 1. 32 3. 96 10. 92 1. 32 3. 96 11. 00 1. 32 3. 96 11. 00 1. 32 3. 96 11. 05 1. 32 3. 96 11. 25 1. 32 3. 96 11. 25 1. 32 2. 31 11. 42 1. 32 2. 31 11. 50 1. 32 2. 31 11. 58 1. 32 2. 31 11. 67 1. 32 2. 31 11. 75 1. 32 2. 31 11. 83 1. 32 2. 31 11. 92 2. 31 11. 92
2. 833 1. 98	5. 917 31. 68	9.000	2. 31 12. 00
3. 000 1. 98 3. 083 1. 98	6. 083 87. 12 6. 167 87. 12	9. 167	2. 31 12. 17
Max.Eff.Inten.(mm/hr) = over (min) Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) =	87. 12 15. 00 15. 71 (ii) 15. 00 0. 07	38. 29 30. 00 28. 47 (ii) 30. 00 0. 04	
		0. 11	*TOTALS* 0.355 (iii)
PEAK FLOW (cms)= TIME TO PEAK (hrs)=	6. 33	6. 58	6.33
RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) =	65. 00	19. 52 66. 00	35. 43
TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT =	66. 00 0. 98	0. 30	66.00 0.54
(i) CN PROCEDURE SELECTI CN* = 59.0 Ia (ii) TIME STEP (DT) SHOUL THAN THE STORAGE COI (iii) PEAK FLOW DOES NOT	= Dep. Storage LD BE SMALLER OF EFFICIENT.	(Above) R EQUAL	

CALIB STANDHYD (0028) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	3. 43 50. 00	Dir. Conn. (%)=	35. 00
Surface Area	(ha)=	I MPERVI 1. 7		PERVIOUS (i)	
Dep. Storage Average Slope	(mm) = (%) = (m) =	1. 0 1. 0 151. 2	0 0	5. 00 2. 00 40. 00	
Length	(111) =	151.2	_	40.00	

	cms)= hrs)=	0. 29 6. 25	0. 11 6. 33	0.384 (iii) 6.25
RUNOFF VOLUME	(mm) =	65.00	19. 52	35.43
TOTAL RAINFALL	(mm) =	66.00	66.00	66.00
RUNOFF COEFFICIEN	T =	0. 98	0. 30	0.54

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

RESERVOIR(0029) | IN= 2---> OUT= 1 | DT= 5.0 min | OVERFLOW IS OFF OUTFLOW STORAGE | OUTFLOW (cms) 0.0000 (ha.m.) (cms) 0.0000 0.0900 (ha.m.) 0.1200 TPFAK OPFAK ARFA (ha) 3. 430 (cms) 0.384 (hrs) 6.25 7.00 INFLOW: ID= 2 (0028) OUTFLOW: ID= 1 (0029) 35. 43 0. 384 3. 430 PEAK FLOW REDUCTION [Qout/Qin] (%) = 13. 12
TIME SHIFT OF PEAK FLOW (min) = 45. 00
MAXIMUM STORAGE USED (ha.m.) = 0.0672

ADD HYD (0007) 1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.
ID1= 1 (0023): + ID2= 2 (0029):	(ha) 0.41 3.43	(cms) 0.027 0.050		(mm) 22. 25 35. 34
ID = 3 (0007):		0. 067	6. 42	33. 94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

	ADD	H١	/D	(000	07)				
ĺ	3	+	2	=	1	İ	AREA	QPEAK	TPEAK	R.V.
٠.							(ha)	(cms)	(hrs)	(mm)
			ID:	1=	3 (0007):	3.84	0.067	6.42	33. 94
		+	ID:	2=	2 (0030):	1.56	0.090	6.33	20.89
			==:	===	===:					

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0007):	6.05	0. 200	6. 33	29. 16
+ ID2= 2 (0005):	5.32	0. 355	6. 33	35. 43
ID = 1 (0007):	11.37	0. 555	6.33	32. 09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008) IN= 2> OUT= 1	OVERFLOW	IS OFF			
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE	
51		(ha.m.)	(cms)		
		0.0000	0.4220		
	0.0410	0.0120	0.4630	0.1758	
	0.0580	0.0253	0.6510	0.1989	
	0.0710	0.0399	0.7480	0. 2228	
	0. 0830	0.0559	0.8280	0.2476	
	0.0920	0.0732	0.8990	0.2733	
	0. 2500	0.0918	0.9640	0.2998	
	0. 3200	0.1116	1.0240	0.3263	
	0. 3750	0.1321	1.0800	0.3528	
	AR	EA QPEAK	TPEAK	R. V.	
	(h	a) (cms)	(hrs)	(mm)	
INFLOW : ID= 2 (0007) 11.	370 0. 5	55 6.33	32. 09	
OUTFLOW: ID= 1 (0008) 11.	370 0. 20	64 6.92	32. 09	

PEAK	FL0	W	REDU	CTION	[Qout/Qi n] (%)=	47.	53
TIME	SHIFT	0F	PEAK	FLOW	(mi n)=	35.	00
MAXIN	MUM S	TOR	AGE	USED	(ha. m.)=	0.	0958

2. 333 2. 417 2. 500 2. 583 2. 667 2. 750 2. 833 2. 917 3. 000	1. 98 1. 98 1. 98 1. 98 1. 98 1. 98 1. 98 1. 98	5. 417 5. 500 5. 583 5. 667 5. 750 5. 833 5. 917 6. 000	7. 92 7. 92 7. 92 7. 92 7. 92 31. 68 31. 68 31. 68	8.583 8.667 8.750 8.833 8.917 9.000 9.083	2. 31 2. 31 2. 31 2. 31 2. 31 2. 31 2. 31	11. 58 11. 67 11. 75 11. 83 11. 92 12. 00 12. 08 12. 17	1. 32 1. 32 1. 32 1. 32 1. 32 1. 32 1. 32
3. 000 3. 083	1. 98 1. 98	6. 083 6. 167	87. 12 87. 12	9. 167 9. 250	2. 31 2. 31	12. 25	1. 32

Unit Hyd Qpeak (cms) = 0.764

PEAK FLOW (cms)= 0. 278 (1)
TIME TO PEAK (hrs)= 6. 833
RUNOFF VOLUME (mm)= 17. 293
TOTAL RAI NFALL (mm)= 66. 000
RUNOFF COEFFI CI ENT = 0. 262

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0039)	Area	(ha)=	0.83	Curve Number (CN) = 75.0
ID= 1 DT= 5.0 min	Ιa	(mm)=	10.00	# of Linear Res. (N) = 3.00
	U. H. 1	Γp(hrs)=	0.19	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH									
TIME	RAIN	TIME	RAIN	' TIME	RAI N	TIME	RAIN			
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr			
0.083	0.00	3. 167	1.98	6.250	87. 12	9. 33	2. 31			
0. 167	0.00	3. 250	1.98	6.333	11.88	9. 42	2. 31			
0. 250	0.00	3. 333	2.64	6.417	11.88	9. 50	2. 31			
0. 333	1.65	3. 417	2.64	6.500	11.88	9. 58	2. 31			
0. 417	1.65	3. 500	2.64	6.583	11.88	9. 67	2. 31			
0.500	1.65	3. 583	2.64	6.667	11.88	9. 75	2. 31			
0. 583	1.65	3.667	2.64	6.750	11. 88	9. 83	2. 31			
0.667	1.65	3. 750	2.64	6.833	5. 28	9. 92	2. 31			
0.750	1.65	3.833	2.64	6.917	5. 28	10.00	2. 31			
0.833	1.65	3. 917	2.64	7.000	5. 28	10.08	2. 31			
0. 917	1.65	4.000	2.64	7.083	5. 28	10. 17	2. 31			
1.000	1.65	4. 083	2.64	7.167	5. 28	10. 25	2. 31			
1.083	1.65	4. 167	2.64	7.250	5. 28	10. 33	1. 32			
1. 167	1.65	4. 250	2.64	7.333	3. 96	10. 42	1. 32			
1. 250	1.65	4. 333	3.96	7.417	3. 96	10.50	1. 32			
1. 333	1.65	4. 417	3.96	7.500	3. 96	10. 58	1. 32			
1. 417	1.65	4. 500	3.96	7.583	3. 96	10. 67	1. 32			
1.500	1.65	4. 583	3.96	7.667	3. 96	10. 75	1. 32			

ADD HYD (0016)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0022):	0.83	0.056	6.33	22. 24
+ ID2= 2 (0008):	11.37	0. 264	6.92	32.09
	=======		=======	=======
ID = 3 (0016):	12.20	0. 279	6.83	31. 42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALI B			
NASHYD (0019)	Area (ha)=	12. 20	Curve Number (CN) = 64.0
ID= 1 DT= 5.0 min	la (mm)=	6. 90	# of Linear Res. (N) = 3.00
	U.H. Tp(hrs)=	0.61	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

				HYETOGR			
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	
hrs	mm/hr	hrs		' hrs			
0.083	0.00	3. 167		6.250	87. 12		2. 31
0. 167	0.00	3. 250	1.98	6.333	11. 88	9. 42	2. 31
0. 250	0.00	3. 333	2.64	6.417	11. 88		2. 31
0. 333	1.65	3. 417	2.64	6.500	11. 88	9. 58	2. 31
0. 417	1.65	3.500	2.64	6.583	11. 88	9. 67	2. 31
0.500	1.65	3. 583	2.64	6.667	11. 88	9. 75	2. 31
0. 583	1.65	3. 667	2.64	6.750	11. 88	9. 83	2. 31
0.667	1.65	3. 750	2.64	6.833	5. 28	9. 92	2. 31
0.750	1.65	3.833	2.64	6.917	5. 28	10.00	2. 31
0.833	1.65	3. 917	2.64	7.000	5. 28	10.08	2. 31
0. 917	1.65	4.000	2.64	7.083	5. 28	10. 17	2. 31
1.000	1.65	4. 083	2.64	7.167	5. 28	10. 25	2. 31
1.083	1.65	4. 167	2.64	7.250	5. 28	10. 33	1. 32
1. 167	1.65	4. 250	2.64	7.333	3. 96	10. 42	1. 32
1. 250	1.65	4. 333	3.96	7.417	3. 96	10.50	1. 32
1. 333	1.65	4. 417	3.96	7.500	3. 96	10. 58	1. 32
1. 417	1.65	4. 500	3.96	7.583	3. 96	10. 67	1. 32
1.500	1.65	4. 583	3.96	7.667	3. 96	10. 75	1. 32
1. 583	1.65	4. 667	3.96	7.750	3. 96	10. 83	1. 32
1. 667	1.65	4. 750	3.96	7.833	3. 96	10. 92	1. 32
1. 750	1.65	4. 833	5.28	7.917	3. 96	11.00	1. 32
1.833	1.65	4. 917	5.28	8.000	3. 96	11. 08	1. 32
1. 917	1.65	5.000	5.28	8.083	3. 96	11. 17	1. 32
2.000	1.65	5. 083	5.28	8.167	3. 96	11. 25	1. 32
2.083	1.65	5. 167	5.28	8.250	3. 96	11. 33	1. 32
2. 167	1.65	5. 250	5.28	8.333	2. 31	11. 42	1. 32
2. 250	1.65	5. 333	7.92	8.417	2. 31	11. 50	1. 32

1. 583	1.65	4. 667	3.96	7.750	3. 96	10.83	1. 32
1. 667	1.65	4. 750	3.96	7.833	3. 96	10. 92	1. 32
1. 750	1.65	4.833	5.28	7.917	3. 96	11.00	1. 32
1.833	1.65	4. 917	5.28	8.000	3. 96	11.08	1. 32
1. 917	1.65	5.000	5.28	8.083	3. 96	11. 17	1. 32
2.000	1.65	5.083	5.28	8.167	3.96	11. 25	1. 32
2.083	1.65	5. 167	5.28	8.250	3.96	11. 33	1. 32
2. 167	1.65	5. 250	5.28	8.333	2. 31	11. 42	1. 32
2. 250	1.65	5. 333	7.92	8.417	2. 31	11. 50	1. 32
2. 333	1.98	5. 417	7.92	8.500	2. 31	11. 58	1. 32
2. 417	1.98	5.500	7.92	8.583	2. 31	11. 67	1. 32
2.500	1.98	5. 583	7.92	8.667	2. 31	11. 75	1. 32
2. 583	1.98	5. 667	7.92	8.750	2. 31	11. 83	1. 32
2. 667	1.98	5. 750	7.92	8.833	2. 31	11. 92	1. 32
2.750	1.98	5.833	31.68	8.917	2. 31	12.00	1. 32
2.833	1.98	5. 917	31.68	9.000	2. 31	12.08	1. 32
2. 917	1.98	6.000	31.68	9.083	2. 31	12. 17	1. 32
3.000	1.98	6.083	87.12	9.167	2. 31	12. 25	1. 32
3. 083	1.98	6. 167	87.12	9.250	2. 31	İ	

Unit Hyd Opeak (cms)= 0.167

PEAK FLOW (cms)= 0.056 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 22.242
TOTAL RAI NFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.337

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0033)	Area (ha)=	0.41	Curve Number (CN) = 75.0
ID= 1 DT= 5.0 min	la (mm)=	10.00	# of Linear Res. (N) = 3.00
<u> </u>	U.H. Tp(hrs)=	0.20	

NOTE:	RAINFALL	WAS	TRANSFORMED	T0	5.0 MIN.	TIME STEP.

		TR	ANSFORME	HYETOGR	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.98	6.250	87. 12	9. 33	2. 31
0. 167	0.00	3. 250	1.98	6.333	11.88	9. 42	2. 31
0. 250	0.00	3. 333	2.64	6.417	11.88	9. 50	2. 31
0.333	1.65	3. 417	2.64	6.500	11.88	9. 58	2. 31
0.417	1.65	3. 500	2.64	6.583	11.88	9. 67	2. 31
0.500	1.65	3. 583	2.64	6.667	11.88	9. 75	2. 31
0.583	1.65	3. 667	2.64	6.750	11.88	9. 83	2. 31
0.667	1.65	3. 750	2.64	6.833	5. 28	9. 92	2. 31
0.750	1.65	3. 833	2.64	6.917	5. 28	10.00	2. 31

Unit Hyd Opeak (cms) = 0.078

PEAK FLOW (cms)= 0.027 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 22.250
TOTAL RAINFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.337

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | STANDHYD (0036)| |ID= 1 DT= 5.0 min | Area (ha)= 5.32Total Imp(%)= 50.00 Dir. Conn.(%)= 35.001MPERVIOUS 2. 66 1. 00 1. 00 188. 33 PERVI OUS (i) 2.66 5.00 Surface Area Dep. Storage Average Slope Length (mm) = (%) = (m) = 40.00 Manni ngs n 0.130 0.250

RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = 0.98 0.30 0.54

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 59.0 | Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | CALIB | NASHYD (0037) | Area (ha)= 0.65 Curve Number (CN)= 73.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.14

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME	HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.98	6.250	87. 12	9. 33	2. 31
0. 167	0.00	3. 250	1.98	6.333	11. 88	9. 42	2. 31
0. 250	0.00	3. 333	2.64	6.417	11. 88	9. 50	2. 31
0.333	1.65	3. 417	2.64	6.500	11. 88	9. 58	2. 31
0.417	1.65	3. 500	2.64	6.583	11. 88	9. 67	2. 31
0.500	1.65	3. 583	2.64	6.667	11. 88		2. 31
0. 583	1.65	3.667		6.750	11. 88	9. 83	2. 31
0.667	1.65	3. 750	2.64		5. 28	9. 92	2. 31
0. 750	1.65	3.833		6.917		10.00	2. 31
0.833	1.65	3. 917	2.64	7.000	5. 28	10.08	2. 31
0. 917	1.65	4.000	2.64	7.083	5. 28	10. 17	2. 31
1.000	1.65	4. 083	2.64	7.167		10. 25	2. 31
1. 083	1.65		2.64	7.250	5. 28	10. 33	1. 32
1. 167	1.65	4. 250	2.64	7.333	3. 96	10. 42	1. 32
1. 250	1.65	4. 333		7.417		10. 50	1. 32
1. 333	1.65	4. 417	3.96	7.500	3. 96	10. 58	1. 32
1. 417	1.65	4.500	3.96	7.583		10. 67	1. 32
1.500	1.65	4. 583	3.96	7.667		10. 75	1. 32
1. 583	1.65	4. 667	3.96	7.750	3. 96	10. 83	1. 32
1. 667	1.65	4. 750	3.96	7.833		10. 92	1. 32
1. 750	1.65	4. 833	5. 28	7.917		11.00	1. 32
1.833	1.65	4. 917	5. 28	8.000	3. 96	11. 08	1. 32
1. 917	1.65	5.000	5. 28	8.083		11. 17	1. 32
2.000	1.65	5. 083	5. 28	8.167	3. 96	11. 25	1. 32
2.083	1.65	5. 167	5.28	8.250	3. 96	11. 33	1. 32
2. 167	1.65		5. 28	8.333		11. 42	1. 32
2. 250	1.65			8.417		11. 50	1. 32
2. 333	1.98	5. 417	7.92	8.500	2. 31	11. 58	1. 32

		TR/	ANSFORME	HYETOGR	APH		
TIME	RAIN	TIME		' TIME		TIME	
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0. 083	0.00	3. 167		6.250		9. 33	2. 31
0. 167		3. 250		6.333			2. 31
0. 250		3. 333		6.417			2. 31
0. 333	1.65	3. 417	2.64	6.500	11. 88		2. 31
0. 417	1.65	3. 500	2.64	6.583	11.88		2. 31
0.500	1.65	3. 583	2.64	6.667	11. 88	9. 75	2. 31
0. 583	1.65	3. 667	2.64	6.750	11. 88	9. 83	2. 31
0. 667		3. 750	2.64		5. 28		
0. 750	1.65	3.833	2.64	6.917	5. 28		2. 31
0.833	1.65		2.64	7.000	5. 28		2. 31
0. 917		4.000	2.64	7.083	5. 28		2. 31
1.000	1.65		2.64	7.167	5. 28		2. 31
1. 083	1.65		2.64	7.250	5. 28		
1. 167		4. 250	2.64	7.333	3. 96		1. 32
1. 250	1.65		3.96	7.417	3. 96		1. 32
1. 333	1.65		3.96	7.500	3. 96		1. 32
1. 417		4.500	3.96	7.583	3. 96		1. 32
1. 500		4. 583	3.96	7.667			1. 32
1. 000		4. 667		7.750			
1. 667		4. 750	3.96	7.833	3. 96		1. 32
1. 750	1.65		5.28	7.917	3. 96		1. 32
1. 833		4. 917	5.28	8.000	3. 96		1. 32
1. 917	1.65	5. 000	5.28	8.083	3. 96		1. 32
2. 000		5. 083	5.28	8.167			1. 32
2. 083		5. 167	5.28	8.250			
2. 167	1.65	5. 250	5.28	8.333	2. 31		1. 32
2. 250	1.65	5. 333	7.92	8.417	2. 31		1. 32
2. 333		5. 417	7.92	8.500	2. 31	11. 58	1. 32
2. 417		5. 500	7.92	8.583			1. 32
2. 500	1.98		7.92	8.667			
2. 583	1.98		7.92	8.750	2. 31	11. 83	1. 32
2. 667	1.98	5. 750	7.92	8.833	2. 31	11. 92	1. 32
2. 750	1.98		31.68	8.917	2. 31	12.00	1. 32
2. 833		5. 917		9.000	2. 31	12.08	1. 32
2. 917			31.68	9.083		12. 17	
3. 000			87.12			12. 25	1. 32
3. 083	1.98	6. 16/	87.12	9.250	2. 31		

Max. Eff. Inten. (mm/hr)= 87. 12 38, 29 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 15. 00 15. 71 (ii) 30. 00 28. 47 (ii) 15.00 30.00 0. 07 0. 04

TOTALS 0. 355 (iii) 6. 33 PEAK FLOW (cms)= (hrs)= 0. 11 0. 28 TIME TO PEAK

> 1. 98 | 5. 500 1. 98 | 5. 583 1. 98 | 5. 667 1. 98 | 5. 750 1. 98 | 5. 917 1. 98 | 6. 000 1. 98 | 6. 083 1. 98 | 6. 167 11. 67 11. 75 11. 83 11. 92 12. 00 7.92 7.92 7.92 7.92 | 8.583 | 8.667 | 8.750 | 8.833 2. 31 2. 31 2. 31 2. 31 2 417 1. 32 1. 32 1. 32 1. 32 1. 32 2. 500 2. 667 2. 750 7. 92 | 8. 833 31. 68 | 8. 917 31. 68 | 9. 000 31. 68 | 9. 083 87. 12 | 9. 167 87. 12 | 9. 250 2. 31 2. 31 2. 31 12. 08 12. 17 12. 25 1. 32 1. 32 1. 32 2.833 2 917 2. 31 3.083

Unit Hyd Qpeak (cms) = 0.177

| PEAK FLOW | Cms | = | 0.049 | (1) | TIME TO PEAK | (hrs | = | 6.250 | RUNOFF VOLUME | (mm) = | 20.757 | TOTAL RAINFALL | (mm) = | 66.000 | RUNOFF COEFFICIENT | = | 0.314 |

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0038) Area (ha)= 1.56 Curve Number (CN)= 73.0 I a (mm)= 10.00 # of Linear Res. (N)= 3.00 U.H. Tp(hrs)= 0.22 |ID= 1 DT= 5.0 min |

		TRA	ANSFORME	D HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	1.98	6.250	87. 12	9. 33	2. 31
0. 167	0.00	3. 250	1.98	6.333	11. 88	9. 42	2. 31
0. 250	0.00	3. 333	2.64	6.417	11. 88	9. 50	2. 31
0.333	1.65	3. 417	2.64	6.500	11. 88	9. 58	2. 31
0.417	1.65	3. 500	2.64	6.583	11. 88	9. 67	2. 31
0.500	1.65	3. 583	2.64	6.667	11. 88	9. 75	2. 31
0. 583	1.65	3. 667	2.64	6.750	11. 88	9. 83	2. 31
0.667	1.65	3. 750	2.64	6.833	5. 28	9. 92	2. 31
0.750	1.65	3.833	2.64	6.917	5. 28	10.00	2. 31
0.833	1.65	3. 917	2.64	7.000	5. 28	10.08	2. 31
0. 917	1.65	4.000	2.64	7.083	5. 28	10. 17	2. 31
1.000	1.65	4. 083	2.64	7.167	5. 28	10. 25	2. 31
1.083	1.65	4. 167	2.64	7.250	5. 28	10. 33	1. 32
1. 167	1.65	4. 250	2.64	7.333	3. 96	10. 42	1. 32
1. 250	1.65	4. 333	3.96	7.417	3. 96	10.50	1. 32
1. 333	1.65	4.417	3.96	7.500	3. 96	10. 58	1. 32
1. 417	1.65	4. 500	3.96	7.583	3. 96	10. 67	1. 32
1.500	1.65	4. 583	3.96	7.667	3. 96	10. 75	1. 32
1. 583	1.65	4. 667	3.96	7.750	3. 96	10.83	1. 32

1. 667	750 3. 96 833 5. 28 917 5. 28 000 5. 28	7. 917 8. 000 8. 083	3. 96 3. 96 3. 96	10. 92 11. 00 11. 08 11. 17	1. 32 1. 32 1. 32 1. 32
2,000 1,65 5 2,083 1,65 5 2,167 1,65 5 2,250 1,65 5 2,233 1,98 5 2,417 1,98 5	083 5. 28 167 5. 28 250 5. 28 333 7. 92	8. 167 8. 250 8. 333 8. 417	3. 96 3. 96 2. 31 2. 31	11. 25 11. 33 11. 42 11. 50	1. 32 1. 32 1. 32 1. 32
2. 333	417 7. 92 500 7. 92 583 7. 92 667 7. 92	8. 500 8. 583 8. 667	2. 31 2. 31 2. 31 2. 31	11. 58 11. 67 11. 75 11. 83	1. 32 1. 32 1. 32 1. 32
2. 583 1. 98 5 2. 667 1. 98 5 2. 750 1. 98 5 2. 833 1. 98 5 2. 917 1. 98 6 3. 000 1. 98 6 3. 083 1. 98 6	750 3.96 833 5.28 917 5.28 000 5.28 167 5.28 250 5.28 250 5.28 250 5.28 333 7.92 417 7.92 500 7.92 583 7.92 667 7.92 833 31.68 900 31.68 000 31.68 87.12	8.833 8.917 9.000 9.083 9.167	2. 31 2. 31 2. 31 2. 31 2. 31	11. 92 12. 00 12. 08 12. 17 12. 25	1. 32 1. 32 1. 32 1. 32 1. 32
unit Hyd Upeak (cms)= 0.2	/ 1	9.230	2.31		
PEAK FLOW (Cms) = 0.0' TIME TO PEAK (hrs) = 6.3: RUNOFF VOLUME (mm) = 20.8: TOTAL RAI NFALL (mm) = 66.0 RUNOFF COEFFICIENT = 0.3	00				
(i) PEAK FLOW DOES NOT INCLU	DE BASEFLOW	IF ANY.			
CALIB STANDHYD (0040) Area (h: ID= 1 DT= 5.0 min	a)= 3.43 6)= 50.00	Dir. Conn	1. (%)= 3	5. 00	
IMP	ERVIOUS P 1. 71 1. 00 1. 00 51. 22 0. 013	ERVIOUS (i 1. 71 5. 00 2. 00 40. 00 0. 250)		
NOTE: RAINFALL WAS TRANS			TIME STE	P.	
TIME RAIN 1	TRANSFORM FIME RAIN hrs mm/hr 167 1.98 250 1.98 333 2.64	TIME	RAIN	TIME	RAIN mm/hr 2. 31 2. 31 2. 31
0.333 1.65 3	417 2.64	6.500	11.88	9. 58	2. 31
(iii) PEAK FLOW DOES NOT INC	LUDE BASEFLO	W IF ANY.			
ADD HYD (0041)	QPEAK	TPEAK	R. V.		

ADD HYD (0041) AREA OPEAK TPEAK R.V. 1 + 2 = 3					
3 + 2 = 1					
(ha) (cms) (hrs) (mm) 1D1= 3 (0041): 5.73 0.382 6.33 34.49 + 1D2= 2 (0037): 0.65 0.049 6.25 20.76 					
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.					
ADD HYD (0041) 1 + 2 = 3					
ID = 3 (0041): 7.94 0.515 6.33 30.69 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.					
ADD HYD (0041) 3 + 2 = 1					

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

0. 417 0. 500 0. 583 0. 667 0. 750 0. 833 0. 917 1. 000 1. 083 1. 167 1. 250 1. 333 1. 417 1. 500 1. 583 1. 667 1. 750 1. 833 1. 917 2. 000 2. 083 2. 167 2. 250 2. 333 2. 147 2. 500 2. 583 2. 417 2. 500 2. 583 2. 667 2. 750 2. 833 2. 917 3. 000 3. 083	1.65 3.5 1.65 3.5 1.65 3.7 1.65 3.9 1.65 4.0 1.65 4.1 1.65 4.2 1.65 4.2 1.65 4.2 1.65 4.4 1.65 4.5 1.65 4.5 1.65 4.5 1.65 4.5 1.65 5.0 1.65 5.5 1.98 5.6 1.98 5.6 1.98 6.0 1.98 6.0 1.98 6.0	83 2.64 650 2.64 650 2.64 33 2.64 33 2.64 600 2.64 667 2.64 667 2.64 667 3.96 667 3.96 667 3.96 667 3.96 667 5.28 83 5.28 83 7.92 667 5.28 83 7.92 667 7.92 667 7.92 667 7.92 667 7.92 667 7.92 667 7.92 668 7.92 668 7.92 669 7.92 660 7.92 66	6. 667	1. 88 1. 88	9. 67 9. 75 9. 83 9. 92 10. 00 10. 08 10. 17 10. 25 10. 33 10. 42 10. 50 10. 57 10. 67 10. 75 10. 83 10. 92 11. 08 11. 17 11. 25 11. 33 11. 42 11. 50 11. 50 12. 50 12. 50 13. 50 14. 50 15. 50 16	2. 31 2. 31 2. 31 2. 31 2. 31 2. 31 2. 31 3. 32 1. 32
	n) 5 n)= 3 n)= 5 s)= 0 s)= 0 s)= 6 m)= 65	. 12 . 00 . 46 (ii) . 00 . 26 . 29 . 25 . 00	38. 29 15. 00 13. 82 (ii) 15. 00 0. 08 0. 11 6. 33 19. 52	6. 35.	384 (iii) 25 43	
TOTAL RAINFALL (m RUNOFF COEFFICIENT ** WARNING: STORAGE CO	= 0	. 00 . 98 ALLER THAN	66. 00 0. 30 TIME STEP!		00 54	
(i) CN PROCEDURE	SELECTED FO	R PERVIOUS	LOSSES:			

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $\text{CN}^* = 59.0$ la = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

+ ID2= 2 (00	(ha) 39): 0.83	0. 848	(hrs) 6.33 6.25	(mm) 22. 24 32. 12
	32): 12.20			
NOTE: PEAK FLO	WS DO NOT INCL	UDE BASEFL	OWS IF ANY	
	====			
V V I	SSSSS U U	A L		(v 6.2.2011)
V V I	SS U U	A A L		
V V I	SS U U	AAAAA L		
	SS U U			
VV I	SSSSS UUUUU	A A LL	LLL	
000 TTTTT	TTTTT H H	Y Y M	M 000	TM
0 0 T	т н н	Y Y MM	MM O O	
	т н н		M O O	
000 T	т н н	Y M	M 000	
Developed and Distri	buted by Smart	: City Wate	r Inc	
Copyright 2007 - 202 All rights reserved.	1 Smart City V	later Inc		

***** DETAILED OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

Output filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\da9b1730-67ff-4641-9a4c-6b11a6
Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\da9b7f30-67ff-4641-9a4c-6b11a6

DATE: 06-15-2023	TIME: 02: 15: 49
USER:	
COMMENTS:	

		TR	ANSFORME) HYETOGE	RAPH	_	
TIME	RAIN	TIME	RAIN	I' TIME	RAIN	I TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.34	6.250	102. 96	9. 33	2.73
0. 167	0.00	3. 250	2.34	6.333	14.04	9. 42	2.73
0. 250	0.00	3. 333	3.12	6.417	14.04	9. 50	2. 73
0.333	1.95	3. 417	3.12	6.500	14.04	9. 58	2.73
0.417	1.95	3. 500	3.12	6.583	14.04	9. 67	2.73
0.500	1.95	3. 583	3.12	6.667	14.04	9. 75	2. 73
0.583	1.95	3. 667	3.12	6.750	14.04	9. 83	2.73
0.667	1.95	3. 750	3.12	6.833	6. 24	9. 92	2.73
0.750	1.95	3. 833	3.12	6.917	6. 24	10.00	2.73
0.833	1.95	3. 917	3.12	7.000	6. 24	10.08	2.73
0. 917	1.95	4.000	3.12	7.083	6. 24	10. 17	2.73
1.000	1.95	4. 083	3.12	7.167	6. 24	10. 25	2.73
1.083	1.95	4. 167	3.12	7.250	6. 24	10. 33	1. 56
1. 167	1.95	4. 250	3.12	7.333	4. 68	10. 42	1. 56
1. 250	1.95	4. 333	4.68	7.417	4. 68	10.50	1. 56
1. 333	1.95	4. 417	4.68	7.500	4. 68	10.58	1. 56
1. 417	1.95	4.500	4.68	7.583	4. 68	10.67	1. 56
1.500	1.95	4. 583	4.68	7.667	4. 68	10.75	1. 56
1. 583	1.95	4. 667	4.68	7.750	4. 68	10.83	1. 56
1. 667	1.95	4. 750	4.68	7.833	4. 68	10. 92	1. 56
1. 750	1.95	4.833	6.24	7.917	4. 68	11.00	1. 56
1.833	1.95	4. 917	6.24	8.000	4. 68	11.08	1. 56
1. 917	1.95	5.000	6.24	8.083	4. 68	11. 17	1. 56
2.000	1.95	5. 083	6.24	8.167	4. 68	11. 25	1. 56
2.083	1.95	5. 167	6.24	8.250	4. 68	11. 33	1. 56
2. 167	1.95	5. 250	6.24	8.333	2. 73	11. 42	1. 56
2. 250	1.95	5. 333	9.36	8.417	2. 73	11.50	1. 56
2. 333	2.34	5. 417	9.36	8.500	2. 73	11. 58	1. 56
2. 417	2.34	5. 500	9.36	8.583	2. 73	11. 67	1. 56
2.500	2.34	5. 583	9.36	8.667	2. 73	11. 75	1. 56
2. 583	2.34	5. 667	9.36	8.750	2. 73	11. 83	1. 56
2. 667	2.34	5. 750	9.36	8.833	2. 73	11. 92	1. 56
2. 750	2.34	5. 833	37.44	8.917	2. 73	12.00	1. 56
2. 833	2.34	5. 917	37.44	9.000	2. 73	12.08	1. 56
2. 917	2.34	6.000	37.44	9.083	2. 73	12. 17	1. 56
3.000	2.34	6. 083	102.96	9.167	2. 73	12. 25	1. 56
3.083	2.34	6. 167	102.96	9.250	2. 73		

CALIB NASHYD (0022) ID= 1 DT= 5.0 min	Area Ia U.H.	10.00	Curve Number (CN) = 75.0 # of Linear Res.(N) = 3.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
TRANSFORMED HYETOGRAPH
ME RAIN | TIME
                                            RAIN |
                                                                          RAIN |
                           hrs
3. 167
3. 250
3. 333
3. 417
                                          mm/hr | hrs mm/hr
2.34 | 6.250 | 102.96 |
2.34 | 6.333 | 14.04 |
                                                                                        hrs
9. 33
9. 42
                                                                                                      mm/hr
2. 73
2. 73
                                                                         mm/hr j
    hrs
              mm/hr
0. 083
0. 167
               0.00
0. 250
0. 333
               0.00
                                            3. 12 | 6. 417
3. 12 | 6. 500
                                                                        14.04
                                                                                        9.50
                                                                                                       2. 73
```

CALIB STANDHYD (0006) ID= 1 DT= 5.0 min	Area Total	(ha)= 5.62 Imp(%)= 50.00		35. 00
		I MPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2. 81	2. 81	
Dep. Storage	(mm) =	1.00	5. 00	
Average Slope	(%)=	1.00	2. 00	
Length	(m) =	193. 56	10.00	
Manni ngs n	=	0.013	0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

3.00	2.34	6. 25	14.04	9. 50	2. 73	

i i		ata\	Local \Ter	mp\			
į į				o-43a3-ad			
Ptotal = 78.00 mm	Comment	s: crea	ted from	IDF Grou	p New II)FGroup -	2
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	3.12	6. 50	14.04	9. 75	2. 73
0. 25	1.95	3.50	3.12	6. 75	6. 24	10.00	2. 73
0.50	1.95	3.75	3.12	7.00	6. 24	10. 25	1. 56
0.75	1.95	4.00	3.12	7. 25	4. 68	10.50	1. 56
1.00	1.95	4.25	4.68	7. 50	4. 68	10. 75	1. 56
1. 25	1.95	4.50	4.68	7. 75	4. 68	11.00	1. 56
1.50	1.95	4.75	6.24	8.00	4. 68	11. 25	1. 56
1.75	1.95	5.00	6.24	8. 25	2. 73	11.50	1. 56
2.00	1.95	5.25	9.36	8. 50	2. 73	11. 75	1. 56
2. 25	2.34	5.50	9.36	8. 75	2. 73	12.00	1. 56
2.50	2.34	5.75	37.44	9. 00	2. 73		
2.75	2.34	6.00	102.96	9. 25	2. 73		
3.00	2.34	6.25	14.04	9. 50	2. 73		

Filename: C:\Users\r.rajachockalingam\AppD

*************	3
** SIMULATION: 025yr 12hr 15min SCS *	
***********	. 3

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP. TRANSFORMED HYETOGRAPH -RAIN |' mm/hr |' 2.34 | 6 TIME RAIN TIME TIME RAIN | TIME RAIN hrs 3. 167 hrs mm/hr | 6.250 102.96 | hrs 9. 33 mm/hr 2. 73 hrs 0.083 0.00 6. 250 6. 333 6. 417 6. 500 6. 583 6. 667 6. 750 0. 167 0. 250 0. 333 0. 417 0. 500 0. 583 0.00 0.00 1.95 1.95 1.95 3. 250 3. 333 3. 417 3. 500 3. 583 3. 667 9. 42 9. 50 9. 58 9. 67 9. 75 9. 83 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2.34 14. 04 14. 04 3. 12 3. 12 3. 12 3. 12 3. 12 3. 12 3. 12 14. 04 14. 04 14. 04 14.04 2.73 1. 95 1. 95 1. 95 6. 833 6. 917 7. 000 0. 667 0. 750 3. 750 3. 833 0.833 3. 12 3. 12 3. 12 6, 24 2.73 3.917 10.08 7. 083 7. 167 7. 250 0. 917 1. 000 1. 95 1. 95 4. 000 4. 083 2. 73 2. 73 4. 167 4. 250 4. 333 1. 083 1. 167 1. 250 3. 12 3. 12 4. 68 6. 24 4. 68 4. 68 10. 33 10. 42 10. 50 1 95 1.56 1. 95 1. 95 7. 333 7. 417 1. 56 1. 56 7. 500 7. 583 7. 667 7. 750 7. 833 7. 917 1. 95 1. 95 1. 95 4. 417 4. 500 4. 583 10. 58 10. 67 10. 75 1. 333 1. 417 4.68 4.68 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1.500 4.68 4.68 1. 95 1. 95 1. 95 10. 83 10. 92 11. 00 1. 583 1. 667 4. 667 4. 750 4.68 4.68 6. 24 6. 24 6. 24 1.750 4.833 4.68 1. 833 1. 917 1. 95 1. 95 4. 917 5. 000 8. 000 8. 083 4. 68 4. 68 6. 24 | 8. 083 6. 24 | 8. 167 6. 24 | 8. 250 6. 24 | 8. 333 9. 36 | 8. 417 9. 36 | 8. 500 5. 000 5. 083 5. 167 5. 250 5. 333 5. 417 4. 68 4. 68 2. 73 11. 25 11. 33 11. 42 2.000 1.95 2. 083 2. 167 1. 95 1. 95 2. 250 1.95 2.34 2. 73 | 11. 50 2. 73 | 11. 58 1. 56 1. 56

CALIB NASHYD (0023) ID= 1 DT= 5.0 min	Ia (mm)=	10.00	Curve Number (CN) = 75.0 # of Linear Res.(N) = 3.00
	U.H. Tp(hrs)=		

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

PEAK FLOW (cms)= 0.077 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 30.217
TOTAL RAI NFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.387

Unit Hyd Opeak (cms)= 0.167

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 59.0 | 1a = Dep. Storage (Above)

(i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

Max. Eff. Inten. (m	m/hr)=	102. 96	55. 74	
over	(mi n)	5. 00	10.00	
Storage Coeff.	(mi n) =	3.75 (ii)	7.25 (ii)	
Unit Hyd. Tpeak	(mi n) =	5. 00	10.00	
Unit Hyd. peak	(cms)=	0. 25	0. 14	
				TOTALS
PEAK FLOW	(cms)=	0. 56	0. 34	0.895 (iii)
TIME TO PEAK	(hrs)=	6. 25	6. 25	6.25
RUNOFF VOLUME	(mm) =	77. 00	26. 19	43.98
TOTAL RAINFALL	(mm) =	78. 00	78.00	78.00
RUNOFF COEFFICIE	NT =	0. 99	0. 34	0.56

0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3. 583	3.12	6.667	14.04	9. 75	2.73
0. 583	1.95	3. 667	3.12	6.750	14.04	9. 83	2.73
0.667	1.95	3. 750	3.12	6.833	6. 24	9. 92	2.73
0. 750	1.95	3. 833	3.12	6.917	6. 24	10.00	2.73
0.833	1.95	3. 917	3.12	7.000	6. 24	10.08	2.73
0. 917	1.95	4.000	3.12	7.083	6. 24	10.17	2.73
1.000	1.95	4. 083	3.12	7.167	6. 24		2.73
1.083	1.95	4. 167	3.12	7.250	6. 24	10. 33	1. 56
1. 167	1.95	4. 250	3.12	7.333	4. 68	10.42	1. 56
1. 250	1.95	4. 333	4.68	7.417	4. 68	10.50	1. 56
1. 333	1.95	4. 417	4.68	7.500	4. 68	10.58	1. 56
1. 417	1.95	4. 500	4.68	7.583	4. 68	10.67	1. 56
1. 500	1.95	4. 583	4.68	7.667	4. 68		1. 56
1. 583	1.95	4. 667	4.68	7.750	4. 68	10. 83	1. 56
1. 667	1.95	4. 750	4.68	7.833	4. 68	10. 92	1. 56
1. 750	1.95	4.833	6.24	7.917			1. 56
1. 833	1.95	4. 917	6.24	8.000	4. 68	11.08	1. 56
1. 917	1.95	5.000	6.24	8.083	4. 68	11. 17	1. 56
2.000	1.95	5. 083	6.24	8.167	4. 68		1. 56
2. 083	1.95	5. 167	6.24	8.250	4. 68	11. 33	1. 56
2. 167	1.95	5. 250	6.24	8.333	2. 73	11. 42	1. 56
2. 250	1.95	5. 333	9.36	8.417	2. 73		1. 56
2. 333	2.34	5. 417	9.36	8.500	2. 73	11.58	1. 56
2. 417	2.34	5. 500	9.36	8.583	2. 73	11. 67	1. 56
2.500	2.34	5. 583	9.36	8.667	2. 73		1. 56
2. 583	2.34	5. 667	9.36	8.750	2. 73	11.83	1. 56
2. 667	2.34	5. 750	9.36	8.833	2. 73	11. 92	1. 56
2. 750	2.34	5. 833	37.44	8.917	2. 73		1. 56
2. 833	2.34	5. 917	37.44	9.000	2.73	12.08	1. 56
2. 917	2.34	6.000	37.44	9.083			1. 56
3.000	2.34	6. 083	102.96	9.167	2. 73	12. 25	1. 56
3. 083	2.34	6. 167	102.96	9.250	2.73		

```
2. 34
2. 34
2. 34
2. 34
                                                           9. 36 |
9. 36 |
9. 36 |
9. 36 |
                                                                                                   2. 73
2. 73
2. 73
2. 73
                                     5. 500
5. 583
2 417
                                                                              8 583
                                                                                                                    11. 67
11. 75
11. 83
11. 92
12. 00
                                                                             8. 667
8. 750
8. 833
2. 500
2. 583
                                    5. 563
5. 667
5. 750
5. 833
5. 917
6. 000
6. 083
                                                                                                                                           1. 56
1. 56
2.667
                                                       37. 44 |
37. 44 |
37. 44 |
102. 96 |
                                                                                                    2. 73
                    2. 34 |
2. 34 |
2. 34 |
                                                                            9. 000
9. 083
9. 167
                                                                                                   2. 73
2. 73
2. 73
                                                                                                                    12. 08
12. 17
12. 25
2.833
                                                                                                                                           1. 56
1. 56
2 917
3.083
                   2.34 | 6.167
                                                       102.96 9.250
                                                                                                   2.73
```

Unit Hyd Opeak (cms) = 0.078

 PEAK FLOW
 (cms) =
 0.037 (l)

 TIME TO PEAK
 (hrs) =
 6.333

 RUNOFF VOLUME
 (mm) =
 30.229

 TOTAL RAINFALL
 (mm) =
 78.000

 RUNOFF COEFFICIENT
 =
 0.388

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME	HYETOGI	RAPH	_	
TIME	RAIN	TIME	RAIN	' TIME	RAI N	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.34	6.250	102. 96	9. 33	2. 73
0. 167	0.00	3. 250	2.34	6.333	14.04	9. 42	2. 73
0. 250	0.00	3. 333	3.12	6.417	14.04	9. 50	2.73
0. 333	1.95	3. 417	3.12	6.500	14.04	9. 58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9. 67	2.73
0.500	1.95	3. 583	3.12	6.667	14.04	9. 75	2. 73
0. 583	1.95	3.667	3.12	6.750	14.04	9. 83	2. 73
0.667	1.95	3. 750	3.12	6.833	6. 24	9. 92	2. 73
0.750	1.95	3.833	3.12	6.917	6. 24	10.00	2. 73
0.833	1.95	3. 917	3.12	7.000	6. 24	10.08	2. 73
0. 917	1.95	4.000	3.12	7.083	6. 24	10. 17	2. 73
1.000	1.95	4.083	3.12	7.167	6. 24	10. 25	2. 73
1.083	1.95	4. 167	3.12	7.250	6. 24	10. 33	1.56
1. 167	1.95	4. 250	3.12	7.333	4. 68	10. 42	1. 56
1. 250	1.95	4. 333	4.68	7.417	4. 68	10.50	1. 56
1. 333	1.95	4. 417	4.68	7.500	4. 68	10. 58	1. 56
1. 417	1.95	4.500	4.68	7.583	4. 68	10. 67	1. 56
1.500	1.95	4. 583	4.68	7.667	4. 68	10. 75	1. 56
1. 583	1.95	4. 667	4.68	7.750	4. 68	10. 83	1. 56

0. 917	
1 000 1 05 1 4 002 2 12 1 7 147 4 24 1 10 25	2. 73
1.000 1.70 4.000 3.12 7.107 0.24 10.20	
1. 083	1. 56
1. 167	1. 56
1. 250 1. 95 4. 333 4. 68 7. 417 4. 68 10. 50	1. 56
1. 333	1. 56
1. 417	1. 56
1.500 1.95 4.583 4.68 7.667 4.68 10.75	1. 56
1. 583	1. 56
1. 667 1. 95 4. 750 4. 68 7. 833 4. 68 10. 92	1. 56
1. 750	1. 56
1. 833	1. 56
1. 917	1. 56
2.000 1.95 5.083 6.24 8.167 4.68 11.25	
2. 083	
2. 167	1. 56
2. 250	
2. 333 2. 34 5. 417 9. 36 8. 500 2. 73 11. 58	
2. 417 2. 34 5. 500 9. 36 8. 583 2. 73 11. 67	1. 56
2. 500 2. 34 5. 583 9. 36 8. 667 2. 73 11. 75	
2. 583 2. 34 5. 667 9. 36 8. 750 2. 73 11. 83	
2. 667 2. 34 5. 750 9. 36 8. 833 2. 73 11. 92	1. 56
2. 750 2. 34 5. 833 37. 44 8. 917 2. 73 12. 00	
2. 833 2. 34 5. 917 37. 44 9. 000 2. 73 12. 08	
2. 917 2. 34 6. 000 37. 44 9. 083 2. 73 12. 17	1. 56
3. 000 2. 34 6. 083 102. 96 9. 167 2. 73 12. 25	1. 56
3. 083 2. 34 6. 167 102. 96 9. 250 2. 73	

Unit Hyd Opeak (cms)= 0.177

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (000		(ha)= 5.		25.00
ID= 1 DT= 5.0 mi	n Total	Imp(%) = 50.	00 Dir. Conn. (%)=	35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	a (ha)=	2. 66	2. 66	
Dep. Storage	e (mm) =	1.00	5. 00	
Average Slop	oe (%)=	1.00	1. 00	
Length	(m) =	188. 33	40. 00	
Manni ngs n	=	0.130	0. 250	
NOTE: F	RAINFALL WAS	TRANSFORMED	TO 5.0 MIN. TIME S	STEP.

4.68 | 7.833 6.24 | 7.917 6.24 | 8.000 6.24 | 8.083 6.24 | 8.167 1. 95 | 1. 95 | 1. 95 | 1. 95 | 4. 750 4. 833 4. 917 5. 000 4. 68 4. 68 1.667 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 750 1. 833 1. 917 11. 08 11. 17 4. 68 4. 68 1. 95 1. 95 1. 95 1. 95 11. 25 11. 33 11. 42 11. 50 5. 167 5. 250 5. 333 6. 24 6. 24 9. 36 8. 250 8. 333 8. 417 4. 68 2. 73 2. 73 2.083 2. 167 2. 250 2. 333 2. 417 2. 500 2. 34 2. 34 2. 34 5. 417 5. 500 5. 583 9. 36 | 8. 500 9. 36 | 8. 583 9. 36 | 8. 667 2. 73 | 2. 73 | 2. 73 | 11. 58 11. 67 11. 75 2.34 | 5.583 | 9.36 | 8.560 2.34 | 5.667 | 9.36 | 8.750 2.34 | 5.750 | 9.36 | 8.833 2.34 | 5.833 | 37.44 | 9.000 2.34 | 6.000 | 37.44 | 9.083 2.34 | 6.083 | 102.96 | 9.167 2.34 | 6.167 | 102.96 | 9.250 2. 73 | 2. 73 | 2. 73 | 2. 73 | 2. 73 | 2. 73 | 2. 73 | 2. 73 | 11. 75 11. 83 11. 92 12. 00 12. 08 12. 17 1. 56 1. 56 1. 56 1. 56 2.583 2. 667 2. 750 2 833 2. 917 1.56 3.000 12. 25 3.083

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms) = 0.124 (i)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 28.515
TOTAL RAI NFALL (mm) = 78.000
RUNOFF COEFFICIENT = 0.366

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | NASHYD (0031) | Area (ha)= 0.65 Curve Number (CN)= 73.0 | D= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.14

		TR/	ANSFORME	HYETOG	RAPH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.34	6.250	102. 96	9. 33	2.73
0. 167	0.00	3. 250	2.34	6.333	14.04	9. 42	2.73
0. 250	0.00	3. 333	3.12	6.417	14.04	9. 50	2.73
0. 333	1.95	3. 417	3.12	6.500	14.04	9. 58	2.73
0.417	1.95	3. 500	3.12	6.583	14.04	9. 67	2.73
0.500	1.95	3. 583	3.12	6.667	14.04	9. 75	2.73
0. 583	1.95	3. 667	3.12	6.750	14.04	9. 83	2.73
0.667	1.95	3. 750	3.12	6.833	6. 24	9. 92	2.73
0.750	1.95	3. 833	3.12	6.917	6. 24	10.00	2.73
0.833	1.95	3. 917	3.12	7.000	6. 24	10.08	2.73

	TRANSFORMED HYETOGRAPH									
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN			
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr			
0.083	0.00	3. 167	2.34	6.250	102. 96	9. 33	2.73			
0. 167	0.00	3. 250	2.34	6.333	14.04	9. 42	2.73			
0. 250	0.00	3. 333	3.12	6.417	14.04	9. 50	2.73			
0. 333	1.95	3. 417	3.12	6.500	14.04	9. 58	2.73			
0.417	1.95	3. 500	3.12	6.583	14.04	9. 67	2.73			
0.500	1.95	3. 583	3.12	6.667	14.04	9. 75	2.73			
0. 583	1.95	3. 667	3.12	6.750	14. 04	9. 83	2.73			
0. 667	1.95	3. 750	3.12	6.833	6. 24	9. 92	2. 73			
0.750	1.95	3. 833	3.12	6.917	6. 24	10.00	2. 73			
0.833	1.95	3. 917	3.12	7.000	6. 24	10.08	2. 73			
0. 917	1.95	4. 000	3.12	7.083	6. 24	10. 17	2.73			
1. 000	1.95	4. 083	3.12	7.167	6. 24	10. 25	2.73			
1. 083	1.95	4. 167	3.12	7.250	6. 24	10. 33	1. 56			
1. 167	1.95	4. 250	3.12	7.333	4. 68	10. 42	1. 56			
1. 250	1.95	4. 333	4.68	7.417	4. 68	10.50	1. 56			
1. 333	1.95	4. 417	4.68	7.500	4. 68	10. 58	1. 56			
1. 417	1.95	4. 500	4.68	7.583	4. 68	10. 67	1. 56			
1. 500	1.95	4. 583	4.68	7.667	4. 68	10. 75	1. 56			
1. 583	1.95	4. 667	4.68	7.750	4. 68	10.83	1. 56			
1. 667	1.95	4. 750	4.68	7.833	4. 68	10. 92	1. 56			
1. 750	1.95 1.95	4. 833	6.24	7.917	4. 68	11.00	1. 56			
1. 833 1. 917	1. 95	4. 917 5. 000	6. 24 6. 24	8.000	4. 68 4. 68	11. 08 11. 17	1. 56 1. 56			
2. 000	1. 95	5. 083	6. 24	8.167	4. 68	11. 17	1. 56			
2. 083	1. 95	5. 167	6. 24	8.250	4. 68	11. 23	1. 56			
2. 167	1. 95	5. 250	6. 24	8.333	2. 73	11. 42	1. 56			
2. 250	1. 95	5. 333	9. 36	8.417	2. 73	11. 50	1. 56			
2. 333	2.34	5. 417	9.36	8.500	2. 73	11. 58	1. 56			
2. 417	2.34	5. 500	9. 36	8.583	2. 73	11. 67	1. 56			
2. 500	2.34	5. 583	9. 36	8.667	2. 73	11. 75	1. 56			
2. 583	2.34	5. 667	9. 36	8.750	2. 73	11. 83	1. 56			
2. 667	2.34	5. 750	9. 36	8.833	2. 73	11. 92	1. 56			
2. 750	2.34	5. 833	37.44	8.917	2. 73	12.00	1. 56			
2. 833	2.34	5. 917	37.44	9.000	2. 73	12. 08	1. 56			
2. 917	2.34	6. 000	37.44	9.083	2. 73	12. 17	1. 56			
3. 000	2.34	6. 083	102.96	9.167	2. 73	12. 25	1. 56			
3.083	2.34	6. 167	102.96	9. 250	2. 73					

Max. Eff. Inten. (n	nm/hr)=	102. 96	51. 58	
over	(mi n)	15.00	30.00	
Storage Coeff.	(mi n) =	14.70 (ii)) 26.02 (ii)	
Uni t Hyd. Tpeak	(mi n) =	15. 00	30.00	
Unit Hyd. peak	(cms)=	0.08	0. 04	
				TOTALS
PEAK FLOW	(cms)=	0.34	0. 16	0.447 (iii)
TIME TO PEAK	(hrs)=	6. 33	6. 58	6.33
RUNOFF VOLUME	(mm) =	77. 00	26. 19	43.97

TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = 1. 95 1. 95 5. 083 5. 167 6. 24 | 8. 167 6. 24 | 8. 250 2 000 4 68 2. 083 11. 33 6.24 9.36 8.333 1.56 1.56 2.167 5. 250 2. 73 2. 73 5. 333 8.417 (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT. 2.417 2.34 2.34 5.500 9.36 8.583 2. 73 2. 73 8. 667 8. 750 2 500 5. 583 5. 667 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. 2. 34 2. 34 2. 34 8. 833 8. 917 9. 000 2. 73 | 2. 73 | 2. 73 | 1. 56 1. 56 1. 56 2. 667 2. 750 5. 750 9.36 37.44 5. 833 5. 917 37.44 2.833 12.08 2.34 2.34 2.34 2. 73 2. 73 2. 73 2.917 6.000 37.44 9.083 1.56 STANDHYD (0028) Area (ha)= 3.43 Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00 3.083 6. 167 102.96 I || D= 1 DT= 5.0 min | Max.Eff.Inten.(mm/hr)= 5. 00 3. 24 (ii) IMPERVIOUS PERVIOUS (i) over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= 15.00 1. 71 1. 00 Surface Area 12.15 (ii) (mm) = Dep. Storage Average Slope Length (%) = (m) = 1.00 2.00 Unit Hyd. peak (cms)= 0. 27 0.09 *TOTALS* Manni ngs n 0.013 0.250 PEAK FLOW (cms)= 0. 34 0. 16 0. 481 (iii) TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) = 6. 25 77. 00 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP. 78.00 78.00 RUNOFF COEFFICIENT TRANSFORMED HYETOGRAPH ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! TIME RAIN TIME RAIN | TIME mm/hr | hrs RAIN RAIN | TIME mm/hr 2.34 2.34 0. 083 9.42 2.73 0.00 3. 250 6.333 14.04 6. 417 6. 500 0.417 1.95 3, 500 3.12 6.583 14.04 9.67 2.73 0. 500 0. 583 3. 583 3. 667 3. 12 3. 12 6.667 6.750 0 667 1 95 3 750 3 12 6.833 6 24 2 73 0. 750 0. 833 1. 95 1. 95 3. 12 3. 12 6. 917 7. 000 6. 24 6. 24 RESERVOIR(0029)| | N= 2---> OUT= 1 | 2. 73 2. 73 OVERFLOW IS OFF OUTFLOW STORAGE | 1. 95 1. 95 0 917 4 000 7 083 DT= 5.0 min STORAGE 1.083 1.95 4. 167 3.12 7.250 6.24 10.33 0.0000 0.0000 0.1200 7. 333 7. 417 AREA QPEAK (ha) 3. 430 3. 430 (cms) 0. 481 0. 063 (hrs) 6.25 7.00 (mm) 43. 97 43. 88 1. 333 1.95 4.417 4.68 7.500 4.68 4.68 4.68 7.583 7.667 INFLOW: ID= 2 (0028) OUTFLOW: ID= 1 (0029) 1.583 4.667 4.68 7.750 4.68 10.83 1.56 4. 750 4. 833 7.833 7.917 1. 95 1. 95 6.24 11.00 1.750 4.68 1.56 1.833 1.95 4. 917 6. 24 6. 24 8.000 4. 68 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE 0.0000 0.4220 0.0000 0. 1535 0. 1758 ADD HYD (0007) | 1 + 2 = 3 | 0.0120 0.4630 0.0253 AREA (hrs) 6.33 7.00 (ha) 0.41 (cms) 0.037 (mm) 30, 23 0.0710 0.0399 0.7480 0.2228 ID1= 1 (0023): + ID2= 2 (0029): 0.0830 0.0559 0.8280 0.2476 0. 0920 0.0732 0. 2733 0.2500 0.0918 0.9640 0.2998 ID = 3 (0007): 3.84 0.086 0. 3200 0. 3750 1. 0240 1. 0800 0.1321 0.3528 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. QPEAK (hrs) 6.33 6.92 (ha) 11, 370 (cms) 0.717 (mm) INFLOW: ID= 2 (0007) OUTFLOW: ID= 1 (0008) `40´ 43 ADD HYD (0007) 3 + 2 = 1 11. 370 0. 336 AREA QPEAK **TPEAK** PEAK FLOW REDUCTION [Qout/Qin] (%) = 46.87
TIME SHIFT OF PEAK FLOW (min) = 35.00
MAXIMUM STORAGE USED (ha.m.) = 0.1178 (cms) 0.086 ID1= 3 (0007): + ID2= 2 (0030): 1.56 0.124 6.33 28. 52 ID = 1 (0007): 5.40 0.211 6.33 38. 40 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0016) | | 1 + 2 = 3 | AREA QPEAK **TPEAK** (hrs) 6.33 ID1= 1 (0022): + ID2= 2 (0008): 0.83 0.077 ARFA OPFAK 0. 336 (ha) 5.40 (cms) 0. 211 (hrs) 6.33 38. 40 ID = 3 (0016): 12. 20 0. 356 6.83 39. 73 0.067 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ID = 3 (0007): 6.05 0.271 6.33 37. 32 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. (0019) ADD HYD (0007) | 3 + 2 = 1 | NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP. (ha) (cms) (hrs) (mm) 37.32 6.33 TRANSFORMED HYETOGRAPH RAIN | TIME TIME RAIN | TIME RAIN RAIN | TIME mm/hr 0.00 hrs 3. 167 mm/hr 2.34 mm/hr | 102.96 | hrs 0. 083 hrs 6.250 hrs 9. 33 mm/hr 2.73 2. 34 | 6. 333 3. 12 | 6. 417 3. 12 | 6. 500 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. 0.167 0.00 3. 250 14. 04 İ 9.42 2.73 0.00 3. 333 3. 417 14. 04 14. 04 9. 50 9. 58 2. 73 2. 73 0.333 RESERVOIR(0008) | IN= 2---> OUT= 1 | OVERFLOW IS OFF 0.417 1.95 3.500 3. 12 3. 12 6.583 6.667 14.04 9. 67 2.73

0.583	1.95	3.667	3.12	6.750	14.04	9. 83	2. 73
0.667	1.95	3. 750	3.12	6.833	6. 24	9. 92	2. 73
0.750	1.95	3. 833	3.12	6.917	6. 24	10.00	2. 73
0.833	1.95	3. 917	3.12	7.000	6. 24	10.08	2. 73
0. 917	1.95	4.000	3.12	7.083	6. 24	10. 17	2. 73
1.000	1.95	4. 083	3.12	7.167	6. 24	10. 25	2. 73
1. 083	1.95	4. 167	3.12	7.250	6. 24	10. 33	1. 56
1. 167	1.95	4. 250	3.12	7.333	4. 68	10. 42	1. 56
1. 250	1.95	4. 333	4.68	7.417	4. 68	10.50	1. 56
1. 333	1.95	4. 417	4.68	7.500	4. 68	10. 58	1. 56
1. 417	1.95	4.500	4.68	7.583	4. 68	10. 67	1. 56
1. 500	1.95	4. 583	4.68	7.667	4. 68	10. 75	1. 56
1. 583	1.95	4.667	4.68	7.750	4. 68	10.83	1. 56
1. 667	1.95	4. 750	4.68	7.833	4. 68	10. 92	1. 56
1. 750	1.95	4.833	6.24	7.917	4. 68	11.00	1. 56
1.833	1.95	4. 917	6.24	8.000	4. 68	11.08	1. 56
1. 917	1.95	5.000	6.24	8.083	4. 68	11. 17	1. 56
2.000	1.95	5. 083	6.24	8.167	4. 68	11. 25	1. 56
2.083	1.95	5. 167	6.24	8.250	4. 68	11. 33	1. 56
2. 167	1.95	5. 250	6.24	8.333	2. 73	11. 42	1. 56
2. 250	1.95	5. 333	9.36	8.417	2. 73	11.50	1. 56
2. 333	2.34	5. 417	9.36	8.500	2. 73	11. 58	1. 56
2. 417	2.34	5. 500	9.36	8.583	2. 73	11. 67	1. 56
2. 500	2.34	5. 583	9.36	8.667	2. 73	11. 75	1. 56
2. 583	2.34	5. 667	9.36	8.750	2. 73	11. 83	1. 56
2. 667	2.34	5. 750	9.36	8.833	2. 73	11. 92	1. 56
2. 750	2.34	5. 833	37.44	8.917	2. 73	12.00	1. 56
2. 833	2.34	5. 917	37.44	9.000	2. 73	12.08	1. 56
2. 917	2.34	6.000	37.44	9.083	2. 73	12. 17	1. 56
3.000	2.34	6. 083	102.96	9.167	2. 73	12. 25	1. 56
3. 083	2.34	6. 167	102.96	9.250	2. 73		

Unit Hyd Opeak (cms) = 0.764

PEAK FLOW (cms)= 0.383 (i)
TIME TO PEAK (hrs)= 6.833
RUNOFF VOLUME (mm)= 23.625
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.303

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

- TRANSFORMED HYETOGRAPH ---IME RAIN | TIME RAIN | TIME
hrs mm/hr | hrs mm/hr | hrs
167 2.34 | 6.250 102.96 | 9.33
250 2.34 | 6.333 14.04 | 9.42
333 3.12 | 6.417 14.04 | 9.50
417 3.12 | 6.500 14.04 | 9.58
500 3.12 | 6.500 14.04 | 9.58 TIME RAIN | TIME RAIN hrs 0. 083 0. 167 mm/hr 0.00 hrs 3. 167 mm/hr 2.73 0.00 3. 250 2.73 0 250 0.00 3 333 2 73 3. 12 3. 12 3. 12 3. 12 3. 12 3. 12 0. 333 0.417 1.95 3, 500 6.583 14.04 9.67 2.73 6.667 6.750 0.500 1.95 3.583 14.04 9.75 2 73 0. 583 3. 667 14. 04 2. 73 0.667 1.95 3, 750 6.833 6.24 9.92 2.73 0. 750 0. 833 1. 95 1. 95 3. 833 3. 917 3. 12 6. 917 7. 000 6. 24 10. 00 10. 08 2. 73 1. 95 1. 95 1. 95 3. 12 3. 12 3. 12 0 917 4 000 7.083 6.24 2 73 7. 167 7. 250 6. 24 . 000 4. 083 1.083 4. 167 10.33 1.56 1. 95 1. 95 3. 12 4. 68 7.333 7.417 4. 68 4. 68 10. 42 10. 50 1. 167 4 250 1.95 1.333 4.417 4.68 7.500 4.68 10.58 1.56 1. 95 1. 95 1. 95 1. 95 7.583 7.667 7.750 4. 68 4. 68 417 4. 500 1. 583 4.68 4.667 4.68 10.83 1.56 4. 68 6. 24 6. 24 4. 750 4. 833 7.833 7.917 4. 68 4. 68 1.833 1.95 4.917 8.000 4.68 11.08 1.56 1. 917 2. 000 5. 000 5. 083 6.24 8. 083 8. 167 4. 68 4. 68 1. 56 1. 56 2 083 1 95 5. 167 6 24 8 250 4.68 11.33 1 56 1. 95 1. 95 5. 250 5. 333 6. 24 9. 36 8. 333 8. 417 2. 73 2. 73 1. 56 1. 56 2. 250 2. 73 2. 73 2. 73 2 333 2.34 2.34 5 417 9.36 9.36 8.500 8.583 417 2.500 2.34 5. 583 9.36 8.667 11.75 1.56 2. 583 2. 667 2.34 5. 667 5. 750 9. 36 9. 36 8.750 8.833 2. 73 2. 73 2.750 2.34 5.833 37.44 8.917 2.73 12.00 1.56 2. 833 2. 917 2.34 5. 917 6. 000 37. 44 37. 44 9. 000 9. 083 2. 73 2. 73 12. 08 12. 17 1. 56 1. 56 102.96 | 9.167 102.96 | 9.250 2. 73 2.34 | 6.083 2.34 | 6.167 3.000 12. 25 1.56

Unit Hyd Opeak (cms) = 0.078

		TR	ANSFORME	HYETOG	RAPH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.34	6.250	102. 96	9. 33	2.73
0. 167	0.00	3. 250	2.34	6.333	14.04	9. 42	2.73
0. 250	0.00	3. 333	3.12	6.417	14.04	9. 50	2.73
0. 333	1.95	3. 417	3.12	6.500	14.04	9. 58	2.73
0.417	1.95	3. 500	3.12	6.583	14.04	9. 67	2.73
0.500	1.95	3. 583	3.12	6.667	14.04	9. 75	2.73
0. 583	1.95	3. 667	3.12	6.750	14.04	9. 83	2.73
0.667	1.95	3. 750	3.12	6.833	6. 24	9. 92	2.73
0.750	1.95	3. 833	3.12	6.917	6. 24	10.00	2.73
0.833	1.95	3. 917	3.12	7.000	6. 24	10.08	2.73
0. 917	1.95	4.000	3.12	7.083	6. 24	10.17	2.73
1. 000	1.95	4. 083	3.12	7.167	6. 24	10. 25	2.73
1. 083	1.95	4. 167	3.12	7.250	6. 24	10. 33	1. 56
1. 167	1.95	4. 250	3.12	7.333	4. 68	10.42	1. 56
1. 250	1.95	4. 333	4.68	7.417	4. 68	10.50	1. 56
1. 333	1.95	4. 417	4.68	7.500	4. 68	10. 58	1. 56
1. 417	1.95	4. 500	4.68	7.583	4. 68	10.67	1. 56
1. 500	1.95	4. 583	4.68	7.667	4. 68	10. 75	1. 56
1. 583	1.95	4. 667	4.68	7.750	4. 68	10.83	1. 56
1. 667	1.95	4. 750	4.68	7.833	4. 68	10. 92	1. 56
1. 750	1.95	4. 833	6.24	7.917	4. 68	11.00	1. 56
1. 833	1.95	4. 917	6.24	8.000	4. 68	11. 08	1. 56
1. 917	1.95	5. 000	6.24	8.083	4. 68	11. 17	1. 56
2. 000	1.95	5. 083	6. 24	8.167	4. 68	11. 25	1. 56
2. 083	1.95	5. 167	6. 24	8.250	4. 68	11. 33	1. 56
2. 167	1.95	5. 250	6. 24	8.333	2. 73	11. 42	1. 56
2. 250	1.95	5. 333	9.36	8.417	2. 73	11.50	1. 56
2. 333	2.34	5. 417	9.36	8.500	2. 73	11.58	1. 56
2. 417	2.34	5. 500	9.36	8.583	2. 73	11. 67	1. 56
2. 500	2.34	5. 583	9.36	8.667	2. 73 2. 73	11. 75	1. 56
2. 583	2.34	5. 667	9.36 9.36	8.750	2. 73	11.83	1. 56
2. 667 2. 750	2.34	5. 750 5. 833	9. 36 37. 44	8.833	2. 73	11. 92 12. 00	1. 56 1. 56
2. 750	2.34	5. 633	37.44	9.000	2. 73	12.00	1. 56
2. 633	2.34	6.000	37.44	9.000	2. 73	12.06	1. 56
3. 000	2.34	6.083	102.96	9.063	2. 73	12.17	1. 56
3. 083	2.34	6. 167	102. 96	9. 107	2. 73	12.23	1. 30
3.003	2.34	0. 107	102.70	7.200	2. 13		

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.077 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 30.217
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.387

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

PEAK FLOW (cms)= 0.037 (1)
T1ME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 30.229
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.388

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | STANDHYD (0036) | Area (ha)= 5.32 | Dir. Conn. (%)= 35.00 |
| ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00 |
| Surface Area (ha)= 2.66 2.66 |
| Dep. Storage (mm)= 1.00 5.00 |
| Average Slope (%)= 1.00 1.00 |
| Length (m)= 188.33 40.00 |
| Mannings n = 0.130 0.250 |

	TRANSFORMED HYETOGRAPH								
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	0.00	3. 167	2.34	6.250	102. 96	9. 33	2.73		
0. 167	0.00	3. 250	2.34	6.333	14.04	9. 42	2.73		
0. 250	0.00	3. 333	3.12	6.417	14. 04	9. 50	2.73		
0. 333	1.95	3. 417	3.12	6.500	14.04	9. 58	2.73		
0.417	1.95	3.500	3.12	6.583	14.04	9. 67	2.73		
0.500	1.95	3. 583	3.12	6.667	14. 04	9. 75	2.73		
0. 583	1.95	3. 667	3.12	6.750	14.04	9. 83	2.73		
0.667	1.95	3. 750	3.12	6.833	6. 24	9. 92	2.73		
0.750	1.95	3. 833	3.12	6.917	6. 24	10.00	2.73		
0.833	1.95	3. 917	3.12	7.000	6. 24	10.08	2.73		
0. 917	1.95	4.000	3.12	7.083	6. 24	10. 17	2.73		
1.000	1.95	4. 083	3.12	7.167	6. 24	10. 25	2.73		
1.083	1.95	4. 167	3.12	7.250	6. 24	10. 33	1. 56		
1. 167	1.95	4. 250	3.12	7.333	4. 68	10. 42	1. 56		
1. 250	1.95	4. 333	4.68	7.417	4. 68	10.50	1. 56		
1. 333	1.95	4. 417	4.68	7.500	4. 68	10. 58	1. 56		
1. 417	1.95	4. 500	4.68	7.583	4. 68	10. 67	1. 56		
1.500	1.95	4. 583	4.68	7.667	4. 68	10. 75	1. 56		
1. 583	1.95	4. 667	4.68	7.750	4. 68	10.83	1. 56		
1. 667	1.95	4. 750	4.68	7.833	4. 68	10. 92	1. 56		
1. 750	1.95	4. 833	6.24	7.917	4. 68	11.00	1. 56		
1.833	1.95	4. 917	6.24	8.000	4. 68	11.08	1. 56		
1. 917	1.95		6.24	8.083	4. 68		1. 56		
2.000	1.95		6.24	8.167	4. 68		1. 56		
2. 083	1.95	5. 167	6.24	8.250	4. 68	11. 33	1. 56		

```
1. 95
1. 95
                                           5. 250
5. 333
                                                          6. 24
9. 36
                                                                     8. 333
8. 417
                                                                                   2. 73
2. 73
2. 73
2. 73
                 2 167
                  2. 250
                  2.333
                                2.34
2.34
                                                          9.36
9.36
                                                                                                11.58
                                           5. 417
                                                                      8.500
                                                                                                               1.56
1.56
                 2.417
                                           5.500
                                                                      8.583
                  2.583
                                2.34
2.34
                                           5. 667
5. 750
                                                          9.36
                                                                      8.750
                                                                                    2. 73
2. 73
                                                                                                11.83
                                                        9. 36
37. 44
                  2.667
                                                                      8.833
                                                                                                11 92
                                           5. 833
                                                                                    2. 73
                               2.34
2.34
2.34
                                                       37. 44 |
37. 44 |
102. 96 |
                                                                     9. 000
9. 083
9. 167
                                                                                    2. 73 |
2. 73 |
2. 73 |
                 2.833
                                           5. 917
                                                                                                12. 08
12. 17
                                                                                                               1.56
                                           6. 000
6. 083
                 3. 000
                                                                                               12. 25
                 3.083
                               2.34
                                           6. 167
                                                       102.96 9.250
Max. Eff. Inten. (mm/hr)=
over (min)=
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                             15.00
                                                                  30.00
                                             14. 70 (ii)
                                                                  26. 02 (ii)
                                             15.00
                                                                  30.00
                                              0.08
                                                                   0.04
                                                                                          0.447 (iii)
PEAK FLOW
                                              0.34
                                                                   0.16
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
                                             6. 33
77. 00
                                                                  6. 58
26. 19
                                                                                            6.33
```

78 00

78 00

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

 (ii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT =

78 00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH RAIN | TIME RAIN | TIME mm/hr | hrs TIME hrs mm/hr hrs mm/hr hrs mm/hr 0. 083 0. 167 0.00 3. 167 3. 250 2.34 2.34 6. 250 6. 333 102. 96 14. 04 0.00 | 1.95 | 1.95 | 3. 12 | 6. 417 3. 12 | 6. 500 3. 12 | 6. 583 0.250 3. 333 14.04 9.50 2.73 0. 333 0. 417 3. 417 3. 500 14. 04 14. 04 9. 58 9. 67 2.73 0.500 1.95 3. 583 3. 667 3. 12 | 6. 667 3. 12 | 6. 750 14.04 9. 75 2. 73

RAIN | TIME RAIN TIME TIME RAIN I TIME RAIN hrs 3. 167 mm/hr 9. 33 0. 083 0. 167 6.250 102.96 0.00 2.34 2. 73 2. 73 6.333 6.417 0.00 3. 250 14.04 3. 12 3. 12 3. 12 6. 500 6. 583 6. 667 0.333 3.417 14.04 9.58 2.73 0.417 1 95 3 500 14 04 9. 67 9. 75 2 73 3. 583 3. 12 3. 12 3. 12 6. 750 6. 833 6. 917 0.583 1.95 3.667 14.04 9. 83 9. 92 2.73 0. 667 0. 750 3. 750 3. 833 6. 24 1.95 10.00 2.73 1. 95 1. 95 3. 12 3. 12 0.833 3.917 7.000 6.24 10.08 2.73 917 4. 000 7.083 6. 24 1.000 1.95 4.083 3. 12 3. 12 7.167 7.250 6.24 10.25 1 083 1 95 4 167 6 24 10 33 7. 333 7. 417 1.250 1.95 4. 333 4.68 4.68 10.50 333 1 95 4 417 4.68 7 500 4. 68 10 58 4.68 7.583 4. 68 1. 500 1.95 4. 583 4.68 7.667 4.68 10.75 1.56 . 583 4. 667 4. 750 4.68 7.750 4. 68 10. 83 4.68 7.833 4. 68 10. 92 1. 667 750 1.95 4 833 6 24 7 917 4 68 11.00 1. 833 1. 917 1. 95 1. 95 6. 24 8. 000 8. 083 11. 08 11. 17 5.000 4.68 1.56 4. 68 4. 68 2 000 1.95 5.083 6.24 8.167 6. 24 9. 36 9. 36 2.167 1.95 5. 250 8.333 2.73 8. 417 8. 500 8. 583 1. 95 2. 34 5. 333 5. 417 2. 73 2. 73 2.34 9.36 2.73 2.417 5.500 11.67 1.56 2.34 5. 583 5. 667 2.667 2.34 5.750 9.36 8.833 2.73 11, 92 1.56 2. 750 2. 833 2.34 37. 44 37. 44 8. 917 9. 000 2. 73 2. 73 12. 00 12. 08 1. 56 1. 56 2.34 | 6.000 2.34 | 6.083 2.34 | 6.167 2 917 37 44 9 083 2 73 12 17 1 56 102.96 | 9.167 102.96 | 9.250

3.083 Unit Hyd Qpeak (cms) = 0.271

 PEAK FLOW
 (cms) =
 0.124

 TIME TO PEAK
 (hrs) =
 6.333

 RUNOFF VOLUME
 (mm) =
 28.515

 TOTAL RAI NFALL
 (mm) =
 78.000

 RUNOFF COEFFICI ENT =
 0.366
 0.124 (i)

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
1. 95 |
1. 95 |
1. 95 |
1. 95 |
                           3. 750
3. 833
3. 917
4. 000
                                           3. 12 |
3. 12 |
3. 12 |
3. 12 |
                                                       6.833
6.917
7.000
7.083
                                                                       6. 24
6. 24
6. 24
6. 24
0. 667
0. 750
                                                                                   10.00
                                                                                   10. 08
10. 17
                                                                                                   2. 73
2. 73
0.833
0.917
                                                                                   10. 33
10. 42
10. 50
                                                                                                   1. 56
1. 56
1. 56
1.083
                1.95
                            4. 167
                                           3. 12
3. 12
                                                       7.250
                                                                       6. 24
4. 68
 1. 167
                   95
                            4. 250
                                                       7 333
 1. 250
                            4. 333
1. 333
1. 417
1. 500
                                                       7.500
7.583
7.667
                                                                                                   1. 56
1. 56
1. 56
                            4.417
                                           4.68
                                                                       4.68
                                                                                   10.58
                           4. 500
4. 583
                                           4. 68
4. 68
                                                                       4. 68
4. 68
                                                                                   10.75
1.583
                           4. 667
4. 750
                                           4.68
                                                       7.750
                                                                       4.68
                                                                                   10. 83
10. 92
                                                       7. 833
7. 917
                            4.833
                                           6.24
                                                                                   11.00
 1.750
                1.95
                                                                       4.68
                                                                                                   1.56
1 833
                            4 917
                                           6 24
                                                       8 000
                                                                       4 68
                                                                                   11 08
                                                                                                   1 56
                            5. 000
                                                       8.083
2.000
                1.95
                           5.083
                                           6.24
                                                       8.167
                                                                       4.68
                                                                                   11. 25
                                                                                                   1.56
                           5. 167
5. 250
2.083
                1 95
                                           6.24
                                                       8.250
                                                                       4.68
                                                                                   11. 33
                                                                                                   1 56
2. 167
                                           6.24
                                                       8.333
                                                                       2. 73
2, 250
                1.95
                           5. 333
                                           9.36
                                                       8.417
                                                                       2.73
                                                                                   11.50
                                                                                                   1.56
2. 333
                           5. 417
5. 500
                                                      8. 500
8. 583
                                                                       2. 73
2. 73
                                                                                                   1. 56
1. 56
2. 417
                                           9.36
                           5. 583
5. 667
5. 750
                                                       8. 667
8. 750
8. 833
2 500
                2 34
                                           9.36
                                                                       2 73
                                                                                   11 75
                                                                                                   1.56
               2.34
                                           9. 36
9. 36
                                                                       2. 73
2. 73
2. 583
2.667
                                                                                   11.92
                                                                                                   1.56
               2.34 | 5.750
2.34 | 5.833
2.34 | 5.917
2.34 | 6.000
2.34 | 6.083
2.34 | 6.167
                                         37. 44 |
37. 44 |
37. 44 |
                                                                       2. 73
2. 73
2 750
                                                       8.917
                                                                                                   1.56
                                                      9.000
                                                                      2. 73
2. 73
2. 73
2.917
                                                                                                   1.56
1.56
3.000
                                       102.96
102.96
                                                       9. 167
9. 250
```

Unit Hyd Opeak (cms) = 0.177

PEAK FLOW (cms) = 0.067 (i)TIME TO PEAK (hrs) = 6. 250
RUNOFF VOLUME (mm) = 28. 339
TOTAL RAINFALL (mm) = 78. 000
RUNOFF COEFFICIENT = 0. 363

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

CALLB | STANDHYD (0040) | |ID= 1 DT= 5.0 min | Area (ha)= 3.43 Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00 IMPERVIOUS PERVIOUS (i) 1. 71 5. 00 2. 00 Surface Area (ha)= 1.71 (mm) = (%) = (m) = Dep. Storage Average Slope 1. 00 151. 22 Length 40.00 Mannings n 0.250

			ANSFORME						
TIME	RAIN	TIME	RAIN	' TIME	RAI N	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	0.00	3. 167	2.34	6.250	102. 96	9. 33	2. 73		
0. 167	0.00	3. 250	2.34	6.333	14.04	9. 42	2. 73		
0. 250	0.00	3. 333	3.12	6.417	14.04	9. 50	2. 73		
0. 333	1.95	3. 417	3.12	6.500	14.04	9. 58	2. 73		
0. 417	1.95	3.500	3.12	6.583	14.04	9. 67	2. 73		
0.500	1.95	3. 583	3.12	6.667	14.04	9. 75	2.73		
0. 583	1.95	3. 667	3.12	6.750	14.04	9. 83	2. 73		
0.667	1.95	3. 750	3.12	6.833	6. 24	9. 92	2. 73		
0.750	1.95	3.833	3.12	6.917	6. 24	10.00	2.73		
0.833	1.95	3. 917	3.12	7.000	6. 24	10.08	2. 73		
0. 917	1.95	4. 000	3.12	7.083	6. 24	10. 17	2. 73		
1. 000	1.95	4. 083	3.12	7.167	6. 24	10. 25	2. 73		
1. 083	1.95	4. 167	3.12	7.250	6. 24	10. 33	1. 56		
1. 167	1.95	4. 250	3.12	7.333	4. 68	10. 42	1. 56		
1. 250	1.95	4. 333	4.68	7.417	4. 68	10.50	1. 56		
1. 333	1.95	4. 417	4.68	7.500	4. 68	10. 58	1. 56		
1. 417	1.95	4. 500	4.68	7.583	4. 68	10. 67	1. 56		
1. 500	1.95	4. 583	4.68	7.667	4. 68	10. 75	1. 56		
1. 583	1.95	4. 667	4.68	7.750	4. 68	10. 83	1. 56		
1. 667	1.95	4. 750	4.68	7.833	4. 68	10. 92	1. 56		
1. 750	1.95	4. 833	6.24	7.917	4. 68	11.00	1. 56		
1. 833	1.95	4. 917	6.24	8.000	4. 68	11. 08	1. 56		
1. 917	1.95	5. 000	6.24	8.083	4. 68	11. 17	1. 56		
2. 000	1.95	5. 083	6.24	8.167	4. 68	11. 25	1. 56		
2. 083	1.95	5. 167	6.24	8. 250	4. 68	11. 33	1. 56		
2. 167	1.95	5. 250	6.24	8.333	2. 73	11. 42	1. 56		
2. 250	1.95	5. 333	9.36	8.417	2. 73	11.50	1. 56		
2. 333	2.34	5. 417	9.36	8.500	2. 73	11. 58	1. 56		
2. 417	2.34	5. 500	9.36	8.583	2. 73	11. 67	1. 56		
2. 500	2.34	5. 583	9.36	8.667	2. 73	11. 75	1. 56		
2. 583	2.34	5. 667	9.36	8.750	2. 73	11. 83	1. 56		
2. 667	2.34	5. 750	9.36	8.833	2. 73	11. 92	1. 56		
2. 750	2.34	5. 833	37.44	8.917	2. 73	12.00	1. 56		
2. 833	2.34	5. 917	37.44	9.000	2. 73	12.08	1. 56		
2. 917	2.34	6. 000	37.44	9.083	2. 73	12. 17	1. 56		

```
3. 000
3. 083
                                 2.34 | 6.083 102.96 | 9.167
2.34 | 6.167 102.96 | 9.250
                                                                                2. 73 | 12. 25 1. 56
2. 73 |
       Max.Eff.Inten.(mm/hr)=
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                               102. 96
                                                 5. 00
                                                                  12. 15 (ii)
15. 00
                                                 3. 24 (ii)
5. 00
0. 27
                                                                    0.09
                                                                                      *TOTALS*
0. 481 (iii)
6. 25
       PEAK FLOW
TIME TO PEAK
                                                  0. 34
                                                                    0. 16
                             (hrs)=
                                                  6. 25
                                                                    6.33
       RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                77.00
                                                                  26. 19
78. 00
                                                                                         43.97
                                                 0.99
                                                                   0.34
                                                                                          0.56
 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       (1) ON PROCEDURE SELECTED FOR PERVITORS LOSSES:

CN* = 59.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  ADD HYD ( 0041) |
1 + 2 = 3 |
                                          AREA
                                                     OPFAK
                                                                   TPFAK
                                                                                 R.V.
                                                                              (mm)
30. 23
43. 97
                                          (ha)
0.41
                                                    (cms)
0.037
                                                                  (hrs)
6.33
         ID1= 1 ( 0033):
+ ID2= 2 ( 0036):
                                          5.32
                                                    0.447
                                                                  6.33
                                          5.73
           ID = 3 (0041):
                                                    0. 484
                                                                  6.33
                                                                              42. 99
       NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  ADD HYD ( 0041)|
3 + 2 = 1 |
                                          ARFA
                                                     OPFAK
                                                                   TPFAK
                                                                                 R. V.
                                          (ha)
5.73
                                                    (cms)
0. 484
                                                                  (hrs)
6.33
                                                                              (mm)
42. 99
         ID1= 3 ( 0041):
+ ID2= 2 ( 0037):
                                          0.65
                                                    0.067
                                                                   6.25
                                                                              28. 34
          ID = 1 ( 0041):
                                          6.38 0.544
                                                                              41.50
                                                                  6.33
       NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  ADD HYD ( 0041)|
1 + 2 = 3 |
                                          AREA
                                                     QPEAK
                                                                  TPEAK
   Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
   Output filename:
    \Users\r. raj achockal i ngam\AppData\Local \Ci vi ca\VH5\98a3b801-fe45-439a-999a-909776
f7886e\e387f366-ff51-4f79-8e27-b8ee68
   Summary filename:
\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\e387f366-ff51-4f79-8e27-b8ee68
DATE: 06-15-2023
                                                              TIME: 02:15:49
USER:
COMMENTS:
   Filename: C:\Users\r.rajachockalingam\AppD
ata\Local\Temp\
073789e9-0d0b-43a3-ada4-078b0c00e084\b3fa3004
       READ STORM
  Ptotal = 86.40 mm
                                   Comments: created from IDF Group New IDFGroup - \mathbf{2}
                         TIME
                                   RAIN I
                                                TIME
                                                           RAIN J
                                                                        TIME
                                                                                   RAIN I
                                                                                               TIME
                                                                                                           RAIN
                                   mm/hr
0.00
                                                          mm/hr
3.46
                                                                                 mm/hr
15.55
                                                                                                          mm/hr
3. 02
                         hrs
0.00
                                                hrs
3.25
                                                                       hrs
6.50
                                                                                              hrs
9. 75
                        0. 25
0. 50
0. 75
                                                                       6. 75
7. 00
7. 25
                                    2.16
                                                3.50
                                                           3 46
                                                                                   6 91
                                                                                             10.00
                                                                                                          3 02
                                    2. 16
2. 16
                                                3.75
4.00
                                                           3. 46
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114. 05
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9. 25
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3. 02
                         3.00
                                    2.59
                                              6.25
                                                         15.55
                                                                      9.50
                                                                                  3. 02
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ID1= 1 (0041): + ID2= 2 (0038):	6.38 1.56	(cms) 0.544 0.124	6. 33 6. 33	28. 52
ID = 3 (0041):	7.94	0. 668	6.33	38. 95
NOTE: PEAK FLOWS DO NO				
ADD HYD (0041) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0041): + ID2= 2 (0040):	7.94 3.43	0. 668 0. 481	6.33 6.25	38. 95 43. 97
ID = 1 (0041):				
NOTE: PEAK FLOWS DO NO				
ADD HYD (0032) 1 + 2 = 3 ID1= 1 (0039):	AREA (ha) 0.83	QPEAK (cms) 0.077	TPEAK (hrs)	R. V. (mm) 30. 22
+ ID2= 2 (0041):	11.37	1. 084	6.25	40. 46
ID = 3 (0032):				
NOTE: PEAK FLOWS DO NO			WS IF AN	IY.
V V I SSSSS V V I SS V V I SS V V I SS V V I SS	U U U U U U	A A L AAAAA L A A L		(v 6.2.2011)
000 TTTTT TTTTT 0 0 T T 0 0 T T 000 T T Developed and Distributed by Copyright 2007 - 2021 Smart' All rights reserved.	H H H H H H /Smart	YY MM Y M Y M City Water	MM O M OOC	0
***** D	ЕТА	ILED C	UTPU	T *****

CALIB STANDHYD (0006) ID= 1 DT= 5.0 min	Area Total	(ha)= 5.6 Imp(%)= 50.0		35. 00
		IMPERVIOUS	PERVIOUS (i)	
		TWI LIVI 003		
Surface Area	(ha)=	2. 81	2. 81	
Dep. Storage	(mm) =	1. 00	5. 00	
Average Slope	(%)=	1. 00	2. 00	
Length	(m) =	193, 56	10.00	
Manni ngs n	=	0.013	0. 250	

			ANSFORME				
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.59	6.250	114. 05	9. 33	3. 02
0. 167	0.00	3. 250	2.59	6.333	15. 55	9. 42	3. 02
0. 250	0.00	3. 333	3.46	6.417	15. 55	9. 50	3. 02
0. 333	2.16	3. 417	3.46	6.500	15. 55	9. 58	3. 02
0. 417	2.16	3. 500	3.46	6.583	15. 55	9. 67	3. 02
0.500	2.16	3. 583	3.46	6.667	15. 55	9. 75	3. 02
0. 583	2.16	3. 667	3.46	6.750	15. 55	9. 83	3. 02
0. 667	2.16	3. 750	3.46	6.833	6. 91	9. 92	3. 02
0.750	2.16	3. 833	3.46	6.917	6. 91	10.00	3. 02
0.833	2.16	3. 917	3.46	7.000	6. 91	10.08	3. 02
0. 917	2.16	4. 000	3.46	7.083	6. 91	10. 17	3. 02
1. 000	2.16	4. 083	3.46	7.167	6. 91	10. 25	3. 02
1. 083	2.16	4. 167	3.46	7.250	6. 91	10. 33	1. 73
1. 167	2.16	4. 250	3.46	7.333	5. 18	10. 42	1. 73
1. 250	2.16	4. 333	5. 18	7.417	5. 18	10.50	1. 73
1. 333	2.16	4. 417	5.18	7.500	5. 18	10. 58	1. 73
1. 417	2.16	4. 500	5.18	7.583	5. 18	10. 67	1. 73
1. 500	2.16	4. 583	5. 18	7.667	5. 18	10. 75	1. 73
1. 583	2.16	4. 667	5.18	7.750	5. 18	10. 83	1. 73
1. 667	2.16	4. 750	5.18	7.833	5. 18	10. 92	1. 73
1. 750	2.16	4. 833	6.91	7.917	5. 18	11.00	1. 73
1. 833	2.16	4. 917	6. 91	8.000	5. 18	11. 08	1. 73
1. 917	2.16	5.000	6.91	8.083	5. 18	11. 17	1. 73
2. 000	2.16	5. 083	6. 91	8.167	5. 18	11. 25	1. 73
2. 083	2.16	5. 167	6.91	8.250	5. 18	11. 33	1. 73
2. 167	2.16	5. 250	6.91	8.333	3. 02	11. 42	1. 73
2. 250	2.16	5. 333	10.37	8.417	3. 02	11.50	1. 73
2. 333	2.59	5. 417	10.37	8.500	3. 02	11. 58	1. 73
2. 417	2.59	5. 500	10.37	8.583	3. 02	11. 67	1. 73
2. 500	2.59	5. 583	10.37	8.667	3. 02	11. 75	1. 73
2. 583	2.59	5. 667	10.37	8.750	3. 02	11. 83	1. 73
2. 667	2.59	5. 750	10.37	8.833	3. 02	11. 92	1. 73
2. 750	2.59	5. 833	41.47	8.917	3. 02	12.00	1. 73
2. 833	2.59	5. 917	41.47	9.000	3. 02	12.08	1. 73
2. 917	2.59	6. 000	41.47	9.083	3. 02	12. 17	1. 73

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2. 16 |
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5. 18 | 7. 833

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    114. 05 | 9. 167
    3. 02 | 12. 25
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10. 92
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                                                                     66. 34
      Max. Eff. Inten. (mm/hr)=
                                                                                                                                                                                     1.667
      over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                                                                                                                                                                                                    7. 917
8. 000
                                                   3.60 (ii)
                                                                       6. 96 (ii)
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11. 42
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5. 250
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3. 02
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1. 73
      PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                   0. 62
                                                                       0.41
                                                                                            1.028 (iii)
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***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
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6. 000
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         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
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41. 47
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                                                                                                                                                                                                                                                                            1.73
      (1) ON PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 59.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                                    2. 917
                                                                                                                                                                                                 2.59
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                                                                                                                                                                                                                                                             12. 17
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2.59 | 6.167 | 114.05 | 9.250
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                                                                                                                                                                                    3. 083
                                                                                                                                                                                                                                                   3. 02
                                                                                                                                                                  Unit Hyd Opeak (cms) = 0.167
                                                                                                                                                                   PEAK FLOW
                                                                                                                                                                                            (cms) = 0.092 (i)
                                                                                                                                                                   TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 36.155
TOTAL RAINFALL (mm)= 86.400
RUNOFF COEFFICIENT = 0.418
 CALLB
NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                                                                                                   (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                     TRANSFORMED HYETOGRAPH
                        TIME
                                   RAIN | TIME
mm/hr | hrs
                                                           RAIN | TIME RAIN | TIME RAIN mm/hr | hrs mm/hr hrs mm/hr
                                                                                                                                                            | CALIB | NASHYD ( 0023) | Area (ha)= 0.41 Curve Number (CN)= 75.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.20
                           hrs
                                                                                                   9 33
                       0.083
                                     0 00
                                               3 167
                                                             2 59
                                                                        6 250 114 05 |
                                                                                                               3 02
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                                                                                                 11.00
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                        2.000
                                     2.16
                                               5.083
                                                             6.91
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                                                                                                 11, 25
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7.833
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                        2. 417
                                               5. 500
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11. 17
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                          583
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                                                                        8.750
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                                               5. 750
                                                            10.37
                                                                        8.833
                                                                                      3.02
                                                                                                 11.92
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                        2.667
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12. 08
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8. 250
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                       2 750
                                     2.59
                                                                        8.917
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                                                                         9.000
                                    2.59 | 6.000
2.59 | 6.083
2.59 | 6.167
                                                          41. 47 | 9. 083
114. 05 | 9. 167
114. 05 | 9. 250
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10. 37
10. 37
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1. 73
1. 73
                       2.917
                                                                                      3.02
                                                                                                 12.17
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                                                                                                                                                                                                                                                             11.42
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8. 500
8. 583
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5. 417
                       3. 000
                                                                                      3. 02
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2. 583
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                                                                                                                                                                                                            5. 583
5. 667
                                                                                                                                                                                                                         10. 37
10. 37
                                                                                                                                                                                                                                     8. 667
8. 750
      Unit Hyd Opeak (cms) = 0.078
       PEAK FLOW
                             (cms)= 0.044 (i)
                                                                                                                                                                                    2.667
                                                                                                                                                                                                  2.59
                                                                                                                                                                                                            5. 750
                                                                                                                                                                                                                         10.37
                                                                                                                                                                                                                                    8.833
                                                                                                                                                                                                                                                   3.02
                                                                                                                                                                                                                                                             11. 92
                                                                                                                                                                                                                                                                            1.73
      TIME TO PEAK (hrs) = 0.044

RUNOFF VOLUME (mm) = 36.170

TOTAL RAINFALL (mm) = 86.400

RUNOFF COEFFICIENT = 0.419

    2. 59
    5. 750
    10. 37
    8. 833

    2. 59
    5. 833
    41. 47
    8. 917

    2. 59
    5. 917
    41. 47
    9. 000

    2. 59
    6. 003
    114. 05
    9. 167

    2. 59
    6. 167
    114. 05
    9. 250

                                                                                                                                                                                    2. 750
2. 833
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12. 08
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1. 73
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                                                                                                                                                                                                                                                   3. 02
3. 02
                                                                                                                                                                                                                                                             12. 25
                                                                                                                                                                                    3.083
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                   Unit Hyd Qpeak (cms) = 0.271
                                                                                                                                                                   PEAK FLOW (Cms) = 0.150
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 34.220
TOTAL RAI NFALL (mm) = 86.4090
RUNOFF COEFFICIENT = 0.396
                                                                                                                                                                                                        0. 150 (i)
                ( 0030)
                                 Area (ha)= 1.56 Curve Number (CN)= 73.0 I a (mm)= 10.00 # of Li near Res. (N)= 3.00 U.H. Tp(hrs)= 0.22
                                                                                           (CN) = 73.0
  NASHYD
| ID= 1 DT= 5.0 min |
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---- TRANSFORMED HYETOGRAPH ----

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGI	RAPH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAI N
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.59	6.250	114.05	9. 33	3.02
0. 167	0.00	3. 250	2.59	6.333	15. 55	9. 42	3. 02
0. 250	0.00	3. 333	3.46	6.417	15. 55	9. 50	3. 02
0. 333	2.16	3. 417	3.46	6.500	15. 55	9. 58	3.02
0.417	2.16	3. 500	3.46	6.583	15. 55	9. 67	3. 02
0.500	2.16	3. 583	3.46	6.667	15. 55	9. 75	3.02
0.583	2.16	3. 667	3.46	6.750	15. 55	9.83	3.02
0.667	2.16	3. 750	3.46	6.833	6. 91	9. 92	3.02
0.750	2.16	3. 833	3.46	6.917	6. 91	10.00	3.02
0.833	2.16	3. 917	3.46	7.000	6. 91	10.08	3. 02
0. 917	2.16	4.000	3.46	7.083	6. 91	10. 17	3. 02
1.000	2.16	4. 083	3.46	7.167	6. 91	10. 25	3. 02
1.083	2.16	4. 167	3.46	7.250	6. 91	10. 33	1. 73
1. 167	2.16	4. 250	3.46	7.333	5. 18	10. 42	1. 73
1. 250	2.16	4. 333	5.18	7.417	5. 18	10.50	1. 73
1. 333	2.16	4. 417	5. 18	7.500	5. 18	10. 58	1. 73
1. 417	2.16	4.500	5. 18	7.583	5. 18	10.67	1. 73
1. 500	2.16	4. 583	5. 18	7.667	5. 18	10. 75	1. 73
1. 583	2.16	4. 667	5. 18	7.750	5. 18	10. 83	1. 73
1. 667	2.16	4. 750	5.18	7.833	5. 18	10. 92	1. 73
1. 750	2.16	4. 833	6. 91	7.917	5. 18	11.00	1. 73
1. 833	2.16	4. 917	6. 91	8.000	5. 18	11. 08	1. 73
1. 917	2.16	5.000	6. 91	8.083	5. 18	11. 17	1. 73
2.000	2.16	5. 083	6. 91	8.167	5. 18	11. 25	1. 73
2. 083	2.16	5. 167	6. 91	8.250	5. 18	11. 33	1. 73
2. 167	2.16	5. 250	6. 91	8.333	3. 02	11. 42	1. 73
2. 250	2.16	5. 333	10.37	8.417	3. 02	11.50	1. 73
2. 333	2.59	5. 417	10.37	8.500	3. 02	11. 58	1. 73
2. 417	2.59	5. 500	10.37	8.583	3. 02	11. 67	1. 73
2. 500	2.59	5. 583	10.37	8.667	3. 02	11. 75	1. 73
2. 583	2.59	5. 667	10.37	8.750	3. 02	11. 83	1. 73
2. 667	2.59	5. 750	10.37	8.833	3. 02	11. 92	1. 73
2. 750	2.59	5.833	41.47	8.917	3. 02	12.00	1. 73
2. 833	2.59	5. 917	41.47	9.000	3. 02	12.08	1. 73 1. 73
2. 917 3. 000	2.59 2.59	6.000	41. 47 114. 05	9.083	3. 02 3. 02	12. 17 12. 25	1. 73
3.000	2.59	6.083	114.05	9.167	3. 02	12. 20	1. /3
3.003	2.39	0.10/	114.05	7.200	3. 02		

Unit Hyd Opeak (cms) = 0.177 (cms)= 0.081 (i)

> 2. 16 2. 59 2. 59 2. 59 5. 333 5. 417 10.37 10.37 1. 73 1. 73 1. 73 1. 73 2. 333 2. 417 8.500 8.583 5. 500 5. 583 3. 02 3. 02 10.37 8.667 8.750 2.500 10.37 2.59 | 5.750 | 10.37 | 8.833 2.59 | 5.833 | 41.47 | 8.917 2.59 | 5.917 | 41.47 | 9.000 2.59 | 6.000 | 41.47 | 9.083 2.59 | 6.083 | 114.05 | 9.167 2.59 | 6.167 | 114.05 | 9.250 1. 73 1. 73 1. 73 2.667 3.02 3. 02 3. 02 12. 00 12. 08 3. 02 3. 02 3. 02 12. 17 12. 25 1. 73 1. 73 2.917 3. 000 3. 083

114. 05 61. 59 15. 00 25. 00 14. 11 (ii) 24. 66 (ii) Max.Eff.Inten.(mm/hr)= over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 0.08 0.05 *TOTALS* 0.542 (iii) TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) = 6. 33 85. 40 86. 40 6.50 6.42 31. 21 86. 40 RUNOFF COFFFICIENT 0 99

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 | la = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | STANDHYD (0028)| |ID= 1 DT= 5.0 min | Area (ha)= 3.43 Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00 1. 71 1. 00 1. 00 1. 00 151. 22 PERVIOUS (i) Surface Area (ha)= 1. /1 5. 00 2. 00 1.71 (mm) = (%) = (m) = Dep. Storage Average Slope Length 40.00 Manni ngs n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

- TRANSFORMED HYETOGRAPH ----| Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | Time | TIME RAI N hrs mm/hr 0.083 3. 02

TIME TO PEAK (hrs) = 6.250 RUNOFF VOLUME (mm) = 34.008 TOTAL RAINFALL (mm) = 86.400 RUNOFF COEFFICIENT = 0.394

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area Total	(ha)= 5.32 Imp(%)= 50.00	?) Dir. Conn.(%)=	35. 00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2. 66	2. 66	
Dep. Storage	(mm) =	1, 00	5. 00	
Average Slope	(%)=	1. 00	1. 00	
Length	(m) =	188. 33	40. 00	
Manni ngs n	=	0. 130	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME) HYETOGI			
TIME	RAIN	TIME	RAIN	' TIME		TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.59	6.250	114.05	9. 33	3. 02
0. 167	0.00	3. 250	2.59	6.333	15. 55	9. 42	3.02
0. 250	0.00	3. 333	3.46	6.417	15. 55	9.50	3. 02
0. 333	2.16	3. 417	3.46	6.500	15. 55	9. 58	3. 02
0.417	2.16	3. 500	3.46	6.583	15. 55	9.67	3. 02
0.500	2.16	3. 583	3.46	6.667	15. 55	9. 75	3.02
0. 583	2.16	3. 667	3.46	6.750	15. 55	9.83	3. 02
0.667	2.16	3. 750	3.46	6.833	6. 91	9. 92	3. 02
0.750	2.16	3. 833	3.46	6.917	6. 91	10.00	3.02
0.833	2.16	3. 917	3.46	7.000	6. 91	10.08	3. 02
0. 917	2.16	4.000	3.46	7.083	6. 91	10. 17	3.02
1.000	2.16	4. 083	3.46	7.167	6. 91	10. 25	3.02
1. 083	2.16	4. 167	3.46	7.250	6. 91	10.33	1. 73
1. 167	2.16	4. 250	3.46	7.333	5. 18	10.42	1. 73
1. 250	2.16	4. 333	5.18	7.417	5. 18	10.50	1. 73
1. 333	2.16	4. 417	5.18	7.500	5. 18	10.58	1. 73
1. 417	2.16	4. 500	5.18	7.583	5. 18	10. 67	1. 73
1. 500	2.16	4. 583	5.18	7.667	5. 18	10.75	1. 73
1. 583	2.16	4. 667	5.18	7.750	5. 18	10.83	1. 73
1. 667	2.16	4. 750	5.18	7.833	5. 18	10. 92	1. 73
1. 750	2.16	4. 833	6.91	7.917	5. 18	11.00	1. 73
1.833	2.16	4. 917	6.91	8.000	5. 18	11.08	1. 73
1. 917	2.16	5.000	6.91	8.083	5. 18	11. 17	1. 73
2.000	2.16	5. 083	6.91	8.167	5. 18	11. 25	1. 73
2.083	2.16	5. 167	6.91	8.250	5. 18	11. 33	1. 73
2. 167	2.16	5. 250	6.91	8.333	3. 02	11. 42	1. 73

0. 250	0.00	3. 333	3, 46	6.417	15. 55	9, 50	3. 02
0. 333	2.16	3. 417	3.46		15. 55	9. 58	3. 02
0. 417	2.16	3. 500	3.46	6.583	15. 55	9. 67	3. 02
0. 500	2.16	3. 583	3.46	6.667	15. 55	9. 75	3. 02
0. 583	2.16	3. 667	3.46	6.750	15. 55	9. 83	3. 02
0. 667	2.16	3. 750	3.46	6.833	6. 91	9. 92	3. 02
0. 750	2.16	3. 833	3.46	6.917	6. 91	10.00	3. 02
0. 833	2.16	3. 917	3.46	7.000	6. 91	10.08	3. 02
0. 917	2.16	4.000	3.46	7.083	6. 91	10. 17	3. 02
1. 000	2.16	4. 083	3.46	7.167	6. 91	10. 25	3. 02
1. 083	2.16	4. 167	3.46	7.250	6. 91	10. 33	1. 73
1. 167	2.16	4. 250	3.46	7.333	5. 18	10. 42	1. 73
1. 250	2.16	4. 333	5.18	7.417	5. 18	10.50	1. 73
1. 333	2.16	4. 417	5.18	7.500	5. 18	10.58	1. 73
1. 417	2.16	4. 500	5.18	7.583	5. 18	10. 67	1. 73
1. 500	2.16	4. 583	5.18		5. 18	10. 75	1. 73
1. 583	2.16	4. 667	5.18	7.750	5. 18	10.83	1. 73
1. 667	2.16	4. 750	5. 18		5. 18	10. 92	1. 73
1. 750	2.16	4. 833	6.91	7.917	5. 18	11.00	1. 73
1. 833	2.16	4. 917	6.91	8.000	5. 18	11.08	1. 73
1. 917	2.16	5. 000	6.91	8.083	5. 18	11. 17	1. 73
2. 000	2.16	5. 083	6.91	8.167	5. 18	11. 25	1. 73
2. 083	2.16	5. 167	6.91	8.250	5. 18	11. 33	1. 73
2. 167	2.16	5. 250	6.91	8.333	3. 02	11. 42	1. 73 1. 73
2. 250	2.16 2.59	5. 333	10.37	0. 117	3. 02 3. 02	11. 50 11. 58	1. 73
2. 333 2. 417	2.59	5. 417 5. 500	10. 37 10. 37	8.500 8.583	3. 02	11. 56	1. 73
2. 500	2.59	5. 583	10.37		3. 02	11. 07	1. 73
2. 583	2.59	5. 667	10.37		3. 02	11. 73	1. 73
2. 667	2.59	5. 750	10.37	8.833	3. 02	11. 92	1. 73
2. 750	2.59	5. 833	41.47	8.917	3. 02	12.00	1. 73
2, 833	2.59	5. 917	41.47	9.000	3. 02	12.08	1. 73
2. 917	2.59	6. 000	41.47	9.083	3. 02	12. 17	1. 73
3. 000	2.59	6. 083	114.05	9. 167	3. 02	12. 25	1. 73
3. 083	2.59	6. 167	114.05	9. 250	3. 02	12.25	1. 75
3. 003	2.57	0. 107	114.00	7.250	3. 02	ı	
Max. Eff. Inten. (mm/h	nr)=	114. 05		66. 34			
over (mi		5. 00		15. 00			
	n) =		(ii)	11.42 (ii)			
	n) =	5. 00	` ′	15. 00			
	ns)=	0. 27		0. 09			
, ,					*T0	TALS*	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ la = Dep. Storage (Above)

0. 38 6. 25 85. 40

TOTALS

50.18

0.551 (iii) 6.25

0. 20 6. 33 31. 21

RESERVOIR(0029) | IN= 2---> OUT= 1 | OVERFLOW IS OFF
 OUTFLOW
 STORAGE (cms)
 OUTFLOW (ha.m.)
 STORAGE (ha.m.)

 0.0000
 0.0000
 0.0900
 0.1200
 DT= 5.0 min AREA QPEAK TPEAK
(ha) (cms) (hrs)
3.430 0.551 6.25
3.430 0.072 7.00 (mm) INFLOW: ID= 2 (0028) OUTFLOW: ID= 1 (0029) 3 430 3. 430

ADD HYD (0007) | 1 + 2 = 3 | ID1= 1 (0023): + ID2= 2 (0029): R.V. (mm) AREA QPEAK TPFAK (cms) 0. 044 (hrs) 0.41 6.33 7.00 3.43 0.072 50. 08 ID = 3 (0007): 3.84 0.101 6.33 48, 59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007) | 3 + 2 = 1 | AREA QPEAK (ha) (cms) (hrs) (mm) ID1= 3 (0007): + ID2= 2 (0030): 3 84 0 101 6.33 48 59 ID = 1 (0007): 5.40 0.251 6.33 44.44

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS LE ANY.

ADD HYD (0007) | 1 + 2 = 3 | AREA QPEAK TPEAK (ha) (cms) 5.40 0.251 (hrs) 6.33 (mm) 44.44 ID1= 1 (0007):

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO $5.0 \ \text{MIN}.$ TIME STEP.

- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | RAIN | TIME RAIN TIME hrs mm/hr hrs mm/hr hrs mm/hr i hrs mm/hr 3. 167 0.167 0.00 3. 250 2.59 6.333 15. 55 9.42 3.02 6. 417 6. 500 0 250 0.00 3 333 3 46 15 55 9 50 3 02 9. 58 0. 333 2.16 3. 417 3.46 3.02 0.417 2.16 3.500 3.46 6.583 15.55 9.67 3.02 0.500 2.16 3. 583 3.46 6.667 6.750 3 02 0. 583 2.16 3. 667 15.55 9. 83 3.02 0 667 2.16 3 750 3 46 6 833 6 91 9 92 3 02 2.16 3. 833 3. 917 6. 917 7. 000 6. 91 . 750 3.46 3.46 0.833 10.08 3.02 0.917 2.16 7. 083 7. 167 6. 91 6. 91 4 000 3.46 10.17 3 02 6. 91 1.083 2.16 4. 167 3.46 7.250 10.33 1.73 2. 16 2. 16 2. 16 2. 16 3. 46 5. 18 7. 333 7. 417 4. 250 5. 18 4. 333 5.18 7.500 1.333 4. 417 5. 18 10.58 1.73 . 417 . 500 2. 16 2. 16 4. 500 4. 583 7. 583 7. 667 5. 18 5. 18 1.583 2.16 4.667 5.18 7.750 5. 18 10.83 1.73 2.16 4. 750 4. 833 7.833 7.917 5. 18 5. 18 1 833 2 16 4 917 6.91 8 000 5 18 11 08 1 73 1. 917 2. 000 6. 91 6. 91 8. 083 8. 167 2.16 5. 18 5. 18 5. 000 5. 083 1.73 2. 16 2. 16 2. 16 2 083 5 167 6 91 8 250 5 18 6. 91 10. 37 8. 333 8. 417 2.250 5. 333 3.02 11.50 1.73 2. 333 5. 417 10.37 10.37 2.500 2.59 5. 583 10.37 8.667 3.02 11. 75 1.73 2. 583 2. 667 2.59 2.59 5. 667 5. 750 10.37 10.37 8. 750 8. 833 3. 02 3. 02 2.750 2.59 5. 833 41.47 8.917 3. 02 12.00 1.73 2.59 5. 917 6. 000 41. 47 41. 47 9.000 9.083 3. 02 3. 02 2.917 12.17 1.73 3.000 2.59 6. 083 114. 05 9.167 9.250 3. 02 12. 25

+	I D2=	2	(0031):	0.	65	-	O. C	81		6.	25		34.	01
	=====	===	===			===	==	===	===	====	===	==:	====		===
	ID =	3	(0007):	6.	05	-	0. 3	23		6.	33		43.	32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007) | 3 + 2 = 1 | QPEAK AREA TPEAK R.V. (ha) (cms) (hrs) (mm) ID1= 3 (0007): + ID2= 2 (0005): 6.05 5.32 0.323 6.33 43. 32 50. 18 ID = 1 (0007): 11.37 0.861 6.33 46.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008) OVERFLOW IS OFF IN= 2---> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE (cms) 0.0000 (ha.m.) 0.0000 (cms) 0.4220 0.0410 0.0120 0.4630 0.1758 0.6510 0.7480 0.0580 0.0253 0 1989 0.0710 0.0399 0.0559 0.0830 0.8280 0.2476 0. 0920 0. 2500 0.0732 0. 8990 0. 9640 0.2733 0.0918 0.3200 0.1116 1.0240 0.3263 0. 3750 0.1321 1.0800 0.3528 AREA QPEAK TPEAK R. V.

(hrs) 6.33 6.92 (mm) 46.53 46. 52

 PEAK
 FLOW
 REDUCTION [Qout/Qin] (%) = 44.80

 TIME SHIFT OF PEAK FLOW (min) = 35.00

 MAXIMUM STORAGE USED (ha. m.) = 0.1372

ADD HYD (0016) | 1 + 2 = 3 | (hrs) 6.33 (ha) (cms) (mm) ID1= 1 (0022): + ID2= 2 (0008): 11.37 0.386 6.92 46.52 ID = 3 (0016): 6.75

Uni t Hyd Qpeak (cms) = 0.764

PEAK FLOW (cms)= 0.463 (i)
TIME TO PEAK (hrs)= 6.833
RUNOFF VOLUME (mm)= 28.421
TOTAL RAINFALL (mm)= 86.400
RUNOFF COEFFICIENT = 0.329

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(0039)

		TRA	ANSFORME	D HYETOGE	RAPH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.59	6.250	114.05	9. 33	3. 02
0. 167	0.00	3. 250	2.59	6.333	15. 55	9. 42	3. 02
0. 250	0.00	3. 333	3.46	6.417	15. 55	9. 50	3. 02
0. 333	2.16	3. 417	3.46	6.500	15. 55	9. 58	3. 02
0. 417	2.16	3. 500	3.46	6.583	15. 55	9. 67	3. 02
0. 500	2.16	3. 583	3.46	6.667	15. 55	9. 75	3. 02
0. 583	2.16	3. 667	3.46	6.750	15. 55	9. 83	3. 02
0. 667	2.16	3. 750	3.46	6.833		9. 92	3. 02
0. 750	2.16	3. 833	3.46	6.917		10.00	3. 02
0. 833	2.16	3. 917	3.46	7.000	6. 91	10.08	3. 02
0. 917	2.16	4. 000	3.46	7.083	6. 91	10. 17	3. 02
1.000	2.16	4. 083	3.46	7.167	6. 91	10. 25	3. 02
1. 083	2.16	4. 167	3.46	7.250	6. 91	10. 33	1. 73
1. 167	2.16	4. 250	3.46	7.333	5. 18	10. 42	1. 73
1. 250	2.16	4. 333	5. 18	7.417	5. 18	10.50	1. 73
1. 333	2.16	4. 417	5.18	7.500		10. 58	1. 73
1. 417	2.16	4. 500	5. 18	7.583		10. 67	1. 73
1. 500 1. 583	2.16 2.16	4. 583 4. 667	5. 18 5. 18	7.667 7.750	5. 18 5. 18	10. 75 10. 83	1. 73 1. 73
1. 563	2. 16	4. 750	5. 18	7.750	5. 18	10. 63	1. 73
1. 750	2. 16	4. 730	6, 91	7. 033 7. 917	5. 18	11. 00	1. 73
1. 730	2. 16	4. 033	6. 91	8.000	5. 18	11. 08	1. 73
1. 917	2.16	5.000	6. 91	8.083	5. 18	11. 17	1. 73
2. 000	2.16	5. 083	6. 91	8.167	5. 18	11. 17	1. 73
2. 083	2.16	5. 167	6. 91	8.250	5. 18	11. 33	1. 73
2. 167	2.16	5. 250	6. 91	8.333	3. 02		1. 73
2. 250	2.16	5. 333	10.37	8.417	3. 02	11. 50	1. 73
2. 333	2.59		10.37	8.500	3. 02	11. 58	1. 73
2. 333	2.07	J. 717		0.000	5. 02	50	

2.59	5. 500	10.37	8.583	3. 02	11. 67	1. 73
2.59	5. 583	10.37	8.667	3. 02	11. 75	1. 73
2.59	5. 667	10.37	8.750	3. 02	11.83	1. 73
2.59	5. 750	10.37	8.833	3. 02	11. 92	1. 73
2.59	5. 833	41.47	8.917	3. 02	12.00	1. 73
2.59	5. 917	41.47	9.000	3. 02	12.08	1. 73
2.59	6.000	41.47	9.083	3. 02	12. 17	1. 73
2.59	6. 083	114.05	9.167	3. 02	12. 25	1. 73
2.59	6. 167	114.05	9.250	3. 02	ĺ	
	2.59 2.59 2.59 2.59 2.59 2.59 2.59	2.59 5.583 2.59 5.667 2.59 5.750 2.59 5.833 2.59 5.917 2.59 6.000 2.59 6.083	2.59 5.583 10.37 2.59 5.667 10.37 2.59 5.750 10.37 2.59 5.833 41.47 2.59 5.917 41.47 2.59 6.000 41.47 2.59 6.083 114.05	2.59 5.583 10.37 8.667 2.59 5.667 10.37 8.750 2.59 5.750 10.37 8.833 2.59 5.833 41.47 8.917 2.59 5.917 41.47 9.000 2.59 6.000 41.47 9.083 2.59 6.083 114.05 9.167	2.59 5.583 10.37 8.667 3.02 2.59 5.667 10.37 8.750 3.02 2.59 5.750 10.37 8.833 3.02 2.59 5.833 41.47 8.917 3.02 2.59 5.917 41.47 9.000 3.02 2.59 6.000 41.47 9.083 3.02 2.59 6.083 114.05 9.167 3.02	2.59 5.583 10.37 8.667 3.02 11.75 2.59 5.667 10.37 8.750 3.02 11.83 2.59 5.750 10.37 8.833 3.02 11.92 2.59 5.750 10.37 8.833 3.02 12.00 2.59 5.917 41.47 9.000 3.02 12.08 2.59 6.000 41.47 9.083 3.02 12.17 2.59 6.083 114.05 9.167 3.02 12.25

Unit Hyd Opeak (cms) = 0.167

PEAK FLOW (cms) = 0.092 (i)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 36.155
TOTAL RAINFALL (mm) = 86.400
RUNOFF COEFFICIENT = 0.418

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | NASHYD (0033) | Area (ha)= 0.41 Curve Number (CN)= 75.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.20

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME	HYETOGI	RAPH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAI N
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.59	6.250	114.05	9. 33	3.02
0. 167	0.00	3. 250	2.59	6.333	15. 55	9. 42	3.02
0. 250	0.00	3. 333	3.46	6.417	15. 55	9. 50	3. 02
0. 333	2.16	3. 417	3.46	6.500	15. 55	9. 58	3. 02
0. 417	2.16	3.500	3.46	6.583	15. 55	9. 67	3. 02
0.500	2.16	3. 583	3.46	6.667	15. 55	9. 75	3. 02
0. 583	2.16	3. 667	3.46	6.750	15. 55	9. 83	3. 02
0.667	2.16	3. 750	3.46	6.833	6. 91	9. 92	3. 02
0.750	2.16	3. 833	3.46	6.917	6. 91	10.00	3. 02
0.833	2.16	3. 917	3.46	7.000	6. 91	10.08	3. 02
0. 917	2.16	4.000	3.46	7.083	6. 91	10. 17	3. 02
1.000	2.16	4. 083	3.46	7.167	6. 91	10. 25	3. 02
1.083	2.16	4. 167	3.46	7.250	6. 91	10. 33	1. 73
1. 167	2.16	4. 250	3.46	7.333	5. 18	10. 42	1. 73
1. 250	2.16	4. 333	5.18	7.417	5. 18	10.50	1. 73
1. 333	2.16	4. 417	5.18	7.500	5. 18	10. 58	1. 73
1. 417	2.16	4. 500	5. 18	7.583	5. 18	10. 67	1. 73
1.500	2.16	4. 583	5.18	7.667	5. 18	10. 75	1. 73
1. 583	2.16	4. 667	5.18	7.750	5. 18	10. 83	1. 73

0.417	2.16	3, 500	3.46	6.583	15. 55	9. 67	3. 02
0.500	2.16	3. 583	3.46	6.667	15. 55	9. 75	3. 02
0.583	2.16	3. 667	3.46	6.750	15, 55	9. 83	3. 02
0.667	2.16	3. 750	3.46	6.833	6. 91	9. 92	3. 02
0.750	2.16	3. 833	3.46	6.917	6. 91	10.00	3. 02
0.833	2.16	3. 917	3.46	7.000	6. 91	10.08	3. 02
0. 917	2.16	4. 000	3.46	7.083	6. 91	10. 17	3. 02
1.000	2.16	4. 083	3.46	7.167	6. 91	10. 25	3. 02
1.083	2.16	4. 167	3.46	7.250	6. 91	10. 33	1.73
1. 167	2.16	4. 250	3.46	7.333	5. 18	10. 42	1. 73
1. 250	2.16	4. 333	5.18	7.417	5. 18	10.50	1. 73
1. 333	2.16	4. 417	5.18	7.500	5. 18	10. 58	1. 73
1. 417	2.16	4. 500	5.18	7.583	5. 18	10. 67	1. 73
1.500	2.16	4. 583	5.18	7.667	5. 18	10. 75	1. 73
1. 583	2.16	4. 667	5.18	7.750	5. 18	10.83	1. 73
1. 667	2.16	4. 750	5.18	7.833	5. 18	10. 92	1. 73
1. 750	2.16	4.833	6. 91	7.917	5. 18	11.00	1. 73
1. 833	2.16	4. 917	6. 91	8.000	5. 18	11. 08	1. 73
1. 917	2.16	5.000	6. 91	8.083	5. 18	11. 17	1. 73
2.000	2.16	5. 083	6. 91	8.167	5. 18	11. 25	1. 73
2.083	2.16	5. 167	6. 91	8.250	5. 18	11. 33	1. 73
2. 167	2.16	5. 250	6. 91	8.333	3. 02	11. 42	1. 73
2. 250	2.16	5. 333	10.37	8.417	3. 02	11.50	1. 73
2. 333	2.59	5. 417	10.37	8.500	3. 02	11. 58	1. 73
2. 417	2.59	5. 500	10.37	8.583	3. 02	11. 67	1. 73
2.500	2.59	5. 583	10.37	8.667	3. 02	11. 75	1. 73
2. 583	2.59	5. 667	10.37	8.750	3. 02	11. 83	1. 73
2. 667	2.59	5. 750	10.37	8.833	3. 02	11. 92	1. 73
2. 750	2.59	5. 833	41.47	8.917	3. 02	12.00	1. 73
2. 833	2.59	5. 917	41.47	9.000	3. 02	12.08	1. 73
2. 917	2.59	6.000	41.47	9.083	3. 02	12. 17	1. 73
3.000	2.59	6. 083	114.05	9.167	3. 02	12. 25	1. 73
3. 083	2.59	6. 167	114.05	9.250	3. 02	l	

Max. Eff. Inten. (n	nm/hr)= (mi n)	114. 05 15. 00	61. 59 25. 00	
Storage Coeff.	(mi n) =	14. 11 (ii) 24.66 (ii)	
Uni t Hyd. Tpeak	(mi n)=	15. 00 `	25. 00	
Uni t Hyd. peak	(cms)=	0.08	0. 05	
				TOTALS
PEAK FLOW	(cms)=	0. 39	0. 20	0.542 (iii)
TIME TO PEAK	(hrs)=	6. 33	6. 50	6.42
RUNOFF VOLUME	(mm) =	85. 40	31. 21	50.18
TOTAL RAINFALL	(mm) =	86. 40	86. 40	86.40
RUNOFF COEFFICIE	ENT =	0. 99	0. 36	0.58

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 59.0 | Ia = Dep. Storage (Above)

 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

 THAN THE STORAGE COEFFICIENT.

 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

1. 667	2.16	4. 750	5.18	7.833	5. 18	10. 92	1. 73
1. 750	2.16	4. 833	6.91	7.917	5. 18	11.00	1. 73
1.833	2.16	4. 917	6.91	8.000	5. 18	11.08	1. 73
1. 917	2.16	5.000	6.91	8.083	5. 18	11. 17	1. 73
2.000	2.16	5. 083	6.91	8.167	5. 18	11. 25	1. 73
2.083	2.16	5. 167	6.91	8.250	5. 18	11. 33	1. 73
2. 167	2.16	5. 250	6.91	8.333	3. 02	11. 42	1. 73
2. 250	2.16	5. 333	10.37	8.417	3. 02	11. 50	1. 73
2. 333	2.59	5. 417	10.37	8.500	3. 02	11. 58	1. 73
2. 417	2.59	5. 500	10.37	8.583	3. 02	11. 67	1. 73
2.500	2.59	5. 583	10.37	8.667	3. 02	11. 75	1. 73
2. 583	2.59	5. 667	10.37	8.750	3. 02	11. 83	1. 73
2. 667	2.59	5. 750	10.37	8.833	3. 02	11. 92	1. 73
2. 750	2.59	5. 833	41.47	8.917	3. 02	12.00	1. 73
2. 833	2.59	5. 917	41.47	9.000	3. 02	12.08	1. 73
2. 917	2.59	6. 000	41.47	9.083	3. 02	12. 17	1. 73
3.000	2.59	6. 083	114.05	9.167	3. 02	12. 25	1. 73
3. 083	2.59	6. 167	114.05	9.250	3. 02		

Unit Hyd Opeak (cms) = 0.078

PEAK FLOW (cms)= 0.044 (1)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 36.170
TOTAL RAI NFALL (mm)= 86.400
RUNOFF COEFFICIENT = 0.419

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALI B				
STANDHYD (0036)	Area	(ha)= 5.32		
ID= 1 DT= 5.0 min	Total		Dir. Conn. (%)=	35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	2. 66	2. 66	
Dep. Storage	(mm) =	1.00	5. 00	
Average Slope	(%)=	1.00	1. 00	
Length	(m)=	188. 33	40.00	
Mannings n	=	0.130	0. 250	
NOTE DALVE		TRANSFORMER TO	5 0 MIN TIME	OTER

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME) HYETOGI	RAPH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.59	6.250	114.05	9. 33	3.02
0. 167	0.00	3. 250	2.59	6.333	15. 55	9. 42	3. 02
0. 250	0.00	3. 333	3.46	6.417	15. 55	9.50	3. 02
0. 333	2.16	3. 417	3.46	6.500	15. 55	9. 58	3. 02

CALI B			
NASHYD (0037)	Area	(ha)= 0.65	Curve Number (CN) = 73.0
ID= 1 DT= 5.0 min	Ιa	(mm) = 10.00	# of Linear Res. (N) = 3.00
	U.H. Tp(hrs)= 0.14	

			ANSFORME			-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0. 083	0.00	3. 167	2.59	6.250	114. 05	9. 33	3. 02
0. 167	0.00	3. 250	2.59	6.333	15. 55	9. 42	3. 02
0. 250	0.00	3. 333	3.46	6.417	15. 55	9.50	3. 02
0. 333	2.16	3. 417	3.46	6.500	15. 55	9. 58	3. 02
0. 417	2.16	3.500	3.46	6.583	15. 55	9. 67	3. 02
0.500	2.16	3. 583	3.46	6.667	15. 55	9. 75	3. 02
0. 583	2.16	3.667	3.46	6.750	15. 55	9.83	3. 02
0.667	2.16	3. 750	3.46	6.833	6. 91	9. 92	3. 02
0.750	2.16	3.833	3.46	6.917	6. 91	10.00	3. 02
0.833	2.16	3. 917	3.46	7.000	6. 91	10.08	3. 02
0. 917	2.16	4.000	3.46	7.083	6. 91	10. 17	3. 02
1. 000	2.16	4. 083	3.46	7.167	6. 91	10. 25	3. 02
1. 083	2.16	4. 167	3.46	7.250	6. 91	10. 33	1. 73
1. 167	2.16	4. 250	3.46	7.333	5. 18	10. 42	1. 73
1. 250	2.16	4. 333	5.18	7.417	5. 18	10.50	1. 73
1. 333	2.16	4. 417	5.18	7.500	5. 18	10.58	1. 73
1. 417	2.16	4. 500	5.18	7.583	5. 18	10.67	1. 73
1. 500	2.16	4. 583	5.18	7.667	5. 18	10. 75	1. 73
1. 583	2.16	4. 667	5.18	7.750	5. 18	10.83	1. 73
1. 667	2.16	4. 750	5.18	7.833	5. 18	10. 92	1. 73
1. 750	2.16	4. 833	6. 91	7.917	5. 18	11.00	1. 73
1. 833	2.16	4. 917	6. 91	8.000	5. 18	11.08	1. 73
1. 917	2.16	5.000	6. 91	8.083	5. 18	11. 17	1. 73
2.000	2.16	5. 083	6.91	8.167	5. 18	11. 25	1. 73
2. 083	2.16	5. 167	6. 91	8.250	5. 18	11. 33	1. 73
2. 167	2.16	5. 250	6. 91	8.333	3. 02	11. 42	1. 73
2. 250	2.16	5. 333	10.37	8.417	3. 02	11.50	1. 73
2. 333	2.59	5. 417	10.37	8.500	3. 02	11. 58	1. 73
2. 417	2.59	5. 500	10.37	8.583	3. 02	11. 67	1. 73
2. 500	2.59	5. 583	10.37	8.667	3. 02	11. 75	1. 73
2. 583	2.59	5. 667	10.37	8.750	3. 02	11.83	1. 73
2. 667	2.59	5. 750	10.37	8.833	3. 02	11. 92	1. 73
2. 750	2.59	5. 833	41.47	8.917	3. 02	12.00	1. 73
2. 833	2.59	5. 917	41.47	9.000	3. 02	12.08	1. 73
2. 917	2.59	6.000	41.47	9.083	3. 02	12. 17	1. 73
3. 000	2.59	6. 083	114.05	9.167	3. 02	12. 25	1. 73
3. 083	2.59	6. 167	114.05	9.250	3. 02		

```
PEAK FLOW (cms) = 0.081 (i)
TIME TO PEAK (hrs) = 6.250
RUNOFF VOLUME (mm) = 34.008
TOTAL RAINFALL (mm) = 86.400
RUNOFF COEFFICIENT = 0.394
                     ( 0038)
```

Unit Hyd Qpeak (cms) = 0.177

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALLB Area (ha)= 1.56 Curve Number (CN)= 73.0 Ia (mm)= 10.00 # of Li near Res. (N)= 3.00 U.H. Tp(hrs)= 0.22 NASHYD || ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH TIME RAIN | TIME RAIN | TIME RAIN | TIME mm/hr | hrs mm/hr | hrs RAIN hrs 0. 083 0. 167 mm/hr 0.00 0.00 hrs 3. 167 hrs 9. 33 9. 42 mm/hr 3.02 mm/hr 2.59 6. 250 3. 250 15. 55 3.02 0. 250 0. 333 0.00 3. 333 3. 417 6.417 6.500 9. 50 9. 58 3.46 15.55 3 02 2. 16 2. 16 2. 16 2. 16 3. 500 3. 583 3. 667 6. 583 6. 667 6. 750 9. 67 9. 75 9. 83 0.417 3.46 15.55 3.02 0. 500 0. 583 3. 46 3. 46 3. 02 3.750 3.46 6.833 6. 91 9. 92 0.667 3.02 0. 750 0. 833 3. 833 3. 917 3. 46 3. 46 6. 917 7. 000 6. 91 6. 91 10. 00 10. 08 7.083 0.917 2.16 4.000 3.46 6.91 10.17 3.02 7. 167 7. 250 7. 333 . 000 2.16 4. 083 4. 167 3. 46 3. 46 10. 25 10. 33 3. 02 1. 73 1 167 2.16 4 250 3 46 5 18 10 42 1 73 1. 250 1. 333 2.16 4. 333 4. 417 5. 18 5. 18 7. 417 7. 500 5. 18 5. 18 10. 50 10. 58 1. 73 1. 73 2. 16 2. 16 2. 16 5. 18 5. 18 5. 18 7. 583 7. 667 7. 750 4. 500 4. 583 10. 67 10. 75 417 5. 18 1. 583 4.667 5. 18 10.83 1.73 . 667 . 750 2.16 4. 750 4. 833 5. 18 6. 91 7.833 7.917 5. 18 5. 18 10. 92 11. 00 6. 91 8.000 1.833 2.16 4.917 5. 18 11.08 1.73 1. 917 2. 000 2.16 5. 000 5. 083 6. 91 6. 91 8. 083 8. 167 5. 18 5. 18 1. 73 1. 73 2. 16 | 2. 16 | 2. 16 | 6. 91 6. 91 10. 37 11. 33 11. 42 11. 50 2.083 5. 167 8.250 5. 18 1.73 2. 167 2. 250 5. 250 5. 333 8. 333 8. 417 3. 02 3. 02 1.73 2. 333 2.59 5. 417 5. 500 10.37 8.500 8.583 3. 02 11.58 1.73 10.37

2. 16 2. 16 2. 16 2. 16 4. 333 4. 417 5. 18 5. 18 5. 18 5. 18 7.417 7.500 7.583 7.667 5. 18 5. 18 1 250 . 333 417 4. 500 4. 583 5. 18 5. 18 10. 67 10. 75 1. 73 1. 73 500 2. 16 2. 16 2. 16 7.833 1.667 4.750 5.18 5.18 10.92 1.73 1.73 750 4. 833 6. 91 6. 91 5. 18 5. 18 11. 00 11. 08 8.000 5. 000 5. 083 5. 167 6. 91 6. 91 6. 91 8. 083 8. 167 8. 250 2.16 2.16 11. 17 11. 25 917 5. 18 1. 73 1. 73 2. 000 2. 083 2.16 5. 18 11.33 1.73 2. 16 2. 16 2. 59 5. 250 5. 333 6. 91 10. 37 8.333 8.417 2.167 3.02 1.73 2. 250 2.333 5. 417 10.37 8.500 3.02 11.58 1.73 2 417 2 59 5 500 10 37 8 583 3 02 11.67 1 73 5. 583 2.583 2.59 5.667 10.37 8.750 3.02 11.83 1.73 5. 750 5. 833 2 667 2.59 10.37 8.833 3. 02 11 92 1 73
 2.59
 | 5.750
 10.37
 | 8.83s

 2.59
 | 5.833
 41.47
 | 8.917

 2.59
 | 5.917
 41.47
 | 9.000

 2.59
 | 6.000
 41.47
 | 9.083

 2.59
 | 6.083
 114.05
 | 9.250

 2.59
 | 6.167
 114.05
 | 9.250
 3. 02 1. 73 2.833 3.02 12.08 1.73 2. 917 3. 02 3. 02 12. 17 3. 000 12. 25 3.083 3 02 114.05 5. 00 3. 11 (ii) 15. 00 11. 42 (ii) 5.00 15.00

Max. Eff. Inten. (mm/hr)= over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 0. 27 0. 09 0.551 (iii) PEAK FLOW (cms)= 0. 38 0. 20 TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) = 6. 25 85. 40 6. 33 31. 21 6. 25 50. 18 TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = 86.40 86, 40 86.40

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 59.0 la = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0041)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0033):	0.41	0.044	6.33	36. 17
+ ID2= 2 (0036):	5.32	0. 542	6.42	50. 18

2.500	2.59	5. 583	10.37	8.667	3. 02	11.75	1. 73
2. 583	2.59	5. 667	10.37	8.750	3.02	11. 83	1.73
2. 667	2.59	5. 750	10.37	8.833	3.02	11. 92	1.73
2. 750	2.59	5. 833	41.47	8.917	3. 02	12.00	1. 73
2. 833	2.59	5. 917	41.47	9.000	3.02	12.08	1.73
2. 917	2.59	6.000	41.47	9.083	3.02	12. 17	1.73
3.000	2.59	6. 083	114.05	9.167	3. 02	12. 25	1. 73
3. 083	2.59	6. 167	114.05	9.250	3.02	ĺ	

Unit Hyd Opeak (cms) = 0.271

PFAK FLOW (cms)= 0.150 (i) (hrs) = 6.333 (mm) = 34.220 (mm) = 86.400 TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIENT =

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040)	Area	(ha)=	3. 43				
ID= 1 DT= 5.0 min	Total	I mp (%) =	50.00	Dir.	Conn. (%) =	35. 00	
		IMPERVI	DUS	PERVI 0	JS (i)		
Surface Area	(ha)=	1. 7	1	1. 7	1		
Dep. Storage	(mm) =	1. 0	0	5.0)		
Average Slope	(%)=	1. 0	0	2. 0)		
Length	(m) =	151. 2	2	40.0	0		
Manni ngs n	=	0.01	3	0.25	0		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		IR	ANSFORME	D HYE TOG	RAPH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.59	6.250	114.05	9. 33	3. 02
0. 167	0.00	3. 250	2.59	6.333	15. 55	9.42	3. 02
0. 250	0.00	3. 333	3.46	6.417	15. 55	9.50	3. 02
0. 333	2.16	3. 417	3.46	6.500	15. 55	9.58	3. 02
0.417	2.16	3. 500	3.46	6.583	15. 55	9.67	3.02
0.500	2.16	3. 583	3.46	6.667	15. 55	9.75	3. 02
0. 583	2.16	3. 667	3.46	6.750	15. 55	9.83	3. 02
0.667	2.16	3. 750	3.46	6.833	6. 91	9. 92	3.02
0.750	2.16	3. 833	3.46	6.917	6. 91	10.00	3. 02
0.833	2.16	3. 917	3.46	7.000	6. 91	10.08	3.02
0. 917	2.16	4.000	3.46	7.083	6. 91	10.17	3.02
1.000	2.16	4. 083	3.46	7.167	6. 91	10. 25	3.02
1.083	2.16	4. 167	3.46	7.250	6. 91	10.33	1.73
1. 167	2.16	4. 250	3.46	7.333	5. 18	10. 42	1. 73

		0041				
	ID = 3 (0041):	5.73	0. 582	6.33	49. 17
	NOTE: PEAK	FLOWS DO N	OT INCL	JDE BASEFL	OWS IF A	VY.
	HYD (004	11)				
	+ 2 = 1		ARFA	OPFAK	TPFAK	R V
			(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (
	+ ID2= 2 (
		0041):				
	10 = 1 (0041).	0.30	0. 034	0.33	47.03
	NOTE: PEAK	FLOWS DO N	OT INCL	JDE BASEFL	OWS IF A	NY.
ADD	HYD (004	11)				
	+ 2 = 3	í i	AREA	QPEAK	TPEAK	R. V.
			(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0041):	6.38	0. 654	6.33	47. 63
	+ ID2= 2 (0038):				
		0041):				
	10 - 3 (0041).	7.74	0.004	0.55	44. //
	NOTE: PEAK	FLOWS DO N	IOT INCL	JDE BASEFL	OWS IF A	NY.

ADD HYD (0041)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0041):	7.94	0. 804	6.33	44. 99
+ ID2= 2 (0040):	3.43	0. 551	6.25	50. 18
ID = 1 (0041):	11.37	1. 277	6.25	46. 56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0039):	0.83	0. 092	6.33	36. 15
+ ID2= 2 (0041):	11.37	1. 277	6.25	46. 56
ID = 3 (0032):	12.20	1. 364	6.25	45. 85

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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       V V I SSSSS U U AAA L
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                     ***** DETAILED OUTPUT *****
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1. 250 2. 40 1. 333 2. 40 1. 417 2. 40 1. 500 2. 40 1. 583 2. 40 1. 667 2. 40 1. 750 2. 40 1. 833 2. 40 1. 917 2. 40 2. 000 2. 40 2. 083 2. 40 2. 167 2. 40 2. 250 2. 40 2. 333 2. 88 2. 417 2. 88 2. 500 2. 88 2. 667 2. 88 2. 750 2. 88 2. 833 2. 88 2. 917 2. 88 2. 917 2. 88 3. 000 2. 88 3. 000 2. 88	4. 417 5. 76 4. 4. 503 5. 76 4. 4. 583 5. 76 4. 4. 583 5. 76 4. 667 5. 76 4. 833 7. 68 7.	7. 417 5. 76 7. 500 5. 76 7. 500 5. 76 7. 563 5. 76 7. 667 5. 76 7. 667 5. 76 7. 67 7. 683 5. 76 8. 083 5. 76 8. 083 5. 76 8. 083 5. 76 8. 083 5. 76 8. 083 3. 36 8. 576 3. 36 8. 583 3. 36 8. 575 3. 36 8. 575 3. 36 8. 575 3. 36 8. 575 3. 36 9. 250 3. 36	10. 50
Max.Eff.Inten.(mm/hr) = over (min) Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) =	5. 00 10. 3. 45 (ii) 6. 5. 00 10.	06 00 68 (ii) 00 14	ALS*
PEAK FLOW (cms)= TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT =	6. 25 6. 95. 00 37. 96. 00 96.	. 25 6. . 26 57. . 00 96.	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 la = Dep. Storage (Above)

 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0022)	Area (ha)=	0.83	Curve Number (CN) = 75.0
ID= 1 DT= 5.0 min	la (mm)=	10.00	# of Linear Res. (N) = 3.00
	U.H. Tp(hrs)=	0. 19	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

Ptotal = 96.00 mm	Comment	s: crea	ted from	IDF Grou	p New ID	FGroup -	2
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	3.84	6.50	17. 28	9. 75	3. 36
0.25	2.40	3.50	3.84	6.75	7. 68	10.00	3.36
0.50	2.40	3.75	3.84	7.00	7. 68	10. 25	1. 92
0.75	2.40	4.00	3.84	7. 25	5. 76	10.50	1. 92
1.00	2.40	4.25	5.76	7.50	5. 76	10. 75	1. 92
1. 25	2.40	4.50	5.76	7.75	5. 76	11.00	1. 92
1.50	2.40	4.75	7.68	8.00	5. 76	11. 25	1. 92
1.75	2.40	5.00	7.68	8. 25	3. 36	11.50	1. 92
2.00	2.40	5.25	11.52	8.50	3. 36	11. 75	1. 92
2.25	2.88	5.50	11.52	8.75	3. 36	12.00	1. 92
2.50	2.88	5.75	46.08	9.00	3. 36		
2.75	2.88	6.00	126.72	9. 25	3. 36		
3.00	2.88	6.25	17.28	9.50	3. 36		
	,						

CALIB	Area Total	(ha)= ! Imp(%)= 50	5. 62 0. 00		35. 00
Surface Area Dep. Storage Average Slope Length Mannings n	(ha) = (mm) = (%) = (m) =	1MPERVI 0US 2. 81 1. 00 1. 00 193. 56 0. 013	S	PERVI OUS (i) 2.81 5.00 2.00 10.00 0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TD	ANCEODAE	LIVETOC	RAPH		
					KAPH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.88	6.250	126. 72	9. 33	3.36
0. 167	0.00	3. 250	2.88	6.333	17. 28	9. 42	3. 36
0. 250	0.00	3. 333	3.84	6.417	17. 28	9. 50	3.36
0. 333	2.40	3. 417	3.84	6.500	17. 28	9. 58	3. 36
0.417	2.40	3. 500	3.84	6.583	17. 28	9. 67	3. 36
0.500	2.40	3. 583	3.84	6.667	17. 28	9. 75	3.36
0.583	2.40	3. 667	3.84	6.750	17. 28	9. 83	3.36
0.667	2.40	3. 750	3.84	6.833	7. 68	9. 92	3. 36
0.750	2.40	3. 833	3.84	6.917	7. 68	10.00	3.36
0.833	2.40	3. 917	3.84	7.000	7. 68	10.08	3.36
0. 917	2.40	4.000	3.84	7.083	7. 68	10. 17	3. 36
1.000	2.40	4. 083	3.84	7.167	7. 68	10. 25	3.36
1.083	2.40	4. 167	3.84	7. 250	7. 68	10. 33	1. 92
1. 167	2.40	4. 250	3.84	7.333	5. 76	10. 42	1. 92

		TD	ANSFORMFI	HYFTOG	DADH		
TIME	RAIN	I TIME	RAIN	l' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	l' hrs	mm/hr	hrs	mm/hr
0. 083	0.00	3. 167	2.88	6.250	126, 72	9. 33	3. 36
0. 167	0.00	3. 250	2.88	6.333	17. 28	9. 42	3. 36
0. 250	0.00	3. 333	3.84	6.417	17. 28	9.50	3. 36
0. 333	2.40	3. 417	3.84	6.500	17. 28	9. 58	3. 36
0. 417	2.40	3.500	3.84	6.583	17. 28	9. 67	3. 36
0. 500	2.40	3. 583	3.84	6.667	17. 28	9. 75	3. 36
0. 583	2.40	3. 667	3.84	6.750	17. 28	9. 83	3, 36
0.667	2.40	3. 750	3.84	6.833	7. 68	9. 92	3. 36
0.750	2.40	3. 833	3.84	6.917	7. 68	10.00	3. 36
0.833	2.40	3. 917	3.84	7.000	7. 68	10.08	3. 36
0. 917	2.40	4.000	3.84	7.083	7. 68	10. 17	3. 36
1.000	2.40	4. 083	3.84	7.167	7. 68	10. 25	3. 36
1. 083	2.40	4. 167	3.84	7.250	7. 68	10. 33	1. 92
1. 167	2.40	4. 250	3.84	7.333	5. 76	10.42	1. 92
1. 250	2.40	4. 333	5.76	7.417	5. 76	10.50	1. 92
1. 333	2.40	4. 417	5.76	7.500	5. 76	10.58	1. 92
1. 417	2.40	4. 500	5.76	7.583	5. 76	10.67	1. 92
1. 500	2.40	4. 583	5.76	7.667	5. 76	10. 75	1. 92
1. 583	2.40	4. 667	5.76	7.750	5. 76	10.83	1. 92
1. 667	2.40	4. 750	5.76	7.833	5. 76	10. 92	1. 92
1. 750	2.40	4. 833	7.68	7.917	5. 76	11.00	1. 92
1. 833	2.40	4. 917	7.68	8.000	5. 76	11. 08	1. 92
1. 917	2.40	5.000	7.68	8.083	5. 76	11. 17	1. 92
2. 000	2.40	5. 083	7.68	8.167	5. 76	11. 25	1. 92
2. 083 2. 167	2.40 2.40	5. 167 5. 250	7.68 7.68	8.250	5. 76 3. 36	11. 33	1. 92 1. 92
2. 167	2.40	5. 230	11.52	6. 333 8. 417	3. 36	11. 42	1. 92
2. 333	2.40	5. 417	11.52	8.500	3, 36	11.50	1. 92
2. 333	2.88	5. 500	11.52	8.583	3. 36	11. 56	1. 92
2. 500	2.88	5. 583	11.52	8.667	3. 36	11. 07	1. 92
2. 583	2.88	5. 667	11.52	8.750	3. 36	11. 83	1. 92
2. 667	2.88	5. 750	11.52	8.833	3. 36	11. 92	1. 92
2. 750	2.88	5. 833	46.08	8.917	3, 36	12.00	1. 92
2. 833	2.88	5. 917	46.08	9.000	3. 36	12.08	1. 92
2. 917	2.88	6.000	46.08	9.083	3. 36	12. 17	1. 92
3. 000	2.88	6. 083	126.72	9. 167	3. 36	12. 25	1. 92
3. 083	2.88	6. 167	126.72	9. 250	3. 36		

Unit Hyd Opeak (cms) = 0.167

PEAK FLOW (cms) = 0.110 (I)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 43.235
TOTAL RAINFALL (mm) = 96.000
RUNOFF COEFFICIENT = 0.450

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORMFI	HYFTOGE	RAPH	_	
TIME	RAIN	TIME	RAIN	I' TIME	RAIN	I TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	i hrs	mm/hr
0.083	0.00	3. 167	2.88	6.250	126. 72	9. 33	3. 36
0. 167	0.00	3. 250	2.88	6.333	17. 28	9. 42	3. 36
0. 250	0.00	3. 333	3.84	6.417	17. 28	9. 50	3. 36
0. 333	2.40	3. 417	3.84	6.500	17. 28	9. 58	3. 36
0.417	2.40	3. 500	3.84	6.583	17. 28	9. 67	3. 36
0.500	2.40	3. 583	3.84	6.667	17. 28	9. 75	3. 36
0.583	2.40	3. 667	3.84	6.750	17. 28	9. 83	3. 36
0.667	2.40	3. 750	3.84	6.833	7. 68	9. 92	3. 36
0.750	2.40	3. 833	3.84	6.917	7. 68	10.00	3. 36
0.833	2.40	3. 917	3.84	7.000	7. 68	10.08	3. 36
0. 917	2.40	4.000	3.84	7.083	7. 68	10. 17	3. 36
1.000	2.40	4. 083	3.84	7.167	7. 68	10. 25	3. 36
1.083	2.40	4. 167	3.84	7.250	7. 68	10. 33	1. 92
1. 167	2.40	4. 250	3.84	7.333	5. 76	10. 42	1. 92
1. 250	2.40	4. 333	5.76	7.417	5. 76	10.50	1. 92
1. 333	2.40	4. 417	5.76	7.500	5. 76	10. 58	1. 92
1. 417	2.40	4.500	5.76	7.583	5. 76	10.67	1. 92
1.500	2.40	4. 583	5.76	7.667	5. 76	10. 75	1. 92
1. 583	2.40	4.667	5.76	7.750	5. 76	10. 83	1. 92
1. 667	2.40	4. 750	5.76	7.833	5. 76	10. 92	1. 92
1. 750	2.40	4.833	7.68	7.917	5. 76	11.00	1. 92
1.833	2.40	4. 917	7.68	8.000	5. 76	11. 08	1. 92
1. 917	2.40	5.000	7.68	8.083	5. 76	11. 17	1. 92
2.000	2.40	5. 083	7.68	8.167	5. 76	11. 25	1. 92
2. 083	2.40	5. 167	7.68	8.250	5. 76	11. 33	1. 92
2. 167	2.40	5. 250	7.68	8.333	3. 36	11. 42	1. 92
2. 250	2.40	5. 333	11.52	8.417	3. 36	11. 50	1. 92
2. 333	2.88	5. 417	11.52	8.500	3. 36	11. 58	1. 92
2. 417	2.88	5. 500	11.52	8.583	3. 36	11. 67	1. 92
2. 500	2.88	5. 583	11.52	8.667	3. 36	11. 75	1. 92
2. 583	2.88	5. 667	11.52	8.750	3. 36	11. 83	1. 92
2. 667	2.88	5. 750	11.52	8.833	3. 36	11. 92	1. 92
2. 750	2.88	5. 833	46.08	8.917	3. 36	12.00	1. 92
2. 833	2.88	5. 917	46.08	9.000	3. 36	12.08	1. 92
2. 917	2.88	6.000	46.08	9.083	3. 36	12.17	1. 92
3.000	2.88	6.083	126.72	9.167	3. 36	12. 25	1. 92
3. 083	2.88	6. 167	126.72	9.250	3. 36		

```
2.88
2.88
2.88
2.88
                         | 5. 583
| 5. 667
                                           11.52 |
11.52 |
11.52 |
2 500
                                                                          3. 36
3. 36
2. 583
                                                          8.750
                            5. 750
5. 833
5. 917
                                                          8.833
8.917
                                                                                        11.92
                                                                                                         1. 92
1. 92
2. 667
2. 750
                                                                           3. 36
3. 36
                                                                                        12. 00
12. 08
                                            46.08
                                                          9.000
               2. 88 | 6. 000
2. 88 | 6. 083
2. 88 | 6. 167
                                                          9. 083
9. 167
9. 250
2.917
                                            46.08
                                                                           3. 36
                                                                                        12.17
                                                                                                         1.92
3 000
                                          126.72
                                                                           3. 36
                                                                                        12. 25
                                                                                                         1 92
```

Unit Hyd Qpeak (cms) = 0.271

PEAK FLOW (cms)= 0.181 (I)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 41.047
TOTAL RAI NFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.428

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | | NASHYD (0031) | Area (ha)= 0.65 Curve Number (CN)= 73.0 | | D= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.14

NOTE: RAINFALL WAS TRANSFORMED TO $\,$ 5.0 MIN. TIME STEP.

- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN RAIN | TIME mm/hr 0.00 hrs 3. 167 mm/hr 2.88 hrs 6.250 s mm/hr | 126.72 | mm/hr 3.36 hrs 0.083 0.167 2.88 6.333 0.00 3. 250 17. 28 9.42 3.36 0. 250 0. 333 0.00 3. 333 3. 417 3. 84 3. 84 6. 417 6. 500 17. 28 17. 28 9. 50 9. 58 3. 36 3. 36 0 417 2 40 3 500 3 84 6.583 17 28 9 67 3 36 0. 500 0. 583 2.40 3. 583 3. 667 3.84 6. 667 6. 750 9. 75 9. 83 17. 28 3.36 6. 833 6. 917 7. 000 0 667 2.40 3 750 3 84 7. 68 7. 68 9 92 3 36 0. 750 2.40 3. 833 3.84 0.833 2.40 3. 917 3.84 7.68 10.08 3.36 0.917 2.40 4. 000 4. 083 3.84 3.84 7. 083 7. 167 7. 68 7. 68 10. 17 10. 25 1.083 2.40 4. 167 3.84 7.250 7. 68 10.33 1.92 1. 167 1. 250 2.40 4. 250 4. 333 3. 84 5. 76 7. 333 7. 417 5. 76 5. 76 10. 42 10. 50 1.333 2.40 4.417 5.76 7.500 5.76 10.58 1.92 7. 583 7. 667 7. 750 7. 833 2.40 4. 500 4. 583 5. 76 5. 76 5. 76 5. 76 1.92 1.500 10.75 1.583 2.40 4. 667 4. 750 5.76 5.76 5. 76 5. 76 10.83 1.92

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms)= 0.053 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 43.252
TOTAL RAI NFALL (mm)= 96.000
RUNOFF COEFFICI ENT = 0.451

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME) HYETOGI	RAPH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3. 167	2.88	6.250	126. 72	9. 33	3. 36
0. 167	0.00	3. 250	2.88	6.333	17. 28	9. 42	3. 36
0. 250	0.00	3. 333	3.84	6.417	17. 28	9. 50	3. 36
0. 333	2.40	3. 417	3.84	6.500	17. 28	9. 58	3. 36
0.417	2.40	3. 500	3.84	6.583	17. 28	9. 67	3. 36
0.500	2.40	3. 583	3.84	6.667	17. 28	9. 75	3. 36
0. 583	2.40	3. 667	3.84	6.750	17. 28	9. 83	3. 36
0. 667	2.40	3. 750	3.84	6.833	7. 68		3. 36
0. 750	2.40	3. 833	3.84	6.917	7. 68	10.00	3. 36
0.833	2.40	3. 917	3.84	7.000	7. 68	10.08	3. 36
0. 917	2.40	4. 000	3.84	7.083	7. 68	10. 17	3. 36
1. 000	2.40	4. 083	3.84	7.167	7. 68	10. 25	3. 36
1. 083	2.40	4. 167	3.84	7.250	7. 68	10. 33	1. 92
1. 167	2.40	4. 250	3.84	7.333	5. 76	10. 42	1. 92
1. 250	2.40	4. 333	5.76	7.417	5. 76	10. 50	1. 92
1. 333	2.40	4. 417	5.76	7.500	5. 76	10. 58	1. 92
1. 417	2.40	4. 500	5.76	7.583	5. 76	10. 67	1. 92
1. 500	2.40	4. 583	5.76	7.667	5. 76	10. 75	1. 92
1. 583	2.40	4. 667	5.76	7.750	5. 76	10. 83	1. 92
1. 667	2.40	4. 750	5.76	7.833	5. 76	10. 92	1. 92
1. 750	2.40	4. 833	7.68	7.917	5. 76	11.00	1. 92
1. 833	2.40	4. 917	7.68	8.000	5. 76	11. 08	1. 92
1. 917	2.40	5. 000	7.68	8.083	5. 76	11. 17	1. 92
2. 000	2.40	5. 083	7.68	8.167	5. 76	11. 25	1. 92
2. 083	2.40	5. 167	7.68	8.250	5. 76	11. 33	1. 92
2. 167	2.40	5. 250	7.68	8.333	3. 36	11. 42	1. 92
2. 250	2.40	5. 333	11.52	8.417	3. 36		1. 92
2. 333	2.88	5. 417	11.52	8.500	3. 36		1. 92
2. 417	2.88	5. 500	11.52	8.583	3. 36	11. 67	1. 92

2.40 | 2.40 | 2.40 | 2.40 | 4. 833 4. 917 7.68 | 7.917 7.68 | 8.000 11. 00 11. 08 11. 17 5. 76 5. 76 8. 000 8. 083 8. 167 1. 833 1. 917 5. 76 5. 76 5. 76 5. 000 5. 083 1. 92 1. 92 7.68 2.000 7.68 11. 25 5. 167 1. 92 1. 92 1. 92 2.167 2.40 5. 250 7.68 8.333 3. 36 11.42 2 250 2 40 5. 333 5. 417 11. 52 11. 52 8. 417 3. 36 3. 36 11. 50 2. 333 8.500 5. 500 5. 583 5. 667 11.52 11.52 11. 67 11. 75 2.417 2.88 8.583 3.36 1.92 2.500 8. 667 8. 750 1. 92 1. 92 2. 583 2.88 11.52 3.36 11.83 2. 88 | 5. 750 | 11. 52 | 8. 833 | 2. 88 | 5. 833 | 46. 08 | 8. 917 | 2. 88 | 5. 917 | 46. 08 | 9. 000 | 2. 88 | 6. 000 | 46. 08 | 9. 083 | 2. 88 | 6. 083 | 126. 72 | 9. 167 | 2. 88 | 6. 167 | 126. 72 | 9. 250 | 2.667 3.36 11. 92 1.92 2. 750 . 92 2.833 3.36 12. 08 12. 17 1. 92 2 917 3 36 1 92 12. 25 3.083 3.36

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.098 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 40.793
TOTAL RAI NFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.425

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | STANDHYD (0005)| |ID= 1 DT= 5.0 min | Area (ha)= 5.32 Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00 IMPERVIOUS PERVIOUS (i) 2. 66 1. 00 Surface Area (ha)= 2. 66 5. 00 (mm) = (%) = (m) = Dep. Storage Average Slope 1. 00 1. 00 188. 33 188. 33 0. 130 40.00 Length Manni ngs n 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYFTOGRAPH -TIME RAIN | TIME RAIN | TIME mm/hr | hrs mm/hr | hrs RAIN I TIME mm/hr hrs hrs mm/hr 2. 88 | 6. 250 | 126. 72 | 2. 88 | 6. 333 | 17. 28 | 3. 84 | 6. 417 | 17. 28 | 9. 33 3. 36 3. 36 3. 36 0.083 0.00 3. 167 3. 250 3. 333 3. 417 3. 500 0. 167 0. 250 0.00 9. 42 9. 50 0.333 2.40 2.40 3.84 | 6.500 3.84 | 6.583 17. 28 9. 58 3. 36

```
2.40
2.40
                                     3. 583
3. 667
                                                   3.84
3.84
               0 500
                                                                        17. 28
17. 28
                                                                                                 3. 36
3. 36
                0. 583
                                                             6.750
                                                                                     9. 83
                            2.40
                                                   3.84
                                                                                     9.92
               0.667
0.750
                                      3.750
                                                             6.833
                                                                          7. 68
7. 68
                                                                                                 3.36
                                                             6. 917
7. 000
                            2.40
                                      3.833
                                                   3.84
                                                                                     10.00
                                                                                                 3.36
                0.917
                            2.40
2.40
                                      4.000
                                                   3.84
                                                             7.083
                                                                          7.68
                                                                                     10.17
                                                                                                 3.36
                                                             7. 167
7. 250
                 000
                                      4. 083
                                                   3 84
                                                                          7 68
                                                                                     10. 25
                                                                                                 3 36
                            2.40
                                      4. 167
                                                   3.84
                                                                           7. 68
                                                                                     10. 33
                            2. 40
2. 40
2. 40
                  167
                                      4. 250
                                                   3.84
                                                             7.333
7.417
                                                                          5. 76
5. 76
                                                                                     10.42
                                                                                                 1.92
                                      4. 333
4. 417
                                                   5. 76
5. 76
                                                             7.500
                 1.333
                                                                          5.76
                                                                                     10.58
                                                                                                 1.92
                  . 417
                            2.40
2.40
                                      4.500
                                                             7.583
                                                                          5. 76
5. 76
                                                                                     10.67
                                      4. 583
                  583
                            2.40
                                                             7.750
7.833
                                      4.667
                                                   5.76
                                                                          5.76
                                                                                     10.83
                                                                                                 1.92
                  667
                            2 40
                                      4 750
                                                   5 76
                                                                          5 76
                                                                                     10 92
                                                                                                 1 92
                                                             7.917
                1.833
                            2.40
                                      4.917
                                                   7.68
                                                             8.000
                                                                          5.76
                                                                                    11.08
                                                                                                 1.92
                                                                          5. 76
5. 76
                  917
                            2 40
                                      5 000
                                                   7.68
                                                             8.083
                                                                                     11 17
                                                                                                 1 92
                                                   7.68
                                                             8. 167
                                      5.083
                2.083
                            2.40
                                      5. 167
                                                   7.68
                                                             8.250
                                                                          5.76
                                                                                     11. 33
                                                                                                 1. 92
               2. 167
2. 250
                                      5 250
                                                             8. 333
8. 417
                            2.40
                                      5. 333
                                                  11.52
                                                                          3.36
                2 333
                            2 88
                                      5 417
                                                  11 52
                                                             8 500
                                                                          3 36
                            2.88
2.88
                                                  11. 52
11. 52
                  417
                                      5. 500
                                                             8.583
                                      5. 583
                2.500
                                                             8.667
                                                                          3.36
                                                                                                 1.92
                                      5. 667
5. 750
                2 583
                            2 88
                                                  11 52
                                                             8 750
                                                                          3.36
                                                             8. 917
9. 000
9. 083
9. 167
                2.750
                            2.88
                                      5. 833
5. 917
                                                  46.08
                                                                          3.36
                                                                                    12.00
                                                                                                 1.92
                                                46. 08
46. 08
126. 72
                            2.88
                                                                          3. 36
3. 36
                                                                                    12. 08
12. 17
                                                                                                 1. 92
1. 92
                  917
                                      6. 000
                            2.88
               3.000
                                      6.083
                                                                          3.36
                                                                                    12. 25
                                                                                                 1. 92
               3. 083
                            2.88
                                      6. 167
                                                126.72 9.250
Max. Eff. Inten. (mm/hr)=
                                      126.72
                                                          79.06
                                       15. 00
13. 53 (ii)
over (min)
Storage Coeff. (min)=
                                                          25. 00
23. 07 (ii)
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                        15 00
                                                          25 00
                                                                              *TOTALS*
                                                                               0. 631 (iii)
6. 42
57. 47
PEAK FLOW
TIME TO PEAK
RUNOFF VOLUME
                                         0 44
                                                           0 25
                    (CMS) =
(hrs) =
/m~`
                                                          6. 50
37. 26
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                        95.00
                                                                                96.00
  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 59.0 Ia = Dep. Storage (Above
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
46.08 | 9.000
46.08 | 9.083
126.72 | 9.167
126.72 | 9.250
                                          2.88 |
2.88 |
2.88 |
2.88 |
                                                    | 5. 917
| 6. 000
                           2 833
                                                                                                   3. 36
3. 36
                           2. 917
                                                                                                                12. 17
                                                       6.083
                           3.000
                                                                                                    3.36
                                                                                                                12. 25
                                                      6. 167
        Max. Fff. Inten. (mm/hr)=
       over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                          5. 00
2. 98 (ii)
                                                                                15. 00
10. 73 (ii)
                                                           5.00
                                                                                15.00
                                                                                                         *TOTALS*
                                                                                                          0. 634 (iii)
6. 25
       PEAK FLOW
TIME TO PEAK
RUNOFF VOLUME
                                                          0.42
                                                                                 0.24
                                (hrs)=
(hrs)=
(mm)=
_ (mm)=
                                                         6. 25
95. 00
                                                                                  6. 33
                                                                                37. 26
        TOTAL RAINFALL
                                                         96 00
                                                                                                           96 00
        RUNOFF COEFFICIENT
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
           (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       (1) ON PROCEDURE SCIENT FOR PERVIOUS LOSSES:

CN* = 59.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SWALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  RESERVOIR( 0029) |
IN= 2---> OUT= 1 |
DT= 5.0 min |
                                          OVERFLOW IS OFF
                                           OUTFLOW
                                                              STORAGE
                                                                                                         STORAGE
                                             (cms)
                                                               (ha.m.)
                                                                                       (cms)
                                                                                                         (ha.m.)
                                             0.0000
                                                                0.0000
                                                                                       0.0900
                                                                                                            0.1200
                                                                                         TPEAK
                                                                                                              R. V.
                                                       AREA
                                                                      QPEAK
                                                                                        (hrs)
6.25
6.92
                                                       (ha)
3. 430
                                                                       (cms)
0.634
    INFLOW: ID= 2 ( 0028)
OUTFLOW: ID= 1 ( 0029)
                                                                        0. 083
                                                      3, 430
                                                                                                               57.37
                                PEAK FLOW REDUCTION [Qout/Qin] (%) = 13.04
TIME SHIFT OF PEAK FLOW (min) = 40.00
MAXIMUM STORAGE USED (ha.m.) = 0.110
                                                                             (mi n) = 40.00
(ha. m.) = 0.1102
                                                              (cms)
0. 053
0. 083
                                                                                (hrs)
6.33
6.92
                                                                                              (mm)
43. 25
57. 37
                                                  (ha)
0.41
         ID1= 1 ( 0023):
+ ID2= 2 ( 0029):
                                                  3.43
             ID = 3 ( 0007):
```

0. 118

6.33

```
CALIB |
STANDHYD ( 0028)
                             Area
                                        (ha)=
                             Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00
                                      IMPERVIOUS
                                                         PERVIOUS (i)
                                           1. 71
1. 00
                           (mm) =
(%) =
(m) =
    Dep. Storage
Average Slope
                                                             5. 00
2. 00
                                            1. 00
                                         151. 22
                                                            40.00
     Length
    Manni ngs n
                                          0.013
                                                            0.250
         NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                              TRANSFORMED HYETOGRAPH
                                                    RAIN |
                    TIME
                               RAIN
                                         TIME
                                                                 TIME
                                                                            RAIN | TIME
                                                                                                  RAIN
                              mm/hr
                                           hrs
                                                    mm/hr
                                                                           mm/hr
                                                                                                 mm/hr
                                                                                        hrs
                      hrs
                   0.083
                               0.00
                                         3, 167
                                                    2.88
                                                               6.250
                                                                       126. 72
                                                                                      9.33
                                                                                                 3.36
                   0. 167
0. 250
                               0.00
                                         3. 250
3. 333
                                                     2.88
                                                             6.333
                                                                          17. 28
17. 28
                                                                                                 3. 36
3. 36
                               0.00
                                                                                      9. 50
                   0. 333
0. 417
                                                              6. 500
6. 583
6. 667
                                                                                                 3. 36
3. 36
                               2 40
                                         3 417
                                                     3 84
                                                                          17 28
                                                                                      9 58
                               2.40
                                         3. 500
3. 583
                                                                                     9. 67
9. 75
                                                      3.84
                                                                          17. 28
                   0.500
                                                     3.84
                                                                          17.28
                                                                                                 3.36
                                                              6. 750
6. 833
6. 917
7. 000
7. 083
7. 167
                                         3. 667
3. 750
                                                                          17. 28
7. 68
                                                                                     9. 83
9. 92
                   0.583
                               2.40
                                                     3.84
                                                                                    10.00
                   0.750
                                2.40
                                         3.833
                                                     3.84
                                                                           7.68
                                                                                                 3.36
                   0. 833
0. 917
                                2.40
                                         3. 917
                                                      3.84
                                                                                                 3. 36
3. 36
                                         4. 000
                                2.40
                                         4.083
                                                                                                 3. 36
                    1.000
                                                     3.84
                                                                           7.68
                                                                                    10.25
                    1. 083
1. 167
                               2. 40
2. 40
                                         4. 167
4. 250
                                                     3.84
3.84
                                                               7. 250
7. 333
                                                                                    10. 33
10. 42
                    1.250
                               2.40
                                         4.333
                                                     5.76
                                                               7.417
                                                                           5.76
                                                                                    10.50
                                                                                                 1.92
                      333
                               2. 40
2. 40
                                         4. 417
4. 500
                                                     5. 76
5. 76
                                                               7. 500
7. 583
                                                                           5. 76
5. 76
                                                                                    10. 58
10. 67
                                                                                                   . 92
. 92
                                                               7. 667
7. 750
7. 833
                    1 500
                               2 40
                                         4 583
                                                     5.76
                                                                           5 76
                                                                                     10 75
                                                                                                 1 92
                    1. 583
1. 667
                               2.40 2.40
                                         4. 667
4. 750
                                                     5. 76
5. 76
                                                                           5. 76
5. 76
                                                                                    10. 73
10. 83
10. 92
                                                                                                 1. 92
1. 92
1. 92
                                         4. 833
4. 917
                                                                           5. 76
5. 76
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                                         5. 083
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11.52
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                   2.667
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                                         5. 750
                                                    11.52
                                                              8.833
                                                                           3. 36
                                                                                    11. 92
                                                                                                 1. 92
                                                    46.08
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
ADD HYD ( 0007) | 3 + 2 = 1
                                     ΔRFΔ
                                               ΩPFΔK
                                                            TPFΔK
                                                                         R V
                                                            (hrs)
                                                                          (mm)
                                     (ha)
                                                (cms)
                                              0.118
                                                                       55. 86
                                     3.84
                                                            6.33
                                              0. 181
                                                            6.33
                                                                       41.05
      ID = 1 (0007):
                                     5.40 0.299
                                                            6.33
                                                                      51.58
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
ADD HYD ( 0007) |
1 + 2 = 3 |
                                               QPEAK
                                     (ha)
5,40
                                                (cms)
                                                            (hrs)
6.33
                                                                          (mm)
      ID1= 1 ( 0007):
+ ID2= 2 ( 0031):
                                              0 299
                                     0.65
                                              0. 098
                                                                       40. 79
       ID = 3 ( 0007):
                                     6.05
                                                                      50, 42
                                            0. 385
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
ADD HYD ( 0007) \begin{vmatrix} 3 + 2 = 1 \end{vmatrix}
                                     AREA
                                               QPEAK
                                                            TPEAK
                                                                         R.V.
                                                            (hrs)
6.33
                                     (ha)
6.05
     ID1= 3 ( 0007):
+ ID2= 2 ( 0005):
                                                                   57. 47
                                    5.32
                                            0. 631
                                                            6.42
     ID = 1 ( 0007):
                                  11.37 1.010
                                                           6.33
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
RESERVOIR( 0008)
```

OVERFLOW IS OFF

STORAGE

(ha. m.) 0.0000

0.0120 0.0253

0.0399

0.0559 0.0732

0.0918

OUTFLOW

(cms) 0.4220

0. 4630 0. 6510

0.7480

0.8280 0.8990

0.9640

STORAGE

0. 1535

0. 1758 0. 1989

0.2228

0.2476 0.2733

0.2998

OUTFLOW

(cms) 0.0000

0. 0410 0. 0580

0.0710

0. 0830

0.0920 0. 2500

IN= 2---> OUT= 1 DT= 5.0 min

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2.40 |
2.40 |
2.40 |
                                                                                                                                                                                                 5.76 | 7.583
5.76 | 7.667
5.76 | 7.750
5.76 | 7.833
                                                                                                                                                                                    4. 500
4. 583
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5. 76
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10. 75
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                                                       QPEAK
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10.92
                                                      (cms) (hrs)
1.010 6.33
0.436 6.92
                                         (ha)
11. 370
                                                                                     (mm)
53.72
                                                                                                                                                                1.667
                                                                                                                                                                           2.40
                                                                                                                                                                                                          7. 917
8. 000
    INFLOW: ID= 2 ( 0007)
                                                                                   53. 71
                                                                                                                                                                                                                       5. 76
5. 76
5. 76
   OUTFLOW: ID= 1 ( 0008)
                                      11. 370
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                        PEAK FLOW REDUCTION [Qout/Qin] (%) = 43.17
TIME SHIFT OF PEAK FLOW (min) = 35.00
MAXIMUM STORAGE USED (ha.m.) = 0.1614
                                                                                                                                                                2. 000
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 ADD HYD ( 0016)|
1 + 2 = 3 |
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                                      AREA QPEAK (ha) (cms) 0.83 0.110 11.37 0.436
                                                             TPEAK
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5. 917
6. 000
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                                                             (hrs)
                                                                           (mm)
                                                                                                                                                                2.750
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       ID1= 1 ( 0022):
+ ID2= 2 ( 0008):
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2.88 | 6.167 | 126.72 | 9.250
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        ID = 3 ( 0016): 12.20 0.467
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     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                Unit Hyd Opeak (cms) = 0.764
                                                                                                                                                PEAK FLOW
                                                                                                                                                                      (cms) = 0.560 (i)
                                                                                                                                                TIME TO PEAK (hrs)= 6.833

RUNOFF VOLUME (mm)= 34.222

TOTAL RAINFALL (mm)= 96.000

RUNOFF COEFFICIENT = 0.356
 CALLB
NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                                                                                (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                               TRANSFORMED HYETOGRAPH
                      TIME
                              RAIN | TIME
mm/hr | hrs
                                                    RAIN | TIME RAIN |
mm/hr | hrs mm/hr |
                                                                              RAIN | TIME RAIN
                                                                                                                                          | CALIB | NASHYD ( 0039) | Area (ha)= 0.83 Curve Number (CN)= 75.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.19
                        hrs
                                                                                          hrs
                                                                                                  mm/hr
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6. 417
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17. 28
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                                                                                                                                                     NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
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                                          5. 833
5. 917
                                                                                      12. 00
12. 08
                                                                                                                                                                                     5. 083
5. 167
                                                                                                                                                                                                 7.68
                                                                                                                                                                                                          8. 167
8. 250
                                                                                                                                                                                                                       5. 76
5. 76
                                                                                                                                                                                                                                11. 25
11. 33
                     2 750
                                 2 88
                                                     46.08
                                                                8 917
                                                                            3.36
                                                                                                   1 92
                                                                                                                                                                2 000
                                                                                                                                                                           2 40
                                                                                                                                                                                                                                             1 92
                                                                9.000
                               2. 88 | 6. 000
2. 88 | 6. 083
2. 88 | 6. 167
                                                   46.08 | 9.083
126.72 | 9.167
126.72 | 9.250
                     2.917
                                                                            3.36
                                                                                      12.17
                                                                                                  1.92
                                                                                                                                                                2.167
                                                                                                                                                                           2.40
                                                                                                                                                                                     5. 250
                                                                                                                                                                                                 7.68
                                                                                                                                                                                                          8.333
                                                                                                                                                                                                                       3. 36
                                                                                                                                                                                                                                11.42
                                                                                                                                                                                                                                             1.92
                                                                                                                                                                                                          8. 417
8. 500
8. 583
                                                                            3. 36
3. 36
                                                                                                                                                                                     5. 333
5. 417
                                                                                                                                                                                                                                              . 92
. 92
                     3. 000
                                                                                      12. 25
                                                                                                                                                                           2.40
                                                                                                                                                                  . 333
                                                                                                                                                                2. 417
                                                                                                                                                                                     5.500
                                                                                                                                                                                                                                11.67
                                                                                                                                                                           2.88
                                                                                                                                                                                                11.52
                                                                                                                                                                                                                       3.36
                                                                                                                                                                                                                                             1.92
                                                                                                                                                               2. 500
2. 583
                                                                                                                                                                           2.88
                                                                                                                                                                                    5. 583
5. 667
                                                                                                                                                                                                          8. 667
8. 750
      Unit Hyd Opeak (cms) = 0.167
      PEAK FLOW (cms) = 0.110 (1)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 43.235
TOTAL RAI NFALL (mm) = 96.000
RUNOFF COEFFICI ENT = 0.450
                                                                                                                                                               2.667
                                                                                                                                                                           2.88
                                                                                                                                                                                    5. 750
                                                                                                                                                                                                11.52
                                                                                                                                                                                                          8.833
                                                                                                                                                                                                                       3.36
                                                                                                                                                                                                                                11. 92
                                                                                                                                                                                                                                             1.92
                                                                                                                                                                          2. 88 | 5. /50 | 11. 52 | 8. 833 | 2. 88 | 5. 833 | 46. 08 | 8. 917 | 2. 88 | 5. 917 | 46. 08 | 9. 000 | 2. 88 | 6. 000 | 46. 08 | 9. 083 | 2. 88 | 6. 083 | 126. 72 | 9. 167 | 2. 88 | 6. 167 | 126. 72 | 9. 250
                                                                                                                                                               2. 750
2. 833
                                                                                                                                                                                                                       3. 36
3. 36
                                                                                                                                                                                                                                12. 00
12. 08
                                                                                                                                                                                                                                             1. 92
1. 92
                                                                                                                                                               2 917
                                                                                                                                                                                                                       3 36
                                                                                                                                                                                                                                12 17
                                                                                                                                                                                                                                             1 92
                                                                                                                                                               3.083
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                Unit Hyd Opeak (cms) = 0.078
                                                                                                                                                PEAK FLOW (Cms) = 0.053
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 43.252
TOTAL RAI NFALL (mm) = 96.000
RUNOFF COEFFICIENT = 0.451
                                                                                                                                                                                  0.053 (i)
(CN) = 75.0
           NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                                                                                 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

---- TRANSFORMED HYETOGRAPH ----

```
CALLB
                                 Area (ha)= 5.32
Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00
| STANDHYD ( 0036) |
|ID= 1 DT= 5.0 min |
                                            IMPERVIOUS PERVIOUS (i)
       Surface Area
                                             2. 66
1. 00
1. 00
                                                                  2. 66
5. 00
1. 00
                                 (ha)=
      Dep. Storage
Average Slope
Length
Mannings n
                                (mm) =
(%) =
(m) =
=
                                               188. 33
                                                                    40.00
                                                0.130
                                                                   0.250
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORMFI	HYFTOGE	RAPH	_	
TIME	RAIN	TIME	RAIN	I' TIME	RAIN	I TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	i hrs	mm/hr
0.083	0.00	3. 167	2.88	6.250	126. 72	9. 33	3. 36
0. 167	0.00	3. 250	2.88	6.333	17. 28	9. 42	3. 36
0. 250	0.00	3. 333	3.84	6.417	17. 28	9. 50	3. 36
0. 333	2.40	3. 417	3.84	6.500	17. 28	9. 58	3. 36
0.417	2.40	3.500	3.84	6.583	17. 28	9. 67	3. 36
0.500	2.40	3. 583	3.84	6.667	17. 28	9. 75	3. 36
0. 583	2.40	3. 667	3.84	6.750	17. 28	9. 83	3. 36
0.667	2.40	3. 750	3.84	6.833	7. 68	9. 92	3. 36
0.750	2.40	3. 833	3.84	6.917	7. 68	10.00	3. 36
0.833	2.40	3. 917	3.84	7.000	7. 68	10.08	3. 36
0. 917	2.40	4. 000	3.84	7.083	7. 68	10. 17	3. 36
1.000	2.40	4. 083	3.84	7.167	7. 68	10. 25	3. 36
1. 083	2.40	4. 167	3.84	7.250	7. 68	10. 33	1. 92
1. 167	2.40	4. 250	3.84	7.333	5. 76	10. 42	1. 92
1. 250	2.40	4. 333	5. 76	7.417	5. 76	10.50	1. 92
1. 333	2.40	4. 417	5.76	7.500	5. 76	10. 58	1. 92
1. 417	2.40	4. 500	5.76	7.583	5. 76	10. 67	1. 92
1.500	2.40	4. 583	5.76	7.667	5. 76	10.75	1. 92
1. 583	2.40	4. 667	5.76	7.750	5. 76	10.83	1. 92
1. 667	2.40	4. 750	5.76	7.833	5. 76	10. 92	1. 92
1. 750	2.40	4. 833	7.68	7.917	5. 76	11.00	1. 92
1.833	2.40	4. 917	7.68	8.000	5. 76	11.08	1. 92
1. 917 2. 000	2.40 2.40	5. 000 5. 083	7.68 7.68	8.083	5. 76 5. 76	11. 17 11. 25	1. 92 1. 92
2. 083	2.40	5. 167	7.68	8.250	5. 76	11. 23	1. 92
2. 167	2.40	5. 250	7.68	8.333	3. 36	11. 33	1. 92
2. 250	2.40	5. 333	11.52	8.417	3. 36	11. 42	1. 92
2. 333	2.88	5. 417	11.52	8.500	3. 36	11. 58	1. 92
2. 417	2.88	5. 500	11.52	8.583	3. 36	11. 67	1. 92
2. 500	2.88	5. 583	11.52	8.667	3. 36	11. 75	1. 92
2. 583	2.88	5. 667	11.52	8.750	3. 36	11. 83	1. 92
2. 667	2.88	5. 750	11.52	8.833	3. 36	11. 92	1. 92
2. 750	2.88	5. 833	46.08	8.917	3. 36	12. 00	1. 92
2. 833	2.88	5. 917	46.08	9.000	3. 36	12. 08	1. 92
2. 917	2.88	6.000	46.08	9.083	3. 36	12. 17	1. 92

1. 500 1. 583 1. 667 1. 750 1. 833 1. 917 2. 000	2. 40 2. 40 2. 40 2. 40 2. 40 2. 40 2. 40 2. 40	4. 583 4. 667 4. 750 4. 833 4. 917 5. 000 5. 083	5. 76 5. 76 5. 76 7. 68 7. 68 7. 68 7. 68	7.667 7.750 7.833 7.917 8.000 8.083 8.167	5. 76 5. 76 5. 76 5. 76 5. 76 5. 76 5. 76	10. 75 10. 83 10. 92 11. 00 11. 08 11. 17 11. 25	1. 92 1. 92 1. 92 1. 92 1. 92 1. 92 1. 92
2.083	2.40	5. 167	7.68	8.250	5. 76	11. 33	1. 92
2. 167	2.40	5. 250	7.68	8.333	3. 36	11. 42	1. 92
2. 250	2.40	5. 333	11.52	8.417	3. 36	11. 50	1. 92
2. 333	2.88	5. 417	11.52	8.500	3. 36	11. 58	1. 92
2. 417	2.88	5. 500	11.52	8.583	3. 36	11. 67	1. 92
2.500	2.88	5. 583	11.52	8.667	3. 36	11. 75	1. 92
2. 583	2.88	5. 667	11.52	8.750	3. 36	11. 83	1. 92
2.667	2.88	5. 750	11.52	8.833	3. 36	11. 92	1. 92
2.750	2.88	5. 833	46.08	8.917	3. 36	12.00	1. 92
2.833	2.88	5. 917	46.08	9.000	3. 36	12.08	1. 92
2. 917	2.88	6.000	46.08	9.083	3. 36	12. 17	1. 92
3.000	2.88	6. 083	126.72	9.167	3. 36	12. 25	1. 92
3. 083	2.88	6. 167	126.72	9.250	3. 36		

Unit Hyd Opeak (cms)= 0.177

PEAK FLOW (cms) = 0.098 (i)
TIME TO PEAK (hrs) = 6.250
RUNOFF VOLUME (mm) = 40.793
TOTAL RAINFALL (mm) = 96.000
RUNOFF COEFFICIENT = 0.425

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0038)	Area	(ha)=	1 56	Curve Number (CN) = 73.0
ID= 1 DT= 5.0 min	Ιa	(mm)=	10.00	# of Linear Res. (N) = 3.00
	U.H.	Tp(hrs)=	0. 22	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH									
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	0.00	3. 167	2.88	6.250	126. 72	9. 33	3. 36		
0. 167	0.00	3. 250	2.88	6.333	17. 28	9. 42	3. 36		
0. 250	0.00	3. 333	3.84	6.417	17. 28	9. 50	3. 36		
0.333	2.40	3. 417	3.84	6.500	17. 28	9. 58	3. 36		
0.417	2.40	3. 500	3.84	6.583	17. 28	9. 67	3.36		
0.500	2.40	3. 583	3.84	6.667	17. 28	9. 75	3. 36		
0.583	2.40	3. 667	3.84	6.750	17. 28	9. 83	3. 36		
0.667	2.40	3. 750	3.84	6.833	7. 68	9. 92	3.36		

3.00	10 2.88	6.083	126.72	9.167	3. 36 12. 25 1.	92
3. 08	3 2.88	6. 167	126.72	9.250	3. 36	
				'		
Max. Eff. Inten. ((mm/hr)=	126. 72		79. 06		
over	(min)	15.00		25.00		
Storage Coeff.	(mi n) =	13. 53	(ii)	23.07 (ii)		
Uni t Hyd. Tpeak	(mi n) =	15.00		25. 00		
Unit Hyd. peak	(cms)=	0.08		0. 05		
					TOTALS	
PEAK FLOW	(cms)=	0.44		0. 25	0.631 (iii)	
TIME TO PEAK	(hrs)=	6. 33		6. 50	6.42	
RUNOFF VOLUME	(mm) =	95.00		37. 26	57.47	
TOTAL RAINFALL	(mm) =	96.00		96.00	96.00	
RUNOFF COFFFICE	FNT =	0. 99		0. 39	0.60	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 59.0 | la = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH									
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	0.00	3. 167	2.88	6.250	126. 72	9. 33	3. 36		
0. 167	0.00	3. 250	2.88	6.333	17. 28	9. 42	3. 36		
0. 250	0.00	3. 333	3.84	6.417	17. 28	9. 50	3. 36		
0. 333	2.40	3. 417	3.84	6.500	17. 28	9. 58	3. 36		
0.417	2.40	3.500	3.84	6.583	17. 28	9. 67	3. 36		
0.500	2.40	3. 583	3.84	6.667	17. 28	9. 75	3. 36		
0. 583	2.40	3. 667	3.84	6.750	17. 28	9. 83	3. 36		
0.667	2.40	3. 750	3.84	6.833	7. 68	9. 92	3. 36		
0.750	2.40	3. 833	3.84	6.917	7. 68	10.00	3. 36		
0.833	2.40	3. 917	3.84	7.000	7. 68	10.08	3. 36		
0. 917	2.40	4.000	3.84	7.083	7. 68	10. 17	3. 36		
1.000	2.40	4. 083	3.84	7.167	7. 68	10. 25	3. 36		
1.083	2.40	4. 167	3.84	7.250	7. 68	10. 33	1. 92		
1. 167	2.40	4. 250	3.84	7.333	5. 76	10. 42	1. 92		
1. 250	2.40	4. 333	5.76	7.417	5. 76	10.50	1. 92		
1. 333	2.40	4. 417	5.76	7.500	5. 76	10. 58	1. 92		
1. 417	2.40	4. 500	5.76	7.583	5. 76	10. 67	1. 92		

0.750	2.40	3.833	3.84	6.917	7. 68	10.00	3, 36
0.833	2.40	3. 917	3.84	7.000	7. 68	10.08	3. 36
0. 917	2.40	4. 000	3.84	7.083	7. 68	10. 17	3. 36
1.000	2.40	4. 083	3.84	7.167	7. 68	10. 25	3. 36
1.083	2.40	4. 167	3.84	7.250	7. 68	10. 33	1. 92
1. 167	2.40	4. 250	3.84	7.333	5. 76	10. 42	1. 92
1. 250	2.40	4. 333	5.76	7.417	5. 76	10.50	1. 92
1. 333	2.40	4. 417	5.76	7.500	5. 76	10. 58	1. 92
1. 417	2.40	4.500	5.76	7.583	5. 76	10. 67	1. 92
1. 500	2.40	4. 583	5.76	7.667	5. 76	10. 75	1. 92
1. 583	2.40	4. 667	5.76	7.750	5. 76	10. 83	1. 92
1. 667	2.40	4. 750	5.76	7.833	5. 76	10. 92	1. 92
1. 750	2.40	4. 833	7.68	7.917	5. 76	11.00	1. 92
1. 833	2.40	4. 917	7.68	8.000	5. 76	11. 08	1. 92
1. 917	2.40	5.000	7.68	8.083	5. 76	11. 17	1. 92
2. 000	2.40	5. 083	7.68	8.167	5. 76	11. 25	1. 92
2. 083	2.40	5. 167	7.68	8.250	5. 76	11. 33	1. 92
2. 167	2.40	5. 250	7.68	8.333	3. 36	11. 42	1. 92
2. 250	2.40	5. 333	11.52	8.417	3. 36	11. 50	1. 92
2. 333	2.88	5. 417	11.52	8.500	3. 36	11. 58	1. 92
2. 417	2.88	5. 500	11.52	8.583	3. 36	11. 67	1. 92
2. 500	2.88	5. 583	11.52	8.667	3. 36	11. 75	1. 92
2. 583	2.88	5. 667	11.52	8.750	3. 36	11. 83	1. 92
2. 667	2.88	5. 750	11.52	8.833	3. 36	11. 92	1. 92
2. 750	2.88	5. 833	46.08	8.917	3. 36	12.00	1. 92
2. 833	2.88	5. 917	46.08	9.000	3. 36	12. 08	1. 92
2. 917	2.88	6.000	46.08	9.083	3. 36	12. 17	1. 92
3. 000	2.88	6. 083	126.72	9.167	3. 36	12. 25	1. 92
3. 083	2.88	6. 167	126.72	9.250	3. 36		

Unit Hyd Opeak (cms) = 0.271

PEAK FLOW (cms)= 0.181 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 41.047
TOTAL RAI NFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.428

CALIB				
STANDHYD (0040)	Area	(ha)= 3.43		
ID= 1 DT= 5.0 min	Total	I mp (%) = 50.00	Dir. Conn. (%)=	35. 00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1. 71	1. 71	
Dep. Storage	(mm) =	1. 00	5. 00	
Average Slope	(%)=	1. 00	2. 00	
Length	(m) =	151. 22	40.00	
Manni ngs n	` =	0.013	0.250	

	TRANSFORMED HYETOGRAPH							
TIME	RAIN	TIME	RAIN	' TIME	RAI N	TIME	RAIN	
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr	
0. 083	0.00	3. 167	2.88		126. 72		3. 36	
0. 167	0.00	3. 250	2.88	6.333	17. 28	9. 42	3. 36	
0. 250	0.00	3. 333	3.84	6.417	17. 28	9. 50	3. 36	
0. 333	2.40		3.84	6.500	17. 28	9. 58	3. 36	
0. 417	2.40	3. 500	3.84	6.583	17. 28	9. 67	3. 36	
0. 500	2.40	3. 583	3.84	6.667	17. 28	9. 75	3. 36	
0. 583	2.40		3.84	6.750	17. 28	9. 83	3. 36	
0. 667	2.40		3.84	6.833	7. 68 7. 68		3. 36	
0. 750 0. 833			3.84	6.917	7. 68	10.00	3. 36 3. 36	
0. 833	2.40 2.40		3.84	7.083	7. 68		3. 36	
1. 000	2.40		3.84	7.167	7. 68		3. 36	
1. 083	2.40		3.84	7. 250	7. 68		1. 92	
1. 167	2.40		3.84	7.333	5. 76		1. 92	
1. 250	2.40		5. 76	7.417	5. 76		1. 92	
1. 333	2.40		5.76	7.500	5. 76		1. 92	
1. 417	2.40		5.76	7.583	5. 76		1. 92	
1.500	2.40	4. 583	5.76	7.667	5. 76	10. 75	1. 92	
1. 583	2.40	4. 667	5.76	7.750	5. 76	10.83	1. 92	
1. 667	2.40	4. 750	5.76	7.833	5. 76	10. 92	1. 92	
1. 750	2.40		7.68	7.917	5. 76	11.00	1. 92	
1. 833	2.40		7.68	8.000	5. 76	11. 08	1. 92	
1. 917	2.40		7.68	8.083	5. 76	11. 17	1. 92	
2. 000	2.40		7.68	8.167	5. 76	11. 25	1. 92	
2. 083	2.40		7.68	8.250	5. 76	11. 33	1. 92	
2. 167	2.40	5. 250	7.68	8.333	3. 36	11. 42	1. 92	
2. 250 2. 333	2.40 2.88	5. 333 5. 417	11.52 11.52	8.417	3. 36 3. 36	11. 50 11. 58	1. 92 1. 92	
2. 333	2.88		11. 52	8.583	3. 36	11. 56	1. 92	
2, 500	2.88	5. 583	11.52	8.667	3. 36	11. 75	1. 92	
2. 583	2.88		11.52	8.750	3. 36	11.83	1. 92	
2. 667	2.88		11.52	8.833	3. 36	11. 92	1. 92	
2. 750	2.88		46.08	8. 917	3. 36	12.00	1. 92	
2. 833	2.88	5. 917	46.08	9.000	3. 36	12.08	1. 92	
2. 917	2.88	6.000	46.08	9.083	3. 36	12. 17	1. 92	
3.000	2.88	6. 083	126.72	9.167	3. 36	12. 25	1. 92	
3. 083	2.88	6. 167	126.72	9. 250	3. 36	İ		
Max.Eff.Inten.(mm		126. 72		79. 06				
over (5. 00		15. 00				
	mi n) =		(ii)	10. 73 (ii)			
Unit Hyd. Tpeak (5. 00		15.00				
Unit Hyd. peak (cms)=	0. 28		0. 09	***	TALC*		
PEAK FLOW (cms)=	0. 42		0. 24		TALS* .634 (iii)	`	
FEAR FLUW (uiis)=	0. 42		U. 24	U.	. 034 (111	,	

ADD HYD (0041) 3 + 2 = 1 					
NOTE: PEAK FLOWS DO					
ID1= 1 (0039): + ID2= 2 (0041):	(ha) 0.83 11.37	1. 490	(hrs) 6.33 6.25	(mm) 43. 23 53. 75	
ID = 3 (0032): NOTE: PEAK FLOWS DO	12. 20	1. 595	6.25	53. 03	
V V I SSSSS V V I SS V V I SS V V I SS VV I SSSSS	U U U U U U	A A L AAAAA L A A L	LLL	(v 6.2.	2011)
000 TTTTT TTTTT 0 0 T T 0 0 T T 000 T T Developed and Distributed Copyright 2007 - 2021 Smar All rights reserved.	H H H H H H by Smart	YY MM Y M Y M City Wate	1 MM O M O M OOO	0	

***** DETAILED OUTPUT *****

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C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\f82b2933-6454-44e7-825f-1f59f9

TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT = ***** WARNING: STORAGE COEFFI (i) CN PROCEDURE SELI CN* = 59.0 (ii) TIME STEP (DT) SI THAN THE STORAGE (iii) PEAK FLOW DOES N	F. IS SI ECTED FO Ia = DO HOULD BI COEFFI	MALLER THA OR PERVIOL ep. Storag E SMALLER CIENT.	IN TIME ST IS LOSSES: IE (Above OR EQUAL	ΓΕΡ! e)	6. 25 57. 47 96. 00 0. 60				
ADD HYD (0041) 1 + 2 = 3									
ADD HYD (0041) 3 + 2 = 1 ID1= 3 (0041): + ID2= 2 (0037):	AREA (ha) 5. 73 0. 65	QPEAK (cms) 0. 679 0. 098	TPEAK (hrs) 6.33 6.25	R. V. (mm) 56. 45 40. 79					
ID = 1 (0041): NOTE: PEAK FLOWS DO N									
ADD HYD (0041) 1 + 2 = 3									

COMMENTS:				
** SIMULATION : 2-00	 	Chi cago **		
READ STORM	at 07	\Users\r.rajachock a\Local\Temp\ 3789e9-0d0b-43a3-a eated from IDF Gro	ada4-078b0c00e084\	
TIME hrs 0.00 0.17 0.33 0.50 0.67 0.83	2. 45 1. 0 2. 76 1. 1 3. 17 1. 3 3. 78 1. 5 4. 76 1. 6	s mm/hr hrs 0 13.68 2.00 7 71.35 2.17	5.08 3.00 4.44 3.17	2. 67 2. 52 2. 39
CALIB STANDHYD (0006) D= 1 DT= 5.0 min	Area (ha)= Total Imp(%)=	5.62 50.00 Dir. Cor	nn. (%)= 35. 00	
Surface Area Dep. Storage Average Slope Length Mannings n	(mm) = 1.	81 2. 81 00 5. 00 00 2. 00 56 10. 00	(i)	

TIME: 02:15:46

DATE: 06-15-2023

USER:

TRANSFORMED HYETOGRAPH									
TIME	RAIN	TIME	RAIN	Ι.	TIME	RAIN		TIME	RAIN
hrs	mm/hr	hrs	mm/hr	į.	hrs	mm/hr	ĺ	hrs	mm/hr

0. 08:		1.083	13.68	2.083	5. 08	3. 08	2. 85
0. 16		1. 167	13.68		5. 08	3. 17	2. 85
0. 250		1. 250	71.35	2.250	4.44	3. 25	2. 67
0. 333		1. 333	71.35	2.333	4.44	3. 33	2. 67
0. 41	7 3.17	1.417	17.30	2.417	3. 96	3. 42	2. 52
0. 500	0 3.17	1.500	17.30	2.500	3. 96	3. 50	2. 52
0. 583	3 3.78	1.583	10.08	2.583	3. 59	3. 58	2. 39
0. 66	7 3.78	1.667	10.08	2.667	3.59	3. 67	2. 39
0. 750	0 4.76	1. 750	7.43	2.750	3. 30	3. 75	2. 27
0. 833	3 4.76	1.833	7.43	2.833	3. 30	3. 83	2. 27
0. 91	7 6.70	1. 917	5.99	2.917	3.05	3. 92	2. 16
1. 000	0 6.70	2.000	5.99	3.000	3. 05	4. 00	2. 16
Max. Eff. Inten. (r	mm/hr)=	71. 35		10. 26			
over	(mi n)	5.00		10.00			
Storage Coeff.	(mi n) =	4. 35	(ii)	8.40 (ii)			
Uni t Hyd. Tpeak		5.00		10.00			
Unit Hyd. peak		0. 23		0. 12			
, , , , , , , , , , , , , , , , , , ,	,				*T0	ΓALS*	
PEAK FLOW	(cms)=	0. 36		0.06		398 (111)
TIME TO PEAK	(hrs)=	1. 33		1. 42		1.33	•
RUNOFF VOLUME	(mm) =	30. 29		4. 61		3. 60	
TOTAL RAINFALL	(mm) =	31. 29		31. 29		1. 29	
RUNOFF COEFFICII		0. 97		0. 15		0. 43	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: (i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(0022)

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH RAIN | TIME TIME RAIN | TIME RAIN RAIN | TIME mm/hr 2.45 mm/hr 13.68 mm/hr 5.08 | hrs 3. 08 mm/hr 2.85 0.167 2.45 1. 167 13.68 2.167 5. 08 3. 17 2.85 2.76 1. 250 1. 333 71. 35 | 2. 250 71. 35 | 2. 333 4. 44 4. 44 0.333 3. 33 2.67 0.417 3.17 1. 417 17.30 2.417 2.500 3.96 3. 42 2.52

(0030) Area (ha)= 1.56 Curve Number (CN)= 73.0 I a (mm)= 10.00 # of Li near Res.(N)= 3.00 U.H. Tp(hrs)= 0.22 |ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYFTOGRAPH TIME TIME RAIN | RAIN hrs mm/hr hrs mm/hr hrs mm/hr i hrs mm/hr 2 083 0.083 2 45 1 083 13 68 5 08 3 08 2 85 0.250 2.76 1. 250 71.35 2.250 4.44 3.25 2.67 2.76 0 333 1 333 71 35 2 333 4 44 3 33 2 67 17.30 3. 96 2. 52 0.500 3.17 1.500 17.30 2.500 3.96 2. 52 3. 78 3. 78 1. 583 10 08 2.583 2. 39 0. 667 1. 667 10.08 2.667 3. 59 3. 67 2. 39 7. 43 | 7. 43 | 5. 99 | 1. 750 1. 833 0.750 4 76 2 750 3 30 3 75 2 27 0. 833 0. 917 4. 76 6. 70 2. 833 2. 917 3. 83 3. 92 3. 30 2. 27 1. 917 3.05 2.16 1.000 6.70 | 2.000 5.99 3.000 3.05

Unit Hyd Opeak (cms) = 0.271

0.012 (i) TIME TO PEAK (hrs) = 1. 667
RUNOFF VOLUME (mm) = 3. 927
TOTAL RAINFALL (mm) = 31. 287
RUNOFF COEFFICIENT = 0. 126

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALLB CALIB | NASHYD (0031)|

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH ---RAIN | TIME RAIN | TIME RAIN | TIME mm/hr | hrs mm/hr | hrs mm/hr | hrs TIME RAIN mm/hr hrs hrs mm/hr 3. 08 0.083 2. 45 2. 45 1. 083 13.68 | 2.083 5.08 2.85 13.68 | 2.167

3. 78 | 1. 583 3. 78 | 1. 667 0.583 10 08 | 2 583 2. 39 2. 39 2. 27 2. 27 2. 563 2. 667 2. 750 2. 833 0. 667 0. 750 10.08 3. 59 3. 67 4.76 4.76 1. 750 1. 833 7.43 7.43 3. 30 3. 75 3. 83 0.833 1.000 6.70 2.000 5.99 | 3.000 3. 05 j 2.16

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms) = 0.007 (1)
TIME TO PEAK (hrs) = 1.583
RUNOFF VOLUME (mm) = 4.266
TOTAL RAINFALL (mm) = 31.287
RUNOFF COEFFICIENT = 0.136

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(0023) | ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYFTOGRAPH TIME RAIN TIME RAIN | TIME RAIN | TIME RAIN mm/hr mm/hr 2.083 0.083 3.08 2.45 1.083 13.68 5.08 I 2.85 0. 167 0. 250 1. 167 1. 250 2. 167 2. 250 3. 17 3. 25 2. 85 2. 67 0.333 2.76 1. 333 71.35 2.333 4.44 3.33 2.67 0. 417 0. 500 17.30 17.30 2. 417 2. 500 3. 96 3. 96 2. 52 2. 52 0.583 3 78 1 583 10 08 2 583 3 59 2 39 10.08 | 2.667 7.43 | 2.750 7.43 | 2.833 0. 667 0. 750 3. 78 4. 76 1. 667 1. 750 2. 39 2. 27 3. 67 3. 75 3.30 1. 833 1. 917 0.833 4.76 3 30 3 83 2. 27 5. 99 | 2. 917 5. 99 | 3. 000 1.000 6.70 | 2.000 3.05 2.16

Unit Hyd Opeak (cms) = 0.078

PEAK FLOW TIME TO PEAK (cms)= (hrs)= 0.004 (i) 1. 583 RUNOFF VOLUME (mm) = 4.268 TOTAL RAI NFALL (mm) = 31.287 RUNOFF COEFFICIENT = 0.136 RUNOFF VOLUME

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

2.76 2.76 3.17 3.17 71.35 71.35 17.30 17.30 0. 333 0. 417 2.333 1. 333 4. 44 3. 33 1.417 3. 42 3. 50 3. 96 3. 96 2. 52 2. 52 0.500 1.500 2.500 2. 39 2. 27 2. 27 0.667 3.78 1.667 10.08 2.667 3.59 3.67 0.750 4. 76 | 4. 76 | 1. 750 7. 43 7. 43 2 750 3. 30 0. 833 1. 833 2.833 3. 30 3. 83 6. 70 | 1. 917 6. 70 | 2. 000 3. 92 4. 00 2. 16 2. 16 0.917 5.99 2.917 3.05 1. 000 5.99 3.000

Unit Hyd Opeak (cms) = 0.177

| (cms) = 0.006 | (hrs) = 1.500 | (NNOFF VOLUME | (mm) = 3.902 | TOTAL RAINFALL | (mm) = 31.007 | RUNOFF COFFELOR | (mm) = 31.007 PEAK FLOW (cms)= 0.006 (i)

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

STANDHYD (0005) (ha)= 5.32 Area ID= 1 DT= 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 IMPERVIOUS PERVIOUS (i) Surface Area Dep. Storage 2. 66 1. 00 (ha)= 2. 66 5. 00 (mm) = (%) = (m) = 1.00 Average Slope 1.00 188. 33 0. 130 40. 00 0. 250 Mannings n

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | RAIN TIME TIME RAIN RAIN | TIME mm/hr 2.45 2.45 mm/hr mm/hr mm/hr 0.167 1.167 13.68 2.167 5.08 3.17 2.85 0 250 2.76 2.76 1 250 2, 250 4 44 2.67 0.417 3.17 1.417 17.30 2.417 3.96 3.42 2.52 0. 500 0. 583 3. 17 3. 78 1. 500 1. 583 17. 30 10. 08 2.500 2.583 3. 96 3. 59 2. 52 2. 39 3. 67 3. 75 0.667 3.78 1.667 10.08 2.667 3.59 2.39 7. 43 | 2. 750 7. 43 | 2. 833 2. 27 2. 27 4.76 1.833 3.83 0.833 3.30 0.917 6.70 6.70 1. 917 5.99 2.917 3.05 3. 92 2. 16

```
Max. Eff. Inten. (mm/hr)=
                                                   20. 00
20. 59 (ii)
                                                                           50. 00
47. 63 (ii)
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                     0.06
                                                                             0.02
                                                                                                    *T0T4LS*
                                                                                                       0. 153 (iii)
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
                                                   1. 58
30. 29
31. 29
                                                                           2. 25
4. 61
31. 29
                                                                                                         1.58
RUNOFF COEFFICIENT
```

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: (1) ON PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 59.0 Ia = Dep. Storage (Above)

 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

 THAN THE STORAGE COEFFICIENT.

 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALLB | STANDHYD (0028)| |ID= 1 DT= 5.0 min | Area (ha)= 3.43 Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00 IMPERVIOUS PERVIOUS (i) 1. 71 1. 00 1. 00 151. 22 1. 71 5. 00 2. 00 Surface Area Dep. Storage Average Slope Length (mm) = (%) = (m) = 40.00 Manni ngs n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH									
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	2.45	1.083	13.68	2.083	5. 08	3. 08	2.85		
0. 167	2.45	1. 167	13.68	2.167	5. 08	3. 17	2.85		
0. 250	2.76	1. 250	71.35	2.250	4.44	3. 25	2. 67		
0. 333	2.76	1. 333	71.35	2.333	4.44	3. 33	2. 67		
0.417	3.17	1. 417	17.30	2.417	3. 96	3. 42	2. 52		
0.500	3.17	1.500	17.30	2.500	3. 96	3.50	2. 52		
0. 583	3.78	1. 583	10.08	2.583	3. 59	3. 58	2.39		
0.667	3.78	1. 667	10.08	2.667	3. 59	3. 67	2.39		
0.750	4.76	1. 750	7.43	2.750	3. 30	3.75	2. 27		
0.833	4.76	1.833	7.43	2.833	3. 30	3.83	2. 27		
0. 917	6.70	1. 917	5.99	2.917	3.05	3. 92	2. 16		
1.000	6.70	2.000	5.99	3.000	3. 05	4.00	2. 16		

	0007): 0030): ======= 0007):	1.56 ======= 5.40	QPEAK (cms) 0.023 0.012 0.033	1.67 ======= 1.67	3. 93 ====== 10. 03	
ADD HYD (000 1 + 2 = 3 ID1= 1 (+ ID2= 2 (0007): 0031):	AREA (ha) 5.40 0.65	QPEAK (cms) 0.033 0.006	TPEAK (hrs) 1.67 1.50	R.V. (mm) 10.03 3.90	
	0007):	6.05	0. 038	1.67	9. 37	
ADD HYD (000 3 + 2 = 1 ID1= 3 (+ ID2= 2 (0007): 0005):	5.32	0. 153	1.58	13. 59	
3 + 2 = 1 ID1= 3 (+ ID2= 2 (=======	0007): 0005): ====== 0007):	5. 32 ====== 11. 37	0. 153 0. 190	1.58 ====== 1.58	13. 59 ====== 11. 35	

AREA

INFLOW: ID= 2 (0007)

TPEAK

```
Max. Eff. Inten. (mm/hr) =
Max.ETT.Inten. (mm/nr)=
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                          5. 00
3. 75 (ii)
5. 00
                                                                                   25. 00
24. 89 (ii)
                                                                                   25.00
                                                                                                               *TOTALS*
                                                                                                                 0. 228 (III)
1. 33
PEAK FLOW
                               (cms)=
(hrs)=
                                                          0. 22
                                                                                     0 02
 TIME TO PEAK
                                                           1. 33
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                        30. 29
31. 29
                                                                                   4. 61
31. 29
                                                                                                                  13.60
                                                          0. 97
                                                                                    0.15
```

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: (I) ON PROCEDURE SELECTED FOR PERVITORS LOSSES:

 CN* = 59.0 Ia = Dep. Storage (Above)

 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

 THAN THE STORAGE COEFFICIENT.

 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

OVERFLOW IS OFF

RESERVOI R(0029) | I N= 2---> OUT= 1 | IN= 2---> OUT= DT= 5.0 min OUTFLOW STORAGE | OUTFLOW STORAGE (ha.m.) (cms) 0.0000 QPEAK ARFA TPFAK (hrs) 1.33 2.67 (ha) 3. 430 (cms) 0. 228 INFLOW: ID= 2 (0028) OUTFLOW: ID= 1 (0029) 13, 60

 PEAK
 FLOW
 REDUCTION [Qout/Qin] (%) = 9.25

 TIME SHIFT OF PEAK FLOW (min) = 80.00

 MAXIMUM STORAGE USED (ha. m.) = 0.0281

0. 021

3. 430

ADD HYD (0007) | 1 + 2 = 3 | AREA QPEAK **TPEAK** (ha) 0.41 (cms) 0.004 (hrs) 1.58 ID1= 1 (0023): + ID2= 2 (0029): 3.43 0.021 13, 50 ID = 3 (0007): 3.84 0.023

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

OUTFLOW: ID= 1 (0008) 11.370 0.070 2.83 11 34

> PEAK FLOW REDUCTION [Qout/Qin] (%) = 36.70
> TIME SHIFT OF PEAK FLOW (min) = 75.00 MAXIMUM STORAGE USED (min)= 75.00 (ma.m.)= 0.0387

ADD HYD (0016) | 1 + 2 = 3 | QPEAK AREA TPEAK (ha) 0.83 (cms) 0.007 (hrs) 1.58 (mm) 4. 27 ID1= 1 (0022): + ID2= 2 (0008): 11.37 0.070 2.83 ID = 3 (0016): 12.20 0.073 10.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALLB Area (ha)= 12.20 Curve Number (CN)= 64.0 la (mm)= 6.90 # of Linear Res. (N)= 3.00 U.H. Tp(hrs)= 0.61 (0019) || ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYFTOGRAPH -TIME RAIN | hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0. 083 0. 167 1. 083 1. 167 13.68 13.68 2. 083 2. 167 2.250 0.250 2.76 1. 250 71.35 4.44 2.67 0. 333 0. 417 2.76 3.17 1. 333 71.35 17.30 2. 333 2. 417 3. 33 3. 42 2. 67 2. 52 0.500 3 17 1 500 17 30 2 500 3 96 2 52 0. 583 0. 667 3. 78 3. 78 1. 583 1. 667 10.08 | 2.583 10.08 | 2.667 3. 59 3. 59 3. 58 3. 67 2. 39 2. 39 2. 750 2. 833 2. 917 0.750 1. 750 1. 833 7.43 | 3. 30 3. 30 3. 75 3. 83 2. 27 2. 27 0. 833 0.917 6. 70 | 1. 917 6. 70 | 2. 000 5.99 3.05 3. 92 2. 16 1.000 5.99 | 3.000 3.05 4.00

Unit Hyd Opeak (cms) = 0.764

TIME TO PEAK (hrs) = 2.167
RUNOFF VOLUME (mm) = 3.556
TOTAL RAINFALL (mm) = 31.287
RUNOFF COEFFICIENT = 0.114

(0039)

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME mm/hr hrs mm/hr hrs mm/hr mm/hr 0.167 2.45 1. 167 13.68 2.167 5.08 3.17 2.85 0 250 2.76 1 250 2 250 4 44 2 67 2.76 1. 333 2.333 3. 33 0.417 3.17 1.417 17.30 2.417 3.96 2. 52 3.17 1. 500 17.30 2.500 2. 52 0. 583 1. 583 10.08 2.583 3. 78 | 4. 76 | 4. 76 | 1. 667 1. 750 1. 833 2. 667 2. 750 2. 833 0 667 10.08 3 59 2 39 7. 43 | 0. 750 3. 30 2. 27 2. 27 0.833 3.30 3.83 0. 917 1. 000 6. 70 | 1. 917 6. 70 | 2. 000 5 99 2 917 3 05 3 92 2 16

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms)= 0.007 (i) TIME TO PEAK (hrs) = 1.583
RUNOFF VOLUME (mm) = 4.266
TOTAL RAINFALL (mm) = 31.287 TOTAL RAINFALL (mm) = 31.287 RUNOFF COEFFICIENT = 0.136

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(0033)

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH RAIN | TIME RAIN | TIME RAIN | TIME
mm/hr | hrs mm/hr | hrs mm/hr | hrs
2.45 | 1.083 | 13.68 | 2.083 | 5.08 | 3.08 TIME RAIN mm/hr

1.000 6.70 | 2.000 5.99 | 3.000 3.05 | 4.00 2.16

Max. Eff. Inten. (mm/hr) = over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 20.00 50.00 20.59 (ii) 47.63 (ii) 20.00 50.00 0. 06 0. 02 0. 15 1. 58 30. 29 0. 153 (iii) 1. 58 0.02 (cms)= TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) = 2. 25 4. 61 13.59 TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = 31.29 31. 29

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 59.0 | Ia = Dep. Storage (Above)

(i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | NASHYD (0037) | Area (ha)= 0.65 Curve Number (CN)= 73.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.14

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH ME RAIN | TIME F TIME hrs mm/hr hrs mm/hr hrs mm/hr i hrs mm/hr 0. 083 0. 167 2. 45 2. 45 5. 08 5. 08 3. 08 3. 17 13.68 13.68 2.083 2.167 2. 85 2. 85 1.167 0 250 2 76 1 250 71 35 2 250 4 44 2 67 0. 333 0. 417 71. 35 17. 30 2. 333 2. 417 4. 44 3. 96 1. 333 1. 417 2. 67 2. 52 0.500 3. 17 3. 78 1 500 17 30 2 500 3 96 2 52 2.583 2.667 0.667 3.78 1.667 10.08 3.59 3.67 2.39 4.76 4.76 1. 750 1. 833 7.43 7.43 2.750 2.833 3. 30 3. 30 2 27 0.917 6.70 1. 917 5.99 2.917 3.05 3.92 2.16 6.70 | 2.000 5.99 | 3.000

Unit Hyd Opeak (cms) = 0.177

PEAK FLOW (cms)= 0.006 (i) TIME TO PEAK (hrs) = 1.500 (mm) = 3.902

1. 167 13.68 | 2.167 71.35 | 2.250 5. 08 4. 44 0 167 2. 76 2. 76 3. 17 0. 250 1. 250 0.333 71.35 17.30 2.333 2.417 4.44 3. 33 1.333 2. 67 2. 52 0.417 1.417 3.96 3. 42 0.583 3.78 1.583 10.08 2.583 3.59 3.58 2. 39 2. 39 0. 667 0. 750 1. 667 1. 750 2. 667 2. 750 3.78 10.08 3 50 3. 67 4.76 3. 30 2. 27 0.833 4.76 1. 833 1. 917 7.43 2.833 3.30 3.83 2.27 1. 000 6.70 | 2.000 5.99 | 3.000

Unit Hyd Opeak (cms) = 0.078

PEAK FLOW (cms)= 0.004 (i) PEAK FLOW (CMS) = 0.004
TIME TO PEAK (hrs) = 1.583
RUNOFF VOLUME (mm) = 4.268
TOTAL RAINFALL (mm) = 31.287
RUNOFF COEFFICIENT = 0.136 1. 583 4. 268

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| STANDHYD (0036)| |ID= 1 DT= 5.0 min | Area (ha)= 5.32Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00IMPERVIOUS PERVIOUS (i) 2. 66 1. 00 2. 66 5. 00 (mm) = Dep. Storage Average Slope Length (%) = (m) = 1. 00 188. 33 Manni ngs n

0.130 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

> TRANSFORMED HYETOGRAPH RAIN | TIME mm/hr | hrs TIME RAIN TIME RAIN | TIME RAIN hrs 0.083 mm/hr 13.68 | 2.083 3. 08 2.45 1.083 5.08 | 2.85 0. 167 0. 250 2.45 2.76 1. 167 1. 250 13. 68 | 2. 167 71. 35 | 2. 250 2. 85 2. 67 2. 76 3. 17 3. 17 71.35 0.333 1.333 2.333 4.44 3. 33 2.67 0. 417 0. 500 1. 417 1. 500 17. 30 17. 30 2. 417 2. 500 3. 96 3. 96 2. 52 2. 52 0.583 3.78 1.583 10.08 2.583 3.59 3. 58 2.39 1. 667 1. 750 10.08 | 2.667 7.43 | 2.750 2. 39 2. 27 4.76 3. 30 0.750 3.75 0.833 4.76 1.833 7.43 2.833 3. 30 3. 83 2. 27

0.250

TOTAL RAINFALL (mm) = 31.287 RUNOFF COEFFICIENT = 0.125

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH RAIN | TIME TIME RAIN | TIME RAIN | TIME RAIN mm/hr 2.45 hrs 1. 083 mm/hr 2.85 mm/hr mm/hr 13.68 | 2.083 5. 08 | 0.167 2.45 1, 167 13.68 2.167 5.08 3. 17 2.85 2.76 1. 250 2. 250 2. 67 2. 67 0. 333 1. 333 3. 17 3. 17 17.30 17.30 0 417 1 417 2 417 3 96 2 52 0. 500 0. 583 2.500 2.583 3. 96 3. 59 1. 500 3.78 1.583 3.58 2.39 10.08 10.08 | 7.43 | 7.43 | 0. 667 0. 750 1. 667 1. 750 2. 667 2. 750 3. 67 3. 75 3.78 2. 39 4. 76 | 1. 833 6. 70 | 1. 917 6. 70 | 2. 000 0.833 2.833 3.30 3.83 2.27 5.99 0. 917 2.917 3.000

Unit Hyd Opeak (cms) = 0.271

PEAK FLOW (cms)= 0.012 (i) TIME TO PEAK (hrs) = 1. 667
RUNOFF VOLUME (mm) = 3. 927
TOTAL RAI NFALL (mm) = 31. 287
RUNOFF COEFFICIENT = 0. 126

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

STANDHYD (0040) (ha)= Area 3.43 Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00 | ID= 1 DT= 5.0 min | PERVIOUS (i) IMPERVIOUS 1. 71 1. 00 (ha)= (mm)= 1. 71 5. 00 Dep. Storage Average Slope Length (%) = (m) = 1.00 2.00

Manni ngs n 0.013 0 250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	NSFORME	D HYETOGRA	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	2.45	1.083	13.68	2.083	5. 08	3. 08	2.85
0. 167	2.45	1. 167	13.68	2.167	5. 08	3. 17	2.85
0. 250	2.76	1. 250	71.35	2.250	4.44	3. 25	2.67
0. 333	2.76	1. 333	71.35	2.333	4.44	3. 33	2.67
0.417	3.17	1.417	17.30	2.417	3. 96	3. 42	2. 52
0.500	3.17	1.500	17.30	2.500	3. 96	3.50	2. 52
0. 583	3.78	1.583	10.08	2.583	3. 59	3. 58	2. 39
0.667	3.78	1.667	10.08	2.667	3. 59	3. 67	2.39
0.750	4.76	1. 750	7.43	2.750	3. 30	3.75	2. 27
0.833	4.76	1.833	7.43	2.833	3. 30	3.83	2. 27
0. 917	6.70	1. 917	5.99	2.917	3.05	3. 92	2. 16
1.000	6.70	2.000	5.99	3.000	3. 05	4.00	2. 16

Max. Eff. Inten. (mm/hr)= over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)= 5. 00 3. 75 (ii) 5. 00 25. 00 24. 89 (ii) 25. 00 Unit Hyd. peak (cms)= 0. 25 0.05 *TOTALS* PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT = 0. 228 (iii) 1. 33 13. 60 0. 22 0. 02 1. 33 30. 29 31. 29 1. 67 4. 61 31. 29 31.29

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 59.0 | Ia = Dep. Storage (Above
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0041)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0033):	0.41	0. 004	1.58	4. 27
+ ID2= 2 (0036):	5.32	0. 153	1.58	13. 59
			=======	
ID = 3 (0041):	5.73	0. 156	1.58	12. 93

V	V	1	SSSSS	U	U		Д	L				(v 6.2.2011)
٧	V	- 1	SS	U	U	Α	Α	L					
V	٧	- 1	SS	U	U	AA	AAA	L					
V	V	- 1	SS	U	U	Α	Α	L					
V	V	- 1	SSSSS	UUI	JUU	Α	Α	LLI	LLL				
00	0	TTTTT	TTTTT	Н	Н	Υ	Υ	M	М	00	00	TM	
0	0	Т	T	Н	Н	Υ	Υ	MM	MM	0	0		
0	0	T	T	Н	Н	,	Y	M	M	0	0		
00	0	T	T	Н	Н	,	Y	M	M	00	00		

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***** DETAILED OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

Output filename:

C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\6a5948be-f7d0-4ef1-9bb6-200d1f

Summary filename:

C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\6a5948be-f7d0-4ef1-9bb6-200d1f

DATE: 06-15-2023

TIME: 02:15:47

USER:

** SIMULATION : 2-005yr 4hr 10min Chicago **

Filename: C:\Users\r.rajachockalingam\AppD READ STORM ata\Local\Temp\
073789e9-0d0b-43a3-ada4-078b0c00e084\e64c0150

Comments: created from IDF Group New IDFGroup - 2 Ptotal = 41.38 mm RAIN | TIME RAIN | TIME RAIN | TIME RAIN

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS LE ANY

ADD HYD (0041)				
3 + 2 = 1	AREA (ha) 5.73 0.65	QPEAK (cms) 0. 156 0. 006	TPEAK (hrs) 1.58 1.50	R.V. (mm) 12.93 3.90
ID = 1 (0041):	6.38	0. 162	1.58	12. 01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041) | 1 + 2 = 3 | ARFA OPFAK TPFAK R. V. (hrs) (cms) (mm) (ha) ID1= 1 (0041): + ID2= 2 (0038): 6.38 0.162 12. 01 0. 012 ID = 3 (0041): 7.94 0.173 1 58 10.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)| 3 + 2 = 1 | AREA (mm) (ha) (cms) (hrs) 0. 173 0. 228 10. 42 13. 60 3.43 11.37 0.317

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS LE ANY

ADD HYD (0032)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0039):	0.83	0.007	1.58	4. 27
+ ID2= 2 (0041):	11.37	0. 317	1.33	11. 38
===============				
ID = 3 (0032):	12.20	0. 320	1.33	10.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

hrc	mm/hr	bro	mm/hr '	hrc	mm/hr l	hrc	mm/hr
			18.09				
			94.66				
			22.88				
0.50	4.98	1.50	13.31	2.50	4.74	3.50	3. 14
			9.80				
0.83	8.85	1.83	7. 91	2.83	4. 02	3.83	2.85

CALIB | STANDHYD (0006) | |ID= 1 DT= 5.0 min | Area (ha)= 5.62Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00I MPERVI OUS PERVIOUS (i)

2. 81 1. 00 1. 00 Surface Area (ha)= 2. 81 5. 00 (mm) = (%) = (m) = Dep. Storage Average Slope 2. 00 Lenath 193, 56 10.00 Mannings n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	HYETOGRA	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.23	1. 083	18.09	2.083	6. 70	3. 08	3.75
0. 167	3.23	1. 167	18.09	2.167	6. 70	3. 17	3.75
0. 250	3.63	1. 250	94.66	2.250	5. 86	3. 25	3. 52
0.333	3.63	1. 333	94.66	2.333	5. 86	3. 33	3. 52
0.417	4.18	1. 417	22.88	2.417	5. 23	3. 42	3. 32
0.500	4.18	1. 500	22.88	2.500	5. 23	3.50	3. 32
0.583	4.98	1. 583	13.31	2.583	4.74	3. 58	3. 14
0.667	4.98	1. 667	13.31	2.667	4.74	3. 67	3.14
0.750	6.28	1. 750	9.80	2.750	4. 35	3. 75	2. 99
0.833	6.28	1.833	9.80	2.833	4. 35	3.83	2. 99
0. 917	8.85	1. 917	7.91	2.917	4. 02	3. 92	2.85
1. 000	8.85	2.000	7.91	3.000	4. 02	4. 00	2.85

1.000	0.00	2.000	7. 71 3.000	4.02 4.00
Max. Eff. Inten. (r	mm/hr)=	94. 66	19. 23	
over	(mi n)	5. 00	10.00	
Storage Coeff.	(mi n) =	3. 88	(ii) 7.50 (ii)	
Uni t Hyd. Tpeak	(mi n) =	5. 00	10. 00	
Unit Hyd. peak	(cms)=	0. 25	0. 13	
,				*TOTALS*
PEAK FLOW	(cms)=	0.49	0. 11	0.567 (iii)
TIME TO PEAK	(hrs)=	1. 33	1. 42	1.33
RUNOFF VOLUME	(mm) =	40. 38	8. 13	19.42
TOTAL RAINFALL	(mm) =	41. 38	41. 38	41.38
RUNOFF COEFFICII	ENT =	0. 98	0. 20	0.47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

CALLB NASHYD (0022) |ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ansformei) HYETOGRA	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.23	1.083	18.09	2.083	6.70	3. 08	3.75
0. 167	3.23	1. 167	18.09	2.167	6. 70	3. 17	3.75
0. 250	3.63	1. 250	94.66	2.250	5.86	3. 25	3. 52
0.333	3.63	1. 333	94.66	2.333	5.86	3. 33	3. 52
0.417	4.18	1. 417	22.88	2.417	5. 23	3. 42	3. 32
0.500	4.18	1.500	22.88	2.500	5. 23	3. 50	3. 32
0.583	4.98	1. 583	13.31	2.583	4.74	3. 58	3. 14
0.667	4.98	1. 667	13.31	2.667	4.74	3. 67	3. 14
0.750	6.28	1. 750	9.80	2.750	4. 35	3. 75	2. 99
0.833	6.28	1. 833	9.80	2.833	4. 35	3. 83	2. 99
0. 917	8.85	1. 917	7.91	2.917	4. 02	3. 92	2.85
1.000	8.85	2.000	7.91	3.000	4. 02	4.00	2.85

Unit Hyd Opeak (cms) = 0.167

PEAK FLOW (cms) = 0.017 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 8.466
TOTAL RAINFALL (mm) = 41.381
RUNOFF COEFFICIENT = 0.205

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALI B (0023) || ID= 1 DT= 5.0 min |

Unit Hyd Qpeak (cms) = 0.271

PEAK FLOW (cms)= 0.027 (i) TIME TO PEAK (hrs) = 1.583
RUNOFF VOLUME (mm) = 7.847
TOTAL RAINFALL (mm) = 41.381
RUNOFF COEFFICIENT = 0.190

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH RAIN | TIME RAIN | TIME mm/hr | hrs mm/hr | hrs 18.09 | 2.083 | 6.70 | 3.08 TIME RAIN | TIME mm/hr 3.23 hrs 1. 083 6. 70 5. 86 5. 86 0.167 3.23 1. 167 18.09 2.167 3.75 3. 63 3. 63 4. 18 94. 66 94. 66 22. 88 2. 250 2. 333 2. 417 0. 250 1. 250 0. 333 1. 333 1.417 0.417 5. 23 3.32 1. 500 1. 583 2.500 2.583 4.98 | 1.583 4.98 | 1.667 6.28 | 1.750 6.28 | 1.833 8.85 | 1.917 8.85 | 2.000 2.667 0.667 13.31 4.74 3.67 3.14 0. 750 0. 833 9.80 2.750 2.833 4. 35 4. 35 3. 75 3. 83 0 917 7. 91 | 2. 917 7. 91 | 3. 000 4 02 3 92 2 85

Unit Hyd Qpeak (cms) = 0.177

PEAK FLOW 0.014 (i) (cms)= TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 7.798
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.188

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

		TR	ANSFORMFI) HYFTOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.23	1. 083	18.09	2.083	6.70	3.08	3.75
0. 167	3.23	1. 167	18.09	2.167	6. 70	3. 17	3.75
0. 250	3.63	1. 250	94.66	2.250	5. 86	3. 25	3. 52
0.333	3.63	1. 333	94.66	2.333	5. 86	3. 33	3. 52
0.417	4.18	1. 417	22.88	2.417	5. 23	3.42	3. 32
0.500	4.18	1.500	22.88	2.500	5. 23	3.50	3. 32
0.583	4.98	1. 583	13.31	2.583	4.74	3. 58	3. 14
0.667	4.98	1. 667	13.31	2.667	4.74	3. 67	3. 14
0.750	6.28	1. 750	9.80	2.750	4. 35	3. 75	2. 99
0.833	6.28	1. 833	9.80	2.833	4. 35	3.83	2. 99
0. 917	8.85	1. 917	7.91	2.917	4. 02	3. 92	2.85
1. 000	8.85	2.000	7.91	3.000	4. 02	4.00	2.85

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms)= 0.008 (i) TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 8.469
TOTAL RAINFALL (mm) = 41.381
RUNOFF COEFFICIENT = 0.205

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | NASHYD (0030) | Area (ha)= 1.56 Curve Number (CN)= 73.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP

		TRA	ANSFORME) HYETOGRA	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.23	1.083	18.09	2.083	6. 70	3. 08	3.75
0. 167	3.23	1. 167	18.09	2.167	6. 70	3. 17	3. 75
0. 250	3.63	1. 250	94.66	2.250	5. 86	3. 25	3. 52
0. 333	3.63	1. 333	94.66	2.333	5. 86	3. 33	3. 52
0.417	4.18	1. 417	22.88	2.417	5. 23	3. 42	3. 32
0.500	4.18	1.500	22.88	2.500	5. 23	3. 50	3. 32
0.583	4.98	1. 583	13.31	2.583	4.74	3. 58	3. 14
0.667	4.98	1. 667	13.31	2.667	4.74	3. 67	3. 14
0. 750	6.28	1. 750	9.80	2.750	4. 35	3. 75	2. 99
0.833	6.28	1.833	9.80	2.833	4. 35	3, 83	2. 99

| STANDHYD (0005)| |ID= 1 DT= 5.0 min | Area (ha)= 5.32Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00IMPERVIOUS PERVIOUS (i) 2. 66 1. 00 1. 00 2. 66 5. 00 1. 00 Surface Area (mm) = (%) = (m) = Dep. Storage Average Slope Length Manni ngs n 0.130 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME	D HYETOGRA	PH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	s mm/hr	hrs	mm/hr	j' hrs	mm/hr	hrs	mm/hr
0. 083	3.23	1. 083	18.09	2.083	6. 70	3.08	3. 75
0. 167	7 3.23	1. 167	18.09	2.167	6.70	3. 17	3. 75
0. 250	3.63	1. 250	94.66	2.250	5.86	3. 25	3. 52
0. 333	3.63	1. 333	94.66	2.333	5.86	3. 33	3. 52
0. 417	7 4.18	1. 417	22.88	2.417	5. 23	3. 42	3. 32
0. 500	4.18	1.500	22.88	2.500	5. 23	3.50	3. 32
0. 583	4.98	1. 583	13.31	2.583	4.74	3. 58	3. 14
0. 667	7 4.98	1. 667	13.31	2.667	4.74	3. 67	3. 14
0. 750	6.28	1. 750	9.80	2.750	4.35	3. 75	2. 99
0. 833	6.28	1.833	9.80	2.833	4.35	3.83	2. 99
0. 917	7 8.85	1. 917	7.91	2.917	4.02	3. 92	2.85
1. 000	8.85	2.000	7.91	3.000	4. 02	4.00	2.85
Max. Eff. Inten. (r	nm /hr) _	58. 77		13. 48			
	(mi n)	20. 00		40. 00			
Storage Coeff.		18. 39	(1.1.)	37.76 (ii)			
Unit Hyd. Tpeak		20. 00		40.00			
Unit Hyd. peak		0.06		0.03			
on t nyu. peak	(CIIIS)=	0.00		0. 03	*T0	ΓALS*	
PEAK FLOW	(cms)=	0. 21		0. 04		223 (iii)	
TIME TO PEAK	(hrs)=	1. 58		2. 00		1.58	
RUNOFF VOLUME	(III S) = (mm) =	40. 38		2. 00 8. 13		7. 36 9. 41	
TOTAL RAINFALL	(IIIII) = (mm) =	41. 38		41. 38		1. 38	
DUNCE COFFELCI		41.30		41.30		1.30	

0.98

0. 20

CALLB STANDHYD (0028) Area (ha)= 3.43

RUNOFF COEFFICIENT

```
Surface Area
Dep. Storage
Average Slope
Length
Mannings n
                                                1. 71
1. 00
                                                                    1. 71
5. 00
                                 (ha)=
                                (mm) =
(%) =
(m) =
                                                   1.00
                                                                      2.00
                                                                     40 00
                                                 0.013
            NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                 --- TRANSFORMED HYETOGRAPH ----
                        TIME
                                    RAIN | TIME
                                                                                                               RAIN
                                                            RAIN | TIME
                                   mm/hr
3.23
                          hrs
                                                  hrs
                                                           mm/hr
                                                                            hrs
                                                                                     mm/hr
                                                                                                              mm/hr
                       0. 083
                       0.167
                                                                        2.167
                                     3.23
                                                1. 167
                                                            18.09
                                                                                      6.70
                                                                                                  3.17
                                                                                                               3.75
                                                                        2. 250
2. 333
2. 417
                       0 250
                                     3.63
                                                1 250
                                                            94.66
                                                                                      5 86
                                                                                                              3 52
                       0. 333
                                                1. 333
                                                            94.66
                                                                                                  3. 33
                                     3.63
                                                                                      5. 86
                                                                                                              3. 52
                       0.417
                                     4.18
                                                1.417
                                                           22.88
                                                                                      5. 23
                                                                                                  3. 42
                                                                                                              3. 32
                       0. 500
                                     4. 18
                                               1. 500
1. 583
                                                           22. 88
13. 31
                                                                        2.500
2.583
                                                                                     5. 23
4. 74
                                                                                                  3. 50
3. 58
                                                                                                              3. 32
                       0. 583
                                               1. 667
1. 750
1. 833
                                                                        2.667
2.750
2.833
                       0 667
                                     4.98
                                                            13.31
                                                                                      4 74
                                                                                                              3 14
                                     6. 28
6. 28
                                                             9. 80
9. 80
                                                                                                              2. 99
                        0. 750
                                                                                      4. 35
                       0.833
                                                                                      4.35
                                                                                                  3.83
                       0. 917
1. 000
                                     8. 85
8. 85
                                                             7. 91 | 2. 917
7. 91 | 3. 000
                                                                                                  3. 92
4. 00
                                                1 917
                                                                                                              2 85
      Max. Eff. Inten. (mm/hr) = over (min)
Storage Coeff. (min) =
                                                 94. 66 15. 30
5. 00 20. 00
3. 35 (ii) 18. 30 (ii)
      Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                  5. 00
0. 26
                                                                     20. 00
                                                                                          *TOTALS*
      PEAK FLOW (cms) =
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT =
                                                  0. 30
1. 33
                                                                                           0. 315 (iii)
1. 33
                                                                      1. 58
                                                 40.38
                                                                      8 13
                                                                                            19 41
                                                 41. 38
0. 98
                                                                                            41.38
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
        THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
 RESERVOIR( 0029) |
IN= 2---> OUT= 1 |
                                   OVERFLOW IS OFF
 ADD HYD ( 0007) |
3 + 2 = 1 |
                                           AREA
                                                       QPEAK
                                           (ha)
6.05
                                                     (cms)
0.071
                                                                     (hrs)
1.58
                                                                                (mm)
14.39
        ID1= 3 ( 0007):
+ ID2= 2 ( 0005):
         ID = 1 ( 0007):
                                         11.37 0.294
                                                                    1.58
                                                                               16. 74
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 RESERVOIR( 0008) |
IN= 2---> OUT= 1 |
DT= 5.0 min |
                                     OVERFLOW IS OFF
                                     OUTFLOW
                                                      STORAGE
                                                                         OUTFLOW
                                                                           (cms)
0.4220
0.4630
                                      (cms)
0.0000
                                                      (ha. m. )
0.0000
                                       0.0410
                                                       0.0120
                                                                                             0.1758
                                                                           0.6510
0.7480
                                       0.0580
                                                       0.0253
                                                                                             0 1989
                                       0.0710
                                                       0.0399
                                       0.0830
                                                       0.0559
                                                                           0.8280
                                                                                             0.2476
                                      0. 0920
0. 2500
                                                       0.0732
                                                                           0.8990
                                                                                             0.2733
                                                                                             0.2998
                                                       0. 1116
0. 1321
                                       0 3200
                                                                           1 0240
                                                                                             0.3263
                                               AREA
                                                             QPEAK
                                                                            TPEAK
                                            (ha)
11. 370
11. 370
                                                           (cms)
0. 294
0. 089
                                                                           (hrs)
1.58
3.17
   INFLOW: ID= 2 ( 0007)
OUTFLOW: ID= 1 ( 0008)
                                                                                               16. 74
16. 73

        PEAK
        FLOW
        REDUCTION
        [Qout/Qi n] (%) = 30. 25

        TIME
        SHIFT OF PEAK
        FLOW
        (min) = 95. 00

        MAXIMUM
        STORAGE
        USED
        (ha.m.) = 0.0674

 ADD HYD ( 0016) |
1 + 2 = 3 |
ID1= 1 ( 0022):
+ ID2= 2 ( 0008):
                                           AREA
                                                      QPEAK
                                                                     TPEAK
                                           (ha)
0.83
                                                     (cms)
0.017
                                                                     (hrs)
1.50
                                          11.37
                                                     0.089
                                                                     3.17
                                                                                 16.73
          ID = 3 ( 0016):
                                         12.20 0.093
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                 Area (ha)= 12.20 Curve Number (CN)= 64.0 I a (mm)= 6.90 # of Li near Res. (N)= 3.00 U.H. Tp(hrs)= 0.61
                    0019)
| ID= 1 DT= 5.0 min |
```

|ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00 I MPERVI OUS

PERVIOUS (i)

DT= 5.0 min	TFLOW STORAGEMS) (ha.m. 0000 0.000	GE OUTFLOW) (cms) 00 0.0900	STORAGE (ha.m.) 0.1200
INFLOW: ID= 2 (0028) OUTFLOW: ID= 1 (0029)	AREA (ha) (ha) (ha) (ha) (ha) (ha) (ha) (ha)	OPEAK TPEAK (cms) (hrs) 0.315 1.33 0.030 2.58	R. V. (mm) 19. 41 19. 32
PEAK FI TIME SHII MAXIMUM	FT OF PEAK FLOW STORAGE USED	N [Qout/Qin](%)= 9 V (min)= 75 O (ha.m.)= 0	. 66 . 00 . 0406
ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0023): + ID2= 2 (0029):	AREA QPEA (ha) (cms) 0.41 0.008 3.43 0.030	(TPEAK R.V.) (hrs) (mm) 1.50 8.47 2.58 19.32	
ID = 3 (0007): NOTE: PEAK FLOWS DO NO	3.84 0.033 OT INCLUDE BASE	2.17 18.16 EFLOWS IF ANY.	
ADD HYD (0007) 3 + 2 = 1 ID1= 3 (0007): + ID2= 2 (0030): ID = 1 (0007): NOTE: PEAK FLOWS DO NOTE:	5.40 0.059	1. 58 15. 18	
ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0007): + ID2= 2 (0031):	AREA QPEA (ha) (cms) 5.40 0.059 0.65 0.014	(TPEAK R.V.) (hrs) (mm) 1.58 15.18 1.42 7.80	
ID = 3 (0007): NOTE: PEAK FLOWS DO NO	6.05 0.071	1. 58 14. 39	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH							
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.23	1. 083	18.09	2.083	6. 70	3. 08	3.75
0. 167	3.23	1. 167	18.09	2.167	6.70	3. 17	3.75
0. 250	3.63	1. 250	94.66	2.250	5. 86	3. 25	3. 52
0. 333	3.63	1. 333	94.66	2.333	5. 86	3. 33	3. 52
0.417	4.18	1. 417	22.88	2.417	5. 23	3. 42	3. 32
0.500	4.18	1. 500	22.88	2.500	5. 23	3.50	3. 32
0.583	4.98	1. 583	13.31	2.583	4.74	3. 58	3. 14
0.667	4.98	1. 667	13.31	2.667	4.74	3. 67	3. 14
0.750	6.28	1. 750	9.80	2.750	4. 35	3. 75	2. 99
0.833	6.28	1. 833	9.80	2.833	4. 35	3.83	2. 99
0. 917	8.85	1. 917	7.91	2.917	4. 02	3. 92	2.85
1.000	8.85	2.000	7.91	3.000	4. 02	4.00	2.85
)I. (0.7/4					

Unit Hyd Qpeak (cms) = 0.764

PEAK FLOW 0.105 (i) PEAK FLUW (CMS) = 0.105
TIME TO PEAK (hrs) = 2.167
RUNOFF VOLUME (mm) = 6.703
TOTAL RAINFALL (mm) = 41.381
RUNOFF COEFFICIENT = 0.162

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(0039) Area (ha)= 0.83 Curve Number (CN)= 75.0 la (mm)= 10.00 # of Li near Res. (N)= 3.00 U.H. Tp(hrs)= 0.19 NASHYD |ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH									
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	3.23	1. 083	18.09	2.083	6. 70	3.08	3.75		
0. 167	3.23	1. 167	18.09	2.167	6. 70	3. 17	3.75		
0. 250	3.63	1. 250	94.66	2.250	5. 86	3. 25	3. 52		
0.333	3.63	1. 333	94.66	2.333	5. 86	3. 33	3.52		
0.417	4.18	1. 417	22.88	2.417	5. 23	3. 42	3. 32		
0.500	4.18	1. 500	22.88	2.500	5. 23	3. 50	3. 32		
0.583	4.98	1. 583	13.31	2.583	4.74	3. 58	3. 14		
0.667	4.98	1. 667	13.31	2.667	4.74	3. 67	3. 14		
0.750	6.28	1. 750	9.80	2.750	4. 35	3. 75	2. 99		

```
      0.833
      6.28 | 1.833
      9.80 | 2.833
      4.35 | 3.83
      2.99

      0.917
      8.85 | 1.917
      7.91 | 2.917
      4.02 | 3.92
      2.81

      1.000
      8.85 | 2.000
      7.91 | 3.000
      4.02 | 4.00
      2.81
```

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 8.466
TOTAL RAI NFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.205

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TD	MOFORME		A D. I		
	IR	ANSFURME	J HYETUGRA	APH	-	
RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
3.23	1.083	18.09	2.083	6. 70	3. 08	3.75
3.23	1. 167	18.09	2.167	6. 70	3. 17	3.75
3.63	1. 250	94.66	2.250	5.86	3. 25	3. 52
3.63	1. 333	94.66	2.333	5.86	3. 33	3.52
4.18	1. 417	22.88	2.417	5. 23	3. 42	3. 32
4.18	1.500	22.88	2.500	5. 23	3. 50	3. 32
4.98	1. 583	13.31	2.583	4.74	3. 58	3. 14
4.98	1. 667	13.31	2.667	4.74	3. 67	3. 14
6.28	1. 750	9.80	2.750	4.35	3. 75	2. 99
6.28	1.833	9.80	2.833	4. 35	3. 83	2. 99
8.85	1. 917	7.91	2.917	4. 02	3. 92	2.85
8.85	2.000	7.91	3.000	4. 02	4.00	2.85
	mm/hr 3.23 3.23 3.63 3.63 4.18 4.18 4.98 6.28 6.28 8.85	RAIN TIME mm/hr hrs 3.23 1.083 3.23 1.167 3.63 1.250 3.63 1.353 4.18 1.417 4.18 1.500 4.98 1.583 4.98 1.667 6.28 1.750 6.28 1.833	RAIN TIME RAIN mm/hr hrs mm/hr mm/hr lns mm/hr la.083 18.09 3.23 1.167 18.09 3.63 1.250 94.66 4.18 1.417 22.88 4.98 1.550 22.88 4.98 1.560 22.88 4.98 1.667 13.31 6.28 1.750 9.80 6.28 1.833 9.80 6.28 1.833 9.80 6.28 1.833 9.80 6.28 1.917 7.91	RAIN TIME mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs hrs 1.083 18.09 2.083 3.23 1.167 18.09 2.167 3.63 1.250 94.66 2.250 3.63 1.333 94.66 2.333 4.18 1.417 22.88 2.417 4.18 1.500 22.88 2.500 4.98 1.583 13.31 2.583 4.98 1.667 13.31 2.667 6.28 1.750 9.80 2.750 6.28 1.750 9.80 2.750 6.28 1.833 9.80 2.833 8.85 1.917 7.91 2.917	mm/hr hrs mm/hr hrs mm/hr 3.23 1.083 18.09 2.167 6.70 3.23 1.167 18.09 2.167 6.70 3.63 1.250 94.66 2.250 5.86 3.63 1.333 94.66 2.250 5.86 4.18 1.417 22.88 2.417 5.23 4.18 1.500 22.88 2.500 5.23 4.98 1.583 13.31 2.583 4.74 4.98 1.667 13.31 2.667 4.74 6.28 1.750 9.80 2.750 4.35 6.28 1.833 9.80 2.833 4.35 8.85 1.917 7.91 2.917 4.02	RAIN TIME

Unit Hyd Opeak (cms) = 0.078

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 8.469
TOTAL RAI NFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.205

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH								
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN	
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr	
0.083	3.23	1.083	18.09	2.083	6. 70	3. 08	3.75	
0. 167	3.23	1. 167	18.09	2.167	6. 70	3. 17	3.75	
0. 250	3.63	1. 250	94.66	2.250	5.86	3. 25	3. 52	
0.333	3.63	1. 333	94.66	2.333	5.86	3. 33	3. 52	
0.417	4.18	1. 417	22.88	2.417	5. 23	3. 42	3. 32	
0.500	4.18	1.500	22.88	2.500	5. 23	3. 50	3. 32	
0.583	4.98	1. 583	13.31	2.583	4.74	3. 58	3. 14	
0.667	4.98	1. 667	13.31	2.667	4.74	3. 67	3. 14	
0.750	6.28	1. 750	9.80	2.750	4.35	3. 75	2. 99	
0.833	6.28	1.833	9.80	2.833	4. 35	3. 83	2. 99	
0. 917	8.85	1. 917	7.91	2.917	4. 02	3. 92	2.85	
1.000	8.85	2.000	7.91	3.000	4. 02	4. 00	2.85	

Uni t Hyd Qpeak (cms) = 0.177

PEAK FLOW (cms)= 0.014 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 7.798
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.188

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0038)	Area (ha)=	1.56	Curve Number (CN) = 73.0
ID= 1 DT= 5.0 min	la (mm)=	10.00	# of Linear Res. (N) = 3.00
·	U.H. Tp(hrs)=	0. 22	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	HYETOGR.	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.23	1.083	18.09	2.083	6. 70	3. 08	3. 75
0. 167	3.23	1. 167	18.09	2.167	6. 70	3. 17	3.75
0. 250	3.63	1. 250	94.66	2.250	5. 86	3. 25	3. 52
0.333	3.63	1. 333	94.66	2.333	5. 86	3. 33	3. 52
0.417	4.18	1. 417	22.88	2.417	5. 23	3. 42	3. 32
0.500	4.18	1.500	22.88	2.500	5. 23	3. 50	3. 32

CALIB STANDHYD (0036) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	5. 32 50. 00	Dir. Conn.(%)=	35. 00	
Surface Area Dep. Storage Average Slope Length Mannings n	(ha) = (mm) = (%) = (m) =	1 MPERVI (2. 6 1. 0 1. 0 188. 3 0. 13	6 0 0 3	PERVI OUS (i) 2.66 5.00 1.00 40.00 0.250		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		MED HYETOGRA		
TIME RAIN	TIME RAIN		RAIN TIME	RAIN
hrs mm/hr	hrs mm/h		mm/hr hrs	mm/hr
0. 083 3. 23	1.083 18.09		6. 70 3. 08	3. 75
0. 167 3. 23	1. 167 18. 09	9 2.167	6. 70 3. 17	3. 75
0. 250 3. 63	1. 250 94. 66	5 2.250	5. 86 3. 25	3. 52
0. 333 3. 63	1. 333 94. 66	5 2.333	5. 86 3. 33	3. 52
0. 417 4. 18	1. 417 22. 88	3 2.417	5. 23 3. 42	3. 32
0. 500 4. 18	1.500 22.88	3 2.500	5. 23 3. 50	3. 32
0. 583 4. 98	1. 583 13. 3	1 2.583	4. 74 3. 58	3. 14
0. 667 4. 98	1. 667 13. 3	2.667	4. 74 3. 67	3. 14
0. 750 6. 28	1. 750 9. 80	2.750	4. 35 3. 75	2. 99
0. 833 6. 28	1.833 9.80	2.833	4. 35 3. 83	2. 99
0. 917 8. 85	1. 917 7. 9	1 2.917	4. 02 3. 92	2.85
1. 000 8. 85	2.000 7.9	1 3.000	4. 02 4. 00	2.85
Max.Eff.Inten.(mm/hr)=	58. 77	13. 48		
over (min)	20. 00	40.00		
Storage Coeff. (min)=	18.39 (ii)			
Unit Hyd. Tpeak (min)=	20. 00	40.00		
Unit Hyd. peak (cms)=	0.06	0. 03		
			TOTALS	
PEAK FLOW (cms)=	0. 21	0. 04	0. 223 (iii))
TIME TO PEAK (hrs)=	1. 58	2.00	1.58	
RUNOFF VOLUME (mm) =	40. 38	8. 13	19.41	
TOTAL RAINFALL (mm)=	41. 38	41. 38	41.38	
RUNOFF COEFFICIENT =	0. 98	0. 20	0.47	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALLB

```
        0.583
        4.98
        1.583
        13.31
        2.583
        4.74
        3.58
        3.14

        0.667
        4.98
        1.667
        13.31
        2.667
        4.74
        3.67
        3.14

        0.750
        6.28
        1.750
        9.80
        2.750
        4.35
        3.75
        2.99

        0.833
        6.28
        1.833
        9.80
        2.833
        4.35
        3.83
        2.99

        0.917
        8.85
        1.917
        7.91
        2.917
        4.02
        3.92
        2.85

        1.000
        8.85
        2.000
        7.91
        3.000
        4.02
        4.00
        2.85
```

Unit Hyd Qpeak (cms) = 0.271

PEAK FLOW (cms)= 0.027 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 7.847
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.190

over (min) Storage Coeff. (min)=

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	3. 43 50. 00	Dir.	Conn. (%) =	35. 00
Surface Area Dep. Storage Average Slope Length Mannings n	(ha) = (mm) = (%) = (m) =	1 MPERVI (1. 7 1. 0 1. 0 151. 2 0. 01	1 0 0 2	PERVI OU 1. 71 5. 00 2. 00 40. 00 0. 250)))	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	NSFORME	D HYETOGRA	APH		
TIME	RAIN	TIME	RAIN	I' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0. 083	3.23	1.083	18.09	2.083	6. 70	3. 08	3.75
0. 167	3.23	1. 167	18.09	2.167	6. 70	3. 17	3.75
0. 250	3.63	1. 250	94.66	2.250	5. 86	3. 25	3. 52
0. 333	3.63	1. 333	94.66	2.333	5.86	3. 33	3. 52
0. 417	4.18	1. 417	22.88	2.417	5. 23	3. 42	3. 32
0. 500	4.18	1.500	22.88	2.500	5. 23	3.50	3. 32
0. 583	4.98	1.583	13.31	2.583	4.74	3. 58	3. 14
0. 667	4.98	1. 667	13.31	2.667	4.74	3. 67	3. 14
0. 750	6.28	1. 750	9.80	2.750	4.35	3. 75	2. 99
0. 833	6.28	1.833	9.80	2.833	4.35	3.83	2. 99
0. 917	8.85	1. 917	7.91	2.917	4.02	3. 92	2.85
1. 000	8.85	2.000	7.91	3.000	4.02	4.00	2.85
Max. Eff. Inten. (mm/	/hr)=	94. 66		15. 30			

5.00 20.00 3.35 (ii) 18.30 (ii)

Unit Hyd. Tpeak (min): Unit Hyd. peak (cms):				*1	TOTAL S*	
PEAK FLOW (cms): TIME TO PEAK (hrs): RUNOFF VOLUME (mm): TOTAL RAINFALL (mm): RUNOFF COEFFICIENT :	= (= 1 = 4(= 41 = (). 30 I. 33). 38 I. 38). 98	0. 04 1. 58 8. 13 41. 38 0. 20	'	0. 315 (iii) 1. 33 19. 41 41. 38 0. 47	
**** WARNING: STORAGE COE						
(i) CN PROCEDURE SEI CN* = 59.0 (ii) TIME STEP (DT): THAN THE STORAGI (iii) PEAK FLOW DOES I	la = De SHOULD BE E COEFFIC	ep. Storag E SMALLER CLENT.	ge (Above OR EQUAL			
ADD HYD (0041) 1 + 2 = 3	(ha) 0.41 5.32 ====== 5.73	(cms) 0.008 0.223 0.231	1.58	(mm) 8. 47 19. 41 ====== 18. 63		
NUTE: PEAK FLOWS DU I			_UWS IF AP	ır. 		
ADD HYD (0041) 3 + 2 = 1 ID1= 3 (0041): + ID2= 2 (0037): 	6.38	0. 243	1.58	17. 53		
NOTE: PEAK FLOWS DO I						
ADD HYD (0041) 1 + 2 = 3 ID1= 1 (0041): + ID2= 2 (0038):	AREA (ha) 6.38 1.56	QPEAK (cms) 0. 243 0. 027	TPEAK (hrs) 1.58 1.58	R.V. (mm) 17.53 7.85		
ID = 3 (0041):						

 $\label{lem:condition} Summary\ filename: C: \label{lem:condition} C: \label{lem:condition} C: \label{lem:condition} WH5 \label{lem:condition} Summary\ filename: C: \label{lem:condition} Users \label{lem:condition} I: \label{lem:condition} Summary\ filename: C: \label{lem:condition} Users \label{lem:condition} I: \label{lem:condition} Summary\ filename: C: \label{lem:condition} Users \label{lem:condition} Summary\ filename: C: \label{lem:condition} Summary\$ f7886e\d61ef36d-bf63-46ca-b062-ef10e4

TLMF: 02:15:47

COMMENTS:

DATE: 06-15-2023

CALLB

Filename: C:\Users\r.rajachockalingam\AppD ata\Local\Temp\ 073789e9-0d0b-43a3-ada4-078b0c00e084\81712ad3 READ STORM Ptotal = 48.34 mm Comments: created from IDF Group New IDFGroup - 2 TIME RAIN I TIME RAIN | TIME RAIN I TIME RAIN

mm/hr 3.78 4.26 hrs 2. 00 2. 17 hrs 0.00 mm/hr 21.14 mm/hr 7.85 hrs 3.00 mm/hr 4.40 1.17 110.25 3. 17 0.17 6.86 4. 13 26. 74 15. 57 2. 33 2. 50 0.67 7.35 1.67 11.47 2. 67 5.09 3.67 3.50

STANDHYD (0006) Area (ha)= 5.62Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00|ID= 1 DT= 5.0 min | IMPERVIOUS PERVIOUS (i) 2. 81 1. 00 1. 00 2. 81 5. 00 2. 00 Surface Area (ha)= Dep. Storage Average Slope (mm) = (%) = Length Mannings n (m) = 193, 56 10.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0041) | 3 + 2 = 1 | ARFA OPFAK TPFAK (cms) 0. 270 (mm) 15. 62 ID1= 3 (0041): + ID2= 2 (0040): 3.43 0.315 1.33 19.41 ID = 1 (0041): 11.37 0.457 16.77 1.33 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0032) | 1 + 2 = 3 | AREA OPFAK TPFAK (hrs) (mm) (ha) (cms) ID1= 1 (0039): + ID2= 2 (0041): 0.83 0.017 8. 47 ID = 3 (0032): 12.20 0.466 1 33 16, 20 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

_____ (v 6.2.2011)

SSSSS U U A L
SS U U AAAAA L
SS U U AAAAA L
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SSSS UUUUU A A LLLLL V V V V SS SS VV Ω 000

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***** DETAILED OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

C: \Users\r.raj achockal i ngam\AppData\Local \Civi ca\VH5\98a3b801-fe45-439a-999a-909776 f7886e\d61ef36d-bf63-46ca-b062-ef10e4

		TR/	ANSFORME	ED HYETOGRAI	PH		
TIME	RAIN	TIME	RAIN	I' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.78	1. 083	21.14	2.083	7.85	3. 08	4.40
0. 167	3.78	1. 167	21.14	2.167	7. 85	3. 17	4.40
0. 250	4.26	1. 250	110.25	2.250	6. 86	3. 25	4. 13
0. 333	4.26	1. 333	110.25	2.333	6.86	3. 33	4. 13
0. 417	4.90	1. 417	26.74	2.417	6. 13	3. 42	3.89
0. 500	4.90	1. 500	26.74	2.500	6. 13	3.50	3.89
0. 583	5.83	1. 583	15.57	2.583	5. 55	3. 58	3.69
0. 667	5.83	1. 667	15.57	2.667	5. 55	3. 67	3.69
0. 750	7.35	1. 750	11.47	2.750	5. 09	3. 75	3.50
0. 833	7.35	1. 833	11.47	2.833	5. 09	3.83	3.50
0. 917	10.36	1. 917	9. 26	2.917	4. 72	3. 92	3.34
1. 000	10.36	2.000	9. 26	3.000	4.72	4.00	3. 34
Max. Eff. Inten. (mm	/hr)_	110. 25		26, 58			
over (5. 00		10. 00			
			(11)				
Storage Coeff. (Unit Hvd. Tpeak (min)=	5. 00	(ii)	7.06 (ii) 10.00			

Unit Hyd. peak (cms)= 0. 25 0. 14 *TOTALS* PEAK FLOW TIME TO PEAK 0. 15 0.689 (iii) 1.33 1.42 (hrs)= 1.33 RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT = 10 98 23 71 0. 98 0.23

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY

CALIB NASHYD (0022) Area (ha)= 0.83 Curve Number (CN)= 75.0 la (mm)= 10.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.19 | ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

- TRANSFORMED HYETOGRAPH ---RAIN TIME RAIN 'TIME RAIN TIME mm/hr hrs mm/hr hrs mm/hr hrs RAI N hrs mm/hr hrs mm/hr 0.083 3. 78 3. 78 1. 083 21. 14 | 2. 083 21. 14 | 2. 167 7. 85 | 7. 85 | 3. 08 4.40

```
4. 26
4. 26
4. 90
                                             2. 250
2. 333
2. 417
                    | 1. 250 | 110. 25 |
| 1. 333 | 110. 25 |
0 250
0. 333
                                                                       3. 33
0.417
                       1.417
                                  26.74
                                                           6.13
                                                                                  3.89
0.500
             4.90
                       1.500
                                  26.74
                                              2.500
                                                           6. 13
                                                                      3.50
                                                                                  3.89
                                             2. 667
2. 750
2. 833
0.667
             5.83
7.35
                       1. 667
1. 750
                                  15.57
                                                           5. 55
                                                                      3. 67
3. 75
                                                                                  3.69
0.750
                                  11 47
                                                           5 09
                                                                                  3 50
             7.35
                      1. 833
                                                           5. 09
                                                                                  3. 50
0. 917
1. 000
           10.36 | 1.917
10.36 | 2.000
                                    9.26
                                              2.917
                                                           4.72
                                                                      3.92
                                                                                  3.34
                                   9. 26
                                             3.000
                                                           4. 72
```

Unit Hyd Opeak (cms) = 0.167

PEAK FLOW (cms)= 0.026 (1)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 11.924
TOTAL RAI NFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.247

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH TIME RAIN | TIME hrs mm/hr hrs mm/hr hrs mm/hr i hrs mm/hr 0. 083 0. 167 3.78 1.083 21.14 2. 083 2. 167 7. 85 | 7. 85 | 4. 40 4. 40 1.167 0 250 4 26 1 250 110 25 2 250 6 86 4 13 0. 333 0. 417 2. 333 2. 417 4. 26 4. 90 1. 333 1. 417 110. 25 26. 74 6. 13 3.89 26. 74 15. 57 0.500 4.90 1 500 2 500 3 89 1. 583 2.583 0.667 5.83 1.667 15.57 2.667 5. 55 3.67 3.69 7.35 1. 750 1. 833 11. 47 11. 47 2.750 2.833 0.750 5.09 3 50 0.917 10.36 İ 1. 917 9.26 2.917 4.72 3.92 3.34 10.36 | 2.000

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms) = 0.012 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 11.928

RAIN | TIME RAIN TIME TIME RAIN I TIME RAIN 2.083 0.083 1.083 21.14 21.14 7.85 3. 08 3. 17 4.40 0.167 3.78 1.167 2.167 7.85 4.40 0.333 4.26 1.333 110.25 2.333 6.86 3.33 0.417 4 90 1 417 26.74 2 417 6. 13 6. 13 3 42 3 89 26.74 0.583 5.83 1.583 15.57 2.583 5.55 3.58 3.69 5.83 | 1.583 5.83 | 1.667 7.35 | 1.750 7.35 | 1.833 10.36 | 1.917 10.36 | 2.000 0. 667 0. 750 15.57 11.47 2.667 2.750 5. 09 3.50 3.75 2.833 2.917 0.833 11.47 5.09 3.83 3.50 0. 917 9. 26 4. 72 92 1.000 3.000 4.72 3.34

Unit Hyd Opeak (cms) = 0.177

PEAK FLOW (cms) = 0.022 (i) PEAK FLUW (CMS) = 0. U2Z

TIME TO PEAK (hrs) = 1. 417

RUNOFF VOLUME (mm) = 11. 030

TOTAL RAINFALL (mm) = 48. 343

RUNOFF COEFFICIENT = 0. 228

Length Mannings n

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

STANDHYD (0005) | ID= 1 DT= 5.0 min | Area (ha)= 5.32Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00IMPERVIOUS PERVIOUS (i) Surface Area 2. 66 1. 00 2. 66 Dep. Storage Average Slope (mm) = 5.00 1. 00 188. 33 (%) = (m) =

0.130 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

> TRANSFORMED HYETOGRAPH TIME RAIN | TIME RAIN TIME RAIN |' mm/hr |' RAIN mm/hr 0.083 21. 14 21. 14 110. 25 2.083 3. 08 3.78 1.083 7.85 4.40 0. 167 0. 250 3. 78 4. 26 2. 167 2. 250 1. 167 1. 250 6.86 4.13 0.333 4.26 1. 333 110.25 2.333 6.86 3. 33 4.13 0. 417 0. 500 4. 90 4. 90 1. 417 1. 500 26.74 2.417 6. 13 6. 13 3. 42 3. 50 3.89 0.583 5.83 1.583 15.57 2.583 2.667 5. 55 3. 58 3. 69 15.57

0.250

TOTAL RAINFALL (mm) = 48.343 RUNOFF COEFFICIENT = 0.247

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH -RAIN | TIME TIME RAIN | TIME RAIN RAIN | TIME mm/hr | hrs 21.14 | 2.083 21.14 | 2.167 mm/hr 3.78 hrs 1. 083 hrs 3.08 mm/hr 4.40 mm/hr 7. 85 | 0.167 3.78 1, 167 7.85 3. 17 4.40 0. 250 1. 250 110. 25 | 2. 250 110. 25 | 2. 333 4. 13 4. 13 0. 333 1. 333 3. 33 4.26 6.86 0 417 4 90 1 417 26 74 2 417 6 13 3 89 0. 500 0. 583 26. 74 15. 57 2.500 2.583 4.90 1. 500 3. 89 1.583 3.69 5.83 5. 55 3.58 0. 667 0. 750 5. 83 | 7. 35 | 7. 35 | 1. 667 1. 750 15.57 11.47 2.667 2.750 3. 67 3. 75 5 55 3 69 7.35 | 1.833 | 11.47 | 2.833 10.36 | 1.917 | 9.26 | 2.917 10.36 | 2.000 | 9.26 | 3.000 0.833 5.09 3.83 3.50 0. 917 3. 34 3. 34

Unit Hyd Opeak (cms) = 0.271

PEAK FLOW (cms) = 0.041 (i)TIME TO PEAK (hrs)= 1.583 RUNOFF VOLUME (mm)= 11.099 TOTAL RAINFALL (mm)= 48.343 RUNOFF COEFFICIENT = 0.230

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

0. 750	7.35	1. 750	11.47	2.750	5.09	3.75	3. 50
0. 833	3 7.35	1.833	11.47	2.833	5.09	3. 83	3. 50
0. 917	7 10.36	1. 917	9.26	2.917	4.72	3. 92	3. 34
1. 000	0 10.36	2.000	9.26	3.000	4.72	4.00	3. 34
Max. Eff. Inten. (r	mm/hr)=	82. 41		18. 48			
over	(mi n)	15. 00		35. 00			
Storage Coeff.	(mi n) =	16. 07	(ii)	33.14 (ii)			
Uni t Hyd. Tpeak	(mi n) =	15.00		35.00			
Uni t Hyd. peak	(cms)=	0. 07		0. 03			
					T0	ΓALS	
PEAK FLOW	(cms)=	0. 27		0.06	0.	292 (iii)
TIME TO PEAK	(hrs)=	1. 50		1. 83		1.50	
RUNOFF VOLUME	(mm) =	47. 34		10. 98	23	3.71	
TOTAL RAINFALL	(mm) =	48. 34		48. 34	48	3. 34	
RUNOFF COEFFICIE	ENT =	0. 98		0. 23	(0. 49	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 la = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | STANDHYD (0028)| |ID= 1 DT= 5.0 min | Area (ha)= 3.43Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00IMPERVIOUS PERVIOUS (i) (ha) = (mm) = (%) = (m) = Surface Area Dep. Storage 1. 71 1. 00 1. 71 5. 00 Average Slope Length Mannings n 1.00 2.00 151. 22 0. 013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH -RAIN TIME RAIN | TIME TIME RAIN | TIME RAIN mm/hr 3.78 hrs 1. 083 mm/hr 21.14 hrs mm/hr 7.85 | mm/hr 0.167 3.78 1. 167 21.14 | 2.167 7.85 3.17 4.40 0. 250 0. 333 1. 250 1. 333 110. 25 | 110. 25 | 2. 250 2. 333 6. 86 6. 86 3. 25 3. 33 4. 26 4. 26 4. 13 4. 13 0.417 4.90 1.417 26.74 | 2.417 6. 13 3.42 3.89 0. 500 0. 583 1. 500 1. 583 26. 74 | 2. 500 15. 57 | 2. 583 3. 89 3. 69 5.83 3. 58 5. 55 0.667 5.83 7.35 1. 667 15.57 | 2.667 11.47 | 2.750 5. 55 3. 67 3. 69

Max. Eff. Inten. (mm/hr)= over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)= 5. 00 20. 00 3. 15 (ii) 16. 31 (ii) 5. 00 20. 00 Unit Hyd. peak (cms)= 0. 27 0.06 PEAK FLOW (cms)= 0. 36 0.06

TOTALS 0.374 (iii) PEAK FLOW
TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) =
RUNOFF COEFFICIENT = 1. 33 47. 34 1. 58 10. 98 1.33 23.71 48.34 48.34 48.34 0.98 0. 23

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 59.0 Ia = Dep. Storage (Above (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029)| OVERFLOW IS OFF IN= 2---> OUT= 1 DT= 5.0 min
 OUTFLOW
 STORAGE
 OUTFLOW

 (cms)
 (ha.m.)
 (cms)

 0.0000
 0.0000
 0.0900
 STORAGE 0.1200 QPEAK AREA (cms) (hrs) 0.374 1.33 0.037 2.58 (ha) (mm) INFLOW: ID= 2 (0028) OUTFLOW: ID= 1 (0029) 3. 430 3. 430

ADD HYD (0007) | 1 + 2 = 3 | QPEAK AREA R. V. (mm) (cms) (ha) (hrs) ID1= 1 (0023): + ID2= 2 (0029): 1.50 11. 93 0.41 0.012 ID = 3 (0007): 3.84 0.042 1.75 22, 36

ARFA QPEAK (ha) 11. 370 (cms) (hrs) 1.50 (mm) INFLOW: ID= 2 (0007) OUTFLOW: ID= 1 (0008) 0. 391 1. 50 0. 147 2. 50 20, 80 11. 370

ADD HYD (0016) | 1 + 2 = 3 | ARFA OPFAK TPFAK R V (ha) (cms) (hrs) ID1= 1 (0022): + ID2= 2 (0008): 11, 92 0.83 0.026 11.37 0 147 2 50 20. 79 ID = 3 (0016): 12. 20 0. 154 2, 50 20, 19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

(0019)

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH TIME RAIN | TIME RAIN | TIME RAIN RAIN | TIME hrs 0.083 mm/hr 3.78 hrs 1.083 mm/hr 21.14 mm/hr 7.85 | hrs 3.08 mm/hr 4.40 0 167 3 78 1 167 21 14 2 167 7 85 3 17 4 40 0. 250 0. 333 1. 250 1. 333 110. 25 110. 25 2. 250 2. 333 3. 25 3. 33 4.26 4.13 6.86 0 417 4 90 1 417 26.74 2 417 6. 13 3 89 26. 74 15. 57 2.500 0.583 5.83 1.583 5.55 3.58 3.69 15.57 | 15.57 | 11.47 | 5.83 7.35 1. 667 1. 750 2.667 2.750 5.55 7. 35 | 1. 833 10. 36 | 1. 917 10. 36 | 2. 000 2.833 0.833 5.09 3.83 3.50 0. 917 9. 26 2. 917 3. 000 4. 72 4. 72

Unit Hyd Qpeak (cms) = 0.764

PEAK FLOW (cms)= 0.149 (i) TIME TO PEAK (hrs)= 2.083

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS LE ANY

ADD HYD (0007) | 3 + 2 = 1 | QPEAK ARFA TPFAK (ha) 3.84 (cms) 0. 042 (mm) 22. 36 ID1= 3 (0007): + ID2= 2 (0030): 1.56 0.041 1.58 11.10 ID = 1 (0007): 5.40 0.081 19. 11 1.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007) | 1 + 2 = 3 | ARFA OPFAK TPFAK R V (hrs) (mm) (ha) (cms) ID1= 1 (0007): + ID2= 2 (0031): 5.40 0. 081 1.58 19, 11 0.65 0. 022 ID = 3 (0007): 6.05 0.099 1 50 18 24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007) | 3 + 2 = 1 | ARFA (ha) (cms) (hrs) (mm) ID1= 3 (0007): + ID2= 2 (0005): 6.05 0. 099 ID = 1 (0007): 11.37 0.391

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS LE ANY

RESERVOIR(0008) | IN= 2---> OUT= 1 | OVERFLOW IS OFF IN= 2---> OUT= DT= 5.0 min OUTFLOW OUTFLOW STORAGE STORAGE (cms) 0.4220 (cms) 0.0000 (ha.m.) 0.0000 0.0410 0.0120 0.4630 0.1758 0. 0580 0. 0710 0.0253 0.0399 0. 6510 0. 7480 0. 1989 0. 2228 0.0830 0.0559 0.8280 0.2476 0.0732 0.8990 0.9640 0. 0920 0. 2500 0.2998 0. 3200 0.1116 1.0240 0.3263

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0039)

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH RAIN I TIME TIME RAIN | TIME RAIN | TIME RAIN mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs 21. 14 | 2. 083 21. 14 | 2. 167 110. 25 | 2. 250 0.083 3.78 1.083 7.85 3.08 4.40 0. 167 0. 250 1. 167 1. 250 4. 40 4.26 6.86 4.13 1. 333 1. 417 0 333 110 25 2 333 6 86 3 33 4 13 4. 90 4. 90 26. 74 26. 74 0. 417 2.417 6. 13 3. 89 1.500 2.500 3.89 0.500 6. 13 3.50 1. 583 1. 667 0.583 5 83 15.57 2 583 3 69 1. 750 1. 833 1. 917 0.750 7.35 7.35 11.47 2.750 5.09 3.75 3.50 11. 47 | 2. 730 11. 47 | 2. 833 9. 26 | 2. 917 9. 26 | 3. 000 3. 50 3. 34 3. 34 3. 83 3. 92 0.833 11.47 5. 09 917 10.36 | 2.000 4.72 4.00 1.000

Unit Hyd Opeak (cms) = 0.167

PEAK FLOW (cms)= 0.026 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 11.924
TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.247

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALI B | NASHYD (0033)|

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGRA	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.78	1. 083	21.14	2.083	7.85	3.08	4.40
0. 167	3.78	1. 167	21.14	2.167	7.85	3. 17	4.40
0. 250	4.26	1. 250	110.25	2.250	6.86	3. 25	4. 13
0.333	4.26	1. 333	110.25	2.333	6.86	3. 33	4. 13
0.417	4.90	1. 417	26.74	2.417	6. 13	3. 42	3.89
0.500	4.90	1. 500	26.74	2.500	6. 13	3. 50	3.89
0.583	5.83	1. 583	15.57	2.583	5. 55	3. 58	3.69
0.667	5.83	1. 667	15.57	2.667	5. 55	3. 67	3.69
0.750	7.35	1. 750	11.47	2.750	5.09	3. 75	3.50
0.833	7.35	1. 833	11.47	2.833	5.09	3. 83	3.50
0. 917	10.36	1. 917	9.26	2.917	4. 72	3. 92	3.34
1.000	10.36	2.000	9. 26	3.000	4.72	4.00	3.34

Uni t Hyd Qpeak (cms)= 0.078

(cms)= 0.012 (i) TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 11.928
TOTAL RAINFALL (mm) = 48.343
RUNOFF COEFFICIENT = 0.247

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Area (ha)= 5.32Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00STANDHYD (0036) ID= 1 DT= 5.0 min | I MPERVI OUS PERVIOUS (i) 2. 66 1. 00 1. 00 2. 66 5. 00 1. 00 Surface Area (ha)= Dep. Storage Average Slope Length Mannings n (mm) = (%) = (m) = 188 33 40 00 0.130

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH
TIME RAIN | TIME F TIME mm/hr 3.78 3.78 mm/hr | 7.85 | 7.85 | hrs hrs mm/hr hrs hrs mm/hr 0. 083 0. 167 1. 083 1. 167 21.14 2. 083 2. 167 3. 08 3. 17 4. 40 4. 40 1. 250 110. 25 | 2. 250 1. 333 110. 25 | 2. 333 1. 417 26. 74 | 2. 417 6. 86 6. 86 6. 13 3. 25 3. 33 3. 42 0.250 4.26 4.13 0. 333 0. 417 4. 26 4. 90 3.89 0.500 4.90 1.500 26. 74 15. 57 2.500 2.583 6. 13 5. 55 3. 89

PEAK FLOW (cms) = 0.022 (I)
TIME TO PEAK (hrs) = 1.417
RUNOFF VOLUME (mm) = 11.030
TOTAL RAI NFALL (mm) = 48.343
RUNOFF COEFFICI ENT = 0.228

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NASHYD (0038) Area (ha)= 1.56 Curve Number (CN)= 73.0 la (mm)= 10.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.22 |ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH TIME RAIN I TIME RAIN | TIME mm/hr | hrs RAIN | TIME RAIN mm/hr hrs hrs mm/hr i hrs mm/hr 21.14 | 21.14 | 110.25 | 3.78 3.78 1. 083 7. 85 | 7. 85 | 3. 08 0.083 2 083 4 40 2. 167 2. 250 0. 167 4. 40 0.250 4.26 1. 250 6.86 4.13 0. 333 0. 417 110. 25 26. 74 2. 333 6. 86 6. 13 1. 333 26. 74 15. 57 15. 57 6. 13 5. 55 5. 55 0.500 4.90 1.500 2.500 3.89 2.583 2.667 2.750 5.83 5.83 0. 583 1. 583 7.35 1.750 11.47 3.50 0.750 5.09 3.75 7. 35 | 1. 833 10. 36 | 1. 917 10. 36 | 2. 000 0. 833 0. 917 11.47 2.833 2.917 5. 09 4. 72 3. 50 3. 34 9.26 3.000

Unit Hyd Qpeak (cms) = 0.271

PEAK FLOW (cms)= 0.041 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 11.099
TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.230

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Area (ha)= 3.43Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00ID= 1 DT= 5.0 min IMPERVIOUS PERVIOUS (i)

0. 66	7 5.83	1. 667	15.57	2.667	5.55	3. 67	3.69
0. 75	7.35	1. 750	11.47	2.750	5.09	3.75	3.50
0. 83	3 7.35	1. 833	11.47	2.833	5.09	3.83	3.50
0. 91	7 10.36	1. 917	9.26	2.917	4.72	3. 92	3.34
1.00	0 10.36	2.000	9.26	3.000	4.72	4.00	3.34
Max. Eff. Inten. (mm/hr)=	82. 41		18. 48			
over	(mi n)	15.00		35.00			
Storage Coeff.	(mi n) =	16.07	(ii)	33.14 (ii)			
Uni t Hyd. Tpeak	(mi n) =	15.00		35.00			
Uni t Hyd. peak	(cms)=	0.07		0. 03			
					T0T	ALS	
PEAK FLOW	(cms)=	0. 27		0.06	0.	292 (iii))
TIME TO PEAK	(hrs)=	1.50		1. 83	1	. 50	
RUNOFF VOLUME	(mm) =	47. 34		10. 98	23	. 71	
TOTAL RAINFALL	(mm) =	48. 34		48. 34	48	. 34	
RUNOFF COEFFICI	ENT =	0. 98		0. 23	0	. 49	

| CALIB | NASHYD (0037) |ID= 1 DT= 5.0 min | Area (ha)= 0.65 Curve Number (CN)= 73.0 I a (mm)= 10.00 # of Linear Res. (N)= 3.00 U.H. Tp(hrs)= 0.14

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.78	1. 083	21.14	2.083	7.85	3.08	4.40
0. 167	3.78	1. 167	21.14	2.167	7.85	3. 17	4.40
0. 250	4.26	1. 250	110.25	2.250	6.86	3. 25	4. 13
0. 333	4.26	1. 333	110.25	2.333	6.86	3. 33	4. 13
0.417	4.90	1. 417	26.74	2.417	6. 13	3. 42	3.89
0.500	4.90	1. 500	26.74	2.500	6. 13	3.50	3.89
0.583	5.83	1. 583	15.57	2.583	5. 55	3. 58	3.69
0.667	5.83	1. 667	15.57	2.667	5. 55	3. 67	3.69
0.750	7.35	1. 750	11.47	2.750	5. 09	3. 75	3.50
0.833	7.35	1. 833	11.47	2.833	5. 09	3. 83	3.50
0. 917	10.36	1. 917	9.26	2.917	4. 72	3. 92	3.34
1.000	10.36	2.000	9.26	3.000	4. 72	4. 00	3. 34

Unit Hyd Opeak (cms) = 0.177

Surface Area	(ha)=	1. 71	1. 71
Dep. Storage	(mm) =	1. 00	5. 00
Average Slope	(%)=	1.00	2.00
Length	(m) =	151. 22	40.00
Mannings n	-	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGRA	PH		
TIME	RAIN		RAIN	l' TIME	RAIN		RAIN
hrs		hrs			mm/hr		mm/hr
0. 083		1. 083			7. 85 I	3. 08	4. 40
0. 167	3.78	1. 167	21.14	2.167	7. 85	3. 17	4. 40
0. 250	4.26	1. 250	110.25	2.250	6.86	3. 25	4. 13
0. 333	4.26	1. 333	110.25	2.333	6.86	3. 33	4. 13
0. 417	4.90	1. 417	26.74	2.417	6. 13	3. 42	3.89
0. 500	4.90	1.500	26.74	2.500	6. 13	3.50	3.89
0. 583	5.83	1. 583	15.57	2.583	5. 55	3. 58	3. 69
0. 667					5.55		3. 69
0. 750		1. 750	11.47		5.09		3.50
0. 833			11.47		5.09		3.50
0. 917					4.72		3. 34
1. 000	10.36	2.000	9. 26	3.000	4. 72	4. 00	3. 34
Max. Eff. Inten. (r		110. 25		21. 07			
	(mi n)	5. 00		20.00			
Storage Coeff.				16. 31 (ii)			
Unit Hyd. Tpeak		0. 27		20. 00 0. 06			
Unit Hyd. peak	(CIIIS)=	0. 27		0.00	*TOT	ALS*	
PEAK FLOW	(cms)=	0. 36		0. 06		374 (iii)	
TIME TO PEAK	(hrs)=			1. 58		1.33	
RUNOFF VOLUME	(mm) =	47. 34		10. 98		3.71	
TOTAL RAINFALL	(mm) =	48. 34		48. 34		3. 34	
RUNOFF COEFFICIE		0. 98		0. 23), 49	
		0. 70					
*** WADNING CTODAG	COFFE	IC CMALL	ED THAN	TIME CTEDI			

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 59.0 | Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ID1= 1 (0033):

ADD HYD (0041) | 1 + 2 = 3 | AREA TPEAK QPEAK (ha) 0.41 (hrs) 1.50

+ ID2= 2 (C					
ID = 3 (C					
NOTE: PEAK FL					
I ADD HVD (0041)	d.	ADEA	ODEAK	TDEAK	D. V
3 + 2 = 1	-	(ha)	(CMS)	(hrs)	(mm)
3 + 2 = 1 ID1= 3 (C + ID2= 2 (C	0041): 0037):	5.73 0.65	0. 305 0. 022	1.50 1.42	22. 86 11. 03
======== ID = 1 (C					
NOTE: PEAK FL					
ADD HYD (0041)	-				
1 + 2 = 3	 -	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3 ID1= 1 (C + ID2= 2 (C	0041): 0038):	6.38	0.325	1.50	21. 66 11 10
ID = 3 (C					
NOTE: PEAK FL	,				
NOTE. FEAR FL					
ADD HYD (0041)	- . I				
3 + 2 = 1	1	AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1 ID1= 3 (C + ID2= 2 (C	0041):	(ha) 7.94	(cms) 0.365	(hrs) 1.50	(mm) 19.58
+ ID2= 2 (C)040): 	3.43	0. 374	1.33 	23. 71
ID = 1 (C	0041): 1	1.37	0. 603	1.33	20. 83
NOTE: PEAK FL					
ADD HYD (0032) 1 + 2 = 3	1	ADEA	ODEAK	TDEAK	D. V
1 + 2 = 3	-	(ha)	(CMS)	(hrs)	(mm)
1 + 2 = 3 ID1= 1 (C + ID2= 2 (C	พ.ส.ศ): 1041): 1	0.83 1.37	0. 026 0. 603	1.50	11. 92 20. 83
ID = 3 (0					

 Ptotal = 56.70 mm			da4-078b0c00e084\53809fdb up New IDFGroup - 2
0. 17 0. 33 0. 50 0. 67	mm/hr hrs 4.44 1.00 4.99 1.17 5.75 1.33 6.84 1.50 8.62 1.67	24.80 2.00 129.30 2.17 31.36 2.33 18.26 2.50	mm/hr hrs mm/hr 9.21 3.00 5.16 8.05 3.17 4.84 7.18 3.33 4.56 6.51 3.50 4.32 5.97 3.67 4.11
CALIB		5.62 50.00 Dir. Con	n. (%)= 35. 00
Manni ngs n	ha) = 2.8 mm) = 1.0 (%) = 1.0 (m) = 193.5 = 0.01	0 5. 00 0 2. 00 6 10. 00	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TR	ANSFORMED	HYETOGRAP	H		
TIME	RAIN TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs m	m/hr hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0. 083	4.44 1.083	24.80	2.083	9. 21	3.08	5. 16
0. 167	4.44 1.167	24.80	2.167	9. 21	3. 17	5. 16
0. 250	4.99 1.250	129.30	2.250	8. 05	3. 25	4.84
0. 333	4.99 1.333	129.30	2.333	8. 05	3. 33	4.84
0. 417	5.75 1.417	31.36		7. 18	3. 42	4.56
	5.75 1.500	31.36		7. 19	3. 50	4.56
0. 583	6.84 1.583	18. 26	2.583	6. 51	3. 58	4. 32
	6.84 1.667	18. 26		6. 51	3. 67	4.32
	8.62 1.750	13.46		5. 97	3. 75	4. 11
	8.62 1.833	13.46		5. 97	3. 83	4. 11
	2. 15 1. 917	10.86	2.917	5. 53	3. 92	3. 92
1. 000 1	2.15 2.000	10.86	3.000	5. 53	4. 00	3. 92
Max.Eff.Inten.(mm/hr)= 129, 30	3	36. 73			
over (min		1	0.00			
Storage Coeff. (min)= 3.43	(ii)	6.62 (ii)			
Unit Hyd. Tpeak (min			10.00			
Unit Hyd. peak (cms) = 0. 26		0. 14			
				TOTAL	_S	
PEAK FLOW (cms)= 0.68		0. 22	0. 84	17 (111)	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. V V I SSSSS U U AAA L
V V I SS U U AAAA L
V V I SS U U AAAAA L
V V I SS U U AAAAA L
VV I SSSSS UUUUU A A L (v 6.2.2011) uvu I I H H Y M M Developed and Distributed by Smart City Water Inc Copyright 2007 - 2021 Smart City Water Inc All rights reserved. ***** DETAILED OUTPUT ***** Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat Output filename: C: \Users\r.raj achockal i ngam\AppData\Local \Ci vi ca\VH5\98a3b801-fe45-439a-999a-909776 f7886e\7ccc5064-45ad-4e72-9bdd-52779b | Summary filename: | Summary filename: | C: \Users\r. raj achockal i ngam\AppData\Local \Ci vi ca\VH5\98a3b801-fe45-439a-999a-909776 | f7886e\7ccc5064-45ad-4e72-9bdd-52779b DATE: 06-15-2023 TIME: 02:15:47 USER: COMMENTS: ** SIMULATION : 2-025yr 4hr 10min Chicago ** Filename: C:\Users\r.rajachockalingam\AppD READ STORM | ata\Local\Temp\ TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = 1. 33 55. 70 56.70 56.70 56.70 0. 98 0. 26 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT. (III) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | CALIB | NASHYD (0022) | Area (ha)= 0.83 Curve Number (CN)= 75.0 | | D= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.19 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP. TRANSFORMED HYETOGRAPH -TIME RAIN | TIME RAIN | TIME RAIN RAIN | TIME mm/hr 4.44 hrs 1. 083 mm/hr 24.80 ' hrs 2.083 mm/hr | 9.21 | hrs 3.08 mm/hr 5. 16 hrs 24.80 | 2.167 129.30 | 2.250 129.30 | 2.333 31.36 | 2.417 0.167 4.44 1. 167 9. 21 3.17 5. 16 4. 99 4. 99 5. 75 1. 250 1. 333 1. 417 8. 05 8. 05 7. 18 0. 250 0. 333 3. 25 3. 33 4. 84 4. 84 0.417 3, 42 4.56 0. 500 0. 583 5. 75 6. 84 1. 500 1. 583 31. 36 | 2. 500 18. 26 | 2. 583 7. 19 6. 51
 0. 583
 0. 84
 1. 583

 0. 667
 6. 84
 1. 667

 0. 750
 8. 62
 1. 750

 0. 833
 8. 62
 1. 833

 0. 917
 12. 15
 1. 917

 1. 000
 12. 15
 2. 000
 18.26 | 2.667 6. 51 3.67 4.32 13. 46 | 2. 750 13. 46 | 2. 833 5. 97 5. 97 3. 75 3. 83 4. 11 4. 11 10 86 | 2 917 5 53 3 92 3 92 10.86 | 3.000 Unit Hyd Qpeak (cms) = 0.167 PEAK FLOW (cms) = 0.038 (i) TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 16.562
TOTAL RAINFALL (mm) = 56.700
RUNOFF COEFFICIENT = 0.292

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Area (ha)= 0.41 Curve Number (CN)= 75.0 Ia (mm)= 10.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.20 | NASHYD (0023)| |ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYFTOGRA	APH	_	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1. 083	24.80	2.083	9. 21	3. 08	5. 16
0. 167	4.44	1. 167	24.80	2.167	9. 21	3. 17	5. 16
0. 250	4.99	1. 250	129.30	2.250	8.05	3. 25	4.84
0.333	4.99	1. 333	129.30	2.333	8.05	3. 33	4.84
0.417	5.75	1. 417	31.36	2.417	7. 18	3. 42	4. 56
0.500	5.75	1.500	31.36	2.500	7. 19	3. 50	4. 56
0.583	6.84	1. 583	18.26	2.583	6. 51	3. 58	4.32
0.667	6.84	1. 667	18.26	2.667	6. 51	3. 67	4.32
0.750	8.62	1. 750	13.46	2.750	5. 97	3. 75	4. 11
0.833	8.62	1.833	13.46	2.833	5. 97	3. 83	4. 11
0. 917	12.15	1. 917	10.86	2.917	5. 53	3. 92	3. 92
1.000	12.15	2.000	10.86	3.000	5. 53	4. 00	3. 92

Unit Hyd Opeak (cms)= 0.078

PEAK FLOW (cms) = 0.018 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 16.569
TOTAL RAI NFALL (mm) = 56.700
RUNOFF COEFFICIENT = 0.292

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(0030)

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1.083	24.80	2.083	9. 21	3. 08	5. 16
0. 167	4.44	1. 167	24.80	2.167	9. 21	3. 17	5. 16
0. 250	4.99	1. 250	129.30	2.250	8. 05	3. 25	4.84
0.333	4.99	1. 333	129.30	2.333	8. 05	3. 33	4.84
0.417	5.75	1. 417	31.36	2.417	7. 18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7. 19	3.50	4. 56

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	5. 32 50. 00	Dir. Conn.(%)=	35. 00
Surface Area Dep. Storage Average Slope Length Mannings n	(ha) = (mm) = (%) = (m) =	IMPERVI 2. 6 1. 0 1. 0 188. 3 0. 13	6 0 0 3	PERVI OUS (i) 2.66 5.00 1.00 40.00 0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP

		TR/	ANSFORME	D HYETOGRA	PH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0. 083	4.44	1.083	24.80	2.083	9. 21	3. 08	5. 16
0. 167	4.44	1. 167	24.80	2.167	9. 21	3. 17	5. 16
0. 250		1. 250	129.30		8. 05	3. 25	4.84
0. 333	4.99	1.333	129.30	2.333	8. 05	3. 33	4.84
0. 417	5.75	1. 417	31.36	2.417	7. 18	3. 42	4. 56
0. 500		1.500	31.36		7. 19	3.50	4. 56
0. 583		1. 583	18. 26	2.583	6. 51	3. 58	4. 32
0. 667		1. 667	18. 26	2.667	6. 51	3. 67	4. 32
0. 750		1. 750	13.46		5. 97	3. 75	4. 11
0. 833		1.833	13.46		5. 97		4. 11
0. 917		1. 917	10.86	2.917	5. 53		3. 92
1. 000	12.15	2.000	10.86	3.000	5. 53	4. 00	3. 92
Max.Eff.Inten.(m		96. 65		28. 99			
	(mi n)	15.00		30.00			
Storage Coeff.				29.33 (11)			
Unit Hyd. Tpeak		15. 00		30.00			
Unit Hyd. peak	(CMS)=	0. 07		0. 04	+T07	TAL C+	
DEAK FLOW	()	0 22		0.00		TALS*	
	(cms)=	0. 32		0.09		368 (111)	1
	(hrs)=	1.50		1. 75		1.50	
RUNOFF VOLUME	(mm) =	55. 70		14. 81		9. 12	
TOTAL RAINFALL RUNOFF COEFFICIE	(mm) = NT =	56. 70		56. 70		5. 70	
KUNUFF CUEFFICIE	N I =	0. 98		0. 26	(). 51	

```
6.84 | 1.583
6.84 | 1.667
8.62 | 1.750
8.62 | 1.833
12.15 | 1.917
                                                       18. 26 | 2. 583
18. 26 | 2. 667
13. 46 | 2. 750
13. 46 | 2. 833
                                                                                                                                    4. 32
4. 32
4. 11
4. 11
                                                                                              6. 51
6. 51
5. 97
5. 97
0 583
0. 667
0. 750
                                                                                                                  3. 67
                8. 62
8. 62
12. 15
                                                                                                                 3. 75
3. 83
0.833
1.000 12.15 | 2.000 10.86 | 3.000
                                                                                               5. 53 İ
```

Unit Hyd Qpeak (cms) = 0.271

PEAK FLOW (cms)= 0.059 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 15.486
TOTAL RAI NFALL (mm)= 56.700
RUNOFF COEFFICIENT = 0.273

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | NASHYD (0031)

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TO	ANGEODUE	. III/ETOOD			
		IK	ANSFURME	D HYETOGRA	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.44	1. 083	24.80	2.083	9. 21	3.08	5. 16
0. 167	4.44	1. 167	24.80	2.167	9. 21	3. 17	5. 16
0. 250	4.99	1. 250	129.30	2.250	8. 05	3. 25	4.84
0.333	4.99	1. 333	129.30	2.333	8. 05	3. 33	4.84
0.417	5.75	1. 417	31.36	2.417	7. 18	3. 42	4.56
0.500	5.75	1. 500	31.36	2.500	7. 19	3. 50	4. 56
0.583	6.84	1. 583	18.26	2.583	6. 51	3. 58	4. 32
0.667	6.84	1. 667	18.26	2.667	6. 51	3. 67	4.32
0.750	8.62	1. 750	13.46	2.750	5. 97	3. 75	4. 11
0.833	8.62	1. 833	13.46	2.833	5. 97	3. 83	4. 11
0. 917	12.15	1. 917	10.86	2.917	5. 53	3. 92	3. 92
1.000	12.15	2.000	10.86	3.000	5. 53	4.00	3. 92

Unit Hyd Qpeak (cms) = 0.177

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 15.389
TOTAL RAINFALL (mm)= 56.700
RUNOFF COEFFICIENT = 0.271

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0028) ID= 1 DT= 5.0 min	Area Total	(ha)= 3.43 Imp(%)= 50.00		35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	1. 71	1. 71	
Dep. Storage	(mm) =	1. 00	5. 00	
Average Slope	(%)=	1.00	2. 00	
Length	(m) =	151. 22	40.00	
Manni ngs n	=	0.013	0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGRA	рн		
TIM	E RAIN			l' TIME	RAIN		RAIN
hr			mm/hr	' hrs	mm/hr	hrs	mm/hr
0.08	3 4.44	1. 083	24.80	2.083	9. 21	3. 08	5. 16
0. 16	7 4.44	1. 167	24.80	2.167	9. 21	3. 17	5. 16
0. 25	0 4.99	1. 250	129.30	2.250	8. 05 j	3. 25	4.84
0. 33		1. 333	129.30	2.333	8. 05 j	3. 33	4.84
0. 41	7 5.75	1. 417	31.36	2.417	7. 18	3. 42	4. 56
0. 50	0 5.75	1.500	31.36	2.500	7. 19	3.50	4. 56
0. 58					6.51	3. 58	4. 32
0. 66		1.667	18.26		6.51	3. 67	4. 32
0. 75			13.46		5. 97	3. 75	4. 11
0. 83		1. 833			5. 97		4. 11
0. 91		1. 917			5. 53		3. 92
1. 00	0 12.15	2.000	10.86	3.000	5. 53	4.00	3. 92
May Eff Inton (mm /h r)	129, 30		28. 99			
Max. Eff. Inten. ((min)	5. 00		15. 00			
Storage Coeff.				14. 54 (ii)			
Uni t Hyd. Tpeak				15.00			
Unit Hyd. peak				0. 08			
on t nyu. peak	(CIII3) -	0. 20		0.00	*TOT	ALS*	
PEAK FLOW	(cms)=	0. 42		0. 09		461 (iii)	
TIME TO PEAK	(hrs)=			1. 50		. 33	
RUNOFF VOLUME	(mm) =	55. 70		14. 81		. 12	
TOTAL RAINFALL	(mm) =	56. 70		56. 70		. 70	
RUNOFF COEFFICI		0. 98		0. 26		. 51	
						-	
**** WADNING: STODA	CE COEFE	IS SMALLE	ED THAN	TIME STEDI			

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

(1) THE STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

(ii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
RESERVOIR( 0029)|
                                    OVERFLOW IS OFF
  IN= 2---> OUT= 1
DT= 5.0 min

        OUTFLOW
        STORAGE
        OUTFLOW
        STORAGE

        (cms)
        (ha.m.)
        (cms)
        (ha.m.)

        0.0000
        0.0900
        0.1200

                                             AREA OPEAK TPEAK
(ha) (cms) (hrs)
3.430 0.461 1.33
3.430 0.046 2.58
                                                                                            (mm)
29. 12
   INFLOW: ID= 2 ( 0028)
OUTFLOW: ID= 1 ( 0029)
                                           3. 430
                       PEAK FLOW REDUCTION [Qout/Qin] (%) = 9,98
TIME SHIFT OF PEAK FLOW (min) = 75.00
MAXIMUM STORAGE USED (ha.m.) = 0.0613
AREA
                                                    QPEAK
                                                                  TPEAK
                                         (ha)
0.41
                                                   (cms)
0.018
                                                                  (hrs)
1.50
                                                                             (mm)
16. 57
                                                    0.046
                                                                  2.58
                                                                              29.02
                                         3.43
         ID = 3 ( 0007):
                                         3.84 0.054
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  ADD HYD ( 0007) |
3 + 2 = 1 |
                                                                              R.V.
                                         AREA QPEAK
                                                                  TPEAK
                                                                            (mm)
27. 69
15. 49
                                                    (cms)
0.054
                                                                  (hrs)
1.67
       ID1= 3 ( 0007):
+ ID2= 2 ( 0030):
                                         1.56 0.059
                                                                  1.58
                                         5. 40 0. 113 1. 58 24. 17
         ID = 1 ( 0007):
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0007) |
1 + 2 = 3 |
                                                  QPEAK
(cms)
0.113
                                                                  TPEAK
(hrs)
1.58
                                                                                R. V.
(mm)
                                         AREA
                                          (ha)
        ID1= 1 ( 0007):
+ ID2= 2 ( 0031):
                                                                              24.17
                                          5.40
         ID = 3 (0007):
                                         6.05 0.140
                                                                  1.50
                                                                             23. 22
```

CALID			
NASHYD (0019)	Area (ha)=	12. 20	Curve Number (CN) = 64.0
			# of Linear Res. (N) = 3.00
	U.H. Tp(hrs)=	0.61	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME) HYETOGRA	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1.083	24.80	2.083	9. 21	3. 08	5. 16
0. 167	4.44	1. 167	24.80	2.167	9. 21	3. 17	5. 16
0. 250	4.99	1. 250	129.30	2.250	8. 05	3. 25	4.84
0.333	4.99	1. 333	129.30	2.333	8. 05	3. 33	4.84
0.417	5.75	1. 417	31.36	2.417	7. 18	3. 42	4.56
0.500	5.75	1.500	31.36	2.500	7. 19	3.50	4.56
0.583	6.84	1. 583	18. 26	2.583	6. 51	3. 58	4.32
0.667	6.84	1. 667	18.26	2.667	6. 51	3. 67	4.32
0.750	8.62	1. 750	13.46	2.750	5. 97	3. 75	4. 11
0.833	8.62	1. 833	13.46	2.833	5. 97	3.83	4. 11
0. 917	12.15	1. 917	10.86	2.917	5. 53	3. 92	3. 92
1. 000	12.15	2.000	10.86	3.000	5. 53	4. 00	3. 92

Unit Hyd Qpeak (cms)= 0.764

PEAK FLOW (cms)= 0. 210 (i)
TIME TO PEAK (hrs)= 2. 083
RUNOFF VOLUME (mm)= 12. 871
TOTAL RAI NFALL (mm)= 56. 700
RUNOFF COEFFICIENT = 0. 227

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0039)	Area	(ha)=	0.83	Curve Number (CN) = 75.0
ID= 1 DT= 5.0 min	Ιa	(mm)=	10.00	# of Linear Res. (N) = 3.00
<u> </u>	U. H.	Tp(hrs)=	0.19	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

RAIN
ı/hr
16
16
84
84
56
1 1 8

ADD HYD (0007) 3 + 2 = 1	AREA (ha)	OPEAK (cms) 0.140	TPEAK (hrs)	R.V.)
+ ID2= 2 (0005):	5.32	0. 368	1.50	29. 12	
ID = 1 (0007):					=
NOTE: PEAK FLOWS DO	NOT INCL	UDE BASEFL	OWS IF A	NY.	
RESERVOIR(0008) 0	VERFLOW	IS NEE			
IN= 2> OUT= 1					
DT= 5.0 min 0	UTFLOW (cms)	STORAGE	OUT		STORAGE (ha.m.)
	0. 0000	(ha.m.) 0.0000	0.		0. 1535
	0.0410	0.0120	0.	4630	0.1758
		0.0253		6510 7480	0. 1989 0. 2228
	0. 0830	0.0399 0.0559	0.		0.2476
	0.0920	0.0732	1 0	8990	0 2733
	0. 2500	0.0918	0.	9640	0.2998
	0. 3200	0. 1116 0. 1321	1.	0800	0. 3528
	AR	FA OPF	AK T	PFAK	R. V.
	(h	EA QPE a) (cm	s) (hrs)	(mm)
INFLOW: ID= 2 (0007) OUTFLOW: ID= 1 (0008)	11.	370 0	. 508	1.50	25. 98
OUTFLOW: TD= T (0008)	11.	3/0 0	. 230	2.17	25. 97
		EDUCTION [
ITME SH	STORAG	EAK FLOW E USED	(ha	min)= 40 m \- (J. UU 1 0896
W/ O(T MOM	3101010	L USED	(IId)- (5. 0070
ADD HYD (0016) 1 + 2 = 3	V DE V	QPEAK	TDEAK	R. V.	
ID1= 1 (0022):	(ha)	(cms)	(hrs)	(mm))
ID1= 1 (0022): + ID2= 2 (0008):	0.83	0. 038	1.50	16. 56	

5.75 | 1.500 6.84 | 1.583 6.84 | 1.667 8.62 | 1.750 8.62 | 1.833 31.36 | 2.500 18.26 | 2.583 4. 56 4. 32 4. 32 4. 11 0 500 18. 26 | 2. 567 13. 46 | 2. 750 6. 51 6. 51 5. 97 3. 58 3. 67 3. 75 0. 583 0. 667 0. 750 0. 833 13.46 | 2.833 5. 97 12. 15 | 1. 917 12. 15 | 2. 000 2.917 0.917 10.86 5. 53 | 5. 53 | 3. 92 4. 00 3. 92 3. 92 1.000 10.86 | 3.000

Uni t Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms)= 0.038 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 16.562
TOTAL RAINFALL (mm)= 56.700
RUNOFF COEFFICIENT = 0.292

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB | | | NASHYD (0033) | Area (ha)= 0.41 Curve Number (CN)= 75.0 | | D= 1 DT= 5.0 min | | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | | U.H. Tp(hrs)= 0.20

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME) HYETOGRA	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1. 083	24.80	2.083	9. 21	3. 08	5. 16
0. 167	4.44	1. 167	24.80	2.167	9. 21	3. 17	5. 16
0.250	4.99	1. 250	129.30	2.250	8. 05	3. 25	4.84
0. 333	4.99	1. 333	129.30	2.333	8. 05	3. 33	4.84
0.417	5.75	1. 417	31.36	2.417	7. 18	3. 42	4. 56
0.500	5.75	1. 500	31.36	2.500	7. 19	3.50	4. 56
0.583	6.84	1. 583	18.26	2.583	6. 51	3. 58	4. 32
0.667	6.84	1. 667	18.26	2.667	6. 51	3. 67	4. 32
0.750	8.62	1. 750	13.46	2.750	5. 97	3. 75	4. 11
0.833	8.62	1. 833	13.46	2.833	5. 97	3.83	4. 11
0. 917	12.15	1. 917	10.86	2.917	5. 53	3. 92	3. 92
1.000	12.15	2.000	10.86	3.000	5. 53	4.00	3. 92

Unit Hyd Opeak (cms) = 0.078

PEAK FLOW (cms)= 0.018 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 16.569
TOTAL RAI NFALL (mm)= 56.700
RUNOFF COEFFICIENT = 0.292

CALIB				
STANDHYD (0036)	Area	(ha)= 5.32		
ID= 1 DT= 5.0 min	Total	Imp(%) = 50.00	Dir. Conn. (%) =	35.00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	2. 66	2. 66	
Dep. Storage	(mm) =	1. 00	5. 00	
Average Slope	(%)=	1. 00	1. 00	
Length	(m) =	188. 33	40.00	
Manni ngs n	=	0.130	0. 250	

NOTE: DAINEALL WAS TRANSCORMED TO E O MIN TIME STED

NOTE: RAINFAL	LL WAS II	RANSFURM	ED TO	5.0 MIN.	TIME SIE	.P.	
				ED HYETOGRA			
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs		' hrs	mm/hr		mm/hr
0. 083	4.44	1.083			9. 21	3. 08	5. 16
0. 167	4.44				9. 21	3. 17	5. 16
0. 250	4.99		129.30		8. 05	3. 25	4.84
0. 333	4.99	1. 333	129.30		8. 05	3. 33	4.84
0. 417	5.75	1.417	31.36		7. 18	3. 42	4. 56
0. 500	5.75	1.500	31.36	2.500	7. 19	3. 50	4. 56
0. 583	6.84				6. 51	3. 58	4. 32
0. 667	6.84		18.26		6. 51	3. 67	4. 32
0. 750	8.62		13.46		5. 97	3. 75	4. 11
0. 833	8.62				5. 97	3. 83	4. 11
0. 917	12.15				5. 53	3. 92	3. 92
1. 000	12.15	2.000	10.86	3.000	5. 53	4. 00	3. 92
N F66 1-1 (/l\	0/ /5		20.00			
Max. Eff. Inten. (mm/		96.65		28. 99			
over (r		15.00		30.00			
Storage Coeff. (r			(11)	29. 33 (11))		
Unit Hyd. Tpeak (r		15. 00		30.00			
Unit Hyd. peak (d	cms)=	0. 07		0. 04	+TOT		
DEAK FLOW	>	0.22		0.00		ALS*	
	cms)=	0. 32		0.09		368 (111)	
	nrs)=	1. 50		1. 75		. 50	
	(mm) =	55. 70		14. 81		. 12	
	(mm) =	56. 70		56. 70		. 70	
RUNOFF COEFFICIENT	Γ =	0. 98		0. 26	0	. 51	

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms) = 0.059 (i)
TIME TO PEAK (hrs) = 1.583
RUNOFF VOLUME (mm) = 15.486
TOTAL RAINFALL (mm) = 56.700
RUNOFF COEFFICIENT = 0.273

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	3. 43 50. 00	Dir. Conn.(%)=	35. 00
Surface Area	(ha)=	IMPERVIO 1.71	US	PERVI OUS (i) 1.71	
Dep. Storage Average Slope Length	(mm) = (%) = (m) =	1. 00 1. 00 151. 22		5. 00 2. 00 40. 00	
Manni ngs n	(111) =	0.013		0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGRA	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1.083	24.80	2.083	9. 21	3. 08	5. 16
0. 167	4.44	1. 167	24.80	2.167	9. 21	3. 17	5. 16
0. 250	4.99	1. 250	129.30	2.250	8. 05	3. 25	4.84
0.333	4.99	1. 333	129.30	2.333	8. 05	3. 33	4.84
0.417	5.75	1. 417	31.36	2.417	7. 18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7. 19	3.50	4.56
0.583	6.84	1. 583	18.26	2.583	6. 51	3. 58	4.32
0.667	6.84	1. 667	18.26	2.667	6. 51	3. 67	4.32
0.750	8.62	1. 750	13.46	2.750	5. 97	3. 75	4. 11
0.833	8.62	1. 833	13.46	2.833	5. 97	3.83	4. 11
0. 917	12.15	1. 917	10.86	2.917	5. 53	3. 92	3. 92
1.000	12.15	2.000	10.86	3.000	5. 53	4.00	3. 92

CALIB				
NASHYD (0037)	Area	(ha)=	0.65	Curve Number (CN) = 73.0
ID= 1 DT= 5.0 min	Ιa	(mm) =	10.00	# of Linear Res. (N) = 3.00
ii	U. H. 1	Γp(hrs)=	0.14	` ′

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGRA	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1. 083	24.80	2.083	9. 21	3.08	5. 16
0. 167	4.44	1. 167	24.80	2.167	9. 21	3. 17	5. 16
0. 250	4.99	1. 250	129.30	2.250	8. 05	3. 25	4.84
0.333	4.99	1. 333	129.30	2.333	8. 05	3. 33	4.84
0.417	5.75	1. 417	31.36	2.417	7. 18	3.42	4.56
0.500	5.75	1. 500	31.36	2.500	7. 19	3.50	4. 56
0.583	6.84	1. 583	18.26	2.583	6. 51	3. 58	4. 32
0.667	6.84	1. 667	18.26	2.667	6. 51	3. 67	4.32
0.750	8.62	1. 750	13.46	2.750	5. 97	3.75	4. 11
0.833	8.62	1. 833	13.46	2.833	5. 97	3.83	4. 11
0. 917	12.15	1. 917	10.86	2.917	5. 53	3. 92	3. 92
1.000	12.15	2.000	10.86	3.000	5. 53	4.00	3. 92

Unit Hyd Opeak (cms) = 0.177

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 15.389
TOTAL RAI NFALL (mm)= 56.700
RUNOFF COEFFICIENT = 0.271

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0038)	Area	(ha)=	1.56	Curve Number (CN) = 73.0
ID= 1 DT= 5.0 min	Ιa	(mm)=	10.00	# of Linear Res. (N) = 3.00
	U.H.	Tp(hrs)=	0. 22	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME	HYETOGRA	APH		
				' TIME			
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1. 083	24.80	2.083	9. 21	3. 08	5. 16
0. 167	4.44	1. 167	24.80	2.167	9. 21	3. 17	5. 16

Max. Eff. Inten. (r	nm/hr)=	129. 30	28. 99		
over	(min)	5. 00	15.00		
Storage Coeff.	(mi n) =	2. 95	(ii) 14.54	(ii)	
Uni t Hyd. Tpeak	(mi n)=	5. 00	15.00		
Unit Hyd. peak	(cms)=	0. 28	0. 08		
,	` ′			*TOTALS*	t
PEAK FLOW	(cms)=	0. 42	0. 09	0. 461	(iii)
TIME TO PEAK	(hrs)=	1. 33	1. 50	1.33	
RUNOFF VOLUME	(mm) =	55. 70	14. 81	29.12	
TOTAL RAINFALL	(mm) =	56. 70	56. 70	56.70	
RUNOFF COEFFICIE	ENT =	0. 98	0. 26	0.51	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 59.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE	COEFFI C	CLENT.		/.
ADD HYD (0041) 1 + 2 = 3 ID1= 1 (0033): + ID2= 2 (0036):	(ha) 0.41 5.32	(cms) 0.018 0.368	(hrs) 1.50 1.50	(mm) 16.57 29.12
ID = 3 (0041): NOTE: PEAK FLOWS DO N	5.73	0. 386	1.50	28. 22
ADD HYD (0041) 3 + 2 = 1 ID1= 3 (0041): + ID2= 2 (0037):	(ha) 5.73		(hrs)	(mm) 28. 22

1.50 26.91

	NOTE:	PEA	FLOWS	NOT	INCLUDE	BASEFLOWS	ΙF	ANY.	
-				 					

ADD HYD (0041)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0041):	6.38	0. 416	1.50	26. 91

ID = 1 (0041): 6.38 0.416

```
+ ID2= 2 ( 0038):
                 1.56 0.059
                              1 58 15 49
 ID = 3 (0041):
                 7.94 0.475
                             1.50 24.67
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0041):	7.94	0. 475	1.50	24. 67
+ ID2= 2 (0040):	3.43	0. 461	1.33	29. 12
===============				
ID = 1 (0041):	11.37	0.760	1.33	26. 01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)										
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.						
	(ha)	(cms)	(hrs)	(mm)						
ID1= 1 (0039):	0.83	0. 038	1.50	16. 56						
+ ID2= 2 (0041):	11.37	0.760	1.33	26. 01						
ID = 3 (0032):	12.20	0. 782	1.33	25. 37						

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----(v 6.2.2011)

V V I SSSSS U U A L
V V I SS U U AAA L
V V I SS U U AAAA L
V V I SS U U AAAA L
VV I SSSSS UUUUU A A L

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***** DETAILED OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

Manni ngs n = 0.0130.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH							
TIME	RAIN	TIME	RAIN	' TIME	RAI N	TIME	RAIN	
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr	
0.083	4.96	1.083	27.61	2.083	10. 27	3. 08	5. 76	
0. 167	4.96	1. 167	27.61	2.167	10. 27	3. 17	5. 76	
0. 250	5.58	1. 250	143.50	2.250	8. 98	3. 25	5.40	
0.333	5.58	1. 333	143.50	2.333	8. 98	3. 33	5.40	
0.417	6.42	1. 417	34.91	2.417	8. 02	3. 42	5. 10	
0.500	6.42	1.500	34.91	2.500	8. 02	3. 50	5. 10	
0.583	7.64	1. 583	20.35	2.583	7. 27	3. 58	4.83	
0.667	7.64	1. 667	20.35	2.667	7. 27	3. 67	4.83	
0.750	9.62	1. 750	15.00	2.750	6. 67	3. 75	4. 59	
0.833	9.62	1. 833	15.00	2.833	6. 67	3. 83	4.59	
0. 917	13.55	1. 917	12.12	2.917	6. 17	3. 92	4. 38	
1.000	13.55	2.000	12.12	3.000	6. 17	4. 00	4. 38	

Max. Eff. Inten. (mm/h	nr)= 143.50	45. 22	
over (mi	n) 5.00	10.00	
Storage Coeff. (mi	n)= 3. 29 ((11) 6.35 (11)	
Unit Hyd. Tpeak (mi	n) = 5.00	10.00	
Unit Hyd. peak (cn	ns)= 0. 27	0. 15	
			TOTALS
	ns)= 0.75	0. 27	0.970 (iii)
	^s)= 1.33	1. 42	1.33
	nm)= 62.12	18. 01	33.45
	nm)= 63.12	63. 12	63.12
RUNOFF COEFFICIENT	= 0. 98	0. 29	0.53

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (1) CN FACOUNTS SELECTED FOR FENTIOUS SESSES.

 CN* = 59.0 | 1a = Dep. Storage (Above)

 (i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

 THAN THE STORAGE COEFFICIENT.

 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Area (ha)= 0.83 Curve Number (CN)= 75.0 I a (mm)= 10.00 # of Li near Res. (N)= 3.00 U.H. Tp(hrs)= 0.19 (0022) NASHYD (CN) = 75.0|ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

Output filename:

Output filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\0190bef0-d295-4ffa-89e8-0f7b80
Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776

f7886e\0190bef0-d295-4ffa-89e8-0f7b80

DATE: 06-15-2023

TIME: 02:15:47

USFR:

COMMENTS: ___

** SIMULATION : 2-050yr 4hr 10min Chicago **

READ STORM		Jsers\r. raj achocka \Local \Temp\	lingam\AppD				
Ptotal = 63.12 mm	073789e9-0d0b-43a3-ada4-078b0c00e084\64963d3c Comments: created from IDF Group New IDFGroup - 2						
TIME hrs 0.00 0.17 0.33 0.50 0.67	RAIN TIME mm/hr hrs 4.96 1.00 5.58 1.17 6.42 1.33 7.64 1.50 9.62 1.67	RAIN TIME mm/hr hrs 27.61 2.00 143.50 2.17 34.91 2.33 20.35 2.50 15.00 2.67	RAIN TIME mm/hr hrs 10.27 3.00 8.98 3.17 8.02 3.33 7.27 3.50 6.67 3.67	RAIN mm/hr 5.76 5.40 5.10 4.83 4.59			

0.83 13.55 | 1.83 12.12 | 2.83 6.17 | 3.83 4.38 STANDHYD (0006) Area (ha)= 5.62Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00ID= 1 DT= 5.0 min

IMPERVIOUS PERVIOUS (i) Surface Area Dep. Storage Average Slope Length (ha)= (mm)= 2. 81 1. 00 2. 81 5. 00 (%) = (m) = 1.00 2.00

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.96	1. 083	27.61	2.083	10. 27	3.08	5.76
0. 167	4.96	1. 167	27.61	2.167	10. 27	3. 17	5.76
0. 250	5.58	1. 250	143.50	2.250	8. 98	3. 25	5.40
0. 333	5.58	1. 333	143.50	2.333	8. 98	3. 33	5.40
0.417	6.42	1. 417	34.91	2.417	8. 02	3.42	5. 10
0.500	6.42	1. 500	34.91	2.500	8. 02	3.50	5. 10
0. 583	7.64	1. 583	20.35	2.583	7. 27	3. 58	4.83
0.667	7.64	1. 667	20.35	2.667	7. 27	3.67	4.83
0.750	9.62	1. 750	15.00	2.750	6. 67	3. 75	4. 59
0.833	9.62	1. 833	15.00	2.833	6. 67	3. 83	4. 59
0. 917	13.55	1. 917	12.12	2.917	6. 17	3. 92	4. 38
1.000	13.55	2.000	12.12	3.000	6. 17	i 4.00	4. 38

Uni t Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms)= 0.048 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 20.429
TOTAL RAINFALL (mm)= 63.117
RUNOFF COEFFICIENT = 0.324

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | NASHYD (0023)| |ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH								
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	4.96	1. 083	27.61	2.083	10. 27	3. 08	5. 76		
0. 167	4.96	1. 167	27.61	2.167	10. 27	3. 17	5. 76		
0. 250	5.58	1. 250	143.50	2.250	8. 98	3. 25	5.40		
0.333	5.58	1. 333	143.50	2.333	8. 98	3. 33	5.40		
0.417	6.42	1. 417	34.91	2.417	8. 02	3. 42	5. 10		
0.500	6.42	1. 500	34.91	2.500	8. 02	3. 50	5. 10		
0.583	7.64	1. 583	20.35	2.583	7. 27	3. 58	4.83		
0.667	7.64	1. 667	20.35	2.667	7. 27	3. 67	4.83		
0.750	9.62	1. 750	15.00	2.750	6. 67	3. 75	4. 59		
0.833	9.62	1. 833	15.00	2.833	6. 67	3. 83	4. 59		
0. 917	13.55	1. 917	12.12	2.917	6. 17	3. 92	4. 38		
1.000	13.55	2.000	12.12	3.000	6. 17	4.00	4.38		

PEAK FLOW (cms) = 0.023 TIME TO PEAK (hrs) = 1.500 RUNOFF VOLUME (mm) = 20.437 TOTAL RAINFALL (mm) = 63.117 (cms) = 0.023 (i) RUNOFF COEFFICIENT = 0.324

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALLB NASHYD (0030) Area (ha)= 1.56 Curve Number (CN)= 73.0 la (mm)= 10.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.22 || ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		IR	ANSFORME	D HYETOGR	APH	-	
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.96	1.083	27.61	2.083	10. 27	3. 08	5. 76
0. 167	4.96	1. 167	27.61	2.167	10. 27	3. 17	5. 76
0. 250	5.58	1. 250	143.50	2.250	8. 98	3. 25	5.40
0.333	5.58	1. 333	143.50	2.333	8. 98	3. 33	5.40
0.417	6.42	1. 417	34.91	2.417	8. 02	3. 42	5. 10
0.500	6.42	1.500	34.91	2.500	8. 02	3. 50	5. 10
0.583	7.64	1. 583	20.35	2.583	7. 27	3. 58	4.83
0.667	7.64	1. 667	20.35	2.667	7. 27	3. 67	4.83
0.750	9.62	1. 750	15.00	2.750	6. 67	3. 75	4.59
0.833	9.62	1. 833	15.00	2.833	6. 67	3. 83	4.59
0. 917	13.55	1. 917	12.12	2.917	6. 17	3. 92	4. 38
1.000	13.55	2.000	12.12	3.000	6. 17	4.00	4.38

Unit Hyd Opeak (cms)= 0.271

PEAK FLOW (cms)= 0.076 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 19.159
TOTAL RAINFALL (mm)= 63.117
RUNOFF COEFFICIENT = 0.304

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(0031) ID= 1 DT= 5.0 min

6. 42 6. 42 7. 64 7. 64 1. 417 1. 500 1. 583 0 417 2. 417 2. 500 2. 583 2. 667 2. 750 2. 833 2. 917 3. 000 34. 91 20. 35 20. 35 8. 02 7. 27 7. 27 3. 50 3. 58 3. 67 3. 75 0. 500 0. 583 5. 10 4.83 0. 667 0. 750 1.667 4.83 6. 67 6. 67 6. 17 6. 17 9.62 13.55 0.833 1. 833 1. 917 15.00 3.83 4.59 0. 917 12.12 3. 92 4 38 Max.Eff.Inten.(mm/hr)=
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 107. 30 15. 00 30.00 14. 46 (ii) 15. 00 27. 59 (ii) 30. 00 0.08 0.04 *TOTALS* PEAK FLOW 0. 37 0. 423 (iii) TIME TO PEAK (hrs) =
RUNOFF VOLUME (mm) =
TOTAL RAINFALL (mm) = 1.50 1.75 1.50 62. 12 63. 12 18.01 33 44 RUNOFF COEFFICIENT 0.98 0.53

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 59.0 | Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | STANDHYD (0028)| |ID= 1 DT= 5.0 min | Area (ha)= 3.43Total Imp(%)= 50.00 Dir. Conn. (%)= 35.001 MPERVIOUS 1.71 1.00 PERVIOUS (i) 1.71 Surface Area (ha)= (mm) = (%) = (m) = Dep. Storage Average Slope 5 00 1. 00 151. 22 2. 00 40. 00 Length Manni ngs n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYFTOGRAPH RAIN mm/hr TIME RAIN | TIME mm/hr | hrs RAIN | mm/hr | TIME hrs hrs mm/hr 4. 96 | 4. 96 | 5. 58 | 1. 083 27. 61 2. 083 1. 167 27. 61 2. 167 1. 250 143. 50 2. 250 2.083 3. 08 3. 17 0.083 10. 27 5.76 0. 167 0. 250 10. 27 3. 25 5. 40 1. 333 143. 50 1. 417 34. 91 0.333 5.58 6.42 2. 333 2. 417 8. 98 3. 33 3. 42 5. 40

	TRANSFORMED HYETOGRAPH								
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	4.96	1. 083	27.61	2.083	10. 27	3.08	5. 76		
0. 167	4.96	1. 167	27.61	2.167	10. 27	3. 17	5. 76		
0. 250	5.58	1. 250	143.50	2.250	8. 98	3. 25	5.40		
0. 333	5.58	1. 333	143.50	2.333	8. 98	3. 33	5.40		
0.417	6.42	1. 417	34.91	2.417	8. 02	3. 42	5. 10		
0.500	6.42	1. 500	34.91	2.500	8. 02	3.50	5. 10		
0.583	7.64	1. 583	20.35	2.583	7. 27	3. 58	4.83		
0.667	7.64	1. 667	20.35	2.667	7. 27	3. 67	4.83		
0.750	9.62	1. 750	15.00	2.750	6. 67	3. 75	4.59		
0.833	9.62	1. 833	15.00	2.833	6. 67	3. 83	4.59		
0. 917	13.55	1. 917	12.12	2.917	6. 17	3. 92	4. 38		
1. 000	13.55	2. 000	12.12	3.000	6. 17	4. 00	4. 38		

Unit Hyd Qpeak (cms) = 0.177

PEAK FLOW (cms)= 0.042 (i) TIME TO PEAK (hrs) = 1. 417
RUNOFF VOLUME (mm) = 19. 041
TOTAL RAINFALL (mm) = 63. 117
RUNOFF COEFFICIENT = 0. 302

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005)	Area	(ha)=			
ID= 1 DT= 5.0 min	Total	I mp (%) =	50.00	Dir. Conn. (9	6) = 35.00
·		IMPERVIO	OUS	PERVIOUS (i)	,
Surface Area	(ha)=	2. 66	5	2. 66	
Dep. Storage	(mm) =	1. 00)	5. 00	
Average Slope	(%)=	1. 00)	1. 00	
Length	(m) =	188. 33	3	40.00	
Manni ngs n	=	0.130)	0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAI N
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.96	1. 083	27.61	2.083	10. 27	3. 08	5. 76
0. 167	4.96	1. 167	27.61	2.167	10. 27	3. 17	5. 76
0. 250	5.58	1. 250	143.50	2.250	8. 98	3. 25	5. 40
0. 333	5.58	1. 333	143.50	2.333	8. 98	3. 33	5. 40

0. 667 7. 64 0. 750 9. 62 0. 833 9. 62 0. 917 13. 55 1. 000 13. 55	1. 667 20. 35 1. 750 15. 00 1. 833 15. 00 1. 917 12. 12 2. 000 12. 12	2.833	6. 67 3. 75 4 6. 67 3. 83 4 6. 17 3. 92 4	1. 83 1. 59 1. 59 1. 38 1. 38
Max.Eff.Inten.(mm/hr) = over (min) Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) =	143. 50 5. 00 2. 83 (ii) 5. 00 0. 28	45. 22 15. 00 12. 53 (ii) 15. 00 0. 08	*TOTALS*	
PEAK FLOW (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT =	0. 47 1. 33 62. 12 63. 12 0. 98	0. 12 1. 50 18. 01 63. 12 0. 29	0. 523 (iii) 1. 33 33. 45 63. 12 0. 53	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 59.0 | Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029)	OVERFLOW I	S OFF			
IN= 2> OUT= 1					
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE	
	(cms)	(ha.m.)	(cms)	(ha.m.)	
	0.0000	0.0000	0.0900	0.1200	
	ARE	A QPEA	K TPEAK	R. V.	
	(ha) (cms) (hrs)	(mm)	
INFLOW : ID= 2 (00	28) 3.4	30 0.	523 1.3	3 33. 45	
OUTFLOW: ID= 1 (OC	29) 3.4	30 0.	053 2.5	8 33.35	
PEAK	: FLOW RE	DUCTION [Q	out/Qi n] (%)=	10. 10	
TIME	SHIFT OF PE	AK FLOW	(mi n)=	75.00	
MAXI	MUM STORAGE	USED	(ha. m.)=	0.0705	

ADD HYD (0007)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0023):	0.41	0. 023	1.50	20. 44	

```
+ ID2= 2 ( 0029):
                                    3, 43 0, 053
                                                          2 58 33 35
         ID = 3 (0007):
                                   3.84 0.064
                                                         1.67 31.97
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0007) |
3 + 2 = 1 |
                                                                        R.V.
(mm)
                                     AREA
                                               QPEAK
                                                            TPEAK
                                     (ha)
                                                (cms)
                                                           (hrs)
      ID1= 3 ( 0007):
+ ID2= 2 ( 0030):
                                     3.84
1.56
                                              0.064
                                                            1.67
                                                                      31.97
                                              0. 076
       ID = 1 ( 0007):
                                     5.40 0.139
                                                          1.58
                                                                     28. 27
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0007)|
| 1 + 2 = 3 |
                                     AREA
                                               QPEAK
                                                            TPEAK
                                     (ha)
5.40
                                              (cms)
0.139
                                                           (hrs)
1.58
                                                                      (mm)
28. 27
       ID1= 1 ( 0007):
+ ID2= 2 ( 0031):
                                              0.042
                                                                      19.04
                                     0.65
                                                            1.42
        ID = 3 ( 0007):
                                     6.05 0.174
                                                                     27. 28
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0007) |
3 + 2 = 1 |
                                                                      R.V.
                                     AREA
                                              QPEAK
                                                           TPEAK
                                     (ha)
6.05
                                              (cms)
0. 174
                                                           (hrs)
1.50
      ID1= 3 ( 0007):
+ ID2= 2 ( 0005):
                                     5, 32 0, 423
                                                           1.50
                                                                     33 44
                                   11. 37 0. 598
                                                        1.50
        ID = 1 ( 0007):
                                                                     30. 16
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 RESERVOIR( 0008)|
                                OVERFLOW IS OFF
 IN= 2---> OUT= 1
DT= 5.0 min
                                OUTFLOW
                                              STORAGE
                                                               OUTFLOW
                                                                              STORAGE
                                  (cms)
                                                                              (ha.m.)
                                               (ha.m.)
                                                                 (cms)
0.4220
                                  0.0000
                                                0.0000
                                                                                0.1535
                                 0. 0410
0. 0580
                                                                 0. 4630
0. 6510
                                                                                0. 1758
0. 1989
                                               0.0253
                                  0.0710
                                               0.0399
                                                                 0.7480
                                                                                0.2228
     Unit Hyd Qpeak (cms) = 0.764
    ______ (cms) = 0.262 (i)

IIME TO PEAK (hrs) = 2.083

RUNOFF VOLUME (mm) = 15.873

TOTAL RAINFALL (mm) = 63.117

RUNOFF COEFFICIENT = 0.251

(i) PEAK FLOTT
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALI B
( 0039)
           NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                              TRANSFORMED HYETOGRAPH
                                                                        RAIN | TIME
mm/hr | hrs
10.27 | 3.08
10.27 | 3.17
                     TIME
                               RAIN | TIME
                                                    RAIN | TIME
                                                                                                RAIN
                              mm/hr
4.96
4.96
                                         hrs
1. 083
                                                   mm/hr
                                                                  hrs
                                                                                               mm/hr
                    0. 083
                                                   27. 61
27. 61
                                                              2.083
                                         1.167
                                                                                               5.76
                    0. 250
0. 333
                                5. 58
5. 58
                                                              2. 250 2. 333
                                                                         8. 98
8. 98
                                         1 250
                                                  143.50
                                                                                               5.40
                                         1. 333
                                6. 42
6. 42
7. 64
                                                   34. 91 |
34. 91 |
20. 35 |
20. 35 |
                                                              2.417
                    0.417
                                         1.417
                                                                          8.02
                                                                                     3.42
                                                                                                5.10
                                        1. 500
1. 583
1. 667
                                                              2.500
2.583
2.667
                                                                          8. 02
7. 27
7. 27
                    0. 500
0. 583
                                7.64
                    0.667
                                                                                     3.67
                                                                                               4.83
                    0. 667 7. 64 1. 667

0. 750 9. 62 1. 750

0. 833 9. 62 1. 833

0. 917 13. 55 1. 917

1. 000 13. 55 2. 000
                                                   15.00 | 2.750
15.00 | 2.833
12.12 | 2.917
                                                                          6. 67
6. 67
                                                                          6.17
                                                                                     3.92
                                                                                               4.38
     Unit Hyd Opeak (cms) = 0.167
     PEAK FLOW (cms) = 0.048 (I)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 20.429
TOTAL RAINFALL (mm) = 63.117
RUNOFF COEFFICIENT = 0.324
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

(0033)

NASHYD || ID= 1 DT= 5.0 min | Area (ha)= 0.41 Curve Number (CN)= 75.0 I a (mm)= 10.00 # of Li near Res. (N)= 3.00 U.H. Tp(hrs)= 0.20

		0. 0920 0. 2500 0. 3200 0. 3750	0 0	. 0732 . 0918 . 1116 . 1321	0.899 0.964 1.024	0 0 0 0 0 0 0 0 0 0 0 0	. 2733 . 2998 . 3263 . 3528	
INFLOW : ID= OUTFLOW: ID=	2 (000							
OUTFLOW: ID=	PEAK	FLOW	REDUC	TION FOC	out/Qi n1 (%)= 46, 06		
	MAXII				(min (ha.m.)= 0.09	90	
ADD HYD (0 1 + 2 = 3	04()	ARE	EA O	PEAK	TPEAK	R. V.		
ADD HYD (0 1 + 2 = 3 	(0022): (0008):	(ha 0. 8 11. 3	a) (33 0. 37 0.	cms) 048 275	(hrs) 1.50 2 2.17 3	(mm) 20. 43 30. 16		
ID = 3 NOTE: PEA	(0016): K FLOWS I	12.2 00 NOT IN	20 0. NCLUDE	291 BASEFLOW	2.08 2 VS IF ANY.	9. 50		
CALI B NASHYD (0						ber (C	N)= 64.0	
CALIB NASHYD (0 ID= 1 DT= 5.0					# of Line 5.0 MIN.			
NOTE.								
	TIME hrs 0.083 0.167	RAIN mm/hr 4.96 4.96	TIME hrs 1. 083 1. 167	RAIN mm/hr 27.61 27.61	ED HYETOGR TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 2.667 2.750 2.833 2.917 3.000	RAIN mm/hr 10.27 10.27	TIME hrs 3.08 3.17	RAIN mm/hr 5.76 5.76
	0. 250 0. 333 0. 417	5.58 5.58 6.42	1. 250 1. 333 1. 417	143.50 143.50 34.91	2. 250 2. 333 2. 417	8. 98 8. 98 8. 02	3. 25 3. 33 3. 42	5. 40 5. 40 5. 10
	0. 500 0. 583 0. 667 0. 750	7.64 7.64 7.64 9.62	1. 500 1. 583 1. 667 1. 750	20. 35 20. 35 15. 00	2.500 2.583 2.667 2.750	8. 02 7. 27 7. 27 6. 67	3. 50 3. 58 3. 67 3. 75	4. 83 4. 83 4. 59
	0. 833 0. 917 1. 000	9. 62 13. 55 13. 55	1. 833 1. 917 2. 000	15.00 12.12 12.12	2.833 2.917 3.000	6. 67 6. 17 6. 17	3. 83 3. 92 4. 00	4. 59 4. 38 4. 38
NOTE:	RAINFALI	_ WAS TRA	ANSFORM	ED TO	5.0 MIN.	TIME STE	P.	
	TIME	RAIN	TIME	ANSFORME RAIN	ED HYETOGR ' TIME ' hrs 2.083	APH RAIN	TIME	RAIN
	0. 083 0. 167 0. 250	4.96	1. 167	27. 61 27. 61 143. 50	2.167	10. 27 8. 98	3. 17 3. 25	5. 76 5. 76 5. 40
	0. 333 0. 417 0. 500	5. 58 6. 42 6. 42	1. 333 1. 417 1. 500	143.50 34.91 34.91	2.333	8. 98 8. 02 8. 02	3. 33 3. 42 3. 50	5. 40 5. 10 5. 10
	0. 583 0. 667 0. 750 0. 833	7. 64 7. 64 9. 62 9. 62	1. 583 1. 667 1. 750 1. 833	20.35 20.35 15.00	2.333 2.417 2.500 2.583 2.667 2.750 2.833 2.917 3.000	7. 27 7. 27 6. 67	3. 58 3. 67 3. 75 3. 83	4. 83 4. 83 4. 59
	0. 917 1. 000	13.55	1. 917	12. 12 12. 12	2.917	6. 17 6. 17	3. 92 4. 00	4. 38 4. 38
Unit Hyd Q PEAK FLOW		ns) = 0. ns) = 0.)				
TIME TO PE RUNOFF VOL TOTAL RAIN RUNOFF COE	AK (hı UME (r FALL (r	^s)= 1. nm)= 20. nm)= 63.	500 437	,				
(i) PEAK F								
CALIB STANDHYD (0	 I							
Surface Ar	 ea (l		MPFRVI ()	US PF	ERVI OUS (i 2.66			
Dep. Stora Average SI Length Mannings n	ope	nm) = (%) = (m) = =	1. 00 1. 00 188. 33 0. 130		5. 00 1. 00 40. 00 0. 250			
•					5.0 MIN.	TIME STE	P.	
	TIME	RAIN	TIME	ANSFORME RAIN	D HYETOGR	APH RAIN	TIME	
	0. 083 0. 167 0. 250	4.96	1. 083	27.61	2. 083 2. 167 2. 250	10. 27 L	3. 08	mm/hr 5.76 5.76 5.40
	hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	' TIME ' hrs	RAIN mm/hr	TIME hrs	mm/hr
		4.96 5.58	1. 167 1. 250	27.61 143.50	2.167	10. 27 8. 98	3. 1 <i>1</i> 3. 25	

```
5.58
6.42
6.42
7.64
                                                            143.50 |
34.91 |
34.91 |
                                                                            2. 333
2. 417
2. 500
2. 583
                   0. 333
0. 417
                                               1. 333
1. 417
                                                                                                                        5. 40
5. 10
                                                                                            8. 02
                                                1.500
                                                                                                          3.50
                                                                                                                        5.10
                   0.500
                                                                                            8. 02
7. 27
                                                                                                          3. 58
                   0.583
                                                1.583
                                                              20.35
                                                                                                                         4.83
                                                                                             7. 27
                                  9. 62
9. 62
13. 55
                                                                           2. 750
2. 833
2. 917
                                                                                           6. 67
6. 67
6. 17
                   0.750
                                                1.750
                                                              15.00
                                                                                                          3. 75
3. 83
                                                                                                                        4.59
                                               1. 833
1. 917
                                                             15.00
12.12
                   0.833
                                                                                                                         4. 38
                   1.000
                                  13.55
                                               2.000
                                                             12.12 | 3.000
                                                                                            6. 17
                                                                                                          4.00
                                                                                                                        4.38
Max.Eff.Inten.(mm/hr)=
                                                107. 30
                                                                        35. 61
over (mi n)
Storage Coeff. (mi n)=
Unit Hyd. Tpeak (mi n)=
Unit Hyd. peak (cms)=
                                                 15. 00
14. 46 (ii)
15. 00
                                                                        30.00
27.59 (ii)
                                                                        30.00
                                                   0.08
                                                                          0.04
                                                                                                *TOTALS*
                                                                                                  0. 423 (iii)
1.50
33.44
PEAK FLOW
                                                   0. 37
                                                                          0. 11
                             (cms)=
PEAK FLOW (GIIS)-
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT =
                                                 1. 50
62. 12
63. 12
                                                                        1. 75
18. 01
                                                                        63.12
                                                                                                   63.12
RUNOFF COEFFICIENT
                                                    0. 98
```

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 59.0 | 1a = Dep. Storage (Above)

 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

 THAN THE STORAGE COEFFICIENT.

 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0037)	Area (ha)=	0.65	Curve Number (CN) = 73.0
ID= 1 DT= 5.0 min	la (mm)=	10.00	# of Linear Res. (N) = 3.00
	U.H. Tp(hrs)=	0.14	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP

		TR	ANSFORME	HYETOGR	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAI N	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.96	1.083	27.61	2.083	10. 27	3. 08	5. 76
0. 167	4.96	1. 167	27.61	2.167	10. 27	3. 17	5. 76
0. 250	5.58	1. 250	143.50	2.250	8. 98	3. 25	5.40
0.333	5.58	1. 333	143.50	2.333	8. 98	3. 33	5.40
0.417	6.42	1. 417	34.91	2.417	8. 02	3. 42	5. 10
0.500	6.42	1.500	34.91	2.500	8. 02	3. 50	5. 10
0.583	7.64	1. 583	20.35	2.583	7. 27	3. 58	4.83
0.667	7.64	1. 667	20.35	2.667	7. 27	3. 67	4.83
0.750	9.62	1. 750	15.00	2.750	6. 67	3. 75	4. 59
0.833	9.62	1.833	15.00	2.833	6. 67	3. 83	4. 59

| STANDHYD (0040)| |ID= 1 DT= 5.0 min | Area (ha)= 3.43Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00IMPERVIOUS PERVIOUS (i) 1. 71 5. 00 2. 00 Surface Area 1. 71 (mm) = (%) = (m) = Dep. Storage Average Slope 1. 00 151. 22 Length Manni ngs n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0. 083	4.96	1.083	27.61	2.083	10. 27	3. 08	5. 76
0. 167	4.96	1. 167	27.61	2.167	10. 27	3. 17	5. 76
0. 250	5.58	1. 250	143.50	2.250	8. 98	3. 25	5.40
0. 333	5.58	1. 333	143.50	2.333	8. 98	3. 33	5.40
0. 417	6.42	1. 417	34.91	2.417	8. 02	3. 42	5. 10
0. 500	6.42	1.500	34.91	2.500	8. 02	3.50	5. 10
0. 583	7.64	1.583	20.35	2.583	7. 27	3. 58	4.83
0. 667	7.64	1.667	20.35	2.667	7. 27	3. 67	4.83
0. 750	9.62	1.750	15.00	2.750	6. 67	3. 75	4.59
0. 833	9.62	1.833	15.00	2.833	6. 67	3. 83	4. 59
0. 917	13.55	1. 917	12.12	2.917	6. 17	3. 92	4.38
1. 000	13.55	2. 000	12.12	3.000	6. 17	4. 00	4. 38
x.Eff.Inten.(mm/	/hr)=	143. 50		45. 22			

Max. Eff. Inten. (r	nm/hr)=	143. 50	45. 22		
over	(mi n)	5. 00	15. 00		
Storage Coeff.	(mi n) =	2. 83	(ii) 12.53	(ii)	
Uni t Hyd. Tpeak	(mi n) =	5. 00	15. 00		
Unit Hyd. peak	(cms)=	0. 28	0.08		
				TOTALS	t
PEAK FLOW	(cms)=	0. 47	0. 12	0. 523	(iii)
TIME TO PEAK	(hrs)=	1. 33	1. 50	1.33	
RUNOFF VOLUME	(mm) =	62. 12	18. 01	33.45	
TOTAL RAINFALL	(mm) =	63. 12	63. 12	63.12	
RUNOFF COEFFICIE	ENT =	0. 98	0. 29	0.53	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
Unit Hyd Opeak (cms) = 0.177
     PEAK FLOW (cms)= 0.042 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 19.041
TOTAL RAINFALL (mm)= 63.117
RUNOFF COEFFICIENT = 0.302
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                            ( 0038)
 NASHYD
| ID= 1 DT= 5.0 min |
          NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                            TRANSFORMED HYETOGRAPH
                               RAIN | TIME
                                                                        RAIN |
                    TIME
                                                                                   TIME
                                                                                             RAIN
                                                  RAIN | TIME
                              mm/hr
4.96
                                        hrs
1. 083
                                                  mm/hr
27.61
27.61
                                                            hrs 2.083
                                                                       mm/hr
10.27
                                                                                            mm/hr
5.76
                                                           2. 167
2. 250
2. 333
2. 417
                                                                      10. 27
                   0.167
                               4.96
                                        1.167
                                                                                  3.17
                                                                                            5.76
                   0. 250
0. 333
0. 417
                                       1. 250
1. 333
1. 417
                                                 143.50
143.50
34.91
                                                                                  3. 25
3. 33
3. 42
                                                                                            5. 40
5. 40
                               6.42
                                                                        8.02
                                                                                            5.10
                               6. 42
7. 64
7. 64
                   0. 500
0. 583
                                       1. 500
1. 583
                                                  34. 91
20. 35
                                                            2. 500
2. 583
                                                                       8. 02
7. 27
                                                                                            5. 10
4. 83
                                       1.667
                                                                        7. 27
                                                                                  3.67
                   0.667
                                                  20.35
                                                           2.667
                                                                                            4.83
                            9. 62 | 1. 750
9. 62 | 1. 833
13. 55 | 1. 917
13. 55 | 2. 000
                   0. 750
0. 833
                                                 15.00 | 2.750
15.00 | 2.833
                                                                       6. 67
6. 67
                                                                                  3. 75
3. 83
                                                                                            4. 59
4. 59
                   0 917
                                                  12 12
                                                            2 917
                                                                       6 17
                                                                                  3 92
                                                                                            4 38
                   1. 000
                                                 12. 12 | 3. 000
     Unit Hyd Qpeak (cms) = 0.271
                          (cms)= 0.076 (i)
     PEAK FLOW
     TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 19.159
TOTAL RAINFALL (mm)= 63.117
RUNOFF COEFFICIENT = 0.304
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
______
```

ADD HYD (0041) 1 + 2 = 3	5.73 VOT INCL	0. 446 UDE BASEFL	1.50 OWS IF A	32. 51 37. 32. 31	
ADD HYD (0041) 3 + 2 = 1	AREA (ha) 5. 73 0. 65 	QPEAK (cms) 0. 446 0. 042	TPEAK (hrs) 1.50 1.42	R. V. (mm) 32. 51 19. 04 	
ADD HYD (0041) 1 + 2 = 3	AREA (ha) 6. 38 1. 56	QPEAK (cms) 0. 484 0. 076	TPEAK (hrs) 1.50 1.50 1.50	R. V. (mm) 31. 14 19. 16 ======= 28. 79	
ADD HYD (0041) 3 + 2 = 1 ID1= 3 (0041): + ID2= 2 (0040): =========== ID = 1 (0041): NOTE: PEAK FLOWS DO N	11.37	0. 878	1. 33	30. 19	
ADD HYD (0032) 1 + 2 = 3 ID1= 1 (0039):	AREA (ha) 0.83	QPEAK (cms) 0.048	TPEAK (hrs) 1.50	R. V. (mm) 20. 43	

+ ID2= 2 (0041): 11.37 0.878 1. 33 30. 19 ID = 3 (0032): 12.20 0.908 1.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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***** DETAILED OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

- C: \Users\r.raj achockal i ngam\AppData\Local \Ci vi ca\VH5\98a3b801-fe45-439a-999a-909776 C: \Users\r.raj\achockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776

 C: \Users\r.raj\achockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
- f7886e\d7b5f2ef-03fb-4ece-8a0d-3aa02d

DATE: 06-15-2023

TIME: 02:15:48

IISFR:

** SIMULATION : 2-100yr 4hr 10min Chicago **

Unit Hyd. Tpeak Unit Hyd. peak		5. 00 0. 27	10. 00 0. 15	
,				*TOTALS*
PEAK FLOW	(cms)=	0. 83	0. 33	1.100 (iii)
TIME TO PEAK	(hrs)=	1. 33	1. 42	1.33
RUNOFF VOLUME	(mm) =	68. 46	21. 38	37.86
TOTAL RAINFALL	(mm) =	69. 46	69. 46	69.46
RUNOFF COEFFICIE	NT =	0. 99	0. 31	0.54

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 59.0 | la = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(0022) Area (ha)= 0.83 Curve Number (CN)= 75.0 I a (mm)= 10.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.19 NASHYD | ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	5.46	1.083	30.39	2.083	11. 31	3. 08	6.34
0. 167	5.46	1. 167	30.39	2.167	11. 31	3. 17	6.34
0. 250	6.14	1. 250	157.92	2.250	9. 88	3. 25	5. 95
0.333	6.14	1. 333	157.92	2.333	9. 88	3. 33	5. 95
0.417	7.06	1. 417	38.42	2.417	8. 83	3. 42	5. 61
0.500	7.06	1.500	38.42	2.500	8. 83	3.50	5. 61
0. 583	8.40	1. 583	22.40	2.583	8. 00	3. 58	5. 31
0.667	8.40	1. 667	22.40	2.667	8. 00	3. 67	5. 31
0.750	10.58	1. 750	16.51	2.750	7. 34	3. 75	5.05
0.833	10.58	1.833	16.51	2.833	7. 34	3.83	5. 05
0. 917	14.91	1. 917	13.33	2.917	6. 80	3. 92	4.82
1.000	14.91	2.000	13.33	3.000	6. 80	4. 00	4. 82

Unit Hyd Opeak (cms) = 0.167

PEAK FLOW (cms) = 0.059 TIME TO PEAK (hrs) = 1.500 RUNOFF VOLUME (mm) = 24.473 TOTAL RAI NFALL (mm) = 69.460 RUNOFF COEFFICI ENT = 0.352 0.059 (i) 1.500

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY

READ STORM Ptotal = 69.46 mm

Comments: created from IDF Group New IDFGroup - 2

TIME	RAIN	TIME	RAIN	ľ	TIME	RAIN		TIME	RAIN
hrs	mm/hr	hrs	mm/hr	į.	hrs	mm/hr	Ĺ	hrs	mm/hr
0.00	5.46	1.00	30.39	İ	2.00	11. 31	Ľ	3.00	6.34
0.17	6.14	1.17	157.92	Ĺ	2. 17	9. 88	ĺ	3. 17	5. 95
0.33	7.06	1.33	38.42	Ĺ	2. 33	8. 83	ĺ	3. 33	5. 61
0.50	8.40	1.50	22.40	İ	2.50	8.00	İ	3.50	5. 31
0.67	10.58	1.67	16.51	Ĺ	2.67	7.34	ĺ	3.67	5.05
0.83	14.91	1.83	13.33	Ĺ	2.83	6.80	ĺ	3.83	4.82

CALIB | STANDHYD (0006) | | ID= 1 DT= 5.0 min |

Area (ha)= 5.62

Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00

IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 2. 81 1. 00 1. 00 2.81 Dep. Storage Average Slope (mm) = (%) = (m) = 5.00 193. 56 Length 10.00 Manni ngs n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	5.46	1. 083	30.39	2.083	11. 31	3.08	6.34
0. 167	5.46	1. 167	30.39	2.167	11. 31	3. 17	6.34
0. 250	6.14	1. 250	157.92	2.250	9.88	3. 25	5. 95
0. 333	6.14	1. 333	157.92	2.333	9.88	3. 33	5. 95
0.417	7.06	1. 417	38.42	2.417	8.83	3. 42	5. 61
0.500	7.06	1. 500	38.42	2.500	8.83	3.50	5. 61
0.583	8.40	1. 583	22.40	2.583	8.00	3. 58	5. 31
0.667	8.40	1. 667	22.40	2.667	8.00	3. 67	5. 31
0.750	10.58	1. 750	16.51	2.750	7.34	3. 75	5.05
0.833	10.58	1. 833	16.51	2.833	7.34	3. 83	5.05
0. 917	14.91	1. 917	13.33	2.917	6.80	3. 92	4.82
1.000	14.91	2.000	13.33	3.000	6.80	4.00	4.82

Max. Eff. Inten. (mm/hr)= over (min) Storage Coeff. (min)=

157. 92 54, 39 5. 00 3. 16 (ii)

10.00

CALLB Area (ha)= 0.41 Curve Number (CN)= 75.0 Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 U.H. Tp(hrs)= 0.20 (0023) | ID= 1 DT= 5.0 min |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH -RAIN | TIME RAIN TIME RAIN | TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0.083 5.46 1 083 30.39 2 083 11 31 3 08 6 34 0. 167 1. 167 2.167 0.250 6.14 1. 250 157. 92 157. 92 2.250 9.88 3. 25 5. 95 6.14 1. 333 0.333 2.333 9.88 3. 33 5. 95 0. 417 38.42 2.417 8. 83 5. 61 0.500 7.06 1.500 38.42 2,500 8.83 3.50 5. 61 0. 583 0. 667 8.40 1. 583 1. 667 22. 40 | 2. 583 22. 40 | 2. 667 5. 31 5. 31 8.40 8. 00 3. 67 10. 58 10. 58 14. 91 1. 750 1. 833 1. 917 16. 51 16. 51 0.750 2 750 7 34 3 75 5 05 2. 833 2. 917 0. 833 7. 34 3. 83 5. 05 0.917 13.33 3.92 6.80 4.82

6.80

4.00

4.82

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms)= 0.028 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 24.483
TOTAL RAINFALL (mm)= 69,460
RUNOFF COEFFICIENT = 0.352

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0030)

1.000 14.91 | 2.000 13.33 | 3.000

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH ----

RAIN | TIME RAIN | TIME RAIN | TIME mm/hr | hrs | mm/hr | hrs | mm/hr | hrs | 5.46 | 1.083 | 30.39 | 2.083 | 11.31 | 3.08 TIME RAI N hrs mm/hr hrs mm/hr 30. 39 | 2. 083 30. 39 | 2. 167 0.083 5. 46 5. 46 6. 34 6. 34

		1. 333 1. 417 1. 500 1. 583 1. 667 1. 750 1. 833 1. 917					5. 95 5. 95 5. 61 5. 61 5. 31 5. 05 5. 05 4. 82 4. 82
--	--	--	--	--	--	--	---

Unit Hyd Qpeak (cms) = 0.271

PEAK FLOW (cms) = 0.094 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 23.016
TOTAL RAINFALL (mm) = 69.460
RUNOFF COEFFICIENT = 0.331

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0031)	Area	(ha)=	0.65	Curve Number (CN) = 73.0
ID= 1 DT= 5.0 min	Ιa	(mm)=	10.00	# of Linear Res. (N) = 3.00
ii	U. H.	Tp(hrs)=	0.14	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	APH	_	
TIME	RAIN	TIME	RAIN	' TIME	RAI N	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	5.46	1.083	30.39	2.083	11. 31	3. 08	6.34
0. 167	5.46	1. 167	30.39	2.167	11. 31	3. 17	6.34
0. 250	6.14	1. 250	157.92	2.250	9.88	3. 25	5. 95
0.333	6.14	1. 333	157.92	2.333	9.88	3. 33	5. 95
0.417	7.06	1. 417	38.42	2.417	8. 83	3. 42	5. 61
0.500	7.06	1.500	38.42	2.500	8.83	3. 50	5. 61
0. 583	8.40	1. 583	22.40	2.583	8.00	3. 58	5. 31
0.667	8.40	1. 667	22.40	2.667	8.00	3. 67	5. 31
0.750	10.58	1. 750	16.51	2.750	7.34	3. 75	5.05
0.833	10.58	1.833	16.51	2.833	7.34	3. 83	5.05
0. 917	14.91	1. 917	13.33	2.917	6.80	3. 92	4.82
1. 000	14.91	2.000	13.33	3.000	6. 80	4. 00	4. 82

Unit Hyd Qpeak (cms) = 0.177

PEAK FLOW (cms) = 0.051 (i)
TIME TO PEAK (hrs) = 1.417
RUNOFF VOLUME (mm) = 22.874

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0028) ID= 1 DT= 5.0 min	Area Total	(ha)= 3.43 Imp(%)= 50.00		35. 00
Surface Area Dep. Storage Average Slope Length Mannings n	(ha) = (mm) = (%) = (m) =	1 MPERVI OUS 1. 71 1. 00 1. 00 151. 22 0. 013	PERVIOUS (i) 1.71 5.00 2.00 40.00 0.250	

NOTE: RAINFALL WAS TRANSFORMED TO $\,$ 5.0 MIN. TIME STEP.

	TRANSFORM	ED HYETOGRA	APH	
TIME RAIN	TIME RAIN	' TIME	RAIN TIME	RAIN
hrs mm/hr	hrs mm/hr	' hrs	mm/hr hrs	mm/hr
0. 083 5. 46	1.083 30.39	2.083	11. 31 3. 08	6.34
0. 167 5. 46	1. 167 30. 39	2.167	11. 31 3. 17	6.34
0, 250 6, 14	1. 250 157. 92	2, 250	9, 88 3, 25	5. 95
0. 333 6. 14	1. 333 157. 92	2.333	9. 88 3. 33	5. 95
0, 417 7, 06	1. 417 38. 42	2.417	8, 83 3, 42	5. 61
0. 500 7. 06	1.500 38.42	2.500	8. 83 3. 50	5. 61
0. 583 8. 40	1.583 22.40	2.583	8. 00 3. 58	5. 31
0. 667 8. 40	1.667 22.40	2.667	8. 00 3. 67	5. 31
0. 750 10. 58	1. 750 16. 51	2.750	7. 34 3. 75	5.05
0. 833 10. 58	1. 833 16. 51	2.833	7. 34 3. 83	5.05
0. 917 14. 91	1. 917 13. 33	2.917	6. 80 3. 92	4.82
1. 000 14. 91	2.000 13.33	3.000	6. 80 4. 00	4. 82
Max.Eff.Inten.(mm/hr)=	157. 92	54. 39		
over (min)	5. 00	15. 00		
Storage Coeff. (min)=	2.73 (11)	11. 73 (ii)	1	
Unit Hyd. Tpeak (min)=	5. 00	15. 00	'	
Unit Hyd. peak (cms)=	0. 29	0. 09		
on t nyu. peak (cms)-	0. 27	0.07	*TOTALS*	
PEAK FLOW (cms)=	0. 52	0. 14	0.587 (iii)	
TIME TO PEAK (hrs)=	1. 33	1. 50	1.33	
RUNOFF VOLUME (mm)=	68. 46	21. 38	37. 85	
TOTAL RAINFALL (mm) =	69. 46	69. 46	69.46	
RUNOFF COFFELCIENT =	0, 99	0, 31	0.54	
KONOTT COLITICIENT -	0. //	0. 01	0.34	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 59.0 la = Dep. Storage (Above)

TOTAL RAINFALL (mm) = 69.460 RUNOFF COEFFICIENT = 0.329

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area Total	(ha)= 5.32 Imp(%)= 50.00	Dir. Conn.(%)=	35. 00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2. 66	2. 66	
Dep. Storage	(mm) =	1. 00	5. 00	
Average Slope	(%)=	1. 00	1.00	
Length	(m) =	188. 33	40.00	
Manni ngs n	=	0.130	0.250	
3 -				

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORM	ED HYETOGRA	APH	
TIME RAIN	TIME RAIN	I' TIME	RAIN TIME RAI	N
hrs mm/hr	hrs mm/hr	' hrs	mm/hr hrs mm/h	ır
0. 083 5. 46	1. 083 30. 39	2.083	11. 31 3. 08 6. 34	
0. 167 5. 46	1. 167 30. 39	2.167	11. 31 3. 17 6. 34	
0. 250 6. 14	1. 250 157. 92	2.250	9. 88 3. 25 5. 95	
0. 333 6. 14	1. 333 157. 92	2.333	9. 88 3. 33 5. 95	
0. 417 7. 06	1. 417 38. 42	2.417	8. 83 3. 42 5. 61	
0. 500 7. 06	1. 500 38. 42	2.500	8. 83 3. 50 5. 61	
0. 583 8. 40	1. 583 22. 40	2.583	8.00 3.58 5.31	
0. 667 8. 40	1. 667 22. 40	2.667	8.00 3.67 5.31	
0. 750 10. 58	1. 750 16. 51		7. 34 3. 75 5. 05	
0. 833 10. 58	1. 833 16. 51		7. 34 3. 83 5. 05	
0. 917 14. 91	1. 917 13. 33		6. 80 3. 92 4. 82	
1.000 14.91	2. 000 13. 33	3.000	6. 80 4. 00 4. 82	
Max.Eff.Inten.(mm/hr)=	118. 09	42. 74		
over (min)	15. 00	30.00		
Storage Coeff. (min)=	13.91 (ii)	26. 12 (ii))	
Unit Hyd. Tpeak (min)=	15. 00 ` ´	30.00		
Unit Hyd. peak (cms)=	0. 08	0. 04		
			TOTALS	
PEAK FLOW (cms)=	0. 41	0. 13	0. 481 (iii)	
TIME TO PEAK (hrs)=	1. 50	1. 75	1.50	
RUNOFF VOLUME (mm) =	68. 46	21. 38	37.85	
TOTAL RAINFALL (mm) =	69. 46	69. 46	69.46	
RUNOFF COEFFICIENT =	0. 99	0. 31	0.54	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ la = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029)	OVEDELOW I	IS OFF			
IN= 2> OUT= 1					
DT= 5.0 min	OUTFLOW	STORAGE	OUTI	LOW	STORAGE
	(cms)	STORAGE (ha.m.) 0.0000	(cr	ns)	(ha.m.)
	0. 0000	0.0000	0.0	0900	0.1200
	ARE	EA QPE	AK TI	PFAK	R V
	(ha	a) (cn	ns) (l	nrs)	(mm)
INFLOW: ID= 2 (0028 OUTFLOW: ID= 1 (0029) 3. 4	430 (). 587	1.33	37. 85
OUTFLOW: ID= 1 (0029) 3.4	430 (). 060	2.50	37. 76
PEAK	FLOW RE	EDUCTION [Qout/Qi n	(%)= 10	. 21
TIME S	HIFT OF PE	EAK FLOW E USED	(r	nin)= 70	. 00
MAX I MUI	M STORAGE	E USED	(ha.	m.)= 0	. 0799
ADD HYD (0007)	ADEA	ODEAK	TDEAK	D.V	
1 + 2 = 3 ID1= 1 (0023):	(ha)	(CMS)	(hrs)	(mm)	
ID1= 1 (0023):	0.41	0. 028	1.50	24. 48	
+ 1D2= 2 (0029):	3.43	0.060	2.50	37.76	
ID = 3 (0007):					
10 - 3 (0007).	3.04	0.074	1.50	30. 34	
NOTE: PEAK FLOWS DO	NOT INCLU	JDE BASEFL	OWS IF A	IY.	
ADD HYD (0007)					
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.	
ID1- 2 (0007)	(ha)	(CMS)	(hrs)	(MM)	
ADD HYD (0007) 3 + 2 = 1 ID1= 3 (0007): + ID2= 2 (0030):	1.56	0.074	1.50	23. 02	
=======================================					
ID = 1 (0007):	5.40	0. 166	1.58	32. 49	
NOTE: PEAK FLOWS DO	NOT INCLI	IDE BASEEI	OWS LE M	IV	
NOTE. TEAR TEORS DO					
ADD 11/D (0007);					
ADD HYD (0007) 1 + 2 = 3	V DE V	ODEVA	TDEAK	p v	
1 + 2 = 3	(ha)	QPEAK (cms)	(hrs)	(mm)	
	()	(05)	(5)	()	

(ha) (cms) 5.40 0.166

ID1= 1 (0007):

(hrs) 1.58

(mm) 32.49

```
+ ID2= 2 ( 0031):
               0, 65 0, 051 1, 42 22, 87
ID = 3 ( 0007): 6.05 0.211 1.50 31.46
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007) | 3 + 2 = 1 | ARFA QPEAK **TPEAK** R.V. (mm) (ha) (cms) (hrs) ID1= 3 (0007): + ID2= 2 (0005): 6.05 5.32 0. 211 1.50 31.46 0. 481 37. 85 ID = 1 (0007): 11.37 0.692 1.50 34.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008) OVERFLOW IS OFF IN= 2---> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE (cms) 0.4220 0.4630 (cms) 0.0000 (ha.m.) 0.0000 0.0410 0.0120 0.1758 0.6510 0.7480 0.0580 0.0253 0 1989 0.0559 0.0830 0.8280 0.2476 0. 0920 0.0732 0.8990 0.9640 0.2733 0. 2500 0.0918 0.2998 0.3200 1.0240 0.3263 0.3750 0.1321 1.0800 0.3528 R. V. AREA QPEAK TPEAK | (ha) | INFLOW : ID= 2 (0007) | 11.370 | OUTFLOW: ID= 1 (0008) | 11.370 (cms) 0. 692 0. 317 (hrs) 1.50 2.17 (mm) 34.45 34. 44

 PEAK
 FLOW
 REDUCTION
 [Qout/Qi n] (%) = 45.83

 TIME
 SHIFT OF PEAK FLOW
 (min) = 40.00

 MAXIMUM
 STORAGE
 USED
 (ha.m.) = 0.1108

ADD HYD (0016) | 1 + 2 = 3 | (mm) 24. 47 34. 44 (cms) 0.059 (hrs) 1.50 (ha) ID1= 1 (0022): + ID2= 2 (0008): 11.37 0.317 2.17 ID = 3 (0016): 12.20 0.336

> 0 167 30 39 2. 250 2. 333 2. 417 157. 92 157. 92 0. 250 1. 250 0.333 6.14 7.06 1.333 9.88 3.33 5.95 0.417 1.417 38.42 8, 83 3.42 5. 61 0.583 8.40 8.40 1.583 22.40 22.40 2.583 8.00 3.58 5.31 0. 667 1. 667 2.667 2.750 8.00 3. 67 5 31 0. 750 10.58 1. 750 16.51 7. 34 5.05 0.833 10.58 1. 833 1. 917 16.51 13.33 2.833 2.917 7.34 3.83 5.05 0. 917 14 91 6. 80 3 92 1.000 14.91 | 2.000 13.33 3.000 6.80 4.82

Unit Hyd Opeak (cms) = 0.167

PEAK FLOW (cms)= 0.059 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 24.473
TOTAL RAI NFALL (mm)= 69,460
RUNOFF COEFFICIENT = 0.352

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(0033)

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH TIME RAIN | TIME RAIN | TIME RAIN RAIN | TIME hrs 0.083 mm/hr 5.46 hrs 1.083 mm/hr 30.39 hrs 2.083 mm/hr | 11.31 | hrs 3.08 mm/hr 6.34 0 167 5 46 1 167 30 39 2 167 11 31 3 17 6 34 0. 250 0. 333 1. 250 1. 333 157. 92 157. 92 2. 250 2. 333 6.14 9. 88 9. 88 5. 95 5. 95 3.33 0 417 7 06 1 417 38 42 2 417 8 83 5. 61 38. 42 22. 40 2.500 0.583 8.40 1.583 8.00 3.58 5.31 8.40 1. 667 1. 750 22. 40 16. 51 2.667 2.750 8. 00 7. 34 5 31 10.58 | 1.833 14.91 | 1.917 14.91 | 2.000 2.833 0.833 16.51 7.34 3.83 5.05 0. 917 13. 33 | 2. 917 3. 000 6.80 4.82

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms)= 0.028 (i) TIME TO PEAK (hrs)= 1.500

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN RAIN | TIME hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 6.34 0.167 5.46 1.167 30.39 2.167 11. 31 3.17 157. 92 | 157. 92 | 0.250 6.14 1 250 2 250 9 88 5 95 9. 88 0. 333 1. 333 2.333 3. 33 0.417 7.06 1.417 38.42 2.417 8.83 3, 42 5. 61 0.500 7.06 1. 500 1. 583 38. 42 | 2. 500 22. 40 | 2. 583 8. 83 5. 61 5. 31 0. 583 8. 00 8.40 1. 667 1. 750 22.40 | 2.667 16.51 | 2.750 16.51 | 2.833 0 667 8 40 8 00 3 67 5 31 7. 34 7. 34 0. 750 10.58 5. 05 10.58 1.833 0.833 3.83 5.05 0.917 14. 91 | 1. 917 14. 91 | 2. 000 13 33 2 917 6 80 3 92 4 82 13.33 | 3.000

Unit Hyd Opeak (cms) = 0.764

PEAK FLOW (cms) = 0.317 (i) TIME TO PEAK (hrs) = 2.083
RUNOFF VOLUME (mm) = 19.050
TOTAL RAINFALL (mm) = 69.460 TOTAL RAINFALL (mm) = 69.460 RUNOFF COEFFICIENT = 0.274

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(0039)

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH --RAIN | TIME RAIN | TIME RAIN | TIME RAIN |
mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr |
5.46 | 1.083 | 30.39 | 2.083 | 11.31 | 3.08 | 6.34 TIME hrs mm/hr

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| STANDHYD (0036) | | ID= 1 DT= 5.0 min | Area (ha)= 5.32 Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00 IMPERVIOUS PERVIOUS (i) (ha)= Surface Area 2. 66 1. 00 2. 66 5. 00 (mm) = (%) = (m) = Dep. Storage Average Slope Lenath 188. 33 40.00 Manni ngs n 0.130 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYFTOGRAPH TIME RAIN TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr | hrs mm/hr 5.46 5.46 30. 39 30. 39 11. 31 | 6. 34 6. 34 0.083 1 083 2 083 0. 167 2.167 157. 92 | 157. 92 | 38. 42 | 5. 95 5. 95 5. 61 0.250 6.14 1. 250 2.250 9.88 0. 333 1. 333 1. 417 2. 333 2. 417 3. 33 3. 42 7.06 0.500 1.500 38.42 2.500 8.83 3.50 5, 61 0. 583 0. 667 8. 40 8. 40 1. 583 1. 667 22. 40 22. 40 2.583 8. 00 8. 00 5. 31 5. 31 0.750 10.58 1.750 16.51 | 2.750 7.34 3.75 5.05 0. 833 0. 917 10.58 14.91 1. 833 1. 917 16.51 13.33 2.833 7. 34 6. 80 3. 83 3. 92 5. 05 4. 82 1 000 14.91 2 000 13.33 | 3.000 6 80 4 00 4 82 Max. Eff. Inten. (mm/hr)= 118.09 42.74 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 15. 00 13. 91 (ii) 30.00 26. 12 (ii) 15.00 30.00 0.08 0.04 *TOTALS* PEAK FLOW 0. 41 0. 13 0. 481 (iii) (cms)= TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)= 1. 50 68. 46 1.50 1. 75 21. 38 TOTAL RAINFALL (mm) = 69.46 69.46 69.46 RUNOFF COEFFICIENT

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 59.0 la = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH RAIN | TIME RAIN | mm/hr | 11.31 | TIME TIME RAIN RAIN | TIME hrs 0.083 mm/hr 5.46 hrs 1.083 mm/hr 30.39 hrs 3.08 mm/hr 6.34 2.083 0.167 5.46 1. 167 30.39 2.167 11. 31 3. 17 6.34 0. 250 0. 333 1. 250 157. 92 157. 92 2. 250 2. 333 9. 88 9. 88 3. 25 3. 33 1. 333 5. 95 1. 417 1. 500 1. 583 38. 42 38. 42 22. 40 0 417 7 06 2 417 8 83 0. 500 0. 583 2.500 8.40 3.58 8.00 5. 31 22. 40 | 2. 583 22. 40 | 2. 667 16. 51 | 2. 750 16. 51 | 2. 833 13. 33 | 2. 917 13. 33 | 3. 000 0. 667 0. 750 1. 667 1. 750 1. 833 1. 917 5 31 7. 34 0.833 10.58 İ 3. 83 5.05 0. 917 1. 000

Unit Hyd Opeak (cms) = 0.177

PEAK FLOW (cms) = 0.051 (i)
TIME TO PEAK (hrs) = 1.417
RUNOFF VOLUME (mm) = 22.874
TOTAL RAINFALL (mm) = 69.460
RUNOFF COEFFICIENT = 0.329

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NASHYD (0038) | Area (ha)= 1.56 Curve Number (CN)= 73.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.22 NASHYD (0038)

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

0. 750	10.58	1.750	16.51	2.750	7.34 3	. 75 5. 05
0. 833	3 10.58	1.833	16.51	2.833	7. 34 3	. 83 5. 05
0. 917	7 14.91	1. 917	13.33	2.917	6.80 3	. 92 4. 82
1.000	14.91	2.000	13.33	3.000	6.80 4	. 00 4. 82
Max. Eff. Inten. (r	nm/hr)=	157. 92		54. 39		
over	(mi n)	5.00		15.00		
Storage Coeff.	(mi n) =	2.73	(ii)	11.73 (ii)		
Uni t Hyd. Tpeak	(mi n) =	5.00		15. 00		
Unit Hyd. peak	(cms)=	0. 29		0.09		
					*TOTALS	*
PEAK FLOW	(cms)=	0. 52		0. 14	0. 587	(iii)
TIME TO PEAK	(hrs)=	1. 33		1. 50	1.33	
RUNOFF VOLUME	(mm) =	68. 46		21. 38	37.85	
TOTAL RAINFALL	(mm) =	69.46		69. 46	69.46	
RUNOFF COEFFICIE	ENT =	0. 99		0. 31	0.54	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

ADD HYD (0041) | 1 + 2 = 3 | QPEAK (mm) 24. 48 (ha) (cms) (hrs) 0. 028 ID = 3 (0041): 5. 73 0. 510

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0041):	5.73	0. 510	1.50	36. 90
+ ID2= 2 (0037):	0.65	0. 051	1.42	22. 87
ID = 1 (0041):	6.38	0. 556	1.50	35. 47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	5.46	1. 083	30.39	2.083	11. 31	3. 08	6.34
0. 167	5.46	1. 167	30.39	2.167	11. 31	3. 17	6.34
0. 250	6.14	1. 250	157.92	2.250	9. 88	3. 25	5. 95
0. 333	6.14	1. 333	157.92	2.333	9. 88	3. 33	5. 95
0.417	7.06	1. 417	38.42	2.417	8. 83	3. 42	5. 61
0.500	7.06	1. 500	38.42	2.500	8. 83	3. 50	5. 61
0.583	8.40	1. 583	22.40	2.583	8. 00	3. 58	5. 31
0.667	8.40	1. 667	22.40	2.667	8.00	3. 67	5. 31
0.750	10.58	1. 750	16.51	2.750	7. 34	3. 75	5.05
0.833	10.58	1. 833	16.51	2.833	7. 34	3. 83	5. 05
0. 917	14.91	1. 917	13.33	2.917	6. 80	3. 92	4.82
1.000	14.91	2.000	13.33	3.000	6. 80	4.00	4.82

Unit Hyd Opeak (cms) = 0.271

PEAK FLOW (cms)= 0.094 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 23.016
TOTAL RAINFALL (mm)= 69.460
RUNOFF COEFFICIENT = 0.331 PEAK FLOW

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	(ha)= 3.43 Imp(%)= 50.00		35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	1. 71	1. 71	
Dep. Storage	(mm) =	1. 00	5. 00	
Average Slope	(%)=	1. 00	2.00	
Length	(m)=	151, 22	40.00	
Manni ngs n	=	0.013	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH											
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN				
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr				
0.083	5.46	1. 083	30.39	2.083	11. 31	3. 08	6.34				
0. 167	5.46	1. 167	30.39	2.167	11. 31	3. 17	6.34				
0. 250	6.14	1. 250	157.92	2.250	9. 88	3. 25	5. 95				
0.333	6.14	1. 333	157.92	2.333	9. 88	3. 33	5. 95				
0.417	7.06	1. 417	38.42	2.417	8. 83	3.42	5. 61				
0.500	7.06	1. 500	38.42	2.500	8. 83	3.50	5. 61				
0.583	8.40	1. 583	22.40	2.583	8.00	3. 58	5. 31				
0.667	8.40	1. 667	22.40	2.667	8. 00	3. 67	5. 31				

ADD HYD (0041)	4054	ODEAN	TDEAK	Б. И
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0041):	6.38	0. 556	1.50	35. 47
+ ID2= 2 (0038):	1.56	0. 094	1.50	23. 02
ID = 3 (0041):	7.94	0. 649	1.50	33. 02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS LE ANY.

ADD HYD (0041)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0041):	7.94	0. 649	1.50	33. 02
+ ID2= 2 (0040):	3.43	0. 587	1.33	37. 85
ID - 1 (0041):	11 37	1 001	1 33	34 48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032) 1 + 2 = 3	AREA (ha) 0.83 11.37	OPEAK (cms) 0. 059 1. 001	TPEAK (hrs) 1.50 1.33	R.V. (mm) 24.47 34.48
ID = 3 (0032):	12. 20	1. 039	1.33	33. 80

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

SSSSS U U A A L
SS U U AAAAA L
SS U U AAAAA L
SS U U A A L
SSSS UUUUU A A L V V V V V V VV

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***** DETAILED OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

Output filename:

C: \Users\r. raj achockal i ngam\AppData\Local \Ci vi ca\VH5\98a3b801-fe45-439a-999a-909776 f7886e\aed83e90-3df7-4aba-a7ed-7ee224

Summary filename:
C: \Users\r.raj achockal i ngam\AppData\Local \Ci vi ca\VH5\98a3b801-fe45-439a-999a-909776
f7886e\aed83e90-3df7-4aba-a7ed-7ee224

DATE: 06-15-2023

TIME: 02:15:50

USER:

COMMENTS:

READ STORM | Ptotal = 24.91 mm | Filename: C:\Users\r.rajachockalingam\AppD

Comments:

ata\Local\Temp\
073789e9-0d0b-43a3-ada4-078b0c00e084\63c7cc5a

hrs mm/hr hrs mm/hr hrs mm/hr i hrs mm/hr 1.64 1.00 6. 46 9. 64 2. 00 4. 30 3. 94 3. 00 2. 17 0.00 0.17 21. 94 83. 39 2 01 1.96 0.33 1.33 28.52 2. 33 3. 18 3.33 1.89 2.27 15.63 10.96 8. 53 7. 04 6. 03 0.58 2.73 1.58 2, 58 2.69 3.58 1.72 0.67 0.75 3. 05 3. 48 2. 67 2. 75 2. 56 2. 45 1.63 0.83 4.07 1.83 5.30 2.83 2.34 3. 83 1.59

Area (ha)= 0.41 Curve Number (CN)= 75.0 I a (mm)= 10.00 # of Li near Res. (N)= 3.00 U.H. Tp(hrs)= 0.20 NASHYD (0023)| | ID= 1 DT= 5.0 min |

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms)= 0.002 (1)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 2.228
TOTAL RAINFALL (mm)= 24,913
RUNOFF COEFFICIENT = 0.089

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALI B NASHYD (0030)

Unit Hyd Qpeak (cms) = 0.271

PEAK FLOW TIME TO PEAK (cms)= 0.006 (i) | PEAK FLUW | CUIIS] = 0.000 | TIME TO PEAK (hrs) = 1.750 | RUNOFF VOLUME (mm) = 2.040 | TOTAL RAINFALL (mm) = 24.913 | RUNOFF COEFFICIENT = 0.082

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB Area (ha)= 0.65 Curve Number (CN)= 73.0 la (mm)= 10.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.14 | NASHYD (0031)| |ID= 1 DT= 5.0 min |

Unit Hyd Qpeak (cms) = 0.177

PEAK FLOW | PEAK | FLUW | (CMS) = | 0.003 | TIME TO | PEAK | (hrs) = | 1.583 | RUNOFF | VOLUME | (mm) = | 24.913 | RUNOFF | COEFFICIENT = | 0.081 |

CALL STANDHYD (0005) | Area (ha)= 5.32

(i)	PEAK	FLOW	DOES	NOT	INCLUDE	BASEFLOW	ΙF	ANY.
I B			1					

CALIB STANDHYD (0006) ID= 1 DT= 5.0 min				Conn. (%)=	35. 00)
		I MDE DVI OUS	PERVI OU	IS (I)		
Surface Area	(ha)-	2. 81				
Dep. Storage						
Average Slope						
Length		193. 56				
Manni ngs n	=	0.013	0.250)		
Max. Eff. Inten. (r	nm/hr)=	83. 39	6. 59			
over	(mi n)	5. 00	10.00)		
Storage Coeff.	(mi n) =	4.08 (7.89 	(ii)		
Uni t Hyd. Tpeak						
Unit Hyd. peak						
on thyu, peak	(6113)-	0. 24	0. 13		TOTALS*	
PEAK FLOW	(cmc)-	0.25	0. 03		0. 364	
						(111)
TIME TO PEAK					1.33	
RUNOFF VOLUME					10.21	
TOTAL RAINFALL			24. 91		24.91	
RUNOFF COEFFICIE	ENT =	0. 96	0. 11		0.41	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 | Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | NASHYD (0022) | Area (ha)= 0.83 Curve Number (CN)= 75.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.19 | ID= 1 DT= 5.0 min |

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW 0.003 (i) (cms)= TIME TO PEAK (
RUNOFF VOLUME
TOTAL RAINFALL (hrs) = 1.667 (mm) = 2.228 TOTAL RAINFALL (mm) = 24. 913 RUNOFF COEFFICIENT = 0. 089

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ID= 1 DT= 5.0 min	Total	I mp (%) =	50.00	Dir.	Conn.	(%)=	35.00)
		IMPERVIO	US PE	ERVI OU	S (i)			
Surface Area	(ha)=	2. 66	,	2. 66	,			
Dep. Storage	(mm) =	1.00)	5.00				
		1.00		1.00				
		188. 33						
Manni ngs n	=			0.250				
Max. Eff. Inten. (m	m/hr)=	32. 09	,	3. 41				
over	(mi n)	25. 00)	60.00				
Storage Coeff.	(mi n) =	23. 43	(ii)	56. 98	(ii)			
Uni t Hyd. Tpeak	(mi n) =	25. 00)	60.00				
Unit Hyd. peak	(cms)=	0.05	;	0.02				
						*T	OTALS'	
PEAK FLOW	(cms)=	0. 11		0. 01			0.114	(iii)
TIME TO PEAK	(hrs)=	1. 67	,	2.50			1.67	
RUNOFF VOLUME	(mm) =	23. 91		2.83			10.20	
TOTAL RAINFALL	(mm) =	24. 91		24. 91			24.91	
RUNOFF COEFFICIE	NT =	0. 96	•	0. 11			0.41	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 59.0 la = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
- THAN THE STORAGE COEFFICIENT.

 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

	Area (ha)= Total Imp(%)=		Conn. (%) =	35. 00
	IMPERVI	OUS PERVIO	us (i)	
Surface Area (ha)= 1.7			
	mm) = 1.0		•	
	(%)= 1.0		-	
	(m) = 151.2			
Mannings n	= 0.01			
marin ngo n	0.01	0.20		
Max.Eff.Inten.(mm/	'hr)= 83.3	9 3. 7	'3	
over (m		0 30.0	0	
Storage Coeff. (m	nin)= 3.5	2 (ii) 29.8	2 (11)	
Unit Hyd. Tpeak (m	ni n) = 5.0	0 ` 30.0	0 ` ´	
Unit Hyd. peak (c	ms)= 0.2	6 0.0	14	
, ,			*T	OTALS*
PEAK FLOW (c	ms)= 0.2	3 0.0)1	0. 227 (iii)
TIME TO PEAK (h	nrs)= 1.3	3 1.9	2	1.33
RUNOFF VOLUME ((mm) = 23.9	1 2.8	13	10.20
TOTAL RAINFALL ((mm) = 24.9	1 24.9	1	24. 91
RUNOFF COEFFICIENT	= 0.9	6 0.1	1	0.41

```
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 59.0 | la = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  RESERVOIR( 0029) |
IN= 2---> OUT= 1 |
DT= 5.0 min |
                                        OVERFLOW IS OFF
                                        OUTFLOW STORAGE | OUTFLOW
                                                                                                 STORAGE
                                                                                (cms)
0.0900
                                          0. 0000
                                                           0.0000
                                                                 QPEAK
                                                                                  TPFAK
                                                                                                      R V
                                                   AREA
                                                                  (cms)
0. 227
                                                                                                      (mm)
10, 20
                                                   (ha)
                                                                                  (hrs)
    INFLOW: ID= 2 ( 0028)
OUTFLOW: ID= 1 ( 0029)
                                                   3, 430
                                                                                    1.33
2.58
                                                   3. 430
                                                                    0.016
                                                                                                       10. 11
                             PEAK FLOW REDUCTION [Qout/Qin] (%) = 7.10
TIME SHIFT OF PEAK FLOW (min) = 75.00
MAXIMUM STORAGE USED (ha.m.) = 0.0215
 ADD HYD ( 0007) |
1 + 2 = 3 |
                                              AREA
                                                          QPEAK
                                                                          TPEAK
                                                                                         R.V.
        ID1= 1 ( 0023):
+ ID2= 2 ( 0029):
                                                                                      (mm)
2. 23
10. 11
                                                                          2.58
                                              3.43
                                                         0.016
           ID = 3 ( 0007):
                                              3.84 0.017
       NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0007)					
3 + 2 = 1	AREA	QPEAK	TPEAK	R. V.	
·	(ha)	(cms)	(hrs)	(mm)	
ID1= 3 (0007):	3.84	0. 017	2. 42	9. 27	
+ ID2= 2 (0030):	1.56	0.006	1.75	2. 04	
ID = 1 (0007):	5.40	0. 022	1.83	7. 18	
NOTE: PEAK FLOWS DO I	NOT INCLU	JDE BASEFL	OWS IF AN	Y.	

+	ID1= 1 (ID2= 2 ((ha) 0.83 11.37	(cms) 0.003 0.059	(hrs) 1.67 2.75	(mm) 2. 23 8. 29
	=======					======
	ID = 3 (0016):	12.20	0.060	2.67	7.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
Unit Hyd Opeak (cms)=	0. 764
PEAK FLOW (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = 2: RUNOFF COEFFICIENT =	2. 250 ´´ 2. 017
(i) PEAK FLOW DOES NOT IN	CLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0039)	Area (ha))= 0.83	Curve Number (CN) = 75.0	
ID= 1 DT= 5.0 min	la (mm))= 10.00	# of Linear Res. (N) = 3.00	
	U.H. Tp(hrs))= 0.19		
Unit Hyd Qpeak	(cms) = 0.16	7		
		- 4.5		
PEAK FLOW	(cms) = 0.003			
TIME TO PEAK	(hrs) = 1.66	7		
RUNOFF VOLUME	(mm) = 2.228	3		
TOTAL RAINFALL	(mm) = 24.913	3		
RUNOFF COEFFICIE	ENT = 0.089	7		
(i) DEAK ELOW DO	JES NOT INCLUDE	E BASEELOW	I F ANV	

(I) FEAR FLOW D			
CALIB NASHYD (0033) ID= 1 DT= 5.0 min	Ιa		Curve Number (CN)= 75.0 # of Linear Res. (N)= 3.00
Unit Hyd Opeak	(cms)=	0. 078	
PEAK FLOW TIME TO PEAK	(cms)= (hrs)=	0. 002 (i) 1. 667	

ADD HYD (0007)	AREA	QPEAK	TPEAK	R. V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0007):	5.40	0. 022	1.83	7. 18
+ ID2= 2 (0031):	0.65	0. 003	1.58	2. 03
ID = 3 (0007):	6. 05	0. 024	1.75	6. 62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
<u></u>	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0007):	6.05	0.024	1.75	6. 62
+ ID2= 2 (0005):	5.32	0. 114	1.67	10. 20
===========				
ID = 1 (0007):	11.37	0. 138	1.67	8. 30

NOTE: PEAK FLOWS DO NOT INCLUDE RASEFLOWS LE ANY

SERVOIR(0008)	OVERFLOW	IS OFF		
= 2> OUT= 1 = 5.0 min	OUTFLOW	STODACE	OUTFLOW	STORAGE
= 5.0 111111			(cms)	
		0.0000		0. 1535
		0.0000		0. 1555
	0. 0580			0.1738
	0. 0380			0. 1969
	0.0710			0. 2476
	0. 0920			0.2733
	0. 2500			0.2733
	0. 3200			0. 3263
	0. 3750		1.0800	
	0. 3730	0. 1321	1.0000	0.3326
	AR	EA QPEAK	TPEAK	R. V.
	(h	a) (cms)	(hrs)	(mm)
NFLOW: ID= 2 (0	007) 11 [.]	370 \ 0. 1:	38 1.67	8. 30
UTFLOW: ID= 1 (0				
			ut/Qin](%)= 4	
TIM	E SHIFT OF P	EAK FLOW	(min)= 6	5. 00
MAX	I MUM STORAG	E USED	(ha. m.)=	0. 0259

ADD HYD (0016)

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0036) Are			
ID= 1 DT= 5.0 min Tot	al Imp(%)= 50.0	00 Dir. Conn.(9	%) = 35.00
	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)	= 2.66	2. 66	
Dep. Storage (mm)			
Average Slope (%)	= 1.00	1.00	
Length (m)	= 188. 33	40.00	
Manni ngs n	= 0.130	0. 250	
Max. Eff. Inten. (mm/hr)	= 32.09	3. 41	
	25. 00		
Storage Coeff. (min)			
Unit Hyd. Tpeak (min)			
Unit Hyd. peak (cms)			
()			*TOTALS*
PEAK FLOW (cms)	= 0.11	0.01	0.114 (iii)
TIME TO PEAK (hrs)			1.67
RUNOFF VOLUME (mm)			
TOTAL RAINFALL (mm)			24. 91
RUNOFF COEFFICIENT			0.41
KUNUII CULIIICILIII	- 0.70	0. 11	0.41

CALI B				
NASHYD (0037)	Area	(ha)=	0.65	Curve Number (CN) = 73.0
ID= 1 DT= 5.0 min	Ιa	(mm)=	10.00	# of Linear Res. (N) = 3.00
	U. H.	Tp(hrs)=	0.14	
Unit Hyd Qpeak	(cms)=	0. 177		
PEAK FLOW	(cms)=	0.003 (i)	
TIME TO PEAK	(hrs)=	1. 583		
RUNOFF VOLUME	(mm) =	2. 027		
TOTAL RAINFALL	(mm) =	24, 913		
RUNOFF COFFFICIE		0. 081		

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALI B NASHYD (0038) | ID= 1 DT= 5.0 min | Unit Hyd Qpeak (cms) = 0.271 PEAK FLOW (cms)= 0.006 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 2.040
TOTAL RAINFALL (mm)= 24, 913
RUNOFF COEFFICIENT = 0.082

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

	ea (ha)= tal Imp(%)= 5		Conn. (%) = 35.	00
	IMPERVIOL	IS PERVI OUS	S (i)	
Surface Area (ha)= 1.71	1. 71		
Dep. Storage (mm	í) = 1.00	5. 00		
Average Slope (%	1.00	2. 00		
Length (m)= 151. 22	40.00		
Manni ngs n	= 0.013	0.250		
Max.Eff.Inten.(mm/hr)= 83, 39	3. 73		
over (min		30.00		
Storage Coeff. (mir) = 3.52	(ii) 29.82	(ii)	
Unit Hyd. Tpeak (mir)= 5.00	30.00		
Unit Hyd. peak (cms	0. 26	0.04		
			T0TAL	S
PEAK FLOW (cms		0. 01		7 (iii)
TIME TO PEAK (hrs		1. 92	1.3	
RUNOFF VOLUME (mm		2. 83	10.2	
)= 24.91		24.9	
RUNOFF COEFFICIENT	= 0.96	0. 11	0.4	1

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

ADD HYD (0032) 1 + 2 = 3 	AREA (ha) 0.83 11.37	QPEAK (cms) 0.003 0.264	TPEAK (hrs) 1.67 1.33	R. V. (mm) 2. 23 8. 33
ID = 3 (0032):	12. 20	0. 265	1.33	7. 91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS LE ANY.

ADD HYD (0041) | 1 + 2 = 3 | ARFA OPFAK TPFAK (ha) 0.41 (cms) 0.002 (mm) 2. 23 ID1= 1 (0033): + ID2= 2 (0036): 5.32 0. 114 1.67 10.20 ID = 3 (0041): 9. 63 5. 73 0. 116 1.67 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0041) | 3 + 2 = 1 | AREA OPFAK TPFAK R V (hrs) (cms) (mm) (ha) ID1= 3 (0041): + ID2= 2 (0037): 5.73 0. 116 9. 63 0.65 0. 003 ID = 1 (0041): 6.38 0.118 8.86 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0041) | 1 + 2 = 3 | AREA QPEAK (mm) (ha) (cms) (hrs) ID1= 1 (0041): + ID2= 2 (0038): 0. 118 ID = 3 (0041): 7. 94 0. 124 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0041) | 3 + 2 = 1 | R.V. AREA QPEAK TPEAK (ha) 7.94 (hrs) 1.67 ID1= 3 (0041): + ID2= 2 (0040): 3.43 0.227 10. 20 1.33 ID = 1 (0041): 11. 37 0. 264 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

APPENDIX G WATER BALANCE

McINTOSH PERRY

CCO-13-9668-01 - PERTHMORE SUBDIVISION - Water Balance Information - Monthly Review

The site exhibits five primary types of pervious land use / soil combinations:

	Values from Thornthwaite-Mather Table 10			Table 10 Values Applied to Site Conditions			
		Available	Root Zone	Applicable Soil Moisture	Available Average	Soil Moisture Retention	Values to
Pre-development / Post-development	Soil Type	Water (mm)	(m)	Rentention Table	Soil Depth (m)	Table Given Soil Depth (mm)	use (mm)
Pasture overtopping sandy soils (class B soils)	Sandy Loam	150	1	150	0.6	90	100
Pasture overtopping sandy soils (class C soils)	Silty/Clay Loam	250	1	250	0.6	150	150
Forest overtopping sandy soils (class B soils)	Sandy Loam	150	2	300	0.6	180	200
Forest overtopping sandy soils (class C soils)	Silty/Clay Loam	250	1.6	400	0.6	240	250

Summary of data below:

Soil Moisture Storage	Surplus
75	398
100	391
125	387
150	384
200	380
250	377
350	373
400	371

Soil Moisture Storage Data

							75	mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	∆P = P-			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		217	0	0	0	0	11	0	11	228
February	-8.1	0	0	54	54		271	0	0	0	0	5	0	5	276
March	-2.3	0	0	64	64		336	0	0	0	0	2	0	2	338
April	6.3	1.4	32	75	43		75	0	32	0	43	22	26	48	166
May	13.3	4.4	79	80	2		75	0	79	0	2	12	117	129	206
June	18.5	7.2	112	93	-19	-19	57	-18	111	1	0	6	59	65	122
July	21	8.8	133	92	-41	-60	33	-24	116	17	0	3	29	32	65
August	19.8	8.0	114	86	-29	-88	22	-11	97	18	0	2	15	17	39
September	15	5.3	73	90	17		39	17	73	0	0	1	7	8	47
October	8	2.0	34	86	52		75	36	34	0	17	9	4	13	105
November	1.5	0.2	5	82	77		75	0	5	0	77	43	2	45	197
December	-6.2	0	0	76	76		151	0	0	0	0	22	1	23	174
		37.4	580	944				0	545	35	138	138	260	398	

Monthly T and P from Environment Canada

Heat Index (I) 37.4 a: 1.06 Table 25 - 75mm soil moisture retention in Thornthwaite [1957]

							100)mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	ΔP = P-			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		241	0	0	0	0	11	0	11	252
February	-8.1	0	0	54	54		296	0	0	0	0	5	0	5	301
March	-2.3	0	0	64	64		360	0	0	0	0	2	0	2	362
April	6.3	1.4	32	75	43		100	0	32	0	43	22	26	48	191
May	13.3	4.4	79	80	2		100	0	79	0	2	12	117	129	231
June	18.5	7.2	112	93	-19	-19	82	-18	111	1	0	6	59	65	147
July	21	8.8	133	92	-41	-60	54	-28	120	13	0	3	29	32	86
August	19.8	8.0	114	86	-29	-88	40	-14	100	15	0	2	15	17	57
September	15	5.3	73	90	17		57	17	73	0	0	1	7	8	65
October	8	2.0	34	86	52		100	43	34	0	10	5	4	9	119
November	1.5	0.2	5	82	77		100	0	5	0	77	41	2	43	220
December	-6.2	0	0	76	76		176	0	0	0	0	21	1	22	198
		37.4	580	944				0	552	28	131	131	260	391	

Monthly T and P from Environment Canada

Table 26 - 100mm soil moisture retention in Thornthwaite [1957]

Heat Index (I)

37.4 a:

							125	mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	ΔP = P-			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		267	0	0	0	0	10	0	10	277
February	-8.1	0	0	54	54		321	0	0	0	0	5	0	5	326
March	-2.3	0	0	64	64		386	0	0	0	0	2	0	2	388
April	6.3	1.4	32	75	43		125	0	32	0	43	23	26	49	217
May	13.3	4.4	79	80	2		125	0	79	0	2	12	117	129	256
June	18.5	7.2	112	93	-19	-19	106	-19	112	0	0	6	59	65	171
July	21	8.8	133	92	-41	-60	76	-30	122	11	0	3	29	32	108
August	19.8	8.0	114	86	-29	-88	61	-15	101	14	0	2	15	17	78
September	15	5.3	73	90	17		78	17	73	0	0	1	7	8	86
October	8	2.0	34	86	52		125	47	34	0	6	3	4	7	138
November	1.5	0.2	5	82	77		125	0	5	0	77	40	2	42	244
December	-6.2	0	0	76	76		201	0	0	0	0	20	1	21	222
		37.4	580	944				0	556	24	127	127	260	387	

Monthly T from Environment Canada

Heat Index (I) 37.4

1.06

Table 27 - 100mm soil moisture retention in Thornthwaite [1957]

							150)mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	ΔP = P-			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		292	0	0	0	0	10	0	10	302
February	-8.1	0	0	54	54		346	0	0	0	0	5	0	5	351
March	-2.3	0	0	64	64		411	0	0	0	0	2	0	2	413
April	6.3	1.4	32	75	43		150	0	32	0	43	23	26	49	242
May	13.3	4.4	79	80	2		150	0	79	0	2	12	117	129	281
June	18.5	7.2	112	93	-19	-19	132	-18	111	1	0	6	59	65	197
July	21	8.8	133	92	-41	-60	100	-32	124	9	0	3	29	32	132
August	19.8	8.0	114	86	-29	-88	83	-17	103	12	0	2	15	17	100
September	15	5.3	73	90	17		100	17	73	0	0	1	7	8	108
October	8	2.0	34	86	52		150	50	34	0	3	2	4	6	159
November	1.5	0.2	5	82	77		150	0	5	0	77	39	2	41	268
December	-6.2	0	0	76	76		226	0	0	0	0	19	1	20	246
		37.4	580	944				0	559	21	124	124	260	384	

Monthly T from Environment Canada Heat Index (I) 37.4 a: 1.06 Table 28 - 150mm soil moisture retention in Thornthwaite [1957]

							200)mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	ΔP = P-			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		341	0	0	0	0	10	0	10	351
February	-8.1	0	0	54	54		396	0	0	0	0	5	0	5	401
March	-2.3	0	0	64	64		460	0	0	0	0	2	0	2	462
April	6.3	1.4	32	75	43		200	0	32	0	43	22	26	48	291
May	13.3	4.4	79	80	2		200	0	79	0	2	12	117	129	331
June	18.5	7.2	112	93	-19	-19	182	-18	111	1	0	6	59	65	247
July	21	8.8	133	92	-41	-60	148	-34	126	7	0	3	29	32	180
August	19.8	8.0	114	86	-29	-88	128	-20	106	9	0	2	15	17	145
September	15	5.3	73	90	17		145	17	73	0	0	1	7	8	153
October	8	2.0	34	86	52		198	52	34	0	0	0	4	4	202
November	1.5	0.2	5	82	77		200	2	5	0	75	38	2	40	315
December	-6.2	0	0	76	76	·	276	0	0	0	0	19	1	20	296
		37.4	580	944				0	564	16	120	120	260	380	

Monthly T from Environment Canada Heat Index (I) 37.4

a: 1.06

Table 29 - 200mm soil moisture retention in Thornthwaite [1957]

							250)mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	$\Delta P = P$ -			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		392	0	0	0	0	9	0	9	401
February	-8.1	0	0	54	54		446	0	0	0	0	5	0	5	451
March	-2.3	0	0	64	64		511	0	0	0	0	2	0	2	513
April	6.3	1.4	32	75	43		250	0	32	0	43	23	26	49	342
May	13.3	4.4	79	80	2		250	0	79	0	2	12	117	129	381
June	18.5	7.2	112	93	-19	-19	231	-19	112	0	0	6	59	65	296
July	21	8.8	133	92	-41	-60	196	-35	127	6	0	3	29	32	228
August	19.8	8.0	114	86	-29	-88	175	-21	107	8	0	2	15	17	192
September	15	5.3	73	90	17		192	17	73	0	0	1	7	8	200
October	8	2.0	34	86	52		245	52	34	0	0	0	4	4	249
November	1.5	0.2	5	82	77		250	5	5	0	72	36	2	38	360
December	-6.2	0	0	76	76		326	0	0	0	0	18	1	19	345
		37.4	580	944				0	567	13	117	117	260	377	

Monthly T from Environment Canada Heat Index (I) 37.4

a:

1.06

19.8

1.5

-6.2

1.06

8.8 133

8.0

5.3

2.0

0.2

37.4 580

-41

-29

-60

-88

Table 30 - 250mm soil moisture retention in Thornthwaite [1957]

							350)mm							
								ΔS = Soil			Soil	Water			
		Heat		P = Total	∆P = P-			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		i
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	[
January	-10.3	0	0	65	65		492	0	0	0	0	9	0	9	1
February	-8.1	0	0	54	54		546	0	0	0	0	4	0	4	1
March	-2.3	0	0	64	64		611	0	0	0	0	2	0	2	<u> </u>
April	6.3	1.4	32	75	43		350	0	32	0	43	23	26	49	
May	13.3	4.4	79	80	2		350	0	79	0	2	12	117	129	
June	18.5	7.2	112	93	-19	-19	331	-19	112	0	0	6	59	65	Ī

-37

-23

Monthly T from Environment Canada Heat Index (I) 37.4

July

August

September

October

November

December

a:

Table 32 - 350mm soil moisture retention in Thornthwaite [1957]

Total Moisture

							400)mm							
				_				ΔS = Soil			Soil	Water			Total
		Heat		P = Total	ΔP = P-			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		542	0	0	0	0	8	0	8	550
February	-8.1	0	0	54	54		596	0	0	0	0	4	0	4	600
March	-2.3	0	0	64	64		661	0	0	0	0	2	0	2	663
April	6.3	1.4	32	75	43		400	0	32	0	43	23	26	49	492
May	13.3	4.4	79	80	2		400	0	79	0	2	12	117	129	531
June	18.5	7.2	112	93	-19	-19	381	-19	112	0	0	6	59	65	446
July	21	8.8	133	92	-41	-60	344	-37	129	4	0	3	29	32	376
August	19.8	8.0	114	86	-29	-88	320	-24	110	5	0	2	15	17	337
September	15	5.3	73	90	17		337	17	73	0	0	1	7	8	345
October	8	2.0	34	86	52		390	52	34	0	0	0	4	4	394
November	1.5	0.2	5	82	77		400	10	5	0	66	33	2	35	501
December	-6.2	0	0	76	76		476	0	0	0	0	17	1	18	494
		37.4	580	944				0	572	8	111	111	260	371	

Monthly T from Environment Canada Heat Index (I) 37.4

1.06

Table 33 - 450mm soil moisture retention in Thornthwaite [1957]

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - PRE-DEVELOPMENT

Water Balance / Water Budget Assessment							
		Develo	opment Land	ds to Pert (A1)	th Long S	Swamp	
Land Use	Fore	oct	Pastu	· /			
Soil (HSG)	C	В	C	В			
, ,	Silt/Clay	Sandy	Silt/Clay	Sandy	Gravel	Asphalt	Total
Soil Characterization	Loam	Loam	Loam	Loam		•	
	(250)	(200)	(150)	(100)			
Area (m²)	34300	15600	17600	54500	-	-	122000
Pervious Area (m²)	34300	15600	17600	54500	-	-	122000
Impervious Area (m²)	_	_	_	_	_	_	_
miper rieds rated (m.)	Infiltrati	on Facto					
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	-	-	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	-	-	
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	-	-	
MOE infiltration Factor	0.522	0.572	0.422	0.472	-	-	
Actual Infiltration Factor	0.522	0.572	0.422	0.472	-	-	
Run-off Coefficient	0.478	0.428	0.578	0.528	-	-	
Runoff from Impervious Surfaces*	0	0	0	0		-	
	Inputs (pe				T	ı	
Precipitation (mm/year)	944	944	944	944	-	-	944
Run-on (mm/year)	0	0	0	0	-	-	0
Other Inputs (mm/year) Total Inputs (mm/year)	944	0 944	0 944	944	-	-	944
Total inputs (illing year)	Outputs (p			344	_	_	344
Precipitation Surplus (mm/year)	377	380	384	391	_	_	385
Net Surplus (mm/year)	377	380	384	391	-	_	385
Evapotranspiration (mm/year)	567	564	560	553	-	-	559
Infiltration (mm/year)	197	217	162	185	-	-	189
Rooftop Infiltration (mm/year)	0	0	0	0	-	-	0
Total Infiltration (mm/year)	197	217	162	185	-	-	189
Runoff Pervious Areas	180	163	222	206	-	-	771
Runoff Impervious Areas	0	0	0	0	-	-	0
Total Runoff (mm/year)	180	163	222	206	-	-	196
Total Outputs (mm/year)	944	944	944	944	-	-	944
Difference (Inputs - Outputs)	0	0	0	0	-	-	0
2		Volume	i	54440	I	I	445460
Precipitation (m³/year)	32379	14726		51448	-	-	115168
Run-on (m³/year)	0	0	0	0	-	-	0
Other Inputs m ³ /year)	0	0	0	0		-	0
Total Inputs (m³/year)	32379	14726		51448	-	-	115168
2	Outputs		e)	T	T	I	
Precipitation Surplus (m³/year)	12931	5928	6758	21310	-	-	46927
Net Surplus (m³/year)	12931	5928	6758	21310	-	-	46927
Evapotranspiration (m³/year)	19448	8798	9856	30139	-	-	68241
Infiltration (m³/year)	6750	3391	2852	10058	-	-	23051
Rooftop infiltration (m³/year)	0	0	0	0	-	-	0
Total Infiltration (m³/year)	6750	3391	2852	10058	-	-	23051
Runoff Pervious Areas (m³/year)	6181	2537	3906	11251	-	-	23876
Runoff Impervious Areas (m³/year)	0	0	0	0	-	-	0
Total Runoff (m³/year)	6181	2537	3906	11251	-	-	23876
Total Outputs (m³/year)	32379	14726	16614	51448	-	_	115168
Difference (Inputs - Outputs)	0	0	0	0	-	-	0
(pato - atpato)						l	

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - POST-DEVELOPMENT

Water Balance / Water Budget Assessment																														
	Developme	nt Lands		ong Swam		70, SWN	1 Block, Re	esidential		Develop	ment Lands	to Perth	ong Swa	mp (West	t Block)		D	evelopme	ent Lands to	Perth Long	Swamp (C	entral Blo	ck)		Developm	ent Lands to	Perth Lo	ng Swamp	(East Bloc	k)
Land Use	Fore	est		Pasture	,,				For	est		Pasture					Fore	est	Р	Pasture				Fo	rest	Pa	asture			
Soil (HSG)	С	В	С	В					С	В	С	В					С	В	С	В				С	В	С	В			
Soil Characterization	Silt/Clay Loam (250)	Sandy Loam (200)	Silt/Clay Loam (150)	Sandy Loam (100)	Sand (75)	Grave	l Asphal	Total	Silt/Clay Loam (250)	Sandy Loam (200)	Silt/Clay Loam (150)	Sandy Loam (100)	Sand (75)	Gravel	Asphalt	Total	Silt/Clay Loam (250)	Sandy Loam (200)	Silt/Clay Loam (150)	Sandy Loam (100)	and Grav	vel Asph	alt Total	Silt/Clay Loam (250)	Sandy Loam (200)	Silt/Clay Loam (150)	Sandy Loam (100)	Sand Gr (75)	avel Asp	ohalt Total
Area (m²)	8300	0	17400	13300	0	0	26600	65600	0	0	0	10290	0	0	24010	34300	0	1560	0	3120	0 0	1092	0 15600	650	0	1300	0	0	0 45	6500
Pervious Area (m²)	8300	0	17400	13300	0	-	-	39000	0	0	0	10290	0	-	-	10290	0	1560	0	3120	0 -	-	4680	650	0	1300	0	0	-	- 1950
Impervious Area (m²)	-	-	-	-	-	0	26600	26600	-	-	-	-	-	0	24010	24010	-	-	-	-	- 0	1092	0 10920	-	-	-	-	-	0 45	550 4550
	•						•		Infil	tration Fa	ictors																			
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0		0.172	0.172	0.172	0.172	0.12	0.12	0		0.172	0.172	0.172	0.172 0	.12 0.1	2 0		0.172	0.172	0.172	0.172	0.12 0	.12 (0
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.35	0.05	0	_	0.15	0.2	0.15	0.2	0.3	0.05	0	1	0.15	0.2	0.15		0.0			0.15	0.2	0.15				0
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0	4 1	0.2	0.2	0.1	0.1	0.1	0.05	0	<u> </u>	0.2	0.2	0.1		0.1			0.2	0.2	0.1	0.1			0
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0.1	4 1	0.522	0.572	0.422	0.472	0.52	0.22	0	4 1	0.522	0.572	0.422		.52 0.2			0.522	0.572	0.422				0
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0	-	0.522	0.572	0.422	0.472	0.52	0.22	0	1	0.522	0.572		+ +	.52 0.2	_	I	0.522	0.572	0.422				0
Run-off Coefficient Runoff from Impervious Surfaces*	0.478	0.428	0.578	0.528	0.43	0.78	0.9	- I	0.478	0.428	0.578 0	0.528	0.48	0.78 0.78	0.9 0.9	-	0.478	0.428	0.578	+ +	.48 0.7 0 0.7	_		0.478	0.428	0.578 0	0.528			.9
Runon from impervious surfaces	1 0	1 0		1 0	1 0	0.76	0.9			s (per Uni		1 0	U	0.78	0.9			1 0	U	0	0 0.7	8 0.9			U	U		0 0	78 0	.9
Precipitation (mm/year)	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944 9	44 94	4 944	944	944	944	944	944	944 9	44 94	44 944
Run-on (mm/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0 0			0	0	0	0			0 0
Other Inputs (mm/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0	0	0	0	0	0	0	0 (0 0
Total Inputs (mm/year)	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944 9	44 94	4 944	944	944	944	944	944	944 9	44 94	44 944
		_							Outpu	ts (per Ur	it Area)																			
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	573	377	380	384	391	398	398	850	712	377	380	384		98 39			377	380	384	391			50 709
Net Surplus (mm/year)	377	380	384	391	398	398	850	573	377	380	384	391	398	398	850	712	377	380	384		98 39			377	380	384	391			50 709
Evapotranspiration (mm/year)	567 197	564	560	553	546	546	94	371	567	564	560	553	546	546	94	232	567	564 217	560		46 54	_		567	564	560	553			04 235 0 52
Infiltration (mm/year) Rooftop and Trench Infiltration (mm/year)	0	217	162 0	185 0	227 0	88	85 0	140	197	217 0	162	185 0	207 0	88 0	0	55 0	197	0	162 0	+ +	07 88 0 0	_		197	217	162 0	185 0			0 52
Total Infiltration (mm/year)	197	217	162	185	227	88	85	140	197	217	162	185	207	88	0	55	197	217	162		07 88			197	217	162	185			0 52
Runoff Pervious Areas	180	163	222	206	171	00	0	942	180	163	222	206	191	0	0	962	180	163	222		91 0	_		180	163	222	206			0 962
Runoff Impervious Areas	0	0	0	0	0	310	765	1075	0	0	0	0	0	310	850	1160	0	0	0	+ + + + + + + + + + + + + + + + + + + +	0 31			0	0	0	0			50 1160
Total Runoff (mm/year)	180	163	222	206	171	310	765	434	180	163	222	206	191	310	850	657	180	163	222	206 1	91 31	3 850	652	180	163	222	206	191 3	10 8	50 657
Total Outputs (mm/year)	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944 9	44 94	4 944	944	944	944	944	944	944 9	44 94	44 944
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0	0	0	0	0	0	0	0 (0 0
	1	T	T	1		1			Inp	outs (Volu	me)				T			1	ı	т т		1			1	l				1
Precipitation (m³/year)	7835	0	16426	12555	0	0	25110	61926	0	0	0	9714	0	0	22665	32379	0	1473	0	2945	0 0	1030	8 14726	614	0	1227	0	0	0 42	95 6136
Run-on (m³/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+ -	0 0	0	0	0	0	0	0	0	0 (0 0
Other Inputs m³/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0	0	0	0	0	0	0	0 (0 0
Total Inputs (m³/year)	7835	0	16426	12555	0	0	25110	61926	0	0	0	9714	0	0	22665	32379	0	1473	0	2945	0 0	1030	8 14726	614	0	1227	0	0	0 42	95 6136
2	1	T	T	_	1	1	1			puts (Vol	ume)	1	1		ı			1	ı	1 1		_			_	T	1	<u> </u>		
Precipitation Surplus (m³/year)	3129	0	6682	5200	0	0		37610	0	0	0	4023	0	0		24422	0	593	0	+ +	0 0		8 11090	245	0	499	0	0		366 4610
Net Surplus (m³/year)	3129	0	6682	5200	0	0		37610	0	0	0	4023	0	0	20399	24422	0	593	0	1220	0 0			245	0	499	0	0		366 4610
Evapotranspiration (m ³ /year)	4706	0	9744	7355	0	0	2511		0	0	0	5690	0	0	2267	7957	0	880	0		0 0	103	1 3636	369	0	728	0	0	0 43	30 1526
Infiltration (m³/year)	1633	0	2820	2455	0	0	2260	9168	0	0	0	1899	0	0	0	1899	0	339	0	576	0 0	0	915	128	0	211	0	0	0 (0 339
Rooftop and Trench Infiltration (m³/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0	0	0	0	0	0	0	0 (0 0
Total Infiltration (m³/year)	1633	0	2820	2455	0	0	2260	9168	0	0	0	1899	0	0	0	1899	0	339	0	576	0 0	0	915	128	0	211	0	0	0 (0 339
Runoff Pervious Areas (m³/year)	1496	0	3862	2746	0	0	0	8103	0	0	0	2124	0	0	0	2124	0	254	0	644	0 0	0	898	117	0	289	0	0	0 (0 406
Runoff Impervious Areas (m³/year)	0	0	0	0	0	0	20339	20339	0	0	0	0	0	0	20399	20399	0	0	0	0	0 0	927	8 9278	0	0	0	0	0	0 38	3866
Total Runoff (m ³ /year)	1496	0	3862	2746	0	0	20339	28443	0	0	0	2124	0	0	20399	22523	0	254	0	644	0 0	927	8 10175	117	0	289	0	0	0 38	366 4271
Total Outputs (m³/year)	7835	0	16426	12555	0	0	25110		0	0	0	9714	0	0	22665	32379	0	1473	0	2945	0 0			614	0	1227	0	0		95 6136
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0 0			0	0	0	0			0 0
• • • • • • • • • • • • • • • • • • • •	•	•	•	•		•	•			•	•	•							•					•		•		-		•

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - MITIGATION REQUIRED

Water Balance	Water Budget Assessment
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	Data Input
944	mm of precipitation per year avg.
118.4	days with precipitation per year avg.
10	mm design rainfall event

1981 to 2010 Canadian Climate Normals station data

Days with Rainfall

	lan	Feb	Mar	Apr	Mav	lun	Iul	Aua	Sep	Oct	Nov	Dec	Year	Code
	J					,	J							
>= 0.2 mm	4.4	3.9	6.7	10.9	13.4	13.2	11.9	11	12.3	13.7	11	6	118.4	<u>A</u>
>= 5 mm	1.6	1.2	2.1	4	4.9	5.8	5.4	4.8	5.1	5	4.2	2.3	46.5	A
>= 10 mm	0.87	0.57	1	2	2.7	2.9	3.1	2.8	3.2	2.7	2.1	1.2	25.2	A
>= 25 mm	0.13	0.07	0.10	0.33	0.47	0.73	0.77	0.67	0.60	0.47	0.43	0.13	4.9	<u>A</u>

Environment Canada	Days exceeding rainfall noted	Days per section	Minimum volume of rain (mm)
0.2 mm	118.4	71.9	14
5 mm	46.5	21.3	107
10 mm	25.2	25.2	252
		Total	373

^{*}Example - Days per section over 5mm = 46.5 - 25.2 = 21.3 days (which are more than 5 mm but, less than 10 mm). 21.3 days x 5 mm = 107 mm

	Development Lands to Perth Long Swamp (Block 70, SWM Block, Residential Lots and Roadway)	Development Lands to Perth Long Swamp (West Block #67)
Area of Asphalt (m ²)	26600	24010
Asphalt Runoff Coefficient	0.9	0.9
Volume of Runoff in 5 mm Event (m ³) to be infiltrated	120	108
Mitigation Required (m³/year)	2873	2593
Annual Volume to be infiltrated by designing for 5 mm Event	2897	2615

By installing trenches sized for the 5 mm event, the annual volume to be infiltrated will exceed that of the mitigation required by the water balance mitigation.

Infiltration Area Footprint Calculation		
Phase 6:	For 0.5m depth	For 0.75m depth
Infiltration Target=	120 m³	120 m³
Assumed trench depth=	0.5 m³	0.75 m ³
Porosity =	0.4	0.4
Trench footprint area required=	600 m ²	400 m ²
West Block:	For 0.5m depth	For 0.75m depth
Infiltration Target=	108 m³	108 m³
Assumed trench depth=	0.5 m³	0.75 m ³
Porosity =	0.4	0.4
Trench footprint area required=	540 m²	360 m²

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - POST-DEVELOPMENT WITH MITIGATION

Water Balance / Water Budget Assessment																																	
water balance / water balaget Assessment	Development Lands to Perth Long Swamp (Block 70, SWM Block, Residential Lots and Roadway)								Development Lands to Perth Long Swamp (West Block)								Lands to Perth Long Swamp (Central Block)								Lands to Perth Long Swamp (East Block)								
Land Use	Forest Pasture							Forest Pasture						Forest Pasture								Forest Pasture											
Soil (HSG)	C	В	C		В					+		C B					C	В	C	В			-	C	В	C	R						
3011 (1130)			C											<u> </u>				_		ь	В										1		
Soil Characterization	Silt/Cl ay Loam (250)	Sandy Loam (200)	Silt/Cl ay Loam (150)	Sandy Loam (100)	Sand (75)	Gravel	Asphali	Total	Silt/Cl ay Loam (250)	Sandy Loam (200)	Silt/Cl ay Loam (150)	Sandy Loam (100)	Sand (75)	Gravel	Asphalt	Total	Silt/Cl ay Loam (250)	Loam	Silt/Cl ay Loam (150)	Sandy Loam (100)	nd Grave	l Asphalt	Total	Silt/Cl ay Loam (250)	Sandy Loam (200)	Silt/Cl ay Loam (150)	Sandy Loam (100)	Sand (75)	Gravel	Asphalt	Total		
Area (m²)	8300	0	17400	13300	0	0	26600	65600	0	0	0	10290	0	0	24010	34300	0	12480	0	3120	0	0	15600	5200	0	1300	0	0	0	0	6500		
Pervious Area (m²)	8300	0	17400	13300	0	-	-	39000	0	0	0	10290	0	-	-	10290	0	12480	0	3120) -	-	15600	5200	0	1300	0	0	-	-	6500		
Impervious Area (m²)	-	_	-	-	-	0	26600	26600	_	-	_	_	-	0	24010	24010	-	-	-	-	- 0	0	0	-	_	-	- 1	_	0	0	0		
			1						Infilti	ration Fa	actors																						
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0		0.172	0.172	0.172	0.172	0.12	0.12	0		0.172	0.172	0.172	0.172 0	12 0.12	0		0.172	0.172	0.172	0.172	0.12	0.12	0			
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.35	0.05	0		0.15	0.2	0.15	0.2	0.35	0.05	0	1	0.15	0.2	0.15	0.2 0	35 0.05	0	7 I	0.15	0.2	0.15	0.2	0.35	0.05	0	1		
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0		0.2	0.2	0.1	0.1	0.1	0.05	0		0.2	0.2	0.1	0.1	.1 0.05	0		0.2	0.2	0.1	0.1	0.1	0.05	0	1		
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0.1		0.522	0.572	0.422	0.472	0.57	0.22	0.1		0.522	0.572	0.422	0.472 0	57 0.22	0.1		0.522		0.422		0.57	0.22	0.1	,		
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0		0.522	0.572	0.422	0.472	0.57	0.22	0		0.522	0.572	0.422	0.472 0		0	_	0.522	0.572	0.422	0.472	0.57	0.22	0	1		
Run-off Coefficient	0.478	0.428	0.578	0.528	0.43	0.78	0.9		0.478	0.428	0.578	0.528	0.43	0.78	0.9		0.478	0.428	0.578	0.528 0		0.9	_	0.478	0.428	0.578	0.528	0.43	0.78	0.9	1		
Runoff from Impervious Surfaces*	0	0	0	0	0	0.78	0.9		0	0	0	0	0	0.78	0.9		0	0	0	0	0.78	0.9		0	0	0	0	0	0.78	0.9			
	1 - 1		_	-	-	-		-		(per Un		- 1	_		_	-								_	_								
Precipitation (mm/year)	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944		14 944	944	944	944	944	944	944	944	944	944	944		
Run-on (mm/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0 0	0	0	0	0	0	0	0	0	0	0		
Other Inputs (mm/year)	0	0	0	0	0	0	0	0	944	0	0	0	0	0	0	0	944	0	0		0 0	0	0	0	0	0	0	0	0	0	0 944		
Total Inputs (mm/year)	944	944	944	944	944	944	944	944		944	944	944	944	944	944	944	944	944	944	944 9	14 944	944	944	944	944	944	944	944	944	944	944		
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	573	Outputs 377	380	384	391	398	398	850	712	377	380	384	391 3	98 398	850	382	377	380	384	391	398	398	850	378		
Net Surplus (mm/year)	377	380	384	391	398	398	850	573	377	380	384	391	398	398	850	712	377	380	384		98 398	850	382	377	380	384	391	398	398	850	378		
Evapotranspiration (mm/year)	567	564	560	553	546	546	94	371	567	564	560	553	546	546	94	232	567	564	560		16 546	94	562	567	564	560	553	546	546	94	566		
Infiltration (mm/year)	197	217	162	185	227	88	85	140	197	217	162	185	227	88	85	115	197	217	162	185 2		85	211	197	217	162	185	227	88	85	190		
Rooftop and Infiltration Basin (mm/year)	0	0	0	0	0	0	108	44	0	0	0	0	0	0	108	76	0	0	0		0 0	0	0	0	0	0	0	0	0	0	0		
Total Infiltration (mm/year)	197	217	162	185	227	88	193	184	197	217	162	185	227	88	193	190	197	217	162		27 88	85	211	197	217	162	185	227	88	85	190		
Runoff Pervious Areas	180	163	222	206	171	0	0	942	180	163	222	206	171	0	0	942	180	163	222	206 1	71 0	0	942	180	163	222	206	171	0	0	942		
Runoff Impervious Areas	0	0	0	0	0	310	657	967	0	0	0	0	0	310	657	967	0	0	0		310	765	1075	0	0	0	0	0	310	765	1075		
Total Runoff (mm/year)	180	163	222	206	171	310	657	390	180	163	222	206	171	310	657	522	180	163	222	206 1	71 310	765	171	180	163	222	206	171	310	765	189		
Total Outputs (mm/year)	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944 9	14 944	944	944	944	944	944	944	944	944	944	944		
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
									Inpu	ıts (Volu	ıme)																						
Precipitation (m³/year)	7835	0	16426	12555		0	25110	61926	0	0	0	9714	0	0	22665	32379	0	11781	0	2945	0	0	14726	4909	0	1227	0	0	0	0	6136		
Run-on (m³/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Other Inputs m ³ /year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total Inputs (m³/year)	7835	0	16426	12555	0	0	25110	61926	0	0	0	9714	0	0	22665	32379	0	11781	0	2945) 0	0	14726	4909	0	1227	0	0	0	0	6136		
								1 1 1 1 1	Outp	uts (Vol	ume)	·				_ ===:=					-		, ===,										
Precipitation Surplus (m³/year)	3129	0	6682	5200	0	0	22599	37610	0	0	0	4023	0	0	20399	24422	0	4742	0	1220	0 0	0	5962	1960	0	499	0	0	0	0	2460		
Net Surplus (m ³ /year)	3129	0	6682	5200	0	0	22599	37610	0	0	0	4023	0	0	20399	24422	0	4742	0	1220	0	0	5962	1960	0	499	0	0	0	0	2460		
Evapotranspiration (m³/year)	4706	0	9744	7355	0	0	2511	24316	0	0	0	5690	0	0	2267	7957	0	7039	0	1725	0	0	8764	2948	0	728	0	0	0	0	3676		
Infiltration (m³/year)	1633	0	2820	2455	0	0	2260	9168	0	0	0	1899	0	0	2040	3939	0	2713	0	576	0	0	3288	1023	0	211	0	0	0	0	1234		
Rooftop and Trench Infiltration (m ³ /year)	0	0	0	0	0	0	2873	2873	0	0	0	0	0	0	2593	2593	0	0	0) 0	0	0	0	0	0	0	0	0	0	0		
Total Infiltration (m³/year)	1633	0	2820	2455		0	5133	12040	0	0	0	1899	0	0	4633	6532	0	2713	0		0 0	0	3288	1023	-	211	0	0	0	0	1234		
Runoff Pervious Areas (m³/year)	1496	0	3862	2746		0	7133	8103	0	0	0	2124	0	0	0	2124	0	2030	0		0 0	0	2674	937	0	289	0	0	0	0	1234		
Runoff Impervious Areas (m ³ /year)							1740-				 			-											-		<u> </u>						
	0	0	0	0	0	0		17467	0	0	0	0	0	0		15766	0	0	0		0	0	0	0	0	0	0	0	0	0	0		
Total Runoff (m³/year)	1496	0	3862	2746	1	0		25570	0	0	0	2124	0	0	15766	17890	0	2030	0	*	0	0	2674	937	0	289	0	0	0	0	1226		
Total Outputs (m³/year)	7835	0	16426			0	25110	61926	0	0	0	9714	0	0	1	32379		11781			0	0	14726	4909	+	1227	1	0	0		6136		
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - SUMMARY

water Balance / Water Budget Assess	Vater Balance / Water Budget Assessment							
Development Lands to Perth Long Swamp								
Pre = Post								
Characteristic	Pre- Development	Post- Development	Change (Pre- to Post)	Post-Development with Mitigation	Change (Pre- to Post-with Mitigation			
		Inputs (Vo	olumes)					
Precipitation (m³/year)	115168	115168	0%	115168	0%			
Run-on (m³/year)	0	0	0%	0	0%			
Other Inputs m³/year)	0	0	0%	0	0%			
Total Inputs (m³/year)	115168	115168	0%	115168	0%			
		Outputs (\	/olumes)					
Precipitation Surplus (m³/year)	46927	77733	66%	70455	50%			
Net Surplus (m³/year)	46927	77733	66%	70455	50%			
Evapotranspiration (m³/year)	68241	37435	-45%	44713	-34%			
Infiltration (m ³ /year)	23051	12320	-47%	17629	-24%			
Rooftop infiltration (m³/year)	0	0	0%	5466	0%			
Total Infiltration (m³/year)	23051	12320	-47%	23095	0%			
Runoff Pervious Areas (m³/year)	23876	11531	-52%	14127	-41%			
Runoff Impervious Areas (m³/year)	0	53882	0%	33233	0%			
Total Runoff (m³/year)	23876	65413	174%	47360	98%			
Total Outputs (m³/year)	115168	115168	0%	115168	0%			

ENVIRONMENTAL IMPACT STATEMENT



Perthmore Estates Subdivision Phase 6, Perth, ON

Project No.: PP-13-9668

Prepared for:

Perthmore Enterprises Inc. 80 Dufferin Street, P.O. Box 20054 Perth, ON K7H 3M6

Prepared by:

McIntosh Perry Consulting Engineers Ltd. 115 Walgreen Road, R.R.3 Carp, Ontario K0A 1L0

ENVIRONMENTAL IMPACT STATEMENT PERTHMORE ESTATES SUBDIVISION PHASE 6, PERTH, ON

Prepared for:

Perthmore Enterprises Inc. 80 Dufferin Street, P.O. Box 20054 Perth, ON K7H 3M6

Prepared by:

McINTOSH PERRY

McIntosh Perry Consulting Engineers Ltd.
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Version 003 June 22, 2023

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1.0 PROPERTY INFORMATION AND INTRODUCTION

The property for this Environmental Impact Statement (EIS) is a portion of an existing 29.7 hectare (ha) parcel of land located between Highway 7 (Dufferin Street) and North Street (Drummond Concession 2), north and west of Perthmore Street. The property is legally known as: "PART SOUTHWEST 1/2 AND PART NORTHEAST 1/2 LOT 3 CONCESSION 2 DRUMMOND BEING PART 1, 27R7125 AND PART 1, 27R8420 SAVE AND EXCEPT PLAN 88, 27M3, 27M14, 27M16, 27M21, 27M55 AND PARTS 3 & 4, 27R7540 AND PART 6, 27R11177 TOWN OF PERTH." The property is located within the Town of Perth, with 300 metres (m) of frontage on the south side of Highway 7 and 380 m of frontage on the north side of North Street (Drummond Concession 2) (**Figure 1**).

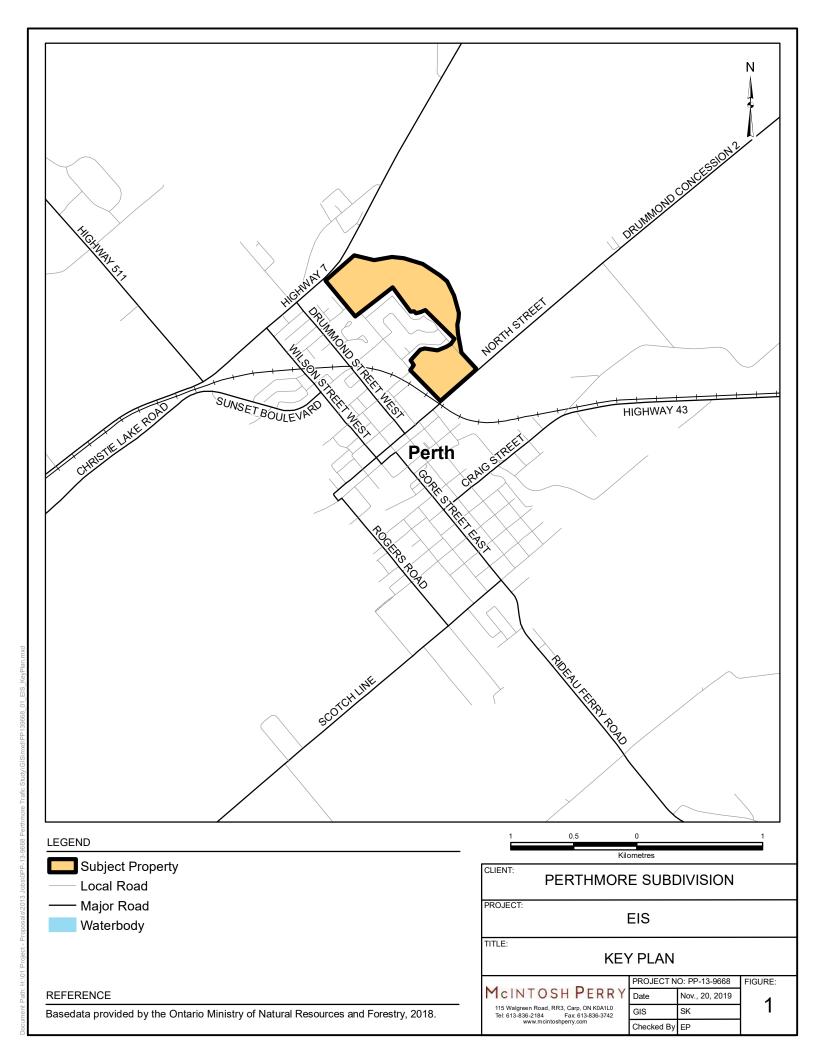
The area of the proposed subdivision, hereinafter referred to as the "subject property" measures approximately 5.5 hectares.

Under the *Town of Perth Official Plan – Land Use Designation* (Tunnock Consulting Ltd., 2015), the subject property is designated as Residential Area, except for two very small areas within the proposed Stormwater Management facility (Block 55 on the proposed Draft Plan of Subdivision) which are designated as Environmental Protection Area (Natural Heritage Feature – NHF / Provincially Significant Wetland – PSW).

The subject property is located within the jurisdiction of the Ministry of Natural Resources and Forestry's (MNRF) - Kemptville District and the Ministry of Environment, Conservation and Park's (MECP) – Ottawa District.

There is confirmed Provincially Significant Wetland (PSW) present within the overall 29.7 hectare holding, and adjacent to the proposed development area. As such, the Town of Perth has required an EIS be completed for the subject property due to the presence of a PSW, as outlined in the *Town of Perth Official Plan* (Town of Perth, 2019). This EIS report assesses the potential impacts that the development of a residential subdivision may have upon the existing woodlands, natural heritage features, including Significant Woodlands and Wetlands and species at risk (SAR), and their habitat.

McIntosh Perry Consulting Engineers Ltd. (McIntosh Perry) was retained by Perthmore Development Co. Ltd. to carry out an EIS to assess the existing natural heritage features. This EIS summarizes the findings of the surveys, outlines potential impacts as a result of the proposed development, and provides recommendations in order to mitigate anticipated impacts on natural heritage features. The information contained in this report represents surveys undertaken in the spring and summer of 2019 and additional field review completed summer of 2022.



2.0 METHODOLOGY

In order to acquire information on habitat present within and adjacent to the area of the proposed development, field investigations were carried out on May 24, 2019 by E. Pohanka of McIntosh Perry as well as June 8, 17, and 22, 2019 by H. Lunn and July 15, 2022 by J. King (**Table 1**). The field investigations were carried out within the undeveloped and cleared areas of the subject property. The area surveyed will be hereafter referred to in this report as the "study area." The field investigation was conducted to provide an inventory and assessment of the natural heritage features of the study area. The field investigation included the identification of the following features within the study area:

- Existing vegetation communities;
- Significant woody vegetation;
- Areas of critical or significant habitat (i.e., Significant Valleylands, Significant Woodlands, Significant Wildlife Habitat, PSW's, etc.);
- Soil types;
- Areas of groundwater recharge and discharge, drainage patterns, watercourses, wetland habitat, other areas of surface water;
- SAR and their habitat, and
- Resident or migratory birds and other wildlife species.

Table 1 outlines activities carried out within the study area during the field investigations.

	Table 1: Summary of Field Investigation Activities							
Date	Date Personnel Involved Time of St		Weather Conditions	Purpose of Visit				
May 24, 2019	E. Pohanka	6:45 a.m. to 10:30 a.m.	13 °C, overcast, light drizzle, low wind	Existing environmental conditions survey (including identification of vegetation and wildlife species present (avian included) and determining vegetation community boundaries) and species at risk habitat review.				
June 8, 2019	H. Lunn	5:35 a.m. to 6:30 a.m.	9 °C, sunny, no precipitation, no wind	Avian survey and targeted Eastern Meadowlark/Bobolink survey.				
June 17, 2019	H. Lunn	7:00 a.m. to 9:00 a.m.	10 °C, sunny, no precipitation, no wind	Avian survey and targeted Eastern Meadowlark/Bobolink survey. Wetland boundary delineation mapping and vegetation community mapping.				
June 22, 2019	H. Lunn	5:30 a.m. to 6:45 a.m.	12 °C, sunny, no precipitation, light breeze	Targeted Eastern Meadowlark/Bobolink survey. Butternut health assessment.				
July 15, 2022	J. King	9:00 a.m. to 10:00 a.m.	25 °C, sunny, no precipitation,	Updated vegetation mapping, butternut review				

Table 1: Summary of Field Investigation Activities						
Date	Personnel Involved	Time of Survey	Weather Conditions	Purpose of Visit		
			light breeze			

The vegetation communities observed within the study area were characterized using the Ecological Land Classification (ELC) protocol (Lee et al., 1998), and delineated on an aerial photograph. Significant Woodlands were identified through several criteria including tree species, age class, canopy, density, land area, etc. This was completed per the Natural Heritage Reference Manual (NHRM) and the Perth OP. Areas that represented Significant Woodlands were mapped in the field utilizing GPS coordinates and visual observations. Wetland boundaries associated with the study area were reclassified due to outdated modelling. This was conducted by walking through the study area and delineating the updated wetland boundaries using GPS coordinates and visual observations.

Migratory bird surveys were performed by conducting a walkthrough of the study area. The surveys began no later than 7:00 AM. The surveys included a review of nesting and migratory birds including nesting habitat. Direct nest searches were not undertaken during the surveys as this practice is not condoned by the Canadian Wildlife Service (e.g. the chance of harming the nest by leading predators to the nesting location is high, and the efficiency of detecting all nesting locations in complex habitats such as riparian corridor or mixed vegetation is low). Breeding evidence codes as used during the Ontario Breeding Bird Atlas (OBBA) were used to assign a likelihood of breeding within the study area based on observed behaviours of individual birds. These standardized codes determine whether the species is possibly, probably or confirmed to be breeding within the study area. Characteristics of habitat were also used to help interpret behaviours and breeding evidence. In concurrence with the migratory bird surveys, grassland SAR bird surveys were conducted in the Mixed Meadow (MEM) vegetation communities within the study area. Three (3) grassland SAR bird surveys were conducted no later than 7:00 AM on sunny days with no precipitation and little to no breeze. Visual and audial observations of grassland SAR birds were recorded.

During the field investigations, observations of wildlife species were made through sight, sound, and physical evidence.

Photographs were taken during the field investigations depicting vegetation communities and natural heritage features observed within the study area. This photographic record can be found in **Appendix A** of this report (**Photos 1 – 37**).

Background information on wildlife and plant species, and other significant natural heritage features known to occur within or adjacent to the study area was obtained from the following sources:

- The Natural Heritage Information Centre (NHIC) database accessed via the MNRF's Make a Map: Natural Heritage Areas (MNRF, 2019a). This search tool allows areas to be searched at up to 1 km² grid resolution and provides reports concerning rare species tracked by the NHIC. Information for each 1 km² square within the study area was reviewed for occurrences of rare species tracked by NHIC;
- The MNRF's Land Information Ontario (LIO) Metadata Management Tool (MNRF, 2019b). This tool contains information (e.g., location of PSW's, SAR element occurrences, etc.) licensed under the Open

Government Licence for Ontario;

- Data from the Ontario Breeding Bird Atlas Database (OBBA) was accessed from the data summaries page of the Atlas of the Breeding Birds of Ontario website (Bird Studies Canada, 2006). Information for each 10 km² grid square was reviewed for the study area;
- Ontario Reptile and Amphibian Atlas was accessed for the data summaries (Ontario Nature, 2019). Information for each 10 km² grid square was reviewed for the study area;
- Information from the *Tay River Subwatershed Report 2017* by Rideau Valley Conservation Authority (RVCA) (2017);
- Habitat in the study area was evaluated by use of aerial photography accessed through Google Earth aerials and StreetView mapping (Maxar Technologies, 2019), and
- SAR listed in the *Town of Perth Official Plan: Appendix 10 List of Endangered and Threatened Species* that are potentially found in the Town of Perth (Town of Perth, 2019).

3.0 DESCRIPTION OF THE SITE AND THE NATURAL ENVIRONMENT

3.1 Existing Land Use

At the time of the field investigations, most of the study area was undeveloped with the exception of a cleared areas near the center and west portions (**Photos 1 and 3**). The undeveloped portions of the study area consist of vegetated areas in a range of forest and wetland types. The cleared areas consist of regenerating fields and thickets as well as some piles of fill.

Schedule A: Land Use, of the *Town of Perth Official Plan* (2019), identifies 'Environmental Protection Area' consisting of 'Natural Heritage Features' and 'PSW' towards the very southeast portion of the study area. A 120 m boundary of 'adjacent lands' to the PSW is also present within the study area which also located within the area designated 'Residential Areas'.

A 'Natural Heritage System' is defined by the *Provincial Policy Statement*, 2020 (PPS) as "...a system made up of natural heritage features and areas, linked by natural corridors which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species and ecosystems." Land uses adjacent to the subject property include residential property directly adjacent to the southwest and vacant lands and wetlands northeast, east, and southeast.

3.2 Natural Heritage System Components

The following background information was collected from various sources (refer to Section 2.0 of this report):

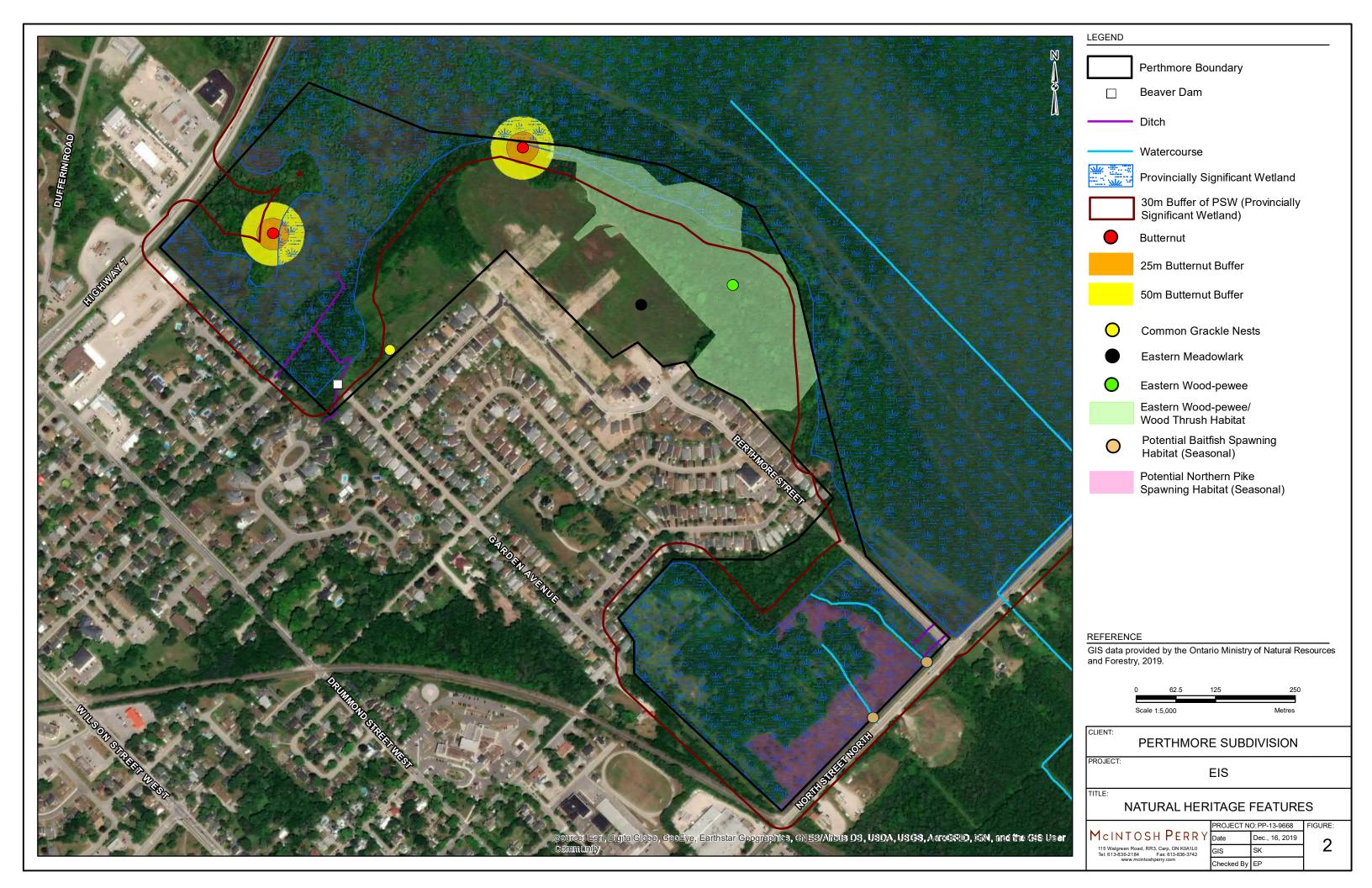
- According to the NHIC mapping reviewed and LIO data, the following natural features have been identified within the vicinity of the study area:
 - A portion of the study area is within/adjacent to the Perth Long Swamp, a PSW;
 - The following additional PSW's are present within 2 km of the study area: Blueberry Marsh, Grant Creek Wetland;
 - o The Perth Blueberry Bog (Candidate Life Science ANSI) is within 2 km of the study area, and
 - The following SAR have been recorded within 2 km of the study area: Barn Swallow (*Hirundo rustica*),
 Bobolink (*Dolichonyx oryzivorus*), Eastern Meadowlark (*Sturnella magna*), Eastern Musk Turtle (*Sternotherus odoratus*), and Gray Ratsnake (Frontenac Axis population) (*Pantherophis spiloides*).

The PPS defines Significant Wetlands as "...an area identified as provincially significant by the Ontario Ministry of Natural Resources using evaluation procedures established by the Province..." (PPS, 2020). Section 8.6.4(b)(2.) of the *Town of Perth Official Plan* (2019), identifies Provincially Significant wetlands as "...ecosystems which are important as habitat for a variety of plant and animal species, for water quality, flood control and water storage and recharge areas and for their value for passive recreation". The Perth Long Swamp was identified within/adjacent to the study area based on NHIC and LIO data. The boundaries of the wetland complex according to LIO data, shows the wetland occurring southeast of the study area (Figure 3). However, this data was determined to be historic (1987) and required updating. H. Lunn conducted a wetland evaluation to map the current boundaries of the PSW within the study area. Figure 3 outlines the updated boundaries of the Perth Long Swamp within the study area contrasting with the outdated boundaries. The wetland drains southeast through

tributaries that cross under North Street. These tributaries drain into Tay River south of the study area. The new boundaries of the wetland do not significantly deviate from the previous boundaries with the exception of expansion of the boundaries southeast of the study area and a reduction towards the northwest.

The PPS defines a Significant Woodland as "...an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area...". Section 8.6.4(e.)(1.) of the *Town of Perth Official Plan* (2019), defines Significant Woodlands as "...areas which serve an important ecological function in the broader landscape because of their location, extent of forest cover, tree age and long-standing forest function, species composition and their potential as wildlife habitat".

Several vegetation communities within and adjacent to the study area (refer to Section 3.5 of this report for information on vegetation communities present within the study area), were considered to be 'Potentially Significant Woodland' based on the *Town of Perth Official Plan* (2019). The forested areas identified as Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4), Ash Mineral Deciduous Swamp (SWD1), and Coniferous Forest (FOC) are within the 'Potentially Significant Woodlands' defined by Appendix 11 of the *Official Plan* (see **Figure 4**).





3.3 Landforms, Soils and Geology

The physiography of the study area is within the Great Lakes Basin. The bedrock geology of the study area consists of dolostone and sandstone of the Beekmantown Group (Ontario Geological Survey, 2010). According to the *Soils Map of Lanark County Ontario* (Canada Department of Agriculture, 1966), soils present within the study area include organic muck with very poor drainage in the PSW, and well drained sandy loam till southwest of the PSW.

3.4 Surface Water, Groundwater, Wetlands, and Fish Habitat

The property is located within the Tay River Subwatershed of the Rideau Valley Watershed managed by the Rideau Valley Conservation Authority (RVCA, 2017). Tributaries of the Tay River flow from the southeast end of the study area through culverts under North Street in a southeast direction. The tributaries drain surface water from the Perth Long Swamp PSW within the study area for approximately 990 m into the Tay River (RVCA, 2017). During the May 24, 2019 field investigation, the tributaries were flowing with an approximate depth of 0.5 m. The tributaries within the study area have an unknown thermal regime. Central Mudminnows (*Umbra limi*), bass (*Micropterus* spp.), sunfish (*Lepomis* spp.), and young-of-year (YOY) Northern Pike (*Esox lucius*) were recorded to be present within a connected tributary which crosses North Street east of the study area (personal observations made by J. King of McIntosh Perry). Graminoid vegetation within the study area upstream of the North Street culverts provide suitable spawning habitat for Northern Pike. The inlets of the culverts also provide suitable baitfish spawning habitat within the gravel riffles. These habitats are seasonal as these areas are influenced by fluctuating groundwater conditions.

During the field investigations, the soils were observed to have poor drainage as was evident with the wet soils and wetlands present in the study area. Standing water was present throughout the wetland areas of the study area (**Photos 8, 13, 25, and 35**). Potential groundwater was observed within the wetland due to oil-like films and iron staining on the water surface within the cattail marsh and ash mineral deciduous swamp areas of the wetland (**Photo 26**).

No well records were identified within the study area. A total of 103 wells are located within 500 m of the original study area. The well depths range from 0.4 m to 68.3 m. The well uses range from domestic water supply (46), industrial water supply (3), commercial water supply (17), irrigation (1), livestock (2), public water supply (1), monitoring (2) abandoned (7), and unknown use (24).

A Preliminary Servicing and Stormwater Management Report was prepared by McIntosh Perry in support of Phase 6 of the Perthmore subdivision where further details can be found.

3.5 Vegetation Cover

Spring and summer vegetation surveys were completed on May 24 and June 17, 2019 and confirmed July 15, 2022. Habitat observed during the field investigations included several vegetation communities (**Photos 1, 3, 6, 8, 13, 14, 16, 17, 18, 20, 24, 25, 29, 30, 32, 34, 35, 37**). The following section outlines the existing vegetation communities identified within the study area. For a detailed map of vegetation communities present within the study area, refer to **Figure 4**. Photographs of the vegetation communities can be found in **Appendix A**. A complete listing of vegetation species observed within the study area during the field investigations is found in **Table 2**. SAR

vegetation was observed within the study area during the June 17, 2019 field investigation. Two (2) Butternut (*Juglans cinerea*) trees were identified in the north end of the study area. No other nationally, provincially or regionally rare or endangered plant species were observed during the field investigation.

3.5.1 Vegetation Community 1: Mixed Meadow (MEM)

Vegetation Community 1 was classified through ELC as a Mixed Meadow (MEM) (**Photo 1 and 3**). This community lacked significant woody vegetation. It was previously cleared and is considered a disturbed area with herbaceous growth regenerating the area. The dominant species included grass (*Poaceae* spp.) and shrub willows (*Salix* spp.). This community was present in the center of the study area, northwest and northeast of the existing development. Additional MEM habitat was noted during the July 15, 2022 survey through recent vegetation removals. The remainder of Community 1 had recently been mown.

3.5.2 Vegetation Community 2: Green Ash Organic Deciduous Swamp (SWDO1-2)

Vegetation Community 2 was classified through ELC as a Green Ash Organic Deciduous Swamp (SWDO1-2) (**Photo 6 and 8**). This vegetation community is located on the west end of the study area adjacent to the western Mixed Meadow. Drains and ditch lines are present within this vegetation community. The community consisted of wet soils and vegetation dominated by green ash (*Fraxinus pennsylvanica*). The majority of this community is situated within the updated boundaries of the PSW.

3.5.3 Vegetation Community 3: Cattail Organic Shallow Marsh (MASO1-1)

Vegetation Community 3 was classified through ELC as a Cattail Shallow Marsh (MASO1-1) (**Photo 13**). This vegetation community is in the western corner of the study area. It is situated entirely within the updated boundaries of the PSW and there is a small, fragmented section of this community north of the main section. This community contains surface water and is dominated by broad-leaved cattail (*Typha latifolia*). Sparse stands of dead trees and shrubs are also present in this community.

3.5.4 Vegetation Community 4: Coniferous Forest (FOC)

Vegetation Community 4 was classified through ELC as a Coniferous Forest (FOC) (**Photo 14**). This vegetation community is in the western end of the study area. It is excluded from the updated boundaries of the PSW. The community consists of a mix of coniferous trees including white spruce (*Picea glauca*), eastern white-cedar (*Thuja occidentalis*), and balsam fir (*Abies balsamea*) as well as a mix of deciduous trees. This community extends to the southern side of Dufferin Street and fragments the Cattail Organic Shallow Marsh community. This community is designated as 'Potentially Significant Woodlands' based on the *Town of Perth Official Plan* (2019).

3.5.5 Vegetation Community 5: Shallow Marsh (MAS)

Vegetation Community 5 was classified through ELC as a Shallow Marsh (MAS) (**Photo 16**). This community is located in the north end of the study area. This vegetation community also exists in the south end of the study area between the existing development and the updated boundaries of the PSW. The features of this community are similar to those of the cattail organic shallow marsh; however, the shrubs are denser within the shallow marsh community. This community is situated entirely within the updated boundaries of the PSW. This vegetation community extends into adjacent lands within the PSW.

3.5.6 Vegetation Community 6: Fresh-Moist Lowland Deciduous Forest (FODM7)

Vegetation Community 6 was classified through ELC as a Fresh-Moist Lowland Deciduous Forest (FODM7) (**Photo 17 and 18**). This community is located between the two Mixed Meadow communities, outside of the updated PSW boundaries. Another portion of this community is present in the southeast end of the study area between the PSW and existing developed subdivision. The canopy of this community consists primarily of green ash with a mix of other deciduous trees. Understory species was dominated by common buckthorn (*Rhamnus cathartica*). A ridge created by a historic stone fence line is present within this community. The southeast portion of this community is designated as 'Potentially Significant Woodlands' based on the *Town of Perth Official Plan* (2019).

3.5.7 Vegetation Community 7: Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4)

Vegetation Community 7 was classified through ELC as a Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4) (**Photo 20**). This is a large community (approximately 20 acres) that begins in the north end between the Shallow Marsh and eastern Mixed Meadow communities, outside of the updated PSW boundaries and continues southeast around the Mixed Meadow. The canopy of this community is dominated by a mix of sugar maple (*Acer saccharum*) and ironwood (*Ostrya virginiana*). The stone wall ridge noted in vegetation community 6 continues within this vegetation community and curves eastward. This community contained very little understory and sparse ground cover dominated by broad-leaved toothwort (*Cardamine diphylla*) and Canada mayflower (*Maianthemum canadense*). This community is designated as 'Potentially Significant Woodlands' based on the *Town of Perth Official Plan* (2019).

3.5.8 Vegetation Community 8: Ash Mineral Deciduous Swamp (SWD1)

Vegetation Community 8 was classified through ELC as Ash Mineral Deciduous Swamp (SWD1) (**Photo 24 and 25**). This community is located along the eastern boundary of the study area from the north end to the south east end at Perthmore Road. It is entirely within the updated PSW boundaries. The community is dominated by a mix of green ash and black ash (*Fraxinus nigra*) with surface water creating vernal pools. There is very little understory; however, there is significant ground cover consisting of herbaceous wetland plants growing from the vernal pools and outside of the pools. This vegetation community extends into adjacent lands within the PSW. This community is designated as 'Potentially Significant Woodlands' based on the *Town of Perth Official Plan* (2019).

3.5.9 Vegetation Community 9: Willow Organic Deciduous Thicket Swamp (SWTO2)

Vegetation Community 9 was classified through ELC as a Willow Organic Deciduous Thicket Swamp (SWTO2) (Photo 29 and 30). This community is located in large fragments in the southern end of the study area. Areas of this community type exist on the east and west side of Perthmore Road, a small portion in the southwestern end of the study area, and a large portion in the centre of the south end of the study area. These areas consist of wet soils, often with surface water dominated by Bebb's willow (Salix bebbiana), peachleaf willow (Salix amygdaloides), and red-osier dogwood (Cornus sericea). Ground cover consists of marsh horsetail (Equisetum palustre) and purple loosestrife (Lythrum salicaria). All of these areas are within the updated PSW boundaries.

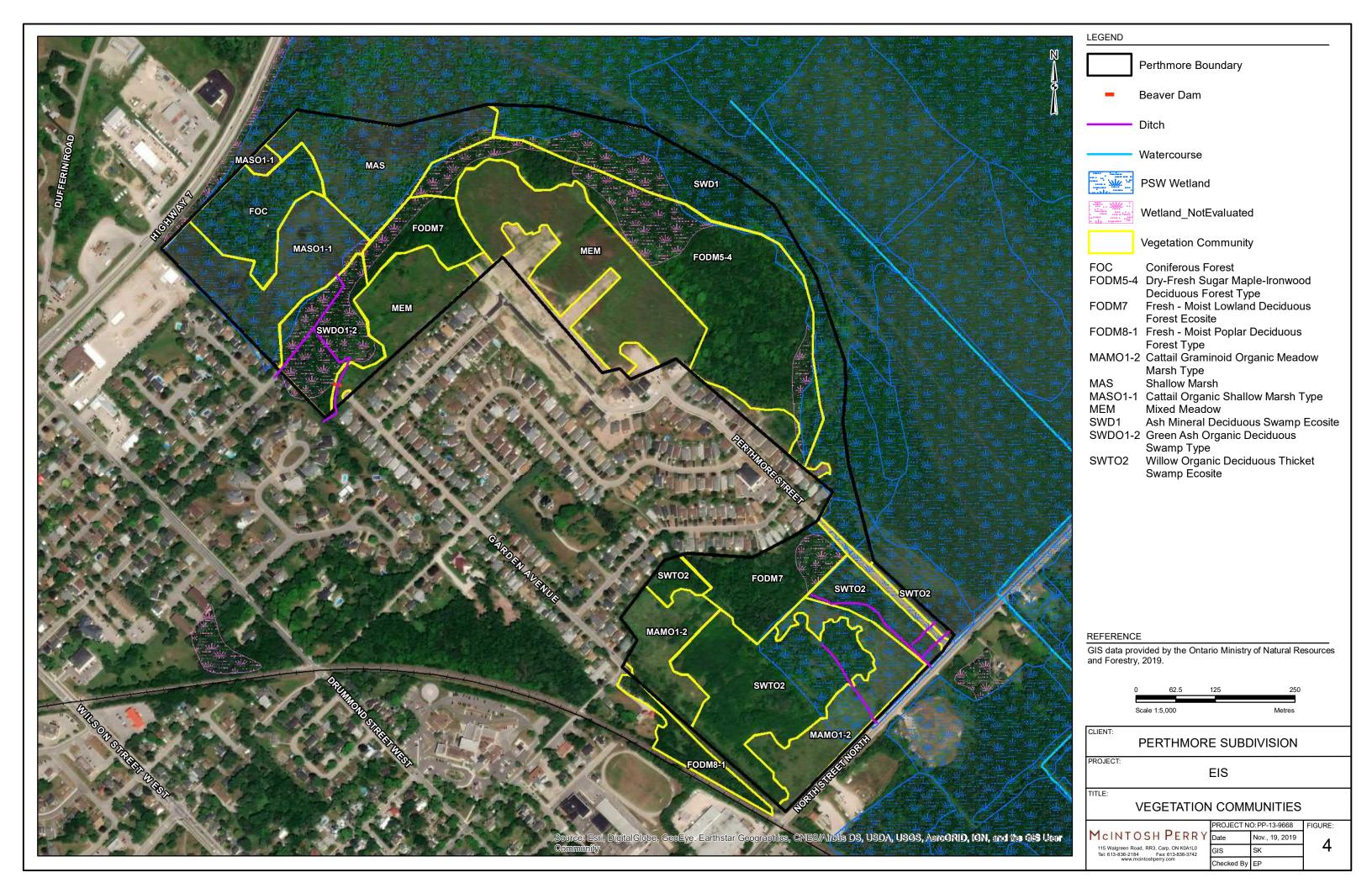
3.5.10 Vegetation Community 10: Cattail Graminoid Organic Meadow Marsh (MAMO1-2)

Vegetation Community 10 was classified through ELC as a Cattail Graminoid Organic Meadow Marsh (MAMO1-2)

(**Photo 34 and 35**). This community is located in on the east and west sides of the large Willow Organic Deciduous Thicket Swamp in the centre of the southern end of the study area. This community consists mainly of broadleaved cattails, but also contains significant amounts of reed canary grass (*Phalaris arundinacea*). Sparse common buckthorn is also present. The soil in these communities are wet and often have surface water.

3.5.11 Vegetation Community 11: Fresh-Moist Poplar Deciduous Forest (FODM8-1)

Vegetation Community 11 was classified through ELC as a Fresh-Moist Poplar Deciduous Forest (FODM8-1) (**Photo 37**). This community is on the west end of a pathway between North Street and Garden Avenue, adjacent to the south end of the study area. This community is dominated by trembling aspen (*Populus tremuloides*) and balsam poplar (*Populus balsamifera*) as well as a mix of other deciduous tree species. A thick understory is present consisting of common buckthorn, Tatarian honeysuckle (*Lonicera tatarica*), and shrub willows. Refer to **Table 2** for a complete listing of species observed within the study area.



Common Name	Scientific Name	Common Name	Scientific Name
Tree Species			
American beech	Faugus grandifolia	green ash	Fraxinus pennsylvanica
balsam fir	Abies balsamea	ironwood	Ostrya virginiana
balsam poplar	Populus balsamifera	largetooth aspen	Populus grandidentata
basswood	Tilia americana	Manitoba maple	Acer negundo
black ash	Fraxinus nigra	paper birch	Betula papyrifera
black cherry	Prunus serotine	red maple	Acer rubrum
black spruce	Picea mariana	silver maple	Acer saccharinum
black walnut	Juglans nigra	sugar maple	Acer saccharum
bur oak	Quercus macrocarpa	trembling aspen	Populus tremuloides
Butternut	Juglans cinereal	white elm	Ulmus americana
eastern white pine	Pinus strobus	white spruce	Picea glauca
eastern white cedar	Thuja occcidentalis	white willow	Salix alba
European white poplar	Populus alba		
Shrub Species			
Bebb's willow	Salix bebbiana	high-bush cranberry	Viburnum trilobum
black currant	Ribes nigrum	nannyberry	Viburnum lentago
black elderberry	Sambucus canadensis	narrow-leaved meadowsweet	Spiraea alba
bunchberry	Cornus canadensis	peach-leaved willow	Salix amygdaloides
choke cherry	Prunus virginiana	red-osier dogwood	Cornus sericea
common barberry	Berberis vulgaris	riverbank grape	Vitis riparia
common blackberry	Rubus allegheniensis	shrub willow	Salix spp.
common buckthorn	Rhamnus cathartica	speckled alder	Alnus incana
common prickly-ash	Zanthoxylum americanum	Tatarian honeysuckle	Lonicera tatarica
fragrant sumac	Rhus aromatica	Virginia creeper	Parthenocissus quinquefolic
glossy buckthorn	Frangula alnus	western poison-ivy	Toxicodendron rydbergii
hawthorn	Crataegus spp.	wild red raspberry	Rubus strigosus

Table 2: Vegetation Species observed within the Study Area					
Common Name	Scientific Name	Common Name	Scientific Name		
bittersweet nightshade	Solanum dulcamara	naked bishop's-cap	Mitella nuda		
bladder campion	Silene vulgaris	northern dewberry	Rubus flagellaris		
bladder sedge	Carex intumescens	oak fern	Gymnocarpium spp.		
Blue-stem goldenrod	Solidago caesia	one-sided shinleaf	Orthilila secunda		
bracken fern	Pteridium aquilinum	orange hawkweed	Pilosella aurantiaca		
broad-leaved cattail	Typha latifolia	orchard grass	Dactylis spp.		
bull thistle	Cirsium vulgare	ostrich fern	Matteuccia struthiopteris		
butter-and-eggs	Linaria vulgaris	ox-eye daisy	Leucanthemum vulgare		
Canada anemone	Anemone canadensis	Pennsylvania sedge	Carex pensylvanica		
Canada lettuce	Lactuca canadensis	phragmites	Phragmites australis australis		
Canada mayflower	Maianthemum canadense	purple loosestrife	Lythrum salicaria		
coltsfoot	Tussilago farfara	red baneberry	Actaea rubra		
common burdock	Arctium minus	red clover	Trifolium pratense		
common dandelion	Taraxacum officinale	reed canary grass	Phalaris arundinacea		
common evening-primrose	Oenothera biennis	rough cinquefoil	Potentilla norvegica		
common helleborine	Epipactis helleborine	rough horsetail	Equisetum hyemale		
common milkweed	Asclepias syriaca	sensitive fern	Onoclea sensibilis		
common yarrow	Achillea millefolium	skunk-cabbage	Symplocarpus foetidus		
cow vetch	Vicia cracca	spinulose woodfern	Dryopteris carthusiana		
curled dock	Rumex crispus	spotted jewelweed	Impatiens capensis		
Dame's-rocket	Hesperis matronalis	spotted Joe-pye-weed	Eutrochium maculatum		
dwarf raspberry	Rubus pubescens	spreading dogbane	Apocynum androsaemifolium		
early meadow-rue	Thalictrum dioicum	stinging nettle	Urtica dioica		
enchanter's nightshade	Circaea lutetiana	tall buttercup	Ranunculus acris		
false Solomon's-seal	Maianthemum racemosum	Timothy grass	Phleum pretense		
field forget-me-not	Myosotis arvensis	trout-lily	Erythronium americanum		
field horsetail	Equisetum arvense	two-leaved toothwort	Cardamine dyphilla		
field pennycress	Thlaspi arvense	viper's bugloss	Echium vulgare		

Table 2: Vegetation Species observed within the Study Area					
Common Name	Scientific Name	Common Name	Scientific Name		
garlic mustard	Allaria petiolate	watercress	Nasturtium officinale		
goat's-beard	Tragopogon dubius	white avens	Geum canadense		
goldenrod	Solidago spp.	white baneberry	Actaea pachypoda		
ground-ivy	Glechoma hederacea	whorled chickweed	Mollugo verticillate		
herb-Robert	Geranium robertianum	wild parsnip	Pastinaca sativa		
Jack-in-the-pulpit	Tussilago farfara	wild strawberry	Fragaria virginiana		
king-devil	Pilosella caespitosa	woolly blue violet	Viola sororia		
lily-of-the-valley	Conallaria majalis	wormseed mustard	Erysimum cheiranthoides		
marsh horsetail	Equisetum pratense	yellow violet	Viola pubescens		
marsh marigold	Caltha palustris				

3.6 Habitat for Species at Risk & Significant Wildlife Habitat

Background information obtained from the sources listed in Section 2.0 of this report, indicated that SAR and their habitat were potentially present within the study area. These species have been listed in **Table 3**. Based on habitat observed during the field investigations and direct observation of SAR, a determination was made as to whether these species had the potential to be or were present within the study area (**Table 3**).

Table	Table 3: Species at Risk Potentially or Confirmed to be Present within the Study Area					
*Common Name	Scientific Name	Provincial Status (ESA, 2007)	Federal Status (SARA Schedule 1)	Potential/Unconfirmed or Confirmed Habitat Present within Property Boundaries		
Plants						
Butternut⁵	Juglans cinerea	Endangered	Endangered	Confirmed present in the study area		
Insects						
Monarch⁵	Danaus plexippus	Special Concern	Special Concern	No habitat		
Amphibians						
Western Chorus Frog ²	Pseudacris triseriata	No Status	Threatened	Potential/Unconfirmed		
Turtles						
Blanding's Turtle ^{2, 5}	Emydoidea blandingii	Threatened	Threatened	Potential/Unconfirmed		
Common Snapping Turtle ^{2, 5}	Chelydra serpentina	Special Concern	Special Concern	Potential/Unconfirmed		
Eastern Musk Turtle ^{2, 5}	Sternotherus odoratus	Special Concern	Special Concern	No habitat		
Snakes and Lizards						
Eastern Milksnake ^{2, 5}	Lampropeltis triangulum triangulum	No Status	Special Concern	Potential/Unconfirmed		
Eastern Ribbonsnake ^{2, 5}	Thamnophis sauritus sauritus	Special Concern	Threatened	Potential/Unconfirmed		
Gray Ratsnake ²	Pantherophis spiloides	Endangered	Threatened	No habitat		
Birds						
Barn Swallow ^{3, 4}	Hirundo rustica	Threatened	Threatened	No habitat		
Black Tern⁵	Chlidonias niger	Special Concern	N/A	No habitat		
Bobolink ^{3, 5}	Dolichonyx	Threatened	Threatened	Marginal habitat only		

Table 3: Species at Risk Potentially or Confirmed to be Present within the Study Area					
*Common Name	Scientific Name	Provincial Status (ESA, 2007)	Federal Status (SARA Schedule 1)	Potential/Unconfirmed or Confirmed Habitat Present within Property Boundaries	
	oryzivorus				
Canada Warbler ⁵	Cardellina Canadensis	Special Concern	Threatened	No habitat	
Chimney Swift ^{3, 5}	Chaetura pelagica	Threatened	Threatened	No habitat	
Common Nighthawk ^{3, 5}	Chordeiles minor	Special Concern	Threatened	No habitat	
Eastern Meadowlark ^{3, 5}	Sturnella magna	Threatened	Threatened	Marginal habitat only	
Eastern Whip-poor- will ⁵	Antrostomus vociferous	Threatened	Threatened	No habitat	
Eastern Wood- pewee ^{3, 5}	Contopus virens	Special Concern	Special Concern	Confirmed present within the study area	
Evening Grosbeak ⁵	Coccothraustes vespertinus	Special Concern	No Status	No habitat	
Golden-winged Warbler ⁵	Vermivora chrysoptera	Special Concern	Threatened	No habitat	
Grasshopper Sparrow ^{3, 5}	Ammodramus savannarum	Special Concern	Special Concern	Marginal habitat only	
Least Bittern ⁵	Ixobrychus exilis	Threatened	Threatened	Potential/Unconfirmed	
Rusty Blackbird⁵	Euphagus carolinus	Special Concern	Special Concern	No habitat	
Short-eared Owl⁵	Asio flammeus	Special Concern	Special Concern	No habitat	
Wood Thrush ³	Hylocichla mustelina	Special Concern	Threatened	Confirmed present within the study area	
Mammals					
Eastern Small- footed Myotis ⁵	Myotis leibii	Endangered	N/A	No habitat	
Little Brown Myotis ⁵	Myotis lucifugus	Endangered	Endangered	No habitat	
Northern Myotis ⁵	Myotis septentrionalis	Endangered	Endangered	No habitat	
Tri-coloured Bat⁵	Perimyotis subflavus	Endangered	Endangered	No habitat	

^{*}This table was assembled from various sources of background information. The following information sources were consulted to compile background information: 1 – LIO geodatabase (MNDMNRF, 2019b); 2 – Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019); 3 – Atlas of the Breeding Birds of Ontario (Bird Studies Canada et al., 2006); 4 – NHIC data (MNDMNRF, 2019a); 5 – General range

Of the SAR identified by background information as potentially present within the vicinity of the study area, habitat observed during the field investigation within the study area does not appear to be suitable for the life processes of the following SAR: Monarch, Western Chorus Frog, Eastern Musk Turtle, Gray Ratsnake, Barn Swallow, Black Tern, Bobolink, Canada Warbler, Chimney Swift, Common Nighthawk, Eastern Meadowlark, Eastern Whip-poor-will, Evening Grosbeak, Golden-winged Warbler, Grasshopper Sparrow, Rusty Blackbird, Shorteared Owl, Eastern Small-footed Myotis, Little Brown Myotis, Northern, and Tri-colored Bat. In addition, although habitat was observed to be suitable for the Eastern Milksnake and Eastern Ribbonsnake, these species were not observed to be present within the study area, or within 50 m of the study area. These species utilize a variety of habitats and are not likely to rely directly on the study area for significant life processes.

An Eastern Meadowlark was heard calling in an agitated behaviour within the Mixed Meadow (MEM) in the centre of the study area during the June 8, 2019 field investigation. Subsequent targeted surveys were conducted during appropriate times of day and during the breeding period to determine if this species was utilizing the Mixed Meadow for breeding habitat. No other observation of this species or other grassland SAR birds were recorded during the field investigations. The individual Eastern Meadowlark observed on June 8, 2019 was likely in the process of searching for appropriate breeding habitat within the study area and vacated the area without establishing territory. It was determined that no suitable habitat for grassland SAR birds is present within or adjacent to the study area.

Areas of the Ash Mineral Deciduous Swamp (SWD1) provide potential habitat for Western Chorus Frog where there are seasonal standing pools of water. Although targeted surveys were not completed for this species, no observation or calls were recorded of this species during any field investigation.

Suitable habitat for the following species was deemed to be potentially present within the study area, during the 2019 field investigations: Butternut, Common Snapping Turtle, Blanding's Turtle, Least Bittern, Wood Thrush and Eastern Wood-pewee.

The Butternut is listed as 'Endangered' under the Endangered Species Act (2007) (ESA) and the Species at Risk Act (2002) (SARA). Habitat for this species and individuals of this species are afforded protection. Habitat is available within the study area due to the wide range of habitat preferences for Butternuts in which to grow. Butternuts are shade intolerant and prefer open areas but often become crowded out by other pioneer species (i.e. regenerating areas). Two (2) Butternuts were identified and located within the study area (however outside of the area to be disturbed for Phase 6) during the June 8, 2019 field investigation. Both individuals were mature trees (Photos 15 and 23). One of the Butternuts was identified within the Coniferous Forest (FOC) in the northwest end of the study area and the other was identified within the Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4) in the north end of the study area. No new butternut were observed during the 2022 field review. Under the ESA, individuals must be assessed by a qualified Butternut Health Inspector to determine the general health and viability of the individual to resist the butternut canker (Sirococcus clavigignenti-juglandacearum) and produce immune offspring.

Suitable habitat for Common Snapping Turtle and Blanding's Turtle is available in the study area within the PSW. The Common Snapping Turtle is listed as 'Special Concern' under the ESA and SARA and does not receive habitat protection. The Blanding's Turtle is listed as 'Threatened' under the ESA and SARA and receives habitat protection.

Several of the vegetation communities in the study area as parts of the PSW (i.e. MASO1-1, MAS, SWTO2, SWD1, and MAMO1-2) provide suitable foraging and migration habitat for these species. No distinct areas of open water marsh with depth were noted during the field reviews as suitable overwintering habitat. Potential nesting habitat for these species was observed within the study area in the form of gravel road shoulders along Perthmore Road as well as adjacent to the study area on North Street and Dufferin Street. However, no nests, evidence of nesting, or individual Common Snapping Turtles or Blanding's Turtles were observed during the 2019 field investigations. No records of Blanding's Turtles were found within 2 km of the study area.

Potential breeding habitat for the Least Bittern is also available in the open wetland areas of the PSW within the study area which contain narrow leaved emergent herbaceous vegetation (MAS and MASO1-1). This species is listed as 'Threatened' under the ESA and SARA and receives habitat protection. This species was not observed or heard calling during any of the field investigations. Targeted studies in Long Swamp in 2020 for Least Bittern along Highway 7 did not yield any sightings. No records were found of this species breeding within or adjacent to the study area.

The Eastern Wood-pewee is listed as 'Special Concern' under the ESA and SARA. The Wood Thrush is listed as 'Special Concern' under the ESA and 'Threatened' under the SARA. The habitat for these species is not afforded protection under the ESA or SARA. However, individuals of these species, their eggs, nest and fledglings are protected under the *Migratory Birds Convention Act* (1994) (MBCA). The Eastern Wood-pewee is a habitat generalist which will utilize a variety of habitats for nesting and foraging, however it prefers edge habitat near water. The Wood Thrush breeds in deciduous and mixed forests containing ironwood and oaks where the trees are over 15 m tall with a moderate understory and open floor consisting of moist soils, decaying leaf litter, and water nearby. During the June 8 and June 22, 2019 field investigations, an Eastern Wood-pewee and Wood Thrush were observed within the Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4) vegetation community in the centre of the study area. The individuals were displaying territorial behaviour (singing males) within suitable habitat during the breeding season of these species. Suitable habitat for these species is present within the Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4) vegetation community of the study area.

3.7 Wildlife

The study area is in the Smiths Falls Ecodistrict (6E-11) of the Lake Simcoe-Rideau Ecoregion (6E) within the Mixedwood Plains Ecozone (Ecological Stratification Working Group, 1996). Characteristic wildlife present within this Ecoregion include: northern raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), white-tailed deer (*Odocoileus virginianus*), groundhog (*Marmota monax*), waterfowl, turtles, snakes, and various bird species (Crins, et al., 2009).

The following section outlines the existing wildlife observations from the field investigations conducted within the study area. **Table 4** lists the species observed during the 2019 field investigations. Habitat present within the study area represented appropriate breeding/nesting/foraging habitat for all wildlife species observed with the exception of the Canada Goose (*Branta canadensis*) and Ring-billed Gull (*Larus delawarensis*).

	Table 4: Wildlife Species Observed within the Study Area						
Common Name	Scientific Name	Resident/Seasonally	Evidence				
Snakes & Lizards							
Eastern Gartersnake	Thamnophis sirtalis sirtalis	Resident	Visual observation				
Birds							
Alder Flycatcher	Empidonax alnorum	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
American Bittern	Botaurus lentiginosus	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
American Crow	Corvus brachyrhynchos	Resident	Visual observation, within appropriate breeding habitat, during appropriate breeding season				
American Goldfinch	Spinus tristis	Seasonally	Visual observation, within appropriate breeding habitat, during appropriate breeding season				
American Robin	Turdus migratorius	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
Baltimore Oriole	Icterus galbula	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
Black-and-white Warbler	Mniotilta varia	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
Black-billed Cuckoo	Coccyzus erythropthalmus	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
Black-capped Chickadee	Poecile atricapilla	Resident	Visual observation, within appropriate breeding habitat, during appropriate breeding season				
Black-throated Green Warbler	Setophaga virens	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
Blue Jay	Cyanocitta cristata	Resident	Visual observation, within appropriate breeding habitat, during appropriate breeding season				

	Table 4: Wildlife Species Observed within the Study Area						
Common Name	Scientific Name	Resident/Seasonally	Evidence				
Canada Goose	Branta canadensis	Seasonally	Flyover				
Chestnut-sided Warbler	Setophaga pensylvanica	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
Chipping Sparrow	Spizella passerine	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
Common Grackle	Quiscalus quiscula	Seasonally	Visual observation, within appropriate breeding habitat, during appropriate breeding season				
Common Yellowthroat	Geothlypis trichas	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
Downy Woodpecker	Dryobates pubescens	Resident	Visual observation, within appropriate breeding habitat, during appropriate breeding season				
Eastern Meadowlark	Sturnella magna	Seasonally	Agitated calls/behaviour of an adult				
Eastern Phoebe	Sayornis phoebe	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
Eastern Towhee	Pipilo erythrophthalmus	Seasonally	Visual observation, within appropriate breeding habitat, during appropriate breeding season				
Eastern Wood-pewee	Contopus virens	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
European Starling	Sturnus vulgaris	Resident	Visual observation, within appropriate breeding habitat, during appropriate breeding season				
Great Crested Flycatcher	Myiarchus crinitus	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season				
Mourning Dove	Zenaida macroura	Resident	Singing male, within appropriate breeding habitat, during appropriate breeding season				
Northern Cardinal	Cardinalis cardinalis	Resident	Singing male, within appropriate breeding habitat, during appropriate breeding season				

Table 4: Wildlife Species Observed within the Study Area				
Common Name	Scientific Name	Resident/Seasonally	Evidence	
Northern Flicker	Colaptes auratus	Resident	Visual observation, within appropriate breeding habitat, during appropriate breeding season	
Pileated Woodpecker	Dryocopus pileatus	Resident	Nest holes observed	
Purple Finch	Haemorhous purpureus	Resident	Singing male, within appropriate breeding habitat, during appropriate breeding season	
Red-eyed Vireo	Vireo olivaceus	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season	
Red-winged Blackbird	Agelaius phoeniceus	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season	
Ring-billed Gull	Larus delawarensis	Resident	Flyover	
Rock Pigeon	Columba livia	Resident	Visual observation, within appropriate breeding habitat, during appropriate breeding season	
Rose-breasted Grosbeak	Pheucticus Iudovicianus	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season	
Savannah Sparrow	Passerculus sandwichensis	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season	
Song Sparrow	Melospiza melodia	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season	
Sora	Porzana Carolina	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season	
Swainson's Thrush	Catharus ustulatus	Seasonally	Visual observation, within appropriate breeding habitat, during appropriate breeding season	
Swamp Sparrow	Melospiza georgiana	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season	
Tree Swallow	Tachycineta bicolor	Seasonally	Visual observation, within appropriate breeding habitat, during appropriate breeding season	

Table 4: Wildlife Species Observed within the Study Area					
Common Name	Scientific Name	Resident/Seasonally	Evidence		
Veery	Catharus fuscescens	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season		
Warbling Vireo	Vireo gilvus	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season		
White-breasted Nuthatch	Sitta carolinensis	Resident	Singing male, within appropriate breeding habitat, during appropriate breeding season		
Wild Turkey	Meleagris gallopavo	Resident	Visual observation, within appropriate breeding habitat, during appropriate breeding season		
Wilson's Snipe	Gallinago gallinago	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season		
Winter Wren	Troglodytes hiemalis	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season		
Wood Thrush	Hylocichla mustelina	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season		
Yellow Warbler	Setophaga petechia	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season		
Yellow-bellied Sapsucker	Sphyrapicus varius	Seasonally	Singing male, within appropriate breeding habitat, during appropriate breeding season		
Mammals					
eastern chipmunk	Tamias striatus	Resident	Visual observation		
eastern cottontail	Sylvilagus floridanus	Resident	Visual observation, scat observed		
eastern gray squirrel	Sciurus carolinensis	Resident	Visual observation		
groundhog	Marmota monax	Resident	Dens		
North American beaver	Castor canadensis	Resident	Chewed branches observed, small beaver dam in ditch line		
red squirrel	Tamiasciurus hudsonicus	Resident	Visual observation		
white-tailed deer	Odocoileus virginianus	Resident	Tracks		

For those observations of male birds singing and visual observations of males, within appropriate breeding habitat, during the appropriate breeding season, this quality of breeding evidence represents "possible breeder," under the Ontario Breeding Bird Atlas' Breeding Evidence Codes (Bird Studies Canada, 2019). The Alder Flycatcher, American Bittern, American Goldfinch, American Robin, Baltimore Oriole, Black-and-white Warbler, Black-billed Cuckoo, Black-capped Chickadee, Black-throated Green Warbler, Canada Goose, Chestnut-sided Warbler, Chipping Sparrow, Common Yellowthroat, Downy Woodpecker, Eastern Meadowlark, Eastern Phoebe, Eastern Towhee, Eastern Wood-pewee, Great Crested Flycatcher, Mourning Dove, Northern Cardinal, Northern Flicker, Purple Finch, Red-eyed Vireo, Ring-billed Gull, Rose-breasted Grosbeak, Savannah Sparrow, Song Sparrow, Sora, Swainson's Thrush, Swamp Sparrow, Tree Swallow, Veery, Warbling Vireo, White-breasted Nuthatch, Wilson's Snipe, Winter Wren, Wood Thrush, Yellow Warbler, Yellow-bellied Sapsucker, their nests, and eggs are protected under the MBCA. The Canada Goose and Ring-billed Gull were observed as flyovers and are not considered to be resident breeders within the study area. The Blue Jay and Wild Turkey are afforded protection under the Fish and Wildlife Conservation Act (1997) (FWCA). The American Crow, Common Grackle, European Starling, Red-winged Blackbird, and Rock Pigeon are not afforded protection under the MBCA or FWCA. Two (2) Common Grackle nests were observed within compost piles located in the western end of the mixed meadow (MEM) in the northern end of the study area during the May 24, 2019 field investigation. One nest contained five (5) unhatched eggs. The other nest contained a fledgling mortality.

A review of NHIC data identified a deer yard present within the Perth Long Swamp PSW (Town of Perth, 2017) not on the subject property. White-tailed deer tracks were observed throughout the study area during the field investigations.

4.0 DESCRIPTION OF THE PROPOSED PROJECT

The Phase 6 development within the study area is subject to a Draft Plan of Subdivision application. The proposed work for Phase 6 includes:

- Clearing of the majority of the subdivision area;
- Construction of residential roads within the cleared area, and
- Development within the cleared area.

Refer to **Figure 5** for the Draft Plan of Subdivision for the proposed development area. The development will include clearing most of the vegetation within the Phase 6 limits as seen on Figure 5 with the exception of retention of the majority of forested habitat at the rear of lots 34-48. This will occur adjacent to a 30 m buffer around the PSW. Residential roads will be constructed within the area to be cleared which will serve as access to potential development of single-detached dwellings and semi-detached dwellings.

The proposed project also includes a number of mitigation measures detailed within Section 6.0 herein, including but not limited to:

- Vegetation planting within the 30 m wetland buffer and associated with the stormwater pond habitat;
- Retention of trees at the rear of lots 34-48 including protection measures during construction; and
- Educational materials for residents outlining the natural heritage features and the importance of conservation



5.0 IMPACT ASSESSMENT

The following sections outline and assess any potential impacts that are expected as a result of the proposed development. Recommendations for mitigation measures to avoid these impacts are outlined in Section 6.0 of this report.

5.1 Natural Heritage System Components, Landforms, Soils, and Geology

The proposed work of Phase 6 will include clearing and development of the Mixed Meadow (MEM) in the center of the study area. No significant landforms, soils or geology are present or adjacent to this area. The FODM5-4, SWD1, and FOC vegetation communities (Figure 4) are considered to be 'Potentially Significant Woodlands' according to the *Town of Perth Official Plan* (Town of Perth, 2017). The proposed project is anticipated to remove approximately 1 hectare of FODM5-4 which is a Dry-fresh Sugar Maple, Ironwood Deciduous Forest.

'Significant Wildlife Habitat' was identified within the Perth Long Swamp PSW and potentially in FODM5-4 based on the presence of species of special concern observed during field reviews. No valleylands were identified within the study area.

Official Plan section 8.6.4(e) addresses Significant Woodlands and Potentially Significant Woodlands, and generally establishes that an EIS is required before development can proceed within/adjacent to these areas. Official Plan policy 8.6.4(e)(3) reads as follows:

Where a potentially Significant Woodland feature corresponds to an area within the Environmental Protection designation on Schedule 'A' of this Plan then development or site alteration shall not be permitted unless an EIS is completed and demonstrates either that the identified feature is not a significant woodland or, where a Woodland is confirmed as significant, there will be no negative impacts to natural features or their ecological functions.

Only small portions of the stormwater management block are designated Environmental Protection on Schedule 'A' of the Official Plan, and this EIS is provided to address impact to natural features and their ecological functions.

5.2 Surface Water, Groundwater, Wetlands, and Fish Habitat

5.2.1 Wetlands

A significant portion of the study area (approximately 52 %) is comprised of the Perth Long Swamp PSW. The boundaries of this PSW were reclassified due to outdated modelling of the wetland boundaries. Approximately 0.61 ha of the previous boundary was removed from the study area. Approximately 9.28 ha were added to the study area. Most of the expansion occurred in the southeast end of the study area (**Figure 3**). Due to the presence of a PSW within the study area, a 30 m setback from the boundaries of the PSW is proposed to be established in which no clearing or development are to take place (see **Figure 5**). This setback was chosen based on recommendations in the Natural Heritage Reference Manual (MNRF, 2010) as well as observations during the field investigation in which non-sensitive vegetation communities and habitats were recorded adjacent to the PSW. It is anticipated that the 30 m forested buffer will remove a large amount of potential nutrient run-off. A stormwater pond is proposed and surface water will be directed to this pond which will significantly reduce the risk of

sedimentation to the wetland. Based on a review of the hydrological impacts that the subdivision will have it is understood that peak flows will not change as a result of the subdivision. Due to the development of the currently vacant lands, wetland volumes have the potential to increase up to 0.4 mm if flows are uncontrolled. Mitigation measures within the subdivision plan will reduce this and there will be no impacts to the Perth Long Swamp.

Although the PSW does provide valuable wildlife function, it is not anticipated that any species at risk critical habitat is found adjacent to the subdivision area. No significant natural areas such as waterfowl staging areas or significant amphibian breeding ponds are found immediately adjacent the subdivision. The wetland itself is likely to provide function for SAR and breeding amphibians and will continue to provide this function. Breeding bird surveys were completed and there were no waterfowl nesting areas noted. Based on personal experience the wetland is likely to provide wintering habitat for wildlife species such as the Bobcat, however this function should not be affected by the proposed works.

The proposed vegetation clearing and Phase 6 development will occur in all of the upland areas including MEM, FODM5-4 and FODM7 vegetation communities. Based on Google Earth satellite imagery (Maxar Technologies, 2019), the MEM community was cleared prior to 2005 and regenerated with meadow conditions. Ecological functions of this area are limited due to the disturbance and cultural impacts of previous clearing. The adjacent woodlands (FODM5-4, FODM7) are at a higher elevation than the Mixed Meadow to the southwest and the deciduous swamp (SWD1) (as part of the PSW) to the northeast. No negative impacts to the PSW are anticipated as part of the clearing and development of the scheduled Phase 6 development plan. A stormwater management pond (proposed Block 55) will be incorporated as part of the subdivision and is proposed outside of the 30 m setback. As such, removal/alteration of these habitats will include upland habitat/vegetation removal a minimum of 30 m from the PSW. Drainage is proposed to be directed towards the Stormwater Management pond, following which it will outlet in a controlled manner farther southeast. As discussed above changes of hydrology within the wetland are not expected.

As such, it is recommended that no future lot-lines should extend within 30 m of the PSW on the property to prevent impacts to the wetland. At this location no vegetation removal should occur within the full 30 m buffer and where vegetation is currently disturbed and a planting plan should be prepared to provide appropriate protection and improvement to habitat. An exception to disturbance in this area could include a modest recreational pathway.

Per Section 8.6.4(b)(2) of the Town of Perth Official Plan, "Development and site alteration shall not be permitted in the Perth Long Swamp, the Blue Berry Creek Wetland, and the Grant's Creek Wetland. Development and site alteration shall not be permitted on adjacent lands to these significant wetlands unless it has been demonstrated, through the preparation of an Environmental Impact Study (EIS) as required in Section 8.5.4 e. EIS of this Plan, that there will be no negative impacts on the natural features or on the ecological functions for which a specific wetland area is identified. This shall include impacts on the wildlife habitat which exists in these wetlands."

As written in Section 5.1 above, this EIS is provided to address impact to natural features and their ecological functions.

Considering the existing landscape, the development of Phase 6 of this subdivision meets the no development within a provincially significant wetland requirements of the Perth OP and provincial documents. It can be

determined that there would be no significant impacts to the PSW based on the current plan provided a 30 m buffer is maintained and where a buffer does not exist one is planted.

In the northern portion of the property, there is commonly a 30 m or less treed buffer between the wetland and the open MEM habitat. Retention of this forested portion and enhancing it along this northern portion of the lands within 30 m would provide a sufficient buffer and would be a positive impact to the Long Swamp PSW at this location.

5.2.2 Fish Habitat

The tributaries associated with the southeast end of the study area provide suitable spawning habitat for sport fish (i.e. Northern Pike) and baitfish. These habitats are seasonal as the water conditions fluctuate. The tributaries are within the PSW in the study. The proposed development is situated more than 30 m from the tributaries. It is not anticipated that the proposed development will have impacts on fish or fish habitat.

5.3 Vegetation Cover

5.3.1 Vegetation Communities

Vegetation removal is proposed to occur for a portion of Phase 6 of the study area. The MEM vegetation community will be fully cleared where previous clearing has occurred (prior to 2005) and regeneration of pioneer graminoid species (i.e. grass) and non-native herbaceous species typical of roadsides (i.e. cow vetch, red clover, etc.) have established. Portions of the Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4) are anticipated to be impacted by vegetation clearing and subsequent development of the property. FODM7 is not expected to be significantly impacted at this time by clearing activities. Approximately 1 hectare of forested community is anticipated for removal as part of Phase 6. Due to the historical disturbance of the Mixed Meadow and the low diversity of native plants, it is not anticipated that significant negative impacts will occur to vegetation within this community. As mentioned above approximately 1 hectare of Community FODM5-4 is anticipated to be removed as a result of the proposed Phase 6 works. This removal is anticipated to be primarily edge habitat. A parkland block is included in the plans for Phase 6 and it has been assumed that this area will remain as wildlife habitat.

Given the location of the development, in close proximity to the Perth Long Swamp, educational signage is recommended as a feature within the park to educate the public about the significant habitats within and adjacent to the Town of Perth and their importance to the ecosystem.

Vegetation communities of this type are not rare within the landscape in Lanark County and it is not anticipated that the removal of this vegetation will impact this type of vegetation community in the broader landscape. It is proposed to off-set the loss of vegetation by planting within any under-vegetated areas within the proposed 30m-buffer adjacent to the Perth Long Swamp and within non-functional areas of the Stormwater Pond block as wildlife habitat where access is not required. Enhancing the wetland buffers and creating habitat associated with the stormwater pond is expected to off-set the loss of primarily fringe habitat proposed for removal.

5.3.2 SAR Vegetation

Two (2) Butternut trees were identified within the Coniferous Forest (FOC) and Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4) of the PSW in the study area. The *Butternut Recovery Strategy* (MNRF, 2013) recommends a 25 m buffer around 'retainable' trees do avoid damage to root zones and prevent shading due to the species' intolerance to shade. An additional 25 m buffer is also recommended to preserve habitat around any 'retainable' for potential establishment of seedlings (**Figure 2**). At least 30 days prior to any vegetation clearing, these individuals must be assessed by a qualified Butternut Health Assessor into Categories 1, 2 or 3 as part of the requirements under Section 23.7 of Ontario Regulation (O. Reg.) 242/08 – *General* of the ESA. One of the butternuts has been assessed, however depending on the potential impact date, the tree and area should be cleared again if it is more than 3 years from the original assessment/area review. The following are definitions of the Butternut Categories during a health assessment under O. Reg. 242/08:

- Category 1 tree "the butternut tree is affected by butternut canker to such an advanced degree that retaining the tree would not support the protection or recovery of butternut trees in the area in which the tree is located";
- Category 2 tree "the butternut is not affected by butternut canker, or the butternut tree is affected by butternut canker, but the degree to which it is affected is not too advanced and retaining the tree could support the protection or recovery of butternut trees in the area in which the tree is located", and
- Category 3 tree "the butternut tree may be useful in determining sources of resistance to butternut canker".

A Butternut Health Assessment Report (Appendix C) was prepared by a qualified Butternut Health Assessor (BHA) which assessed the conditions of the Butternut tree found in the Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4) in the east end of the study area. The tree was deemed as Category 2 (retainable). The assessment was conducted on June 22, 2019 and the report was submitted to the MECP on August 30, 2019. As of the timing of this EIS, the mandatory 30-day period has finished. Development adjacent to the assessed Butternut should occur outside of the 50 m buffer around the individual. It is not anticipated that impacts will occur to the Butternut present within the study area due to the limits of the proposed development.

The Butternut tree in the Coniferous Forest (FOC) in the west end of the study area has not been assessed as of the timing of this EIS. No other at-risk vegetation was observed within the study area. It is not anticipated that the Butternuts present within the study area will be harmed or removed as part of the proposed works.

Butternut can spread to open areas and therefore additional trees can grow as Phase 6 of the subdivision develops. As such, it is recommended that a butternut survey be completed prior to development of Phase 6 of the development.

5.4 Habitat for Species at Risk & Significant Wildlife Habitat

Due to their status of 'Special Concern,' habitat for the Eastern Wood-pewee and Wood Thrush is considered Significant Wildlife Habitat in accordance with the Natural Heritage Reference Manual. Approximately 1 hectare of vegetation clearing is proposed within their habitat identified in **Figure 2**. Although there will be the direct loss of usable breeding habitat for both species, there is no shortage of suitable habitat within Lanark County, including

within the immediate vicinity, and it is not anticipated that either species will be negatively impacted within the County as part of the loss of habitat in the proposed Phase 6 development. This area represented one potential nesting pair of each species in 2019. The function of this woodland will be partially impaired, however the individuals represented will continue to find habitat available in the remaining upland habitat and/or easily find suitable habitat throughout the area. Eastern Wood-pewee and Wood Thrush nests and eggs are afforded protection under the MBCA and cannot be harmed, harassed, or killed as a result of development activities, and these requirements are reflected in the Sections 6.5 and 6.6 of this EIS. This includes retention of forested habitat at the rear of lots 34-48. Drainage plans for the subdivision plan has been altered to retain this vegetation.

Policy 8.6.4(b)(2) of the Official Plan states in part that "Development and site alteration shall not be permitted in significant wildlife habitat," and that "Development and site alteration shall not be permitted on adjacent lands to these natural heritage features unless it has been demonstrated through the preparation of an EIS as required in Section 8.5.4 e. EIS of this Plan, that there will be no negative impacts on the natural features or on their ecological functions."

According to the Natural Heritage Reference Manual (NHRM) (2005) 'Development and site alteration shall not be permitted in: d) significant wildlife habitat; unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

The proposed development includes some development and alteration of significant wildlife habitat, but in an area that is almost entirely separate from the designated Environmental Protection Area - Natural Heritage Features on Schedule "A" of the Official Plan. Accordingly, when considering mitigation measures proposed, the intent of the Official Plan policy is adhered to.

As previously discussed, there is a large amount of this type of forest and forest habitat in general that remains and will remain that these two species are able to use. Neither of these species is rare within the broader study area as they are observed throughout the County based on our extensive knowledge of the area. Additionally, the proposed/future Perth by-pass road, if or when it is constructed, is expected to fragment this forested area and isolate the habitat between the subdivision and by-pass roadway. Accordingly, it is anticipated that the bypass road is likely to eliminate the use of the habitat by the Wood Thrush. The Eastern Wood-pewee may continue to find habitat within the remaining forested after the by-pass is installed as they are adapted to smaller forested areas, however their continued use can't be certain. The Town of Perth is a designated settlement area, the large majority of the subject lands are designated under the Official Plan for residential development, and further to Section 1.1.3 of the PPS, settlement areas shall be the focus of growth and development. Section 1.1.3 also provides that land use patterns within settlement areas shall be based on densities and a mix of land uses which efficiently use land and resources. Given the policy support for development within settlement areas, it is our opinion that the proposal (including the recommendations of the EIS) satisfies the intent of all applicable policies, including those intending to protect significant wildlife habitat and associated SAR and other species. The enhancements discussed above in Section 5.3 are anticipated to off-set significant wildlife habitat impacts by buffering the PSW with upland vegetation and an increased buffer from the wetland in the vicinity of the stormwater pond, constructed in such a way as to enhance habitat.

5.5 Wildlife

A total of 38 species of migratory birds and seven (7) non-migratory birds were observed to be possible breeders within the study area during the 2019 field investigations (**Table 4**). Therefore, if construction (including any vegetation removal) is proposed from April 15 to September 15 (Hussel and Lepage, 2015), of any year, the area where clearing is proposed to occur, must be screened by an avian specialist prior to construction activity. This is recommended in order to prevent negative impacts to migratory birds and other bird species (especially those that are known to nest within recently cleared areas, such as the Killdeer), their nests and eggs, which are protected under the MBCA or the FWCA.

The white-tailed deer is a highly mobile species which travels for extended periods of time in search of food. There were no deer yards observed within the study area (however, deer tracks were observed) which suggests that this species does not rely significantly on the area proposed for clearing. No development is proposed to occur within the Perth Long Swamp PSW where a deer yard has been identified. The North American beaver is an amphibious species which spends most of its life in water. A small beaver dam was observed in a ditch line in the north west end of the study area. Impacts to the ditch lines and dam within the study area are not anticipated as part of the Phase 6 development as they are not located within the proposed area for clearing. Significant negative impacts are not anticipated to wildlife habitat as a result of the proposed development.

5.6 Significant Woodlands

Schedule 11 to the Perth OP identifies areas of potentially significant woodlands. This includes Community FODM5-4 and SWD-1 within the vicinity of Phase 6 of the proposed plan. The Town of Perth Official Plan (2019), defines Significant Woodlands as "...areas which serve an important ecological function in the broader landscape because of their location, extent of forest cover, tree age and long-standing forest function, species composition and their potential as wildlife habitat". Using the criteria in the NHRM (2005) SWD-1 does not classify as a woodland as it is primarily a shrub swamp with some younger water tolerant trees around the periphery adjacent to FODM5-4. Community FODM5-4 generally does not meet the criteria of a significant woodland within the broader study area as it does not meet size thresholds, does not meet interior forest cover size, does not provide a significant link, and is a common vegetation community throughout the landscape that does not have significant vegetation species. McIntosh Perry is unaware of any economic and social values of the woodland. The trees within the forest could be considered mature, however this does not imply woodland significance within the area. However, the proximity of the woodland to a significant feature (within 30m of Perth Long Swamp) would classify it as a significant woodland. The Perth OP also includes potential as wildlife habitat as a contributor to significant woodlands. The woodland is considered significant wildlife habitat which was addressed in Section 5.4.

According to policy Section 8.6.4(e) of the Official Plan, no development is generally to be permitted within significant woodlands "....unless and EIS is completed and demonstrates either that the identified feature is not a significant woodland or, where a Woodland is confirmed as significant, there will be no negative impacts to natural features or their ecological functions."

As explored within Section 5.5 above, the proposed development (including the recommendations of the EIS) satisfies the intent of applicable Official Plan policies, including those intending to protect significant woodlands.

The development currently is planned to remove approximately 1 hectare of the potentially significant woodland.

The loss of woodland habitat for Phase 6 will primarily be edge habitat allowing the significant woodland to remain and wildlife to continue to utilize it in the same function as before. It will also continue to function for the reason it was determined to be significant woodlands which is buffering the Perth Long Swamp. The main reason for it being categorized as Significant Woodland (within 30 m of a significant feature) will potentially be impacted in the future based on plans for an arterial bypass, however this is not being considered as part of this assessment. Therefore, as part of this assessment, the woodland will continue to meet the significant woodland criteria for being adjacent to a significant natural feature. Any water contributions from the woodland to the PSW will be mitigated in the design of the subdivision. As discussed above peak flows will not change and the wetland volume will not decrease. It is expected that without any controls in place the conservative increase in water levels is 0.4mm. However mitigation controls will be in place to alleviate even this small increase.

5.7 Wildland Fire Risk Assessment

According to Section 3.1.8 of the *Provincial Policy Statement*, 2014, "Development shall generally be directed to areas outside of lands that are unsafe for development due to the presence of hazardous forest types for wildland fire. Development may, however, be permitted in lands with hazardous forest types for wildland fire where the risk is mitigated in accordance with wildland fire assessment and mitigation standards."

Wildland fire assessment is necessary to determine the presence or absence of forest types associated with the risk of high to extreme wildland fire. Recommended mitigation techniques are designed to disrupt that principle of combustion by eliminating one or more of the three necessary elements of fire (heat, oxygen and fuel). They do so by minimizing the opportunity for ignition of new fires from embers; reducing the potential for direct flame contact from approaching wildland fires; and reducing the effects of radiant heat from an approaching wildland fire by reducing the opportunity for crown fire potential (MNDMNRF, 2016).

The woody species composition (refer to Section 3.5), condition (i.e. very few coniferous trees on the restricted to the northwest end of the study area adjacent to the PSW, scattered eastern white-cedars in low-lying wet areas, etc.), and health (i.e. low occurrence of insect or diseased trees), within 100 m of the proposed development, characterizes the adjacent wooded area as not a hazardous forest type. Therefore, further risk assessment and mitigation measures are not required.

6.0 RECOMMENDED MITIGATION MEASURES

To minimize or eliminate environmental impacts and to help achieve ecological and environmental improvements from the proposed construction and development, the following mitigation measures are recommended.

6.1 Natural Heritage System Components

- No development or vegetation clearing shall occur within 30 m of the Perth Long Swamp PSW, significant
 woodlands or significant wildlife habitat as part of the Phase 6 proposed development unless identified
 as part of the subdivision plan for Phase 6.
- Educational signs and other materials are to be provided for the future park lands (Block 58) which are within and adjacent to natural features.

6.2 Surface Water, Groundwater, Wetlands, and Fish Habitat

- During construction, the Contractor should have a spill kit on-hand at all times, in case of spills, and
- No development shall occur within the undisturbed Perth Long Swamp PSW (and subsequent tributaries
 of Tay River).

6.3 Vegetation Communities

- It is recommended that only locally appropriate native species be used for landscaping within the subject property. This would contribute to re-establishing native plants within the wider landscape and potentially have a positive impact for biodiversity (i.e., using native species for pollinators such as bees);
- Vegetation found at the rear of lots 34-48 will be primarily retained;
- Where vegetation is not currently present within 30 m of the Perth Long Swamp a plan should be prepared to enhance this buffer. This should occur primarily at the north end of the developable lands.
- The proposed stormwater pond (Block 55) is to be vegetated to allow the habitat to be utilized by wildlife from adjacent communities. Details are to be confirmed at the detailed design phase of approvals.
- To prevent the introduction and spread of invasive plant species into the site, equipment utilized during construction should be inspected and cleaned in accordance with the Clean Equipment Protocol for Industry (Appendix B);
- As part of the proposed works, the following mitigation measures should be implemented to prevent harm to trees adjacent to the area of proposed development:
 - Protect trees and their roots (within the buffer limits) from damage, compaction, and compensation resulting from construction;
 - Do not place material or equipment on bare roots of the protected trees;
 - Do not attach any signs or notices to protected trees to prevent mechanical damage to the tree;
 - o Do not damage the root system, trunk or branches of any protected trees, and
 - Ensure that exhaust fumes from all equipment are not directed towards the canopy of the protected trees.

6.4 SAR Vegetation

- If the Butternut tree assessed as a Category 2 Butternut in the east end of the study area is proposed to be harmed or removed or if development is to occur within the 50 m buffer around the tree, the following steps must be followed under the Ontario Regulation (O. Reg.) 242/08 General to comply with the ESA:
 - "4. If the butternut health assessor's report indicates that one or more of the butternut trees are category 2 trees, the person must satisfy the following additional conditions with respect to those trees after the 30-day period described in paragraph 3 has elapsed:
 - i. before killing, harming or taking the category 2 trees, the person must give the Minister notice of the activity by submitting a notice of butternut impact form available on the Registry to the Minister through the Registry,
 - ii. the person must ensure that the notice of butternut impact form includes,
 - A. the number of category 2 trees that the person proposes to kill, harm or take,
 - B. whether the category 2 trees will be killed, harmed or taken,
 - C. the location of each category 2 tree and the diameter of each tree at breast height, and
 - D. the date and report number of the butternut health assessor's report prepared in respect of the butternut trees in question,
 - iii. the person must follow the requirements of subsections (7) and (8) with respect to the completion of the notice of butternut impact form, the keeping of records relating to the notice of butternut impact form and the updating of the information on the Registry, and
 - iv. the person must comply with the requirements set out in subsection (10) for planting seedlings to replace butternut trees that are killed, harmed or taken and for monitoring and tending to those seedlings, and keeping records in relation to the seedlings. O. Reg. 176/13, s. 14";
 - o (7) Before submitting a notice of butternut impact form to the Minister, the person must ensure that,
 - (a) all mandatory information requested on the form, including the person's contact information, has been provided; and
 - (b) the information provided on the form is complete and accurate. O. Reg. 176/13, s. 14.
 - o (8) After submitting a notice of butternut impact form to the Minister, the person must,
 - (a) promptly upon obtaining from the Ministry confirmation that a notice of butternut impact form submitted through the Registry has been received by the Minister, make a record of the confirmation;
 - (b) for as long as the activity is being carried out,
 - (i) keep the record of the confirmation and, if applicable, ensure that a copy of the record is kept at the site where the activity is being carried out, and
 - (ii) make the record of the confirmation available to the Ministry upon receiving a request for it; and
 - (c) if there is a change in the contact information for the person who submitted the notice of butternut impact form, update the information on the Registry within 10 business days of the change. O. Reg. 176/13, s. 14.
 - (10) A person who kills, harms or takes one or more butternut trees that are category 2 trees and who, pursuant to subsection (4), is exempt from clause 9 (1) (a) of the Act shall comply with the following

requirements:

- 1. For each tree that is killed or taken, the person shall plant butternut seedlings in accordance with the following rules:
 - i. at least two butternut seedlings, if the tree that is killed or taken is described in the butternut health assessor's report as shorter than breast height or less than three centimetres in diameter at breast height,
 - ii. at least five butternut seedlings, if the tree that is killed or taken is described in the butternut health assessor's report as at least three centimetres but less than 15 centimetres in diameter at breast height, and
 - iii. at least 20 butternut seedlings, if the tree that is killed or taken is described in the butternut health assessor's report as 15 centimetres or greater in diameter at breast height.
- 2. For each tree that is harmed, the person shall plant butternut seedlings in accordance with the following rules:
 - i. at least one butternut seedling, if the tree that is harmed is described in the butternut health assessor's report as shorter than breast height or less than three centimetres in diameter at breast height,
 - ii. at least three butternut seedlings, if the tree that is harmed is described in the butternut health assessor's report as at least three centimetres but less than 15 centimetres in diameter at breast height, and
 - iii. at least 10 butternut seedlings, if the tree that is harmed is described in the butternut health assessor's report as 15 centimetres or greater in diameter at breast height.
- 3. Every butternut seedling that is planted must have been grown from seed that originated from the seed zone in which it is planted.
- 4. All butternut seedlings must be planted within three years of the person submitting the relevant notice of butternut impact form under subparagraph 4 i of subsection (4).
- 5. Butternut seedlings must be planted in an area with the following characteristics:
 - i. the soil must be greater than one metre deep, moist but well-drained and have a fine to medium texture with a recognizable organic layer and with a pH ranging from 6.8 to 7.2, and
 - ii. the area must provide full sunlight conditions to the butternut seedlings.
- 6. In order to avoid a monoculture of butternut, the person shall plant deciduous trees and shrubs that are not butternut seedlings and that are native to the area in which the seedlings are planted in such numbers to ensure that there are an equal number of butternut trees and other native Ontario species in the area.
- 7. Every butternut seedling and companion tree or shrub referred to in paragraph 6 must be planted either between March 1 and May 15 or between September 20 and October 30 of any year, except for a butternut seedling or companion tree or shrub that was grown in a container which may be planted between May 16 and May 25 of any year.
- 8. No more than 200 butternut seedlings shall be planted in a hectare.
- 9. Butternut seedlings must be planted at least,
 - i. three metres from other planted butternut seedlings,
 - ii. two metres from other trees or shrubs that are likely to be the same height or shorter than

- the butternut tree at full growth,
- iii. four metres from other trees or shrubs that are likely to be taller than the butternut tree at full growth,
- iv. five metres from the canopy drip line of trees that are greater than four metres in heights at the time of planting, and
- v. 100 metres from a highway consisting of two or more lanes in either direction.
- 10. Every butternut seedling that is planted under this subsection must be monitored once annually between May 15 and September 20 for two years after it is planted to assess the health of the tree and its habitat conditions.
- 11. In order to ensure the good growth and health of the butternut tree, every butternut seedling that is planted under this subsection must be tended to in accordance with the following rules:
 - i. tending activities shall take place once a week from May 15 to September 20 during the first growing season after the butternut seedling is planted,
 - ii. tending activities during the first growing season after the butternut seedling is planted will include,
 - o A. maintenance of tree guards to protect the lower stem from rodents,
 - B. vegetation control 60 centimetres around the base of the tree until the tree is above the herbaceous vegetation, and
 - o C. watering during drought or low rainfall periods, and
 - iii. tending activities shall take place during the second growing season after the butternut seedling is planted as required to ensure that,
 - A. vegetation is controlled 60 centimetres around the base of the tree until the tree is above the herbaceous vegetation, and
 - o B. the tree is watered during drought or low rainfall periods.
- 12. The person must plant a butternut seedling to replace any butternut seedling planted under this subsection that dies within two years of the planting of the seedling and must do so in accordance with the planting requirements of this subsection.
- 13. For each butternut seedling planted under this subsection, the person must maintain a record
 of the planting, monitoring and tending activities required under this subsection, which record
 shall include,
 - i. the date the butternut seedling was planted,
 - ii. the date of each time a person attended to monitor or tend to the butternut tree,
 - iii. a description of every monitoring and tending activity,
 - iv. an assessment of the health status of the butternut seedling every time it is monitored or tended to to indicate if its health is good, poor or whether it is dead, and
 - v. whether the butternut tree shows evidence of butternut canker and, if so, a description of the extent to which the tree is affected by butternut canker.
- 14. Within 14 days of receiving a request from the Ministry, the person shall provide the record maintained under paragraph 13. O. Reg. 176/13, s. 14; O. Reg. 323/13, s. 4.
- Due to the Butternut tree identified in the west end of the study area, a Butternut Health Assessment must be conducted by a qualified Butternut Health Assessor if any works are proposed to occur within

50 m of the tree. The assessment must be conducted, and a report submitted to MECP at least 30 days prior to any vegetation clearing that would impact the Butternut. The assessment must follow the steps outlined in Section 23.7 of O. Reg. 242/08.

6.5 Habitat for Species at Risk and Significant Wildlife Habitat

- Eastern Wood-pewee and Wood Thrush (SAR) were observed in the forest within the study area. The clearing of this habitat should be done so at an appropriate time of year to not disturb these species;
- Butternut habitat has been defined as a 50 m radius around each individual tree in which no development
 or work activities shall occur without further communication with MECP or approval from a Butternut
 Health Assessor. Mitigation measures listed in Section 6.3 may also apply to Butternuts however it is not
 anticipated to have any impact for Phase 6 of the project; and
- Should any SAR be discovered during construction, a management biologist at MECP Kemptville District should be contacted immediately, and operations modified to avoid any negative impacts to SAR or their habitat until further direction is provided by MECP.

6.6 Wildlife

- To prevent harming, harassing or killing migratory birds, no clearing or other construction should occur
 from April 15 to September 15, unless a qualified biologist has determined that no nesting is occurring
 within 5 days prior to the clearing. Note: these dates are based upon breeding bird nesting data for eastern
 Ontario, provided by Environment Canada. The nests and eggs of many bird species are protected under
 federal and/or provincial legislation (i.e. MBCA, FWCA), and
- Thickets or woodlands should not be removed during sensitive times of year (i.e. March through mid-August for the breeding season, Mid-October through March for overwintering wildlife). The Canadian Wildlife Service does not support relying on inspections for migratory bird nests in such habitats due to the difficulty of locating all nests and risk to birds.

7.0 SUMMARY

This EIS has been prepared to review the development area proposed for Phase 6 on Perthmore Road, "Part Lots 3 and 4, Concession 2, Geographic Township of Drummond."

This EIS has assessed the existing land use and determined the potential impacts to the natural heritage features (i.e. PSW, Significant Woodland, unevaluated wetland, Significant Wildlife Habitat, etc.), as well as SAR and SAR habitat as a result of the proposed development. Although the development does impact natural heritage features, adherence to the proposed recommendations and mitigation measures provided in Sections 5.0 and 6.0 of this report will ensure that the intent of applicable natural heritage policies are satisfied.

On a larger landscape scale, the proposed alterations are generally not anticipated to have a significant impact on the ecological function within all habitat types. A Provincially Significant Wetland setback reduction from 120 m to 30 m is proposed, as it has been determined that there will be no significant impacts to the function of the Perth Long Swamp provided that the 30 m setback is either left natural/forested, or and where there is no significant vegetation within 30 m of wetland habitat, that this area be vegetated with native species pursuant to a future planting plan. Subsequent phases and access points to the subdivision should adhere to these setbacks. Future development phases considered require the removal of limited vegetation and are not expected to significantly impact significant features (wildlife, woodland habitats) within the study area provided mitigation measures including setbacks are adhered to.

The Town of Perth is a designated settlement area, and the large majority of the subject lands are designated for development under the Perth Official Plan. Further to Sections 1.1.3 of the PPS, settlement areas shall be the focus of growth and development and land use patterns within settlement areas shall be based on densities and a mix of land uses which efficiently use land and resources. It is our opinion that the proposal satisfies the intent of applicable policy.

8.0 LIMITATIONS

The investigations undertaken by McIntosh Perry with respect to this report and any conclusions or recommendations made in this report reflect McIntosh Perry's judgment based on the site conditions observed at the time of the site inspection(s) on the date(s) set out in this report and on information available at the time of the preparation of this report.

This report has been prepared for specific application to this site, and it is based, in part, upon visual observation of the site and terrestrial investigations at various locations during a specific time interval, as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, or portions of the site which were unavailable for direct investigation.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary.

If you have any question, comments, or concerns, please do not hesitate to contact the undersigned at McIntosh Perry at 613-903-6147.

Sincerely,

McIntosh Perry Consulting Engineers Ltd.

Erik Pohanka, B. Sc.

Erik Pohoaba

Biologist

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APPENDIX A: SITE PHOTOGRAPHS



Photo 1: Mixed Meadow (MEM) vegetation community in the centre of the study area. 17 June 2019.



Photo 2: American Robin (*Turdus migratorius*) observed within the Mixed Meadow (MEM) vegetation community in the centre of the study area. 24 May 2019.



Photo 3: Mixed Meadow (MEM) vegetation community in the west end of the study area. 17 June 2019.



Photo 4: Common Grackle (*Quiscalus quiscula*) nest in compost pile in Mixed Meadow (MEM) vegetation community in the west end of the study area. 24 May 2019.



Photo 5: MEM Community extended into the forested area based on site visit on 15 July 2022.



Photo 6: Ditch line along the Mixed Meadow (MEM) and Green Ash Organic Deciduous Swamp (SWDO1-2) in the west end of the study area. 24 May 2019.



Photo 7: Small beaver dam observed in the ditch lines in the west end of the study area. 24 May 2019.



Photo 8: Green Ash Organic Deciduous Swamp (SWDO1-2) vegetation community within the west end of the study area in the PSW boundaries. 22 June 2019.



Photo 9: Beaver chew observed within the Green Ash Organic Deciduous Swamp (SWDO1-2) in the west end of the study area. 24 May 2019.



Photo 10: White-tailed deer (*Odocoileus virginianus*) tracks observed within the Green Ash Organic Deciduous Swamp (SWDO1-2) in the west end of the study area. 24 May 2019.



Photo 11: Eastern gray squirrel (*Sciurus carolinensis*) observed within the Green Ash Organic Deciduous Swamp (SWDO1-2) in the west end of the study area. 24 May 2019.



Photo 12: Eastern cottontail (*Sylvilagus floridanus*) observed within the Green Ash Organic Deciduous Swamp (SWDO1-2) in the west end of the study area. 24 May 2019.



Photo 13: Cattail Shallow Marsh (MASO1-1) vegetation community within the southeast end of the study area in the PSW boundaries. 08 June 2019.



Photo 14: Coniferous Forest (FOC) vegetation community within the northwest end of the study area. 17 June 2019.



Photo 15: Butternut (*Juglans cinerea*) observed within Coniferous Forest (FOC) vegetation community in the northwest end of the study area. 22 June 2019.



Photo 16: Shallow Marsh (MAS) vegetation community within the northwest end of the study area in the PSW boundaries. 17 June 2019.



Photo 17: Fresh-Moist Lowland Deciduous Forest (FODM7) vegetation community within the northwest end of the study area. 24 May 2019.



Photo 18: Fresh-Moist Lowland Deciduous Forest (FODM7) vegetation community within the southeast end of the study area. 24 May 2019.



Photo 19: Groundhog (Marmota monax) dens observed in the slopes of Perthmore Street. 24 May 2019.



Photo 20: Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4) vegetation community within the east end of the study area. 24 May 2019.



Photo 21: Great Crested Flycatcher (*Myiarchus crinitus*) observed within the Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4) vegetation community within the east end of the study area. 24 May 2019.



Photo 22: Eastern chipmunk (*Tamias striatus*) observed within the Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4) vegetation community within the east end of the study area. 24 May 2019.



Photo 23: Butternut (*Juglans cinerea*) observed within the Dry-Fresh Sugar Maple-Ironwood Deciduous Forest (FODM5-4) vegetation community in the east end of the study area. 17 June 2019.



Photo 24: Ash Mineral Deciduous Swamp (SWD1) vegetation community within the east end of the study area. 17 June 2019.



Photo 25: Ash Mineral Deciduous Swamp (SWD1) vegetation community within the east end of the study area in the PSW. 24 May 2019.



Photo 26: Groundwater upwelling observed within the Ash Mineral Deciduous Swamp (SWD1) vegetation community in the east end of the study area. 24 May 2019.



Photo 27: Watercress (*Nasturtium officinale*) observed within the Ash Mineral Deciduous Swamp (SWD1) vegetation community in the east end of the study area. 24 May 2019.



Photo 28: Veery (*Catharus fuscescens*) observed within the Ash Mineral Deciduous Swamp (SWD1) vegetation community in the east end of the study area. 24 May 2019.



Photo 29: Willow Organic Deciduous Thicket Swamp (SWTO2) vegetation community within the southeast end of the study area. 17 June 2019.



Photo 30: Culvert outlet on Perthmore Street within the Willow Organic Deciduous Thicket Swamp (SWTO2) vegetation community in the southeast end of the study area. 24 May 2019.



Photo 31: Pileated Woodpecker (*Dryocopus pileatus*) observed within the Willow Organic Deciduous Thicket Swamp (SWTO2) vegetation community in the southeast end of the study area. 24 May 2019.



Photo 32: Willow Organic Deciduous Thicket Swamp (SWTO2) vegetation community within the southeast end of the study area. 17 June 2019.



Photo 33: Common Yellowthroat (*Geothlypis trichas*) observed within the Willow Organic Deciduous Thicket Swamp (SWTO2) vegetation community in the southeast end of the study area. 24 May 2019.



Photo 34: Cattail Graminoid Organic Meadow Marsh (MAMO1-2) vegetation community within the southeast end of the study area. 17 June 2019.



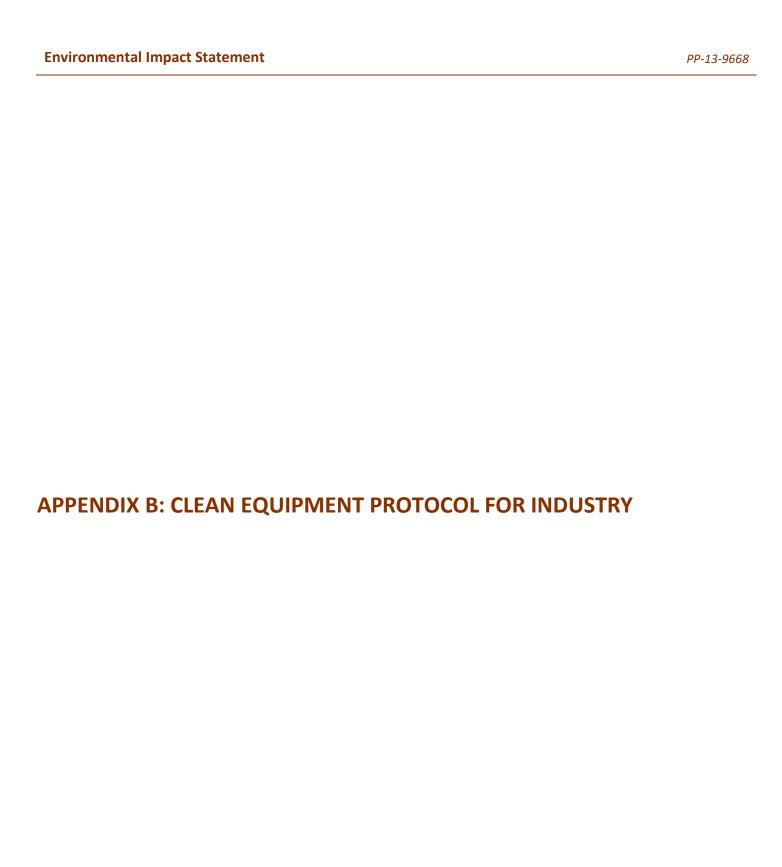
Photo 35: Culvert inlet on North Street conveying a tributary of Tay River within the Cattail Graminoid Organic Meadow Marsh (MAMO1-2) vegetation community in the southeast end of the study area. 24 May 2019.



Photo 36: Song Sparrow (*Melospiza melodia*) observed within the Cattail Graminoid Organic Meadow Marsh (MAMO1-2) vegetation community in the southeast end of the study area. 24 May 2019.



Photo 37: Fresh-Moist Poplar Deciduous Forest (FODM8-1) vegetation community adjacent to the southwest end of the study area. 17 June 2019.



Clean Equipment Protocol for Industry

Inspecting and cleaning equipment for the purposes of invasive species prevention











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For more information on invasive plants in Ontario, visit www.ontario.ca/invasivespecies, www.ontarioinvasivesplants.ca, www.invadingspecies.com or www.invasivespeciescentre.ca

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Introduction

Why Invasive Plants are a Problem

Invasive alien species are "a growing environmental and economic threat to Ontario. Alien species are plants, animals and microorganisms that have been accidentally or deliberately introduced into areas beyond their normal range. Invasive species are defined as harmful alien species whose introduction or spread threatens the environment, the economy, or society, including human health (Government of Canada 2004)." (Ontario Invasive Species Strategic Plan, 2012). The great majority of plant invasions occur in habitats that have been disturbed either naturally or by humans (Rejma'nek 1989; Hobbs and Huenneke 1992; Hobbs 2000).

The ecological effects of invasive species are often irreversible and, once established, they are extremely difficult and costly to control or eradicate. According to Pimental et al. (1999), invasive species in the U.S. cause economic and environmental damages totalling over \$138 billion per year, with agricultural weed control and crop losses totalling approximately \$34 billion per year. Exact figures for the total economic and environmental damages are not available for Canada. In Ontario however, the costs of dealing with just one invasive species is astonishing; Zebra Mussels cost Ontario power producers who draw water from the lake \$6.4 million per year in increased control/operating costs and about \$1 million per year in research costs (Colautti et al. 2006).

Invasive species can spread to new areas when contaminated mud, gravel, water, soil and plant material are unknowingly moved by equipment used on different sites. This method of spread is called an unintentional introduction, and is one of the four major pathways for invasive species introduction into a new area of Ontario (Ontario Invasive Species Strategic Plan, 2012).



Buckthorn removal, Lynde Shores Conservation Area.Photo by: Central Lake Ontario Conservation Authority

Invasive plant seed and propagules (plant material, i.e. rhizomes) have the ability to travel sight unseen in mud attached to or lodged in various parts and spaces between parts of vehicles, machinery and other mechanical equipment. A recent study at Montana State University found that most seeds (99% on paved roads and 96% on unpaved roads) stayed attached to the vehicle after traveling 160 miles (257 km) under dry conditions.

Invasive plant species are commonly transported on or in vehicles and construction equipment when they are moved to new locations. Those vehicles include four-wheel drives, excavators, tractors, loaders, water trucks and all-terrain vehicles. Failure to properly clean vehicles and machinery of soils, mud, and contaminated water that may contain invasive species seed and propagules can result in permanent, irreversible environmental impacts. These impacts can mean substantial cost to the landowner, land manager and/ or the user. Businesses may also face liability issues for activities and operations that result in the introduction of invasive species.

Some of the invasive species in Ontario which have been known to spread through equipment transfer include:

- Common Buckthorn (Rhamnus cathartica)
- Dog-strangling Vine (Cynanchum rossicum)
- Garlic Mustard (Alliaria petiolata)
- **Giant Hogweed** (Heracleum mantegazzianum)
- Glossy Buckthorn (Frangula alnus)
- Japanese Knotweed (Polygonum cuspidatum)
- Miscanthus or Chinese Silver Grass (Miscanthus sinensis)
- Phragmites or Common Reed (Phragmites australis subsp. australis)
- Reed Canary Grass (Phalaris arundinacea)
- Wild Parsnip (Pastinaca sativa)
- Wild Chervil (Anthriscus sylvestri)



Dog-strangling vine (*Cynachum rossicum*) Photo by: Hayley Anderson



Garlic Mustard (Alliaria petiolata) Photo by: Ken Towle



Phragmites (Phragmites australis subsp. Australis) Photo by: Michael Irvine

These plants impact biodiversity by out-competing native species for space, sunlight, and nutrients. They can also have impacts on road and driver safety by physically blocking intersection sightlines, and in the case of Phragmites and Miscanthus, may fuel intense grass fires if ignited, which can damage utility stations and hydro lines.

The harmful effects of invasive species include:

- Physical and structural damage to infrastructure
- Human health hazards (i.e. Giant Hogweed and Wild Parsnip exposure)
- Delays and increased cost in construction activities
- Environmental damage (i.e. erosion)
- Aesthetic degradation
- Loss of biodiversity
- Reduced property values
- Loss of productivity in woodlots and agriculture

Why Cleaning Vehicles and Equipment is Important

Passenger and recreational vehicles as well as heavy machinery are major vectors for spreading terrestrial invasive species into new areas.

It is much more costly to control invasive species after their establishment and spread than it is to prevent their spread. The spread of invasive species through unintentional introduction can be minimized significantly by the diligent cleaning of vehicles and equipment when leaving one site and moving to the next. In the case of large properties, cleaning before moving to a new site is recommended, even if it is within the same property.

This guide has been developed for the construction, agriculture, forestry and other land management industries, to provide equipment operators and practitioners with tools and techniques to identify and prevent the unintentional introduction of invasive species. It establishes a standard for cleaning vehicles and equipment and provides a guide where current codes of practice, industry standards or other environmental management plans are not already in place.

Passenger and recreational vehicles include:

- 2WD and 4WD cars
- 2WD and 4WD trucks
- All Terrain Vehicles (ATV's)
- Motorbikes
- Snowmobiles

Heavy machinery includes:

- Trucks
- Tractors
- Mowers
- Slashers
- Trailers
- Backhoes

- Graders
- Dozers
- Excavators
- Skidders
- Loaders
- Water Tankers and Trucks



Dog-strangling Vine plants attached to ATV.Photo by: Francine Macdonald



Plant material attached to bobcat.

Photo by: TH9 Outdoor Services

Impacts of Invasive Species on Industry

Construction

In the UK, Japanese Knotweed (*Polygonum cuspidatum* or *Fallopia japonica*) is classified as a hazardous material. When construction occurs in established Japanese Knotweed stands workers sift the soil to remove root fragments and institute treatment plans to ensure that the Knotweed does not re-sprout, as it can damage housing foundations by growing through concrete and asphalt. The contractors must also thoroughly clean their equipment, and dispose of the contaminated soil at biohazard waste sites. While we do not have these requirements in Ontario, Japanese Knotweed is present here.

Invasive plant species can also increase site preparation and weed control costs, and reduce property values. For example, in Vermont the presence of the aquatic invasive plant Eurasian Watermilfoil (*Myriophyllum spicatum*) depressed shoreline residence property value by as much as 16.4% (Zhang and Boyle, 2010).

Forestry/Agriculture

Invasive plant species which become established in forests will out-compete native species and prevent forest re-generation after logging or natural disturbance. Dog-strangling Vine rossicum) is of particular concern in conifer plantations. This species thrives in the filtered light and open soils of mature plantations, and suppresses seedling establishment of native hardwoods. If its invasion continues, very few juvenile trees will survive to fill the shrinking canopy of over-mature pines. Reforestation sites are also susceptible; the thick mats of vegetation and aggressive competition from Dog-strangling Vine decrease available planting space and increase costs as more mature vegetation needs to be planted in order to ensure the new vegetation can outcompete the invasive plant. As a result, expensive control programs are often required.

Land Management (Trail Use/Maintenance)

Recreational trail use and the maintenance of trails can facilitate the transport of invasive plant material and seeds, and create open and disturbed sites that are prime locations for the establishment of invasive species. Studies have proven that trails act as corridors which assist in the spread of invasive plant species. Humans, their pets, and vehicles such as ATV's can be vectors of invasion along trails because seeds and plant pieces can be carried on equipment and clothing. In addition, frequent trampling along trails alters soil properties, limits the growth of some native species, and creates conditions that may favour the growth of non-native species (Kuss et al. 1985; Marion et al. 1985; Yorks et al. 1997).

Roadsides/Utilities

Invasive species can increase the cost of roadside and utility maintenance by requiring additional maintenance and control efforts. The presence of invasive species can also provide a safety hazard. In the case of Phragmites and Miscanthus (invasive grass species), along with interrupting sight lines, the dead stalks which remain standing each autumn also provide combustible material. Fires in these stands burn intensely, and can damage utilities and hydro lines. Phragmites along roadsides is generally assumed to be spread through the transport and burial of rhizome fragments through ditching, ploughing, and other human activities that transport rhizomes on machinery. Studies have shown that vehicles and road-fill operations can transport invasive plant seeds into uninfested areas, and road construction and maintenance operations provide optimal disturbed sites for seed germination and seedling establishment (Schmidt 1989; Lonsdale & Lane 1994; Greenberg et al. 1997; Trombulak & Frissell 2000).

Steps to Prevent the Unintentional Introduction of Invasive Species from Equipment

Inspection and cleaning of all machinery and equipment should be performed in accordance with the procedures, checklists and diagrams provided in this protocol.

When visiting more than one site, always schedule work in the sites that are the least disturbed and free of known invasive species first, and visit sites with known invasive species infestations last. This will greatly reduce the risk of transferring plants to new locations.

When to Inspect

Inspection should be done before:

- Moving vehicles out of a local area of operation
- Moving machinery between properties or sites within the same property where invasive species may be present in one area, and not in another
- Using machinery along roadsides, in ditches, and along watercourses
- Vehicles using unformed dirt roads, trails or off road conditions
- Using machinery to transport soil and quarry materials
- Visiting remote areas where access by vehicles is limited

Inspection should be done after:

- Operating in areas known to have terrestrial invasive plants or are in high risk areas (i.e. recently disturbed areas near known invaded areas)
- Transporting material (i.e. soil) that is known to contain, or has the potential to contain, invasive species
- Operating in an area or transporting material that you are uncertain contain invasive species
- In the event of rain. If mud contains seeds, they can travel indefinitely until it rains or the road surface is wet, allowing for long distance transport. This may result in transporting seeds to areas where those species did not previously exist

How to Inspect

- Inspect the vehicle thoroughly inside and out for where dirt, plant material and seeds may be lodged or adhering to interior and exterior surfaces.
- Remove any guards, covers or plates that are easy to remove.
- Attention should be paid to the underside of the vehicle, radiators, spare tires, foot wells and bumper bars.

If clods of dirt, seed or other plant material are found, removal should take place immediately, using the techniques outlined below.

When to Clean

Vehicles and heavy equipment that stay on formed and sealed roads have a low risk of spreading invasive species. Cleaning is only required when inspection identifies visible dirt clods and plant material or when moving from one area to another.

Depending on the invasive species present, vehicles may need to be cleaned even when deep snow is present. Phragmites, for example, can still be spread, even in packed snow because the seed heads are usually above the surface of the snow. Other plants, such as Dog-strangling vine, will be contained beneath deep snow.

*Regular inspection of vehicles and machinery will identify if any soil or plant material has been collected on or in vehicles and machinery.

Where to Clean

Clean the vehicle/equipment in an area where contamination and seed spread is not possible (or limited). The site should be:

- Ideally, mud free, gravel covered or a hard surface. If this option is not available, choose a well maintained (i.e. regularly mowed) grassy area.
- Gently sloping to assist in draining water and material away from the vehicle or equipment. Care should be taken to ensure that localized erosion will not be created, and that water runs back into the area where contamination occurred.
- At least 30m away from any watercourse, water body and natural vegetation.
- Large enough to allow for adequate movement of larger vehicles and equipment.

*Safely locate the vehicle and equipment away from any hazards. If mechanized, ensure engine is off and the vehicle or equipment is immobilized.

How to Clean Inside

Clean the interior of the vehicle by sweeping, vacuuming or using a compressed air device. Particular attention should be paid to the floor, foot wells, pedals, seats and under the seats.

How to Clean Outside

Knock off all large clods of dirt. Use a pry bar or other device if necessary.

Identify areas that may require cleaning with compressed air rather than water such as radiators and grills. Clean these areas first prior to using water.

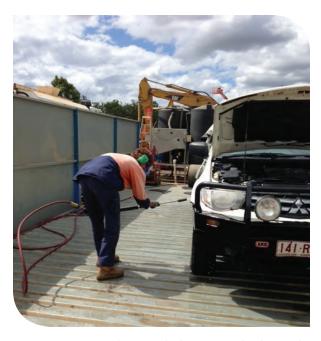
Clean the vehicle with a high pressure hose in combination with a stiff brush and/or pry bar to further assist the removal of dirt clods.

Start cleaning from the top of the vehicle and work down to the bottom.

Emphasis should be placed on the undersides, wheels, wheel arches, guards, chassis, engine bays, radiator, grills and other attachments.

When the cleaning is finished avoid driving through the waste water when removing the vehicle or equipment from the cleaning site.

For equipment such as water trucks that may be exposed to aquatic invasive species, trucks should be disinfected with bleach solution before conducting work in a new area. For further information please refer to the Invading Species Awareness Program's Technical Guidelines listed under Contacts and Resources.



Hosing down a vehicle in Queensland Australia
Photo by: TH9 Outdoor Services

Final Inspection Checklist

Conduct a final inspection to ensure the following general clean standard has been achieved:

- No clods of dirt should be visible after wash down.
- Radiators, grills and the interiors of vehicles should be free of accumulations of seed, soil, mud and plant material parts including seeds, roots, flowers, fruit and or stems.

Diagrams have been provided to assist in quickly identifying key areas to inspect and clean on a variety of vehicles associated with the targeted industries. These can be used in combination with vehicle checklists to ensure all areas of the vehicles have been inspected and cleaned.

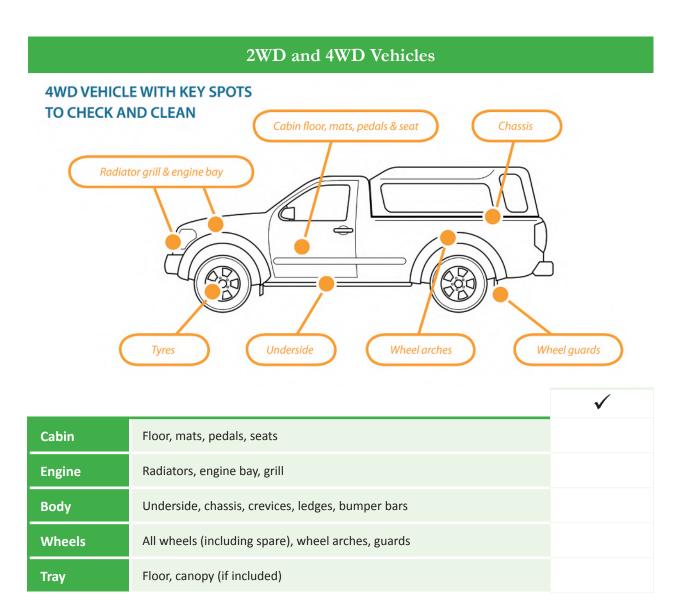
Equipment Required

- A pump and high pressure hose OR High pressure water unit
- Minimum water pressure for vehicle cleaning should be at least 90 pounds per square inch. Water can be supplied as high volume/low pressure or low volume/high pressure (NOAA Fisheries Service).
- Air compressor and blower OR Vacuum
- Shovel
- Pry bar
- Stiff brush or broom



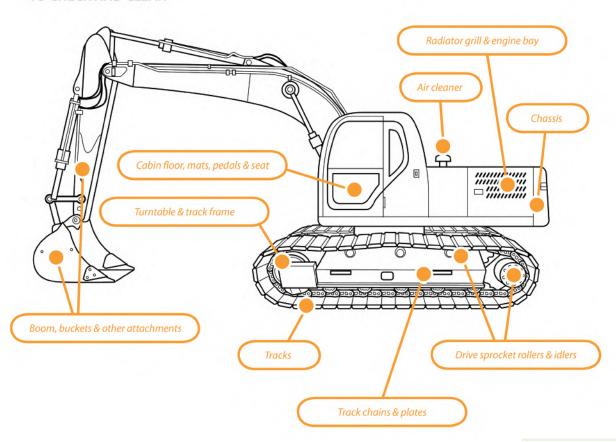
Cleaning station at construction site.
Photo by: Mark Heaton, OMNR

Inspection and Cleaning Diagrams and Checklists



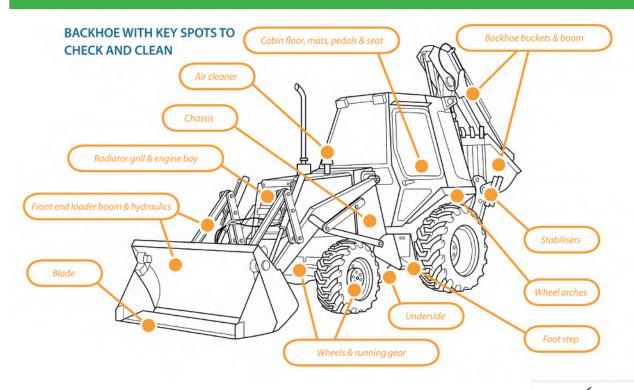
Excavator

EXCAVATOR WITH KEY SPOTS TO CHECK AND CLEAN



		\checkmark
Cabin	Floor, mats, pedals, seats	
Engine	Radiators, engine bay, grill, air cleaner	
Tracks	Tracks, track frame, drive sprocket rollers, idlers	
Body Plates	Plates of cabin	
Body	Ledges, channels	
Bucket		
Booms		
Turret Pivot		

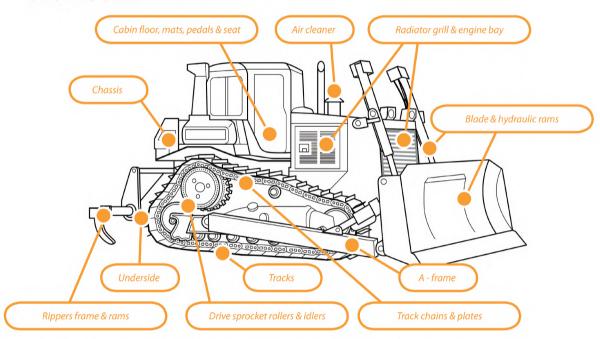
Backhoe



		V
Cabin	Floor, mats, pedals, seats, foot step	
Engine	Radiators, engine bay, grill, air cleaner	
Wheels	All wheels (including spare), wheel arches, guards	
Front end loader	Blade, hydraulics, booms	
Backhoe	Buckets, boom, hydraulics, stabilizers	

Bulldozer

BULLDOZER WITH KEY SPOTS TO CHECK AND CLEAN



		✓
Cabin	Floor, mats, pedals, seats	
Engine	Radiators, engine bay, grill, air cleaner	
Tracks	Tracks, track frame, drive sprocket rollers, idlers	
Body Plates	Belly plates and rear plates	
Body	Ledges, channels	
Blade	Pivot points, hydraulic rams, a-frame	
Ripper	Ripper frame, ripper points	

Contacts and Resources

Ontario Invasive Species Strategic Plan 2012. Government of Ontario. Online, accessed May 8, 2012.

http://www.mnr.gov.on.ca/stdprodconsume/ groups/lr/@mnr/@biodiversity/documents/ document/stdprod_097634.pdf

Invasive Species Management for Infrastructure Managers and the Construction Industry 2008. Wade, M. Booy, O. and White, V. Online, accessed April 27, 2012

http://www.ciria.org/service/Web_Site/ AM/ContentManagerNet/ContentDisplay. aspx?Section=Web_Site&ContentID=9001 T.I.P.S (Targeted Invasive Plant Solutions) Highway Operations. British Columbia Invasive Species Council. Online, accessed May 8, 2012 http://www.bcinvasiveplants.com/iscbc/publications/TIPS/Highways_Operations_TIPS.pdf

Invading Species Awareness Program Workshop Manual: Aquatic Invasive Species: An Introduction to Identification, Collection and Reporting of Aquatic Invasive Species in Ontario Waters (includes information on decontaminating equipment). http://www.invadingspecies.com/download/publications/manuals/WorkshopManual.pdf

Reporting Invasive Species

To report invasive species, or view maps of existing records, visit the Invading Species Awareness Program website www.invadingspecies.com/report/ or www.eddmaps.org/Ontario.

Or call the OFAH/MNR Invading Species Awareness Program Hotline at 1-800-563-7711

Acknowledgements

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We also sincerely thank the Clean Equipment Protocol Working Group and the Ontario Invasive Plant Council Committees and Board of Directors for their ongoing support and valuable input into this document, and the Canada-Ontario Invasive Species Centre and Ontario Ministry of Natural Resources for the support in creating this protocol.

Clean Equipment Protocol Working Group:

Diana Shermet, Central Lake Ontario Conservation Authority; Paula Berketo, Ontario Ministry of Transportation; Travis Cameron, Ontario Ministry of Natural Resources; Jennifer Hoare, Ontario Parks; Michael Irvine, Ontario Ministry of Natural Resources; Alison Kirkpatrick, OFAH/MNR Invading Species Awareness Program; Erika Weisz, Ontario Ministry of Natural Resources; Amanda Chad, Ontario Power Generation; Nancy Vidler, Lambton Shores Phragmites Community Group; Nigel Buffone, Du Pont Canada Company; Ewa Bednarczuk, Lower Trent Conservation Authority

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More Information:

Ontario Invasive Plant Council: www.ontarioinvasiveplants.ca

Appendix A: Identification of Invasive Plants found in Ontario

- Common Buckthorn (Rhamnus cathartica) and Glossy Buckthorn (Frangula alnus)
- **Dog-strangling Vine** (Cynanchum rossicum)
- Garlic Mustard (Alliaria petiolata)
- Japanese Knotweed (Polygonum cuspidatum)
- Phragmites or Common Reed (Phragmites australis subsp. australis)
- Giant Hogweed (Heracleum mantegazzianum)

common & glossy buckthorn (Rhamnus cathartica & R. frangula)







Plant type: Shrub/small tree

Arrangement: Common buckthorn are sub-opposite (almost opposite). Glossy buckthorn are alternate.

Leaf: The common buckthorn leaf is egg shaped, edge of the leaf is "pebbled" (small rounded teeth). Veins converging toward leaf top. The glossy buckthorn leaf is more slender (tear drop shaped) and smooth margined.

Bark: Smooth, young bark with prominent raised patches or lenticels; rough texture and peeling bark when mature.

Seed/Flowers: Flowers are green-yellowish, small and inconspicuous. Green berries becoming purplish/black in late summer, berry > 1 cm in diameter.

Buds/Twigs: Common buckthorn has thorn-like tip on many twigs. Glossy buckthorn buds have no bud scales and lack thorny tips to twigs.

Habitat: Various - forest, thickets, meadows, dry to moist soils.

Similar native species: Native dogwoods, which lack the thorny "tip". Native dogwoods are truly opposite in arrangement of twigs; only alternate leaved (pagoda) dogwood has alternate branching.

dog-strangling vine (Cynanchum rossicum & C. nigrum)







Plant type: Herb, twining vine

Arrangement: Opposite

Leaf: Lance shaped, smooth margin (edge)

Bark: n/a

Seed/Flowers: Bean shaped seed pod with seeds attached to downy 'umbrellas'. Flowers - pink (C. rossicum) or purple (C. nigrum) with five petals.

Buds/Twigs: n/a

Habitat: Dry to moist soils; more dominant in meadows and woodland edges.

Similar native species: Swamp milkweed (Asclepias incarnata spp.), is an upright plant, typically found in wetland habitats.

garlic mustard

(Alliaria petiolata)







Plant type: Herb

Arrangement: Alternate

Leaf: Saw tooth like edge, elongated heart shape. Garlic/onion smell when crushed. Leaves are kidney shaped with prominent veins.

Bark: n/a

Seed/Flowers: Cluster of small white flowers with four petals. Small black < 1 mm rounded seed found in elongated 'tube-like' seed pods (similar to a bean pod).

Buds/Twigs: n/a

Habitat: Various – dry to moist soils, in all habitat types, less often in meadows.

Similar native species: n/a

japanese knotweed

(Polygonum cuspidatum)







Plant type: Herb, 2 - 4 m in height.

Arrangement: Alternate

Leaf: Tear drop shaped, sharp pointed, dark green, flattened at base.

Bark: n/a

Seed/Flowers: Flowering stalk of many small greenish-white flowers.

Buds/Twigs: Large plant with a 'bamboo-like' stem. Stem light green maturing to tan colour.

Habitat: Moist to wet soils found in wetlands, water-courses and roadside ditches.

Similar native species: None.

common reed

(Phragmites australis)







Plant type: Grass

Arrangement: Alternate

Leaf: Broad leaf > 1 cm wide.

Bark: n/a

Seed/Flowers: Dense cascading 'broom-like' flower head. 'Cottony' in appearance when mature.

Buds/Twigs: Stems rough and ridged, ligule a densely hairy band. Mature plants > 3 m tall.

Habitat: Moist to wet soils. Found in wetlands, water- courses and road side ditches.

Similar native species: Species of mannagrass (Glyceria sp) including tall northern, eastern and rattlesnake grass. A native common reed exists but has a smooth stem and the ligule is not hairy. It is also quite rare.

giant hogweed (Heracleum mantegazzianum)







Plant type: Herb. Mature plants can be over 3m tall.

Arrangement: Alternate

Leaf: Lobed leaf 1-2 m wide, lobes sharp-pointed.

Bark: n/a

Seed/Flowers: Small, white flowers in a large umbrellashaped cluster, .75 m wide.

Buds/Twigs: Hairy stem with purple spots.

Habitat: Fresh to wet soils in forests, swamps, meadows, marshes.

Similar native species: Cow parsnip (Heracleum maximum) – has smaller flowers, no purple spots on stems. Angelica (Angelica atropurpurea) has a roundedtopped flower cluster and leaves divided into many leaflets.

Do not touch this plant because it is poisonous. If you do, wash your skin immediately in cool soapy water and do not expose the area to sunlight.

Seek professional advice before removing.

Identification of Invasive Plants found in Ontario Photos by:

Credit Valley Conservation, Greg Bales, Ken Towle, Patrick Hodge, Ontario Federation of Anglers and Hunters, Francine Macdonald, Matt Smith



Environmental Impact Statement	PP-13-9668
ADDENIDIN C. DUTTEDNUT HEALTH ACCECCATENT DEDODT	
APPENDIX C: BUTTERNUT HEALTH ASSESSMENT REPORT	

Enclosures:

- 1. Information from the Ministry of Natural Resources and Forestry about Butternut and the Endangered Species Act, 2007
- 2. Butternut Health Assessor's Report
- 3. Original data forms
- 4. Electronic and printed copies of the Excel data spreadsheet (BHA Tree Analysis)

Butternut Trees on Your Property

INTRODUCTION

The Ministry of Natural Resources is streamlining and automating its approvals processes for natural resource-related activities – with the goal of providing individuals and businesses with faster and more efficient service delivery.

This fact sheet provides information about regulatory provisions under the Endangered Species Act (ESA) for activities that may impact butternut trees.

The ESA provides protection for endangered or threatened species in Ontario. Some activities that would otherwise contravene the ESA may be eligible to proceed without a permit from the Ministry of Natural Resources provided that regulatory conditions for the ongoing protection of species at risk and their habitats are met.

ACTIVITIES THAT MAY AFFECT BUTTERNUT

Anyone intending to cut down or harm butternut tree's may be able to follow the rules set out in the regulation, depending on the health of the trees as determined by a qualified butternut health assessor and the number of trees impacted. In some cases, this will include a requirement for the person to register with the Ministry of

Natural Resources. A permit under the ESA is not required if the rules in regulation are followed for all eligible activities.

What is a "qualified butternut health assessor?"

A butternut health assessor is a person designated by the Ministry of Natural Resources for the purpose of assessing whether, and the extent to which, butternut trees are affected by a disease called butternut canker.

What are the categories for butternut trees?

A qualified butternut health assessor must inspect and report on the tree, and then assign it to one of three categories, based on the tree's condition or value as a genetic resource. The categories are:

- Category 1: the tree is in an advanced state of disease from butternut canker and is considered "non-retainable."
- Category 2: the tree does not have butternut canker, or the disease is not as advanced and the tree is considered "retainable."
- Category 3: the tree may be useful in determining sources of resistance to butternut canker and is considered "archivable." This regulation does not apply to Category 3 trees.

ontario.ca/speciesatrisk





2 Butternut Trees on Your Property

What activities are eligible?

This section may apply to anyone who is proposing an activity the may have an impact on a butternut tree. The butternut must be assessed by a qualified butternut health assessor, and the regulation may apply depending on the number of trees proposed to be affected, and the category of the tree.

A person may be eligible if the activity affects Category 1 trees or 10 or fewer Category 2 trees.

A person is not eligible for the regulation and must obtain an ESA authorization if the activity affects a Category 3 tree, or more than 10 Category 2 trees.

What activities are not eligible?

- A person cannot affect more than
 10 Category 2 trees identified in the butternut health assessors report.
- The regulation does not apply if a person has been previously exempted to remove 10 butternut trees, identified by a butternut health assessor as Category 2 trees and the location of the trees are in the same area or close proximity, the person is proposing to have an impact on additional butternut trees for the same or similar reasons.

What are the rules in regulation?

At least 30 days before any butternut is killed, harmed or taken:

- A designated butternut health assessor must:
- complete an assessment for each butternut tree in accordance with the "Butternut Assessment

Guidelines: Assessment of Butternut Tree Health for the Purposes of the Endangered Species Act, 2007" published by the Ministry of Natural Resources and designate it as Category 1, 2, or 3;

- provide a written report of the assessment in accordance with those guidelines.
- The person proposing to carry out the activity must send the report of the butternut health assessor to the appropriate MNR District Manager and allow MNR staff to access the site during that time, if requested.

After the 30 day period has passed, the person may carry out activities on any Category 1 trees identified in the report.

If 10 or fewer Category 2 trees are affected (and the activity is not otherwise ineligible), the person carrying out the activity must:

- Register using the <u>Notice of Butternut</u>
 <u>Impact</u> form on the Registry.
- Follow the rules in regulation including:
 - Plant replacement trees to benefit butternut using best management practices outlined in the regulation.
 - Conduct monitoring and tending of the seedlings that are planted.
 - Keep required records.

Please refer to **Legal/Technical Background** below for a summary of these conditions.

LEGAL/TECHNICAL BACKGROUND

The following is a summary of the conditions in the regulation that must be fulfilled to allow eligible activities, and is for information purposes only. Please refer to O.Reg. 242/08 section 23.7 at e-laws.gov.on.ca for the full legal text.

Summary of Conditions

Actions to Benefit Butternut:

The person must provide a benefit for butternut by carrying out these activities:

- follow planting ratios as described in the regulation for replacing the trees, based on the size of the tree(s) and whether the tree is being killed and taken or harmed;
- follow the rules in regulation regarding seed origin, timing of planting, soil characteristics, companion trees plantings and spacing requirements; and,
- replace planted butternut that die within two years of planting the seedling.

Monitoring and Tending:

The person must monitor and tend the planted butternut trees by following requirements described in the regulation:

- monitor planted trees once annually for two years between May 15 and September 20 to assess the health of each tree;
- * tend each butternut tree planted once a week during the first growing season (May 15 – September 20) which includes maintenance of tree guards, vegetation control and watering; and,

 tend each butternut tree planted in the second growing season as required by completing vegetation control and watering.

Records:

The person must maintain a record of planting, monitoring and tending activities for every planted butternut tree and provide this record to MNR should it be requested. This record must include planting dates, dates and description of monitoring and tending activities and the health status of each tree, including any signs of butternut canker.

IMPORTANT LINKS

For more information about Ontario's species at risk, visit ontario.ca/speciesatrisk.

FOR MORE INFORMATION

1-855-613-4256

Email: mnr.rasc@ontario.ca

Ministry of Natural Resources and Forestry

Species At Risk P.O. Box 7000, 300 Water Street Peterborough ON K9J 8M5 Ministère des Richesses naturelles et des Forêts

Espèces en péril C.P. 7000, 300, rue Water Peterborough ON K9J 8M5

The enclosed Butternut Health Assessor's Report documents the results of the Butternut health assessment that was conducted by the designated Butternut Health Assessor (BHA) identified in the top section of the report. If there are other Butternut trees (of any size or age) at the site that may be affected by the activity and they are not identified in the enclosed BHA Report, they too must be assessed by a designated BHA.

Butternut is listed as an endangered species on the Species at Risk in Ontario List, and as such, it is protected under the *Endangered Species Act, 2007* (ESA) from being killed, harmed, or removed. If you are planning to undertake an activity that may affect Butternut, you may be eligible to follow the requirements set out in section 23.7 of Ontario Regulation 242/08 under the ESA, or you may need to seek an authorization under the ESA (e.g., a permit).

Please visit e-laws at the link provided below for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled. Information about Butternut is also available at: http://www.ontario.ca/environment-and-energy/butternut-trees-your-property.

If you are eligible to kill, harm or take Butternut under section 23.7 of the regulation, your first step is to submit the BHA Report and the original data forms enclosed in this package to the local Ministry of Natural Resources and Forestry (MNRF) District Manager. Note that MNRF cannot accept photocopies or scanned electronic copies of the data forms.

Note regarding changes:

If the enclosed BHA Report does not identify which Butternut tree(s) are proposed to be killed, harmed, or taken in Table 1 (i.e., if "unknown" is indicated in the second last column of Table 1), or, if the information in the last two columns of Table 1 has changed since the date this BHA Report was produced, do not make any edits to the BHA Report. Instead, please attach a cover letter that identifies which Butternut tree(s) are proposed to be killed, harmed, or taken (by referencing the tree identification numbers) when you submit the enclosed BHA Report to the local MNRF District Manager.

The BHA Report must be submitted at least 30 days prior to registering an eligible activity to kill, harm, or remove a Butternut tree. During this 30 day period, no Butternut trees (of any category) may be killed, harmed, or removed, and MNRF may contact you for an opportunity to examine the trees. If MNRF chooses to examine the trees, a representative of MNRF will contact you using the information you supplied when you submitted the BHA Report.

If you are eligible to follow the rules in regulation under section 23.7, you may register your activity using the "Notice of Butternut Impact" form on the <u>MNRF Registry</u> <u>after the 30 day period has elapsed</u>.

If you are <u>not</u> eligible to follow the rules in regulation under section 23.7, please contact the local MNRF district office to determine whether you will need to seek an authorization (e.g., a permit). A link to the directory of MNRF offices is provided below.

Note that municipal by-laws and legislation other than the ESA may also be applicable to the removal or harming of trees.

Please retain this information and a copy of the BHA Report (including copies of all data forms) for your records, along with any other documentation you may receive from MNRF should an examination of the trees occur. If you have any questions, please contact your local MNRF district office.

Links:

Endangered Species Act, 2007:

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Ontario Regulation 242/08 (refer to section 23.7):

http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm

MNRF Office Locations:

https://www.ontario.ca/government/ministry-natural-resources-and-forestry-regional-and-district-offices

Butternut Health Assessor's Report Number: 289-006

Heather Lunn BHA #289 1909 Sixth Line Road Dunrobin, Ontario K0A 1T0 343-262-4769 heather.lunn@gmail.com

Maurice DeCaria
Perthmore Development Co. Ltd.
80 Dufferin St.
P.O. Box 20054
Perth, ON
K7H 3M6
(416) 697-3804
Maurice@perthmore.com

Site location: Lot 03 Concession 02 Geographic Township of Drummond, Town of Perth

Date(s) of Butternut health assessment: June 22, 2019

Date BHA Report prepared: August 30, 2019

Map datum used: NAD83 WGS84

Total number of trees assessed in this BHA Report: 1

The assessed trees were numbered on site using white flagging tape and numbered on the flagging tape with a black marker. The numbers at the site correspond to the tree numbers referenced in this report.

This BHA Report includes the following tables:

- Table 1: Butternut Trees Assessed
- Table 2: Trees Determined by BHA to be Butternut Hybrids
- Table 3: Summary of Assessment Results

Table 1: Butternut Trees Assessed

Tree #	UTM coordinates	Cate gory (1, 2, or 3)	dbh (cm)	Culti vate d? (Y/ N)	Proposed to be: (enter one: unknown, killed, harmed or taken)	If tree is proposed to be killed, harmed, or taken, indicate reason tree is proposed to be killed, harmed or taken:
1	18T 401236 4974211	2	62	N -	Unknown	N/A

Table 2: Trees Determined by BHA to be Butternut Hybrids

Tree #	UTM coordinates	Method used (genetic testing or field identification):

Table 3: Summary of Assessment Results

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
Category 1	0	 A Category 1 tree is one that is affected by butternut canker to such an advanced degree that retaining the tree would not support the protection or recovery of butternut in the area in which the tree is located; and is considered "non-retainable".
		 During the 30 day period that follows your submission of this BHA Report to the MNRF District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNRF may contact you for an opportunity to examine the trees.
		 Category 1 trees may be killed, harmed or taken after the 30 day period that follows submission of this BHA Report to the MNRF District Manager, unless the results of an MNRF examination indicate that the assessment has not been conducted in accordance with the document entitled "Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the Endangered Species Act, 2007".
Category 2	1	 A Category 2 tree is one that is not affected by Butternut Canker, or is affected by Butternut Canker but the degree to which it is affected is not too advanced and retaining the tree could support the protection or recovery of butternut in the area in which the tree is located, and is considered "retainable".
		 During the 30 day period that follows your submission of this BHA Report to the MNRF District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNRF may contact you for an opportunity to examine the trees.
		 Activities that may kill, harm or take up to a <u>maximum of ten (10)</u> Category 2 trees may be eligible to follow the rules in section 23.7 of Ontario Regulation 242/08, in accordance with the conditions and requirements set out in the regulation.
		 Refer to e-Laws for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm
		 Activities that may kill, harm or take more than ten (10) Category 2 trees are not eligible to follow the rules in section 23.7 of Ontario Regulation 242/08. Contact the local MNRF district office for information on how to seek an ESA authorization (e.g., a permit) or consider an alternative that would be eligible for the regulation.
Category 3	0	 A Category 3 tree is one that may be useful in determining sources of resistance to Butternut Canker, and is considered "archivable".
		 Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08.
		 Contact the local MNRF district office for information on how to seek an ESA authorization, or consider an alternative that will avoid killing, harming or taking any Category 3 trees.
Cultivated	0	 An activity that involves killing, harming, or taking a cultivated Butternut tree that was not required to be planted to fulfill a condition of an ESA permit or a condition of a regulation, may be eligible for the exemption provided by subsection 23.7 (11) of O. Reg. 242/08.
		 Prior to undertaking the activity, the owner or occupier of the land on which the Butternut is located (or person acting on their behalf) will need to determine whether the exemption for cultivated trees is applicable by determining whether or not the tree was cultivated as a result of the requirements for an exemption under O. Reg. 242/08 or a condition of a permit issued under the ESA. This information can be accessed by contacting the local MNRF district office.
		 The owner or occupier of the land on which the Butternut is located (or person acting on their behalf) is encouraged to append the details regarding whether the tree was planted to satisfy a requirement (e.g., the permit number or registration number) to this BHA Report for their records.
Hybrid	0	 Hybrid Butternut trees are not protected under the ESA, but their removal may be subject to municipal by-laws and other legislation.

Butternut Health Assessor's Comments:

This concludes the summary of the BHA Report. A complete BHA Report must also include:

- 1. All original (hard copy) data forms (i.e., all completed sets of Form 1 and Form 2), and
- 2. Electronic and printed copies of the Excel data analysis spreadsheet.

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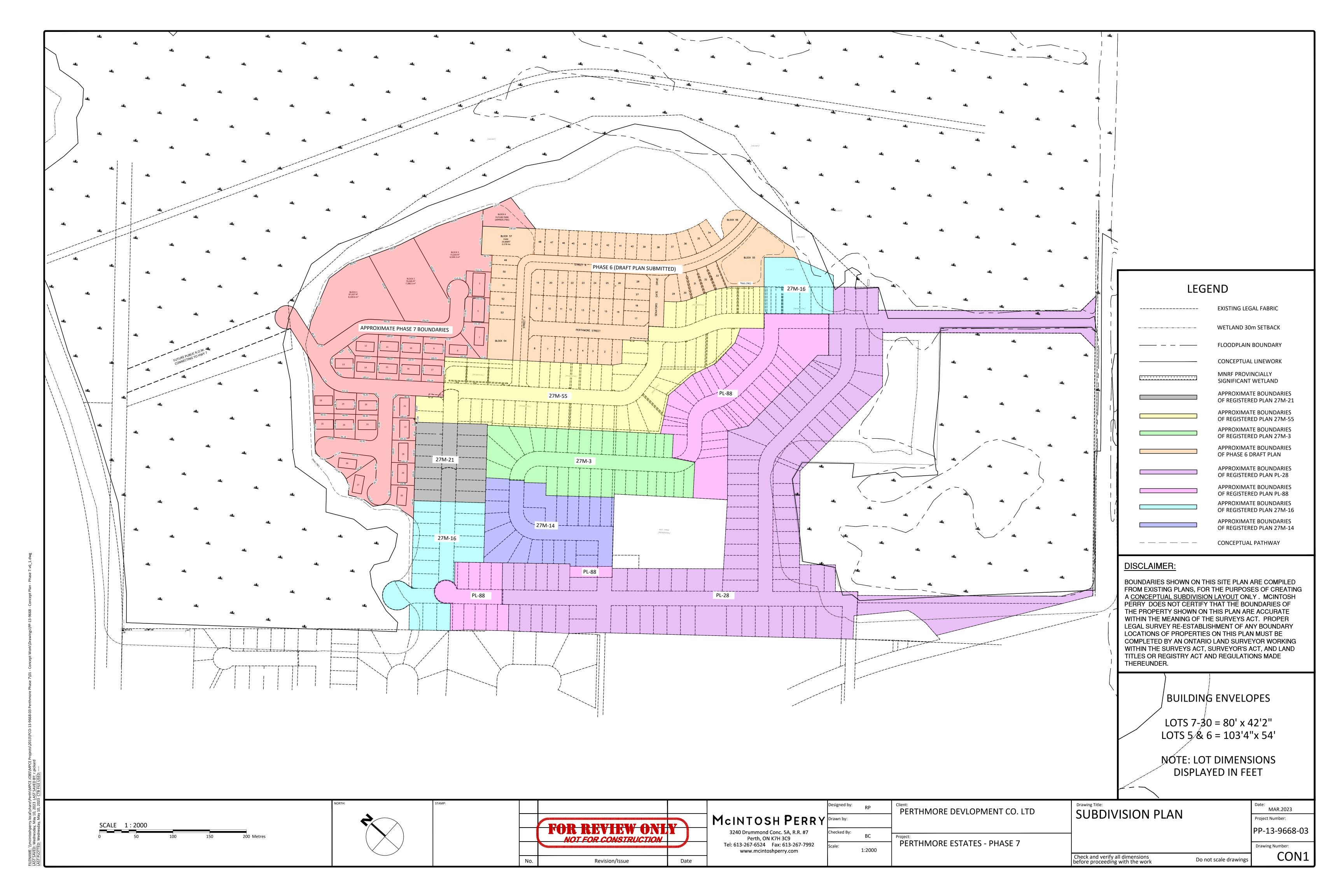
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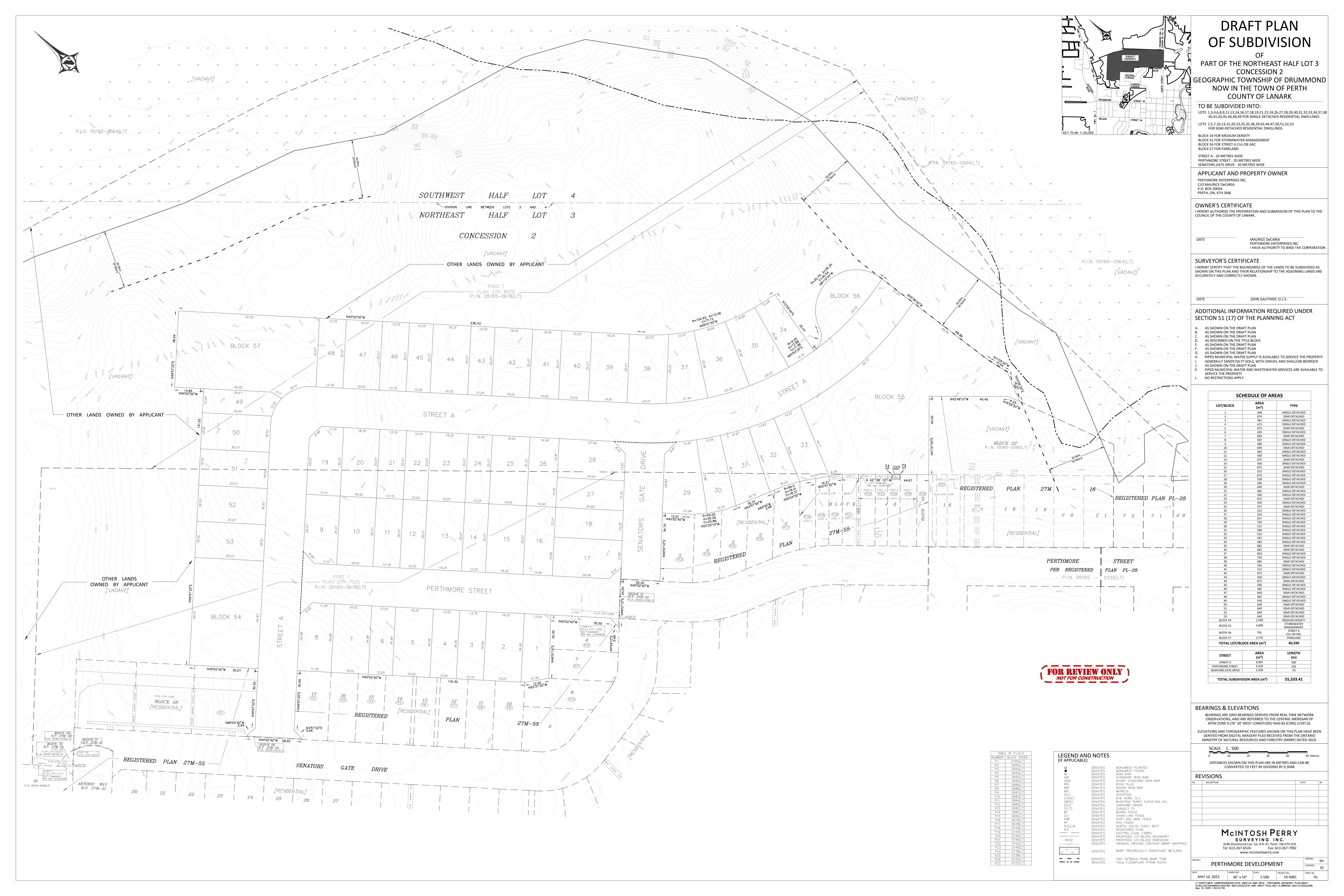
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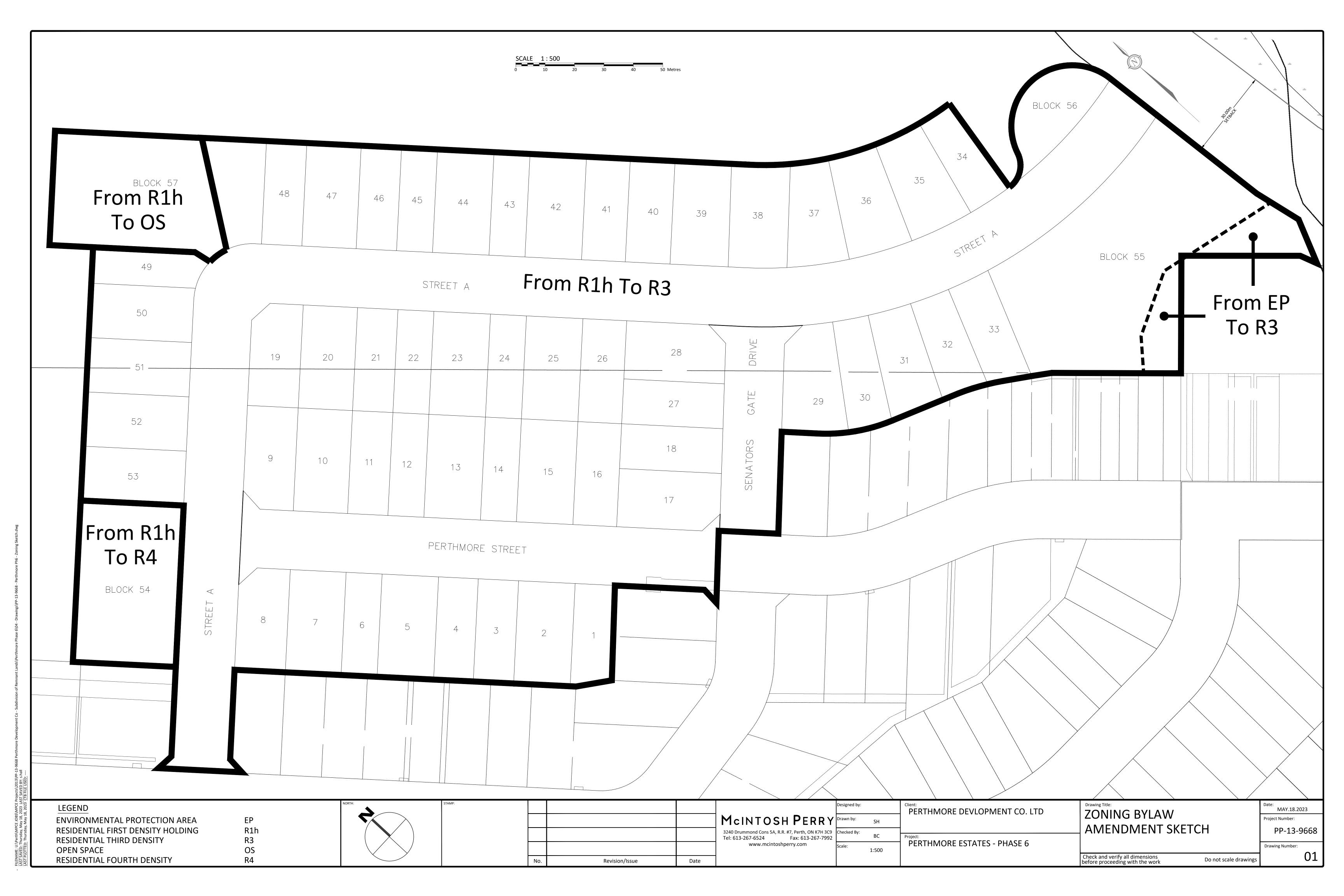




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PRELIMINARY SERVICING AND STORMWATER MANAGEMENT REPORT PERTHMORE SUBDIVISION - PHASE 6



Project No.: 0PP-13-9668-01

October 2023 (Rev. 04)

Prepared for:

Perthmore Development Co. P.O. Box 20054 80 Dufferin Street Perth, ON K7H 0B5

Prepared by:

McIntosh Perry Consulting Engineers Ltd. 115 Walgreen Road Carp, Ontario K0A 1L0

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APPENDIX B: Watermain Design

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APPENDIX G: Water Balance

1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by Perthmore Developments Co. to prepare this Preliminary Servicing and Stormwater Management Report in support of the Draft Plan of Subdivision Application for Phase 6 of the Perthmore Subdivision in Perth, Ontario.

The main purpose of this report is to present preliminary servicing options for the development in accordance with the recommendations and guidelines provided by the Ministry of the Environment, Conservation and Parks (MECP), Rideau Valley Conservation Authority (RVCA) and the Town of Perth (Town). This report will address the servicing for the entire development so that an overall servicing scheme can be presented, ensuring that existing and available services will adequately service the proposed development.

1.2 Site Description

The subject property is generally located within the northeastern quadrant of the Town of Perth and south of Provincial Highway 7. The property is legally described as Part of the northeast and southwest halves of Lot 3 and the southwest half of Lot 4, Concession 2, within the geographic Township of Drummond now in the Town of Perth and part of Block 15 registered plan 27M-21. This phase of development encompasses approximately 5.40 hectares and is bound by vacant land to the north and east, and by the existing phases of the subdivision immediately to the south and west. Refer to the Draft Plan of Subdivision in Appendix 'A' for more details.

The topography of the site varies with a ridge generally bisecting the property near the western limit and splitting the drainage in easterly and westerly directions. The elevation generally slopes off near the eastern limit at the proposed cul-de-sac of Street A. The land is generally overgrown with a variety of grass, shrubs and bush along with some trees located at the northeast portion of the site. At the time of writing of this report, portions of the property have been cleared or are in the process of being cleared.

Phase 6 is made up of 53 lots with 34 single family homes, 38 semi-detached units (18 lots) and 1 apartment block with 14 units. There is also approximately 725 meters of associated municipal roadway and municipal services. The Town and the RVCA will be reviewing and approving this report as part of the Draft Plan of Subdivision Application.

2.0 BACKGROUND INFORMATION

Background studies that have been completed for the site include review of as-built drawings, a topographical survey of the site, along with servicing and stormwater reports from previous phases of the development.

Various as-built drawings, design drawings and design calculations for the existing subdivision services were reviewed in order to determine proper servicing schemes for the site.

A topographic survey of the site was completed by MPSI dated August 2020 and was used to identify the existing drainage characteristics and to delineate catchment areas.

The following reports have previously been completed and are available under separate cover:

- Drainage Design Report Perthmore Subdivision Phase 3 prepared by McIntosh Hill dated March 1998.
- Sanitary Sewer Report Perthmore Subdivision Phase 3 prepared by McIntosh Hill dated February 1998.
- Stormwater Management Report Perthmore Subdivision Phase 4 prepared by McIntosh Perry dated September 12, 2002
- Preliminary Stormwater Management Report Perthmore Subdivision Phase 5 prepared by McIntosh Perry dated February 17, 2004

3.0 EXISTING SERVICES

Phase 6 of the Perthmore Subdivision will be serviced partially via existing services and infrastructure within the existing phases of the development. The majority of the proposed development will be serviced by the newly proposed storm sewers and an associated stormwater management facility.

Existing services within Senators Gate Drive include a 200mm sanitary sewer, a 200mm watermain and a 450mm storm sewer. Existing services within Perthmore Street include a 200mm sanitary sewer, a 300mm watermain and a 525mm storm sewer. Stubs have been left at the intersection of Senators Gate Drive and Perthmore Street. There are stubs extending in both the northeast and northwest directions. Stubs have also been left at the intersection of Senators Gate Drive and Street B. The storm sewer at this intersection is a 300mm and the sanitary and water are both 200mm in diameter.

A newly proposed stormwater management pond will be constructed to service Phase 6. Previous discussions of reconstructing the Phase 5 pond have been eliminated due to sizing constraints that push the pond too close to the existing wetland. The proposed facility is located outside of the wetland setback.

Gas, hydro, cable and telephone utilities are available nearby and locations will be confirmed from respective utility companies during detailed design process.

4.0 SERVICING PLAN

4.1 Proposed Servicing Overview

The overall servicing of Phase 6 of the subdivision will be accomplished through multiple connections to the existing stubs as detailed below. See below for more details pertaining to each specific service.

4.2 Watermain Design

Water servicing for the proposed development will be accomplished through connections at three locations: to the existing 200mm stub at the intersection of Senators Gate Drive and Street A and to the existing 300mm and 200mm stubs at the intersection of Senators Gate Drive and Perthmore Street. The watermain will be 200mm in diameter throughout Phase 6. Flow control valves will be installed as required. See *Drawing 100 – General Plan of Services* for details pertaining to the layout of the watermain.

Fire hydrants will be located on-site as required. The fire hydrants will be spaced 90m to 180m apart in order to meet municipal firefighting requirements. The fire hydrants will be owned and operated by the Town. Individual water services will be installed and will be Pex conforming to AWWA C904. Curb stops will be installed on all water services on the property line, away from driveways and any aboveground utilities. All watermains and associated structures will be designed and constructed per the design criteria detailed in the Design Guidelines for Drinking-Water Systems 2008 by the MECP and constructed per the Ontario Provincial Standard Details (OPSD's).

The watermain is designed to have a minimum of 2.4m cover and when crossing over or under utilities the watermain will have a minimum 0.3m clearance. A minimum horizontal separation of 2.5m (from pipe wall to pipe wall) will be maintained between the proposed watermain and storm/sanitary mains.

Water demands have been calculated per MECP Design Guidelines for Drinking-Water Systems 2008. The population for Phase 6 is calculated as 243.4 people creating the following demands:

- Average Day Flow = 47.33 L/min
- Max. Day Flow = 130.15 L/min
- Peak Hourly Flow = 195.46 L/min

Water demands which account for the anticipated population from the future development areas have also been completed using a population of 570.4 people creating the following demands:

- Average Day Flow = 110.91 L/min
- Max. Day Flow = 305.01 L/min
- Peak Hourly Flow = 458.06 L/min

See Water Demands Sheets 1 and 2 in Appendix 'B' of this report for more details.

Prior to connecting to the municipal water distribution system, it is essential to determine whether the system has adequate capacity and that the overall impact to the existing system is minimal. A WaterCAD model will be generated at the detailed design stage to confirm the capacity, pressure and size of pipes required to service the proposed site.

4.3 Sanitary Sewer Design

The sanitary sewers for the proposed development will flow by gravity to the existing sanitary sewers. Sanitary connections will be made to the stubs at the intersection of Senators Gate Drive and Perthmore Street. See *Drawing 100 – General Plan of Services* for details pertaining to the layout of the sanitary sewers.

The sanitary sewers within the new phase of development are 200mm diameter will be installed throughout with a minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a full flow velocity of not more than 3.0 m/s. All sewers and associated structures will be designed and constructed per the design criteria detailed in the Design Guidelines for Sewage Works 2008 by the MECP and constructed per the Ontario Provincial Standard Details (OPSD's).

Design parameters for Phase 6 include an extraneous infiltration rate of 0.33 L/s/ha. Daily per capita flow rates of 280 L/p/d and residential densities of 3.4 persons per single unit, 2.7 persons per semi-detached units, 1.8 persons per apartment unit and 60 persons per net hectare of futured development blocks were used in the design of this development. The residential peaking factor used is based on the Harmon Equation, with a maximum of 4.0 and a minimum of 2.0.

Phase 6 of the subdivision has been accounted for in the design of sanitary sewers of previous phases. As noted above the new phase of the subdivision will have multiple sanitary outlets. Ultimately the flows will be directed towards the Treelawn Boulevard and to Garden Avenue sewer outlets. Within the *Perthmore Development Phase III – Sanitary Sewer Report*, dated February 1998 by McIntosh Hill, the Treelawn Boulevard and Garden Avenue Sewers have been sized to accommodate the full buildout of the Perthmore Subdivision.

It was assumed the total number of lots being serviced by the Treelawn Boulevard sewer would be 258 lots with a total flow of 17.6 L/s for the full build-out of the development. According to the previous report, the existing 200mm sanitary sewer within Treelawn Boulevard is sloped at 0.40%, therefore the total capacity of the pipe is approximately 21.6 L/s. Phase 6 of the development will generate a total flow of 5.07 L/s to be captured by the Treelawn Boulevard sanitary sewer.

See Sanitary Sewer Design Sheet and PP-13-9668-01 – Sanitary Drainage Areas - SAN in Appendix 'C' of this report for more details.

4.4 Storm Sewer Design

Stormwater runoff will be conveyed through curb and gutter and rear-yard swale networks towards catch basins, where it will be captured and conveyed into the new storm sewer network. The storm sewers are designed with a minimum of 1.5m cover. The storm sewer network within the subdivision is designed to

accommodate a storm event with a 5-year return period. Storms in excess of this event will result in surcharging at catch basin and road sag locations. Stormwater runoff during these major events will be conveyed via overland flow routes within rear-yard swales and along the roadway, as is typical in subdivisions of this nature. A detailed lot grading and drainage plan will be prepared during the detailed design stage outlining the proposed drainage pattern within the subdivision.

The storm sewers within Phase 6 will flow via gravity to a newly proposed stormwater management facility located to the south of the Street A cul-de-sac at the eastern boundary of the property. Future development areas will require additional design to be carried out during their respective designs. See Drawing 100 – General Plan of Services for details pertaining to the layout of the storm sewers.

The storm sewers within this phase of development range in diameter from 250mm to 900mm and are designed with a minimum full flow target velocity (cleansing velocity) of 0.8 m/s (cleansing velocity) and a full flow velocity of not more than 3.0 m/s. No storm sewer will have a slope less than 0.1%. Appropriately sized maintenance holes will be installed at every change in pipe size or direction and will be spaced no more than 120m apart in order to facilitate cleaning and maintenance. All sewers and associated structures will be designed and constructed per the design criteria detailed in the Design Guidelines for Sewage Works 2008 by the MECP and constructed per the Ontario Provincial Standard Details (OPSD's).

A preliminary storm sewer design sheet was created using the rational method, which allows for the proper sizing of the storm pipes within the development. Drainage area information, along with respective pipe slopes and other necessary information was utilized to evaluate the performance of the storm sewer network. The time of concentration calculated for the storm sewer system is based on a 20-minute inlet time. Rainfall intensities were obtained from Intensity-Duration-Frequency (IDF) curves for the Town of Perth from the Ministry of Transportation (MTO).

The preliminary storm sewer design sheet identifies the 5-year flow that is conveyed through each pipe section of the storm sewer network. The peak flow and peak velocity are the maximum results based on gravity flow. Included in the sheet is the full flow capacity of the pipe and the associated full flow velocity when the pipe is under gravity flow condition. The peak flow was checked against the full flow capacity to ensure that each storm sewer pipe can convey the 5-year flow unrestricted.

The proposed storm sewer layout and approach is further detailed in Section 5.0 *Proposed Stormwater Management*.

See *Storm Sewer Design Sheet* and *PP-13-9668-01 - Storm Drainage Areas - STM* in Appendix D of this report for more details regarding pipe sizing.

4.5 Site Utilities

All relevant utility companies will be contacted prior to construction in order to confirm adequate utility servicing for the site. Existing utilities are present in prior phases of the development and will be extended to provide service for this phase.

4.6 Service Locations/Cover

The minimum cover for the sanitary, storm and water mains will be as follows:

Service	Minimum Cover
Sanitary Sewer	1.8m
Storm Sewer	1.5m
Watermain	2.4m

All minimum cover requirements are as per municipal standards. Separation distances between the storm, water and sanitary will be maintained as per the MECP requirements.

5.0 PROPOSED STORMWATER MANAGEMENT

5.1 Design Criteria and Methodology

In Ontario, the watershed-level management and planning are typically done using watershed plans, sub-watershed plans and/or individual stormwater management plans, in that order. The subject property is not covered by any specific watershed or sub watershed plans and has no existing stormwater controls in place. In the absence of such plans for the subject property, the MECP *Stormwater Management Planning and Design Manual* (March 2003) is used to govern the management of stormwater. This methodology promotes stormwater management from an environmentally sustainable perspective. The intent of the stormwater management plan is to provide adequate stormwater treatment for both quantity and quality control.

The following design criteria is established based on the Stormwater Management Manual, 2003:

- Stormwater quantity controls will be required to regulate the post-development peak flows to predevelopment levels for all design storms including the 2-, 5-, 10-, 25-, 50-, and 100-year storm events,
- Stormwater quality controls will be required to achieve the "Enhanced" level of protection, which corresponds to 80% long term average removal of Total Suspended Solids (TSS) as recommended in the MECP SWMPD Manual, 2003;

Stormwater Best Management Practices (BMPs) will be implemented at the "lot level" and "conveyance" locations. These concepts are explained further in Section 5.7.1. To summarize, roof water will be directed to grass surfaces that in turn will be collected in enhanced grassed swales or in rear yard/roadway catch basins prior to entering into the proposed storm sewer network.

An existing stormwater management (SWM) pond is located on the northeast side of Perthmore Street as shown on Figure 1, below. In this upcoming phase of development, the existing SWM facility will be retained, and a new independent SWM pond will be built to fulfill the water quality and quantity control needs of the tributary drainage area.

5.2 Overall SWM Strategy

As the existing stormwater pond will continue to serve Phase 5, this new phase will look to direct all runoff towards a new end of pipe facility. The ultimate outlet for this site will remain consistent in being the Perth Long Swamp. Previous submissions for the Perthmore Subdivision Phase 6 Stormwater Management Plan faced hurdles because of the necessity to rebuild the existing Phase 5 pond. Meeting the surficial area requirements for a stormwater management (SWM) facility capable of handling Phase 5's runoff volume proved challenging, prompting an expansion toward the wetland boundary, which was ultimately rejected by the Rideau Valley Conservation Authority (RVCA). Consequently, a fresh approach has been developed to position the new pond outside the wetland boundary, while still ensuring it possesses the requisite capabilities to independently manage Phase 6's stormwater requirements.

An assembled Visual OTTHMO Version 6 (VO6) model was utilized for analysis, necessitating various measured and calculated input parameters, the calculations for which are outlined below.

5.3 Pre-Development Drainage

5.3.1 General

Since the pre-development land use was rural, the NASHYD command was employed in the VO5 model to calculate the runoff flows. NASHYD is used to simulate runoff flows with NASH instantaneous unit hydrograph. This hydrograph is made of a cascade of "n" linear reservoirs. The n (number of linear reservoirs) parameter was set at 3, in the model, and the rainfall losses were computed by the SCS CN procedure.

5.3.2 Time of Concentration/Time to Peak

The Time of Concentration (Tc), for the pre-development drainage basins, was calculated using the Airport Formula.

$$T_c = 3.26 * (1.1 - C) *L^{0.5} * S_w^{-0.33}$$

Where:

Tc = time of concentration in minutes

C = runoff coefficient

L = watershed length in metres

S_w = watershed slope in percentage

From the Tc value, the Time to Peak (Tp) value was calculated as 0.67 times Tc. The parameters employed in the calculation of Tc and Tp for the single drainage basins is shown in Table 1.

Table 1 – Time of Concentration and Time to Peak

Sub- Catchment	Area	Flow Length	Fall	Slope	Tc ¹	Tp ²
	ha	m	m	%	min	hrs
Area 1	12.20	435	7	1.61	54.6	0.61

Notes:

- 1. Airport Formula
- 2. 0.67×Tc

5.3.3 SCS Curve Number

The Curve Number (CN) is the most important parameter in determining surface runoff when the SCS equation is used. Table 2 shows the parameters and the resulting CN value for Area 1.

Table 2 – Hydrologic Parameters

Sub-	Land Use / Soil Type	Land Use / Soil Type	Land Use / Soil Type	Land Use / Soil Type	Runoff	CN ²	la
Catchment	Pasture B (ha)	Pasture C (ha)	Forest B (ha)	Forest C (ha)	Coefficient ¹	(AMC II)	mm
Area 1	5.45	1.76	1.56	3.20	0.16	64.0	6.9

Notes:

- 1. MTO Drainage Management Manual Design Chart 1.07
- 2. MTO Drainage Management Manual Design Chart 1.09

5.3.4 Rainfall

For the rainfall input to the VO5 model, the 12-hour and 24- hour SCS rainfall distribution, representing a high volume lower intensity storm, and a 4 hour Chicago rainfall distribution, representing a high intensity "thunder storm" type of rainfall event were used ion the analysis. The Intensity-Duration-Frequency (IDF) curve was obtained from the Ministry of Transportation (MTO) IDF Curve Lookup tool with the location centred over the property.

5.4 Pre-Development Results

Employing the above noted parameters and the VO5 hydrologic model, Table 3 shows the calculated predevelopment flow values for the 12-hour, 24-hour SCS Type II and 4-hour Chicago rainfall hyetographs. These flow values will be used for the water quantity control assessment of the proposed SWM facility.

Return Period (Yrs)	4-hour Chicago (m³/s)	12-hour SCS (m³/s)	24-hour SCS (m³/s)	
2	0.053	0.114	0.148	
5	0.105	0.211	0.259	
10	0.149	0.278	0.352	
25	0.210	0.383	0.475	
50	0.262	0.463	0.585	
100	0.317	0.560	0.678	

Table 3 – Pre-Development Calculated Peak Flows

5.5 Post-Development Drainage

As discussed in Section 5.2, the proposed stormwater management (SWM) facility will serve the entirety of the Phase 6 development. The proposed SWM facility will receive runoff from future medium and high-density areas located within west block and accounted for which will require their own site-specific stormwater management design, as the development of that block undergoes site plan control. Runoff from these controlled areas will still be directed to the ponds and therefore, undergo a further reduction of peak flow rates. The wooded area to the north of Phase 6 will remain in its natural state and maintain its existing drainage pattern, directing runoff towards the planned end-of-pipe stormwater management facility.

It's essential to highlight that Phase 7 of the Perthmore development, situated in the western block, is slated to have its dedicated stormwater management (SWM) facility to cater to its drainage requirements, subsequently discharging into the Phase 6 SWM facility. Consequently, the sizing of the SWM facility has been meticulously planned to accommodate the flows from all these drainage areas, thereby ensuring comprehensive stormwater management coverage for the entirety of the Perthmore Subdivision.

5.5.1 Post-Development Parameters

For the post-development hydrologic analysis, since the proposed development is fully urban with full municipal services, the STANHYD command was used in the VO5 model. Table 4 shows the post-development input parameters for the VO5 model. The total imperviousness and directly connected parameters were calculated based on a typical lot in the existing development area. The flow lengths for the pervious area were assumed to be 10 m and the flow lengths for the impervious area were calculated by the standard equation in the VO5 model as shown in the notes below the Table 4. Lastly, the slopes used in the model for pervious and impervious areas were assumed to be 2.0% and 1.0% respectively.

Table 4 – Post-Development Hydrologic Model Parameters

					Pervious Area				Impervious Area		
Sub- Catchment	Area	Total Imp	Directly Connected	CN	Slope	Manning's n	IA	Slope	Manning's n	Depression Storage	
	ha	%	%		%		mm	%		mm	
West Block ²	3.43	50.0	35.0	59.0	2.0	0.25	5.0	1.0	0.013	1.0	
Block 70	0.83	0.0	0.0	75.0	2.0	0.25	10.0	1.0	0.013	1.0	
SWM Block ²	0.41	0.0	0.0	75.0	2.0	0.25	10.0	1.0	0.013	1.0	
Developed Portions ^{1,2}	5.32	50.0	35.0	59.0	1.0	0.25	5.0	1.0	0.130	1.0	

Drainage Area ID	Total Area (ha)	Weighted CN Value	Weighted IA Value	Tc³ (min)	Tp⁴ (hr)
UND - Undeveloped Area	2.05	73.0	10.0	19.07	0.22

Notes

- 1. 604(1) 0.56ha, 604(2) 0.23ha, 606 1.19ha, 608 0.79ha, 609 0.16ha, 612 1.21ha, 617 0.48ha, RY1 0.32ha and RY2 0.25ha
- 2 To Pond
- 3. Airport Formula was used to estimate the time of concentration
- 4. 0.67×Tc

5.6 Quantity Control

The quantity control for the site will mainly be provided by the proposed end of pipe facility. For the phase 7 block and the undeveloped portions the hydrologic modelling assumes that the peak flows, up to and including the 100-year storm event will flow through the Phase 6 SWM facility. It is also noted, the west block outflow from future phases has to be restricted to existing levels through on-site SWM quantity controls within the block. The preliminary calculation of the required on-site detention storage is 1,100 m³ for the West Block. The imperviousness value for the SWM block was assumed to be high, considering the rainfall on the block would be converted to direct runoff.

Tables 5 and 6 show the calculated post-development (uncontrolled) and controlled flow values outletting from the proposed SWM facility. As the 24hr SCS storm resulted in higher outflows and more storage requirements, the results are shown below, however, the 4-year Chicago storm and 12-hour SCS storm data can be found in Appendix F.

Table 5 – Post-Development Calculated Flows – Uncontrolled

24 Hour SCS Uncontrolled											
Return Period	West Block	Undeveloped	NAIONAO		Developed Portions	Total	Pre Dev				
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s				
2	0.225	0.061	0.029	0.014	0.197	0.467	0.148				
5	0.336	0.109	0.051	0.025	0.296	0.729	0.259				
10	0.417	0.148	0.069	0.033	0.390	0.989	0.352				
25	0.518	0.199	0.092	0.044	0.490	1.257	0.475				
50	0.606	0.243	0.111	0.054	0.611	1.516	0.585				
100	0.680	0.280	0.128	0.062	0.689	1.716	0.678				

Table 6 – Post-Development Calculated Flows – Controlled

	24 Hour SCS Controlled											
Return Period	West Block	Undeveloped	Block 70	SWM Block	Developed Portions	Outflow From Pond ¹	Total	Pre Dev				
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s				
2	0.225	0.061	0.029	0.014	0.197	0.094	0.097	0.148				
5	0.336	0.109	0.051	0.025	0.296	0.199	0.207	0.259				
10	0.417	0.148	0.069	0.033	0.390	0.275	0.287	0.352				
25	0.518	0.199	0.092	0.044	0.490	0.350	0.366	0.475				
50	0.606	0.243	0.111	0.054	0.611	0.452	0.474	0.585				
100	0.680	0.280	0.128	0.062	0.689	0.557	0.587	0.678				

Notes:

The proposed stormwater management facility has been designed to have sufficient storage to attenuate the post-development peak flows leaving the site. The estimate of the active storage requirements based on the proposed SWM facility has been performed in VO6 and the results are provided in the Table 7 below. To provide the quantity control as shown in the table would require a total of 2,030 m3 of detention storage. Further details of the SWM facility are available within Appendix F, which were used to ensure the conceptual pond met all MECP design criteria. Additional details concerning the configuration and multi-stage flow control outlet of the SWM pond will be finalized as part of the detailed design process.

^{1.} Restricted flow from the West Block SWM facility.

Catchment ID	5-Year	5-Year Required	100-Year	100-Year
	Restricted Flow	Active Storage	Restricted	Required Active
	(m³/s)	(m³)	Flow (m³/s)	Storage (m³)
Phase 6, Centre, East and West Blocks, and SWM Block	0.199	1,090	0.557	2,030

Table 7 – Quantity Control Storage Requirements

5.6.1 Major Drainage Route

The internal storm sewer network within the subdivision will be designed to accommodate the 5-year storm. Storm events greater that 5-year will make use the roadway as the major drainage route, and this will be incorporated into the grading plan design. The roadway will direct these flows to the proposed SWM pond. Rear yard drainage swales and easements will be incorporated to provide additional overflow capacity.

5.6.2 Peak Flow Comparison Summary

The stormwater pond to be constructed on-site will be equipped with a permanent multi-stage outlet flow control structure designed to restrict the outflow rates to meet the quantity control objectives. Based on the available storage and the discharge through the control structure, the peak flow rates to the respective outlets were modelled in VO6 and are summarized below.

24-hour SCS Storm Event								
	POST	PRE						
Return Period	Outflow From Site	Outflow from Site	Post to Pre	Post to Pre				
Yrs.	m³/s	m³/s	Δ	%				
2	0.097	0.148	-0.051	34.5%				
5	0.207	0.259	-0.052	20.1%				
10	0.287	0.352	-0.065	18.5%				
25	0.366	0.475	-0.109	22.9%				
50	0.474	0.585	-0.111	19.0%				
100	0.587	0.678	-0.091	13.4%				

Table 8 – Peak Flowrates Comparison Summary

The Table 8 confirms that the proposed SWM facility will restrict the post-development flow rates to existing levels. The elevation and sizing details of the flow controls can be finalized during the detailed design phase of the development.

5.7 Quality Control

In addition to incorporating treatment train low-impact development designs at the lot and conveyance levels, the end-of-pipe SWM facility is specifically designed to function independently and offer the required Enhanced level of protection to achieve the necessary quality control for the Phase 6 development.

The facility's design will encompass a wet pond configuration, aimed at achieving an enhanced level of water quality control with 80% total suspended solids (T.S.S.) removal capacity. The determination of the necessary storage volume, totaling 165 m3/ha, was derived using Table 3.2 from the Stormwater Management Planning and Design Manual, factoring in the weighted impervious level of 46% for the entire tributary drainage area. To prevent downstream pond flooding, the MECP Manual (Section 3.3.2) recommends increasing the extended detention capacity from 40m3/ha to 80m3/ha in cases where upstream storage facilities are in place, as dictated by the requirements for the West Block's storage needs. This increase to the extended detention reduces the permanent pool volume, as the majority of the runoff reaching the site has already achieved the 80% TSS removal from the upstream facilities. With that, the permanent pool for this site is required to be 966 m³ with an extended detention volume (458 m³) can be combined with the water quantity volume detailed.

The SWM pond has a combined storage volume of 3,911 m3, with a designated allocation of 1,881 m3 specifically designated for permanent pool storage. As noted, conceptual pond details are included in Appendix F, which include forebay calculations, and extended detention drawdown, pond cleanout, emergency spillway, outlet control device sizing and stage storage discharge tables that were used in modelling the site in VO6. All these features meet MECP requirements and will be further vetted and refined through the detailed design. The total permanent pool volume to be provided will exceed the minimum volume requirement for quality control.

Permanent Pool Permanent Pool **Extended Detention** Permanent Pool Drainage Area Volume Required Volume Required Volume Accounted Volume Provided 80 m³/ha 85 m³/ha 11.21 ha 1850 m³ 1881 m³ $458 \, \text{m}^3$ 953 m³

Table 9 - MECP Table 3.2 Quality Control Storage Requirements

Considering the information presented in the table and the inclusion of additional treatment train low-impact development (LID) features, it is clear that the proposed SWM plan will surpass both the required enhanced level of protection and the statutory quality control standards.

5.7.1 Best Management Practices

The entire subdivision will employ Best Management Practices (BMPs) wherever possible. The intent of implementing stormwater BMPs throughout the entire development is to ensure that water quality and quantity concerns are addressed at all stages of the development. Stormwater BMPs will be implemented at lot, conveyance and end of pipe levels.

Lot level BMPs include the directing of roof leaders onto grassed areas (downspout disconnections), minimizing ground slopes and maintaining as much of the lot as possible in a natural state. Roof leaders will flow to grass areas, which will provide an opportunity for initial filtration of any sediment and provide an opportunity for absorption and ground water recharge. Recent recommendations by a number of Conservation Authorities and the MECP suggest that yard grading as flat as 0.5% be implemented to promote infiltration. The target range for finished ground slopes will be 1% - 5% where possible. This range of slope will still provide an opportunity for the absorption and filtration process.

The conveyance system to be employed within the subdivision is a combination of side/rear swales and road catch basins. All swales will be constructed at minimal gradient where possible, thus promoting infiltration, as well as providing some opportunity for filtration. The gradient of the system will be enough to ensure the continuous flow of stormwater, limiting any standing water. Riprap will be placed at erosion-prone areas and all disturbed areas shall be re vegetated as soon as possible.

6.0 LOW IMPACT DEVELOPMENT

As the practice of SWM has evolved, increasing emphasis has been placed on treating the runoff as close as possible to the source using a sequence of treatment methods called "treatment train approach". As a result, Low Impact Development approaches were established to mimic the existing natural hydrologic environment and to allow the rainwater to infiltrate, filter and evaporate close to the source.

Typical LID practices include Rainwater harvesting, green roofs, downspout disconnection, soak away pits, infiltration trenches and underground chambers, bio-retention cells, vegetated filter strips, enhanced grass swales and permeable pavements.

6.1 Treatment Train

Based on the type of the proposed development and the available geotechnical information, downspout disconnections (lot level), enhanced grass swales (conveyance level) and infiltration basins (conveyance and end-of-pipe level) are identified to be the most suitable LID features for the site.

The feasibility of alternative LID features like rainfall harvesting, green roofs, or soak away pits on this site could be limited by their demanding operation and maintenance prerequisites, especially when installed on private properties, where municipal oversight may be challenging to enforce. Moreover, implementing LID features on roadways, such as permeable pavement or bioswales, could pose challenges if proper maintenance is not ensured, potentially negatively impacting the overall development. The soils in the area are not conducive to accepting stormwater runoff due to the high drawdown timing requirement and are thus likely to remain full at the next storm event, which will render them inefficient.

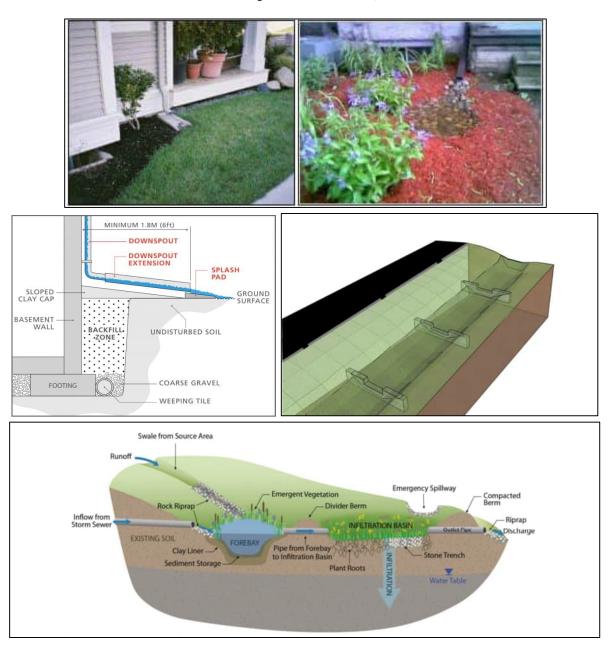
Lot Level - Downspout disconnection involves directing the runoff from roof leader downspouts to a pervious area, which drains away from the building. This gives an opportunity for the runoff to infiltrate before it reaches the typical curb and gutter system on the street. This also prevents the stormwater runoff from directly entering the storm sewer system or flowing across a "connected" impervious surface such as driveways.

Conveyance Level - Enhanced Grass Swales are designed as vegetated open channels that serve multiple functions in stormwater management. Traditionally, simple grass channels or ditches have been utilized for stormwater conveyance, especially for road drainage. However, enhanced grass swales go beyond the basic design by incorporating modified geometry and check dams to enhance their performance in terms of contaminant removal and runoff reduction. These design features improve the functionality of simple grass channels and roadside ditches, providing more effective treatment of storm sewer runoff. Drawing upon the geotechnical findings anticipated during the future detailed design stages of development, the integration of

an infiltration trench into these enhanced grass swales can enhance both the quality control measures and the fulfillment of water balance infiltration targets.

End-of-pipe Level - To promote infiltration and enhance the stormwater management facility, an infiltration basin will be integrated into the outflow from the wet cell. An infiltration basin will be planned and integrated into the SWM pond's outflow system, positioned beyond the wet cell and above the permanent pool elevation. This design aims to fulfill the water balance infiltration objectives. It is advisable to position the infiltration trench past the wet cell area to mitigate the risk of sedimentation and clogging. The storage capacity within the infiltration basin has been excluded from the SWM pond storage calculations. Consequently, any volume retained and infiltrated through this basin will supplement the storage volumes allocated for the permanent pool of the SWM facility. This strategic placement ensures that the stormwater runoff is efficiently managed and encourages the natural process of infiltration, thereby facilitating groundwater recharge and reducing the volume of runoff leaving the proposed development.

Figure 1 – Typical Downspout Disconnection, Enhanced Grass Swale and Infiltration Basin (LID Planning and Design Guide, CVC 2011)



It is important to acknowledge that the recommendations for Low Impact Developments (LIDs) are made based on the available information. However, it is recognized that the design and recommendations may need to be revaluated and potentially adjusted during the detailed design phase, considering the geotechnical information and the maintenance requirements imposed by the Town of Perth. A conceptual LID treatment train plan illustrating the proposed LID features is included in Appendix F.

7.0 WATER BALANCE

7.1 Purpose

The RVCA, in their review comments, have requested an examination of the site's water balance to verify that it hasn't diminished the overall infiltration volumes, particularly considering the site's location in a sensitive groundwater aquifer area. As such, the following provides a review of the conceptual water balance, complete with mitigation measures for the site which were reviewed and broken into the requirements for the developed portion of the land as well as the individual blocks to provide guidance to the designers when they proceed through their site plan control process.

7.2 Land Use



Figure 2 - Land Use

The current vacant land is predominantly a mixture of pasture sections (generally the western, southern and central portions of this phase) and treed areas (generally the northern and eastern extremities of this phase). Perthmore subdivision is directly adjacent to the Perth Long Swamp wetland which surrounds the site to the north, east and west. It is acknowledged that the Provincially Significant Wetlands are a significant natural heritage feature therefore, tree removal and other disturbances will be limited as much as possible. The entire undeveloped site is sloped toward the above-noted wetland. Elevations range from 134 m at the northeast corner of the site to 141 m at the highpoint of the property.

7.3 Soil Conditions

A detailed Geotechnical Report is not available at the conceptual design stage. Therefore, MP used the publicly available documents on AgMaps to review the soils for the site. The area is primarily comprised of Hydrological Soil Group B and C soils through the developed portion of land. The surrounding wetland is Hydrological Soils Group D. Based on the previous phase, McIntosh Perry has assumed that here is approximately 2' or 0.6m of soil overlaying bedrock. This relatively thin soils have been accounted for within the calculations to determine the soil moisture retention capacities of the soils. It is anticipated that during the detailed design stage, a geotechnical report will be completed at which time, these values can be updated if required.

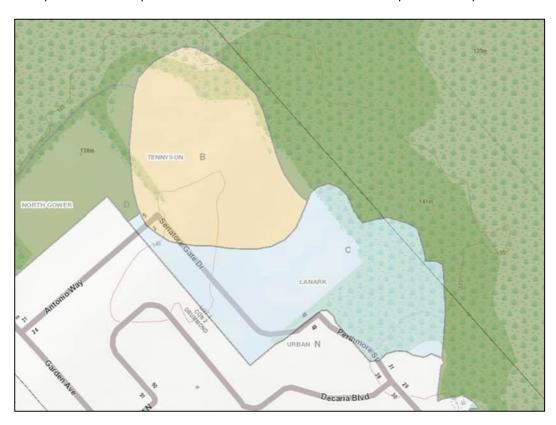


Figure 3 - AgMaps - Site Soils

7.4 Stormwater Management

As part of this assignment and to satisfy both RVCA and the Town, a servicing and stormwater management report has been prepared to ensure that the design criteria from both review agencies along with recommendations from the MNRF, MTO and MECP are adhered to. Site-specific stormwater management facilities will be located in the future high-density west block, which will be required to meet site-specific stormwater management criteria in order to be developed.

The stormwater management (SWM) strategy implemented for the Perthmore Subdivision Phase 6 adopts a treatment train approach, integrating a sequence of controls at various stages to effectively manage stormwater runoff. This comprehensive approach encompasses lot-level controls, conveyance controls, and

end-of-pipe controls to address stormwater management requirements. Lot-level controls include measures such as downspout disconnection, which redirect roof runoff away from impervious surfaces and promote infiltration or reuse. Conveyance controls, such as enhanced grass swales, are incorporated to efficiently convey stormwater runoff while enhancing pollutant removal and runoff reduction capabilities. Lastly, end-of-pipe controls, such as infiltration basins, are implemented to facilitate the final treatment and infiltration of stormwater before it is discharged into the receiving environment. With the combination of these facilities, the mitigation measures that will be discussed below and the ultimate end of pipe facility, will ensure that runoff reaching the wetland is controlled to pre-development rates and exceeds an enhanced level of quality control (80% Total Suspended Solids (TSS) removal).

7.5 Water Balance Calculations

7.5.1 Data

Potential impacts to the existing wetland were reviewed through the use of standard water balance calculations. Data from Environment Canada for the Ottawa International Airport was used to calculate the runoff surplus and total precipitation for the site. Environment Canada data was limited to the precipitation and temperature data, while the remaining information was calculated using the Thornthwaite-Mather water balance methodology as described in the "Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance, C.W. Thornthwaite and J.R. Mather, 1957". Please see sample typical calculations within Appendix D. The pre- and post-development conditions were subdivided for the water balance as follows:

Soils:

- Sandy loam, noted to be HSG B; and
- Silt / clay loam, noted to be HSG C.

Pervious Land uses:

- Pasture overtopping sandy loam;
- Pasture overtopping silt/clay loam;
- Forest overtopping sandy loam; and
- Forest overtopping silt/clay loam.

Impervious Land Uses:

Dwellings and asphalt.

The infiltration factors were chosen based on the following data:

Table 10 - Infiltration Factors from the "Tier 1 Water Budget and Water Quantity Stress Assessment" prepared by the Mississippi-Rideau Source Protection Region, August 2009

Description of Area / Development Site	Value of Infiltration Factor
Topography	
Flat Land (<1.5 slope range)	0.172
Rolling land (1.5 – 3% slope range)	0.120
Hilly land (>3% slope range)	0.073
Soil	
Low (clay, silt)	0.10
Low-Medium (till, sand-silt)	0.15
Medium (till, silty sand)	0.20
Medium-High (sands)	0.30
High (gravel, sands, organic deposits)	0.40
Variable (till)	0.20
Variable (fill)	0.40
Variable (sand)	0.35
Variable (bedrock)	
Precambrian Bedrock	0.20
Paleozoic Bedrock	0.05
Land Cover	
Low Infiltration – urban, aggregate	0.05
Medium Infiltration – agriculture, pasture,	0.10
abandoned fields, wetland	
High Infiltration – forest and plantation	0.20

For pre-development, the site has slopes generally under 1.5%, and as such was assigned a topographic infiltration factor of 0.172.

The soil classification was predominately sandy loam (infiltration rate of 0.2) for the HSG B soils and 0.15 for the HSG C soils.

The site is comprised of open vegetated areas which will results in a value of 0.10 being used and in forested areas, a land cover infiltration factor of 0.20 was used.

The soil classification for each area will not be changed for the pervious surfaces. This will be confirmed when the detailed grading design is advanced.

7.6 Sensitivity Analysis

Each of the land use and soil type was reviewed based on Table 10 of the Thornthwaite – Mather literature to obtain the applicable soil moisture retention of the underlying soils. The soil moisture retention used in our calculations is provided as "mm/m", therefore once the average on-site soil depth above the groundwater (is estimated to be 0.6 m) was applied, a corresponding site-specific soil moisture retention value was obtained for each category above. These soil moisture retention values are used to determine the soil moisture storage,

given the accumulated water losses which are calculated based on the climatic data (temperature and precipitation) for the site. These tables are only noted in specific depths (25 mm and 50 mm intervals), therefore in some instances, the closest possible table was used. Table 11 below illustrates an example at a soil moisture retention value of 75 mm. Located in Appendix G, calculations for 75 mm, 100 mm, 125 mm, 150 mm, 200 mm, 250 mm, 350 mm and 400 mm were completed as part of a bulk sensitivity analysis for the surplus data. Results of this analysis, as calculated for each soil moisture value noted above, indicate that changing moisture retention values by 25 mm to 50 mm yields approximately 1% change in water surplus. This would indicate that regardless of whether the soils had 150 mm or 200 mm of moisture retention, the difference in surplus will be minor.

Table 11 – Monthly Water Balance Example - 75mm - Climate Data per Environment Canada data for Ottawa International Airport (1981 - 2010)

Month	Temp	Heat Index	PET	Р	Δ P = P - PET	WL	ST	ΔS	AET	D	S	RO	SMRO	TR	DT
January	-10.3	0	0	65	65		217	0	0	0	0	11	0	11	228
February	-8.1	0	0	54	54		271	0	0	0	0	5	0	5	276
March	-2.3	0	0	64	64		336	0	0	0	0	2	0	2	338
April	6.3	1.4	32	75	43		75	0	32	0	43	22	26	48	166
May	13.3	4.4	79	80	2		75	0	79	0	2	12	117	129	206
June	18.5	7.2	112	93	-19	-19	57	-18	111	1	0	6	59	65	122
July	21	8.8	133	92	-41	-60	33	-24	116	17	0	3	29	32	65
August	19.8	8.0	114	86	-29	-88	22	-11	97	18	0	2	15	17	39
September	15	5.3	73	90	17		39	17	73	0	0	1	7	8	47
October	8	2.0	34	86	52		75	36	34	0	17	9	4	13	105
November	1.5	0.2	5	82	77		75	0	5	0	77	43	2	45	197
December	-6.2	0	0	76	76		151	0	0	0	0	22	1	23	174
Total		37.4	580	944				0	545	35	138	138	260	398	

PET = Potential Evapotranspiration, P = Total Precipitation, $\Delta P = P-PET$, WL = Accumulated Water Loss, ST= Storage, $\Delta S = Soil Moisture Storage$, $\Delta S = Soil Moisture Storage$, $\Delta S = Soil Moisture Deficit$, S = Soil Moisture Surplus, S = Soil Moisture Deficit, S = Soil Moisture Detention

Note: Shaded cells taken from Thornwaite-Mather Tables. See sample calculation in Appendix D for cell by cell calculations. Total Surplus for example above is 398mm.

Monthly T from Environment Canada:

Heat Index (I) = 37.4, a: 1.06

Sample Calculations:

Calculated Potential Evapotranspiration (PET)

Thornthwaite Equation:

$$PET = 16 \left(\frac{L}{12}\right) \left(\frac{N}{30}\right) \left(\frac{10Ta}{I}\right)^{\alpha}$$

L = Average Daylight (hours)

N = Number of Days per Month

Ta = Average Temperature (°C)

I Heat Index
$$I = \sum_{i=1}^{12} \left(\frac{Tai}{5}\right)^{1.514}$$

$$\alpha = (6.75 \times 10^{-7}) I^3 - (7.71 \times 10^{-5}) I^2 + (1.792 \times 10^{-2}) I + 0.492$$

Example April

Temperature (Ta) = 6.3°C

$$I = (Tai/5)^1.514 = (6.3/5)^1.514 = 1.4$$

Sum of all months I = 37.4

$$\alpha = (6.75 \times 10^{-7}) 37.4^3 - (7.71 \times 10^{-5}) 37.4^2 + (1.792 \times 10^{-2}) 37.4 + 0.49239 = 1.06$$

L = 13.6 hours, N = 30 days

PET = $16 \times (13.6/12) \times (30/30) \times ((10\times6.3)/37.4)^1.06 = 32$ mm

Change between Precipitation and Potential Evapotranspiration ($\Delta P = P-PET$)

Example April

P = 75mm

PET = 32mm

 $\Delta P = P - APET = 75mm - 32mm = 43mm$

Accumulated Water Loss

All Values where the ΔP are negative are brought forward and accumulated on a monthly basis

Example July

 ΔP June = -19mm

 ΔP July = -41mm

WL July = -19mm + -41mm = -60mm

Soil Moisture Storage

Starting Values Taken from Table 10 of Thornthwaite Mather's Water Balance 1957 for individual soil type.

For sample calculations below, assumed soil moisture storage maximum of 75mm. Start in first month with positive temperature (April), carry (75mm) to next month where ΔP is positive. When ΔP becomes negative, accumulated water loss (WL) is reviewed and the reduced soil moisture storage is inserted into the spreadsheet based on the Tables within the Thornthwaite Mather's Water Balance 1957. For the example, Table 25 is used for 75mm soil water retention. The values are then inserted into the ST table based on the corresponding WL for the given month.

WL July = -60mm

Table 25 is used and a ST of 33mm is obtained

Upon positive ΔP values, the ΔP and ST_{i-1} are added together for that months ST value until the maximum soil moisture storage is achieved.

ST September = ΔP September + ST_{i-1} (August) = 17mm + 22mm = 39mm

Upon achieving the maximum soil moisture storage, no additional storage is available until the temperature falls below -1°C, when snow is said to be able to be stored above the ground. At that time the P is added to the previous months ST (ST_{i-1}) until the temporary is above -1°C and snow melt occurs.

Change in Soil Moisture Storage

Change in Soil Moisture Storage = Soil Moisture Storage – Soil Moisture Storage of the previous month

$$(\Delta S = ST - ST_{i-1})$$

Example June

Storage (ST - May) = 75mm

ST June (Table 25, Thornthwaite Mather, 1957) = 57mm

 $\Delta S = 57 \text{mm} - 75 \text{mm} = -18 \text{mm}$

Actual Evapotranspiration (AET)

Three Situations Exist:

- 1) No PET therefore, AET = 0 if, PET = 0;
- 2) WL > 0. AET = PET if, Soil Moisture Storage Capacity is positive; and
- 3) WL < 0. AET = Soil Moisture Storage Capacity + Total Precipitation (AET = Δ S + P_T).

1) Example January

AET = 0 as PET = 0

2) Example April

WL = 0mm

ST = 75mm

PET = 32mm = AET

3) Example July

```
WL = -41 \text{ mm}
```

 $\Delta S = -18$ mm (June)

P (June) = 93mm

AET (June) = $18mm + 93mm = 111mm *Note disregard \Delta S sign.$

Monthly Soil Moisture Deficit or Surplus

Three Situations Exist:

- 1) Where Accumulated Potential Water Loss is lower than 0mm, a deficit exists;
- 2) Where Soil Moisture Capacity is above its maximum, a surplus exist; and
- 3) Where Soil Moisture Capacity is less than the maximum but there is no Accumulated Potential Water Loss, the runoff is being absorbed by the soil (soil is either wetting or drying).

1) Example Deficit (July):

```
WL = -41mm
```

ST (July) = 33mm

 ΔS (July) = -24mm

PFT = 133mm

AET = 116mm

Soil Moisture Deficit (July) = PET – AET = 133mm – 116mm = 17mm

2) Example Wetting (September)

```
WL = 0mm
```

ST (August) = 22mm

 $\Delta P = 17mm$

ST (September) = ΔP + ST (August) = 17mm + 22mm = 39mm, less than 75mm therefore wetting, no surplus, S = 0

3) Example Surplus (October):

WL = 0mm

S (September) = 39mm

 $\Delta P = 52mm$

Soil Moisture Surplus (October) = ΔP + S(September) = 39mm + 52mm = 91mm, as it is over 75mm, 75 is carried and the additional volume is a surplus of 91mm – 75mm = 16mm

Water Runoff

Thornthwaite Mather (1957) noted that the surplus water runoff values in no month can cause a runoff higher than 50% of the its total surplus volume, therefore, 50% is attributed to the month with the initial surplus, then carried forward at a 50% per month value until it is dissipated (i.e.: reaches 0mm).

For this example (rounded to the nearest mm), start at October;

 $S_{Oct} = 17mm$

 $RO_{Oct} = 17mm/2 = 9mm$

November

 $S_{Nov} = 77$ mm,

 $RO_{Nov} = (Remaining RO_{Oct} + S_{Nov})/2 = (9mm + 77mm)/2 = 43mm$

December

 $RO = (Remaining RO_{Nov} + S)/2 = (43mm + 0mm)/2 = 22mm.$

This continues until 0mm is reached.

Snow Melt Runoff (SMRO)

Thornthwaite Mather (1957) noted that in areas with an elevation under 500m above sea level, that in the first month with temperatures above -1°C, only 10% of snow melt runoff occurs. A maximum of 50% melt will occur in each successive month until it is dissipated (i.e.: reaches 0mm).

For this example (rounded to the nearest mm), start at April (first positive average temperature, total snow fall is 260mm, note: 260mm = precipitation accumulated in months with negative temperatures (December through to March);

April

SMRO = 10% = 26mm, remaining 90% (234mm) brought forward to May;

May, 234mm x 50% = 117mm, carry remaining 117mm to June;

June, $117mm \times 50\% = 59mm$.

This continues until 0mm is reached and all snow melt has been accounted for.

Total Runoff

Total runoff is the sum of the water runoff and snow runoff for each month.

TR (April) = RO_{April} + $SMRO_{April}$ = 22mm + 26mm = 48mm

7.6.1 Sensitivity Analysis Conclusion -For Soil Moisture Maximum Capacity

McIntosh Perry completed a sensitivity analysis on the soil moisture capacity and found that for soil depths above 100mm, the annual surplus volume in millimetres diminished at a rate of less than 1%/year per 25mm of available soil. Therefore, as the depths of soils have been averaged across the site and a conservative approach has been pushed forward, it is not expected that in concentrated areas where the soil is less than the indicated depth that the soils will function materially different.

7.7 Pre-Development, Post-Development and Post-Development with Mitigation

Under pre-development, post-development and post-development with mitigation, precipitation, drainage, and infiltration conditions were reviewed. In pre-development, one consolidated area was used, whereas in post-development and post-development with mitigation, the site was broken into each block (west, central, and east) as well as the remaining roadways, residential lots, SWM block and Block 70. The purpose of this breakdown is to provide each of those block's guidance when it comes to the site plan control to achieve

approval in order to meet the site-specific stormwater management criteria. If they were not separated from the "main" area, it would be difficult to break out their individual contributions for the future. The summary, however, combines all together to ensure that the site meets the requirements of pre-development as desired by the RVCA. The results have been summarized below:

Characteristic	Pre- Development	Post- Development	Change (Pre – to Post)	Post- Development with Mitigation	Change (Pre- to Post- with Mitigation				
Developed Lands to Perth Long Swamp Pre = Post Areas									
	Input (Volumes)								
Precipitation (m³/year)	115168	113658	-1%	113658	-1%				
Output (Volumes)									
Total Infiltration (m ³ /year)	23051	16367	-29%	22549	-2%				
Total Runoff (m³/year)	23876	50248	110%	44066	85%				

Table 12 - Summary Water Balance Table

Table 12, above, illustrates that the pre-and post-development areas for the entire development remain relatively similar. The total infiltration is illustrated to indicate that in all instances, the development on-site (i.e.: when comparing post- to pre-development) results in a reduction in infiltration. To address the deficiency, infiltration-promoting measures will be required to ensure runoff is intercepted and permitted to recharge the groundwater aquifer.

Finally, the total runoff illustrated confirms that the wetland will see an increase in total volume as a result of the development. This will result in additional volume within the wetland temporarily until it is permitted to flow downstream. This information is critical for the natural sciences consultant to confirm that the vegetation communities are capable of withstanding the additional volume of runoff over the short term. The evaluation of the potential increase in runoff and its associated impacts on Perth Long Swamp is evaluated in Section 8.0. Please see Appendix G for the water balance tables broken out for each catchment.

7.8 Mitigation Measures

As a result of the lack of recharge when comparing post- to pre-development, the project will require infiltration trenches to ensure that the volume of runoff required enters the ground, providing groundwater recharge and continuing to ensure that the aquifer is maintained.

In order to design the trenches, the 5 mm event was reviewed. Environment Canada data as shown in Table 13 below, indicates that there are 25.2 days with rain over 10 mm, 46.5 days with rain over 5 mm and 118.4 days of rain over 0.2 mm. Therefore, at a minimum there is:

- (46.5 25.2) days = 21.3 days x 5 mm = 107 mm; +
- (118.4 46.5) days = 71.9 days x 0.2 mm = 14 mm;
- Summing these volumes = 107 mm + 14 mm = 121 mm of minimum total volume that would be anticipated to be captured if the trenches are designed to accept the entire 5mm storm event.

1981 to 2010 Canadian Climate Normals station data														
					Days v	with Rai	<u>nfall</u>							
	Jan	Feb	Mar	Apr	May	Jun	<u>Jul</u>	Aug	Sep	Oct	Nov	Dec	Year	Code
>= 0.2 mm	4.4	3.9	6.7	10.9	13.4	13.2	11.9	11	12.3	13.7	11	6	118.4	<u>A</u>
>= 5 mm	1.6	1.2	2.1	4	4.9	5.8	5.4	4.8	5.1	5	4.2	2.3	46.5	A
>= 10 mm	0.87	0.57	1	2	2.7	2.9	3.1	2.8	3.2	2.7	2.1	1.2	25.2	A
>= 25 mm	0.13	0.07	0.10	0.33	0.47	0.73	0.77	0.67	0.60	0.47	0.43	0.13	4.9	<u>A</u>

As described above, the mitigation measures were reviewed for each catchment. The exact geometry and location within the catchment will be completed by the civil engineering team during the detailed design of the development. Based on the volume to be infiltrated, mitigation measures meet or exceed the required infiltration volume required to balance the site.

Table 14 - Mitigation Measure Sizing - Development Lands to Perth Long Swamp

Description	Phase 6 (Bk 70, SWM Bk, Residential Lots and Roadway)	West Block
Area of Asphalt (m²)	26600	17150
Asphalt Runoff Coefficient	0.9	0.9
Volume of Runoff in 5 mm Event (m ³) to be infiltrated	120	77
Mitigation Required (m³/yr)	2873	1852
Annual Volume to be infiltrated by designing for 5 mm Event (m³)	2897	1868

Based on the analysis conducted, it is recommended to provide an infiltration storage volume of 120 cubic meters for the Phase 6 developments to meet the annual water balance infiltration targets. Additionally, a volume of 108 cubic meters should be allocated for the future west block to meet the annual water balance infiltration targets. To determine the rough sizing of the infiltration trench, typical depths of 0.5 meters and 0.75 meters were assumed. The resulting footprint area requirements are summarized in the following table, which helps estimate the necessary surface area for the implementation of the infiltration trench and ensure sufficient storage capacity for infiltration purposes. Detailed calculations are included in Appendix G.

Table 15 – Infiltration Trench Footprint Requirements

Description	Infiltration Target (m³)	Assumed depth (m)	Footprint (m²)
Phase 6 Developments	26.600	26,600	
Priase o Developments	20,000	0.75	400
Most Block	17.150	0.50	540
West Block	17,150	0.75	360

7.8.1 Drawdown Of Infiltration Trenches

As detailed above, the trenches were sized to fully capture the 5 mm storm. The design criteria typical for a site draining to a wetland is that the trenches must be able to drawdown fully between 5 mm storm events. It is acknowledged that in larger events, the trenches will be overtopped and the grading on site will provide conveyance measures to direct the overtopped runoff towards the stormwater management facilities. With the assumed infiltration rates noted below, the drawdown values were reviewed to verify that the trenches were empty between 48-72 hrs as recommended by the TRCA.

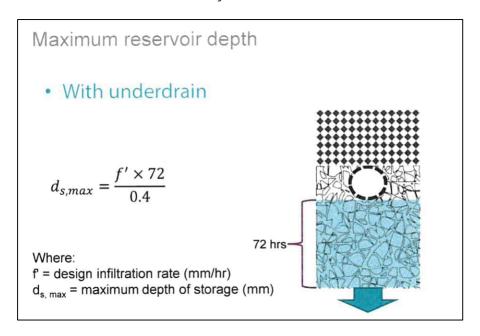


Figure 4 - Maximum Reservoir Depth (TRCA, 2018)

Table 16 - Drawdown Calculations

	Phase 6 Developments	West Block
Assumed Infiltration Rate (mm/hr)	25	25
Assumed Factor of Safety	4.5	4.5
Corrected Infiltration Rate (mm/hr) *assumed	5.5	5.5
Maximum Depth of Storage – 72 hrs (mm)	990	990
Maximum Depth of Storage – 48 hrs (mm)	660	660
Depths of Trenches Provided On Site (mm)	500 / 750	500 / 750
Meets Infiltration Drawdown Criteria	Yes	Yes

As indicated above, the infiltration trench is anticipated to empty between 48 – 72 hrs and therefore, is assumed to meet the drawdown criteria and is anticipated to function as intended by being empty within 2 to 3 days of a 5 mm storm event.

8.0 ANALYSIS OF IMPACTS TO THE WETLAND

The drainage flow from the site will be directed towards the underground storm sewer network before reaching the stormwater management pond, ultimately discharging into the wetland. To prevent downstream erosion and manage surface flows effectively, riprap and other flow spreaders will be employed at the pond outlet, dispersing surface flows and dissipating their energy before directing them toward the wetland. This strategy aims to distribute concentrated flows across a wider area, mitigating the risk of erosion downstream.

To evaluate the water quantity effects of uncontrolled post-development flows, we conducted calculations to determine water depths in the wetlands under both pre-development and post-development scenarios. In this analysis, we first multiplied the runoff depth obtained from the VO6 model results by the tributary drainage area to calculate the runoff volume. Subsequently, we divided this volume by the wetland's surface area to determine the water depth within the wetland. It's important to note that this approach is conservative as it assumes the presence of "vertical walls" around the wetland, potentially underestimating the water depths compared to scenarios where the wetland surface area is greater and water depths may be lower than indicated in the table below.

Pre and Post Development Runoff from the site to Perth Long Swamp Pre-Post-Pre-Post-Pre-Post-Return developmen developmen developmen developmen developmen developmen Difference Period t Runoff t Runoff t Depth in t Depth in t Runoff t Runoff (mm) Volume Wetland Wetland (yrs) Volume Depth (mm) Depth (mm) (m3)(m3)(mm) (mm) 2 11.16 1362 23.06 2813 0.30 0.63 -0.32 5 19.12 2333 34.05 4153 0.52 0.92 -0.4010 25.64 3128 42.51 5186 0.70 1.15 -0.4625 34.22 4175 53.21 6491 0.93 1.44 -0.5150 41.89 5111 62.48 7623 1.14 1.69 -0.56100 48.33 5896 70.11 8553 1.31 1.90 -0.59

Table 17 – Water Depths in Perth Long Swamp

As shown in Table 17, the maximum increase in water depth in the wetlands is approximately 0.6 mm for the 100-year storm event. This increase in water elevation will have negligible impact on the wetlands or the downstream systems.

In conclusion, the overall area of the Perth Long Swamp wetland is immense when compared to the size of this site. Any additional volume, in excess of pre-development volume, once the pond and mitigation measures are in place will not make a measurable difference to the guality, function and operation of the wetland.

9.0 ENVIRONMENTAL COMPLIANCE APPROVAL

In compliance with Ontario's 2021 mandatory stormwater management (SWM) criteria for consolidated linear infrastructure, an environmental compliance approval will be necessary. As part of the approval process, a

detailed application will be prepared and submitted during the detailed design phase. This application will include comprehensive information on the storm sewer infrastructure, the proposed design and function of the SWM facility, associated control structures and other relevant details.

10.0 SEDIMENT EROSION CONTROL

10.1 Temporary Measures

Before construction begins, temporary silt fence, straw bales or rock flow check dams will need to be installed at all-natural runoff outlets from the property. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

The Contractor, at their discretion or at the instruction of the Town of Perth, RVCA or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way into the storm sewer network on site. The straw bales and silt fences shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment from the fences and check dams as required.

Work through winter months shall be closely monitored for erosion along sloped areas. Should erosion be noted, the Contractor shall be alerted and shall take all necessary steps to rectify the situation. Should the Contractor's efforts fail at remediating the eroded areas, the Contractor shall contact the Conservation Authority to review the site conditions and determine the appropriate course of action.

As each lot is developed, proper sediment and erosion controls will need to be installed and maintained. Sediment controls shall consist of, at minimum, straw bales at the down gradient property line. Grass shall be established as soon as possible, and excess fill shall be removed or leveled promptly. All manholes, catch basins and other drainage structures shall be covered in geosock when installed.

10.2 Permanent Measures

Rip-rap will be placed at all locations that have the potential for concentrated flow. It is crucial that the Contractor ensure that the geotextile is keyed in properly to ensure runoff does not undermine the rip-rapped area. Additional rip-rap is to be placed at erosion prone locations as identified by the Contractor / Contract Administrator / Town of Perth or RVCA.

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed/sod and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon as possible and must be located a sufficient distance from any watercourse to ensure that no sediment is washed out into the watercourse. As the vegetation growth within the site provides a key component to the control of sediment for the site, it must be properly maintained once established. Once the construction is complete, it will be up to the landowner to maintain the vegetation and ensure that the vegetation is not overgrown or impeded by foreign objects.

11.0 SUMMARY

- A new subdivision with 34 single family homes, 38 semi-detached homes and 14 apartment units will be constructed in Phase 6 of the Perthmore Subdivision.
- Proposed watermains ranging in diameter from 200mm to 300mm will be installed throughout the subdivision and will have multiple connection points to existing infrastructure.
- The proposed sanitary sewer will be 200 mm in diameter, will be installed throughout the subdivision and will gravity drain through the existing subdivision infrastructure though multiple connections.
- The proposed storm sewer, ranging in diameter from 250 mm to 900 mm, will be installed throughout the subdivision and will drain to a newly proposed stormwater management facility.
- The proposed treatment train low-impact developments, in combination with the end-of-pipe stormwater management facility, will collectively deliver both stormwater quality and quantity controls.
- A review of water balance criteria indicated the necessity for mitigation measures to achieve predevelopment infiltration volumes, and while infiltration trenches have been suggested, final design details, including placement, will be determined in conjunction with the detailed grading and drainage plan during the detailed design phase.
- By maintaining post-development stormwater management and water balance criteria within the limits
 of pre-development rates and volumes and positioning the pond upstream of the wetland, there are no
 expected adverse effects on the Perth Long Swamp.
- Sediment and erosion protection measures will be installed as soon as ground conditions warrant and permit and shall remain in place until construction is complete, and vegetation is re-established.

12.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that the Town approve this Preliminary Servicing and Stormwater Management Report in support of the Draft Plan of Subdivision Application for Phase 6 of the Perthmore Subdivision.

Please feel free to contact the personnel below if you have any questions or concerns.

Regards,

McIntosh Perry Consulting Engineers Ltd.



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13.0 STATEMENT OF LIMITATIONS

This report was produced for the exclusive use of Perthmore Developments Co. The purpose of the report is to assess the existing servicing infrastructure and to provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, Town of Perth and local approval agencies. McIntosh Perry reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by McIntosh Perry and site visits were performed, no field verification/measures of any information were conducted.

Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. McIntosh Perry accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, McIntosh Perry should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

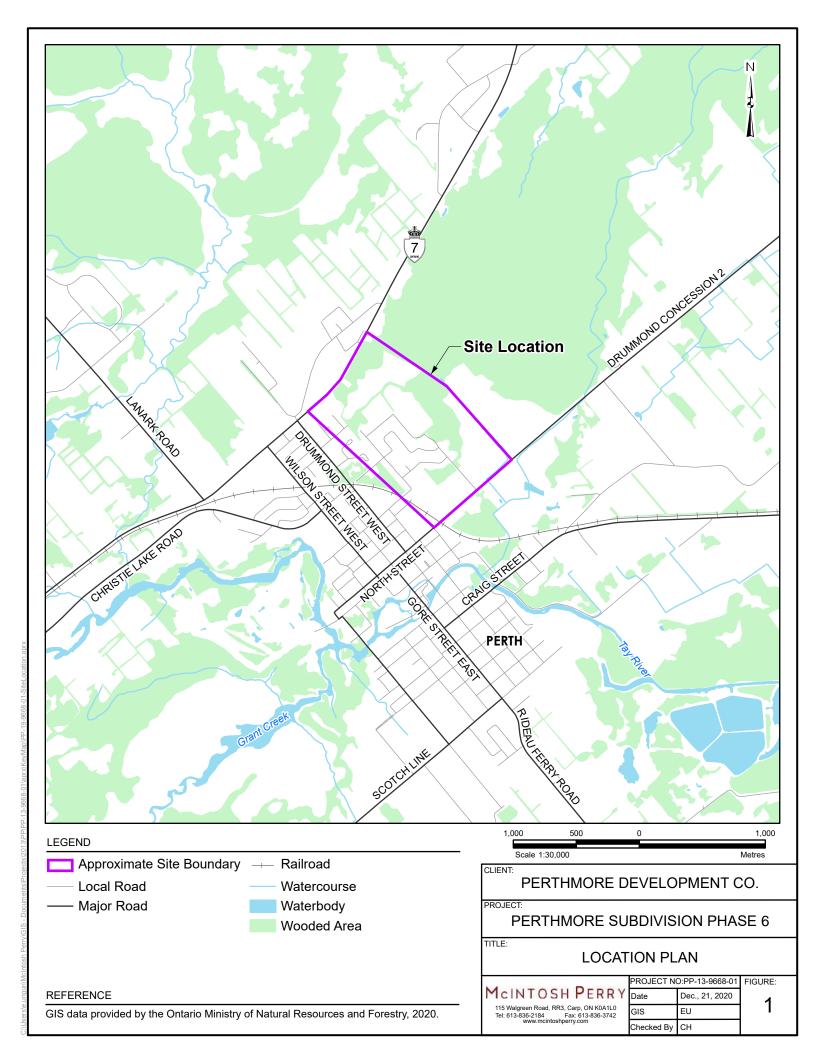
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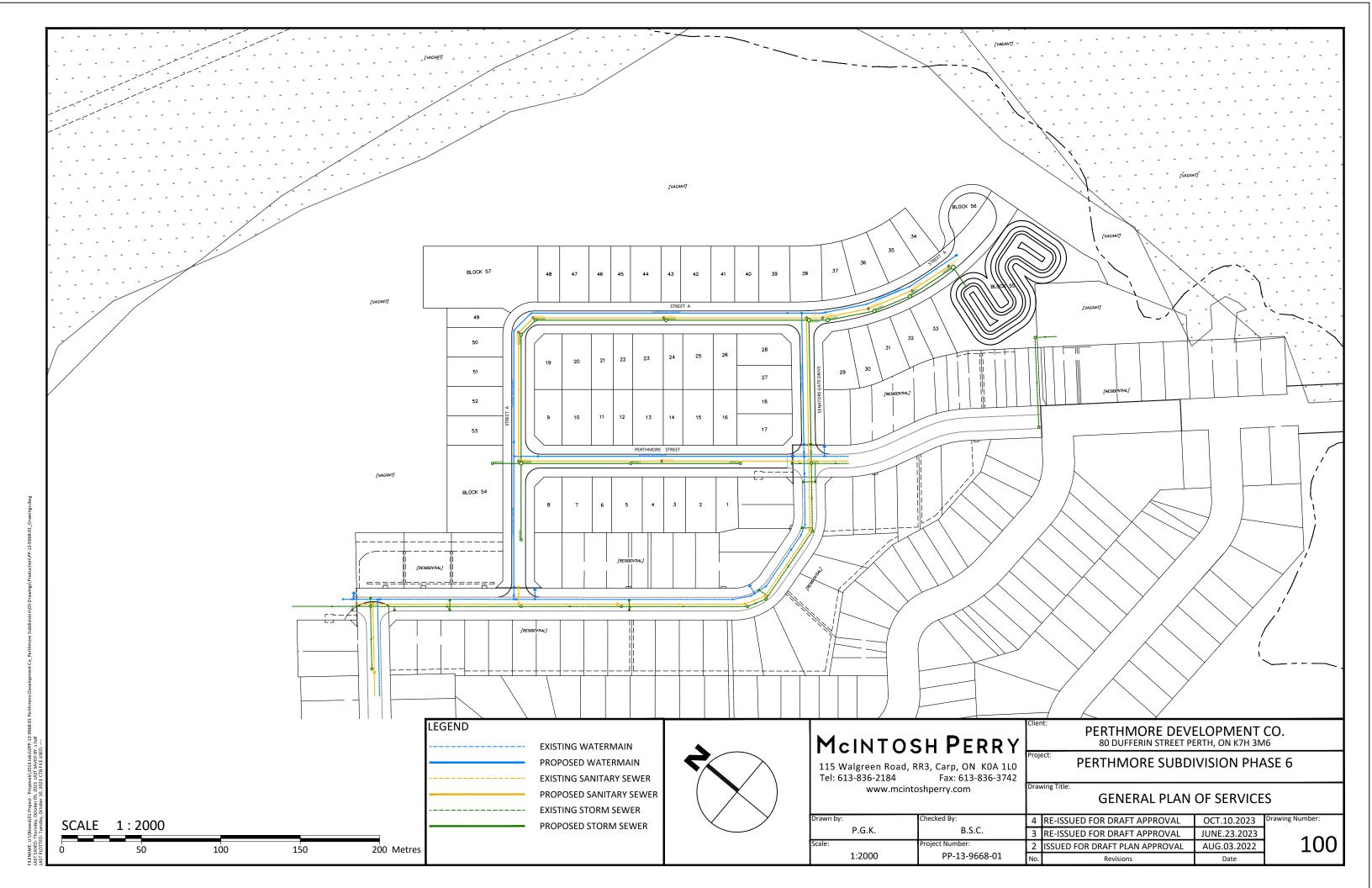
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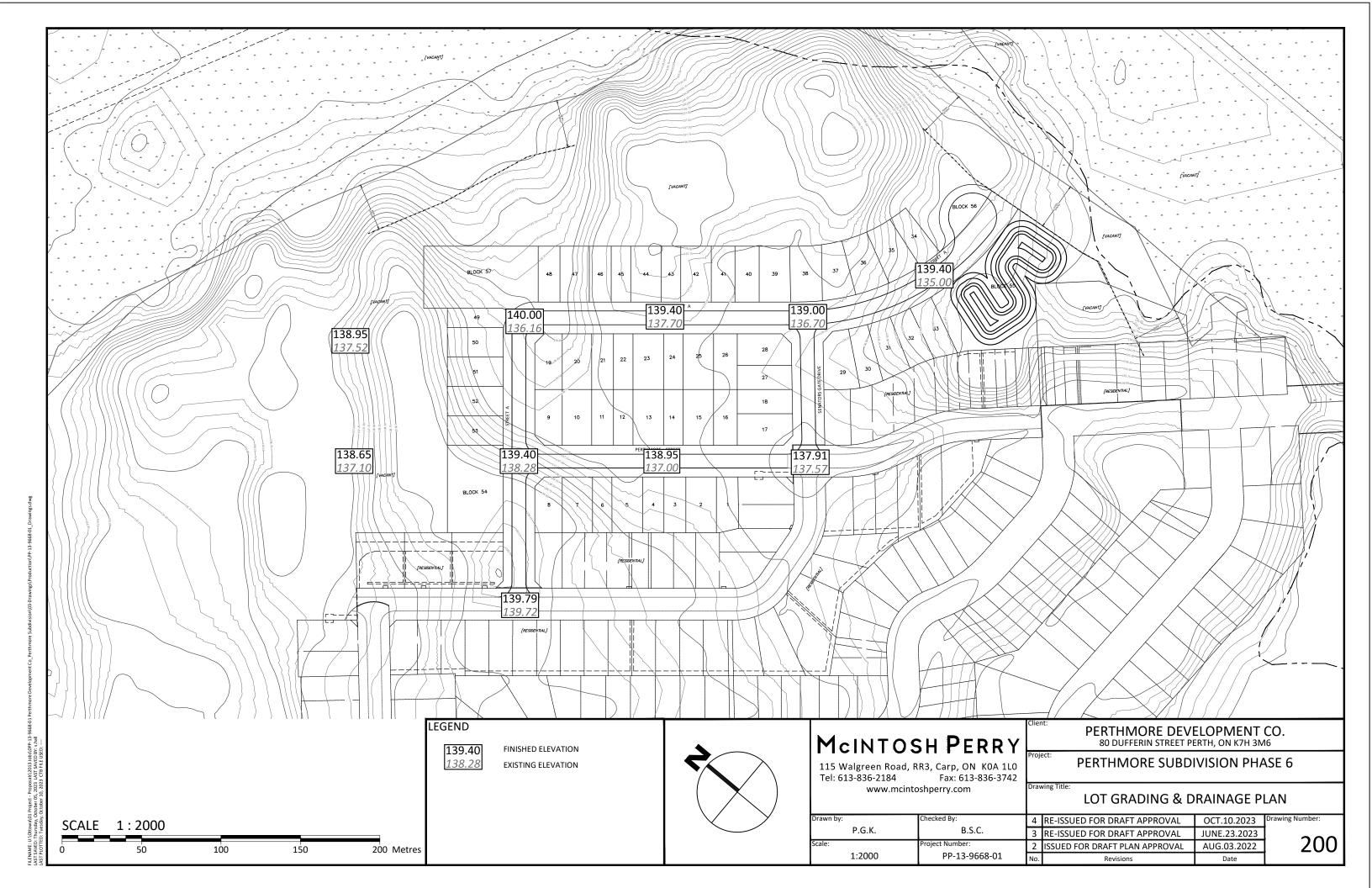
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APPENDIX A LOCATION PLAN







APPENDIX B WATERMAIN DESIGN

PP-13-9668-01 - Perthmore Subdivision Phase 6 - Water Demands 1

Peaking Factors:

Table 3-1: Peaking Factors

POPULATION	MINIMUM RATE FACTOR (MINIMUM HOUR)	MAXIMUM DAY FACTOR	PEAK RATE FACTOR (PEAK HOUR)
500 - 1,000	0.40	2.75	4.13
1,001 - 2,000	0.45	2.50	3.75
2,001 -3,000	0.45	2.25	3.38
3,001 - 10,000	0.50	2.00	3.00
10,001 - 25,000	0.60	1.90	2.85
25,001 - 50,000	0.65	1.80	2.70
50,001 - 75,000	0.65	1.75	2.62
75,001 - 150,000	0.70	1.65	2.48
greater than 150,000	0.80	1.50	2.25

Note: Domestic water demand peaking factors are per Section 3.4.2 of the Design Guidelines for Drinking-Water Systems 2008.

Population Density:

Unit Type	Persons Per Unit (ppu)
Single Family	3.4
Semi-detached	2.7
Townhouse	2.7
Apartment	1.8
Unknown	60/ha

Calculations:

Phase 6 - Consists of 34 single family, 38 Semi-detached units, 14 Apartment units Population = 243.40 people

*Average	Day Flow	Max. D	ay Flow	Peak Hourly Flow				
(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)			
0.79	47.33	2.17	130.15	3.26	195.46			
0.79	47.33	2.17	130.15	3.26	195.46			

^{*}Domestic flow was assumed to be 280L/(cap-day)

PP-13-9668-01 - Perthmore Subdivision Phase 6 - Water Demands 2

Peaking Factors:

Table 3-1: Peaking Factors

POPULATION	MINIMUM RATE FACTOR (MINIMUM HOUR)	MAXIMUM DAY FACTOR	PEAK RATE FACTOR (PEAK HOUR)
500 - 1,000	0.40	2.75	4.13
1,001 - 2,000	0.45	2.50	3.75
2,001 -3,000	0.45	2.25	3.38
3,001 - 10,000	0.50	2.00	3.00
10,001 - 25,000	0.60	1.90	2.85
25,001 - 50,000	0.65	1.80	2.70
50,001 - 75,000	0.65	1.75	2.62
75,001 - 150,000	0.70	1.65	2.48
greater than 150,000	0.80	1.50	2.25

Note: Domestic water demand peaking factors are per Section 3.4.2 of the Design Guidelines for Drinking-Water Systems 2008.

Population Density:

Unit Type	Persons Per Unit (ppu)
Single Family	3.4
Semi-detached	2.7
Townhouse	2.7
Apartment	1.8
Unknown	60/ha

Calculations:

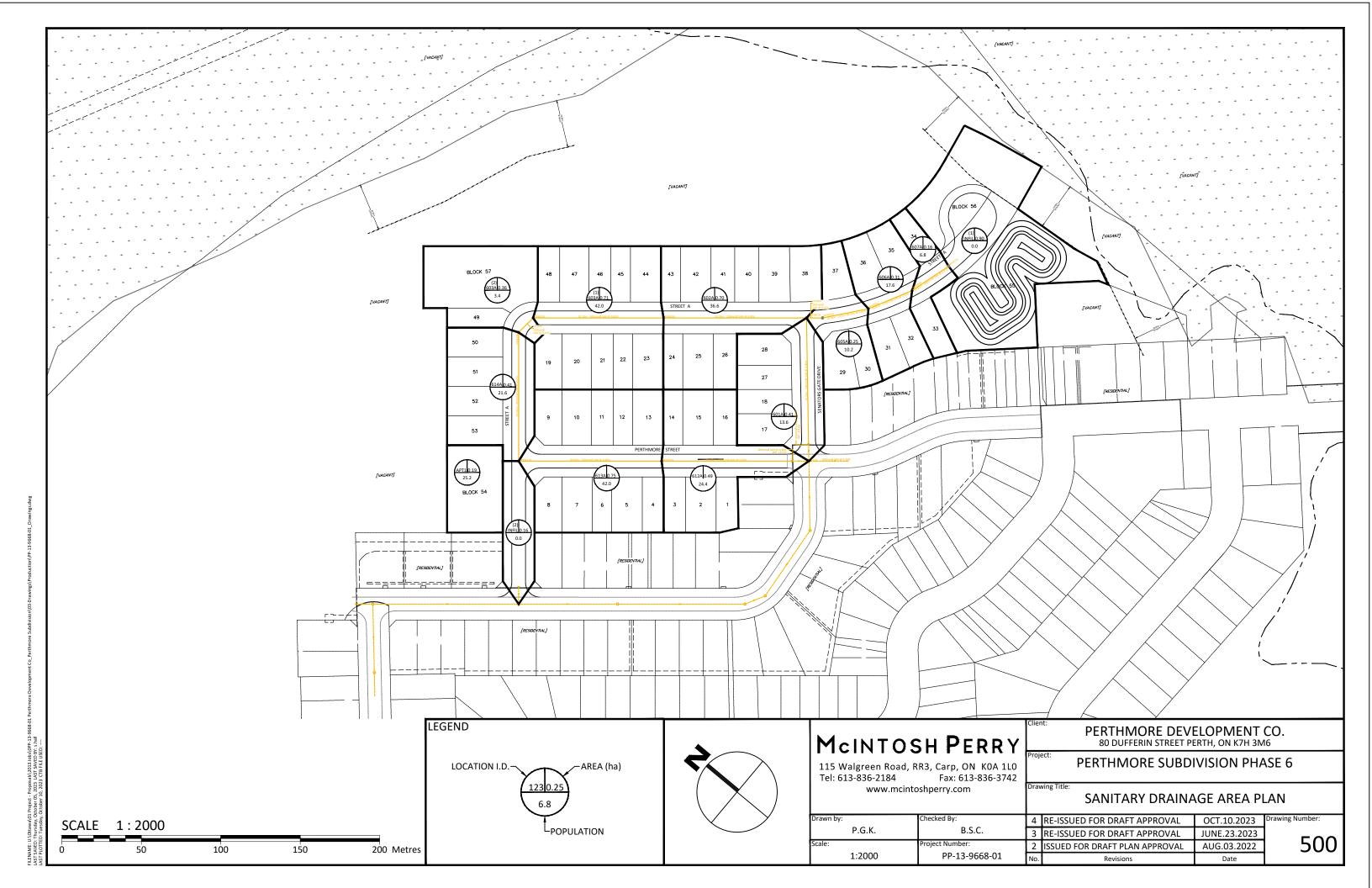
Phase 6 - Consists of 34 single family, 38 Semi-detached units and 14 Apartment units **Future Development** - Consists of 5.45 ha development area

Population = 570.40 people

*Average	Day Flow	Max. D	ay Flow	Peak Hourly Flow				
(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)			
1.85	110.91	5.08	305.01	7.63	458.06			
1.85	110.91	5.08	305.01	7.63	458.06	То		

^{*}Domestic flow was assumed to be 280L/(cap-day)

APPENDIX C SANITARY SEWER DESIGN



SANITARY SEWER DESIGN SHEET

McINTOSH PERRY

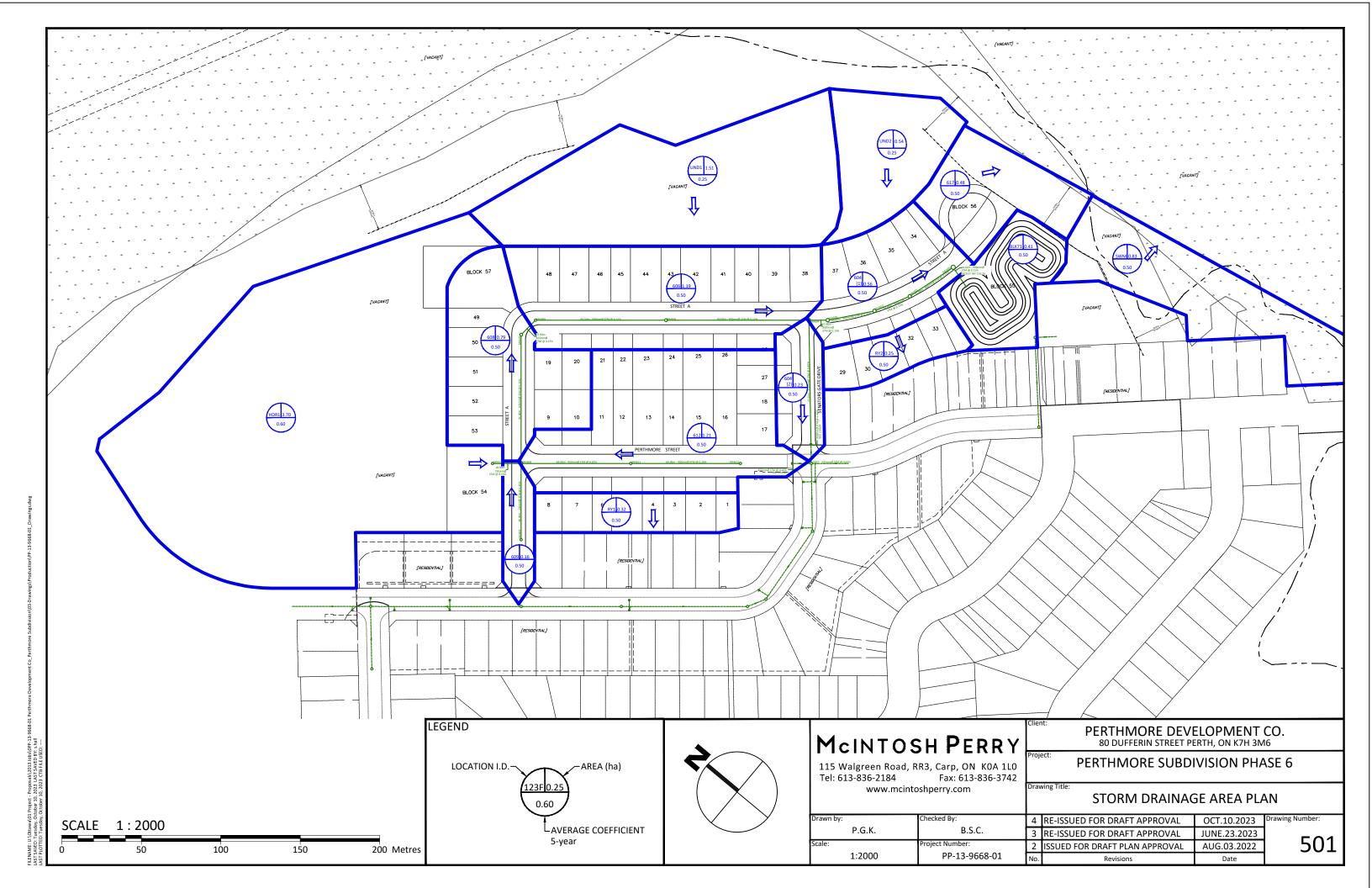
PROJECT: PERTHMORE SUBDIVISION PHASE 6

LOCATION: PERTH, ON

CLIENT: PERTHMORE DEVELOPMENT CO.

	LOCATION			1			RESIDENTI	Λ1				1		ICI ARE	A.C.			INITIO	RATION ALL	OWANCE	ELOVA/	1				SEWER DATA	١			$\overline{}$
1	LOCATION			-	. , .	7 0	KEZIDEN II	AL 10	- 11	10	111	14	1.5			18 19	20				FLOW	25	2/	27				21	20	
1		3	4	5	6	7 8	,		11	12	13	14	15	16 17		18 19	20		22	23	24	25	26		28	29	30	31	30	31
STREET	AREA ID	FDOM			UNIT TYPI	:5	AREA	POP	JLATION		PEAK			AREA (ha)		IN INCIDENCE OF THE PARTY OF TH	PEAI		EA (ha)	FLOW	DESIGN	CAPACITY	LENGTH	DIA	SLOPE	VELOCITY		VELOCITY		AILABLE
SIREEI	AREA ID	FROM	TO	SF	SD	TH APT	(ha)	IND	CUM	PEAK	FLOW		UTIONAL	COMMERCIAL IND CUM		INDUSTRIAL	FLOV		CUM	(L/s)	FLOW	(L/s)	(m)	(mm)	(%)	(full)	DEPTH	(actual)		PACITY
		MH	MH						_	FACTOR	(L/s)	IND	CUM	IND CUN	1	IND CUM	(L/s				(L/S)					(m/s)	(mm)	(m/s)	L/s	(%)
STREET A	603A(1)	603A	602A	,	8		0.71	42.0	42.0	4.00	0.54	1	0.00	0.00	. —	0.00	0.00	0.71	0.71	0.23	0.78	27.59	82 10	200	0.45	0.851	24.7	0.378	07.04	97.18
STREET A	603A(1)	602A	602A 601A	0	Ü		0.71	36.6	78.6			1		0.00		0.00			1.41	0.23	1.48	21.64	90.00	200	0.65	0.851	37.5	0.378	26.81 20.16	97.18
	6U2A	602A	60 TA	6	6		0.70	30.0	78.6	4.00	1.02		0.00	0.00	,	0.00	0.00	0.70	1.41	0.47	1.48	21.04	90.00	200	0.40	0.007	37.5	0.387	20.16	93.14
STREET A	INFIL(1), 607A	607A	606A	2			1.06	6.8	6.8	4.00	0.09		0.00	0.00	,	0.00	0.00	1.06	1.06	0.35	0.44	27.59	27.61	200	0.65	0.851	18.9	0.317	27.15	98.41
SIRELIA	606A	606A	605A	2	4		0.31	17.6	24.4	4.00	0.09		0.00	0.00		0.00			1.00	0.35	0.44	27.59	29.81	200	0.65	0.851	24.6	0.376	26.82	97.21
	605A	605A	604A	3	4		0.25	10.2	34.6	4.00	0.32		0.00	0.00		0.00			1.62	0.43	0.77	27.59	29.40	200	0.65	0.851	27.6	0.376	26.60	96.44
	003A	604A	601A	3			0.23	0.0	34.6	4.00	0.45		0.00	0.00		0.00			1.62	0.53	0.98	27.59	10.08	200	0.65	0.851	27.6	0.405	26.60	96.44
		004A	00 IA					0.0	34.0	4.00	0.43		0.00	0.00		0.00	0.00	0.00	1.02	0.55	0.70	21.57	10.00	200	0.03	0.001	21.0	0.403	20.00	70.44
SENATORS GATE DRIVE	601A	601A	CAP	4		-	0.41	13.6	126.8	4.00	1.64		0.00	0.00)	0.00	0.00	0.41	3.44	1.14	2.78	21.64	79.13	200	0.40	0.667	50.4	0.465	18.86	87.16
SENATORS GATE BRIVE	00174	CAP-1	S106				0.00	0.0	126.8	4.00	1.64		0.00	0.00		0.00	0.00		3.44	1.14	2.78	21.64	11.00	200	0.40	0.667	50.4	0.465	18.86	87.16
		0711 7	3700				0.00	0.0	120.0	4.00	1.01	1	0.00	0.00		0.00	0.00	0.00	3.11	1.17	2.70	21.01	11.00	200	0.10	0.007	50.4	0.100	10.00	- 07.10
																														$\overline{}$
STREET A	603A(2)	603A	614A	1			0.36	3.4	3.4	4.00	0.04		0.00	0.00)	0.00	0.00	0.36	0.36	0.12	0.16	27.59	12.90	200	0.65	0.851	11.9	0.234	27.42	99.41
	614A	614A	613A		8		0.41	21.6	25.0	4.00	0.32		0.00	0.00		0.00			0.77	0.25	0.58	27.59	81.00	200	0.65	0.851	21.5		27.01	97.90
PERTHMORE STREET	APT1, INFIL(2), 613A	613A	612A	6	8	14	1.10	67.2	92.2	4.00	1.20		0.00	0.00)	0.00	0.00	1.10	1.87	0.62	1.81	21.64	90.00	200	0.40	0.667	41.2	0.410	19.83	91.63
	612A	612A	CAP	4	4		0.49	24.4	116.6	4.00	1.51		0.00	0.00)	0.00	0.00	0.49	2.36	0.78	2.29	21.64	81.68	200	0.40	0.667	46.0	0.439	19.35	89.42
		CAP-2	S106				0.00	0.0	116.6	4.00	1.51		0.00	0.00)	0.00	0.00	0.00	2.36	0.78	2.29	21.64	11.00	200	0.40	0.667	46.0	0.439	19.35	89.42
Design Parameters:				Notes:						Designed:		9		No.					Revision								Date			
				1. Mannin	gs coefficient (n)	=	0.013					P.G.K.		1.	ISSU	UED FOR DRAFT	PLAN APPLI	CATION								0	DEC. 18, 202	20		
Residential		ICI Areas		2. Demand	d (per capita):	2	80 L/day							2.	ISSU	UED FOR DRAFT	PLAN APPRO	OVAL								,	AUG.3, 202	!2		
SF 3.4 p/p/u			Peak Factor	3. Infiltrati	ion allowance:	0	33 L/s/Ha			Checked:				3.	3. ISSUED FOR DRAFT PLAN APPROVAL								J	UN. 23, 202	23					
SD 2.7 p/p/u		L/Ha/day	1.5	4. Residen	itial Peaking Facto							B.S.C.		4.	4. RE-ISSUED FOR DRAFT PLAN APPROVAL								(OCT.10, 202	23					
TH 2.7 p/p/u	COM 28,000	L/Ha/day	1.5		Harmon Formul	a = 1+(14/(4+P^0).5))																							
APT 1.8 p/p/u	IND 35,000	L/Ha/day	MOE Chart		where P = popu	lation in thousan	ds			Project No																				
Other 60 p/p/Ha												PP-13-9668	3-01		·		·			·		·			·	·	Sheet No:			
																											1 of 1			

APPENDIX D STORM SEWER DESIGN



STORM SEWER DESIGN SHEET

PROJECT: PERTHMORE SUBDIVISION PHASE 6

LOCATION: PERTH, ON

CLIENT: PERTHMORE DEVELOPMENT CO.

1	LOCATION 2	3	4	-	6 7		BUTING AREA (ha) 9 10	11	12	13	14	15	16	RATI 17	ONAL DESIGN 18	FLOW 19	20	21	22	23	24	25	26	27	SEWER DATA 28	29	30	31	32
·	_	FROM	TO	5		'ALUE	9 10	INDIV	CUMUL	INLET	TIME	TOTAL		i (10)	i (100)	5yr PEAK		100yr PEAK		DESIGN	CAPACITY	LENGTH	26	PIPE SIZE (mn		SLOPE	VELOCITY		32 AP (5yr)
STREET	AREA ID	MH	MH	0.25			0.80 1.00	AC	AC	(min)	IN PIPE	(min)	i (5) (mm/hr)	(mm/hr)	(mm/hr)	FLOW (L/s)) FLOW (L/s)			(L/s)	(m)	DIA	W W	H	(%)	(m/s)	(L/s)	(%)
				0.20						` /		, ,	, ,	, ,	, ,	(, , ,	, , , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , , , ,	(, , ,		(/	,				()	(/	(/	
	HDR1	610	608			3.70		2.22	2.22	20.00	0.30	20.30	58.41	67.89	97.42	360.47				360.47	449.81	18.00	750			0.15	0.986	89.34	19.86
CTDEET A	/00	/00	(00		0.1/	-		0.00	0.00	20.00	0.07	20.07	FO 41	/7.00	07.40	12.00				12.00	41.70	40.00	250			0.45	0.001	20.72	(0.70
STREET A	609	609	608		0.16	-		0.08	0.08	20.00	0.97	20.97	58.41	67.89	97.42	12.99				12.99	41.62	48.00	250	-		0.45	0.821	28.63	68.79
PERTHMORE	/12	/12	/11		1.21			0./1	0./1	20.00	1.40	21.42	FO 41	/7.00	07.40	00.24				00.24	122.02	/0.00	450			0.20	0.010	24.70	2/ 15
STREET	612	612	611		1.21			0.61	0.61	20.00	1.42	21.42	58.41	67.89	97.42	98.24				98.24	133.02	69.00	450			0.20	0.810	34.78	26.15
		611	608					0.00	0.61	21.42	1.42	22.84	55.68	64.71	92.86	93.64				93.64	133.02	69.00	450			0.20	0.810	39.38	29.60
STREET A	608	608	607	+	0.79	1		0.40	3.30	22.84	1.28	24.12	53.23	61.88	88.79	488.36	1	+		488.36	579.98	81.00	825	-		0.15	1.051	91.62	15.80
JIKELIA	000	607	606		0.77			0.00	3.30	24.12	0.20	24.33	51.24	59.55	85.46	470.04				470.04	579.98	12.90	825			0.15	1.051	109.94	18.96
	UND1, 606	606	605	1.51	1.19			0.97	4.27	24.33	1.23	25.56	50.93	59.20	84.95	604.98				604.98	731.45	82.10	900			0.15	1.114	126.47	17.29
		605	604			-		0.00	4.27	25.56	1.35	26.90	49.21	57.20	82.08	584.50				584.50	731.45	90.00	900			0.15	1.114	146.95	20.09
STREET A	UND2, 604(1)	604	603	0.54	0.68			0.48	4.75	26.90	0.18	27.08	47.48	55.18	79.18	626.58		+		626.58	731.45	11.80	900	1		0.15	1.114	104.87	14.34
JIKEETA	01402,004(1)	603	602	0.54	0.00			0.00	4.75	27.08	0.45	27.53	47.26		78.82	623.72				623.72	731.45		900			0.15	1.114	107.73	14.73
		602	601					0.00	4.75	27.53	0.36	27.89	46.72	54.30	77.92	616.59				616.59	731.45	24.00	900			0.15	1.114	114.85	15.70
		601	600 DOND			-		0.00	4.75	27.89	0.49	28.38	46.30	53.81	77.22	611.03				611.03	731.45	32.90	900			0.15	1.114	120.41	16.46
		600	POND	1	 	+	+ +	0.00	4.75	28.38	0.22	28.60	45.73	53.16	76.28	603.60	1	1	+	603.60	731.45	14.61	900	+	+ +	0.15	1.114	127.84	17.48
SENATORS GATE DRIVE	604(2)	604	BULKHEAD		0.23			0.12	0.12	20.00	1.13	21.13	58.41	67.89	97.42	18.67				18.67	188.11	77.63	450			0.40	1.146	169.44	90.07
GATE DRIVE		BULKHEAD	D207					0.00	0.12	21.13	0.18	21.31	56.21	65.33	93.75	17.97				17.97	188.11	12.50	450			0.40	1.146	170.14	90.45
		DULNHEAD	D201			1		0.00	U. 12	21.13	0.10	21.31	JU.Z I	03.33	73.10	17.77	1	1	+	17.77	100.11	12.30	430	<u> </u>	1	0.40	1.140	170.14	70.40
PERTHMORE		BULKHEAD	D207					0.00	0.00	20.00	0.10	20.18	EO //1	67.89	07.42	0.00				0.00	100 11	12.50	450			0.40	1.146	188.11	100.00
STREET		BULKHEAD	D207					0.00	0.00	20.00	0.18	20.18	58.41	07.89	97.42	0.00				0.00	188.11	12.50	450			0.40	1.140	188.11	100.00
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			1	1	 	1	+ +			1		1		1	1	+	1	+	+	1			 	1	+ +		 		
Definitions:	ı	1	1	Notes:	1 1	1				Designed:		1	1	L	No.			1		Revision							Date		
Q = 2.78CiA, where:					ings coefficient (n)	=			0.013			P.G.K.			1.		DRAFT PLAN A										DEC. 18, 2020		
Q = Peak Flow in Litres per S	econd (L/s)									Oh - I :					2.		DRAFT PLAN										AUG. 3, 2022		
A = Area in Hectares (ha) i = Rainfall intensity in millin	neters per hour (mm/h	r)								Checked:		B.S.C.			3. 4.			AN APPROVAL									JUN. 23, 2023 OCT. 10, 2023		
[i = 27.1 * Tc^-0.699]		'/										D.J.G.			4.	IVE-1930ED F	ON DIVALLIFE	III ALI NOVAL									001. 10, 2023	•	
[i = 31.5 * Tc^-0.699]	10 YEAR									Project No.:																			
[i = 45.2 * Tc^-0.699]												PP-13-9668-	01														Sheet No:		
																											1 of 1		

APPENDIX E EXISTING CONDITIONS MEMO

MEMORANDUM

To: Ryan Kennedy, P. Eng., Practice Lead, Land Development

Adam O'Connor, P.Eng., Assistant Vice President, Land Development

From: John Price, P. Eng., Senior Water Resource Engineer

Cc: Jason Sharp, P. Eng. Manager, Water Resources

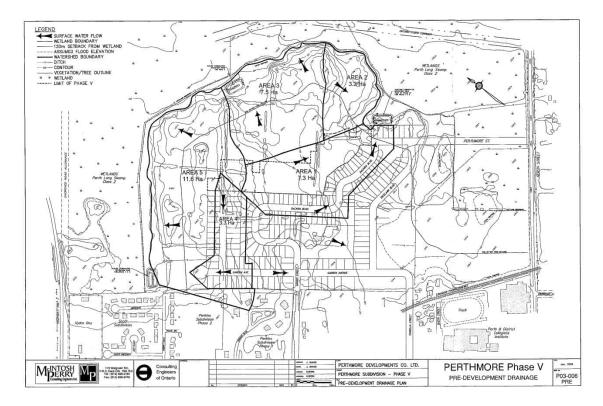
Date: December 2, 2020

Re: Perthmore Subdivision

1.0 BACKGROUND

The Perthmore subdivision is located northwest of North Street in the Town of Perth. Various phases of the subdivision have been under development since the 1990s and the draft plan for a subsequent phase is now under consideration. The drainage and stormwater management infrastructure has also been constructed in phases over many years. The original pre-development flow values were first calculated in 1990s using the Rational Equation.

An existing stormwater management (SWM) pond is located on the northeast side of Perthmore Street as shown on the figure below. As part of development of this subsequent phase, this SWM facility will be reconstructed and expanded to address the water quality and quantity control requirements for the tributary drainage area. For the SWM design the predevelopment flows, to be used as the target flows for the quantity control, were reassessed.



2.0 ANALYSIS

A Visual OTTHMO Version 5 (VO5) model was assembled for the analysis. As shown in the figure above, the predevelopment tributary area to the SWM facility consists of Areas 1 and 2 and the total tributary pre-development drainage area is 10.5 ha. The VO5 hydrologic model requires various measured and calculated input parameters. The calculations of these input parameters area detailed below.

2.1 Parameters

2.1.1 General

Since the pre-development land use was rural the NASHYD command was employed in the VO5 model to calculate the runoff flows. NASHYD is used to simulate runoff flows with NASH instantaneous unit hydrograph. This hydrograph is made of a cascade of "n" linear reservoirs. The n (number of linear reservoirs) parameter was set at 3, in the model, and the rainfall losses were computed by the SCS CN procedure.

2.1.2 Time of Concentration/Time to Peak

The Time of Concentration (Tc), for the pre-development drainage basins, was calculated using the Airport Formula.

$$T_c = 3.26 * (1.1 - C) * L^{0.5} * S_w^{-0.33}$$

Where:

Tc = time of concentration in minutes

C = runoff coefficient

L = watershed length in metres

S_w = watershed slope in percentage

From the Tc value, the Time to Peak (Tp) value was calculated as 0.67 times Tc. The parameters employed in the calculation of Tc and Tp for the two drainage basins are show in Table 1.

Table 1 – Time to Peak

Catchment	Area	Flow Length	Fall	Slope	Tc ¹	Tp ²
	ha	m	m	%	min	hrs
Area 1	7.3	435	7	1.61	58.1	0.65
Area 2	3.2	165	7	4.24	26.0	0.29

Notes: 1 – Airport Formula

2 – 0.67*Tc

2.1.3 SCS Curve Number

The Curve Number (CN) is the most important parameter in determining surface runoff when the SCS equation is used. Table 2 shows the parameters and the resulting CN value for Areas 1 and 2.

Table 2 – Curve Number

Catchment	Soil Type	Hydrologic	Land Use	Runoff	CN ³	la
		Soil Group ¹	(0-5% Slope)	Coefficient ²	(AMC II)	mm
Area 1	Sandy Loam	AB	Pasture	0.10	59	5
Area 2	Sandy Loam	AB	Pasture	0.10	59	5

Notes: 1 – MTO Drainage Management Manual – Design Chart 1.08

2 - MTO Drainage Management Manual - Design Chart 1.07

3 - MTO Drainage Management Manual - Design Chart 1.09 (Pasture, fair condition - average of A and B Hydrologic Soil Groups)

2.1.4 Rainfall

For the rainfall input to the VO5 model, the 12 hour SCS rainfall distribution, representing a high volume lower intensity storm, and a 4 hour Chicago rainfall distribution, representing a high intensity "thunder storm" type of rainfall event were used ion the analysis. The Intensity-Duration-Frequency (IDF) curve was obtained from the Ministry of Transportation (MTO) IDF Curve Lookup tool with the location centred over the property.

3.0 RESULTS

Employing the above noted parameters and the VO5 hydrologic model, Table 3 shows the calculated pre-development flow values for the 12 hour SCS and 4 hour Chicago rainfall hyetographs. It is recommended that these flow values be used for the water quantity control assessment of the reconstructed SWM facility. The redesign of the end of pipe facility will also include water quality control for the post-development tributary drainage area.

Table 3 – Calculated Flows

		12 hour SCS			4 hour Chicago	
Return Period	Area 1	Area 2	Total	Area 1	Area 2	Total
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s
2	0.061	0.047	0.093	0.030	0.022	0.045
5	0.110	0.085	0.168	0.057	0.041	0.085
10	0.143	0.111	0.220	0.080	0.058	0.119
25	0.197	0.152	0.303	0.111	0.083	0.166
50	0.238	0.184	0.367	0.137	0.101	0.206
100	0.288	0.223	0.444	0.165	0.122	0.248

This memorandum is respectfully submitted by, McIntosh Perry Consulting Engineers Ltd.

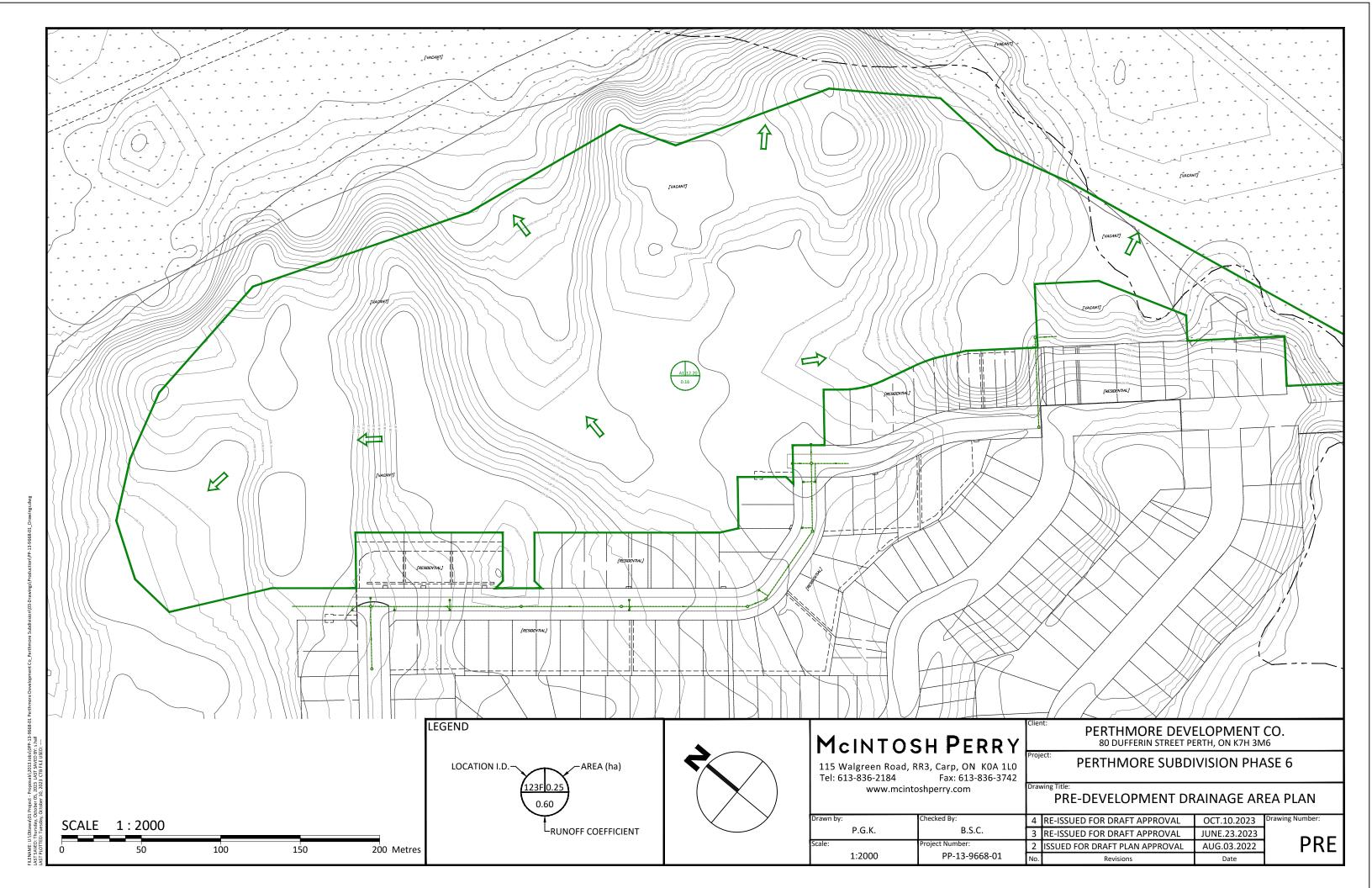
John Price, P. Eng.

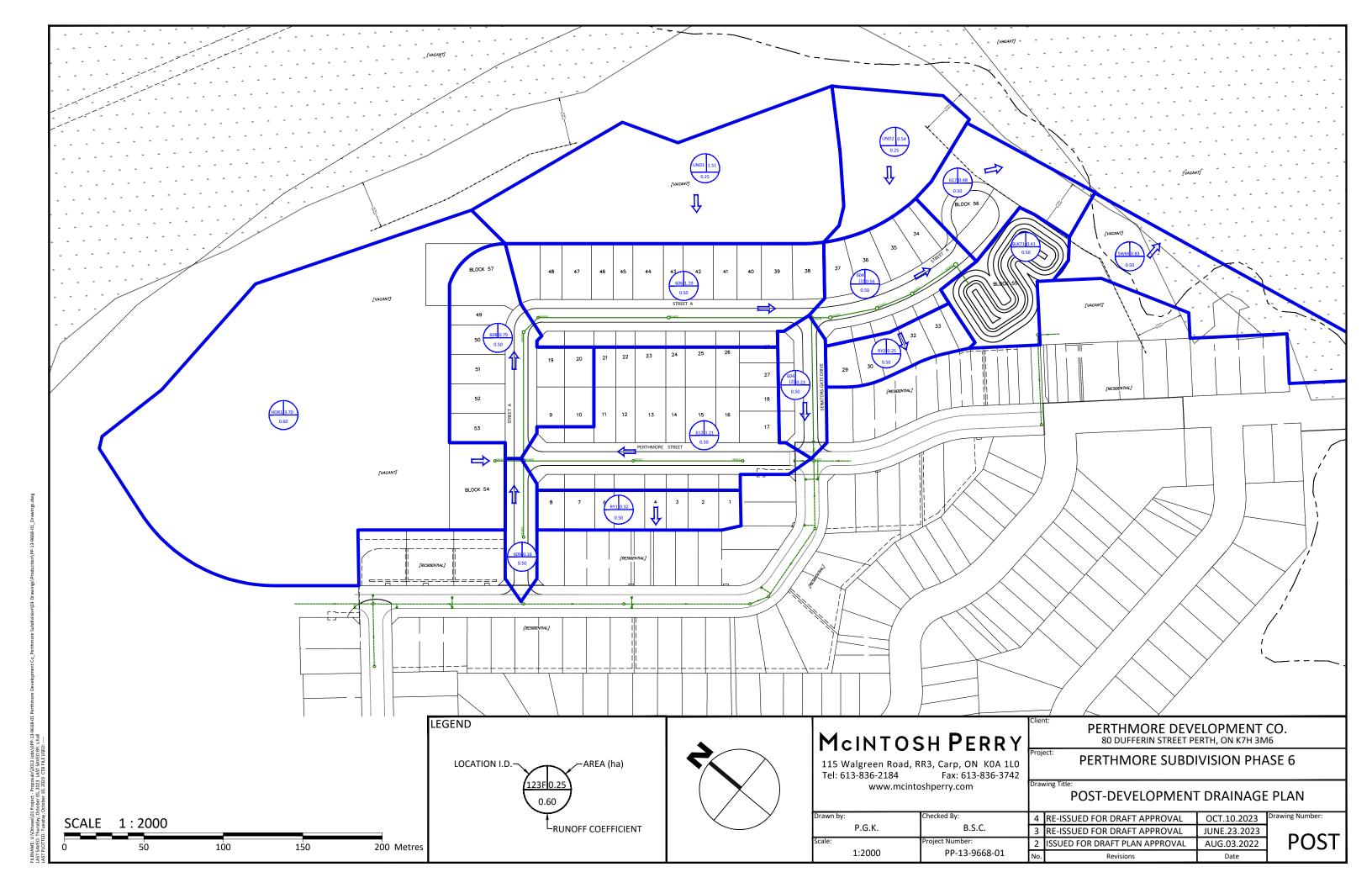
Senior Water Resource Engineer

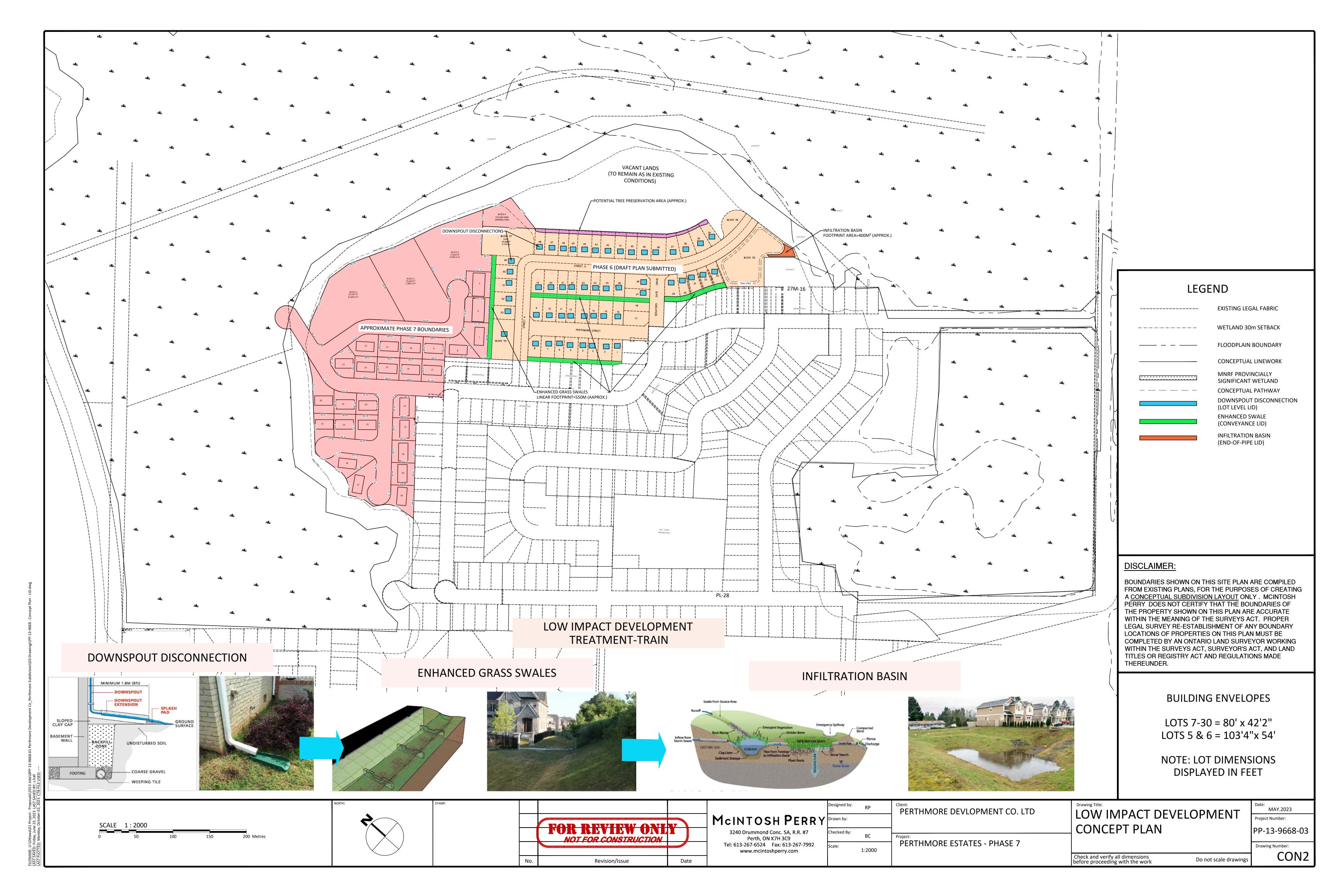
PH No. 613 714 5906

Email. J.Price@McIntoshPerry.com

APPENDIX F STORMWATER MANAGEMENT DESIGN







CCO-13-9668-01 - PERTHMORE SUBDIVISION - PRE-DEVELOPMENT

Values

Land Use	Pasture	Pasture	Forest	Forest
Hydrologic Soil Group	В	С	В	С
Runoff Coefficients*	0.1	0.28	0.08	0.25
CN Values**	59	75	60	73
IA (mm)	5	5	10	10

^{*} Design Chart 1.07 MTO Drainage Management Manual

Land Use

		Pasture	Pasture	Forest	Forest	Weighted CN	Weighted C	Weighted IA Value
Drainage Area ID	Total Area (ha)	В	С	В	С	Value	Value	
		Sub-Area (ha)	Sub-Area (ha)	Sub-Area (ha)	Sub-Area (ha)	value	value	
A1	12.2	5.45	1.76	1.56	3.2	64.0	0.16	6.9

Airport Formula

For use when the runoff coefficient is less than 0.4

$$t_c = 3.26 * (1.1 - C) *L^{0.5} * S_w^{-0.33}$$

Where

tc = time of concentration in minutes

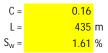
C = runoff coefficient

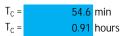
L = watershed length in metres

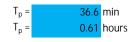
S_w = watershed slope in %

Source: MTO Drainage Manual 1997 - Chapter 8, page 28

Α1







$$T_p = 0.67 T_c$$

^{**} Design Chart 1.09 MTO Drainage Management Manual

CCO-13-9668-01 - PERTHMORE SUBDIVISION - PRE-DEVELOPMENT RESULTS

Return Period (Yrs)	4 hour Chicago (m ³ /s)	12 hour SCS (m ³ /s)	24 hour SCS (m ³ /s)
2	0.053	0.114	0.148
5	0.105	0.211	0.259
10	0.149	0.278	0.352
25	0.210	0.383	0.475
50	0.262	0.463	0.585
100	0.317	0.560	0.678



CCO-13-9668-01 - PERTHMORE SUBDIVISION - POST-DEVELOPMENT

Values

Land Use	Pasture	Pasture	Forest	Forest
Hydrologic Soil Group	В	С	В	С
Runoff Coefficients*	0.1	0.28	0.08	0.25
CN Values**	59	75	60	73
IA (mm)	5	5	10	10

^{*} Design Chart 1.07 MTO Drainage Management Manual

Land Use

Drainage Area ID		Pasture	Pasture	Forest	Forest			Weighted IA
		В	С	В	С	Weighted CN	Weighted C	
	Total Area (ha)	Sub-Area (ha) Sub-Ar		Sub-Area (ha)	Sub-Area (ha)	3	Value	Value
UND - Undeveloped Area	2.05	0	0	0.00	2.05	73.0	0.25	10.0

Airport Formula

For use when the runoff coefficient is less than 0.4

 $t_c = 3.26 * (1.1 - C) *L^{0.5} * S_w^{-0.33}$

<u>UND:</u>

Where

C= 0.25 Tc= 19.7 L= 80.00 Tp= 0.22 Sw= 2.00 min

tc = time of concentration in minutes

C = runoff coefficient

L = watershed length in metres

S_w = watershed slope in %

Source: MTO Drainage Manual 1997 - Chapter 8, page 28

				Pervious Area					Impervious Area				
Sub-Catchment	Area	Total Imperviousne ss	Directly Connected	CN	Slope	Flow Length	Manning's n	la	Slope	Flow Length (measured)	Flow Length ³	Manning's n	Depression Storage
	ha	%	%		%	m		mm	%	m			mm
West Block ⁶	3.43	50.0	35.0	59.0	2.0	40.0	0.25	5.0	1.0	150.0	151.2	0.013	1.0
Block 70	0.83	0.0	0.0	75.0	2.0	10.0	0.25	10.0	1.0	75.0	74.4	0.013	1.0
SWM Block ^{4,6}	0.41	0.0	0.0	75.0	2.0	10.0	0.25	10.0	1.0	50.0	52.3	0.013	1.0
Developed Portions ^{5,6}	5.32	50.0	35.0	59.0	1.0	40.0	0.25	5.0	1.0	350.0	188.3	0.130	1.0

Notes 1 -Airport Formula

- 2 0.67* Tc
- 3 Flow Length = SquareRoot (Area/1.5) (Area in square metres)
- 4 Block 71
- 5 604(1) 0.56ha, 604(2) 0.23ha, 606 1.19ha, 608 0.79ha, 609 0.16ha, 612 1.21ha, 617 0.48ha, RY1 0.32ha and RY2 0.25ha
- 6 To Pond

^{**} Design Chart 1.09 MTO Drainage Management Manual

	Storage	Req	uirem	nents
--	---------	-----	-------	-------

Required Fermanent Foor Volume	1850	m³
Required Permanent Pool Volume		
Ved =	897	m ³
Ved =	80	m³/ha
Req'd Extended Detention Volume		
Vs =	953	m ³
Vs =	85	m³/ha
Req'd Permanent Pool Storage Volume		_
Level of Protection:	Enhanced	
Facility Type:	Wet Pond	
Drainage Area:	11.21	h

%Imperviousness

46%

(Table 3.2, p. 3-10, SWMP Manual - 165m3/ha - 80m3/ha)

Given the upstream individual storage requirements from Blocks 67, 68 and 69, the MECP SWMP Manual notes that the extended detention is increased to account for upstream

storage

MECP SWMP Manual - Section 3.3.2.

It should be noted that the total drainage area contributing to the facility should be included in sizing (lumped imperviousness or separate calculations for internal and external drainage areas is permissible) in most cases. The exception occurs when an external drainage area is itself controlled by a separate water quality facility (and erosion and quantity control are either not required or provided separately). Modelling studies (Marshall Macklin Monaghan Limited, 1997) indicate comparable combined long-term removal rates for ponds in series and separate parallel ponds. More frequent overflows will occur from the most downstream pond, but this can be compensated for by doubling the water quality active storage volume from 40 to 80 m³/ha.

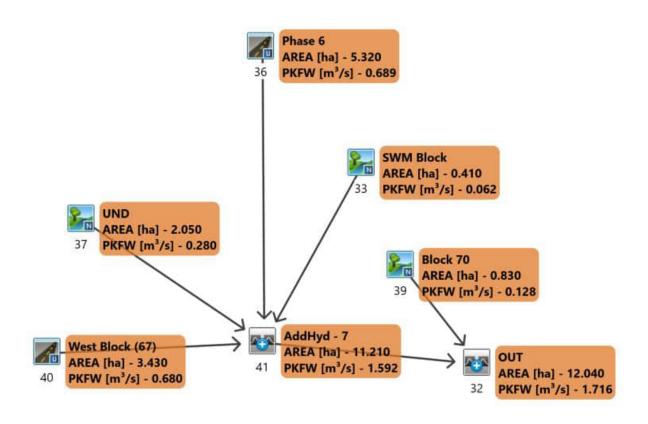
CCO-13-9668-01 - PERTHMORE SUBDIVISION - POST-DEVELOPMENT - RESULTS - UNCONTROLLED

	4 Hour Chicago									
Return Period	West Block	Undeveloped	Block 70	SWM Block	Developed Portions	Total				
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m ³ /s				
2	0.228	0.015	0.007	0.004	0.153	0.318				
5	0.315	0.036	0.017	0.008	0.223	0.459				
10	0.374	0.053	0.026	0.012	0.292	0.606				
25	0.461	0.078	0.038	0.018	0.368	0.765				
50	0.523	0.100	0.048	0.023	0.423	0.886				
100	0.587	0.123	0.059	0.028	0.481	1.012				

	12 Hour SCS									
Return Period	West Block	Undeveloped	Block 70	SWM Block	Developed Portions	Total				
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s				
2	0.215	0.046	0.022	0.011	0.184	0.420				
5	0.306	0.089	0.043	0.020	0.278	0.647				
10	0.384	0.118	0.056	0.027	0.355	0.875				
25	0.481	0.163	0.077	0.037	0.447	1.123				
50	0.551	0.197	0.092	0.044	0.542	1.324				
100	0.634	0.238	0.110	0.053	0.631	1.547				

	24 Hour SCS								
Return Period	West Block	Undeveloped	Block 70	SWM Block	Developed Portions	Total			
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m ³ /s			
2	0.225	0.061	0.029	0.014	0.197	0.467			
5	0.336	0.109	0.051	0.025	0.296	0.729			
10	0.417	0.148	0.069	0.033	0.390	0.989			
25	0.518	0.199	0.092	0.044	0.490	1.257			
50	0.606	0.243	0.111	0.054	0.611	1.516			
100	0.680	0.280	0.128	0.062	0.689	1.716			

Post-Development Uncontrolled - VO5 Model



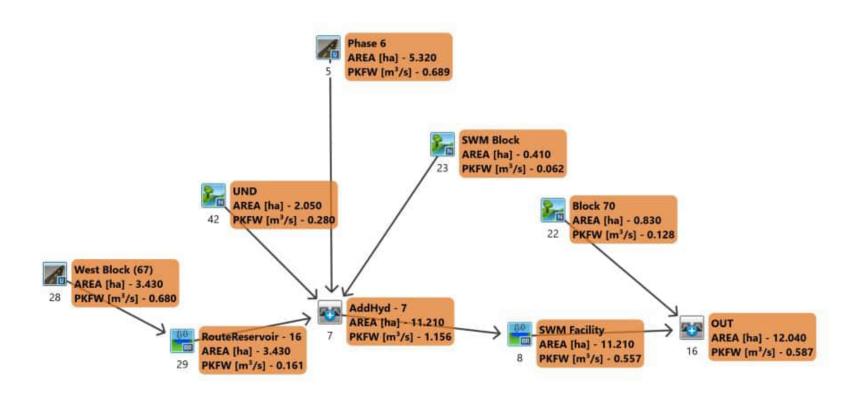
CCO-13-9668-01 - PERTHMORE SUBDIVISION - POST-DEVELOPMENT - RESULTS - CONTROLLED

	4 Hour Chicago									
Return Period	West Block	Undeveloped	Block 70	SWM Block	Developed Portions	Total				
Yrs	m³/s	m³/s	m³/s	m³/s	m ³ /s	m³/s				
2	0.228	0.015	0.007	0.004	0.153	0.077				
5	0.315	0.036	0.017	0.008	0.223	0.098				
10	0.374	0.053	0.026	0.012	0.292	0.139				
25	0.461	0.078	0.038	0.018	0.368	0.217				
50	0.523	0.100	0.048	0.023	0.423	0.264				
100	0.587	0.123	0.059	0.028	0.481	0.311				

	12 Hour SCS								
Return Period	West Block	Undeveloped	Block 70	SWM Block	Developed Portions	Total			
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s			
2	0.215	0.046	0.022	0.011	0.184	0.091			
5	0.306	0.089	0.043	0.020	0.278	0.169			
10	0.384	0.118	0.056	0.027	0.355	0.241			
25	0.481	0.163	0.077	0.037	0.447	0.324			
50	0.551	0.197	0.092	0.044	0.542	0.377			
100	0.634	0.238	0.110	0.053	0.631	0.480			

			24 Hour	SCS		
Return Period	West Block	Undeveloped	Block 70	SWM Block	Developed Portions	Total
Yrs	m³/s	m³/s	m³/s	m³/s	m³/s	m³/s
2	0.225	0.061	0.029	0.014	0.197	0.097
5	0.336	0.109	0.051	0.025	0.296	0.207
10	0.417	0.148	0.069	0.033	0.390	0.287
25	0.518	0.199	0.092	0.044	0.490	0.366
50	0.606	0.243	0.111	0.054	0.611	0.474
100	0.680	0.280	0.128	0.062	0.689	0.587

Post-Development Controlled - VO5 Model



CCO-13-9668-01 - PERTHMORE SUBDIVISION - PRE- TO POST-DEVELOPMENT RESULTS COMPARISON

		4 Hour Chicago	0	
	POST	PRE		
Return Period	Outflow From Site	Outflow from Site	Post to Pre	Post to Pre
Yrs	m³/s	m³/s	Δ	%
2	0.075	0.053	0.022	-41.5%
5	0.094	0.105	-0.011	10.5%
10	0.133	0.149	-0.016	10.7%
25	0.208	0.210	-0.002	1.0%
50	0.252	0.262	-0.010	3.8%
100	0.295	0.317	-0.022	6.9%

		12 hour SCS		
	POST	PRE		
Return Period	Outflow From Site	Outflow from Site	Post to Pre	Post to Pre
Yrs	m³/s	m³/s	Δ	%
2	0.088	0.114	-0.026	22.8%
5	0.164	0.211	-0.047	22.3%
10	0.232	0.278	-0.046	16.5%
25	0.310	0.383	-0.073	19.1%
50	0.359	0.463	-0.104	22.5%
100	0.456	0.560	-0.104	18.6%

		24 Hour SCS		
	POST	PRE		
Return Period	Outflow From Site	Outflow from Site	Post to Pre	Post to Pre
Yrs	m³/s	m³/s	Δ	Δ
2	0.094	0.148	-0.054	36.5%
5	0.199	0.259	-0.060	23.2%
10	0.275	0.352	-0.077	21.9%
25	0.350	0.475	-0.125	26.3%
50	0.452	0.585	-0.133	22.7%
100	0.557	0.678	-0.121	17.8%

VO6 Route Reservoir Input - Rating Curve

Storage (ha.m)	Storage (m ³)
0.0000	0
0.0120	120
0.0253	253
0.0399	399
0.0559	559
0.0732	732
0.0918	918
0.1116	1116
0.1321	1321
0.1535	1535
0.1758	1758
0.1989	1989
0.2228	2228
0.2476	2476
0.2733	2733
0.2998	2998
0.3263	3263
0.3528	3528

25mm storm

5year - 1090 m³

100year-2030 m³

Top of Pond

For Orifice Flow, C =	0.60
For Weir Flow, C =	1.84

	Orifice 1	Orifice 2	Orifice 3
Invert Elevation	133.36	134.00	134.40
Center of Crest Elevation			
Orifice Width/Weir Length	250 mm	450 mm	475 mm
Orifice Height			
Orifice Area (m ²)	0.049	0.159	0.177

Elevation	Orifi	ce 1	Orif	ice 2	Orif	ice 3	Total
Elevation	H [m]	Q [Vs]	H [m]	Q [Vs]	H [m]	Q [Vs]	Q [l/s]
133.36	0.00	0					0
133.46	0.10	41					41
133.56	0.20	58					58
133.66	0.30	71					71
133.76	0.40	83					83
133.86	0.50	92					92
133.96	0.60	101					101
134.06	0.70	109	0.06	104			213
134.16	0.80	117	0.16	169			286
134.26	0.90	124	0.26	216			339
134.36	1.00	130	0.36	254			384
134.46	1.10	137	0.46	287	0.06	115	539
134.56	1.20	143	0.56	316	0.16	188	648
134.66	1.30	149	0.66	343	0.26	240	732
134.76	1.40	154	0.76	368	0.36	283	805
134.86	1.50	160	0.86	392	0.46	319	871
134.96	1.60	165	0.96	414	0.56	352	932
135.06	1.70	170	1.06	435	0.66	383	988

Notes: 1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.

2. Orifice Equation: Q = cA(2gh)^{1/2} (m³/s*1000 = l/s)

3. Weir Equation: Q = CLH³²² (m³/s*1000 = l/s)

4. These Computations Do Not Account for Submergence Effects

5. H for orifice equations is depth of water above the centroide of the orifice.

6. H for weir equations is depth of water above the weir crest.

Reference: Urban Hydrology, Hydraulics and Stormwater Quality: engineering application and computer modeling / A. Akan, Robert J. Houghtalen, 2003.

CCO-13-9668-01 - PERTHMORE SUBDIVISION - EXTENDED DETENSION AND DRAWDOWN

Table E-3

As per the Section 4.6.2 (Wet Ponds) of the MECP Stormwater Management Planning and Design Manual, March 2003, a detention time of 24 hours should be targeted in all instances. The detention time can be easily solved if the relationship between pond surface area and pond depth is approximated using a linear regression equation as follows:

where, t = Drawdown time in seconds

C₂= Slope coefficient from the area-depth linear regression

C₃ = Intercept from the area-depth linear regression
h = Maximum water elevation above the orifice (m)

 $A_0 =$ Cross-sectional area of the orifice (m²)

The relationship between A and h using Linear Regression (i.e., A = $C_2h + C_3$)

Orifice Details:

Α1

Orifice Diameter =	250 mm	450 mm
Orifice Invert Elevation =	133.36 m	134.00 m

Active Storage Pond Details:

Active Storage Elevation (m)	Max Water Elevation Above Orifice (m)	Surface area of the Pond (m²)	
133.36	0.00	18,800.00	Permanent Pool Level
133.46	0.10	20,009.54	
133.56	0.20	21,339.54	25mm Event
133.76	0.40	24,398.04	
133.86	0.50	26,126.64	
133.96	0.60	27,991.04	

Drawdown Time Results (During

Construction):	Extended Detention	25mm	Event	
Orifices	250 mm	250 mm		
Slope (C_2) =	15,309	15,309		
Intercept (C ₃) =	18,672	18,518		
Maximum Water Elevation Above Orifice (h) =	0.40 m	0.20 m		
Therefore, A =	24,796	21,580		
Cross-sectional area of the orifice (A _o) =	0.049 m2	0.049 m2		
Drawdown time	193,901 s	129,393 s		
Drawdown Time	54 hrs	36 hrs	0 hrs	
Diawdown Time	341113	36 hrs		

CCO-13-9668-01 - PERTHMORE SUBDIVISION - STORMWATER MANAGEMENT POND FOREBAY AND PERMANENT POOL

STORAGE VOLUME

STORAGE VO	JEUIVIE					
C€	ell 1		Ce	II 2	Com	oined
Elevation (m)	Total Storage (m³)		Elevation (m)	Total Storage (m³)	Elevation (m)	Total Storage (m³)
131.76	0		131.26	0	131.26	0
131.86	9		131.36	37	131.36	218
131.96	20	1	131.46	48	131.46	229
132.06	32		131.56	61	131.56	242
132.16	47		131.66	76	131.66	257
132.26	64		131.76	93	131.76	274
132.36	82		131.86	112	131.86	293
132.46	103		131.96	134	131.96	315
132.56	127		132.06	159	132.06	340
132.66	153		132.16	186	132.16	367
132.76	181	Top of forebay	132.26	216	132.26	397
		•	132.36	249	132.36	430
			132.46	285	132.46	466
			132.56	324	132.56	504
			132.66	366	132.66	547
			132.76	411	132.76	592
			132.86	523	132.86	704
			132.96	645	132.96	826
			133.06	777	133.06	958
			133.16	921	133.16	1101
			133.26	1074	133.26	1255
			133.36	1700	133.36	1881

1. Forebay Storage Volumes

A conservative estimate for forebay volume is equal to or greater than ten (10) years of sediment accumulation.

The conservative estimate for minimum forebay volume based on ten (10) times the sediment accumulation is 118 m3.

The total forebay volume is 181 m3.

Therefore, the forebay volume meets the conservative minimum requirements for total volume.

2. Permanent Pool Storage Volumes

Total Permanent Pool Volume Required = 953 m^3 Total Permanent Pool Volume Provided = 1881 m^3

Therefore, the permanent pool volume provided is greater than the required volume.

3. Settling Length

Distance = 31 m Settling Length (based on settling particles of approx. 0.15mm diameter)

4. Dispersion Length

Distance = 8 m Length of dispersion (based on pipe full flow capacity)

The forebay should be 31 m long to settle particles and for pipe full flow dispersion.

The forebay length provided in the proposed pond design is 40 m long for particle settlement and dispersion.

Therefore, the forebay length meets the minimum requirements for particle settlement and dispersion

McINTOSH PERRY

5. Forebay Width

Width = <u>Dist.</u> Equation 4.7 : Minimum Forebay Bottom Width

8

 $Width = \underline{31} = 4 \text{ m}$

8

The forebay deep zone should be at least 4 m wide.

The forebay deep zone width provided in the proposed pond design is 4 m wide.

Therefore, the forebay deep zone provided meets the minimum requirements for bottom width.

6. Forebay Surface Area

In all instances the forebay surface area should not exceed one-third (33.3 %) of the total permanent pool area:

Forebay surface area = 344 m^2 Permanent Pool surface area = 1374 m^2

The forebay surface area is 25.0% of the pond surface area

Therefore, the pond surface area meets the MECP requirements.

7. Forebay Volume

In all instances the forebay volume should not exceed 20% of the total permanent pool volume:

Forebay volume = 181 m³
Total Permanent Pool Volume = 1881 m³

The forebay volume is ---> 9% of the total permanent pool volume

Therefore, the pond volume meets the MECP requirements.

McINTOSH PERRY

CCO-13-9668-01 - PERTHMORE SUBDIVISION - STORMWATER MANAGEMENT POND CLEANOUT FREQUENCY

Catchment Imperviousness	Annual Loading (kg/ha)	Wet Density (kg/m³)	Annual Loading (m³/ha)
35%	770	1,230	0.6
55%	2,300	1,230	1.9
70%	3,495	1,230	2.8
85%	4,680	1,230	3.8

Requirements		Pond 1	Units
Catchment Imperviousness	=	46%	
Sediment Loading Per 1-Year	=	1.3	m³/ha
Total Area to Pond	=	11.2	ha
Yearly Sediment to Pond	=	14.7	m ³
Initial Removal Efficiency	=	80%	
Yearly Accumulation in Pond	=	11.8	m ³
Required Quality Volume	=	165	m³/ha
Required Permanent Pool Volume [(140 - 80 Extended Detention) x Total Area]	=	953	m ³
Permanent Pool Volume Provided	=	1,881	m ³
Required Quality Volume @ 5% less Efficient	=	157	m³/ha
Required Permanent Pool Volume @ 5% less Efficient [(133 - 80 Extended Detention) x Total Area]	=	860	m³
Total Sediment Accumlation Allowed Before Removal Required (Provided - Max Allowed 5% Reduction)	=	1021	m ³
Total Approximate Number of Years Before Sediment Removal is Required	=	87	years

See Extended Detention and Permanent Pool Volumes

McINTOSH PERRY

CCO-13-9668-01 - PERTHMORE SUBDIVISION - STORMWATER MANAGEMENT POND EMERGENCY SPILLWAY

Outlet Control Device - Outlet Control Structure

For Orifice Flow, C =	0.60
For Weir Flow, C =	1.70

	Emergency Weir
Invert Elevation	134.76
Weir Length	7.50 m

Elevation	We	Total	
Lievation	H [m]	Q [l/s]	Q [l/s]
134.76	Х	Х	0
134.86	0.10	403	403
134.96	0.20	1140	1140
135.06	0.30	2095	2095

Notes: 1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.

- 2. Orifice Equation: $Q = cA(2gh)^{1/2}$ (m³/s *1000 = l/s)
- 3. Weir Equation: $Q = CLH^{3/2}$ (m³/s *1000 = I/s)
- 4. These Computations Do Not Account for Submergence Effects Within the Pond Riser.

Reference: Urban Hydrology, Hydraulics and Stormwater Quality: engineering application and computer modeling

VO Model Pre-Development Results



NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
---- TRANSFORMED HYETOGRAPH ----
TIME
        RAIN | TIME
                       RAIN I'
                                TIME
                                       RAIN I
                                               TIME
                                                       RAIN
 hrs
       mm/hr
                hrs
                       mm/hr
                                 hrs
                                       mm/hr
                                                hrs
                                                       mm/hr
0.083
        2.45
               1.083
                       13.68
                              2.083
                                       5.08
                                               3.08
                                                       2.85
0.167
        2.45
               1.167
                       13. 68 İ
                              2. 167
                                       5.08
                                               3.17
                                                       2.85
0.250
        2.76
               1.250
                       71.35
                              2. 250
                                       4.44
                                               3.25
                                                       2.67
0.333
        2.76
               1.333
                       71.35
                              2. 333
                                       4.44
                                               3.33
                                                       2.67
0.417
        3.17
               1.417
                       17.30
                              2. 417
                                       3.96
                                               3.42
                                                       2.52
0.500
        3.17
               1.500
                       17.30
                              2.500
                                       3.96
                                               3.50
                                                       2.52
0.583
        3.78
               1.583
                       10.08
                              2.583
                                       3.59
                                               3.58
                                                       2.39
0.667
        3.78
               1.667
                       10.08
                              2.667
                                       3.59
                                               3.67
                                                       2.39
0.750
        4.76
               1.750
                       7.43
                              2.750
                                       3.30
                                               3.75
                                                       2.27
0.833
               1.833
                       7. 43 | 2. 833
                                       3.30
                                              3.83
                                                       2.27
        4.76
0.917
               1.917
                       5. 99 | 2. 917
                                       3.05
                                              3.92
        6.70 l
                                                      2. 16
       6.70 | 2.000
1.000
                       5. 99 | 3. 000
                                       3.05
                                             4.00
                                                      2. 16
```

Unit Hyd Opeak (cms) = 0.764

PEAK FLOW (cms) = 0.053 (i)
TIME TO PEAK (hrs) = 2.167
RUNOFF VOLUME (mm) = 3.556
TOTAL RAI NFALL (mm) = 31.287
RUNOFF COEFFICIENT = 0.114

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME RAIN | TIME TIME RAIN | RAIN | TIME RAIN mm/hr hrs mm/hr |' hrs mm/hr | mm/hr hrs hrs 0.083 3.23 1.083 18.09 | 2.083 6.70 3.08 3.75 18.09 | 2.167 3.17 3. 23 | 1. 167 6.70 0.167 3.75 0.250 3.63 | 1.250 94.66 | 2.250 5.86 3. 25 3.52 3.63 | 1.333 0.333 94.66 | 2.333 5.86 İ 3.33 3.52 1.417 22. 88 | 2. 417 0.417 4.18 5. 23 3.42 3.32 0.500 4. 18 İ 1.500 22. 88 | 2. 500 5. 23 İ 3.50 3.32 0.583 4.98 1.583 13. 31 | 2. 583 4.74 İ 3.58 3.14 0.667 4.98 1.667 13. 31 | 2. 667 4.74 3.67 3.14 0.750 6. 28 İ 1.750 9. 80 | 2. 750 4. 35 İ 3.75 2.99 0.833 6.28 1.833 9. 80 | 2. 833 4.35 İ 3.83 2.99 0.917 8.85 İ 1.917 7. 91 | 2. 917 4. 02 İ 3. 92 2.85 7. 91 | 3. 000 1.000 8.85 | 2.000 4.02 | 4.00 2.85

Unit Hyd Opeak (cms) = 0.764

PEAK FLOW (cms) = 0.105 (i)
TIME TO PEAK (hrs) = 2.167
RUNOFF VOLUME (mm) = 6.703
TOTAL RAINFALL (mm) = 41.381
RUNOFF COEFFICIENT = 0.162

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

** SI MULATION: 1-010yr 4hr 10min Chicago **

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		111	THE CHARLE		** **		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2. 167	7.85	3.17	4.40
0.250	4.26	1.250	110. 25	2. 250	6.86	3. 25	4. 13
0.333	4.26	1.333	110. 25	2. 333	6.86	3.33	4. 13
0.417	4.90	1.417	26.74	2. 417	6. 13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6. 13	3.50	3.89
0.583	5.83	1.583	15. 57	2. 583	5. 55	3.58	3.69
0.667	5.83	1.667	15. 57	2. 667	5. 55	3.67	3.69
0.750	7.35	1.750	11. 47	2. 750	5.09	3.75	3.50
0.833	7.35	1.833	11. 47	2. 833	5.09	3.83	3.50
0. 917	10.36	1.917	9. 26	2. 917	4.72	3. 92	3. 34

```
1.000 10.36 | 2.000 9.26 | 3.000 4.72 | 4.00 3.34
```

PEAK FLOW (cms) = 0.149 (i)TIME TO PEAK (hrs)= 2.083 RUNOFF VOLUME (mm) = 9.318 TOTAL RAINFALL (mm) = 48.343 RUNOFF COEFFICIENT = 0.193

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

** SIMULATION: 1-025yr 4hr 10min Chicago ** **********

CALIB NASHYD (0019) Area (ha)= 12.20 Curve Number (CN)= 64.0 | ID= 1 DT= 5.0 min | Ia (mm)= 6.90 # of Linear Res. (N)= 3.00 ----- U.H. Tp(hrs) = 0.61

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1.083	24.80	2. 083	9. 21	3.08	5. 16
0.167	4.44	1.167	24.80	2. 167	9. 21	3. 17	5. 16
0.250	4. 99	1.250	129.30	2. 250	8.05	3. 25	4.84
0.333	4. 99	1.333	129.30	2. 333	8.05	3. 33	4.84
0.417	5.75	1.417	31.36	2. 417	7. 18	3. 42	4.56
0.500	5.75	1.500	31.36	2.500	7. 19	3.50	4. 56
0.583	6.84	1.583	18. 26	2. 583	6. 51	3. 58	4.32
0.667	6.84	1.667	18. 26	2. 667	6. 51	3.67	4.32
0.750	8.62	1.750	13.46	2. 750	5. 97	3. 75	4. 11
0.833	8.62	1.833	13.46	2. 833	5. 97	3.83	4. 11
0. 917	12.15	1.917	10.86	2. 917	5. 53	3. 92	3.92
1.000	12.15	2.000	10.86	3.000	5. 53	4.00	3. 92

Unit Hyd Qpeak (cms)= 0.764

(cms) = 0.210 (i)PEAK FLOW (hrs) = 2.083TIME TO PEAK RUNOFF VOLUME (mm) = 12.871TOTAL RAINFALL (mm) = 56.700 RUNOFF COEFFICIENT = 0.227

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

********** ** SIMULATION: 1-050yr 4hr 10min Chicago ** CALIB Curve Number (CN)= 64.0 NASHYD (0019) | Area (ha)= 12.20 | ID= 1 DT= 5.0 min | Ia (mm)= 6.90 # of Linear Res. (N) = 3.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	APH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.96	1.083	27.61	2.083	10. 27	3.08	5. 76
0. 167	4.96	1.167	27. 61	2. 167	10. 27	3. 17	5.76
0.250	5.58	1.250	143.50	2. 250	8. 98	3. 25	5.40
0.333	5.58	1.333	143.50	2. 333	8. 98	3.33	5.40
0.417	6.42	1.417	34. 91	2. 417	8. 02	3.42	5. 10
0.500	6.42	1.500	34. 91	2.500	8. 02	3.50	5. 10
0.583	7.64	1.583	20.35	2. 583	7. 27	3.58	4.83
0.667	7.64	1.667	20.35	2.667	7. 27	3.67	4.83
0.750	9.62	1.750	15.00	2. 750	6.67	3.75	4.59
0.833	9.62	1.833	15.00	2.833	6.67	3.83	4. 59
0. 917	13.55	1.917	12. 12	2. 917	6. 17	3. 92	4.38
1.000	13.55	2.000	12. 12	3.000	6. 17	4.00	4. 38

Unit Hyd Qpeak (cms) = 0.764

----- U. H. Tp(hrs) = 0.61

PEAK FLOW (cms) = 0.262 (i)TIME TO PEAK (hrs)= 2.083 (mm) = 15.873RUNOFF VOLUME TOTAL RAINFALL (mm) = 63.117 RUNOFF COEFFICIENT = 0.251

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

** SIMULATION: 1-100yr 4hr 10min Chicago ** **********

| CALIB | |ID= 1 DT= 5.0 min | Ia (mm)= 6.90

NASHYD (0019) Area (ha) = 12.20 Curve Number (CN) = 64.0 # of Linear Res. (N) = 3.00 ----- U. H. Tp(hrs)= 0.61

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
TIME
                      RAIN | TIME RAIN | TIME
        RAIN | TIME
                                                       RAIN
       mm/hr
                      mm/hr |' hrs
                                       mm/hr | hrs
                                                      mm/hr
 hrs
                hrs
0.083
        5.46
               1.083
                       30. 39 | 2. 083
                                     11. 31 | 3. 08
                                                       6.34
                      30. 39 | 2. 167
        5.46
0.167
              1.167
                                      11.31
                                              3. 17
                                                      6.34
0.250
       6. 14 | 1. 250 | 157. 92 | 2. 250
                                       9.88 İ
                                              3. 25
                                                      5.95
       6. 14 | 1. 333 | 157. 92 | 2. 333
0.333
                                       9.88
                                              3.33
                                                      5. 95
0.417
       7.06
               1.417
                      38. 42 | 2. 417
                                       8.83
                                              3.42
                                                      5.61
0.500
       7.06 İ
               1.500
                      38. 42 | 2. 500
                                       8.83
                                              3.50
                                                      5. 61
0.583
       8. 40 İ
               1.583
                      22.40 | 2.583
                                       8.00
                                              3.58
                                                      5.31
0.667
       8.40
               1.667
                       22. 40 | 2. 667
                                       8.00
                                              3.67
                                                      5. 31
0.750
      10.58
               1.750
                       16. 51 | 2. 750
                                       7.34
                                              3.75
                                                      5.05
0.833
      10.58
               1.833
                      16. 51 | 2. 833
                                      7.34
                                              3.83
                                                      5.05
0. 917 14. 91
               1.917
                      13. 33 | 2. 917
                                       6.80
                                              3. 92
                                                      4.82
1.000 14.91 | 2.000
                      13. 33 | 3. 000
                                       6.80 | 4.00
                                                      4.82
```

PEAK FLOW (cms) = 0.317 (i)(hrs) = 2.083TIME TO PEAK RUNOFF VOLUME (mm) = 19.050TOTAL RAINFALL (mm) = 69.460 RUNOFF COEFFICIENT = 0.274

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

** SIMULATION: 2-025yr 12hr 15min SCS **

CALIB NASHYD (0019)

(ha)= 12.20 Curve Number (CN)= 64.0 Area (mm) = 6.90|ID= 1 DT= 5.0 min | Ιa # of Linear Res. (N) = 3.00 ----- U.H. Tp(hrs)= 0.61

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

____ TRANSFORMED HYFTOGRAPH ____

		110/	ANDI ORIVILI		VALII	='	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.34	6. 250	102.96	9. 33	2.73
0. 167	0.00	3.250	2.34	6. 333	14.04	9.42	2.73
0.250	0.00	3.333	3. 12	6. 417	14.04	9.50	2.73
0.333	1.95	3.417	3. 12	6. 500	14.04	9. 58	2.73
0.417	1. 95	3.500	3. 12	6. 583	14.04	9. 67	2.73
0.500	1. 95	3.583	3. 12	6. 667	14.04	9. 75	2.73
0.583	1.95	3.667	3. 12	6. 750	14.04	9.83	2.73
0.667	1.95	3.750	3. 12	6. 833	6. 24	9. 92	2.73
0.750	1.95	3.833	3. 12	6. 917	6. 24	10.00	2.73
0.833	1.95	3.917	3. 12	7. 000	6. 24	10.08	2.73
0. 917	1.95	4.000	3. 12	7. 083	6. 24	10. 17	2.73

```
1.000 1.95 | 4.083
                        3. 12 | 7. 167
                                        6. 24 | 10. 25
1.083
       1.95 | 4.167
                        3. 12 | 7. 250
                                        6. 24 | 10. 33
                        3. 12 | 7. 333
1.167
        1.95
               4.250
                                        4.68
                                               10.42
               4.333
1.250
        1. 95 İ
                        4. 68 | 7. 417
                                        4. 68 | 10. 50
1.333
        1.95
               4.417
                        4.68 | 7.500
                                        4. 68 | 10. 58
                                                        1.56
1.417
        1. 95 İ
               4.500
                        4. 68 | 7. 583
                                        4. 68 | 10. 67
                                                        1.56
                        4.68 7.667
1.500
        1.95
               4.583
                                        4.68
                                               10.75
1.583
        1.95
               4.667
                        4. 68 | 7. 750
                                        4.68 İ
                                               10.83
                                                        1.56
1.667
        1.95
               4.750
                        4.68 | 7.833
                                        4.68 İ
                                               10. 92
                                                        1.56
1.750
        1.95
               4.833
                        6. 24 | 7. 917
                                        4.68
                                               11.00
                                                        1 56
1.833
        1.95
               4.917
                        6. 24 | 8. 000
                                        4. 68 İ
                                               11.08
                                                        1 56
                        6. 24 | 8. 083
1.917
        1.95
               5.000
                                        4.68 İ
                                               11, 17
                                                        1.56
2.000
        1.95
               5.083
                        6. 24 | 8. 167
                                        4.68 İ
                                               11. 25
                                                        1.56
2.083
        1.95
                        6. 24 | 8. 250
               5.167
                                        4.68 İ
                                               11.33
                                                        1.56
2.167
        1.95
               5.250
                        6.24
                               8.333
                                        2.73 İ
                                               11.42
                                                        1.56
2.250
        1.95
               5.333
                               8. 417
                        9.36
                                        2.73
                                               11.50
                                                        1.56
2.333
         2.34
               5.417
                        9.36 İ
                               8.500
                                        2.73
                                               11.58
                                                        1.56
2.417
         2.34
               5.500
                        9. 36 | 8. 583
                                        2.73
                                               11.67
                                                        1.56
2.500
        2.34
               5.583
                        9.36 | 8.667
                                        2.73
                                               11. 75
                                                        1.56
2.583
         2.34
               5.667
                        9. 36 | 8. 750
                                        2.73
                                               11.83
                                                        1.56
2.667
         2.34
               5.750
                        9. 36 | 8. 833
                                        2.73
                                               11. 92
                                                        1.56
2.750
        2.34 | 5.833
                       37. 44 | 8. 917
                                        2.73
                                               12.00
                                                        1.56
2.833
        2.34
               5.917
                       37.44 | 9.000
                                        2. 73 | 12. 08
                                                        1.56
                       37. 44 | 9. 083
                                        2. 73 | 12. 17
2.917
         2.34
               6.000
                                                        1.56
3.000
        2. 34 | 6. 083 | 102. 96 | 9. 167
                                        2. 73 | 12. 25
                                                        1.56
3.083
       2. 34 | 6. 167 | 102. 96 | 9. 250
                                        2.73
```

Unit Hyd Qpeak (cms) = 0.764

PEAK FLOW (cms) = 0.383 (i)TIME TO PEAK (hrs) = 6.833RUNOFF VOLUME (mm) = 23.625TOTAL RAINFALL (mm) = 78.000 RUNOFF COEFFICIENT = 0.303

----- U.H. Tp(hrs) = 0.61

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

********* ** SIMULATION: 2-02yr 12hr 15min SCS ** ************ CALIB NASHYD (0019) Area (ha)= 12.20 Curve Number (CN) = 64.0 |ID= 1 DT= 5.0 min | la (mm) = 6.90# of Linear Res. (N) = 3.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME

```
hrs mm/hr
                 hrs
                      mm/hr | hrs mm/hr | hrs
                                                      mm/hr
0.083
        0.00
               3.167
                       1.30 | 6.250
                                      57.02
                                               9.33
                                                      1.51
0.167
        0.00
               3.250
                        1.30 | 6.333
                                       7.78
                                               9.42
                                                       1.51
               3.333
0.250
        0.00
                       1. 73 | 6. 417
                                       7.78
                                              9.50
                                                      1.51
0.333
               3.417
                       1. 73 | 6. 500
                                       7.78
                                              9.58
        1.08
                                                      1.51
                       1. 73 | 6. 583
0.417
        1.08
               3.500
                                       7.78
                                              9.67
                                                      1.51
0.500
        1.08
               3.583
                        1.73
                              6.667
                                       7.78
                                               9.75
                                                      1. 51
                                       7.78
0.583
        1.08
               3.667
                       1. 73 | 6. 750
                                              9.83
                                                      1. 51
0.667
        1.08
               3.750
                       1.73
                              6.833
                                       3.46
                                              9. 92
                                                      1.51
0.750
        1.08
               3.833
                       1.73
                              6. 917
                                       3.46
                                              10.00
                                                      1.51
0.833
        1.08
               3.917
                       1.73
                              7.000
                                       3.46
                                              10.08
                                                      1.51
                                              10.17
0.917
        1.08
               4.000
                       1.73
                              7.083
                                       3.46
                                                      1.51
1.000
        1.08
               4.083
                       1. 73 İ
                              7. 167
                                       3.46
                                              10.25
                                                      1.51
1.083
               4.167
                              7. 250
        1.08
                       1.73
                                       3.46
                                              10.33
                                                       0.86
1.167
        1.08
               4.250
                       1.73
                              7.333
                                       2.59
                                              10.42
                                                       0.86
1.250
               4.333
                              7. 417
        1.08
                        2.59
                                       2.59
                                              10.50
                                                       0.86
1.333
        1.08
               4.417
                        2.59
                              7.500
                                       2.59
                                              10.58
                                                       0.86
1.417
        1.08
               4.500
                       2.59
                              7.583
                                       2.59
                                              10.67
                                                       0.86
1.500
        1.08
               4.583
                        2.59
                              7.667
                                       2.59
                                              10.75
                                                       0.86
1.583
        1.08
               4.667
                        2.59
                              7.750
                                       2.59
                                              10.83
                                                       0.86
1.667
        1.08
               4.750
                        2.59
                              7.833
                                       2.59
                                              10.92
                                                       0.86
1.750
        1.08
               4.833
                        3.46
                              7. 917
                                       2.59
                                              11.00
                                                       0.86
1.833
        1.08
               4.917
                        3.46
                              8.000
                                       2.59
                                              11.08
                                                       0.86
1.917
        1.08
               5.000
                        3.46
                              8.083
                                       2.59
                                              11.17
                                                       0.86
2.000
               5.083
                              8. 167
                                       2.59
                                              11. 25
        1.08
                        3.46
                                                       0.86
2.083
        1.08
               5.167
                        3.46
                              8. 250
                                       2.59
                                              11.33
                                                       0.86
2.167
        1.08
               5.250
                       3.46
                              8. 333
                                       1.51
                                              11.42
                                                       0.86
2.250
        1.08
               5.333
                        5. 18
                              8. 417
                                       1.51
                                              11.50
                                                       0.86
2.333
        1.30
               5.417
                              8.500
                                              11.58
                        5. 18
                                       1.51
                                                       0.86
2.417
               5.500
                              8.583
                                              11.67
        1.30
                        5. 18
                                       1.51
                                                       0.86
2.500
               5.583
                              8.667
                                              11.75
        1.30
                        5. 18
                                       1.51
                                                       0.86
2.583
               5.667
                              8.750
        1.30
                        5. 18
                                       1.51
                                              11.83
                                                       0.86
               5.750
                              8.833
2.667
        1.30
                       5. 18
                                       1.51
                                              11.92
                                                       0.86
2.750
        1.30
               5.833
                       20. 74 | 8. 917
                                       1.51
                                             12.00
                                                       0.86
2.833
        1.30
               5.917
                       20.74 | 9.000
                                             12.08
                                       1.51
                                                       0.86
                       20. 74 | 9. 083
2.917
        1.30
               6.000
                                       1.51
                                             12.17
                                                       0.86
3.000
        1.30
               6.083
                       57.02 | 9.167
                                       1.51
                                             12. 25
                                                       0.86
3.083
       1. 30 | 6. 167
                       57. 02 | 9. 250
                                       1.51
```

PEAK FLOW (cms) = 0.114 (i)
TIME TO PEAK (hrs) = 6.833
RUNOFF VOLUME (mm) = 7.354
TOTAL RAINFALL (mm) = 43.200
RUNOFF COEFFICIENT = 0.170

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB									
NASHYD (0019)	Area	(ha)=	12.20	Curve Number (CN)= 64.0					
ID= 1 DT= 5.0 min	Ιa	(mm) =	6.90	# of Linear Res. (N) = 3.00					
	U. H.	Tp(hrs)=	0.61						

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORMEI) HYFTOGI	RAPH	_	
TIME	RAI N	I TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs		hrs	mm/hr
0.083	0.00	3.167	2.59	6. 250	114.05	9.33	3.02
0. 167	0.00	3.250	2.59	6. 333	15. 55	9.42	3.02
0. 250	0.00	3.333	3.46	6. 417	15. 55	9.50	3.02
0.333	2.16	3.417	3.46	6. 500	15.55	9. 58	3.02
0.417	2.16	3.500	3.46	6. 583	15. 55	9.67	3.02
0.500	2.16	3.583	3.46	6. 667	15. 55	9.75	3.02
0.583	2.16	3.667		6. 750	15. 55	9.83	3.02
0. 667	2.16	3.750		6. 833	6. 91	9. 92	3.02
0. 750		3.833		6. 917		10.00	3.02
0.833		3.917	3.46		6. 91	10.08	3.02
0. 917	2.16	4.000	3.46	7. 083	6. 91	10. 17	3.02
1.000	2.16	4.083	3.46	7. 167	6. 91	10. 25	3. 02
1.083		4.167	3.46	7. 250	6. 91	10.33	1. 73
1. 167		4.250	3. 46			10.42	1. 73
1. 250		4.333	5. 18				1.73
1. 333	2.16		5. 18	7. 500			1. 73
1. 417	2.16	4.500	5. 18	7. 583		10.67	1. 73
1.500	2.16	4.583	5. 18	7. 667		10.75	1.73
1.583	2.16	4.667	5. 18	7. 750	5. 18	10.83	1.73
1.667		4.750	5. 18	7.833	5. 18	10.92	1. 73 1. 73
1.750	2. 16	4.833	6. 91	1			1. 73
1. 833 1. 917	2. 16	5.000	6. 91 6. 91	8. 000 8. 083	5. 18 5. 18	11. 08 11. 17	1. 73
2.000	2. 16	5.083		6. 063 8. 167		11.17 11.25	1. 73
2.083	2. 16	5. 167		8. 250	5. 18	11. 23	1. 73
2. 167		5. 250	6. 91	8.333		11. 33	1. 73
2. 250		5.333	10. 37	8. 417			1. 73
2. 333	2.59	5.417	10. 37	8. 500	3. 02	11.58	1. 73
2. 417	2.59	5.500	10. 37	8. 583	3. 02	11.67	1. 73
2.500	2.59	5.583	10. 37	8. 667	3. 02	11. 75	1. 73
2. 583	2.59	5.667	10. 37	8. 750	3.02	11.83	1. 73
2.667	2.59	5.750	10. 37	8. 833	3.02	11. 92	1.73
2.750	2.59	5.833	41. 47	8. 917	3.02	12.00	1.73
2.833	2.59	5. 917	41. 47	9. 000	3.02	12.08	1.73
2. 917	2.59	6.000	41. 47	9. 083	3.02	12. 17	1.73
3.000	2.59	6.083	114.05	9. 167	3.02	12. 25	1.73
3.083	2.59	6. 167	114.05	9. 250	3.02		

Unit Hyd Qpeak (cms) = 0.764

^{**} SIMULATION: 2-050yr 12hr 15min SCS **

```
PEAK FLOW
              (cms) = 0.463 (i)
TIME TO PEAK
              (hrs) = 6.833
RUNOFF VOLUME
                (mm) = 28.421
TOTAL RAINFALL (mm) = 86.400
RUNOFF COEFFICIENT = 0.329
```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

______ **********

** SIMULATION: 2-05yr 12hr 15min SCS ** **********

CALIB NASHYD (0019)|

Area (ha)= 12.20 Curve Number (CN)= 64.0 | ID= 1 DT= 5.0 min | (mm) = 6.90# of Linear Res. (N) = 3.00 Ιa U. H. Tp(hrs) = 0.61

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0.083 9.33 2.02 0.00 3.167 1.73 6. 250 76.03 0.167 0.00 3.250 1.73 6. 333 10.37 9.42 2.02 0.250 0.00 3.333 2.30 6. 417 10.37 9.50 2.02 0.333 3.417 2.30 6.500 9.58 2.02 1.44 10.37 6. 583 0.417 3.500 2.30 9.67 2.02 1.44 10.37 6. 667 0.500 3.583 2.30 10.37 9.75 2.02 1.44 0.583 1.44 3.667 2.30 6.750 10.37 9.83 2.02 6.833 0.667 1.44 3.750 2.30 4.61 9.92 2.02 0.750 1.44 3.833 2.30 İ 6. 917 4 61 10 00 2.02 0.833 3.917 2.30 7 000 10.08 1.44 4.61 2.02 0.917 1.44 4.000 2.30 7.083 4.61 10.17 2.02 1.000 1.44 4.083 2.30 7. 167 4.61 10.25 2.02 1.083 1.44 4.167 2.30 7. 250 4.61 10.33 1.15 1.167 1.44 4.250 2.30 7.333 3.46 10.42 1.15 1.250 1.44 4.333 3.46 7. 417 3.46 10.50 1.15 1.333 1.44 4.417 3.46 7.500 3.46 10.58 1.15 4.500 7.583 1.417 1.44 3.46 3.46 10.67 1.15 1.500 1.44 4.583 3.46 İ 7.667 3.46 10.75 1.15 1.583 1.44 4.667 3.46 | 7.750 3.46 10.83 1.15 1.667 1.44 4.750 3.46 | 7.833 3.46 10.92 1.15 4.833 1.750 1.44 4.61 | 7.917 3.46 11.00 1.15 1.833 1.44 4.917 4.61 | 8.000 3.46 11. 08 1.15 5.000 8.083 1.917 1.44 4.61 3.46 11. 17 1.15 5.083 3.46 2.000 1.44 4. 61 | 8. 167 11. 25 1. 15 2.083 1.44 5.167 4.61 | 8.250 3.46 11. 33 1.15 2.167 1.44 5.250 4.61 | 8.333 2. 02 | 11. 42 1. 15 2.250 1.44 | 5.333 6. 91 | 8. 417 2.02 | 11.50 1. 15

```
2.333
       1.73 | 5.417
                         6. 91 | 8. 500
                                         2.02 | 11.58
2.417
        1.73 | 5.500
                         6. 91 | 8. 583
                                         2.02 | 11.67
2.500
         1.73 | 5.583
                         6. 91 | 8. 667
                                         2.02 | 11.75
2.583
        1.73 | 5.667
                         6. 91 | 8. 750
                                         2. 02 | 11. 83
                                                          1 15
        1.73 | 5.750
                         6. 91 | 8. 833
                                         2.02 | 11.92
2.667
                                                          1 15
2.750
        1.73 | 5.833
                        27.65 | 8.917
                                         2.02 | 12.00
                                                          1.15
2.833
        1.73 | 5.917
                        27.65 | 9.000
                                         2. 02 | 12. 08
                                                         1. 15
2.917
        1.73 | 6.000
                        27. 65 | 9. 083
                                         2.02 | 12.17
                                                          1.15
3.000
        1.73 | 6.083
                        76.03 | 9.167
                                         2. 02 | 12. 25
                                                          1.15
3.083
        1.73 | 6.167
                       76. 03 | 9. 250
                                         2.02
```

Unit Hyd Qpeak (cms) = 0.764

PEAK FLOW (cms) = 0.211 (i)TIME TO PEAK (hrs) = 6.833RUNOFF VOLUME (mm) = 13.279TOTAL RAINFALL (mm) = 57.600RUNOFF COEFFICIENT = 0.231

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

** SIMULATION: 2-100yr 12hr 15min SCS **

1.083

1.167

1.250

2.40 | 4.167

2.40 | 4.250

2.40 | 4.333

CALIB NASHYD (0019) (ha) = 12.20Curve Number (CN) = 64.0 Area | ID= 1 DT= 5.0 min | (mm) = 6.90Ιa # of Linear Res. (N) = 3.00 U. H. Tp(hrs) = 0.61_____

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr hrs mm/hr |' hrs mm/hr | hrs mm/hr 0.083 0.00 | 3.167 2.88 | 6.250 126.72 | 9.33 3.36 0.167 0.00 | 3.250 2. 88 | 6. 333 17. 28 9.42 3.36 0.250 0.00 | 3.333 3. 84 | 6. 417 17. 28 9.50 3.36 0.333 2.40 | 3.417 3.84 | 6.500 17. 28 9.58 3.36 0.417 2.40 | 3.500 3.84 | 6.583 17. 28 9.67 3.36 0.500 2.40 | 3.583 3.84 | 6.667 17. 28 9.75 3.36 0.583 2.40 | 3.667 3.84 | 6.750 17. 28 9.83 3.36 0.667 2.40 | 3.750 3.84 | 6.833 7.68 9.92 3.36 0.750 2.40 | 3.833 3.84 | 6.917 7.68 10.00 3.36 0.833 2.40 | 3.917 3.84 | 7.000 7.68 10.08 3.36 0.917 2.40 | 4.000 3.84 | 7.083 7.68 10.17 3.36 1.000 2.40 | 4.083 3.84 | 7.167 10. 25 7.68 3.36

3.84 | 7.250

3.84 | 7.333

5. 76 | 7. 417

7.68 | 10.33

5. 76 | 10. 42

5. 76 | 10. 50

1.92

1.92

1. 92

```
1.333
       2.40 | 4.417
                       5.76 | 7.500
                                       5. 76 | 10. 58
                                                      1. 92
1.417
        2.40
               4.500
                        5.76 | 7.583
                                       5.76
                                              10. 67
                                                       1. 92
1.500
        2.40
               4.583
                        5.76 | 7.667
                                       5.76
                                              10.75
                                                       1.92
1.583
                        5. 76 | 7. 750
                                              10.83
        2.40
               4.667
                                       5.76
                                                       1.92
               4.750
                        5. 76 | 7. 833
                                              10.92
1.667
        2.40
                                       5.76
                                                       1.92
1.750
        2.40 İ
               4.833
                        7. 68 | 7. 917
                                       5.76
                                              11.00
                                                       1.92
1.833
        2.40
               4.917
                        7.68
                               8.000
                                       5.76
                                              11.08
                                                       1.92
1.917
        2.40
               5.000
                        7.68
                               8.083
                                       5.76
                                              11. 17
                                                       1.92
2.000
        2.40
               5.083
                        7.68
                               8. 167
                                       5.76
                                              11. 25
                                                       1. 92
                                       5.76
2.083
        2.40
               5.167
                        7.68
                               8. 250
                                              11.33
                                                       1.92
2.167
        2.40
               5.250
                               8.333
                                              11.42
                       7.68
                                       3.36
                                                       1. 92
2.250
        2.40
               5.333
                       11. 52
                               8. 417
                                       3.36
                                              11.50
                                                       1. 92
2.333
        2.88
               5.417
                       11.52
                               8.500
                                       3.36
                                              11.58
                                                       1. 92
2.417
        2.88
               5.500
                       11. 52
                               8.583
                                       3.36
                                              11.67
                                                       1.92
2.500
        2.88
               5.583
                       11.52
                               8.667
                                       3.36
                                              11.75
                                                       1. 92
2.583
        2.88
               5.667
                       11.52
                               8.750
                                       3.36
                                              11.83
                                                       1.92
2.667
               5.750
                       11. 52
                               8.833
                                              11. 92
        2.88
                                       3.36
                                                       1. 92
2.750
        2.88
               5.833
                       46.08
                               8. 917
                                              12.00
                                                       1. 92
                                       3.36
2.833
        2.88
               5.917
                       46.08
                               9.000
                                       3.36
                                              12.08
                                                       1. 92
2.917
        2.88
               6.000
                       46.08
                               9.083
                                       3.36
                                              12.17
                                                       1. 92
3.000
        2.88
               6.083
                      126.72
                               9. 167
                                       3.36
                                              12. 25
                                                       1.92
3.083
        2.88
               6. 167 126. 72 | 9. 250
                                       3.36
```

PEAK FLOW (cms) = 0.560 (i) TIME TO PEAK (hrs) = 6.833 RUNOFF VOLUME (mm) = 34.222 TOTAL RAINFALL (mm) = 96.000 RUNOFF COEFFICIENT = 0.356

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----RAIN I' TIME TIME RAIN | TIME RAIN | TIME RAIN mm/hr | hrs mm/hr hrs hrs mm/hr | hrs mm/hr 0.083 0.00 3.167 1. 98 | 6. 250 87.12 | 9.33 2.31 0.167 0.00 | 3.250 1. 98 | 6. 333 11.88 9.42 2.31 0.250 0.00 | 3.333 2. 64 | 6. 417 | 11. 88 | 9. 50 2.31

```
0.333
       1.65 | 3.417
                        2.64 | 6.500 | 11.88 | 9.58
                                                         2.31
0.417
        1.65 | 3.500
                        2.64 | 6.583 | 11.88 |
                                                         2.31
0.500
         1.65 | 3.583
                         2.64 | 6.667
                                       11.88
                                                 9.75
                                                         2.31
0.583
                         2. 64 | 6. 750
                                                9.83
         1.65 | 3.667
                                       11. 88
                                                         2 31
                                                9. 92
        1.65 | 3.750
                        2.64 | 6.833
0.667
                                        5. 28 I
                                                         2.31
0.750
        1.65 | 3.833
                        2.64 | 6.917
                                         5. 28
                                                10.00
                                                         2.31
0.833
        1.65
               3.917
                         2.64 | 7.000
                                         5. 28
                                                10.08
                                                         2.31
0.917
        1.65
               4.000
                        2.64 | 7.083
                                         5. 28
                                                10.17
                                                         2.31
1.000
        1.65
               4.083
                        2.64 | 7.167
                                         5. 28
                                                10. 25
                                                         2.31
                                         5. 28
1.083
        1.65
               4.167
                         2.64 | 7.250
                                                10.33
                                                         1.32
1.167
               4.250
                         2.64 | 7.333
                                         3.96
                                                10.42
        1.65
                                                         1.32
1.250
        1.65
               4.333
                         3. 96 | 7. 417
                                         3.96
                                                10.50
                                                         1.32
1.333
        1.65
               4.417
                         3.96 | 7.500
                                         3.96
                                                10.58
                                                         1.32
1.417
        1.65
               4.500
                         3.96 | 7.583
                                         3.96
                                                10.67
                                                         1.32
1.500
        1.65
               4.583
                         3.96
                                7.667
                                         3.96
                                                10.75
                                                         1.32
                                7.750
1.583
        1.65
               4.667
                         3.96
                                         3.96
                                                10.83
                                                         1.32
1.667
               4.750
                         3.96 İ
                                7.833
                                                10.92
         1.65
                                         3.96
                                                         1.32
1.750
        1.65
               4.833
                         5. 28
                                7. 917
                                         3.96
                                                11.00
                                                         1.32
1.833
        1.65
               4.917
                         5.28
                                8.000
                                         3.96
                                                11.08
                                                         1.32
1.917
        1.65
               5.000
                         5. 28
                                8.083
                                         3.96
                                                11. 17
                                                         1.32
2.000
        1.65
               5.083
                         5. 28
                                8. 167
                                         3.96
                                                11. 25
                                                         1.32
2.083
        1.65
               5.167
                         5. 28
                                8. 250
                                         3.96
                                                11.33
                                                         1.32
2.167
         1.65
               5.250
                         5. 28
                                8. 333
                                         2.31
                                                11.42
                                                         1.32
2.250
        1.65
               5.333
                         7.92
                                8. 417
                                         2.31
                                                11.50
                                                         1.32
2.333
               5.417
                         7. 92 | 8. 500
        1.98
                                         2.31
                                                11. 58
                                                         1.32
2.417
               5.500
                        7. 92 | 8. 583
                                         2.31
                                                11.67
        1.98
                                                         1.32
2.500
        1.98
               5.583
                        7. 92 | 8. 667
                                         2.31
                                                11. 75
                                                         1.32
2.583
        1.98
               5.667
                        7. 92 | 8. 750
                                         2.31
                                               11.83
                                                         1.32
2.667
        1.98 | 5.750
                        7. 92 | 8. 833
                                         2.31
                                               11. 92
                                                         1.32
2.750
                        31.68 | 8.917
        1.98 | 5.833
                                         2.31
                                               12.00
                                                         1.32
2.833
        1. 98 | 5. 917
                        31.68 | 9.000
                                         2.31
                                               12.08
                                                         1.32
2.917
        1. 98 | 6. 000
                       31.68 | 9.083
                                         2. 31 | 12. 17
                                                         1.32
                        87. 12 | 9. 167
3.000
        1.98 | 6.083
                                         2. 31 | 12. 25
                                                         1.32
3.083
       1. 98 | 6. 167
                       87. 12 | 9. 250
                                         2.31
```

Unit Hyd Qpeak (cms) = 0.764

PEAK FLOW (cms) = 0.278 (i)
TIME TO PEAK (hrs) = 6.833
RUNOFF VOLUME (mm) = 17.293
TOTAL RAINFALL (mm) = 66.000
RUNOFF COEFFICIENT = 0.262

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| ID= 1 DT= 5.0 min | Ia (mm)= 6.90 # of Linear Res. (N)= 3.00 ----- U. H. Tp(hrs)= 0.61

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGF	RAPH		
TIM	E RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	s mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.08	3 0.00	6.167	2.09	12. 250	127. 21	18. 33	2.08
0.16	7 0.00	6.250	2.09	12. 333	20. 17	18. 42	2.08
0. 250	0.00	6.333	2. 15	12. 417	20. 15	18.50	2.08
0.33	3 1.19	6.417	2. 15	12. 500	20. 15	18. 58	2.01
0.41	7 1.19	6.500	2. 15	12. 583	13. 72	18. 67	2.01
0.500	1.19	6.583	2. 20	12. 667	13. 72	18. 75	2.01
0.583	3 1.22	6.667	2. 20	12. 750	13. 72	18. 83	1. 93
0.66	7 1.22	6.750	2. 20	12. 833	9.44	18. 92	1. 93
0.750	1.22	6.833	2. 26	12. 917	9. 44	19.00	1. 93
0.83	3 1.25	6.917	2. 26	13.000	9.44	19.08	1.86
0. 91	7 1.25	7.000	2. 26	13. 083	7. 97	19. 17	1.86
1.000	0 1.25	7.083	2.32	13. 167	7. 97	19. 25	1.86
1.083	3 1.28	7.167	2.32	13. 250	7. 97	19. 33	1. 79
1. 16	7 1.28	7.250	2.32	13. 333	6. 75	19.42	1. 79
1. 250	0 1.28	7.333		13. 417	6. 75	19.50	1. 79
1. 33	3 1.31	7.417	2.38	13. 500	6. 75	19. 58	1. 71
1.41	7 1.31	7.500	2.38	13. 583	5. 96	19. 67	1. 71
1.500		7.583		13. 667	5. 96	19. 75	1. 71
1. 58		7.667		13. 750	5. 96	19.83	1.64
1.66		7.750		13. 833	5. 22	19. 92	1.64
1. 750		7.833		13. 917	5. 22	20.00	1. 64
1.83		7.917		14.000	5. 22	20.08	1.57
1. 91		8.000		14. 083	4.66	20. 17	1.57
2.000		8.083		14. 167	4. 66	20. 25	1.57
2.08		8.167		14. 250	4. 66	20. 33	1. 52
2. 16		8.250		14. 333	4. 25	20. 42	1. 52
2. 250		8.333		14. 417	4. 25	20.50	1. 52
2. 33		8.417	2. 74	14. 500	4. 25	20. 58	1. 51
2. 41		8.500		14. 583	4. 05	20. 67	1. 51
2.500		8.583		14. 667	4. 05	20. 75	1.51
2. 58		8.667		14. 750	4.05	20.83	1. 49
2. 66		8.750		14. 833	3. 83	20. 92	1.49
2. 750		8.833		14. 917	3. 83	21.00	1.49
2. 83		8.917		15.000	3.83	21.08	1.48
2. 91		9.000		15. 083	3.63	21. 17	1.48
3.000		9.083	3. 61 3. 61	15. 167 15. 250	3.63	21. 25 21. 33	1. 48 1. 46
					3.63		
3. 16 ³ 3. 25		9.250	3. 61 3. 76	15. 333 15. 417	3. 42	21. 42 21. 50	1. 46 1. 46
3. 23		9.333		15. 417	3. 42 3. 42	21.50	1. 46
3. 41				15. 500 15. 583	3. 42	21.58	1. 45
3. 41		9.500		15. 583 15. 667	3. 22	21. 67	1. 45
3. 58		9.583		15. 667 15. 750	3. 22	21.75	1. 45
3. 58.	5 1.5/	9.00/	3.76	10.700	3. 22	21.03	1.43

TRANSFORMER HVETOCRADH

```
3.750 1.57 | 9.833
                        4. 01 | 15. 917 3. 01 | 22. 00 1. 43
                        4. 01 | 16. 000
3.833
        1.60 | 9.917
                                        3.01 | 22.08
                        4. 01 | 16. 083
3.917
        1.60 | 10.000
                                         2. 81 | 22. 17
                                                         1 42
        1.60 | 10.083
                        4. 46 | 16. 167
                                         2. 81 | 22. 25
4.000
                                                        1.42
        1.63 | 10.167
                        4. 46 | 16. 250
                                        2. 81 | 22. 33
4.083
                                                        1.40
        1.63 | 10.250
                        4. 46 | 16. 333
                                         2. 67 | 22. 42
4. 167
        1.63 10.333
                        5. 07 | 16. 417
4.250
                                         2. 67 | 22. 50
                                                        1 40
4.333
        1.68 | 10.417
                        5. 07 | 16. 500
                                         2. 67 | 22. 58
                                                        1.39
        1.68 | 10.500
                        5. 07 | 16. 583
4.417
                                         2.60 | 22.67
                                                         1.39
4.500
        1.68 | 10.583
                        5. 75 | 16. 667
                                         2.60 | 22.75
                                                         1.39
4.583
        1.73 | 10.667
                        5. 75 | 16. 750
                                         2.60 | 22.83
                                                         1.37
4.667
        1.73 | 10.750
                        5. 75 | 16. 833
                                         2. 52 | 22. 92
                                                         1.37
4.750
        1. 73 | 10. 833
                        6. 73 | 16. 917
                                         2. 52 | 23. 00
                                                         1.37
4.833
        1. 79 | 10. 917
                        6. 73 | 17. 000
                                         2. 52 | 23. 08
                                                         1.36
4.917
        1. 79 | 11. 000
                        6. 73 | 17. 083
                                         2. 45 | 23. 17
                                                         1.36
5.000
        1.79 | 11.083
                        7. 86 | 17. 167
                                         2. 45 | 23. 25
                                                         1.36
                        7. 86 | 17. 250
5.083
        1.85 | 11.167
                                         2.45
                                               23.33
                                                         1.35
5. 167
        1.85 | 11.250
                        7.86 | 17.333
                                         2.37
                                               23.42
                                                         1.35
5.250
        1.85 | 11.333
                        9. 93 | 17. 417
                                         2.37
                                               23.50
                                                         1.35
5.333
        1. 91 | 11. 417
                        9. 93 | 17. 500
                                         2. 37 | 23. 58
                                                         1.33
5.417
        1. 91 | 11. 500
                        9. 93 | 17. 583
                                         2.30 | 23.67
                                                         1.33
5.500
        1. 91 | 11. 583
                        12.64 | 17.667
                                         2. 30 | 23. 75
                                                         1.33
                                         2. 30 | 23. 83
5.583
        1. 97 | 11. 667
                        12.64 | 17.750
                                                         1.31
        1. 97 | 11. 750
                       12. 64 | 17. 833
5.667
                                         2. 23 | 23. 92
                                                         1.31
                                         2. 22 | 24. 00
5.750
        1. 97 | 11. 833
                       51. 54 | 17. 917
                                                         1.31
        2.03 | 11.917 | 51.54 | 18.000
5.833
                                         2. 22 | 24. 08
                                                         1.30
5.917
        2.03 | 12.000 | 51.54 | 18.083
                                         2. 15 | 24. 17
                                                         1.30
6.000 2.03 | 12.083 127.20 | 18.167
                                         2. 15 | 24. 25
                                                        1.30
6. 083 2. 09 | 12. 167 127. 21 | 18. 250
                                         2.15 İ
     (cms) = 0.678 (i)
```

Unit Hyd Qpeak (cms) = 0.764

PEAK FLOW TIME TO PEAK (hrs)= 12.750 (mm) = 48.326RUNOFF VOLUME TOTAL RAINFALL (mm) = 117.600 RUNOFF COEFFICIENT = 0.411

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

*********** ** SIMULATION: 3-10yr 24hr 15min SCS Type II **

************* | CALIB

NASHYD (0019) | Area (ha)= 12.20 Curve Number (CN) = 64.0 # of Linear Res. (N) = 3.00 | ID= 1 DT= 5.0 min | Ia (mm)= 6.90 ----- U. H. Tp(hrs) = 0.61

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr hrs mm/hr |' hrs mm/hr | hrs mm/hr 0.083 0.00 6.167 1. 45 | 12. 250 88.27 | 18. 33 1.44 0.167 0.00 6.250 1. 45 | 12. 333 13.99 18.42 1.44 0.250 0.00 6.333 1. 49 | 12. 417 13.98 18.50 1.44 0.333 0.83 6.417 1.49 | 12.500 13.98 18.58 1.39 0.417 0.83 6.500 1.49 | 12.583 9.52 18.67 1 39 0.500 0.83 6.583 1. 53 | 12. 667 9.52 18.75 1 39 0.583 0.85 6.667 1.53 | 12.750 9.52 18.83 1.34 0.667 0.85 6.750 1, 53 | 12, 833 6.55 18.92 1.34 0.750 0.85 6.833 1.57 112.917 6.55 19.00 1 34 0.833 0.87 6.917 1.57 | 13.000 6.55 19.08 1.29 0.917 1. 57 | 13. 083 0.87 7.000 5.53 19.17 1.29 1.000 0.87 7.083 1, 61 | 13, 167 19. 25 5. 53 1. 29 1.083 0.89 7.167 13. 250 5.53 19.33 1.61 1.24 1.167 0.89 7.250 1.61 | 13.333 19.42 4.68 1.24 1.250 0.89 7.333 1.65 | 13.417 4.68 19.50 1.24 1.333 0.91 7.417 1.65 | 13.500 4.68 19.58 1.19 1.417 0.91 7.500 1.65 | 13.583 4.13 19.67 1.19 1.500 0.91 7.583 1.69 | 13.667 4.13 19.75 1.19 1.583 0.93 7.667 1.69 | 13.750 4.13 19.83 1.14 1.667 0.93 7.750 1. 69 | 13. 833 3.62 19.92 1.14 1.750 0.93 7.833 1. 73 | 13. 917 3.62 20.00 1.14 1.833 0.95 7.917 1. 73 | 14. 000 3.62 20.08 1.09 1.917 0.95 8.000 1. 73 | 14. 083 20.17 1.09 3. 23 2.000 0.95 8.083 1. 77 | 14. 167 20. 25 3.23 1.09 2.083 0.97 1.77 | 14.250 8.167 3.23 20.33 1.06 2.167 0.97 8.250 1.77 | 14.333 2.95 20.42 1.06 2.250 1. 90 | 14. 417 0.97 8.333 2.95 20.50 1.06 1. 90 | 14. 500 2.333 0.99 8.417 2.95 20.58 1.05 2.417 0.99 8.500 1. 90 | 14. 583 2.81 20.67 1.05 2.500 0.99 8.583 2. 10 | 14. 667 2.81 20.75 1.05 2.583 1.01 8.667 2. 10 | 14. 750 2.81 20.83 1.03 2.667 1.01 8.750 2. 10 | 14. 833 2.66 20.92 1 03 2.750 2. 31 | 14. 917 1.01 8.833 2.66 21.00 1.03 2.833 1.03 8.917 2. 31 | 15. 000 2.66 21.08 1.02 2.917 1.03 9.000 2. 31 | 15. 083 2.52 21.17 1.02 3.000 1.03 9.083 2. 51 | 15. 167 2.52 21. 25 1.02 3.083 2. 51 | 15. 250 1.05 9.167 2.52 21.33 1.02 3.167 1.05 9.250 2. 51 | 15. 333 2.37 21.42 1.02 3.250 1.05 9.333 2. 61 | 15. 417 2.37 21.50 3.333 1.07 9.417 2.61 | 15.500 2.37 21.58 3.417 9.500 2. 61 | 15. 583 1.07 2.24 21.67 1.01 3.500 1.07 9.583 2.61 | 15.667 2.24 21.75 1.01 2.61 | 15.750 3.583 1.09 9.667 2. 24 21.83 0.99 9.750 2. 61 | 15. 833 2.09 0.99 3.667 1.09 21. 92 3.750 1.09 9.833 2. 78 | 15. 917 2.09 22.00 0.99 2.78 | 16.000 22.08 3.833 1.11 | 9.917 2.09 0.98 3.917 1.11 | 10.000 2. 78 | 16. 083 1. 95 | 22. 17 0.98

```
4.000
        1.11 | 10.083
                          3.09 | 16.167
                                           1. 95 | 22. 25
                                                             0.98
4.083
         1. 13 | 10. 167
                          3.09 | 16.250
                                           1. 95 | 22. 33
                                                             0.97
4.167
         1.13 | 10.250
                          3.09 | 16.333
                                           1.85
                                                   22.42
                                                             0.97
         1. 13 | 10. 333
                          3. 52 | 16. 417
                                           1.85 | 22.50
4.250
                                                             0.97
4.333
         1.16 | 10.417
                          3.52 | 16.500
                                           1.85 | 22.58
                                                             0.96
4.417
         1.16 | 10.500
                          3.52 | 16.583
                                           1.80
                                                   22.67
                                                             0.96
         1. 16 | 10. 583
4.500
                          3. 99 | 16. 667
                                           1.80
                                                   22.75
                                                             0.96
4.583
         1. 20 | 10. 667
                          3. 99 | 16. 750
                                           1.80 j
                                                   22.83
                                                             0.95
4.667
         1.20 | 10.750
                          3. 99 | 16. 833
                                           1.75
                                                   22.92
                                                             0.95
4.750
         1. 20 | 10. 833
                          4. 67 | 16. 917
                                           1.75
                                                   23.00
                                                             0.95
4.833
         1. 25 | 10. 917
                          4. 67 | 17. 000
                                           1.75
                                                   23.08
                                                             0.94
4.917
         1. 25 | 11. 000
                          4. 67 | 17. 083
                                           1.70
                                                   23.17
                                                             0.94
5.000
         1. 25 | 11. 083
                          5. 45 | 17. 167
                                           1.70 İ
                                                   23. 25
                                                             0.94
                          5. 45 | 17. 250
5.083
         1. 28 | 11. 167
                                           1.70
                                                   23.33
                                                             0.93
5. 167
         1. 28 | 11. 250
                          5. 45 | 17. 333
                                           1.65
                                                   23.42
                                                             0.93
                          6. 89 | 17. 417
5.250
         1.28 | 11.333
                                           1.65
                                                   23.50
                                                             0.93
5.333
         1. 33 | 11. 417
                          6.89
                                17, 500
                                                             0.92
                                           1.65
                                                   23.58
5.417
         1.33 | 11.500
                          6. 89 | 17. 583
                                                   23.67
                                                             0.92
                                           1.60
5.500
         1.33 | 11.583
                          8.77 | 17.667
                                           1.60
                                                   23.75
                                                             0.92
5.583
         1.37 | 11.667
                          8.77 | 17.750
                                           1.60
                                                   23.83
                                                             0.91
5.667
         1.37 | 11.750
                          8.77 | 17.833
                                           1.54
                                                   23.92
                                                             0.91
5.750
         1.37 | 11.833
                          35. 76 | 17. 917
                                           1.54
                                                   24.00
                                                             0.91
5.833
         1.41 | 11.917
                          35.77 | 18.000
                                           1.54
                                                   24.08
                                                             0.90
5.917
         1.41 | 12.000
                         35. 77 | 18. 083
                                           1.49
                                                   24. 17
                                                             0.90
         1.41 | 12.083
6.000
                         88. 26 | 18. 167
                                                             0.90
                                           1.49
                                                   24. 25
6.083
         1.45 | 12.167
                         88. 27 | 18. 250
                                           1.49
     (cms) = 0.352 (i)
     (hrs) = 12.750
      (mm) = 25.646
```

Unit Hyd Qpeak (cms) = 0.764

PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL (mm) = 81.600 RUNOFF COEFFICIENT = 0.314

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

** SIMULATION: 3-25yr 24hr 15min SCS Type II ** **************

| CALIB NASHYD (0019) Area (ha) = 12.20Curve Number (CN) = 64.0 |ID= 1 DT= 5.0 min | Ia (mm) = 6.90# of Linear Res. (N) = 3.00 U. H. Tp(hrs) = 0.61

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN

```
mm/hr | hrs mm/hr | hrs
  hrs mm/hr
                  hrs
                                                           mm/hr
0.083
         0.00
                         1.70 | 12.250 | 103.84 |
                6.167
                                                 18. 33
                                                           1.70
0.167
         0.00
                6.250
                         1.70 | 12.333
                                         16.46
                                                  18.42
                                                           1.70
0.250
         0.00
                6.333
                         1. 75 | 12. 417
                                         16.45
                                                 18.50
                                                           1.70
0.333
         0.97
                         1. 75 | 12. 500
                6.417
                                         16.45
                                                 18. 58
                                                           1.64
0.417
         0.97
                6.500
                         1. 75 | 12. 583
                                         11. 20
                                                  18.67
                                                           1.64
0.500
         0.97
                6.583
                         1. 80 | 12. 667
                                         11. 20
                                                  18.75
                                                           1.64
         1.00
0.583
                6.667
                         1. 80 | 12. 750
                                         11. 20
                                                  18.83
                                                           1.58
0.667
         1.00
                6.750
                         1.80 | 12.833
                                          7.70
                                                  18.92
                                                          1.58
                                          7.70
0.750
         1.00
                6.833
                         1.85 | 12.917
                                                  19.00
                                                          1.58
0.833
         1.02
                6.917
                         1. 85 | 13. 000
                                          7.70
                                                  19.08
                                                          1.52
0.917
         1.02
                7.000
                         1. 85 | 13. 083
                                          6.51
                                                  19.17
                                                          1.52
1.000
         1.02
                7.083
                         1. 90 | 13. 167
                                          6.50
                                                 19. 25
                                                          1.52
1.083
         1.04
                7.167
                         1. 90 | 13. 250
                                          6.50
                                                  19.33
                                                           1 46
1.167
         1.04
                7.250
                         1. 90 | 13. 333
                                          5. 51
                                                  19.42
                                                           1.46
1.250
                         1. 94 | 13. 417
         1.04
                7.333
                                          5. 51
                                                  19.50
                                                           1.46
1.333
         1.07
                7.417
                         1. 94 | 13. 500
                                          5. 51
                                                  19.58
                                                           1.40
1.417
         1.07
                7.500
                         1. 94 | 13. 583
                                                  19.67
                                          4.86
                                                           1.40
1.500
         1.07
                7.583
                         1. 99 | 13. 667
                                          4.86
                                                  19.75
                                                           1.40
1.583
         1.09
                7.667
                         1. 99 | 13. 750
                                          4.86
                                                  19.83
                                                           1.34
1.667
         1.09
                7.750
                         1. 99 | 13. 833
                                          4.26
                                                  19.92
                                                           1.34
1.750
         1.09
                7.833
                         2.04 | 13.917
                                          4.26
                                                  20.00
                                                           1.34
1.833
         1.12
                7.917
                         2.04 | 14.000
                                          4.26
                                                  20.08
                                                           1.28
1.917
         1.12
                8.000
                         2.04 | 14.083
                                          3.80
                                                  20.17
                                                           1.28
2.000
                8.083
                         2. 09 | 14. 167
         1.12
                                          3.80
                                                 20. 25
                                                           1. 28
2.083
                8.167
                         2.09 | 14.250
         1.14
                                          3.80
                                                 20.33
                                                           1. 24
2.167
         1.14
                8.250
                         2.09 | 14.333
                                          3.47
                                                  20.42
                                                           1. 24
2.250
         1.14
                8.333
                         2. 24 | 14. 417
                                          3.47
                                                  20.50
                                                           1. 24
2.333
         1.17
                8.417
                         2. 24 | 14. 500
                                          3.47
                                                 20.58
                                                           1. 23
2.417
                8.500
                         2. 24 | 14. 583
         1.17
                                          3.30
                                                 20.67
                                                           1. 23
2.500
                8.583
                         2. 47 | 14. 667
                                                 20.75
         1.17
                                          3.30
                                                           1. 23
                         2. 47 | 14. 750
2.583
                8.667
                                                 20.83
                                                           1. 22
         1.19
                                          3.30
                         2. 47 | 14. 833
2.667
         1.19
                8.750
                                          3. 13
                                                 20.92
                                                           1. 22
2.750
         1.19
                8.833
                         2. 72 | 14. 917
                                          3. 13
                                                 21.00
                                                           1. 22
2.833
                8.917
                         2. 72 | 15. 000
         1. 21
                                          3.13
                                                 21.08
                                                           1. 21
2.917
         1.21
                9.000
                         2. 72 | 15. 083
                                          2.97
                                                 21.17
                                                           1. 21
3.000
         1.21
                9.083
                         2. 95 | 15. 167
                                          2.97
                                                 21. 25
                                                           1 21
3.083
                         2. 95 | 15. 250
                                          2.97
         1.23
                9.167
                                                 21.33
                                                           1. 19
3.167
         1.23
                9.250
                         2. 95 | 15. 333
                                          2.79
                                                 21.42
                                                           1.19
3.250
         1.23
                9.333
                         3. 07 | 15. 417
                                          2.79
                                                 21.50
                                                           1.19
3.333
         1.26
                9.417
                         3. 07 | 15. 500
                                          2.79
                                                 21.58
                                                           1. 18
3.417
                9.500
                         3. 07 | 15. 583
         1.26
                                          2.63
                                                 21.67
                                                           1. 18
3.500
         1.26
                9.583
                         3. 07 | 15. 667
                                                 21.75
                                          2.63
                                                           1. 18
                         3. 07 | 15. 750
3.583
         1.28
                9.667
                                          2.63
                                                 21.83
                                                           1.17
                         3. 07 | 15. 833
3.667
         1.28
                9.750
                                          2.46
                                                 21.92
                                                           1.17
3.750
                9.833
                         3. 27 | 15. 917
        1. 28
                                          2.46
                                                 22.00
                                                           1.17
3.833
        1.31 | 9.917
                         3. 27 | 16. 000
                                          2.46
                                                 22. 08
         1.31 | 10.000
                         3. 27 | 16. 083
3.917
                                          2.29
                                                 22. 17
         1.31 10.083
4.000
                         3. 64 | 16. 167
                                          2. 29
                                                 22. 25
                                                           1.16
                         3. 64 | 16. 250
4.083
         1.33 | 10.167
                                          2.29
                                                 22.33
                                                           1.15
                                                 22.42
4.167
         1.33 | 10.250
                          3.64 | 16.333
                                          2.18
                                                           1. 15
4.250
         1.33 | 10.333
                         4. 14 | 16. 417
                                          2. 18 | 22. 50
                                                           1. 15
```

```
4.333
       1.37 | 10.417
                         4. 14 | 16. 500
                                          2. 18 | 22. 58
                                                           1. 13
4.417
         1.37 | 10.500
                          4. 14 | 16. 583
                                           2. 12 | 22. 67
4.500
         1.37 | 10.583
                          4.69 | 16.667
                                           2.12
                                                  22.75
         1.42 10.667
4.583
                          4.69 | 16.750
                                          2. 12 | 22. 83
                                                            1 12
         1.42 | 10.750
                          4.69 | 16.833
                                           2.06 | 22.92
4.667
                                                            1.12
4.750
         1.42 | 10.833
                          5. 49 | 16. 917
                                           2.06
                                                  23.00
                                                            1 12
         1.46 | 10.917
                          5. 49 | 17. 000
4.833
                                           2.06
                                                  23.08
                                                            1. 11
4.917
         1.46 | 11.000
                          5. 49 | 17. 083
                                           2.00
                                                  23.17
                                                            1 11
5.000
         1.46 | 11.083
                          6. 41 | 17. 167
                                           2.00
                                                  23. 25
                                                            1 11
5.083
         1.51 | 11.167
                          6. 41 | 17. 250
                                           2.00
                                                  23.33
                                                            1 10
5.167
         1.51 | 11.250
                          6. 41 | 17. 333
                                           1.94
                                                  23.42
                                                            1 10
5.250
         1.51 | 11.333
                          8. 11 | 17. 417
                                           1.94
                                                  23.50
                                                            1.10
5.333
         1.56 111.417
                          8. 11 | 17. 500
                                           1. 94 İ
                                                  23.58
                                                            1.09
                         8. 11 | 17. 583
5.417
         1.56 | 11.500
                                           1.88
                                                  23.67
                                                            1.09
5.500
         1.56 | 11.583
                         10. 32 | 17. 667
                                           1.88
                                                  23.75
                                                            1.09
         1.61 | 11.667
                         10. 32 | 17. 750
5.583
                                           1.88
                                                  23.83
                                                            1.07
5.667
         1.61 | 11.750
                         10. 32 | 17. 833
                                                  23. 92
                                           1.82
                                                            1.07
5.750
         1.61 | 11.833
                         42.07 | 17.917
                                           1.82
                                                  24.00
                                                            1.07
5.833
         1.66 | 11.917
                         42.08 | 18.000
                                           1.82
                                                  24.08
                                                            1.06
         1.66 | 12.000
5.917
                         42.08 | 18.083
                                           1.76
                                                  24. 17
                                                            1.06
6.000
         1. 66 | 12. 083 | 103. 84 | 18. 167
                                           1.76
                                                  24. 25
                                                            1.06
6.083
        1.70 | 12.167 | 103.84 | 18.250
                                           1.76
```

PEAK FLOW (cms)= 0.475 (i)
TIME TO PEAK (hrs)= 12.750
RUNOFF VOLUME (mm)= 34.222
TOTAL RAINFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.356

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

** SIMULATION: 3-2yr 24hr 15min SCS Type II **

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		110	TIVOI OITIVIL	D III LIOON	./ \		
TIME	RAI N	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	0.94	12. 250	57. 11	18.33	0. 93
0. 167	0.00	6.250	0.94	12. 333	9.05	18.42	0. 93
0. 250	0.00	6.333	0. 96	12. 417	9.05	18.50	0. 93

```
0.333
        0.54 | 6.417
                         0.96 | 12.500
                                          9.05 | 18.58
                                                           0.90
0.417
         0.54
                6.500
                         0.96 | 12.583
                                                  18.67
                                                           0.90
                                          6.16
0.500
         0.54
                6.583
                         0.99 | 12.667
                                          6.16
                                                  18.75
                                                           0.90
                         0. 99 | 12. 750
0.583
         0.55
                                                  18.83
                6.667
                                          6.16
                                                           0.87
         0.55
                6.750
                         0. 99 | 12. 833
                                          4. 24
                                                  18.92
0.667
                                                           0.87
0.750
         0.55
                6.833
                         1.02 | 12.917
                                          4.24
                                                  19.00
                                                           0.87
         0.56
                         1.02 | 13.000
0.833
                6.917
                                          4.24
                                                  19.08
                                                           0.84
                                                  19.17
0.917
         0.56
                7.000
                         1.02 | 13.083
                                          3.58
                                                           0.84
1.000
         0.56
                7.083
                         1.04 | 13.167
                                          3.58
                                                  19. 25
                                                           0.84
1.083
         0.57
                7.167
                         1.04 | 13.250
                                          3.58
                                                  19.33
                                                           0.80
1.167
         0.57
                7.250
                         1. 04 | 13. 333
                                          3.03
                                                  19.42
                                                           0.80
1.250
         0.57
                7.333
                         1. 07 | 13. 417
                                          3.03
                                                  19.50
                                                           0.80
1.333
         0.59
                7.417
                         1.07 | 13.500
                                          3.03
                                                  19.58
                                                           0.77
                         1. 07 | 13. 583
1.417
         0.59
                7.500
                                          2.67
                                                  19.67
                                                           0.77
1.500
         0.59
                7.583
                         1. 10 | 13. 667
                                          2.67
                                                  19.75
                                                           0.77
                         1. 10 | 13. 750
1.583
         0.60
                7.667
                                          2.67
                                                  19.83
                                                           0.73
1.667
         0.60
                7.750
                         1. 10 | 13. 833
                                                  19.92
                                                           0.73
                                          2.34
1.750
         0.60
                7.833
                         1. 12 | 13. 917
                                          2.34
                                                  20.00
                                                           0.73
1.833
         0.61
                7.917
                         1. 12 | 14. 000
                                          2.34
                                                  20.08
                                                           0.70
1.917
         0.61
                8.000
                         1. 12 | 14. 083
                                          2.09
                                                  20.17
                                                           0.70
2.000
         0.61
                8.083
                         1. 15 | 14. 167
                                          2.09
                                                  20. 25
                                                           0.70
2.083
         0.63
                8.167
                         1. 15 | 14. 250
                                          2.09
                                                  20.33
                                                           0.68
2.167
         0.63
                8.250
                         1. 15 | 14. 333
                                          1.91
                                                  20.42
                                                           0.68
                         1. 23 | 14. 417
2.250
         0.63
                8.333
                                          1.91
                                                  20.50
                                                           0.68
2.333
                8.417
                         1. 23 | 14. 500
         0.64
                                          1. 91
                                                 20.58
                                                           0.68
2.417
         0.64
                8.500
                         1, 23 | 14, 583
                                                  20.67
                                          1.82
                                                           0.68
2.500
         0.64
                8.583
                         1. 36 | 14. 667
                                          1.82
                                                 20.75
                                                           0.68
2.583
         0.65
                8.667
                         1. 36 | 14. 750
                                                 20.83
                                          1.82
                                                           0.67
2.667
                8.750
                         1. 36 | 14. 833
                                          1.72
                                                 20.92
         0.65
                                                           0.67
2.750
                         1. 49 | 14. 917
         0.65
                8.833
                                          1.72
                                                 21.00
                                                           0.67
                         1.49 | 15.000
2.833
         0.67
                8.917
                                          1.72
                                                 21.08
                                                           0.66
2.917
                         1. 49 | 15. 083
         0.67
                9.000
                                                 21.17
                                          1.63
                                                           0.66
3.000
         0.67
                         1. 62 | 15. 167
                9.083
                                          1.63
                                                 21. 25
                                                           0.66
3.083
         0.68
                9.167
                         1.62 | 15.250
                                          1.63
                                                 21.33
                                                           0.66
3.167
                9.250
                         1.62 | 15.333
         0.68
                                          1.54
                                                 21.42
                                                           0.66
3.250
         0.68
                9.333
                         1. 69 | 15. 417
                                          1.54
                                                 21.50
                                                           0.66
3.333
         0.69
                9.417
                         1.69 | 15.500
                                          1.54
                                                 21.58
                                                           0.65
3.417
                9.500
                         1. 69 | 15. 583
         0.69
                                          1.45
                                                 21.67
                                                           0.65
3.500
         0.69
                9.583
                         1.69 | 15.667
                                          1.45
                                                 21.75
                                                           0.65
3.583
         0.71
                9.667
                         1.69 | 15.750
                                          1.45
                                                 21.83
                                                           0.64
3.667
         0.71
                9.750
                         1. 69 | 15. 833
                                          1.35
                                                 21.92
                                                           0.64
3.750
         0.71
                9.833
                         1. 80 | 15. 917
                                          1.35
                                                 22.00
                                                           0.64
3.833
         0.72
                9.917
                         1.80 | 16.000
                                          1.35
                                                  22.08
                                                           0.64
3.917
         0.72 | 10.000
                         1.80 | 16.083
                                          1.26
                                                  22.17
                                                           0.64
         0.72 | 10.083
4.000
                         2.00 | 16.167
                                          1.26
                                                 22. 25
                                                           0.64
4.083
         0.73 | 10.167
                         2.00 | 16.250
                                          1. 26
                                                 22.33
                                                           0.63
4. 167
         0.73 | 10.250
                         2.00 | 16.333
                                          1.20
                                                 22.42
                                                           0.63
4.250
         0.73 | 10.333
                         2. 28 | 16. 417
                                          1. 20
                                                 22.50
                                                           0.63
         0.75 | 10.417
                         2. 28 | 16. 500
4.333
                                          1. 20
                                                 22. 58
                                                           0.62
4.417
         0.75 | 10.500
                         2. 28 | 16. 583
                                          1.17
                                                 22.67
                                                           0.62
         0.75 | 10.583
                                                 22.75
4.500
                          2.58 | 16.667
                                          1.17
                                                           0.62
4.583
         0.78 | 10.667
                         2.58 | 16.750
                                          1. 17 | 22. 83
                                                           0.62
```

```
4.667
         0.78 | 10.750
                          2.58 | 16.833
                                           1. 13 | 22. 92
                                                            0.62
4.750
         0.78 | 10.833
                          3.02 | 16.917
                                           1. 13 | 23. 00
                                                             0.62
4.833
         0.81 | 10.917
                          3.02 | 17.000
                                           1.13 | 23.08
                                                             0.61
         0.81 | 11.000
                          3. 02 | 17. 083
4.917
                                           1. 10 | 23. 17
                                                             0.61
         0.81 | 11.083
5.000
                          3. 53 | 17. 167
                                           1. 10 | 23. 25
                                                            0.61
         0.83 | 11.167
                          3. 53 | 17. 250
5.083
                                           1. 10 | 23. 33
                                                            0.60
         0.83 | 11.250
                                           1.07 İ
5. 167
                          3.53 | 17.333
                                                  23.42
                                                            0.60
                                           1.07
5.250
         0.83 | 11.333
                          4. 46 | 17. 417
                                                  23.50
                                                            0.60
5.333
         0.86 | 11.417
                          4.46 | 17.500
                                           1.07
                                                  23.58
                                                            0.60
         0.86 | 11.500
5.417
                          4.46 17.583
                                           1.03
                                                  23.67
                                                            0.60
5.500
         0.86 | 11.583
                          5. 68 | 17. 667
                                           1.03
                                                  23.75
                                                            0.60
5.583
         0.88 | 11.667
                          5. 68 | 17. 750
                                           1.03 İ
                                                  23.83
                                                            0.59
5.667
         0.88 | 11.750
                          5, 68 | 17, 833
                                           1.00 İ
                                                  23.92
                                                            0.59
         0.88 | 11.833
                         23. 14 | 17. 917
5.750
                                           1.00 İ
                                                  24.00
                                                            0.59
5.833
         0. 91 | 11. 917
                         23. 14 | 18. 000
                                           1.00
                                                  24.08
                                                            0.58
         0.91 | 12.000
                         23. 14 | 18. 083
5. 917
                                           0.97
                                                  24.17
                                                            0.58
6.000
         0. 91 | 12. 083
                         57. 11 | 18. 167
                                           0.97
                                                            0.58
                                                  24. 25
6.083
         0.94 | 12.167
                         57. 11 | 18. 250
                                           0.97
```

PEAK FLOW (cms)= 0.148 (i)
TIME TO PEAK (hrs)= 12.750
RUNOFF VOLUME (mm)= 11.160
TOTAL RAINFALL (mm)= 52.800
RUNOFF COEFFICIENT = 0.211

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

** SIMULATION: 3-50yr 24hr 15min SCS Type II **

CALIB

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	1. 92	12. 250	116.82	18. 33	1. 91
0. 167	0.00	6.250	1. 92	12. 333	18. 52	18.42	1. 91
0.250	0.00	6.333	1. 97	12. 417	18. 51	18.50	1. 91
0.333	1.10	6.417	1. 97	12. 500	18. 51	18.58	1.84
0.417	1.10	6.500	1. 97	12. 583	12.60	18.67	1.84
0.500	1.10	6.583	2.02	12. 667	12.60	18. 75	1.84
0.583	1.12	6.667	2.02	12. 750	12.60	18.83	1.77

```
0.667
       1.12 | 6.750
                         2. 02 | 12. 833
                                          8. 67 | 18. 92
                                                         1.77
0.750
        1.12 | 6.833
                         2.08 | 12.917
                                          8.67
                                                 19.00
                                                          1.77
0.833
        1.15
                6.917
                         2.08 | 13.000
                                          8.67
                                                 19.08
                                                           1.71
0.917
                7.000
                         2.08 | 13.083
                                          7. 32
                                                 19. 17
         1.15
                                                           1.71
1.000
                7.083
                         2. 13 | 13. 167
                                          7. 32
                                                 19. 25
        1.15
                                                           1.71
                         2. 13 | 13. 250
1.083
        1.17
                7.167
                                          7. 32
                                                 19.33
                                                          1.64
                         2. 13 | 13. 333
1. 167
         1.17
                7.250
                                          6.20
                                                  19.42
                                                          1.64
1.250
        1.17
                7.333
                         2. 19 | 13. 417
                                          6. 19
                                                 19.50
                                                          1 64
1.333
        1.20
                7.417
                         2. 19 | 13. 500
                                          6. 19
                                                 19.58
                                                          1.57
                         2. 19 | 13. 583
1.417
         1.20
                7.500
                                          5.47
                                                  19.67
                                                          1.57
1.500
        1.20
                7.583
                         2. 24 | 13. 667
                                          5.47
                                                  19.75
                                                          1.57
1.583
         1.23
                7.667
                         2. 24 | 13. 750
                                          5.47
                                                 19.83
                                                          1.50
1.667
         1.23
                7.750
                         2. 24 | 13. 833
                                          4.80
                                                 19.92
                                                          1.50
1.750
                7.833
                         2. 30 | 13. 917
        1.23
                                          4.80
                                                 20.00
                                                          1.50
1.833
        1.25
                7.917
                         2. 30 | 14. 000
                                          4.80
                                                 20.08
                                                           1.44
1.917
                8.000
                         2. 30 | 14. 083
         1.25
                                          4. 28
                                                 20.17
                                                           1.44
2.000
         1.25
                8.083
                         2. 35 | 14. 167
                                                 20. 25
                                          4. 28
                                                           1.44
2.083
         1.28
                8.167
                         2. 35 | 14. 250
                                          4. 28
                                                 20.33
                                                           1.40
2.167
         1.28
                8.250
                         2.35 | 14.333
                                          3.90
                                                 20.42
                                                           1.40
2.250
         1.28
                8.333
                         2.52 | 14.417
                                          3.90
                                                 20.50
                                                           1.40
2.333
         1.31
                8.417
                         2. 52 | 14. 500
                                          3.90
                                                 20.58
                                                           1.38
2.417
         1.31
                8.500
                         2. 52 | 14. 583
                                          3.72
                                                 20.67
                                                           1.38
2.500
         1.31
                8.583
                         2. 78 | 14. 667
                                          3.72
                                                 20.75
                                                           1.38
2.583
         1.34
                8.667
                         2. 78 | 14. 750
                                          3.72
                                                 20.83
                                                           1.37
2.667
                8.750
                         2. 78 | 14. 833
                                                 20.92
                                                           1.37
         1.34
                                          3.52
2.750
                8.833
                         3.06 | 14.917
                                                 21.00
         1.34
                                          3.52
                                                           1.37
2.833
         1.36
                8.917
                         3.06 | 15.000
                                          3.52
                                                 21.08
                                                           1.36
2.917
         1.36
                9.000
                         3.06 | 15.083
                                          3.34
                                                 21.17
                                                           1.36
3.000
        1.36
                9.083
                         3. 32 | 15. 167
                                                 21. 25
                                          3.34
                                                           1.36
3.083
                         3. 32 | 15. 250
                9.167
         1.39
                                          3.34
                                                 21.33
                                                           1.34
                         3. 32 | 15. 333
3.167
                9.250
         1.39
                                          3.14
                                                 21.42
                                                           1.34
3.250
                9.333
                         3. 46 | 15. 417
         1.39
                                                 21.50
                                          3. 14
                                                           1.34
                9.417
                         3. 46 | 15. 500
3.333
         1.42
                                          3.14
                                                 21.58
                                                           1.33
3.417
         1.42
                9.500
                         3. 46 | 15. 583
                                          2.96
                                                 21.67
                                                           1.33
3.500
                9.583
                         3. 46 | 15. 667
         1.42
                                          2.96
                                                 21.75
                                                           1.33
3.583
         1.45
                9.667
                         3. 46 | 15. 750
                                          2.96
                                                 21.83
                                                           1.32
                         3. 46 | 15. 833
3.667
         1.45
                9.750
                                          2.76
                                                 21.92
                                                           1.32
3.750
                9.833
                         3. 68 | 15. 917
         1.45
                                          2.76
                                                 22.00
                                                           1.32
3.833
         1.47 İ
                9.917
                         3.68 | 16.000
                                          2.76
                                                 22.08
                                                           1.30
3.917
         1.47 | 10.000
                         3.68 | 16.083
                                          2.58
                                                 22.17
                                                           1.30
4.000
        1.47 | 10.083
                         4. 10 | 16. 167
                                          2.58
                                                 22. 25
                                                           1.30
4.083
         1.50 | 10.167
                         4. 10 | 16. 250
                                          2.58
                                                 22.33
                                                           1.29
4.167
         1.50 | 10.250
                         4. 10 | 16. 333
                                          2.45
                                                 22.42
        1.50 | 10.333
4.250
                         4. 66 | 16. 417
                                          2.45
                                                 22.50
                                                           1.29
4.333
         1.54 | 10.417
                         4.66 | 16.500
                                          2.45
                                                 22.58
         1.54 | 10.500
                         4. 66 | 16. 583
4.417
                                          2.38
                                                 22.67
                                                           1. 28
4.500
        1.54 | 10.583
                         5. 28 | 16. 667
                                          2.38 İ
                                                 22.75
                                                           1. 28
        1.59 | 10.667
                         5. 28 | 16. 750
                                          2. 38 İ
                                                 22.83
4.583
                                                           1.26
        1.59 | 10.750
                         5. 28 | 16. 833
                                          2.31
4.667
                                                 22. 92
                                                           1.26
4.750
        1.59 | 10.833
                         6. 18 | 16. 917
                                          2.31
                                                 23.00
                                                           1.26
                          6. 18 | 17. 000
4.833
         1.65 | 10.917
                                          2. 31 | 23. 08
                                                           1. 25
4.917
         1.65 | 11.000
                         6. 18 | 17. 083
                                          2. 25 | 23. 17
                                                          1. 25
```

```
5.000
       1.65 | 11.083
                         7. 21 | 17. 167
                                           2. 25 | 23. 25
                                                           1. 25
5.083
        1.70 | 11.167
                          7. 21 | 17. 250
                                           2. 25 | 23. 33
5.167
         1.70 | 11.250
                          7. 21 | 17. 333
                                           2.18
                                                  23.42
                                                            1.24
         1.70 | 11.333
5.250
                          9. 12 | 17. 417
                                           2. 18 | 23. 50
                                                            1 24
                          9. 12 | 17. 500
5.333
         1.76 | 11.417
                                           2. 18 | 23. 58
                                                            1.22
         1.76 | 11.500
                         9. 12 | 17. 583
5.417
                                           2. 11 | 23. 67
                                                            1.22
         1. 76 | 11. 583
                         11. 61 | 17. 667
5.500
                                           2.11
                                                  23.75
                                                            1.22
5.583
         1.81 | 11.667
                         11. 61 | 17. 750
                                           2.11
                                                  23.83
                                                            1. 21
5.667
         1.81 | 11.750
                        11.61 | 17.833
                                           2.04
                                                  23.92
                                                            1. 21
         1.81 | 11.833
                        47. 33 | 17. 917
5.750
                                           2.04
                                                  24.00
                                                            1. 21
5.833
         1.86 | 11.917
                        47. 34 | 18. 000
                                           2.04 | 24.08
                                                            1.19
                                           1. 98 | 24. 17
5.917
         1.86 | 12.000 | 47.34 | 18.083
                                                            1. 19
6.000
        1. 86 | 12. 083 | 116. 82 | 18. 167
                                           1. 98 | 24. 25
                                                            1. 19
        1. 92 | 12. 167 | 116. 82 | 18. 250
6.083
                                           1. 98 İ
```

PEAK FLOW (cms)= 0.585 (i)
TIME TO PEAK (hrs)= 12.750
RUNOFF VOLUME (mm)= 41.894
TOTAL RAINFALL (mm)= 108.000
RUNOFF COEFFICIENT = 0.388

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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** SIMULATION: 3-5yr 24hr 15min SCS Type II **
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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

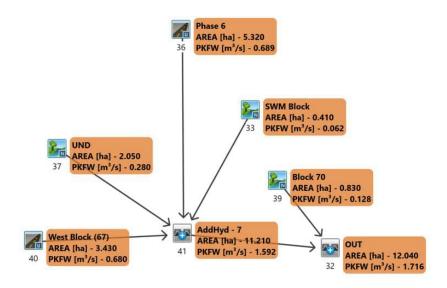
		110	THOI OITHIL	D III LIOON	.,		
TIME	RAI N	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1. 23	12. 250	75. 29	18. 33	1. 23
0.167	0.00	6.250	1. 23	12. 333	11. 93	18.42	1. 23
0.250	0.00	6.333	1. 27	12. 417	11. 93	18.50	1. 23
0.333	0.71	6.417	1. 27	12.500	11. 93	18. 58	1. 19
0.417	0.71	6.500	1. 27	12. 583	8. 12	18. 67	1. 19
0.500	0.71	6.583	1.30	12. 667	8. 12	18. 75	1. 19
0.583	0.72	6.667	1.30	12. 750	8. 12	18.83	1.14
0.667	0.72	6.750	1.30	12. 833	5.59	18. 92	1.14
0.750	0.72	6.833	1.34	12. 917	5.58	19.00	1.14
0.833	0.74	6.917	1.34	13.000	5.58	19.08	1.10
0. 917	0.74	7.000	1.34	13. 083	4.72	19. 17	1. 10

```
1.000
        0.74 | 7.083
                         1. 37 | 13. 167
                                          4. 72 | 19. 25
                                                          1. 10
1.083
         0.76 | 7.167
                         1. 37 | 13. 250
                                          4.72
                                                 19.33
                                                           1.06
1.167
         0.76
                7.250
                         1. 37 | 13. 333
                                          3.99
                                                  19.42
                                                           1.06
                7.333
                         1. 41 | 13. 417
1.250
         0.76
                                          3.99
                                                 19.50
                                                           1.06
         0.78 | 7.417
                         1.41 | 13.500
                                          3.99
1.333
                                                 19.58
                                                           1.01
                7.500
                         1.41 | 13.583
                                                  19.67
1.417
         0.78
                                          3.52
                                                           1.01
                7.583
                         1. 44 | 13. 667
1.500
         0.78
                                          3.52
                                                  19.75
                                                           1.01
1.583
                         1.44 | 13.750
         0.79
                7.667
                                          3.52
                                                 19.83
                                                           0.97
1.667
         0.79
                7.750
                         1.44 | 13.833
                                          3.09
                                                 19.92
                                                           0.97
1.750
                7.833
                         1. 48 | 13. 917
         0.79
                                          3.09
                                                 20.00
                                                           0.97
1.833
         0.81
                7.917
                         1.48 | 14.000
                                          3.09
                                                 20.08
                                                           0.93
1.917
         0.81
                8.000
                         1.48 | 14.083
                                          2.76
                                                 20.17
                                                           0.93
2.000
         0.81
                8.083
                         1.51 | 14.167
                                          2.76
                                                 20. 25
                                                           0.93
2.083
                8.167
                         1.51 14.250
         0.83
                                          2.76
                                                 20.33
                                                           0.90
2.167
         0.83
                8.250
                         1. 51 | 14. 333
                                          2.51
                                                 20.42
                                                           0.90
2.250
         0.83
                8.333
                         1.62 | 14.417
                                                           0. 90
                                          2.51
                                                 20.50
2.333
         0.84
                8.417
                         1, 62 | 14, 500
                                          2.51
                                                 20.58
                                                           0.89
2.417
         0.84
                8.500
                         1.62 | 14.583
                                          2.40
                                                 20.67
                                                           0.89
2.500
         0.84
                8.583
                         1.79 | 14.667
                                          2.40
                                                 20.75
                                                           0.89
2.583
         0.86
                8.667
                         1.79 | 14.750
                                          2.40
                                                  20.83
                                                           0.88
2.667
         0.86
                8.750
                         1. 79 | 14. 833
                                          2.27
                                                  20.92
                                                           0.88
2.750
         0.86
                8.833
                         1. 97 | 14. 917
                                          2.27
                                                 21.00
                                                           0.88
2.833
         0.88
                8.917
                         1. 97 | 15. 000
                                          2.27
                                                 21.08
                                                           0.87
2.917
                         1. 97 | 15. 083
         0.88
                9.000
                                          2.15
                                                 21.17
                                                           0.87
3.000
                         2. 14 | 15. 167
         0.88
                9.083
                                          2.15
                                                 21. 25
                                                           0.87
3.083
         0.90
                9.167
                         2. 14 | 15. 250
                                          2.15
                                                 21.33
                                                           0.87
3.167
         0.90
                9.250
                         2. 14 | 15. 333
                                          2.03
                                                 21.42
                                                           0.87
3.250
         0.90
                9.333
                         2. 23 | 15. 417
                                          2.03
                                                 21.50
                                                           0.87
3.333
         0.91
                9.417
                         2. 23 | 15. 500
                                          2.03
                                                 21.58
                                                           0.86
3.417
         0.91
                9.500
                         2. 23 | 15. 583
                                          1.91
                                                 21.67
                                                           0.86
3.500
         0.91
                9.583
                         2. 23 | 15. 667
                                          1.91
                                                 21.75
                                                           0.86
3.583
         0.93
                9.667
                         2. 23 | 15. 750
                                          1.91
                                                 21.83
                                                           0.85
3.667
         0.93
                9.750
                         2. 23 | 15. 833
                                          1.78
                                                 21.92
                                                           0.85
3.750
                9.833
                         2. 37 | 15. 917
         0.93
                                          1.78
                                                 22.00
                                                           0.85
3.833
         0.95
                9.917
                         2. 37 | 16. 000
                                          1.78
                                                 22.08
                                                           0.84
3.917
         0.95 | 10.000
                         2. 37 | 16. 083
                                          1.66
                                                 22.17
                                                           0.84
4.000
         0.95 | 10.083
                         2.64 | 16.167
                                          1.66
                                                 22. 25
                                                           0.84
4.083
         0.96 | 10.167
                         2.64 | 16.250
                                          1.66
                                                 22.33
                                                           0.83
                                                 22.42
4.167
         0.96 | 10.250
                         2.64 | 16.333
                                          1.58
                                                           0.83
4.250
         0.96 | 10.333
                         3.00 | 16.417
                                          1.58
                                                 22.50
                                                           0.83
4.333
         0.99 | 10.417
                         3.00 | 16.500
                                          1.58
                                                 22.58
                                                           0.82
4.417
         0.99 | 10.500
                         3.00 | 16.583
                                          1.54
                                                 22.67
                                                           0.82
                         3. 40 | 16. 667
4.500
         0.99 | 10.583
                                          1.54
                                                 22.75
                                                           0.82
4.583
         1.03 10.667
                         3. 40 | 16. 750
                                          1.54
                                                 22.83
                                                           0.81
         1.03 | 10.750
                         3. 40 | 16. 833
4.667
                                          1.49
                                                 22.92
                                                           0.81
                         3. 98 | 16. 917
                                          1.49
4.750
         1.03 | 10.833
                                                 23.00
                                                           0.81
4.833
         1.06 | 10.917
                         3. 98 | 17. 000
                                          1.49
                                                 23.08
                                                           0.80
4.917
         1.06 | 11.000
                         3. 98 | 17. 083
                                          1.45
                                                 23.17
                                                           0.80
         1.06 | 11.083
5.000
                         4. 65 | 17. 167
                                          1.45
                                                 23. 25
                                                           0.80
5.083
         1.10 | 11.167
                         4.65 | 17.250
                                          1.45
                                                 23.33
                                                           0.80
         1.10 | 11.250
                         4.65 | 17.333
                                          1.40 | 23.42
                                                           0.80
5. 167
5.250
         1.10 | 11.333
                         5. 88 | 17. 417
                                          1.40 | 23.50
                                                           0.80
```

```
5.333
        1.13 | 11.417
                           5.88 | 17.500
                                            1.40 | 23.58
                                                              0.79
5.417
         1.13 | 11.500
                           5. 88 | 17. 583
                                             1. 36 | 23. 67
                                                               0.79
         1.13 | 11.583
                           7. 48 | 17. 667
5.500
                                             1.36
                                                    23.75
                                                               0.79
         1. 17 | 11. 667
                           7. 48 | 17. 750
5.583
                                             1. 36 | 23. 83
                                                              0.78
         1. 17 | 11. 750
                          7. 48 | 17. 833
                                             1. 32 | 23. 92
                                                              0.78
5.667
         1. 17 | 11. 833
                          30.50 | 17.917
                                             1. 32 | 24. 00
5.750
                                                              0.78
         1. 20 | 11. 917
                          30. 51 | 18. 000
                                            1. 32 | 24. 08
5.833
                                                              0.77
         1. 20 | 12. 000
                          30. 51 | 18. 083
5.917
                                            1. 28 | 24. 17
                                                              0.77
6.000
        1. 20 | 12. 083
                         75. 28 | 18. 167
                                            1. 28 | 24. 25
                                                              0.77
        1. 23 | 12. 167 | 75. 29 | 18. 250
6.083
                                            1. 28
```

PEAK FLOW (cms) = 0.259 (i) TIME TO PEAK (hrs) = 12.750 RUNOFF VOLUME (mm) = 19.123 TOTAL RAINFALL (mm) = 69.600 RUNOFF COEFFICIENT = 0.275

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.



NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME) HYETOGRA	APH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0.167	2.45	1.167	13.68	2. 167	5.08	3. 17	2.85
0.250	2.76	1.250	71. 35	2. 250	4.44	3. 25	2.67
0.333	2.76	1.333	71. 35	2. 333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2. 417	3. 96	3.42	2.52
0.500	3.17	1.500	17. 30	2.500	3. 96	3.50	2.52
0.583	3.78	1.583	10.08	2. 583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2. 667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2. 750	3.30	3.75	2. 27
0.833	4.76	1.833	7.43	2. 833	3.30	3.83	2. 27
0.917	6.70	1.917	5. 99	2. 917	3.05	3.92	2. 16
1.000	6.70	2.000	5. 99	3.000	3.05	4.00	2. 16

Unit Hyd Qpeak (cms) = 0.078

----- U. H. Tp(hrs) = 0.20

PEAK FLOW (cms) = 0.004 (i)
TIME TO PEAK (hrs) = 1.583
RUNOFF VOLUME (mm) = 4.268
TOTAL RAI NFALL (mm) = 31.287
RUNOFF COEFFICIENT = 0.136

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO $5.0~{\rm MIN.}$ TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr | hrs mm/hr | hrs mm/hr hrs mm/hr 0.083 2. 45 | 1. 083 | 13. 68 | 2. 083 5.08 | 3.08 2.85

0. 167 2. 45 | 1. 167 13. 68 | 2. 167 5.08 | 3.17 0.250 2. 76 | 1. 250 71. 35 | 2. 250 4.44 3.25 2. 76 | 1. 333 | 71. 35 | 2. 333 4.44 0.333 3.33 2.67 3. 17 | 1. 417 | 17. 30 | 2. 417 0.417 3. 96 | 3. 42 2.52 3. 17 | 1. 500 | 17. 30 | 2. 500 0.500 3. 96 | 3. 50 2.52 3.78 | 1.583 10.08 | 2.583 0.583 3.59 | 3.58 2.39 10.08 | 2.667 3.78 | 1.667 0.667 3.59 3.67 2.39 7. 43 | 2. 750 0.750 4. 76 | 1. 750 3. 30 i 3. 75 2. 27 0.833 4.76 | 1.833 7. 43 | 2. 833 3.30 | 3.83 2. 27 5. 99 | 2. 917 0. 917 6.70 | 1.917 3.05 | 3.92 2. 16 1.000 6.70 | 2.000 5. 99 | 3. 000 3.05 | 4.00 2. 16

Unit Hyd Qpeak (cms)= 0.356

PEAK FLOW (cms) = 0.015 (i) TIME TO PEAK (hrs) = 1.667 RUNOFF VOLUME (mm) = 3.927 TOTAL RAINFALL (mm) = 31.287 RUNOFF COEFFICIENT = 0.126

TIME

0.083

0.167

0.250

0.333

0.417

0.500

0.583

0.667

0.750

0.833

0.917

hrs

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | STANDHYD (0036) | Area (ha) = 5.32 | ID = 1 DT = 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 | IMPERVIOUS | PERVIOUS (i) | Surface Area (ha) = 2.66 | 2.66 | 2.66

		I WIF LIKVI 003	FLKVIUUS (I,
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm) =	1.00	5.00
Average SI ope	(%)=	1.00	1.00
Length	(m) =	188. 33	40.00
Mannings n	=	0. 130	0. 250

4. 76 | 1. 833

6.70 | 1.917

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----RAIN | TIME RAIN | TIME RAIN | TIME mm/hr hrs mm/hr | hrs mm/hr | hrs mm/hr 2.45 | 1.083 13. 68 | 2. 083 5.08 | 3.08 2.85 2.45 | 1.167 13.68 | 2.167 5.08 İ 2.85 71. 35 | 2. 250 2.76 | 1.250 4.44 3.25 2.76 | 1.333 71. 35 | 2. 333 4.44 İ 3.33 2.67 3. 17 | 1. 417 | 17. 30 | 2. 417 3. 96 i 3. 42 2.52 3. 17 | 1. 500 | 17. 30 | 2. 500 3.96 | 3.50 2.52 3.78 | 1.583 10.08 | 2.583 3.59 | 3.58 2.39 3.78 | 1.667 10.08 | 2.667 3.59 | 3.67 2.39 7. 43 | 2. 750 3. 30 | 3. 75 4.76 | 1.750 2. 27

3. 30 | 3. 83

3.05 | 3.92

2. 27

2. 16

7. 43 | 2. 833

5. 99 | 2. 917

1.000	6.70	2.000	5. 99 3. 000	3.05 4.00	2. 1
Max. Eff. Inten. (n	nm/hr)=	44. 33	5.85		
over	(mi n)	20.00	50.00		
Storage Coeff.	(mi n)=	20. 59	(ii) 47.63 (ii)		
Unit Hyd. Tpeak	(mi n)=	20.00	50.00		
Unit Hyd. peak	(cms)=	0.06	0.02		
				TOTALS	
PEAK FLOW	(cms)=	0. 15	0.02	0.153 (iii)	
TIME TO PEAK	(hrs)=	1. 58	2. 25	1.58	
RUNOFF VOLUME	(mm) =	30. 29	4. 61	13.59	
TOTAL RAINFALL	(mm) =	31. 29	31. 29	31. 29	
RUNOFF COEFFICIE	ENT =	0. 97	0. 15	0.43	

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	3. 43 50. 00	Dir.	Conn. (%)=	35. 00
		IMPERVI	0US	PERVI OL	JS (i)	
Surface Area	(ha)=	1.7	1	1.71		
Dep. Storage	(mm) =	1.0	0	5.00)	
Average Slope	(%)=	1.0	0	2.00)	
Length	(m)=	151. 2	2	40.00)	
Mannings n	=	0. 01	3	0. 250)	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGRA	APH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0. 167	2.45	1.167	13.68	2. 167	5.08	3.17	2.85
0.250	2.76	1.250	71. 35	2. 250	4.44	3. 25	2.67
0.333	2.76	1.333	71. 35	2. 333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2. 417	3. 96	3.42	2.52
0.500	3.17	1.500	17. 30	2.500	3. 96	3.50	2.52
0.583	3.78	1.583	10.08	2. 583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2. 667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2. 750	3. 30	3.75	2. 27
0.833	4.76	1.833	7.43	2.833	3. 30	3.83	2. 27
0. 917	6.70	1.917	5. 99	2. 917	3.05	3.92	2.16
1.000	6.70	2.000	5. 99	3.000	3. 05	4.00	2. 16

Max. Eff. Inten. (r	nm/hr)=	71. 35	6.44		
over	(mi n)	5.00	25.00		
Storage Coeff.	(mi n)=	3. 75	(ii) 24.89	(ii)	
Unit Hyd. Tpeak	(mi n)=	5.00	25.00		
Unit Hyd. peak	(cms)=	0. 25	0.05		
•				*TOTALS*	
PEAK FLOW	(cms)=	0. 22	0.02	0. 228 (i	iii)
TIME TO PEAK	(hrs)=	1. 33	1. 67	1. 33	
RUNOFF VOLUME	(mm) =	30. 29	4. 61	13.60	
TOTAL RAINFALL	(mm) =	31. 29	31. 29	31. 29	
RUNOFF COEFFICIE	ENT =	0. 97	0.15	0.43	
 WARNING OTORA			D TUAN TIME 0	TER	

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0041)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0033):	0.41	0.004	1. 58	4.27
+ ID2= 2 (0036):	5.32	0. 153	1.58	13.59
=======================================			=======	
ID = 3 (0041):	5.73	0. 156	1. 58	12.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0041)| 3 + 2 = 1 AREA QPEAK TPEAK R. V. (ha) (cms) (hrs) (mm) ID1= 3 (0041): 5.73 0. 156 1. 58 12. 93 + ID2= 2 (0037): 2.05 0.015 1.67 3.93 _____

ID = 1 (0041):

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

1.58

10.56

7. 78 0. 172

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
---- TRANSFORMED HYETOGRAPH ----
TIME
       RAIN | TIME RAIN | TIME RAIN | TIME
              hrs mm/hr | hrs mm/hr | hrs
      mm/hr
                                                   mm/hr
 hrs
0.083
       2.45 | 1.083
                    13.68 | 2.083
                                     5.08 | 3.08
                                                    2.85
       2. 45 | 1. 167
0.167
                     13.68 | 2.167
                                     5.08
                                            3. 17
                                                     2.85
0.250
       2.76 | 1.250
                     71. 35 | 2. 250
                                     4.44
                                            3. 25
                                                    2.67
0.333
       2.76 | 1.333
                     71. 35 | 2. 333
                                     4.44
                                            3.33
                                                    2.67
0.417
        3. 17 | 1. 417
                     17. 30 | 2. 417
                                     3.96
                                             3.42
                                                    2.52
0.500
        3.17
              1.500
                     17. 30 | 2. 500
                                     3.96
                                             3.50
                                                    2.52
0.583
       3. 78 | 1. 583
                     10.08 | 2.583
                                     3.59
                                            3.58
                                                    2.39
0.667
      3.78 | 1.667
                     10.08 | 2.667
                                     3.59 İ
                                            3.67
                                                    2.39
0.750
      4.76 | 1.750
                      7. 43 | 2. 750
                                     3.30
                                            3.75
                                                    2. 27
0.833
      4.76 | 1.833
                      7. 43 | 2. 833
                                     3. 30 | 3. 83
                                                    2. 27
0. 917 6. 70 | 1. 917
                      5. 99 | 2. 917
                                     3.05 i 3.92
                                                    2. 16
1.000 6.70 2.000
                     5. 99 | 3. 000
                                    3.05 | 4.00
                                                    2. 16
```

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms) = 0.007 (i)
TIME TO PEAK (hrs) = 1.583
RUNOFF VOLUME (mm) = 4.266
TOTAL RAINFALL (mm) = 31.287
RUNOFF COEFFICIENT = 0.136

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
ADD HYD ( 0032)|
1 + 2 = 3
                  AREA QPEAK
                            TPEAK
                                  R. V.
                  (ha) (cms)
                             (hrs)
                                  (mm)
   ID1= 1 ( 0039):
                  0. 83 0. 007
                            1.58 4.27
   + ID2= 2 ( 0041): 11.21 0.315
                            1. 33 11. 49
    _____
    ID = 3 (0032): 12.04 0.318
                            1. 33 10. 99
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME) HYETOGRA	APH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.23	1.083	18.09	2. 083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2. 167	6.70	3. 17	3.75
0.250	3.63	1.250	94.66	2. 250	5. 86	3. 25	3.52
0.333	3.63	1.333	94.66	2. 333	5. 86	3.33	3.52
0.417	4.18	1.417	22.88	2. 417	5. 23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5. 23	3.50	3. 32
0.583	4.98	1.583	13. 31	2. 583	4.74	3.58	3. 14
0.667	4.98	1.667	13. 31	2. 667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2. 750	4. 35	3.75	2.99
0.833	6.28	1.833	9.80	2. 833	4. 35	3.83	2.99
0.917	8.85	1.917	7. 91	2. 917	4.02	3. 92	2.85
1.000	8.85	2.000	7. 91	3.000	4.02	4.00	2.85

Unit Hyd Qpeak (cms) = 0.078

----- U. H. Tp(hrs)= 0.20

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 8.469
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.205

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN

```
mm/hr |' hrs
 hrs mm/hr
                hrs
                                     mm/hr | hrs
                                                    mm/hr
0.083
       3.23
              1.083
                      18.09 | 2.083
                                     6.70
                                             3.08
                                                     3.75
0.167
        3.23
              1.167
                      18.09 | 2.167
                                     6.70
                                             3.17
                                                     3.75
0.250
                      94.66 2.250
                                             3.25
       3.63
              1.250
                                                    3.52
                                     5.86
0.333
       3.63 | 1.333
                      94.66 | 2.333
                                             3.33
                                     5.86
                                                    3.52
0.417
                      22. 88 | 2. 417
                                             3.42
       4.18
              1.417
                                     5. 23
                                                    3.32
0.500
              1.500
                      22. 88 | 2. 500
                                             3.50
       4. 18
                                     5.23
                                                    3.32
0.583
              1.583
                      13. 31 | 2. 583
       4.98
                                     4.74
                                             3.58
                                                    3.14
0.667
       4. 98 İ
              1.667
                      13. 31 | 2. 667
                                     4.74
                                             3.67
                                                    3.14
0.750
       6.28
              1.750
                      9. 80 | 2. 750
                                             3.75
                                     4.35
                                                    2.99
                                     4.35
0.833
       6.28
              1.833
                      9. 80 | 2. 833
                                            3.83
                                                    2.99
0.917
        8.85
              1.917
                      7. 91 | 2. 917
                                     4.02
                                            3.92
                                                    2.85
                                                    2.85
1.000
        8.85 | 2.000
                      7. 91 | 3. 000
                                     4.02 | 4.00
```

PEAK FLOW (cms) = 0.036 (i) TIME TO PEAK (hrs) = 1.583 RUNOFF VOLUME (mm) = 7.847 TOTAL RAINFALL (mm) = 41.381 RUNOFF COEFFICIENT = 0.190

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0036) Area (ha) = 5.32 | ID= 1 DT= 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 _____ I MPERVI OUS PERVIOUS (i) Surface Area (ha)= 2.66 2.66 1.00 5.00 Dep. Storage (mm) =Average Slope (%)= 1.00 1.00 Length (m) =188.33 40.00 Mannings n 0.130 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME) HYETOGRA	APH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.23	1.083	18.09	2. 083	6.70	3.08	3.75
0. 167	3.23	1.167	18.09	2. 167	6.70	3. 17	3.75
0.250	3.63	1.250	94.66	2. 250	5.86	3. 25	3. 52
0.333	3.63	1.333	94.66	2. 333	5.86	3.33	3. 52
0.417	4. 18	1.417	22.88	2. 417	5. 23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5. 23	3.50	3. 32
0.583	4.98	1.583	13. 31	2. 583	4.74	3.58	3. 14
0.667	4.98	1.667	13. 31	2. 667	4.74	3.67	3. 14
0.750	6.28	1.750	9.80	2. 750	4.35	3.75	2. 99

0. 833 0. 917 1. 000	6. 28 8. 85 8. 85	1.833 1.917 2.000	9. 80 7. 91 7. 91	2.833 2.917 3.000	4. 35 3. 83 4. 02 3. 92 4. 02 4. 00	2. 99 2. 85 2. 85
Max. Eff. Inten. (mm		58. 77 20. 00		13. 48 40. 00		
	(mi n)=	18. 39 20. 00	(ii)	37. 76 (ii) 40. 00		
Unit Hyd. peak (0.06		0. 03	*TOTALS*	
PEAK FLOW ((cms)=	0. 21		0.04	0.223 (iii)	
TIME TO PEAK ((hrs)=	1. 58		2.00	1. 58	
RUNOFF VOLUME	(mm) =	40.38		8. 13	19. 41	
TOTAL RAINFALL	(mm) =	41.38		41.38	41.38	
RUNOFF COEFFICIEN	IT =	0. 98		0. 20	0.47	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	(ha)=	3. 43	Dir. Conn.(%)=	35. 00
1.5 . 5. 0.0	·otai	·p (,0)	00.00	5111 001111 (10)	00.00
		I MPERVI	OUS	PERVIOUS (i)	
Surface Area	(ha)=	1. 7	1	1. 71	
Dep. Storage	(mm) =	1.00	0	5.00	
Average Slope	(%)=	1.00	0	2.00	
Length	(m)=	151. 2	2	40.00	
9	` '				
Mannings n	=	0. 01:	3	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME) HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3. 23	1.083	18.09	2. 083	6.70	3.08	3.75
0. 167	3. 23	1.167	18.09	2. 167	6.70	3. 17	3.75
0.250	3.63	1.250	94.66	2. 250	5.86	3. 25	3.52
0.333	3.63	1.333	94.66	2. 333	5.86	3.33	3.52
0.417	4. 18	1.417	22.88	2. 417	5. 23	3.42	3.32
0.500	4. 18	1.500	22.88	2.500	5. 23	3.50	3.32
0.583	4. 98	1.583	13. 31	2. 583	4.74	3.58	3.14
0.667	4. 98	1.667	13. 31	2. 667	4.74	3.67	3. 14
0.750	6. 28	1.750	9.80	2. 750	4.35	3.75	2. 99
0.833	6. 28	1.833	9. 80	2. 833	4. 35	3.83	2. 99

```
8.85 | 2.000
                                   7. 91 | 3. 000
              1.000
                                                  4.02 | 4.00 2.85
    Max. Eff. Inten. (mm/hr)=
                              94.66
                                         15.30
                                         20.00
                              5.00
              over (min)
    Storage Coeff. (min)=
                              3.35 (ii) 18.30 (ii)
                              5.00
    Unit Hyd. Tpeak (min)=
                                         20.00
    Unit Hyd. peak (cms)=
                              0. 26
                                          0.06
                                                      *TOTALS*
    PEAK FLOW
                   (cms)=
                              0.30
                                          0.04
                                                       0.315 (iii)
    TIME TO PEAK
                  (hrs)=
                              1.33
                                          1.58
                                                       1.33
    RUNOFF VOLUME
                   (mm) =
                              40.38
                                          8.13
                                                       19.41
    TOTAL RAINFALL (mm)=
                              41.38
                                         41.38
                                                       41.38
    RUNOFF COEFFICIENT =
                              0.98
                                          0.20
                                                        0.47
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN^* = 59.0 Ia = Dep. Storage (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 ADD HYD ( 0041)|
 1 + 2 = 3
                          AREA
                                 QPEAK
                                         TPEAK
                                                   R. V.
                          (ha)
                                 (cms)
                                          (hrs)
                                                   (mm)
     ID1= 1 ( 0033):
                          0.41 0.008
                                         1.50
                                                 8.47
     + ID2= 2 ( 0036):
                                0. 223
                          5.32
                                         1.58
                                                19.41
      ______
                                         -----
      ID = 3 (0041):
                          5. 73 0. 231
                                         1.58
                                               18.63
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0041)|
 3 + 2 = 1
                          AREA
                                         TPEAK
                                                   R. V.
                          (ha)
                                 (cms)
                                         (hrs)
                                                   (mm)
     ID1= 3 ( 0041):
                                0. 231
                          5.73
                                         1.58
                                                 18.63
     + ID2= 2 ( 0037):
                                0.036
                                                 7.85
      ID = 1 (0041):
                          7. 78 0. 267
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0041)|
                          AREA
                                QPEAK
                                        TPEAK
                                                   R. V.
 1 + 2 = 3
```

0.917 8.85 | 1.917 7.91 | 2.917 4.02 | 3.92 2.85

```
-----
                          (ha)
                                 (cms)
                                         (hrs)
                                                  (mm)
    ID1= 1 ( 0041):
                                              15.79
                          7. 78 0. 267
     + ID2= 2 ( 0040):
                          3. 43 0. 315
                                         1. 33 19. 41
       _____
       ID = 3 (0041): 11.21 0.450
                                         1. 33 16. 90
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALLB
 NASHYD ( 0039)
                   Area (ha) = 0.83 Curve Number (CN) = 75.0
| ID= 1 DT= 5.0 min |
                   la
                           (mm) = 10.00
                                         # of Linear Res. (N) = 3.00
----- U. H. Tp(hrs)= 0.19
        NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                            ---- TRANSFORMED HYETOGRAPH ----
               TIME
                      RAIN | TIME
                                    RAIN | TIME
                                                   RAIN |
                                                           TIME
                hrs
                     mm/hr
                              hrs
                                    mm/hr
                                             hrs
                                                   mm/hr
                                                           hrs
                                                                  mm/hr
              0.083
                      3.23
                            1.083
                                    18.09
                                           2.083
                                                   6.70
                                                          3.08
                                                                  3.75
              0.167
                      3.23
                            1.167
                                    18.09
                                           2. 167
                                                   6.70
                                                          3.17
                                                                  3.75
              0.250
                      3.63
                            1.250
                                    94.66
                                           2. 250
                                                   5.86
                                                          3.25
                                                                  3.52
              0.333
                      3.63
                            1.333
                                    94.66
                                           2. 333
                                                   5.86
                                                          3.33
                                                                  3.52
              0.417
                            1.417
                                    22. 88 | 2. 417
                      4.18
                                                   5.23
                                                          3.42
                                                                 3.32
              0.500
                            1.500
                                    22.88 | 2.500
                                                          3.50
                      4.18 l
                                                   5. 23
                                                                 3.32
              0.583
                      4.98
                            1.583
                                    13. 31 | 2. 583
                                                   4.74
                                                          3.58
                                                                 3.14
              0.667
                      4.98
                            1.667
                                    13. 31 | 2. 667
                                                   4.74
                                                          3.67
                                                                 3. 14
              0.750
                      6. 28 | 1. 750
                                    9.80 | 2.750
                                                   4.35
                                                          3.75
                                                                 2.99
                                    9.80 | 2.833
              0.833
                      6.28 | 1.833
                                                   4.35
                                                          3.83
                                                                 2.99
                                    7. 91 | 2. 917
                                                   4.02
              0.917
                      8.85 | 1.917
                                                          3.92
                                                                 2.85
              1.000
                      8.85 | 2.000
                                    7. 91 | 3. 000
                                                   4.02 | 4.00
                                                                 2.85
    Unit Hyd Qpeak (cms) = 0.167
    PEAK FLOW
                   (cms) = 0.017 (i)
    TIME TO PEAK
                  (hrs) = 1.500
    RUNOFF VOLUME
                    (mm) = 8.466
    TOTAL RAINFALL
                   (mm) = 41.381
    RUNOFF COEFFICIENT = 0.205
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
_____
| ADD HYD ( 0032)|
1 + 2 = 3
                          AREA
                                         TPEAK
                                 QPEAK
                                                  R. V.
                          (ha)
                                 (cms)
                                         (hrs)
                                                  (mm)
```

ID1= 1 (0039):

+ ID2= 2 (0041):

0.83

11. 21 0. 450

0.017

1.50

8.47

ID = 3 (0032): 12.04 0.459 1.33 16.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION: 1-010yr 4hr 10min Chicago **

CALIB

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

		110	ANSI UNWL	D III LI OUN	AIII		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21. 14	2. 167	7.85	3. 17	4.40
0.250	4.26	1.250	110. 25	2. 250	6.86	3. 25	4. 13
0.333	4.26	1.333	110. 25	2. 333	6.86	3.33	4. 13
0.417	4.90	1.417	26.74	2. 417	6. 13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6. 13	3.50	3.89
0.583	5.83	1.583	15. 57	2. 583	5. 55	3.58	3.69
0.667	5.83	1.667	15. 57	2. 667	5. 55	3.67	3.69
0.750	7.35	1.750	11. 47	2. 750	5.09	3.75	3.50
0.833	7.35	1.833	11. 47	2.833	5.09	3.83	3.50
0. 917	10.36	1.917	9. 26	2. 917	4.72	3. 92	3.34
1.000	10.36	2.000	9. 26	3.000	4.72	4.00	3.34

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms)= 0.012 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 11.928
TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.247

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

.....

CALIB |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

NY.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME hrs mm/hr hrs mm/hr | hrs mm/hr | hrs mm/hr 3.78 | 1.083 | 21.14 | 2.083 0.083 7.85 | 3.08 4.40 3. 78 | 1. 167 | 21. 14 | 2. 167 7. 85 | 3. 17 0. 167 4.40 4. 26 | 1. 250 | 110. 25 | 2. 250 0.250 6.86 3. 25 4.13 4. 26 | 1. 333 | 110. 25 | 2. 333 0.333 6.86 3.33 4.13 0.417 4. 90 | 1. 417 | 26. 74 | 2. 417 6. 13 3.42 3.89 0.500 4.90 | 1.500 26.74 | 2.500 6. 13 3.50 3.89 1.583 0.583 5.83 15. 57 | 2. 583 5.55 3.58 3.69 15. 57 | 2. 667 0.667 5.83 | 1.667 5.55 j 3.67 3.69 0.750 7. 35 | 1. 750 11. 47 | 2. 750 5.09 3.75 3.50 0.833 7. 35 | 1. 833 11. 47 | 2. 833 5.09 | 3.83 3.50 0.917 10.36 | 1.917 9. 26 | 2. 917 4.72 | 3.92 3.34

9. 26 | 3. 000

4.72 | 4.00

3.34

Unit Hyd Qpeak (cms)= 0.356

PEAK FLOW (cms) = 0.053 (i)
TIME TO PEAK (hrs) = 1.583
RUNOFF VOLUME (mm) = 11.099
TOTAL RAINFALL (mm) = 48.343
RUNOFF COEFFICIENT = 0.230

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

1.000 10.36 2.000

| CALIB | STANDHYD (0036)| |ID= 1 DT= 5.0 min |

STANDHYD (0036) | Area (ha) = 5.32

Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00

I MPERVI OUS PERVIOUS (i) (ha)= 2.66 Surface Area 2.66 Dep. Storage (mm) = 1.00 5.00 Average Slope (%)= 1.00 1.00 Length (m) =188.33 40.00 Mannings n 0.130 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.78	1.083	21.14	2. 083	7.85	3.08	4.40
0. 167	3.78	1.167	21.14	2. 167	7.85	3. 17	4.40
0.250	4.26	1.250	110. 25	2. 250	6.86	3. 25	4. 13
0.333	4. 26	1.333	110. 25	2. 333	6.86	3.33	4. 13
0.417	4.90	1.417	26.74	2. 417	6. 13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6. 13	3.50	3.89
0.583	5.83	1.583	15. 57	2. 583	5. 55	3.58	3. 69

0. 66 0. 75 0. 83 0. 91 1. 00	7.35 3 7.35 7 10.36	1.667 1.750 1.833 1.917 2.000	15. 57 11. 47 11. 47 9. 26 9. 26	2. 667 2. 750 2. 833 2. 917 3. 000	5. 55 3. 67 5. 09 3. 75 5. 09 3. 83 4. 72 3. 92 4. 72 4. 00	3. 69 3. 50 3. 50 3. 34 3. 34
Max. Eff. Inten. (mm/hr)= (min)	82. 41 15. 00		18. 48 35. 00		
Storage Coeff.	(mi n)=	16. 07	(ii)	33.14 (ii)		
Unit Hyd. Tpeak		15. 00		35.00		
Unit Hyd. peak	(cms)=	0. 07		0.03		
					TOTALS	
PEAK FLOW	(cms)=	0. 27		0.06	0.292 (iii)	
TIME TO PEAK	(hrs)=	1.50		1.83	1.50	
RUNOFF VOLUME	(mm) =	47.34		10. 98	23.71	
TOTAL RAINFALL	(mm) =	48. 34		48.34	48.34	
RUNOFF COEFFICII	ENT =	0. 98		0. 23	0.49	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) Area (ha)= 3.43 | ID= 1 DT= 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 _____ IMPERVIOUS PERVIOUS (i) (ha)= Surface Area 1.71 1.71 Dep. Storage (mm) =1.00 5.00 Average Slope (%)= 1.00 2.00 Length (m) =151. 22 40.00 Mannings n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGRA	APH	_	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0. 167	3.78	1.167	21. 14	2. 167	7.85	3.17	4.40
0.250	4.26	1.250	110. 25	2. 250	6.86	3. 25	4. 13
0.333	4.26	1.333	110. 25	2. 333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2. 417	6. 13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6. 13	3.50	3.89
0.583	5.83	1.583	15. 57	2. 583	5. 55	3.58	3.69
0.667	5.83	1.667	15. 57	2. 667	5. 55	3.67	3.69

```
0.750 7.35 | 1.750 11.47 | 2.750
                                                  5.09 | 3.75
              0.833 7.35 | 1.833 11.47 | 2.833
                                                  5.09 | 3.83
                                                                 3.50
              9. 26 | 2. 917
                                                  4.72 | 3.92
                                                                 3.34
              1.000 10.36 2.000
                                   9. 26 | 3. 000
                                                  4.72 | 4.00
                                                                3.34
    Max. Eff. Inten. (mm/hr)=
                            110. 25
                                         21.07
              over (min)
                              5.00
                                         20.00
                              3.15 (ii)
    Storage Coeff. (min)=
                                        16.31 (ii)
    Unit Hyd. Tpeak (min)=
                              5.00
                                         20.00
    Unit Hyd. peak (cms)=
                              0.27
                                         0.06
                                                     *TOTALS*
    PEAK FLOW
                  (cms)=
                              0.36
                                         0.06
                                                      0.374 (iii)
    TIME TO PEAK
                  (hrs)=
                             1.33
                                         1.58
                                                      1.33
    RUNOFF VOLUME
                   (mm)=
                             47.34
                                                      23.71
                                         10.98
    TOTAL RAINFALL (mm)=
                             48.34
                                         48.34
                                                      48.34
    RUNOFF COEFFICIENT =
                              0.98
                                                       0.49
                                         0.23
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN^* = 59.0   Ia = Dep. Storage (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0041)|
                         AREA
                                QPEAK
                                         TPEAK
                                                 R. V.
 1 + 2 = 3
                                (cms)
                                         (hrs)
                                                 (mm)
                          (ha)
      ID1= 1 ( 0033):
                         0. 41
                               0.012
                                         1.50
                                                11.93
     + ID2= 2 ( 0036):
                               0. 292
                                        1.50 23.71
                         5.32
      _____
      ID = 3 (0041):
                         5. 73 0. 305
                                        1.50 22.86
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0041)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R. V.
·	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0041):	5.73	0.305	1.50	22.86
+ ID2= 2 (0037):	2.05	0. 053	1. 58	11.10
==============				
ID = 1 (0041):	7. 78	0. 357	1. 50	19. 76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ______

```
ADD HYD ( 0041)|
1 + 2 = 3
                  AREA QPEAK
                             TPEAK
                                   R. V.
                  (ha) (cms)
                              (hrs)
                                     (mm)
   ID1= 1 ( 0041):
                  7. 78 0. 357
                              1.50 19.76
  + ID2= 2 ( 0040):
                  3. 43 0. 374
                             1. 33 23. 71
    -----
   ID = 3 ( 0041): 11.21 0.592 1.33 20.97
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
---- TRANSFORMED HYETOGRAPH ----
TIME
        RAIN | TIME RAIN | TIME RAIN | TIME
       mm/hr
              hrs
                     mm/hr |
                              hrs
                                     mm/hr |
                                             hrs
                                                    mm/hr
 hrs
0.083
       3.78
              1.083
                     21. 14 | 2. 083
                                     7.85
                                            3.08
                                                    4.40
0.167
        3.78
              1.167
                     21. 14 | 2. 167
                                     7.85
                                            3.17
                                                    4.40
0.250
       4. 26 | 1. 250 | 110. 25 | 2. 250
                                            3. 25
                                     6.86
                                                    4.13
0.333
       4.26
              1.333 110.25 | 2.333
                                            3.33
                                     6.86
                                                    4.13
0.417
       4.90
              1.417
                     26. 74 | 2. 417
                                     6. 13
                                            3.42
                                                    3.89
0.500
       4. 90 | 1. 500
                     26. 74 | 2. 500
                                     6.13
                                            3.50
                                                    3.89
0.583
       5.83 | 1.583
                     15. 57 | 2. 583
                                            3.58
                                     5.55
                                                    3.69
0.667
       5.83 | 1.667
                     15. 57 | 2. 667
                                     5. 55
                                            3.67
                                                    3.69
                     11. 47 | 2. 750
0.750
       7. 35 | 1. 750
                                     5.09
                                            3.75
                                                    3.50
      7. 35 | 1. 833
                     11. 47 | 2. 833
0.833
                                     5.09
                                           3.83
                                                    3.50
                      9. 26 | 2. 917
4.72
                                           3. 92
                                                    3.34
1.000 10.36 | 2.000
                      9. 26 | 3. 000
                                     4.72 | 4.00
```

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms) = 0.026 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 11.924
TOTAL RAINFALL (mm) = 48.343
RUNOFF COEFFICIENT = 0.247

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0033)	Area	(ha)=	0.41	Curve Number (CN)= 75.0
ID= 1 DT= 5.0 min	Ιa	(mm) =	10.00	# of Linear Res. (N) = 3.00
	U. H.	Tp(hrs)=	0.20	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

		111	ANDI ONWE		VI II		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1.083	24.80	2. 083	9. 21	3.08	5. 16
0.167	4.44	1.167	24.80	2. 167	9. 21	3. 17	5. 16
0.250	4.99	1.250	129.30	2. 250	8.05	3. 25	4.84
0.333	4.99	1.333	129.30	2. 333	8.05	3. 33	4.84
0.417	5.75	1.417	31.36	2. 417	7. 18	3.42	4.56
0.500	5.75	1.500	31. 36	2.500	7. 19	3.50	4. 56
0.583	6.84	1.583	18. 26	2. 583	6. 51	3.58	4. 32
0.667	6.84	1.667	18. 26	2. 667	6. 51	3.67	4. 32
0.750	8.62	1.750	13.46	2. 750	5. 97	3.75	4. 11
0.833	8.62	1.833	13.46	2. 833	5. 97	3.83	4. 11
0. 917	12.15	1.917	10.86	2. 917	5. 53	3. 92	3. 92
1.000	12.15	2.000	10.86	3.000	5. 53	4.00	3. 92

Unit Hyd Opeak (cms) = 0.078

PEAK FLOW (cms) = 0.018 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 16.569
TOTAL RAINFALL (mm) = 56.700
RUNOFF COEFFICIENT = 0.292

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH							
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1.083	24.80	2.083	9. 21	3.08	5. 16
0. 167	4.44	1.167	24.80	2. 167	9. 21	3.17	5. 16
0.250	4.99	1.250	129.30	2. 250	8.05	3. 25	4.84
0.333	4.99	1.333	129.30	2. 333	8.05	3.33	4.84
0.417	5.75	1.417	31.36	2. 417	7. 18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7.19	3.50	4.56
0.583	6.84	1.583	18. 26	2. 583	6. 51	3.58	4.32
0.667	6.84	1.667	18. 26	2. 667	6. 51	3.67	4.32
0.750	8.62	1.750	13.46	2. 750	5. 97	3.75	4.11
0.833	8.62	1.833	13.46	2. 833	5. 97	3.83	4. 11
0. 917	12.15	1.917	10.86	2. 917	5.53	3. 92	3. 92
1.000	12.15	2.000	10.86	3.000	5.53	4.00	3. 92

PEAK FLOW (cms)= 0.078 (i) TIME TO PEAK (hrs)= 1.583 RUNOFF VOLUME (mm) = 15.486 TOTAL RAINFALL (mm) = 56.700 RUNOFF COEFFICIENT = 0.273

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0036) | Area (ha) = 5.32 |ID= 1 DT= 5.0 min'| Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00-----IMPERVIOUS PERVIOUS (i)

(ha)=	2.66	2.66
(mm) =	1.00	5.00
(%)=	1.00	1.00
(m) =	188. 33	40.00
=	0. 130	0. 250
	(mm) = (%) = (m) =	(mm) = 1.00 (%) = 1.00 (m) = 188.33

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	APH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1.083	24.80	2. 083	9. 21	3.08	5. 16
0. 167	4.44	1.167	24.80	2. 167	9. 21	3. 17	5. 16
0.250	4.99	1.250	129.30	2. 250	8.05	3. 25	4.84
0.333	4.99	1.333	129. 30	2. 333	8.05	3.33	4.84
0. 417	5.75	1.417	31. 36	2. 417	7. 18	3.42	4. 56

0.500 0.583 0.667 0.750 0.833 0.917 1.000	8 6.84 7 6.84 9 8.62 8 8.62 7 12.15	1.500 1.583 1.667 1.750 1.833 1.917 2.000	31. 36 2. 500 18. 26 2. 583 18. 26 2. 667 13. 46 2. 750 13. 46 2. 833 10. 86 2. 917 10. 86 3. 000	7. 19 3. 50 6. 51 3. 58 6. 51 3. 67 5. 97 3. 75 5. 97 3. 83 5. 53 3. 92 5. 53 4. 00	4. 56 4. 32 4. 32 4. 11 4. 11 3. 92 3. 92
Max. Eff. Inten. (n	nm/hr)= (min)	96. 65 15. 00	28. 99 30. 00	·	
Storage Coeff.	(mi n)=	15. 00			
Unit Hyd. Tpeak	(mi n)=	15.00	30.00		
Unit Hyd. peak	(cms)=	0.07	0.04		
				TOTALS	
PEAK FLOW	(cms)=	0.32	0.09	0.368 (iii)	
TIME TO PEAK	(hrs)=	1.50	1. 75	1.50	
RUNOFF VOLUME	(mm) =	55.70	14.81	29. 12	
TOTAL RAINFALL	(mm) =	56.70	56.70	56.70	
RUNOFF COEFFICIE	ENT =	0. 98	0. 26	0.51	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $\begin{array}{ccccc} \text{CN*} &=& 59.0 & \text{Ia} &=& \text{Dep. Storage} & \text{(Above)} \\ \text{(ii)} & \text{TIME STEP (DT)} & \text{SHOULD} & \text{BE SMALLER OR EQUAL} \end{array}$ THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	(ha) = 3.43 Imp(%) = 50.00	
Surface Area Dep. Storage Average Slope Length Mannings n	(ha) = (mm) = (%) = (m) =	1.71 1.00 1.00 1.51.22 0.013	PERVIOUS (i) 1.71 5.00 2.00 40.00 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR <i>I</i>	APH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1.083	24.80	2.083	9. 21	3.08	5. 16
0.167	4.44	1.167	24.80	2. 167	9. 21	3. 17	5. 16
0.250	4.99	1.250	129.30	2. 250	8.05	3. 25	4.84
0.333	4.99	1.333	129.30	2. 333	8.05	3.33	4.84
0.417	5.75	1.417	31. 36	2. 417	7. 18	3.42	4. 56
0.500	5.75	1.500	31. 36	2.500	7. 19	3.50	4. 56
0. 167 0. 250 0. 333 0. 417	4. 44 4. 99 4. 99 5. 75	1.167 1.250 1.333 1.417	24. 80 129. 30 129. 30 31. 36	2. 167 2. 250 2. 333 2. 417	9. 21 8. 05 8. 05 7. 18	3. 17 3. 25 3. 33 3. 42	5. 16 4. 84 4. 84 4. 56

35.00

```
0.583
                     6.84 | 1.583
                                  18. 26 | 2. 583
                                                  6.51 | 3.58
                                                                 4. 32
                                   18. 26 | 2. 667
                                                   6.51
              0.667
                     6.84 | 1.667
                                                          3.67
                                                                 4.32
              0.750
                     8.62
                            1.750
                                   13.46 | 2.750
                                                   5.97
                                                          3.75
                                                                 4.11
                                                         3.83
                            1.833
                                   13. 46 | 2. 833
                                                  5. 97
              0.833
                     8.62
                                                                 4 11
                                                         3.92
              0. 917 12. 15 | 1. 917
                                   10.86 | 2.917
                                                  5.53
                                                                 3. 92
              1.000 12.15 | 2.000
                                   10.86 | 3.000
                                                  5.53 | 4.00
                                                                 3.92
    Max. Eff. Inten. (mm/hr)=
                            129.30
                                         28.99
              over (min)
                              5.00
                                         15.00
    Storage Coeff. (min)=
                              2.95 (ii) 14.54 (ii)
    Unit Hyd. Tpeak (min)=
                              5.00
                                         15.00
    Unit Hyd. peak (cms)=
                              0. 28
                                         0.08
                                                     *TOTALS*
    PEAK FLOW
                  (cms)=
                              0.42
                                         0.09
                                                      0.461 (iii)
    TIME TO PEAK
                  (hrs)=
                              1.33
                                         1.50
                                                       1.33
    RUNOFF VOLUME
                   (mm) =
                             55.70
                                         14.81
                                                      29.12
    TOTAL RAINFALL
                                         56.70
                                                      56.70
                   (mm) =
                             56.70
    RUNOFF COEFFICIENT =
                              0.98
                                         0.26
                                                       0.51
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN^* = 59.0 Ia = Dep. Storage (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 ADD HYD ( 0041)|
                         AREA
                                QPEAK
                                         TPEAK
                                                  R. V.
 1 + 2 = 3
                                         (hrs)
-----
                          (ha)
                                (cms)
                                                  (mm)
     ID1= 1 ( 0033):
                         0.41
                               0.018
                                         1.50
                                                16.57
     + ID2= 2 ( 0036):
                         5.32
                               0.368
                                                29.12
                                         1.50
                                        .=========
      5. 73 0. 386
      ID = 3 (0041):
                                         1.50
                                              28.22
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0041)|
 3 + 2 = 1
                         AREA
                                QPEAK
                                         TPEAK
                                                  R. V.
                          (ha)
                                 (cms)
                                         (hrs)
                                                  (mm)
     ID1 = 3 (0041):
                         5. 73 0. 386
                                         1.50
                                                28.22
     + ID2= 2 ( 0037):
                         2. 05 0. 078
                                         1. 58
                                               15.49
      _____
      ID = 1 (0041):
                         7. 78 0. 464
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
| ADD HYD ( 0041)|
                          AREA
                                QPEAK
                                          TPEAK
                                                   R. V.
 1 + 2 = 3
                          (ha)
                                  (cms)
                                          (hrs)
                                                   (mm)
      ID1= 1 ( 0041):
                          7. 78 0. 464
                                          1.50
                                                 24.86
     + ID2= 2 ( 0040):
                          3. 43 0. 461
                                          1. 33 29. 12
      ______
      ID = 3 (0041): 11.21 0.743
                                          1. 33 26. 17
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALIB
 NASHYD ( 0039)
                    Area (ha)= 0.83 Curve Number (CN)= 75.0
| ID= 1 DT= 5.0 min |
                            (mm) = 10.00
                    La
                                          # of Linear Res. (N) = 3.00
                    U. H. Tp(hrs) = 0.19
       NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                            ---- TRANSFORMED HYETOGRAPH ----
               TIME
                      RAIN |
                             TIME
                                     RAIN | TIME
                                                    RAIN |
                                                            TIME
                                                                    RAIN
                hrs
                      mm/hr
                              hrs
                                    mm/hr
                                              hrs
                                                    mm/hr
                                                             hrs
                                                                   mm/hr
              0.083
                      4.44
                             1.083
                                    24.80
                                            2.083
                                                    9. 21
                                                           3.08
                                                                   5. 16
              0.167
                            1.167
                                            2. 167
                                                    9. 21
                                                           3.17
                      4.44
                                    24.80
                                                                   5.16
              0.250
                      4.99
                            1. 250 129. 30
                                            2. 250
                                                    8.05
                                                           3.25
                                                                   4.84
              0.333
                      4.99
                            1.333 129.30 | 2.333
                                                           3.33
                                                    8.05
                                                                   4.84
              0.417
                            1.417
                                    31. 36 | 2. 417
                      5.75 I
                                                    7. 18
                                                           3.42
                                                                   4.56
              0.500
                            1.500
                                    31.36 | 2.500
                      5.75 l
                                                    7. 19
                                                           3.50
                                                                   4.56
              0.583
                            1.583
                                    18. 26 | 2. 583
                      6.84
                                                    6.51
                                                           3.58
                                                                   4.32
              0.667
                            1.667
                                    18. 26 | 2. 667
                                                    6.51
                      6.84
                                                           3.67
                                                                   4.32
                      8.62 | 1.750
                                    13. 46 | 2. 750
              0.750
                                                    5.97
                                                           3.75
                                                                   4.11
              0.833
                      8.62 | 1.833
                                    13. 46 | 2. 833
                                                    5.97
                                                           3.83
                                                                   4 11
              0.917
                     12.15 | 1.917
                                    10.86 | 2.917
                                                           3.92
                                                                   3 92
                                                    5.53
              1.000 12.15 | 2.000
                                    10.86 | 3.000
                                                    5. 53 | 4. 00
                                                                   3.92
    Unit Hyd Qpeak (cms) = 0.167
    PEAK FLOW
                   (cms) = 0.038 (i)
    TIME TO PEAK
                   (hrs) = 1.500
    RUNOFF VOLUME
                    (mm) = 16.562
    TOTAL RAINFALL
                    (mm) = 56.700
    RUNOFF COEFFICIENT = 0.292
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

AREA

QPEAK

TPEAK

R. V.

| ADD HYD (0032)|

1 + 2 = 3

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION: 1-050yr 4hr 10min Chicago **

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.96	1.083	27. 61	2. 083	10. 27	3.08	5. 76
0.167	4.96	1.167	27. 61	2. 167	10. 27	3. 17	5. 76
0.250	5.58	1.250	143.50	2. 250	8. 98	3. 25	5.40
0.333	5.58	1.333	143.50	2. 333	8. 98	3. 33	5.40
0.417	6.42	1.417	34. 91	2. 417	8. 02	3.42	5. 10
0.500	6.42	1.500	34. 91	2.500	8. 02	3.50	5. 10
0.583	7.64	1.583	20.35	2. 583	7. 27	3. 58	4.83
0.667	7.64	1.667	20.35	2. 667	7. 27	3.67	4.83
0.750	9.62	1.750	15.00	2. 750	6. 67	3. 75	4.59
0.833	9.62	1.833	15.00	2. 833	6.67	3.83	4.59
0.917	13.55	1.917	12. 12	2. 917	6. 17	3. 92	4.38
1.000	13.55	2.000	12. 12	3.000	6. 17	4.00	4. 38

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms) = 0.023 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 20.437
TOTAL RAINFALL (mm) = 63.117
RUNOFF COEFFICIENT = 0.324

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	RAIN
TIME RAIN TIME RAIN TIME RAIN TIME	KAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs	mm/hr
0.083 4.96 1.083 27.61 2.083 10.27 3.08	5. 76
0. 167 4. 96 1. 167 27. 61 2. 167 10. 27 3. 17	5. 76
0. 250 5. 58 1. 250 143. 50 2. 250 8. 98 3. 25	5.40
0. 333	5.40
0. 417 6. 42 1. 417 34. 91 2. 417 8. 02 3. 42	5. 10
0.500 6.42 1.500 34.91 2.500 8.02 3.50	5. 10
0.583 7.64 1.583 20.35 2.583 7.27 3.58	4.83
0.667 7.64 1.667 20.35 2.667 7.27 3.67	4.83
0.750 9.62 1.750 15.00 2.750 6.67 3.75	4.59
0.833 9.62 1.833 15.00 2.833 6.67 3.83	4. 59
0. 917	4. 38
1.000 13.55 2.000 12.12 3.000 6.17 4.00	4. 38

Unit Hyd Qpeak (cms)= 0.356

PEAK FLOW (cms)= 0.100 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 19:159
TOTAL RAINFALL (mm)= 63.117
RUNOFF COEFFICIENT = 0.304

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

		I MPERVI OUS	PERVIOUS (
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm) =	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m) =	188. 33	40.00
Mannings n	=	0. 130	0. 250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.96	1.083	27.61	2.083	10. 27	3.08	5.76
0. 167	4.96	1.167	27.61	2. 167	10. 27	3. 17	5.76
0.250	5.58	1.250	143.50	2. 250	8. 98	3. 25	5.40

0. 333 0. 417		1.333 1.417	143. 50 34. 91	2. 333	8. 98 8. 02	3.33 3.42	5. 40 5. 10
0. 500	6.42	1.500	34. 91	2. 500	8.02	3.50	5. 10
0. 583	7.64	1.583	20. 35	2. 583	7. 27	3.58	4.83
0. 667	7.64	1.667	20. 35	2. 667	7. 27	3.67	4.83
0.750	9.62	1.750	15.00	2. 750	6.67	3.75	4. 59
0.833	9.62	1.833	15.00	2. 833	6.67	3.83	4. 59
0. 917	13.55	1.917	12. 12	2. 917	6. 17	3. 92	4.38
1. 000	13.55	2.000	12. 12	3.000	6. 17	4.00	4. 38
Max. Eff. Inten. (m	nm/hr)=	107. 30		35. 61			
over	(mi n)	15.00		30.00			
Storage Coeff.	(mi n)=	14.46	(ii)	27.59 (ii)			
Unit Hyd. Tpeak	(mi n)=	15.00		30.00			
Unit Hyd. peak	(cms)=	0.08		0.04			
					T0	TALS	
PEAK FLOW	(cms)=	0.37		0. 11	0.	423 (iii)	
TIME TO PEAK	(hrs)=	1.50		1. 75		1.50	
RUNOFF VOLUME	(mm) =	62. 12		18. 01	33	3. 44	
TOTAL RAINFALL	(mm) =	63. 12		63. 12	63	3. 12	
RUNOFF COEFFICIE		0. 98		0. 29	(0. 53	

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total		3.43 50.00 Dir.	Conn. (%)=	35. 00	
		LUDEDVILOU	IC DEDVILO	110 (1.)		
		I MPERVI OL	JS PERVI 0	US (I)		
Surface Area	(ha)=	1. 71	1.7	1		
Dep. Storage	(mm) =	1.00	5.0	0		
Average SI ope	(%)=	1.00	2. 0	0		
Length	(m) =	151. 22	40.0	0		
Mannings n	=	0. 013	0. 25	0		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	:APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.96	1.083	27. 61	2. 083	10. 27	3.08	5. 76
0. 167	4.96	1.167	27.61	2. 167	10. 27	3. 17	5.76
0.250	5.58	1.250	143.50	2. 250	8. 98	3. 25	5.40
0.333	5.58	1.333	143.50	2. 333	8. 98	3. 33	5.40

0. 417	6.42	1.417	34. 91	2. 417	8.02	3.42	5. 10
0.500	6.42	1.500	34. 91	2.500	8.02	3.50	5.10
0. 583	7.64	1.583	20.35	2. 583	7.27	3.58	4.83
0.667	7.64	1.667	20.35	2. 667	7. 27	3.67	4.83
0.750	9.62	1.750	15.00	2. 750	6.67	3.75	4.59
0.833	9.62	1.833	15.00	2. 833	6.67	3.83	4.59
0. 917	7 13.55	1.917	12. 12	2. 917	6. 17	3. 92	4.38
1.000	13.55	2.000	12. 12	3.000	6. 17	4.00	4. 38
Max. Eff. Inten. (r	nm/hr)=	143. 50		45. 22			
over	(mi n)	5.00		15.00			
Storage Coeff.	(mi n)=	2.83	(ii)	12.53 (ii)			
Unit Hyd. Tpeak	(mi n)=	5.00		15.00			
Unit Hyd. peak	(cms)=	0. 28		0.08			
					T0	ΓALS	
PEAK FLOW	(cms)=	0.47		0.12	0.	523 (iii))
TIME TO PEAK	(hrs)=	1. 33		1.50	•	1. 33	
RUNOFF VOLUME	(mm) =	62. 12		18. 01	33	3. 45	
TOTAL RAINFALL	(mm) =	63. 12		63.12	63	3. 12	
RUNOFF COEFFICIE	ENT =	0. 98		0. 29	(0. 53	

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

.....

```
| ADD HYD ( 0041)|
1 + 2 = 3
                   AREA
                        QPEAK
                               TPEAK
                                      R. V.
-----
                   (ha)
                        (cms)
                               (hrs)
                                      (mm)
    ID1= 1 ( 0033):
                   0.41 0.023
                               1. 50
                                    20.44
   + ID2= 2 ( 0036):
                   5. 32 0. 423
                               1.50 33.44
     _____
     ID = 3 (0041):
                   5. 73 0. 446
                               1.50 32.51
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041) 3 + 2 = 1 	AREA (ha) 5. 73 2. 05	QPEAK (cms) 0.446 0.100	TPEAK (hrs) 1.50 1.50	R.V. (mm) 32.51 19.16
ID = 1 (0041):	7. 78	0. 546	1. 50	29. 00

```
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
ADD HYD ( 0041)|
                        AREA QPEAK
 1 + 2 = 3
                                     TPEAK
                                            R. V.
                        (ha) (cms)
                                      (hrs)
                                              (mm)
     ID1= 1 ( 0041):
                       7. 78 0. 546
                                      1.50 29.00
    + ID2= 2 ( 0040):
                       3. 43 0. 523
                                      1. 33 33. 45
      _____
      ID = 3 (0041): 11.21 0.856
                                    1. 33 30. 36
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALIB
 NASHYD ( 0039) Area (ha)= 0.83 Curve Number (CN)= 75.0
|ID= 1 DT= 5.0 min | Ia (mm)= 10.00
                                     # of Linear Res. (N) = 3.00
----- U. H. Tp(hrs)= 0.19
       NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                          ---- TRANSFORMED HYETOGRAPH ----
             TIME
                    RAIN | TIME
                                 RAIN | TIME RAIN | TIME
                                                             RAIN
                                       ' hrs
                                 mm/hr i
                                               mm/hr i hrs
                                                             mm/hr
              hrs
                   mm/hr
                           hrs
             0.083
                    4.96
                          1.083
                                 27. 61 | 2. 083 | 10. 27 |
                                                      3.08
                                                             5. 76
             0.167
                    4.96
                          1.167
                                 27. 61 | 2. 167
                                               10.27
                                                      3.17
                                                             5.76
             0.250
                    5. 58 | 1. 250 | 143. 50 | 2. 250
                                               8. 98
                                                      3.25
                                                             5.40
                    5. 58 | 1. 333 | 143. 50 | 2. 333
             0.333
                                                      3.33
                                               8. 98
                                                             5.40
             0.417
                          1.417
                                 34. 91 | 2. 417
                                                      3.42
                    6.42
                                               8.02
                                                             5.10
                                 34. 91 | 2. 500
             0.500
                   6.42
                          1.500
                                               8.02
                                                      3.50
                                                             5. 10
             0.583
                   7.64
                          1.583
                                 20.35 | 2.583
                                               7.27
                                                      3.58
                                                             4.83
             0.667
                   7.64
                          1.667
                                 20. 35 | 2. 667
                                               7.27
                                                      3.67
                                                             4.83
             0.750
                   9.62
                          1.750
                                 15.00 | 2.750
                                                             4.59
                                               6.67
                                                      3.75
             0.833
                   9.62
                          1.833
                                 15.00 | 2.833
                                               6.67
                                                     3.83
                                                             4.59
                                               6. 17 İ
             12. 12 | 2. 917
                                                     3.92
                                                             4.38
             1.000 13.55 | 2.000
                                 12. 12 | 3. 000
                                               6. 17 | 4. 00
                                                             4.38
   Unit Hyd Qpeak (cms)= 0.167
    PEAK FLOW
                 (cms) = 0.048 (i)
    TIME TO PEAK
                 (hrs) = 1.500
    RUNOFF VOLUME
                 (mm) = 20.429
    TOTAL RAINFALL (mm) = 63.117
    RUNOFF COEFFICIENT = 0.324
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
| ADD HYD ( 0032)|
 1 + 2 = 3
                       AREA QPEAK
                                   TPEAK
                       (ha)
                             (cms)
                                     (hrs)
                                             (mm)
    ID1= 1 ( 0039):
                      0. 83 0. 048
                                     1.50 20.43
    + ID2= 2 ( 0041): 11.21 0.856
                                     1. 33 30. 36
      _____
      ID = 3 (0032): 12.04 0.886
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
***********
** SIMULATION: 1-100vr 4hr 10min Chicago **
***********
 CALIB
 NASHYD ( 0033) | Area (ha) = 0.41
                                     Curve Number (CN) = 75.0
|ID= 1 DT= 5.0 min | Ia
                        (mm) = 10.00
                                     # of Linear Res. (N) = 3.00
----- U. H. Tp(hrs) = 0.20
      NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                         ---- TRANSFORMED HYETOGRAPH ----
             TIME
                    RAIN | TIME
                                RAIN | TIME RAIN |
                                                     TIME
                                mm/hr | hrs
              hrs
                   mm/hr
                          hrs
                                              mm/hr |
                                                     hrs
                                                           mm/hr
            0.083
                                30. 39 | 2. 083 | 11. 31 |
                                                    3.08
                    5.46 l
                         1.083
                                                           6.34
            0.167
                    5. 46 | 1. 167
                                30. 39 | 2. 167
                                             11.31
                                                    3.17
                                                           6.34
            0.250
                    6. 14 | 1. 250 | 157. 92 | 2. 250
                                             9.88
                                                    3.25
                                                           5.95
            0.333
                    6. 14 | 1. 333 | 157. 92 | 2. 333
                                              9.88
                                                    3.33
                                                           5.95
            0.417
                    7.06 | 1.417
                               38. 42 | 2. 417
                                              8.83 l
                                                    3.42
                                                           5. 61
                   7.06 | 1.500
            0.500
                                38. 42 | 2. 500
                                              8.83 I
                                                    3.50
                                                           5.61
            0.583
                    8.40 | 1.583
                                22. 40 | 2. 583
                                              8.00
                                                    3.58
                                                           5. 31
                    8.40 | 1.667
                                22. 40 | 2. 667
            0.667
                                              8.00 | 3.67
                                                           5.31
            0.750
                   10.58 | 1.750
                               16, 51 | 2, 750
                                              7.34 | 3.75
                                                           5.05
            0.833 10.58 | 1.833 16.51 | 2.833
                                             7.34 | 3.83
                                                           5.05
            6.80 | 3.92
                                                           4.82
            1.000 14.91 | 2.000 13.33 | 3.000
                                              6.80 | 4.00
                                                           4.82
    Unit Hyd Opeak (cms) = 0.078
    PEAK FLOW
                 (cms) = 0.028 (i)
    TIME TO PEAK
                (hrs) = 1.500
    RUNOFF VOLUME
                (mm) = 24.483
    TOTAL RAINFALL (mm) = 69.460
    RUNOFF COEFFICIENT = 0.352
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

NASHYD (0037) | Area (ha)= 2.05 Curve Number (CN)= 73.0

CALIB

 $|ID=1DT=5.0 \, \text{min}|$ Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 ----- U. H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	5.46	1.083	30.39	2. 083	11. 31	3.08	6.34
0.167	5.46	1.167	30.39	2. 167	11. 31	3. 17	6.34
0.250	6.14	1.250	157. 92	2. 250	9.88	3. 25	5. 95
0.333	6.14	1.333	157. 92	2. 333	9.88	3. 33	5. 95
0.417	7.06	1.417	38.42	2. 417	8.83	3.42	5. 61
0.500	7.06	1.500	38.42	2.500	8.83	3.50	5. 61
0.583	8.40	1.583	22.40	2. 583	8.00	3. 58	5. 31
0.667	8.40	1.667	22.40	2. 667	8.00	3.67	5. 31
0.750	10.58	1.750	16. 51	2. 750	7.34	3.75	5.05
0.833	10.58	1.833	16. 51	2.833	7.34	3.83	5.05
0.917	14.91	1.917	13. 33	2. 917	6.80	3. 92	4.82
1.000	14.91	2.000	13. 33	3.000	6.80	4.00	4.82

Unit Hyd Qpeak (cms)= 0.356

PEAK FLOW (cms) = 0.123 (i)TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 23.016
TOTAL RAINFALL (mm) = 69.460 RUNOFF COEFFICIENT = 0.331

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0036) ID= 1 DT= 5.0 min	Area Total	,	5. 32 50. 00	Dir.	Conn. (%)=	35. 00	
Surface Area Dep. Storage Average Slope Length Mannings n	(ha) = (mm) = (%) = (m) =	I MPERVI 2. 6 1. 0 1. 0 188. 3 0. 13	6 0 0 3	PERVI 00 2. 60 5. 00 1. 00 40. 00 0. 250	6		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRANSFORMED) HYETOGF	RAPH		
TIME	RAIN TIM	ME RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr hi	rs mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	5.46 1.08	33 30.39	2. 083	11. 31	3.08	6.34

	0.167	7 5.46	1.167	30.39	2. 167	11. 31	3.17	6.34
	0. 250	6.14	1.250	157. 92	2. 250	9.88	3. 25	5. 95
	0.333	6.14	1.333	157. 92	2. 333	9.88	3. 33	5. 95
	0.417	7.06	1.417	38. 42	2. 417	8.83	3.42	5. 61
	0.500	7.06	1.500	38. 42	2. 500	8.83	3.50	5. 61
	0.583	8.40	1.583	22.40	2. 583	8.00	3. 58	5. 31
	0.667	8.40	1.667	22.40	2. 667	8.00	3. 67	5. 31
	0.750	10.58	1.750	16. 51	2. 750	7.34	3.75	5.05
	0.833	3 10.58	1.833	16. 51	2.833	7.34	3.83	5.05
	0. 917	7 14.91	1.917	13. 33	2. 917	6.80	3. 92	4.82
	1.000	14.91	2.000	13. 33	3.000	6.80	4.00	4. 82
			440.00					
Max. Eff. I	•	,	118. 09		42.74			
		(mi n)	15.00		30.00			
Storage C			13. 91	(11)	26.12 (ii)			
Unit Hyd.			15.00		30.00			
Unit Hyd.	peak	(cms)=	0.08		0.04			
							ΓALS*	
PEAK FLOW		(cms)=	0. 41		0. 13	0.	481 (iii)	
TIME TO P	EAK	(hrs)=	1.50		1. 75	•	1.50	
RUNOFF VO	LUME	(mm) =	68. 46		21. 38	37	7. 85	
TOTAL RAI	NFALL	(mm) =	69. 46		69. 46	69	9. 46	
RUNOFF CO	EFFICIE	ENT =	0. 99		0. 31	(0. 54	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	(ha) = 3.43 Imp(%) = 50.00	Dir. Conn.(%)=	35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	1. 71	1. 71	
Dep. Storage	(mm) =	1.00	5. 00	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	151. 22	40.00	
Mannings n	=	0. 013	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH									
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	5.46	1.083	30. 39	2. 083	11. 31	3.08	6.34		
0. 167	5.46	1.167	30.39	2. 167	11. 31	3.17	6.34		

```
5. 95
               0.250
                      6. 14 | 1. 250 | 157. 92 | 2. 250
                                                       9.88 | 3.25
                       6. 14 | 1. 333 | 157. 92 | 2. 333
                                                       9.88
                                                               3.33
               0.333
                                                                       5. 95
               0.417
                       7.06
                              1.417
                                       38. 42 | 2. 417
                                                       8.83
                                                               3.42
                                                                        5.61
               0.500
                              1.500
                                       38. 42 | 2. 500
                                                       8.83
                                                               3.50
                       7.06 l
                                                                       5 61
               0.583
                       8.40 | 1.583
                                      22.40 | 2.583
                                                       8.00
                                                               3.58
                                                                       5.31
               0.667
                      8. 40 İ
                              1.667
                                       22.40 | 2.667
                                                       8.00
                                                               3.67
                                                                       5.31
               0.750
                      10.58
                              1.750
                                       16. 51 | 2. 750
                                                       7.34
                                                               3.75
                                                                       5.05
               0.833
                      10.58 İ
                              1.833
                                      16. 51 | 2. 833
                                                       7.34
                                                               3.83
                                                                       5 05
               0. 917 14. 91
                              1.917
                                      13. 33 | 2. 917
                                                       6.80
                                                               3. 92
                                                                       4.82
               1.000 14.91 | 2.000
                                      13. 33 | 3. 000
                                                       6.80
                                                              4.00
                                                                       4.82
    Max. Eff. Inten. (mm/hr)=
                               157. 92
                                             54.39
               over (min)
                                5.00
                                             15.00
                                2.73 (ii) 11.73 (ii)
    Storage Coeff. (min)=
    Unit Hyd. Tpeak (min)=
                                5.00
                                             15.00
    Unit Hyd. peak (cms)=
                                0.29
                                             0.09
                                                          *TOTALS*
    PEAK FLOW
                    (cms) =
                                0.52
                                             0.14
                                                           0.587 (iii)
    TIME TO PEAK
                    (hrs)=
                                1.33
                                             1.50
                                                            1.33
    RUNOFF VOLUME
                     (mm) =
                                68.46
                                             21.38
                                                           37.85
    TOTAL RAINFALL (mm)=
                                69.46
                                             69.46
                                                           69.46
    RUNOFF COEFFICIENT =
                                0.99
                                             0.31
                                                            0.54
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
```

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- $CN^* = 59.0$ Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
- THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| ADD HYD ( 0041)|
 1 + 2 = 3
                      AREA
                            OPFAK
                                    TPFAK
                                            R. V.
                                    (hrs)
                       (ha)
                             (cms)
                                            (mm)
-----
    ID1= 1 ( 0033):
                      0.41 0.028
                                    1.50
                                          24.48
    + ID2= 2 ( 0036):
                      5. 32 0. 481
                                          37.85
      _____
     ID = 3 (0041):
                      5. 73 0. 510
                                    1.50
                                         36.90
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
_____
| ADD HYD ( 0041)|
 3 + 2 = 1
                    AREA
                         QPEAK
                                       R. V.
                                TPEAK
                    (ha)
                         (cms)
                                (hrs)
                                       (mm)
    ID1= 3 ( 0041):
                    5. 73 0. 510
                                1.50
                                     36.90
                    2. 05 0. 123
   + ID2= 2 ( 0037):
                                1.50
                                     23.02
     _____
```

```
ID = 1 ( 0041): 7.78 0.633
                                     1.50 33.24
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
_____
| ADD HYD ( 0041)|
                        AREA
1 + 2 = 3
                              QPEAK
                                      TPEAK
                                               R V
-----
                        (ha)
                              (cms)
                                      (hrs)
                                               (mm)
     ID1= 1 ( 0041):
                       7. 78 0. 633
                                      1.50
                                             33.24
    + ID2= 2 ( 0040):
                        3. 43 0. 587
                                      1. 33 37. 85
      _____
      ID = 3 (0041): 11.21 0.974
                                      1. 33 34. 65
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
 CALIB
 NASHYD ( 0039) Area (ha)= 0.83
                                      Curve Number (CN) = 75.0
| ID= 1 DT= 5.0 min |
                  Ιa
                         (mm) = 10.00
                                      # of Linear Res. (N) = 3.00
-----
                  U. H. Tp(hrs) = 0.19
       NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                          ---- TRANSFORMED HYETOGRAPH ----
              TIME
                    RAIN | TIME
                                 RAIN | TIME
                                               RAIN |
                                                       TIME
                                                              RAIN
                    mm/hr
                            hrs
                                 mm/hr i
                                         hrs
                                               mm/hr |
                                                       hrs
                                                             mm/hr
              hrs
             0.083
                                 30. 39 | 2. 083
                                                      3.08
                    5.46
                          1.083
                                               11.31
                                                             6.34
             0.167
                    5.46 | 1.167
                                 30. 39 | 2. 167
                                               11. 31 İ
                                                      3. 17
                                                             6.34
                    6. 14 | 1. 250 | 157. 92 | 2. 250
             0.250
                                               9.88
                                                      3. 25
                                                             5.95
                    6. 14 | 1. 333 | 157. 92 | 2. 333
             0.333
                                               9.88
                                                      3.33
                                                             5.95
             0.417
                    7.06 | 1.417
                                 38. 42 | 2. 417
                                               8.83
                                                      3.42
                                                             5.61
             0.500
                    7.06 | 1.500
                                 38. 42 | 2. 500
                                               8.83
                                                      3 50
                                                             5 61
             0.583
                    8.40 | 1.583
                                 22, 40 | 2, 583
                                               8.00
                                                      3.58
                                                             5.31
             0.667
                    8.40 | 1.667
                                 22.40 | 2.667
                                               8.00
                                                      3.67
                                                             5.31
             0.750
                    10.58 | 1.750
                                 16.51 | 2.750
                                               7.34
                                                      3.75
                                                             5.05
             0.833
                    10.58 | 1.833
                                 16. 51 | 2. 833
                                               7.34
                                                      3.83
                                                             5.05
             0.917
                   14. 91 | 1. 917
                                 13. 33 | 2. 917
                                               6.80
                                                      3.92
                                                             4.82
             1.000
                  14. 91 | 2. 000
                                13. 33 | 3. 000
                                               6.80 | 4.00
                                                             4.82
    Unit Hyd Qpeak (cms) = 0.167
    PEAK FLOW
                 (cms) = 0.059 (i)
    TIME TO PEAK
                 (hrs) = 1.500
    RUNOFF VOLUME
                  (mm) = 24.473
    TOTAL RAINFALL
                  (mm) = 69.460
    RUNOFF COEFFICIENT = 0.352
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
ADD HYD ( 0032)|
                   AREA QPEAK
1 + 2 = 3
                              TPEAK
                                     R. V.
                               (hrs)
                   (ha)
                      (cms)
                                      (mm)
   ID1 = 1 (0039):
                   0.83 0.059
                               1.50 24.47
   + ID2= 2 ( 0041):
                  11. 21 0. 974
                              1. 33 34. 65
    _____
    ID = 3 (0032): 12.04 1.012
                              1. 33 33. 95
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION: 2-025yr 12hr 15min SCS **

CALIB NASHYD (0033) Area (ha)= 0.41 Curve Number (CN)= 75.0 |ID= 1 DT= 5.0 min | Ιa (mm) = 10.00# of Linear Res. (N) = 3.00 ----- U. H. Tp(hrs) = 0.20

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN I' TIME RAIN I RAIN TIME hrs hrs mm/hr hrs mm/hr | mm/hr | hrs mm/hr 0.083 0.00 3.167 2.34 | 6.250 102.96 | 9.33 2.73 0.167 0.00 | 3.250 2. 34 | 6. 333 9.42 2.73 14.04 0.250 0.00 | 3.333 3. 12 | 6. 417 9.50 2.73 14.04 0.333 1.95 3.417 3. 12 | 6. 500 9.58 2.73 14.04 0.417 3.500 1.95 3. 12 | 6. 583 14.04 9.67 2.73 0.500 1.95 3.583 3. 12 | 6. 667 14.04 9.75 2.73 0.583 1. 95 3.667 3. 12 | 6. 750 14.04 9.83 2.73 1.95 3.750 3. 12 | 6. 833 9.92 2.73 0.667 6.24 0.750 1.95 3.833 3. 12 | 6. 917 6.24 10.00 2.73 0.833 1.95 3.917 3. 12 | 7. 000 6.24 10.08 2.73 3. 12 | 7. 083 0.917 4.000 1.95 6. 24 10.17 2.73 1.000 1.95 4.083 3. 12 | 7. 167 6.24 10. 25 2.73 1.083 1.95 4.167 3. 12 | 7. 250 6.24 10.33 1.167 1.95 4.250 3. 12 | 7. 333 4.68 10.42 1.250 1.95 4.333 4.68 | 7.417 4.68 10.50 1.333 1.95 4.417 4.68 | 7.500 10.58 4.68 1.417 1.95 4.500 4.68 | 7.583 4.68 10.67 1.500 1.95 4.583 4.68 | 7.667 4.68 10.75 1. 95 İ 4.68 | 7.750 1.583 4.667 4.68 10.83 1.667 1. 95 I 4.750 4.68 | 7.833 4.68 10.92 1.95 4.833 1.750 6. 24 | 7. 917 4.68 11.00 1.95 4.917 6. 24 | 8. 000 1.833 4.68 11. 08 6. 24 | 8. 083 1.917 1.95 5.000 4.68 | 11.17 1.56 5.083 2.000 1.95 | 6. 24 | 8. 167 4.68 | 11.25 1.56 2.083 1.95 | 5.167 6. 24 | 8. 250 4. 68 | 11. 33 1.56

```
2. 167 1. 95 | 5. 250
                        6. 24 | 8. 333
                                        2.73 | 11.42
        1.95 | 5.333
                        9. 36 | 8. 417
                                        2. 73 | 11. 50
2. 250
2.333
        2.34 | 5.417
                        9. 36 | 8. 500
                                        2. 73 | 11. 58
2.417
        2.34 | 5.500
                        9. 36 | 8. 583
                                        2. 73 | 11. 67
2.500
        2.34 | 5.583
                        9. 36 | 8. 667
                                        2. 73 | 11. 75
2.583
        2.34 | 5.667
                        9. 36 | 8. 750
                                        2. 73 | 11. 83
2.667
        2.34 | 5.750
                       9. 36 | 8. 833
                                        2. 73 | 11. 92
2.750
        2. 34 | 5. 833 | 37. 44 | 8. 917
                                        2. 73 | 12. 00
                                                        1.56
2.833
        2. 73 | 12. 08
                                                       1.56
2.917
        2.34 | 6.000 37.44 | 9.083
                                        2. 73 | 12. 17
                                                       1.56
3.000
        2.34 | 6.083 | 102.96 | 9.167
                                        2. 73 | 12. 25
                                                       1.56
3.083
       2. 34 | 6. 167 | 102. 96 | 9. 250
                                        2.73
```

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms) = 0.037 (i)TIME TO PEAK (hrs) = 6.333RUNOFF VOLUME (mm) = 30.229TOTAL RAINFALL (mm) = 78.000 RUNOFF COEFFICIENT = 0.388

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
CALIB
NASHYD ( 0037)
                                    Curve Number (CN)= 73.0
                 Area (ha)= 2.05
|ID= 1 DT= 5.0 min | la
                        (mm) = 10.00
                                    # of Linear Res. (N) = 3.00
----- U. H. Tp(hrs) = 0.22
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	I TIME	RAIN	l' TIME	RAIN	I TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.34	6. 250		9. 33	2.73
0. 167	0.00	3.250	2.34	6. 333	14.04	9.42	2.73
0.250	0.00	3.333	3. 12	6. 417	14.04	9.50	2.73
0.333	1.95	3.417	3. 12	6. 500	14.04	9. 58	2.73
0.417	1.95	3.500	3. 12	6. 583	14.04	9.67	2.73
0.500	1.95	3.583	3. 12	6. 667	14.04	9. 75	2.73
0.583	1.95	3.667	3. 12	6. 750	14.04	9.83	2.73
0.667	1. 95	3.750	3. 12	6. 833	6. 24	9.92	2.73
0.750	1.95	3.833	3. 12	6. 917	6. 24	10.00	2.73
0.833	1. 95	3.917	3. 12	7.000	6. 24	10.08	2.73
0. 917	1.95	4.000	3. 12	7. 083	6. 24	10. 17	2.73
1.000	1. 95	4.083	3. 12	7. 167	6. 24	10. 25	2.73
1.083	1.95	4.167	3. 12	7. 250	6. 24	10. 33	1.56
1. 167	1.95	4.250	3. 12	7. 333	4.68	10.42	1.56
1. 250	1.95	4.333	4.68	7. 417	4.68	10.50	1.56
1. 333	1. 95	4.417	4.68	7. 500	4.68	10. 58	1.56

```
1.417 1.95 | 4.500
                      4.68 | 7.583
                                      4.68 | 10.67
                                                    1. 56
1.500
      1.95 | 4.583
                      4.68 | 7.667
                                      4. 68 | 10. 75
                                                    1. 56
1.583
       1.95
              4.667
                      4.68 | 7.750
                                      4.68
                                            10.83
              4.750
                      4. 68 | 7. 833
       1.95
                                      4. 68 | 10. 92
1.667
                                                    1.56
1.750
              4.833
       1.95
                       6. 24 | 7. 917
                                      4.68 | 11.00
                                                    1.56
1.833
       1.95
              4.917
                       6. 24 | 8. 000
                                      4.68
                                            11.08
                                                    1.56
               5.000
                       6. 24 | 8. 083
1.917
       1. 95
                                      4.68
                                            11. 17
2.000
       1.95
              5.083
                       6. 24 | 8. 167
                                      4.68
                                            11. 25
                                                    1.56
2.083
       1.95
              5.167
                       6. 24 | 8. 250
                                      4.68
                                            11.33
                                                    1.56
2.167
       1.95
               5.250
                       6. 24 | 8. 333
                                      2.73
                                            11.42
                                                     1.56
2.250
       1.95
               5.333
                       9. 36 | 8. 417
                                      2.73 j
                                            11.50
                                                     1.56
2.333
       2.34
               5.417
                       9. 36 | 8. 500
                                      2.73
                                            11.58
                                                     1.56
2.417
        2.34
              5.500
                       9. 36 | 8. 583
                                      2.73 İ
                                            11.67
                                                     1.56
2.500
       2.34
              5.583
                       9. 36 | 8. 667
                                            11. 75
                                      2.73 İ
                                                     1.56
2.583
       2.34
               5.667
                       9. 36
                              8.750
                                      2.73
                                            11.83
                                                     1.56
2.667
        2.34
               5.750
                       9. 36
                              8.833
                                            11. 92
                                      2.73
                                                     1.56
2.750
        2.34
               5.833
                      37. 44 İ
                              8. 917
                                      2.73 İ
                                            12.00
                                                     1.56
2.833
        2.34
               5.917
                      37.44 | 9.000
                                      2.73
                                            12.08
                                                     1.56
2.917
        2.34
              6.000
                      37.44 | 9.083
                                      2. 73 | 12. 17
                                                     1.56
3.000
        2.34
              6.083 102.96 | 9.167
                                      2. 73 | 12. 25
                                                    1.56
3.083
       2. 34 | 6. 167 | 102. 96 | 9. 250
                                      2.73
```

PEAK FLOW (cms) = 0.163 (i) TIME TO PEAK (hrs) = 6.333 RUNOFF VOLUME (mm) = 28.515 TOTAL RAINFALL (mm) = 78.000 RUNOFF COEFFICIENT = 0.366

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

		T WIT EIT V T OOO	LICETOOD
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm) =	1.00	5.00
Average SI ope	(%)=	1.00	1.00
Length	(m) =	188. 33	40.00
Mannings n	=	0. 130	0. 250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr | 0.083 | 0.00 | 3.167 | 2.34 | 6.250 | 102.96 | 9.33 | 2.73

0. 167 0. 250 0. 333 0. 417 0. 500 0. 583 0. 667 0. 750 0. 833 0. 917 1. 000 1. 083 1. 167 1. 250 1. 333 1. 417 1. 500 1. 583 1. 667 1. 750 1. 833 1. 917 2. 000 2. 083 2. 167 2. 250 2. 333 2. 417 2. 500 2. 583 2. 667 2. 750 2. 833 2. 917 3. 000	0.00 0.00 1.95 1.95 1.95 1.95 1.95 1.95 1.95 1.95	3. 250 3. 333 3. 417 3. 500 3. 583 3. 667 4. 000 4. 083 4. 167 4. 250 4. 333 4. 417 4. 583 4. 667 4. 750 4. 833 4. 917 5. 000 5. 083 5. 167 5. 250 5. 333 5. 647 5. 750 5. 833 5. 600 5. 833 5. 600 5. 833 5. 600 5. 833 5. 600 6. 833 6. 917 6. 000 6. 833 6. 917 6. 000	2. 34 3. 12 3. 12 3. 12 3. 12 3. 12 3. 12 3. 12 3. 12 3. 12 3. 12 4. 68 4. 68 4. 68 4. 68 4. 68 4. 68 6. 24	6. 417 6. 500 6. 583 6. 667 6. 750 6. 833 6. 917 7. 000 7. 083 7. 167 7. 250 7. 333 7. 667 7. 7500 7. 833 7. 667 7. 750 7. 833 8. 000 8. 083 8. 167 8. 250 8. 333 8. 417 8. 500 8. 833 8. 833 8. 833 8. 833 8. 833 8. 833 8. 833 8. 833 8. 833 8. 833 8. 833 8. 833 8. 917 9. 000 9. 083	14. 04 14. 04 14. 04 14. 04 14. 04 16. 26 16. 26	10. 58 10. 67 10. 75 10. 83 10. 92 11. 00 11. 08 11. 17 11. 25 11. 33 11. 42 11. 50 11. 58 11. 67 11. 75 11. 83 11. 92 12. 00 12. 08 12. 17	2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 1. 56
2. 250	1. 95	5.333	9. 36	8. 417	2.73	11.50	1.56
2. 750	2.34	5.833	37.44	8. 917	2.73		1.56
3. 083	2. 34	6. 167	102. 96	9. 250	2. 73	12.23	1. 30
Max. Eff. Inten. (mm/ over (m		102. 96 15. 00		51. 58 30. 00			
Storage Coeff. (n	ni n)=	14.70	(ii)	26.02 (ii)			
Unit Hyd. Tpeak (n Unit Hyd. peak (d	nin)= cms)=	15. 00 0. 08		30. 00 0. 04			
PEAK FLOW (d	cms)=	0. 34		0. 16		TALS* 447 (iii)	
	nrs)= (mm)=	6. 33 77. 00		6. 58 26. 19		5. 33 3. 97	

78.00

0.34

78.00

0.56

78.00

0.99

TOTAL RAINFALL (mm)=

RUNOFF COEFFICIENT =

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY

Mannings n

CALIB STANDHYD (0040) Area (ha)= 3.43 | ID= 1 DT= 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 _____ IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 1.71 1.71 Dep. Storage (mm) = 1.00 5.00 Average Slope 2.00 (%)= 1.00 Length (m)= 151.22 40.00

> 0.013 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH								
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	0.00	3.167	2.34	6. 250	102.96	9.33	2.73		
0. 167	0.00	3.250	2.34	6. 333	14.04	9.42	2.73		
0.250	0.00	3.333	3. 12	6. 417	14.04	9.50	2.73		
0.333	1. 95	3.417	3. 12	6. 500	14.04	9. 58	2.73		
0.417	1. 95	3.500	3. 12	6. 583	14.04	9. 67	2.73		
0.500	1. 95	3.583	3. 12	6. 667	14.04	9. 75	2.73		
0.583	1. 95	3.667	3. 12	6. 750	14.04	9.83	2.73		
0.667	1. 95	3.750	3. 12	6. 833	6. 24	9. 92	2.73		
0.750	1. 95	3.833	3. 12	6. 917	6. 24	10.00	2.73		
0.833	1. 95	3.917	3. 12	7.000	6. 24	10.08	2.73		
0. 917	1. 95		3. 12	7. 083	6. 24	10. 17	2.73		
1.000	1. 95		3. 12	7. 167	6. 24				
1.083	1. 95	4.167	3. 12	7. 250	6. 24	10. 33	1. 56		
1. 167	1. 95	4.250	3. 12	7. 333	4.68	10.42	1. 56		
1. 250	1. 95	4.333	4. 68	7. 417	4.68	10. 50	1. 56		
1. 333	1. 95	4.417	4. 68	7. 500		10. 58	1. 56		
1. 417	1. 95		4. 68	7. 583	4.68	10. 67			
1.500	1. 95		4. 68	7. 667		10. 75			
1. 583	1. 95	4.667	4. 68	7. 750	4.68	10.83	1. 56		
1. 667	1. 95		4. 68	7. 833		10. 92	1. 56		
1. 750	1. 95	4.833		7. 917		11.00			
1.833	1. 95	4.917	6. 24	8. 000		11. 08	1. 56		
1. 917	1. 95	5.000	6. 24	8. 083		11. 17	1. 56		
2.000	1. 95		6. 24	8. 167		11. 25			
2.083	1. 95	5.167	6. 24	8. 250		11. 33	1. 56		
2. 167	1. 95	5.250	6. 24	8. 333	2. 73	11. 42	1. 56		
2. 250	1. 95		9. 36	8. 417	- 1				
2. 333	2.34	5.417	9. 36	8. 500		11. 58	1. 56		
2. 417	2.34	5.500	9. 36	8. 583	2. 73	11. 67	1. 56		

0.250

```
2.500
                      2.34 | 5.583
                                     9. 36 | 8. 667
                                                     2. 73 | 11. 75
               2.583
                       2.34 | 5.667
                                     9. 36 | 8. 750
                                                     2. 73 | 11. 83
               2.667
                       2.34 | 5.750
                                     9. 36 | 8. 833
                                                     2. 73 | 11. 92
                       2. 34 | 5. 833 | 37. 44 | 8. 917
               2.750
                                                     2. 73 | 12. 00
                       2. 34 | 5. 917 | 37. 44 | 9. 000
               2.833
                                                     2. 73 | 12. 08
                                                                    1.56
                       2.34 | 6.000 37.44 | 9.083
                                                     2. 73 | 12. 17
               2.917
                                                                   1.56
                             6.083 102.96 9.167
               3.000
                      2.34
                                                     2. 73 | 12. 25
                                                                   1.56
               3.083
                      2. 34 | 6. 167 | 102. 96 | 9. 250
                                                     2.73
    Max. Eff. Inten. (mm/hr)=
                             102.96
                                           55.74
              over (min)
                               5.00
                                           15.00
    Storage Coeff. (min)=
                               3.24 (ii)
                                          12.15 (ii)
    Unit Hyd. Tpeak (min)=
                               5.00
                                           15.00
    Unit Hyd. peak (cms)=
                               0.27
                                           0.09
                                                       *TOTALS*
    PEAK FLOW
                                                        0.481 (iii)
                   (cms) =
                               0.34
                                           0.16
    TIME TO PEAK
                   (hrs)=
                               6. 25
                                           6.33
                                                         6.25
    RUNOFF VOLUME
                    (mm) =
                               77.00
                                           26.19
                                                         43.97
    TOTAL RAINFALL
                   (mm) =
                               78.00
                                           78.00
                                                         78.00
    RUNOFF COEFFICIENT =
                               0.99
                                           0.34
                                                         0.56
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN^* = 59.0 Ia = Dep. Storage (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0041)|
 1 + 2 = 3
                           AREA
                                  QPEAK
                                           TPFAK
                                                    R. V.
                                  (cms)
                                           (hrs)
-----
                           (ha)
                                                    (mm)
      ID1= 1 ( 0033):
                           0.41
                                 0.037
                                           6.33
                                                  30.23
     + ID2= 2 ( 0036):
                           5.32
                                 0.447
                                           6.33
                                                43.97
       _____
       ID = 3 (0041):
                           5. 73 0. 484
                                           6.33
                                                42.99
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0041)|
 3 + 2 = 1
                           AREA
                                  QPEAK
                                           TPEAK
                                                    R. V.
                           (ha)
                                  (cms)
                                           (hrs)
                                                    (mm)
```

0.484

7. 78 0. 647

0.163

5.73

2.05

42.99

28.52

39. 18

6.33

6.33

6.33

ID1= 3 (0041):

+ ID2= 2 (0037):

ID = 1 (0041):

```
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
| ADD HYD ( 0041)|
              AREA QPEAK
1 + 2 = 3
                     TPEAK R. V.
              (ha) (cms)
-----
                     (hrs)
                         (mm)
  ID1= 1 ( 0041):
             7. 78 0. 647
                      6. 33 39. 18
  + ID2= 2 ( 0040): 3.43 0.481
                      6. 25 43. 97
   ______
   ID = 3 ( 0041): 11.21 1.051 6.25 40.64
  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
_____
CALIB
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- U. H. Tp(hrs)= 0.19

	TRANSFORMED HYETOGRAPH									
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN			
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr			
0.083	0.00	3.167	2.34	6. 250	102. 96	9. 33	2.73			
0. 167						9.42	2.73			
0. 250	0.00	3.333	3. 12	6. 417	14.04	9.50	2.73			
0.333	1. 95	3.417	3. 12	6. 500	14.04	9. 58	2.73			
0.417	1. 95	3.500	3. 12	6. 583	14.04	9. 67	2.73			
0.500	1. 95	3.583	3. 12	6. 667	14.04	9. 75	2.73			
0.583	1. 95	3.667	3. 12	6. 750	14.04	9.83	2.73			
0.667	1. 95	3.750	3. 12	6. 833	6. 24	9. 92	2.73			
0.750	1. 95	3.833	3. 12	6. 917	6. 24	10.00	2.73			
0.833	1. 95	3.917	3. 12	7.000	6. 24	10.08	2.73			
0. 917	1. 95	4.000	3. 12	7. 083	6. 24	10. 17	2.73			
1.000	1. 95	4.083	3. 12	7. 167	6. 24	10. 25	2.73			
1.083	1. 95	4.167	3. 12	7. 250	6. 24	10.33	1.56			
1. 167	1. 95	4.250	3. 12	7. 333	4. 68	10.42	1. 56			
1. 250	1. 95	4.333		7. 417	4. 68	10.50				
1. 333	1. 95	4.417	4.68	7. 500	4. 68	10. 58	1. 56			
1. 417				7. 583						
1.500	1. 95	4.583	4. 68	7. 667	4. 68	10. 75	1. 56			
1.583	1. 95	4.667		7. 750	4. 68		1. 56			
1. 667	1. 95			7. 833		10. 92				
1. 750	1. 95	4.833	6. 24	7. 917	4. 68	11.00	1. 56			
1.833	1. 95	4.917	6. 24			11. 08	1. 56			
1. 917	1. 95	5.000	6. 24	8. 083	4. 68	11. 17	1. 56			
2.000		5.083				11. 25				
2.083		5.167				11. 33	1. 56			
2. 167	1. 95	5.250	6. 24	8. 333	2. 73	11. 42	1. 56			

```
2. 333 2. 34 | 5. 417
                             9. 36 | 8. 500
                                         2. 73 | 11. 58 1. 56
           2.417
                  2.34 | 5.500
                              9. 36 | 8. 583
                                          2. 73 | 11. 67
           2.500
                  2.34 | 5.583
                              9. 36 | 8. 667
                                          2. 73 | 11. 75
                             9. 36 | 8. 750
           2.583
                  2.34 | 5.667
                                          2. 73 | 11. 83
                  2.667
                                          2. 73 | 11. 92
                 2. 34 | 5. 833 | 37. 44 | 8. 917
           2.750
                                          2. 73 | 12. 00
           2.833
                 2. 34 | 5. 917 37. 44 | 9. 000
                                         2. 73 | 12. 08
                                                      1.56
           1.56
           3.000 2.34 | 6.083 102.96 | 9.167
                                         2. 73 | 12. 25 1. 56
           3. 083 2. 34 | 6. 167 102. 96 | 9. 250
                                         2.73
   Unit Hyd Qpeak (cms) = 0.167
   PEAK FLOW
               (cms) = 0.077 (i)
   TIME TO PEAK (hrs)= 6.333 RUNOFF VOLUME (mm)= 30.217
   TOTAL RAINFALL (mm) = 78.000
   RUNOFF COEFFICIENT = 0.387
   (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0032)|
1 + 2 = 3
                     AREA QPEAK TPEAK
                     (ha) (cms)
                                  (hrs)
                                         (mm)
-----
    ID1= 1 ( 0039):
                   0. 83 0. 077
                                  6. 33 30. 22
   + ID2= 2 ( 0041): 11.21 1.051
                                  6. 25 40. 64
     _____
     ID = 3 ( 0032): 12.04 1.123 6.25 39.92
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
*********
** SIMULATION: 2-02yr 12hr 15min SCS **
**********
 NASHYD (0033) Area (ha)= 0.41 Curve Number (CN)= 75.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00
----- U. H. Tp(hrs) = 0.20
      NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----RAIN | TIME RAIN |' TIME RAIN | TIME

mm/hr ' hrs mm/hr hrs

1. 30 | 6. 250 57. 02 | 9. 33

RAIN

mm/hr

1.51

1.51

TIME

0.083

0.167

hrs

mm/hr | hrs

0.00 | 3.167

0.00 | 3.250

```
7. 78 | 9. 50 1. 51
0.333
       1.08 | 3.417
                      1.73 | 6.500
                                     7.78 | 9.58
                                                   1. 51
0.417
       1.08 | 3.500
                      1. 73 | 6. 583
                                            9.67
                                     7.78
                                                   1.51
0.500
       1.08 | 3.583
                      1. 73 | 6. 667
                                            9.75
                                     7. 78
                                                   1. 51
0.583
       1.08 | 3.667
                      1. 73 | 6. 750
                                     7. 78 | 9. 83
                                                   1. 51
       1.08 | 3.750
                      1. 73 | 6. 833
                                            9. 92
0.667
                                     3.46
                                                   1.51
0.750
              3.833
                      1. 73 | 6. 917
                                     3.46
                                            10.00
       1.08
                                                   1.51
                      1. 73 | 7. 000
0.833
       1.08 | 3.917
                                     3.46
                                            10.08
                                                   1. 51
0. 917
       1.08
              4.000
                      1. 73 | 7. 083
                                     3.46
                                            10.17
                                                   1.51
1.000
              4.083
                      1. 73 | 7. 167
                                     3.46
       1.08
                                            10. 25
                                                    1.51
1.083
       1.08
              4.167
                      1. 73 | 7. 250
                                     3.46
                                            10.33
                                                    0.86
1. 167
        1.08
              4.250
                      1. 73 | 7. 333
                                     2.59
                                            10.42
                                                    0.86
1. 250
       1.08 İ
              4.333
                      2.59 İ
                             7. 417
                                      2.59
                                            10.50
                                                    0.86
1.333
       1.08
              4.417
                      2.59
                             7.500
                                     2.59
                                            10.58
                                                    0.86
1.417
       1.08
              4.500
                      2.59
                             7.583
                                     2.59
                                            10.67
                                                    0.86
1.500
        1.08
              4.583
                      2.59
                             7.667
                                            10.75
                                      2.59
                                                    0.86
1.583
              4.667
        1.08
                       2.59
                             7.750
                                     2.59
                                            10.83
                                                    0.86
              4.750
                             7.833
1.667
        1.08
                      2.59
                                      2.59
                                            10.92
                                                    0.86
1.750
              4.833
                             7. 917
        1.08
                       3.46
                                      2.59
                                            11.00
                                                    0.86
1.833
              4.917
                             8.000
        1.08
                       3.46
                                      2.59
                                            11.08
                                                    0.86
1.917
        1.08
              5.000
                       3.46
                             8.083
                                      2.59
                                            11. 17
                                                    0.86
2.000
        1.08
              5.083
                       3.46
                             8. 167
                                      2.59
                                            11. 25
                                                    0.86
2.083
        1.08
              5.167
                       3.46
                             8. 250
                                      2.59
                                            11.33
                                                    0.86
2.167
        1.08
              5.250
                       3.46
                             8. 333
                                      1.51
                                            11.42
                                                    0.86
2.250
        1.08
              5.333
                       5. 18
                             8. 417
                                     1.51
                                            11.50
                                                    0.86
2.333
        1.30
              5.417
                       5. 18
                             8.500
                                     1.51
                                            11.58
                                                    0.86
2.417
        1.30
              5.500
                      5. 18 | 8. 583
                                     1.51
                                            11.67
                                                    0.86
2.500
        1.30 |
              5.583
                       5. 18 | 8. 667
                                     1.51
                                            11. 75
                                                    0.86
2.583
        1.30
              5.667
                       5. 18 | 8. 750
                                     1.51
                                            11.83
                                                    0.86
2.667
        1.30 | 5.750
                      5. 18 | 8. 833
                                            11. 92
                                     1.51
                                                    0.86
2.750
              5.833
                      20. 74 | 8. 917
                                     1.51 | 12.00
       1.30
                                                    0.86
2.833
              5.917
                      20. 74 | 9. 000
                                     1.51 | 12.08
        1.30
                                                    0.86
2.917
        1.30 | 6.000
                      20. 74 | 9. 083
                                     1. 51 | 12. 17
                                                    0.86
                      57. 02 | 9. 167
3.000
       1.30 | 6.083
                                     1.51 | 12.25
                                                    0.86
3.083
       1.30 | 6.167
                      57. 02 | 9. 250
                                     1.51
```

PEAK FLOW (cms) = 0.011 (i) TIME TO PEAK (hrs) = 6.333 RUNOFF VOLUME (mm) = 9.333 TOTAL RAINFALL (mm) = 43.200 RUNOFF COEFFICIENT = 0.216

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORMFI) HYETOGR	APH	_	
TIME	RAI N	I TIME	RAIN	l' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	l' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1. 30	6. 250	57. 02	9.33	1. 51
0. 167	0.00	3.250	1.30	6. 333	7. 78	9.42	1. 51
0. 250	0.00	3.333	1. 73	6. 417	7. 78	9.50	1. 51
0.333	1.08	3.417	1. 73	6. 500	7. 78	9.58	1. 51
0. 417	1.08	3.500	1. 73	6. 583	7. 78	9. 67	1. 51
0.500	1.08	3.583	1.73	6. 667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6. 750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6. 833	3.46	9. 92	1.51
0.750	1.08	3.833	1.73	6. 917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7. 000	3.46	10. 08	1.51
0. 917	1.08	4.000	1. 73	7. 083	3.46	10.17	1. 51
1.000	1.08	4.083	1. 73	7. 167	3.46	10. 25	1. 51
1.083	1.08	4.167	1. 73	7. 250	3.46	10.33	0.86
1. 167	1.08	4.250	1. 73	7. 333	2.59	10.42	0.86
1. 250	1.08	4.333	2.59	7. 417	2.59	10. 50	0.86
1. 333	1.08	4.417	2.59	7. 500	2.59	10. 58	0.86
1. 417	1.08	4.500	2.59	7. 583	2.59	10.67	0.86
1.500	1.08	4.583	2. 59	7. 667	2.59	10. 75	0.86
1.583	1.08	4.667	2. 59	7. 750	2.59	10.83	0.86
1. 667	1.08	4.750	2.59	7. 833	2. 59	10. 92	0.86
1.750	1.08	4.833	3. 46	7. 917	2. 59	11.00	0.86
1.833	1.08	4.917	3. 46	8.000	2. 59	11.08	0.86
1. 917	1.08	5.000	3. 46	8. 083	2. 59	11.17	0.86
2.000	1.08	5.083	3.46	8. 167	2. 59	11. 25	0.86
2.083	1.08	5.167	3.46	8. 250	2. 59	11.33	0.86
2. 167	1.08	5.250	3.46	8. 333	1.51	11.42	0.86
2. 250	1.08	5.333	5. 18	8. 417	1.51	11.50	0.86
2.333	1.30	5.417	5. 18 5. 18	8.500	1.51	11.58	0.86
2. 417 2. 500	1. 30 1. 30	5.500 5.583	5. 18	8. 583 8. 667	1. 51 1. 51	11. 67 11. 75	0. 86 0. 86
2. 583	1.30	5.667	5. 18	8. 750	1. 51	11.73	0. 86
2. 667	1.30	5.750	5. 18	8. 833	1. 51	11. 03	0.86
2.750	1.30	5.833	20. 74	8. 917	1. 51	11. 72	0.86
2. 833	1.30	5.033	20. 74	9.000	1. 51	12.08	0.86
2. 917	1.30	6.000	20. 74	9. 083	1. 51	12.00	0.86
3.000	1.30	6.083	57. 02	9. 167	1. 51	12. 17	0.86
3. 083	1.30	6. 167	57.02	9. 250	1. 51	.2.20	0.00

Unit Hyd Opeak (cms) = 0.356

PEAK FLOW (cms)= 0.046 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 8.657
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.200

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Mannings n

CALIB STANDHYD (0036) Area (ha)= 5.32 Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 | ID= 1 DT= 5.0 min | IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 2. 66 2.66 Dep. Storage (mm) = 1.00 5.00 Average Slope (%)= 1.00 1.00 Length (m) = 188.33 40.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

0.130

		TRA	ANSFORME) HYETOGR	APH		
TIME	RAI N			' TIME			
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.30	6. 250	57.02	9. 33	1.51
0. 167	0.00	3.250	1.30	6. 333	7.78	9.42	1.51
0.250	0.00	3.333	1. 73	6. 417	7.78	9.50	1.51
0.333	1.08	3.417	1. 73	6. 500	7.78	9. 58	1. 51
0.417	1.08	3.500	1. 73	6. 583	7. 78	9. 67	1. 51
0.500	1.08	3.583	1. 73	6. 667		9. 75	
0.583	1.08	3.667	1. 73	6. 750	- 1	9.83	
0.667	1.08	3.750	1. 73	6. 833	3.46	9. 92	1. 51
0.750		3.833	1. 73	6. 917	3.46	10.00	1. 51
0.833	1.08	3.917	1. 73	7.000	3.46		1. 51
0. 917	1.08	4.000	1. 73	7. 083		10. 17	
1.000	1.08		1. 73	7. 167		10. 25	1. 51
1. 083		4.167	1. 73	7. 250	3.46	10. 33	0.86
1. 167		4.250	1. 73	7. 333	2.59	10. 42	0.86
1. 250	1.08	4.333	2. 59	7. 417	2.59	10.50	0.86
1. 333	1.08		2. 59	7.500		10. 58	
1. 417		4.500	2. 59	7. 583		10.67	
1.500		4.583	2. 59	7. 667	2.59	10. 75	
1. 583		4.667	2. 59	7. 750	2.59	10.83	0.86
1. 667	1.08	4.750	2.59	7. 833	2.59	10. 92	0.86
1. 750	1.08		3.46	7. 917	2.59	11.00	0.86
1.833	1.08		3. 46	8.000	2.59	11. 08	0.86
1. 917	1.08	5.000	3. 46	8. 083	2.59	11. 17	0. 86
2.000	1.08	5.083	3. 46	8. 167	2.59	11. 25	0.86
2.083	1.08	5.167	3. 46	8. 250		11. 33	
2. 167	1.08	5.250	3. 46			11. 42	
2. 250	1.08	5.333		8. 417		11. 50	
2. 333		5.417		8. 500		11. 58	0. 86
2. 417	1.30	5.500	5. 18	8. 583		11. 67	0. 86
2.500	1.30	5.583	5. 18	8. 667	1.51	11. 75	0.86

0.250

2.583 1.3 2.667 1.3 2.750 1.3 2.833 1.3 2.917 1.3 3.000 1.3 3.083 1.3	0 5.750 0 5.833 0 5.917 0 6.000 0 6.083	5.18 8.750 5.18 8.833 20.74 8.917 20.74 9.000 20.74 9.083 57.02 9.167 57.02 9.250	1. 51 11. 83 1. 51 11. 92 1. 51 12. 00 1. 51 12. 08 1. 51 12. 17 1. 51 12. 25 1. 51	0. 86 0. 86 0. 86 0. 86 0. 86
Max. Eff. Inten. (mm/hr)=	47. 95	13.86		
over (min)	20.00	40.00		
Storage Coeff. (min)=	19. 95	(ii) 39.10 (ii)		
Unit Hyd. Tpeak (min)=	20.00	40.00		
Unit Hyd. peak (cms)=	0.06	0.03		
3. ()			*TOTALS*	
PEAK FLOW (cms)=	0. 16	0.04	0.184 (ii	i)
TIME TO PEAK (hrs)=	6. 42	6.83	6.42	
RUNOFF VOLUME (mm)=	42. 20	8.84	20.51	
TOTAL RAINFALL (mm)=	43. 20	43. 20	43. 20	
RUNOFF COEFFICIENT =	0. 98	0. 20	0. 47	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
- THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	,	Dir.	Conn. (%)=	35. 00
Surface Area	(ha)=	I MPERVI	PERVI 0	,	

Surface Area	(ha)=	1. 71	1. 71
Dep. Storage	(mm) =	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151. 22	40.00
Mannings n	=	0. 013	0. 250

mm/hr

1.08 | 3.583

TIME

0.167

0.250

0.333

0.417

0.500

hrs 0.083

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.00	3.167	1.30	6. 250	57.02	9. 33	1.51
0.00	3.250	1.30	6. 333	7.78	9.42	1.51
0.00	3.333	1.73	6. 417	7.78	9.50	1.51
1.08	3.417	1.73	6. 500	7.78	9. 58	1.51
1.08	3.500	1. 73	6. 583	7. 78	9.67	1.51

7. 78 | 9. 75

1.51

---- TRANSFORMED HYETOGRAPH ----

1. 73 | 6. 667

0.583 1.08 0.667 1.08 0.750 1.08 0.833 1.08 1.000 1.08 1.083 1.08 1.167 1.08 1.250 1.08 1.333 1.08 1.417 1.08 1.500 1.08 1.583 1.08 1.750 1.08 1.833 1.08 1.917 1.08 2.000 1.08 2.083 1.08 2.167 1.08 2.250 1.08 2.333 1.30 2.417 1.30 2.500 1.30 2.583 1.30 2.667 1.30 2.750 1.30 2.833 1.30 2.917 1.30 3.000 1.30 3.083 1.30	3. 750	3 6.833 3 6.917 3 7.000 8 7.083 8 7.083 8 7.250 8 7.333 9 7.417 9 7.500 9 7.583 9 7.667 9 7.750 9 7.750 9 7.750 9 7.750 9 7.833 6 8.083 6 8.083 6 8.167 6 8.250 6 8.333 8 8.417 8 8.500 8 8.583 8 8.583 8 8.590 8 8.583 8 8.667 8 8.750 8 8.833 1 8.833 1 8.917 1 9.000 1 9.003 2 9.003	7.78 9.83 1.51 3.46 9.92 1.51 3.46 10.00 1.51 3.46 10.17 1.51 3.46 10.25 1.51 3.46 10.25 1.51 3.46 10.33 0.86 2.59 10.42 0.86 2.59 10.50 0.86 2.59 10.50 0.86 2.59 10.83 0.86 2.59 10.83 0.86 2.59 10.92 0.86 2.59 11.00 0.86 2.59 11.00 0.86 2.59 11.08 0.86 2.59 11.10 0.86 2.59 11.17 0.86 2.59 11.17 0.86 2.59 11.17 0.86 2.59 11.18 0.86 2.59 11.17 0.86 1.51 11.50 0.86 1.51 11.50 0.86 1.51 11.58 0.86 1.51 11.83 0.86 1.51 11.92 0.86 1.51 12.00 0.86 1.51 12.00 0.86
Max. Eff. Inten. (mm/hr) = over (min) Storage Coeff. (min) =	57. 02 5. 00 4. 10 (ii)	17.16 20.00 18.38 (ii)	
Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)=	5. 00 0. 24	20. 00 0. 06	#T0T11.0#
PEAK FLOW (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT =	0. 19 6. 25 42. 20 43. 20 0. 98	0. 04 6. 42 8. 84 43. 20 0. 20	*TOTALS* 0. 215 (iii) 6. 25 20. 52 43. 20 0. 47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (004 1 + 2 = 3	ĺ	AREA	QPEAK (cms)	TPEAK	R. V.	
ID1= 1 (+ ID2= 2 (0033):	0. 41 5. 32	0. 011 0. 184	6. 33 6. 42	9. 33 20. 51	
	0041):					
NOTE: PEAK	FLOWS DO NO	T INCLU	JDE BASEFLO	OWS IF AN	۱Y.	
ADD HYD (004 3 + 2 = 1 ID1= 3 (+ ID2= 2 (0041):	(ha) 5. 73 2. 05	QPEAK (cms) 0.193 0.046	(hrs) 6.42 6.33	(mm) 19.71 8.66	
	0041):					
NOTE: PEAK	FLOWS DO NO	T INCLU	JDE BASEFLO	OWS IF AN	۱Y.	
ADD HYD (004 1 + 2 = 3 ID1= 1 (+ ID2= 2 (0041):	(ha) 7. 78 3. 43	QPEAK (cms) 0.237 0.215	(hrs) 6.42 6.25	(mm) 16.80 20.52	
	0041):					
NOTE: PEAK	FLOWS DO NO	T INCLU	JDE BASEFLO	OWS IF AN	۱Y.	
CALIB NASHYD (003 ID= 1 DT= 5.0 mi	n la	(mm))= 0.83)= 10.00)= 0.19	Curve N # of Li	Number near Res	(CN)= 75.0 c. (N)= 3.00

		TR/	ANSFORME	D HYETOGR	APH		
TIME	RAI N	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.30	6. 250	57.02	9. 33	1.51
0. 167	0.00	3.250	1.30	6. 333	7. 78	9.42	1. 51
0.250	0.00	3.333	1. 73	6. 417	7. 78	9.50	1. 51

```
0.333 1.08 | 3.417
                                1. 73 | 6. 500
                                                7.78 | 9.58
                                                               1. 51
          0.417
                 1.08 | 3.500
                                 1.73 | 6.583
                                                 7.78
                                                        9.67
                                                               1. 51
          0.500
                 1.08 | 3.583
                                 1.73 | 6.667
                                                 7.78
                                                        9.75
                                                               1.51
          0.583
                                 1. 73 | 6. 750
                                                 7.78
                                                        9.83
                  1.08 | 3.667
                                                               1. 51
          0.667
                 1.08 | 3.750
                                 1. 73 | 6. 833
                                                 3.46
                                                        9. 92
                                                               1.51
          0.750
                 1.08 | 3.833
                                 1. 73 | 6. 917
                                                 3.46
                                                       10.00
                                                               1.51
          0.833
                 1.08
                         3.917
                                 1.73 | 7.000
                                                 3.46
                                                        10.08
                                                               1.51
          0.917
                 1.08
                         4.000
                                 1. 73 | 7. 083
                                                 3.46
                                                        10.17
                                                               1. 51
          1.000
                 1.08
                         4.083
                                 1. 73 | 7. 167
                                                 3.46
                                                        10. 25
                                                                1.51
          1.083
                  1.08
                         4.167
                                 1.73
                                        7. 250
                                                 3.46
                                                        10.33
                                                                0.86
          1.167
                  1.08
                         4.250
                                 1.73
                                        7.333
                                                 2.59
                                                        10.42
                                                                0.86
          1.250
                  1.08
                         4.333
                                 2.59
                                        7. 417
                                                 2.59
                                                        10.50
                                                                0.86
          1.333
                  1.08
                         4.417
                                 2.59
                                        7.500
                                                 2.59
                                                        10.58
                                                                0.86
                         4.500
                                        7. 583
          1.417
                  1.08
                                 2.59
                                                 2.59
                                                        10.67
                                                                0.86
          1.500
                  1.08
                         4.583
                                 2.59
                                        7.667
                                                 2.59
                                                        10.75
                                                                0.86
          1.583
                         4.667
                                        7.750
                  1.08
                                 2.59
                                                 2.59
                                                        10.83
                                                                0.86
          1.667
                  1.08
                         4.750
                                 2.59
                                        7.833
                                                 2.59
                                                        10.92
                                                                0.86
          1.750
                  1.08
                         4.833
                                 3.46
                                        7. 917
                                                 2.59
                                                        11.00
                                                                0.86
          1.833
                  1.08
                         4.917
                                 3.46
                                        8.000
                                                 2.59
                                                        11.08
                                                                0.86
          1.917
                  1.08
                         5.000
                                 3.46
                                        8.083
                                                 2.59
                                                        11.17
                                                                0.86
          2.000
                  1.08
                         5.083
                                 3.46
                                        8. 167
                                                 2.59
                                                        11. 25
                                                                0.86
          2.083
                  1.08
                         5.167
                                 3.46
                                        8. 250
                                                 2.59
                                                        11.33
                                                                0.86
          2.167
                  1.08
                         5.250
                                 3.46
                                        8. 333
                                                 1.51
                                                        11.42
                                                                0.86
          2.250
                  1.08
                         5.333
                                 5. 18
                                        8. 417
                                                 1.51
                                                        11.50
                                                                0.86
          2.333
                         5.417
                                        8.500
                  1.30
                                 5. 18
                                                 1.51
                                                       11. 58
                                                                0.86
          2.417
                         5.500
                                        8.583
                                                       11.67
                  1.30
                                 5. 18
                                                 1.51
                                                                0.86
          2.500
                  1.30
                         5.583
                                 5. 18
                                        8.667
                                                 1. 51
                                                       11.75
                                                                0.86
          2.583
                  1.30
                         5.667
                                 5. 18 | 8. 750
                                                 1.51
                                                       11.83
                                                                0.86
          2.667
                         5.750
                                 5. 18 | 8. 833
                                                       11. 92
                  1.30
                                                 1.51
                                                                0.86
          2.750
                         5.833
                                 20. 74 | 8. 917
                                                 1.51 | 12.00
                  1.30
                                                                0.86
          2.833
                         5.917
                                 20.74 | 9.000
                                                 1.51 | 12.08
                  1.30
                                                                0.86
                                 20. 74 | 9. 083
          2.917
                         6.000
                                                 1.51 | 12.17
                  1.30
                                                                0.86
                                 57. 02 | 9. 167
          3.000
                  1.30
                        6.083
                                                 1.51 | 12.25
                                                                0.86
          3.083
                 1.30 | 6.167
                                 57. 02 | 9. 250
                                                 1.51
Unit Hyd Qpeak (cms) = 0.167
               (cms) = 0.022 (i)
              (hrs) = 6.333
               (mm) = 9.330
```

PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL (mm) = 43.200 RUNOFF COEFFICIENT = 0.216

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| ADD HYD ( 0032)|
                       AREA
 1 + 2 = 3
                             QPEAK
                                     TPEAK
                                             R. V.
-----
                       (ha)
                              (cms)
                                     (hrs)
                                             (mm)
     ID1= 1 ( 0039):
                       0.83 0.022
                                     6.33
                                            9.33
```

```
+ ID2= 2 ( 0041): 11.21 0.400 6.25 17.94
 ID = 3 ( 0032): 12.04 0.420
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION: 2-050yr 12hr 15min SCS ** ************

CALIB NASHYD (0033) Area (ha)= 0.41 Curve Number (CN)= 75.0 |ID= 1 DT= 5.0 min | Ia (mm) = 10.00# of Linear Res. (N) = 3.00 ----- U. H. Tp(hrs)= 0.20

 TRANSFORMED	HYFTOGRAPH	_

		TR/	ANSFORMED) HYETOG	RAPH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2. 59	6. 250	114.05	9. 33	3.02
0. 167	0.00	3.250	2.59	6. 333	15. 55	9.42	3.02
0. 250	0.00	3.333	3.46	6. 417	15. 55	9.50	3.02
0.333	2.16	3.417	3. 46	6. 500	15. 55	9. 58	3. 02
0.417	2.16	3.500	3.46	6. 583	15. 55	9. 67	3.02
0.500	2.16	3.583	3.46	6. 667	15. 55	9. 75	3.02
0.583	2.16	3.667	3.46	6. 750	15.55	9.83	3.02
0.667	2.16	3.750	3. 46	6. 833	6. 91	9. 92	3. 02
0.750	2.16	3.833	3.46	6. 917	6. 91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6. 91	10.08	3.02
0. 917	2.16	4.000	3. 46	7. 083	6. 91	10. 17	3. 02
1.000	2.16	4.083	3.46	7. 167	6. 91	10. 25	3.02
1.083	2.16	4.167	3. 46	7. 250	6. 91	10.33	1.73
1. 167	2.16	4.250	3.46	7. 333	5. 18	10.42	1.73
1. 250	2.16	4.333	5. 18	7. 417	5. 18	10.50	1.73
1.333	2.16	4.417	5. 18	7. 500	5. 18	10. 58	1.73
1. 417	2.16	4.500	5. 18	7. 583	5. 18	10.67	1.73
1.500	2.16	4.583	5. 18	7. 667	5. 18	10. 75	1.73
1. 583	2.16	4.667	5. 18	7. 750	5. 18	10.83	1. 73
1. 667	2.16	4.750	5. 18	7. 833	5. 18		1.73
1. 750	2.16	4.833	6. 91	7. 917	5. 18	11.00	1.73
1.833	2.16	4.917	6. 91	8. 000	5. 18	11. 08	1.73
1. 917	2.16	5.000	6. 91	8. 083	5. 18	11. 17	1.73
2.000	2.16	5.083	6. 91	8. 167	5. 18	11. 25	1.73
2.083	2.16	5.167	6. 91	8. 250	5. 18	11. 33	1.73
2. 167	2.16	5.250	6. 91	8. 333	3. 02	11. 42	1. 73
2. 250	2.16	5.333	10. 37	8. 417	3.02	11.50	1.73
2. 333	2.59	5.417	10. 37	8. 500	3. 02	11. 58	1. 73
2.417	2.59	5.500	10. 37	8. 583	3.02	11. 67	1.73
2.500	2.59	5.583	10. 37	8. 667	3.02	11. 75	1.73
2.583	2.59	5.667	10. 37	8. 750	3.02	11.83	1. 73

```
      2. 667
      2. 59 | 5. 750
      10. 37 | 8. 833
      3. 02 | 11. 92
      1. 73

      2. 750
      2. 59 | 5. 833
      41. 47 | 8. 917
      3. 02 | 12. 00
      1. 73

      2. 833
      2. 59 | 5. 917
      41. 47 | 9. 000
      3. 02 | 12. 08
      1. 73

      2. 917
      2. 59 | 6. 000
      41. 47 | 9. 083
      3. 02 | 12. 17
      1. 73

      3. 000
      2. 59 | 6. 083
      114. 05 | 9. 167
      3. 02 | 12. 25
      1. 73

      3. 083
      2. 59 | 6. 167
      114. 05 | 9. 250
      3. 02 |
```

PEAK FLOW (cms) = 0.044 (i) TIME TO PEAK (hrs) = 6.333 RUNOFF VOLUME (mm) = 36.170 TOTAL RAINFALL (mm) = 86.400 RUNOFF COEFFICIENT = 0.419

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME) HYETOGI	RAPH	-	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.59	6. 250	114.05	9. 33	3.02
0. 167	0.00	3.250	2.59	6. 333	15. 55	9.42	3.02
0. 250	0.00	3.333	3.46	6. 417	15. 55	9.50	3.02
0.333	2.16	3.417	3.46	6. 500	15. 55	9. 58	3. 02
0.417	2.16	3.500	3.46	6. 583	15. 55	9.67	3. 02
0.500	2.16	3.583	3. 46	6. 667	15. 55	9. 75	3. 02
0. 583	2.16	3.667	3. 46	6. 750	15. 55	9.83	3. 02
0. 667	2.16	3.750	3. 46	6. 833	6. 91	9. 92	3. 02
0.750	2.16	3.833	3. 46	6. 917	6. 91	10.00	3. 02
0.833	2.16	3.917	3. 46	7.000	6. 91	10. 08	3. 02
0. 917	2.16	4.000	3. 46	7. 083	6. 91	10. 17	3. 02
1.000	2.16	4.083	3.46	7. 167	6. 91	10. 25	3. 02
1.083	2.16	4.167	3. 46	7. 250	6. 91	10. 33	1. 73
1. 167	2.16	4.250	3. 46	7. 333	5. 18	10. 42	1. 73
1. 250	2.16	4.333	5. 18	7. 417	5. 18	10. 50	1. 73
1. 333	2.16	4.417	5. 18	7. 500	5. 18	10. 58	1. 73
1. 417	2.16	4.500	5. 18	7. 583	5. 18	10. 67	1. 73
1.500	2.16	4.583	5. 18	7. 667	5. 18	10. 75	1. 73
1. 583	2.16	4.667	5. 18	7. 750	5. 18	10. 83	1. 73
1. 667	2.16	4.750	5. 18	7. 833	5. 18	10. 92	1. 73
1. 750	2.16	4.833	6. 91	7. 917	5. 18	11.00	1. 73
1.833	2.16	4.917	6. 91	8. 000	5. 18	11. 08	1. 73

```
1. 917 2. 16 | 5. 000 6. 91 | 8. 083 5. 18 | 11. 17 1. 73
2.000 2.16 | 5.083 6.91 | 8.167 5.18 | 11.25 1.73
2.083 2.16 | 5.167 6.91 | 8.250 5.18 | 11.33 1.73
2. 250 2. 16 | 5. 333 10. 37 | 8. 417 3. 02 | 11. 50 1. 73
2. 333 2. 59 | 5. 417 10. 37 | 8. 500 3. 02 | 11. 58 1. 73
2. 417 2. 59 | 5. 500 10. 37 | 8. 583
                                  3. 02 | 11. 67
2.500 2.59 | 5.583 10.37 | 8.667
                                  3. 02 | 11. 75
                                             1.73
2.583 2.59 | 5.667 10.37 | 8.750
                                  3.02 | 11.83
                                              1.73
       2.59 | 5.750 | 10.37 | 8.833
                                 3. 02 | 11. 92
2.667
                                               1.73
2.750
      2.59 | 5.833 | 41.47 | 8.917
                                  3. 02 | 12. 00
                                              1.73
2.833 2.59 | 5.917 41.47 | 9.000 3.02 | 12.08
                                               1.73
2.917 2.59 | 6.000 41.47 | 9.083 3.02 | 12.17
                                               1.73
                                 3. 02 | 12. 25 1. 73
3.000 2.59 6.083 114.05 9.167
3. 083 2. 59 | 6. 167 114. 05 | 9. 250 3. 02 |
```

Unit Hyd Qpeak (cms)= 0.356

PEAK FLOW (cms) = 0.197 (i)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 34.220
TOTAL RAINFALL (mm) = 86.400
RUNOFF COEFFICIENT = 0.396

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

		I MPERVI OUS	PERVIOUS (i)
Surface Area	(ha)=	2. 66	2.66
Dep. Storage	(mm) =	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m) =	188. 33	40.00
Mannings n	=	0. 130	0. 250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		IRA	NSFORMED) HYETOGH	RAPH	-	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.59	6. 250	114.05	9.33	3.02
0. 167	0.00	3.250	2.59	6. 333	15. 55	9.42	3.02
0.250	0.00	3.333	3.46	6. 417	15. 55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15. 55	9. 58	3.02
0.417	2.16	3.500	3.46	6. 583	15. 55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15. 55	9.75	3.02
0.583	2.16	3.667	3.46	6. 750	15. 55	9.83	3. 02

___...

0. 667 0. 750 0. 833 0. 917 1. 000 1. 083 1. 167 1. 250 1. 333 1. 417 1. 500 1. 583 1. 667 1. 750 1. 833 1. 917 2. 000 2. 083 2. 167 2. 250 2. 333 2. 417 2. 500 2. 583 2. 667 2. 750	2. 16 2. 15 2. 16 2. 5 9 2. 5 2. 5 2. 5 2. 5 2. 5 2. 5 2. 5 2. 5	3.750 3.833 3.917 4.000 4.083 4.167 4.250 4.333 4.417 4.500 4.583 4.667 4.750 4.833 4.917 5.000 5.083 5.167 5.250 5.333 5.417 5.500 5.583 5.583	3. 46 3. 46 3. 46 3. 46 3. 46 3. 46 5. 18 5. 18 5. 18 5. 18 6. 91 6. 91 6. 91 6. 91 10. 37 10. 37 10. 37 10. 37 10. 37 10. 37	6.833 6.917 7.000 7.083 7.167 7.250 7.333 7.417 7.500 7.583 7.667 7.750 7.833 7.917 8.000 8.083 8.167 8.250 8.333 8.417 8.500 8.583 8.667 8.750 8.833 8.833 8.833 8.917	6. 91 6. 91 6. 91 6. 91 6. 91 5. 18 5. 18 5. 18 5. 18 5. 18 5. 18 5. 18 5. 18 5. 18 5. 18 5. 18 3. 02 3. 02 3. 02 3. 02 3. 02 3. 02 3. 02	9. 92 10. 00 10. 08 10. 17 10. 25 10. 33 10. 42 10. 50 10. 58 10. 67 10. 83 10. 92 11. 00 11. 08 11. 17 11. 25 11. 33 11. 42 11. 50 11. 58 11. 67 11. 75 11. 75 11. 75 11. 75	3. 02 3. 02 3. 02 3. 02 1. 73
2. 833	2.59	5. 917	41.47	9.000	3. 02	12.00	1. 73
2. 917	2.59	6.000	41. 47	9. 083	3. 02	12.00	1. 73
3. 000	2.59	6.083	114. 05	9. 167	3. 02	12.17	1. 73
3. 083	2.59	6. 167	114. 05	9. 250	3. 02	.2.20	70
Max. Eff. Inten. (mm/l	hr)=	114. 05		61. 59			

Max. Eff. Inten. (r	nm/nr)=	114.05	61.59	
over	(mi n)	15.00	25.00	
Storage Coeff.	(mi n)=	14.11 (ii)	24.66 (ii)	
Unit Hyd. Tpeak	(mi n)=	15.00	25.00	
Unit Hyd. peak	(cms)=	0.08	0.05	
				TOTALS
PEAK FLOW	(cms)=	0.39	0. 20	0.542 (iii)
TIME TO PEAK	(hrs)=	6.33	6.50	6.42
RUNOFF VOLUME	(mm) =	85.40	31. 21	50. 18
TOTAL RAINFALL	(mm) =	86.40	86.40	86. 40
RUNOFF COEFFICIE	ENT =	0. 99	0.36	0.58

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) Area (ha)= 3.43 | ID= 1 DT= 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 IMPERVIOUS PERVIOUS (i) 1.71 Surface Area (ha)= 1. 71 Dep. Storage (mm) = 1.00 5.00 Average Slope (%)= 1.00 2.00 Length (m) = 151. 22 40.00 Mannings n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRANS	FORMED	HYETO(SRAPH
RAI N	TIN	1E	RAIN	' TIME	RAIN
/1	j 1		/I İ	1 1	/

		IRA	ANSFURME) HYETUG	KAPH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.59	6. 250	114.05	9.33	3.02
0. 167	0.00	3.250	2.59	6. 333	15. 55	9.42	3.02
0.250	0.00	3.333	3.46	6. 417	15. 55	9.50	3.02
0.333	2.16	3.417	3.46	6. 500	15. 55	9. 58	3.02
0.417	2.16	3.500	3.46	6. 583	15. 55	9.67	3.02
0.500	2.16	3.583	3.46	6. 667	15. 55	9. 75	3.02
0.583	2.16	3.667	3.46	6. 750	15. 55	9.83	3.02
0.667	2.16	3.750	3.46	6. 833	6. 91	9. 92	3.02
0.750	2.16	3.833	3.46	6. 917	6. 91	10.00	3.02
0.833	2.16	3.917	3.46	7. 000	6. 91	10.08	3.02
0. 917	2.16	4.000	3.46	7. 083	6. 91	10.17	3.02
1.000	2.16	4.083	3.46	7. 167	6. 91	10. 25	3.02
1.083	2.16	4.167	3.46	7. 250	6. 91	10.33	1.73
1. 167	2.16	4.250	3.46	7. 333	5. 18	10.42	1.73
1. 250	2.16	4.333	5. 18	7. 417	5. 18	10.50	1.73
1.333	2.16	4.417	5. 18	7. 500	5. 18	10.58	1.73
1. 417	2.16	4.500	5. 18	7. 583	5. 18	10.67	1.73
1.500	2.16	4.583	5. 18	7. 667	5. 18	10.75	1.73
1.583	2.16	4.667	5. 18	7. 750	5. 18	10.83	1.73
1.667	2.16	4.750	5. 18	7.833	5. 18	10. 92	1.73
1.750	2.16	4.833	6. 91	7. 917	5. 18	11.00	1.73
1.833	2.16	4.917	6. 91	8.000	5. 18	11.08	1.73
1. 917	2.16	5.000	6. 91	8. 083	5. 18	11. 17	1.73
2.000	2.16	5.083	6. 91	8. 167	5. 18	11. 25	1.73
2.083	2.16	5.167	6. 91	8. 250	5. 18	11.33	1.73
2. 167	2.16	5.250	6. 91	8. 333	3. 02	11.42	1.73
2. 250	2.16	5.333	10. 37	8. 417	3. 02	11.50	1. 73
2.333	2.59	5.417	10.37	8. 500	3. 02	11.58	1.73
2.417	2.59	5.500	10.37	8. 583	3. 02	11.67	1.73
2.500	2.59	5.583	10.37	8. 667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8. 750	3.02	11.83	1.73
2.667	2.59	5.750	10. 37	8. 833	3. 02	11. 92	1. 73
2.750	2.59	5.833	41.47	8. 917	3. 02	12.00	1.73
2.833	2.59	5.917	41. 47	9. 000	3. 02		1.73
2. 917	2.59	6.000	41. 47	9. 083	3. 02	12. 17	1.73

```
3.000 2.59 | 6.083 114.05 | 9.167 3.02 | 12.25 1.73
             3. 083 2. 59 | 6. 167 114. 05 | 9. 250
                                               3.02
    Max. Eff. Inten. (mm/hr)=
                           114.05
                                       66.34
                            5.00
             over (min)
                                       15.00
    Storage Coeff. (min)=
                             3.11 (ii) 11.42 (ii)
    Unit Hyd. Tpeak (min)=
                             5.00
                                       15.00
    Unit Hyd. peak (cms)=
                             0.27
                                        0.09
                                                   *TOTALS*
    PEAK FLOW
                 (cms)=
                             0.38
                                        0.20
                                                    0.551 (iii)
    TIME TO PEAK
                 (hrs)=
                             6. 25
                                        6.33
                                                     6.25
    RUNOFF VOLUME
                 (mm) =
                            85.40
                                       31.21
                                                    50.18
    TOTAL RAINFALL (mm)=
                            86.40
                                       86.40
                                                    86.40
    RUNOFF COEFFICIENT =
                                                     0.58
                             0.99
                                        0.36
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN^* = 59.0 Ia = Dep. Storage (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
______
ADD HYD ( 0041)|
 1 + 2 = 3
                        AREA
                               QPEAK
                                       TPEAK
                                                R. V.
                         (ha)
                               (cms)
                                       (hrs)
                                                (mm)
     ID1= 1 ( 0033):
                        0.41 0.044
                                       6.33
                                              36.17
    + ID2= 2 ( 0036):
                        5. 32 0. 542
                                       6. 42
                                              50.18
      ______
                                      ------
      ID = 3 (0041):
                                       6. 33 49. 17
                        5. 73 0. 582
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0041)|
 3 + 2 = 1
                        AREA
                               QPEAK
                                       TPEAK
                                                R. V.
                         (ha)
                               (cms)
                                       (hrs)
                                                (mm)
     ID1= 3 ( 0041):
                        5. 73
                              0.582
                                              49.17
                                       6.33
    + ID2= 2 ( 0037):
                              0.197
                                              34.22
      ID = 1 (0041):
                        7. 78 0. 780
                                             45.23
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0041)|
                        AREA
 1 + 2 = 3
                              QPEAK
                                      TPEAK
                                                R. V.
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

		TR/	ANSFORME) HYETOGE	RAPH	_	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.59	6. 250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6. 333	15. 55	9.42	3.02
0.250	0.00	3.333	3.46	6. 417	15. 55	9.50	3.02
0.333	2.16	3.417	3.46	6. 500	15. 55	9. 58	3.02
0.417	2.16	3.500	3.46	6. 583	15. 55	9.67	3.02
0.500	2.16	3.583	3.46	6. 667	15. 55	9.75	3.02
0.583	2.16	3.667	3.46	6. 750	15. 55	9.83	3. 02
0.667	2.16	3.750	3.46	6. 833	6. 91	9. 92	3. 02
0.750	2.16	3.833	3.46	6. 917	6. 91	10. 00	3. 02
0.833	2.16	3.917	3.46	7.000	6. 91	10. 08	3. 02
0. 917	2.16	4.000	3.46	7. 083	6. 91	10. 17	3. 02
1.000	2.16	4.083	3.46	7. 167	6. 91	10. 25	3. 02
1.083	2.16	4.167	3.46	7. 250	6. 91	10.33	1. 73
1. 167	2.16	4.250	3.46	7. 333	5. 18	10. 42	1. 73
1. 250	2.16	4.333	5. 18	7. 417	5. 18	10.50	1. 73
1. 333	2.16	4.417	5. 18	7. 500	5. 18	10.58	1. 73
1. 417	2.16	4.500	5. 18	7. 583	5. 18	10.67	1. 73
1.500	2.16	4.583	5. 18	7. 667	5. 18	10.75	1. 73
1. 583	2.16		5. 18	7. 750	5. 18	10.83	1. 73
1. 667	2. 16	4.750	5. 18	7. 833	5. 18	10. 92	1. 73
1. 750	2.16	4.833	6. 91	7. 917	5. 18	11.00	1. 73
1.833	2.16	4.917	6. 91	8.000	5. 18	11.08	1. 73
1. 917	2.16	5.000	6. 91	8. 083	5. 18	11.17	1. 73
2.000	2.16	5.083	6. 91	8. 167	5. 18	11. 25	1. 73
2.083	2.16	5.167	6. 91	8. 250	5. 18	11.33	1. 73
2. 167	2.16	5.250	6. 91	8. 333	3. 02	11.42	1. 73
2. 250	2. 16	5.333	10. 37	8. 417	3. 02	11.50	1. 73
2. 333	2.59	5.417	10. 37	8.500	3. 02	11.58	1. 73
2. 417	2.59	5.500	10. 37	8. 583	3. 02	11. 67	1. 73
2.500	2.59	5.583	10. 37	8.667	3. 02	11. 75	1. 73
2.583	2.59	5.667	10. 37	8. 750	3. 02	11.83	1. 73
2. 667	2.59	5.750	10. 37	8.833	3. 02	11. 92	1. 73

```
2.750 2.59 | 5.833 41.47 | 8.917
                                                3. 02 | 12. 00 1. 73
                 2.59 | 5.917 | 41.47 | 9.000
                                                 3.02 | 12.08
          2.833
                                                                1. 73
          2.917
                 2.59 | 6.000 | 41.47 | 9.083
                                                 3. 02 | 12. 17
                                                                 1.73
          3.000
                 2. 59 | 6. 083 | 114. 05 | 9. 167
                                                 3. 02 | 12. 25
                                                                1.73
          3.083
                 2. 59 | 6. 167 | 114. 05 | 9. 250
                                                 3.02
Unit Hyd Qpeak (cms) = 0.167
PEAK FLOW
               (cms) = 0.092 (i)
TIME TO PEAK
              (hrs) = 6.333
RUNOFF VOLUME
               (mm) = 36.155
TOTAL RAINFALL (mm) = 86.400
RUNOFF COEFFICIENT = 0.418
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
ADD HYD ( 0032)|
1 + 2 = 3
                  AREA QPEAK
                              TPEAK
                                    R. V.
-----
                  (ha)
                       (cms)
                              (hrs)
                                    (mm)
   ID1= 1 ( 0039):
                  0. 83 0. 092
                              6.33
                                  36.15
   + ID2= 2 ( 0041): 11.21 1.237
                              6. 25 46. 75
    _____
    ID = 3 (0032): 12.04 1.324
                            6. 25 46. 02
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION: 2-05yr 12hr 15min SCS ** **********

CALLB NASHYD (0033) | Area (ha)= 0.41 Curve Number (CN)= 75.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00

----- U. H. Tp(hrs) = 0.20

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN I' TIME RAIN | TIME RAIN mm/hr | hrs mm/hr hrs mm/hr | hrs mm/hr hrs 1. 73 | 6. 250 0.083 0.00 | 3.167 76.03 | 9.33 2.02 0.00 | 3.250 1. 73 | 6. 333 2.02 0.167 10.37 I 9.42 0.250 0.00 | 3.333 2. 30 | 6. 417 10.37 I 9.50 2.02 1.44 | 3.417 2. 30 | 6. 500 2.02 0.333 10.37 9. 58 1.44 | 3.500 2. 30 | 6. 583 10.37 0.417 9. 67 2.02 0.500 1.44 | 3.583 2. 30 | 6. 667 10.37 9.75 2.02 2.02 0.583 1.44 | 3.667 2. 30 | 6. 750 10.37 9.83 0.667 1.44 | 3.750 2. 30 | 6. 833 4.61 | 9.92 2.02

4.61 | 10.00 2.02 1.44 | 3.917 2.30 | 7.000 4.61 | 10.08 0.833 2.02 0.917 1.44 | 4.000 2.30 | 7.083 4. 61 | 10. 17 2.02 1.000 1.44 | 4.083 2. 30 | 7. 167 4. 61 | 10. 25 2.02 2. 30 | 7. 250 1.083 1.44 | 4.167 4.61 | 10.33 1.15 2. 30 | 7. 333 1.167 1.44 | 4.250 3. 46 | 10. 42 1 15 1.250 1.44 4.333 3. 46 | 7. 417 3.46 10.50 1. 15 1.333 1.44 | 4.417 3.46 7.500 3. 46 | 10. 58 1. 15 1.417 1.44 4.500 3. 46 | 7. 583 3.46 İ 10.67 1.15 1.500 1.44 4.583 3.46 | 7.667 3.46 10.75 1 15 1.583 1.44 İ 4.667 3.46 | 7.750 3. 46 İ 10.83 1 15 1.667 1.44 İ 4.750 3. 46 | 7. 833 3.46 İ 10.92 1.15 1.750 1.44 4.833 4, 61 | 7, 917 3.46 İ 11.00 1.15 1.833 1.44 İ 4.917 4, 61 | 8, 000 3.46 İ 11.08 1.15 1.917 1.44 5.000 4. 61 | 8. 083 3. 46 İ 11. 17 1.15 4. 61 | 8. 167 2.000 1.44 5.083 3.46 11. 25 1.15 2.083 1.44 5.167 8. 250 3.46 İ 11.33 4.61 1.15 2. 167 1.44 5.250 4.61 | 8.333 2.02 11.42 1. 15 2.250 1.44 5.333 6. 91 | 8. 417 2.02 11.50 1.15 2.333 1.73 5.417 6. 91 8.500 2.02 11.58 1.15 2.417 1.73 | 5.500 6. 91 8.583 2.02 11. 67 1.15 2.500 1.73 | 5.583 6. 91 | 8. 667 2.02 11. 75 1. 15 2.583 1.73 5.667 6. 91 8.750 2.02 11.83 1.15 5.750 2.667 1.73 6. 91 8.833 2.02 11. 92 1.15 2.750 1.73 | 5.833 27. 65 | 8. 917 12.00 2.02 1.15 2.833 1.73 | 5.917 27.65 | 9.000 2.02 | 12.08 1.15 2.917 1.73 | 6.000 27.65 | 9.083 2. 02 | 12. 17 1. 15 3.000 1.73 | 6.083 76. 03 | 9. 167 2.02 | 12.25 1. 15 3.083 1. 73 | 6. 167 76. 03 | 9. 250 2.02

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms) = 0.020 (i)TIME TO PEAK (hrs) = 6.333RUNOFF VOLUME (mm) = 17.097TOTAL RAINFALL (mm) = 57.600 RUNOFF COEFFICIENT = 0.297

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB NASHYD (0037) Area (ha)= 2.05 Curve Number (CN)= 73.0 |ID= 1 DT= 5.0 min | Ia (mm) = 10.00# of Linear Res. (N) = 3.00 ----- U. H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME

```
mm/hr | hrs mm/hr | hrs
  hrs mm/hr
                 hrs
                                                       mm/hr
0.083
        0.00
               3.167
                        1. 73 | 6. 250
                                       76.03 |
                                               9.33
                                                       2.02
0.167
        0.00
               3.250
                        1.73 | 6.333
                                       10.37
                                               9.42
                                                       2.02
0.250
        0.00
               3.333
                                               9.50
                        2. 30 | 6. 417
                                       10.37
                                                       2.02
                        2. 30 | 6. 500
                                               9.58
0.333
        1.44
               3.417
                                       10.37
                                                       2.02
               3.500
                        2. 30 | 6. 583
0.417
        1.44
                                       10.37
                                               9.67
                                                       2.02
        1.44
               3.583
                                               9.75
0.500
                        2.30
                               6.667
                                       10.37
                                                       2.02
0.583
        1.44
               3.667
                        2.30
                               6.750
                                       10.37
                                               9.83
                                                       2.02
0.667
        1.44
               3.750
                        2.30
                               6.833
                                       4.61
                                               9.92
                                                       2.02
0.750
                               6. 917
        1.44
               3.833
                        2.30
                                       4.61
                                              10.00
                                                       2.02
0.833
        1.44
               3.917
                        2.30
                               7.000
                                       4.61
                                              10.08
                                                       2.02
0.917
        1.44
               4.000
                        2.30
                               7.083
                                       4.61
                                              10.17
                                                       2.02
                        2.30
1.000
        1.44
               4.083
                               7. 167
                                       4.61
                                              10.25
                                                       2.02
1.083
               4.167
                        2.30
                               7. 250
                                              10.33
        1.44
                                       4.61
                                                       1.15
1.167
        1.44
               4.250
                        2.30
                               7.333
                                       3.46
                                              10.42
                                                       1. 15
1.250
        1.44
               4.333
                               7. 417
                                       3.46
                                              10.50
                        3.46
                                                       1.15
1.333
        1.44
               4.417
                        3.46
                               7.500
                                       3.46
                                              10.58
                                                       1.15
1.417
        1.44
               4.500
                        3.46
                               7.583
                                       3.46
                                              10.67
                                                       1.15
1.500
        1.44
               4.583
                        3.46
                               7.667
                                       3.46
                                              10.75
                                                       1.15
1.583
        1.44
               4.667
                        3.46
                               7.750
                                       3.46
                                              10.83
                                                       1.15
1.667
        1.44
               4.750
                        3.46
                               7.833
                                       3.46
                                              10.92
                                                       1. 15
1.750
        1.44
               4.833
                        4.61
                               7. 917
                                       3.46
                                              11.00
                                                       1. 15
1.833
        1.44
               4.917
                        4.61
                               8.000
                                       3.46
                                              11.08
                                                       1.15
1.917
        1.44
               5.000
                        4.61
                               8.083
                                       3.46
                                              11.17
                                                       1.15
2.000
        1.44
               5.083
                               8. 167
                                              11. 25
                        4.61
                                       3.46
                                                       1.15
2.083
        1.44
               5.167
                               8. 250
                                              11.33
                        4.61
                                       3.46
                                                       1.15
2.167
        1.44
               5.250
                        4.61
                               8. 333
                                       2.02
                                              11.42
                                                       1. 15
2.250
        1.44
               5.333
                        6. 91
                               8. 417
                                       2.02
                                              11.50
                                                       1.15
2.333
        1.73
               5.417
                        6. 91
                               8.500
                                       2.02
                                              11.58
                                                       1.15
2.417
               5.500
                               8. 583
        1.73
                        6. 91
                                       2.02
                                              11.67
                                                       1. 15
2.500
               5.583
        1.73
                        6. 91
                               8.667
                                       2.02
                                              11.75
                                                       1. 15
2.583
               5.667
                               8.750
        1.73
                        6. 91
                                       2.02
                                              11.83
                                                       1. 15
               5.750
                               8.833
                                              11.92
2.667
        1.73
                        6. 91
                                       2.02
                                                       1.15
2.750
        1.73
               5.833
                       27. 65 | 8. 917
                                       2.02
                                              12.00
                                                       1.15
2.833
        1.73
               5.917
                       27.65 | 9.000
                                       2.02
                                              12.08
                                                       1.15
2.917
        1.73
               6.000
                       27. 65 | 9. 083
                                       2.02
                                              12. 17
                                                       1.15
3.000
        1.73
               6.083
                       76.03 | 9.167
                                       2.02
                                              12. 25
                                                       1.15
3.083
       1.73 | 6.167
                       76.03 | 9.250
                                       2.02
```

PEAK FLOW (cms) = 0.089 (i) TIME TO PEAK (hrs) = 6.333 RUNOFF VOLUME (mm) = 15.986 TOTAL RAINFALL (mm) = 57.600 RUNOFF COEFFICIENT = 0.278

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| STANDHYD ( 0036)|
                            (ha) = 5.32
                     Area
|ID= 1 DT= 5.0 min |
                     Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00
                             IMPERVIOUS
                                          PERVIOUS (i)
                     (ha)=
                                2.66
                                             2.66
    Surface Area
                                1.00
    Dep. Storage
                     (mm) =
                                             5.00
                      (%)=
    Average Slope
                                1.00
                                             1.00
    Length
                      (m) =
                               188.33
                                             40.00
    Mannings n
                               0.130
                                            0.250
```

		TR/	ANSFORME	D HYETOGR	APH	_	
TIME	RAI N	TIME	RAIN	I' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	i' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.73	6. 250	76.03	9.33	2.02
0. 167	0.00	3.250	1.73	6. 333	10.37	9.42	2.02
0. 250	0.00	3.333	2.30	6. 417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6. 500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6. 583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6. 667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6. 750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6. 833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6. 917	4. 61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4. 61	10.08	2.02
0. 917	1.44	4.000	2.30	7. 083	4.61	10. 17	2.02
1.000	1.44	4.083	2.30	7. 167	4.61	10. 25	2.02
1. 083	1.44	4.167	2. 30	7. 250	4. 61	10. 33	1. 15
1. 167	1.44	4.250	2.30	7. 333	3.46	10.42	1. 15
1. 250	1.44	4.333	3.46	7. 417	3.46	10. 50	1. 15
1. 333	1.44	4.417	3.46	7.500	3.46	10. 58	1. 15
1. 417	1.44	4.500	3. 46	7. 583	3.46	10.67	1. 15
1. 500	1.44	4.583	3.46	7. 667	3. 46	10.75	1. 15
1. 583	1.44	4.667	3. 46	7. 750	3. 46	10.83	1. 15
1. 667	1.44	4.750	3. 46	7. 833	3. 46	10.92	1. 15
1. 750	1.44	4.833	4. 61	7. 917	3.46	11.00	1. 15
1.833	1.44	4.917	4. 61	8.000	3. 46	11.08	1. 15
1. 917	1.44	5.000	4. 61	8. 083	3.46	11.17	1. 15
2.000	1.44	5.083	4. 61	8. 167	3. 46	11. 25	1. 15
2.083	1.44	5.167	4. 61	8. 250	3. 46	11.33 11.42	1. 15
2. 167 2. 250	1. 44 1. 44	5.250 5.333	4. 61 6. 91	8. 333	2. 02 2. 02	11.42 11.50	1. 15 1. 15
2. 250	1. 44	5. 333	6. 91	8. 417 8. 500	2. 02	11.50	1. 15
2. 333 2. 417	1.73	5.417	6. 91	8.583	2.02	11.36	1. 15
2. 417	1.73	5.583	6. 91	8. 667	2.02	11. 67	1. 15
2. 583	1.73	5.667	6. 91	8. 750	2.02	11.73	1. 15
2. 667	1.73	5.750	6. 91	8.833	2.02	11.03	1. 15
2. 750	1.73	5.833	27. 65	8. 917	2. 02	12.00	1. 15
2. 833	1.73	5. 917	27.65	9.000	2.02	12.00	1. 15
2. 917	1.73	6.000	27.65	9.083	2.02	12.00	1. 15
3.000	1.73		76. 03	9. 167	2. 02	12. 17	1. 15
0.000		, 5.000	. 0. 00	, ,, ,,,,			

3.08	3 1.73	6. 167	76. 03	9. 250	2.02
Max. Eff. Inten. (i	mm/hr)= (min)	63. 94 20. 00		29. 81 35. 00	
Storage Coeff.	` '	17. 78	(ii)	31.88 (ii)	
Unit Hyd. Tpeak	(mi n)=	20.00		35.00	
Unit Hyd. peak	(cms)=	0.06		0.03	
					TOTALS
PEAK FLOW	(cms)=	0. 22		0.08	0.278 (iii)
TIME TO PEAK	(hrs)=	6.42		6. 75	6.42
RUNOFF VOLUME	(mm) =	56.60		15. 25	29.72
TOTAL RAINFALL	(mm) =	57.60		57.60	57.60
RUNOFF COEFFICII	ENT =	0. 98		0. 26	0.52

- THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040)	Area	(ha)=	3. 43	Dir. Cor	on (%)	25.00	
ID= 1 DT= 5.0 min	iotai	Imp(%)=	50.00	Dir. Cor	ırı. (%)=	35.00	
		IMPERVI	OUS	PERVIOUS ((i)		
Surface Area	(ha)=	1. 7		1.71	` '		
Dep. Storage	(mm) =	1.0	0	5.00			
Average SI ope	(%)=	1.0	0	2.00			
Length	(m) =	151. 2	2	40.00			
Mannings n	=	0. 01	3	0. 250			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH									
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN			
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr			
0.083	0.00	3.167	1. 73	6. 250	76.03	9. 33	2.02			
0.167	0.00	3.250	1.73	6. 333	10. 37	9.42	2.02			
0.250	0.00	3.333	2.30	6. 417	10. 37	9.50	2.02			
0.333	1.44	3.417	2.30	6. 500	10. 37	9. 58	2.02			
0.417	1.44	3.500	2.30	6. 583	10. 37	9. 67	2.02			
0.500	1.44	3.583	2.30	6. 667	10. 37	9. 75	2.02			
0.583	1.44	3.667	2.30	6. 750	10. 37	9.83	2.02			
0.667	1.44	3.750	2.30	6. 833	4. 61	9. 92	2.02			
0.750	1.44	3.833	2.30	6. 917	4. 61	10.00	2.02			
0.833	1.44	3.917	2.30	7.000	4. 61	10.08	2.02			
0. 917	1.44	4.000	2.30	7. 083	4. 61	10. 17	2.02			
1.000	1.44	4.083	2. 30	7. 167	4. 61	10. 25	2. 02			

1. 083 1. 167 1. 250 1. 333 1. 417 1. 500 1. 583 1. 667 1. 750 1. 833 1. 917 2. 000 2. 083 2. 167 2. 250 2. 333 2. 417 2. 500 2. 583 2. 667 2. 750 2. 833 2. 917	1. 44 4. 167 1. 44 4. 250 1. 44 4. 333 1. 44 4. 417 1. 44 4. 500 1. 44 4. 583 1. 44 4. 667 1. 44 4. 750 1. 44 4. 917 1. 44 5. 000 1. 44 5. 167 1. 44 5. 167 1. 44 5. 333 1. 73 5. 417 1. 73 5. 583 1. 73 5. 583 1. 73 5. 667 1. 73 5. 750 1. 73 5. 833 1. 73 5. 917 1. 73 6. 000	3. 46 3. 46 3. 46 3. 46 3. 46 4. 61 4. 61 4. 61 4. 61 6. 91 6. 91 6. 91 6. 91 27. 65 27. 65	7. 333 7. 417 7. 500 7. 583 7. 667 7. 750 7. 833 7. 917 8. 000 8. 083 8. 167 8. 250 8. 333 8. 417 8. 500 8. 583 8. 667 8. 750 8. 833 8. 667 8. 750 8. 833 8. 917 9. 000	3. 46 3. 46 3. 46 3. 46 3. 46 3. 46 3. 46 3. 46 2. 02	10. 42 10. 50 10. 58 10. 67 10. 75 10. 83 10. 92 11. 00 11. 08 11. 17 11. 25 11. 33 11. 42 11. 50 11. 58 11. 67 11. 75 11. 83 11. 92 12. 00 12. 08	1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15 1. 15
2.917 3.000 3.083	1. 73 6. 000 1. 73 6. 083 1. 73 6. 167	27. 65 76. 03 76. 03	9. 167	2. 02 2. 02 2. 02	12. 17 12. 25	1. 15 1. 15
RUNOFF VOLUME (m	n) 5.00 n)= 3.65 n)= 5.00 s)= 0.25 s)= 0.25 s)= 6.25 m)= 56.60	20 (ii) 15 20 0	9. 81 0. 00 5. 11 (ii) 0. 00 0. 07 0. 08 6. 42 5. 25	6 29	306 (iii) .25 .72	
TOTAL RAINFALL (m RUNOFF COEFFICIENT	m)= 57.60 = 0.98		7. 60 0. 26		. 60 . 52	
***** WARNING: STORAGE C						
(ii) TIME STEP (DT	la = Dep. S) SHOULD BE SMA AGE COEFFICIENT	Storage (ALLER OR E T.	(Above) EQUAL			
ADD HYD (0041)	ADEA OF	DEAK TO	DEAK E	·		

AREA

(ha)

1 + 2 = 3

QPEAK

(cms)

TPEAK

(hrs)

R. V.

(mm)

```
ID1 = 1 (0033):
                    0. 41 0. 020
                               6. 33 17. 10
    + ID2= 2 ( 0036):
                    5. 32 0. 278 6. 42 29. 72
     ID = 3 (0041):
                    5. 73 0. 297
                                 6. 42 28. 81
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----
ADD HYD ( 0041)|
 3 + 2 = 1
                    AREA QPEAK
                                TPEAK
                                      R. V.
                    (ha) (cms)
                                (hrs)
                                       (mm)
    ID1= 3 ( 0041):
                    5. 73 0. 297
                                 6. 42 28. 81
   + ID2= 2 ( 0037):
                    2. 05 0. 089
                                 6. 33 15. 99
     _____
     ID = 1 ( 0041): 7.78 0.380
                                 6. 42 25. 43
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0041)|
 1 + 2 = 3
                    AREA QPEAK
                                 TPEAK
                                       R. V.
-----
                     (ha) (cms)
                                 (hrs)
                                        (mm)
                    7. 78 0. 380
   ID1= 1 ( 0041):
                                 6. 42 25. 43
   + ID2= 2 ( 0040):
                    3, 43 0, 306
                                 6, 25 29, 72
     _____
                                ______
     ID = 3 (0041): 11.21 0.608
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
CALIB
NASHYD (0039) Area (ha)= 0.83 Curve Number (CN)= 75.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00
----- U. H. Tp(hrs) = 0.19
      NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
```

		TR/	ANSFORMEI) HYETOGR	APH	-	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.73	6. 250	76.03	9. 33	2.02
0.167	0.00	3.250	1.73	6. 333	10. 37	9.42	2.02
0.250	0.00	3.333	2.30	6. 417	10. 37	9.50	2.02
0.333	1.44	3.417	2.30	6. 500	10. 37	9. 58	2.02
0.417	1.44	3.500	2.30	6. 583	10. 37	9. 67	2.02
0.500	1.44	3.583	2.30	6. 667	10. 37	9. 75	2.02
0.583	1.44	3.667	2.30	6. 750	10. 37	9.83	2.02
0.667	1.44	3.750	2.30	6. 833	4. 61	9. 92	2.02
0.750	1.44	3.833	2.30	6. 917	4. 61	10.00	2. 02

```
0.917
       1.44 | 4.000
                       2.30 | 7.083
                                      4. 61 | 10. 17
                       2. 30 | 7. 167
1.000
        1.44 | 4.083
                                       4. 61 | 10. 25
        1.44 | 4.167
                       2. 30 | 7. 250
                                       4. 61 | 10. 33
1.083
                                                      1 15
                       2. 30 | 7. 333
        1.44 | 4.250
                                       3. 46 | 10. 42
1. 167
                                                      1 15
1.250
        1.44 | 4.333
                       3. 46 | 7. 417
                                       3. 46 | 10. 50
1.333
        1.44 | 4.417
                       3.46 7.500
                                       3. 46 | 10. 58
1.417
        1.44 | 4.500
                       3. 46 | 7. 583
                                       3. 46 | 10. 67
                                                      1 15
1.500
        1.44 | 4.583
                       3. 46 | 7. 667
                                       3. 46 | 10. 75
                                                      1 15
1.583
        1.44
               4.667
                       3. 46 | 7. 750
                                       3.46
                                             10.83
                                                      1 15
        1.44 İ
              4.750
                       3. 46 | 7. 833
                                       3. 46 İ
                                             10.92
1.667
                                                      1 15
                       4. 61 | 7. 917
1.750
        1.44 | 4.833
                                       3. 46 | 11. 00
                                                      1. 15
1.833
        1.44 | 4.917
                       4.61 | 8.000
                                       3. 46 | 11. 08
                                                      1.15
1.917
        1.44 | 5.000
                       4. 61 | 8. 083
                                       3. 46 | 11. 17
                                                      1 15
2.000
        1.44 İ
               5.083
                       4. 61 | 8. 167
                                       3.46
                                             11. 25
                                                      1. 15
                       4. 61 | 8. 250
2.083
        1.44 l
               5. 167
                                       3.46 | 11.33
                                                      1.15
2. 167
        1.44 İ
               5.250
                       4. 61 | 8. 333
                                       2.02 İ
                                             11, 42
                                                       1.15
2.250
        1.44
               5.333
                       6. 91 | 8. 417
                                       2.02
                                             11.50
                                                       1. 15
2.333
        1.73 | 5.417
                       6. 91 | 8. 500
                                       2.02 | 11.58
                                                       1. 15
2.417
        1.73
               5.500
                       6. 91 | 8. 583
                                       2.02
                                             11.67
                                                       1.15
2.500
        1.73 | 5.583
                       6. 91 | 8. 667
                                       2. 02 | 11. 75
                                                       1. 15
2.583
        1.73 | 5.667
                       6. 91 | 8. 750
                                       2.02 | 11.83
                                                       1. 15
2.667
        1.73 | 5.750
                       6. 91 | 8. 833
                                       2.02 | 11.92
                                                       1. 15
2.750
        1.73 | 5.833
                       27. 65 | 8. 917
                                       2.02
                                             12.00
                                                       1.15
2.833
        1.73 | 5.917
                       27.65 | 9.000
                                       2. 02 | 12. 08
                                                       1. 15
2.917
        1.73 | 6.000
                      27.65 | 9.083
                                       2. 02 | 12. 17
                                                       1.15
3.000
       1.73 | 6.083
                      76. 03 | 9. 167
                                       2. 02 | 12. 25
                                                      1. 15
3. 083 1. 73 | 6. 167 76. 03 | 9. 250
                                       2.02
```

PEAK FLOW (cms) = 0.043 (i) TIME TO PEAK (hrs) = 6.333 RUNOFF VOLUME (mm) = 17.090 TOTAL RAINFALL (mm) = 57.600 RUNOFF COEFFICIENT = 0.297

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| ADD HYD ( 0032)|
1 + 2 = 3
                   AREA
                       QPEAK
                               TPEAK
                                      R. V.
                   (ha)
                       (cms)
                               (hrs)
                                    (mm)
   ID1= 1 ( 0039):
                  0. 83 0. 043
                               6. 33 17. 09
   + ID2= 2 ( 0041): 11.21 0.608
                               6. 25 26. 74
     _____
     ID = 3 (0032): 12.04 0.647
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
*********
** SIMULATION: 2-100yr 12hr 15min SCS **
```

CALIB

NASHYD (0033) | Area (ha)= 0.41 Curve Number (CN)= 75.0 ----- U. H. Tp(hrs) = 0.20

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH								
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN	
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr	
0.083	0.00	3.167	2.88	6. 250	126.72	9.33	3.36	
0. 167	0.00	3.250	2. 88	6. 333	17. 28	9.42	3.36	
0. 250	0.00	3.333	3.84	6. 417	17. 28	9.50	3. 36	
0.333	2.40	3.417	3.84	6. 500	17. 28	9.58	3.36	
0.417	2.40	3.500	3.84	6. 583	17. 28	9.67	3.36	
0.500	2.40	3.583	3.84	6. 667	17. 28	9.75	3. 36	
0.583	2.40	3.667	3.84	6. 750	17. 28	9.83	3.36	
0.667	2.40	3.750	3.84	6. 833	7. 68	9. 92	3.36	
0.750	2.40	3.833	3.84	6. 917	7. 68	10.00	3.36	
0.833	2.40	3.917	3.84	7.000	7. 68	10.08	3. 36	
0. 917	2.40	4.000	3.84	7. 083	7. 68	10. 17	3. 36	
1.000	2.40	4.083	3.84	7. 167	7. 68	10. 25	3. 36	
1.083	2.40	4.167	3.84	7. 250	7. 68	10.33	1. 92	
1. 167	2.40	4.250	3.84	7. 333	5. 76	10.42	1. 92	
1. 250	2.40	4.333	5. 76	7. 417	5. 76	10. 50	1. 92	
1. 333	2.40	4.417	5. 76	7. 500	5. 76	10. 58	1. 92	
1. 417	2.40	4.500	5. 76	7. 583	5. 76	10. 67	1. 92	
1.500	2.40	4.583	5. 76	7. 667	5. 76	10. 75	1. 92	
1.583	2.40	4.667	5. 76	7. 750	5. 76	10. 83	1. 92	
1.667	2.40	4.750	5. 76	7. 833	5. 76	10. 92	1. 92	
1. 750	2.40	4.833	7. 68	7. 917	5. 76	11.00	1. 92	
1.833	2.40	4.917	7. 68	8.000	5. 76	11.08	1. 92	
1. 917	2.40	5.000	7. 68	8. 083	5. 76	11. 17	1. 92	
2.000	2.40	5.083	7.68	8. 167	5. 76	11. 25	1. 92	
2.083	2.40	5.167	7. 68	8. 250	5. 76	11. 33	1. 92	
2. 167	2.40	5.250	7. 68	8. 333	3. 36	11.42	1. 92	
2. 250	2.40	5.333	11. 52	8. 417	3. 36	11.50	1. 92	
2. 333	2.88	5.417	11. 52	8. 500	3. 36	11.58	1. 92	
2. 417	2.88	5.500	11. 52	8. 583	3. 36	11.67	1. 92	
2.500	2.88	5.583	11. 52	8. 667	3. 36	11. 75	1. 92	
2. 583	2.88	5.667	11. 52	8. 750	3. 36	11.83	1. 92	
2.667	2.88	5.750	11. 52	8. 833	3. 36		1. 92	
2.750	2.88	5.833	46.08	8. 917	3. 36	12.00	1. 92	
2.833	2.88	5.917	46. 08	9.000	3. 36	12.08	1. 92	
2. 917	2.88	6.000	46.08	9. 083	3. 36	12. 17	1. 92	
3.000	2.88	6.083	126. 72	9. 167	3. 36	12. 25	1. 92	
3. 083	2.88	6.167	126. 72	9. 250	3. 36			

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms) = 0.053 (i)TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 43.252
TOTAL RAINFALL (mm) = 96.000 RUNOFF COEFFICIENT = 0.451

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0037) Area (ha) = 2.05 Curve Number (CN) = 73.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 ------ U.H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	i' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.88	6. 250	126.72	9.33	3.36
0. 167	0.00	3.250	2.88	6. 333	17. 28	9.42	3.36
0. 250	0.00	3.333	3.84	6. 417	17. 28	9.50	3.36
0.333	2.40	3.417	3.84	6. 500	17. 28	9. 58	3.36
0.417	2.40	3.500	3.84	6. 583	17. 28	9.67	3.36
0.500	2.40	3.583	3.84	6. 667	17. 28	9. 75	3.36
0.583	2.40	3.667	3.84	6. 750	17. 28	9.83	3.36
0.667	2.40	3.750	3.84	6. 833	7. 68	9. 92	3.36
0.750	2.40	3.833	3.84	6. 917	7. 68	10.00	3.36
0.833	2.40	3.917	3.84	7. 000	7. 68	10.08	3.36
0. 917	2.40	4.000	3.84	7. 083	7.68	10. 17	3.36
1.000	2.40	4.083	3.84	7. 167	7.68	10. 25	3. 36
1.083	2.40	4.167	3.84	7. 250	7.68	10.33	1. 92
1. 167	2.40	4.250	3.84	7. 333	5. 76	10.42	1. 92
1. 250	2.40	4.333	5.76	7. 417	5.76	10.50	1. 92
1. 333	2.40	4.417	5. 76	7. 500	5. 76	10. 58	1. 92
1. 417	2.40	4.500	5.76	7. 583	5. 76	10.67	1. 92
1.500	2.40	4.583	5.76	7. 667	5.76	10.75	1. 92
1. 583	2.40	4.667	5. 76	7. 750	5.76	10.83	1. 92
1.667	2.40	4.750	5. 76	7. 833	5. 76	10. 92	1. 92
1. 750	2.40	4.833	7.68	7. 917	5.76	11.00	1. 92
1.833	2.40	4.917	7.68	8.000	5. 76	11. 08	1. 92
1. 917	2.40	5.000	7.68	8. 083	5.76	11. 17	1. 92
2.000	2.40	5.083	7.68	8. 167	5.76	11. 25	1. 92
2.083	2.40	5.167	7.68	8. 250	5. 76	11. 33	1. 92
2. 167	2.40	5.250	7.68	8. 333	3. 36	11. 42	1. 92
2. 250	2.40	5.333	11. 52	8. 417	3. 36	11.50	1. 92
2.333	2.88	5.417	11. 52	8.500	3. 36	11. 58	1. 92

```
2. 417 2. 88 | 5. 500 11. 52 | 8. 583
                                       3. 36 | 11. 67 1. 92
2.500
       2. 88 | 5. 583 | 11. 52 | 8. 667
                                        3.36 | 11.75
                                                       1. 92
2.583
       2.88 | 5.667
                       11.52 | 8.750
                                        3. 36 | 11. 83
                                                       1. 92
       2.88 | 5.750
                       11. 52 | 8. 833
                                        3. 36 | 11. 92
2.667
                                                       1. 92
                                        3. 36 | 12. 00
2.750
       2.88 | 5.833
                       46. 08 | 8. 917
                                                       1. 92
       2.88 | 5.917
                       46.08 9.000
                                        3. 36 | 12. 08
2.833
                                                       1. 92
       2.88 | 6.000
                      46. 08 | 9. 083
2.917
                                        3. 36 | 12. 17
                                                       1. 92
3.000
       2. 88 | 6. 083 | 126. 72 | 9. 167
                                        3. 36 | 12. 25
                                                       1. 92
3.083
       2. 88 | 6. 167 | 126. 72 | 9. 250
                                        3.36
```

PEAK FLOW (cms)= 0.238 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 41.047
TOTAL RAINFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.428

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

.....

Area Total				35. 00
			DED. (1 0 1 0 1 1)	
	IMPERVIC	105	PERVIOUS (I)	
(ha)=	2. 66)	2. 66	
(mm) =	1.00)	5.00	
(%)=	1.00)	1.00	
(m)=	188. 33		40.00	
=	0. 130)	0. 250	
	Total (ha) = (mm) = (%) = (m) =	Total Imp(%) = IMPERVIC (ha) = 2.66 (mm) = 1.00 (%) = 1.00 (m) = 188.33	Total Imp(%) = 50.00 IMPERVIOUS (ha) = 2.66 (mm) = 1.00 (%) = 1.00 (m) = 188.33	Total $Imp(\%) = 50.00$ Dir. Conn. (%) = IMPERVIOUS PERVIOUS (i) (ha) = 2.66 2.66 (mm) = 1.00 5.00 (%) = 1.00 1.00 (m) = 188.33 40.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME) HYETOG	RAPH	_	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.88	6. 250	126. 72	9.33	3. 36
0. 167	0.00	3.250	2.88	6. 333	17. 28	9.42	3. 36
0.250	0.00	3.333	3.84	6. 417	17. 28	9.50	3.36
0.333	2.40	3.417	3.84	6. 500	17. 28	9. 58	3. 36
0.417	2.40	3.500	3.84	6. 583	17. 28	9.67	3. 36
0.500	2.40	3.583	3.84	6. 667	17. 28	9.75	3. 36
0.583	2.40	3.667	3.84	6. 750	17. 28	9.83	3. 36
0.667	2.40	3.750	3.84	6. 833	7. 68	9.92	3.36
0.750	2.40	3.833	3.84	6. 917	7. 68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7. 68	10.08	3.36
0. 917	2.40	4.000	3.84	7. 083	7. 68	10.17	3.36
1.000	2.40	4.083	3.84	7. 167	7. 68	10. 25	3.36
1.083	2.40	4.167	3.84	7. 250	7. 68	10. 33	1. 92

```
1. 250 2. 40 | 4. 333
                                 5. 76 | 7. 417
                                                 5. 76 | 10. 50 1. 92
          1.333
                  2.40 | 4.417
                                  5. 76 | 7. 500
                                                 5. 76 | 10. 58
          1.417
                  2.40 | 4.500
                                 5. 76 | 7. 583
                                                 5. 76 | 10. 67
                                                                 1.92
                                                 5. 76 | 10. 75
          1.500
                  2.40 | 4.583
                                  5. 76 | 7. 667
                                                                1. 92
                                  5. 76 | 7. 750
          1.583
                  2.40 | 4.667
                                                 5. 76 | 10. 83
                                                                1. 92
                  2.40
                         4.750
                                  5. 76 | 7. 833
          1.667
                                                 5. 76 | 10. 92
          1.750
                  2.40 | 4.833
                                  7. 68 | 7. 917
                                                 5. 76 | 11. 00
                                                                1. 92
          1.833
                  2.40 | 4.917
                                  7. 68 | 8. 000
                                                 5. 76 | 11. 08
                                                                1. 92
                                  7. 68 | 8. 083
          1.917
                  2.40
                         5.000
                                                 5. 76 | 11. 17
                                                                 1. 92
          2.000
                  2.40 İ
                         5.083
                                  7. 68 | 8. 167
                                                 5. 76 | 11. 25
                                                                 1. 92
          2.083
                  2.40 İ
                         5.167
                                  7. 68 | 8. 250
                                                 5. 76 | 11. 33
                                                                1. 92
          2. 167
                  2.40
                         5.250
                                 7. 68 | 8. 333
                                                 3. 36 | 11. 42
                                                                 1. 92
          2.250
                  2.40 İ
                         5.333
                                 11. 52 | 8. 417
                                                 3. 36 | 11. 50
                                                                 1. 92
          2.333
                  2.88
                         5.417
                                 11. 52 | 8. 500
                                                 3.36
                                                        11.58
                                                                 1.92
          2.417
                         5.500
                                 11. 52 | 8. 583
                                                        11.67
                  2.88 I
                                                 3.36
                                                                 1.92
          2.500
                  2.88
                         5.583
                                 11. 52 İ
                                         8.667
                                                 3.36 İ
                                                        11. 75
                                                                 1.92
          2.583
                  2.88
                         5.667
                                 11. 52 | 8. 750
                                                 3.36
                                                        11.83
                                                                 1.92
          2.667
                  2.88
                         5.750
                                 11.52 | 8.833
                                                 3.36
                                                        11. 92
                                                                 1.92
          2.750
                  2.88
                         5.833
                                 46.08 | 8.917
                                                 3.36
                                                        12.00
                                                                 1.92
          2.833
                  2.88
                         5.917
                                 46.08 | 9.000
                                                 3. 36 | 12. 08
                                                                 1.92
          2.917
                  2.88 | 6.000
                               46.08 | 9.083
                                                 3. 36 | 12. 17
                                                                 1. 92
          3.000
                  2.88
                         6.083 126.72 | 9.167
                                                 3. 36 | 12. 25
                                                                1. 92
          3.083
                 2. 88 | 6. 167 | 126. 72 | 9. 250
                                                 3.36
Max. Eff. Inten. (mm/hr)=
                         126.72
                                       79.06
          over (min)
                          15.00
                                       25.00
Storage Coeff. (min)=
                          13.53 (ii)
                                       23.07 (ii)
Unit Hyd. Tpeak (min)=
                          15.00
                                       25.00
Unit Hyd. peak (cms)=
                           0.08
                                       0.05
                                                    *TOTALS*
PEAK FLOW
                           0.44
                                       0.25
                                                     0.631 (iii)
               (cms) =
TIME TO PEAK
               (hrs)=
                           6.33
                                       6.50
                                                     6.42
RUNOFF VOLUME
               (mm) =
                          95.00
                                       37.26
                                                     57.47
TOTAL RAINFALL (mm)=
                          96.00
                                       96.00
                                                     96.00
RUNOFF COEFFICIENT =
                           0.99
                                       0.39
                                                      0.60
 (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN^* = 59.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
     THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.71 1.71

Dep. Storage (mm) = 1.00 5.00 Average Slope (%)= 1.00 2.00 Length (m)= 151. 22 40.00 Mannings n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME) HYETOGI	RAPH	_	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	i' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.88	6. 250	126.72	9.33	3.36
0. 167	0.00	3.250	2.88	6. 333	17. 28	9.42	3.36
0.250	0.00	3.333	3.84	6. 417	17. 28	9.50	3.36
0.333	2.40	3.417	3.84	6. 500	17. 28	9.58	3.36
0.417	2.40	3.500	3.84	6. 583	17. 28	9.67	3.36
0.500	2.40	3.583	3.84	6. 667	17. 28	9.75	3.36
0. 583	2.40	3.667	3.84	6. 750	17. 28	9.83	3. 36
0.667	2.40	3.750	3.84	6. 833	7.68	9. 92	3. 36
0.750	2.40	3.833	3.84	6. 917	7. 68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10. 08	3. 36
0. 917	2.40	4.000	3.84	7. 083	7.68	10. 17	3. 36
1.000	2.40	4.083	3.84	7. 167	7.68	10. 25	3. 36
1.083	2.40	4.167	3.84	7. 250	7. 68	10.33	1. 92
1. 167	2.40	4.250	3.84	7. 333	5. 76	10.42	1. 92
1. 250	2.40	4.333	5. 76	7. 417	5. 76	10.50	1. 92
1. 333	2.40	4.417	5. 76	7. 500	5. 76	10.58	1. 92
1. 417	2.40	4.500	5. 76	7. 583	5. 76	10.67	1. 92
1.500	2.40	4.583	5. 76	7. 667	5. 76	10.75	1. 92
1. 583	2.40	4.667	5. 76	7. 750	5. 76	10.83	1. 92
1. 667	2.40	4.750	5. 76	7.833	5. 76	10.92	1. 92
1. 750	2.40	4.833	7. 68	7. 917	5. 76	11.00	1. 92
1.833	2.40	4.917	7. 68	8.000	5. 76	11.08	1. 92
1. 917	2.40	5.000	7. 68	8. 083	5. 76	11.17	1. 92
2.000	2.40	5.083	7. 68	8. 167	5. 76	11. 25	1. 92
2.083	2.40	5.167	7. 68	8. 250	5. 76	11.33	1. 92
2. 167	2.40	5.250	7.68	8. 333	3. 36	11.42	1. 92
2. 250	2.40	5.333	11. 52	8. 417	3. 36	11.50	1. 92
2. 333 2. 417	2.88	5.417	11. 52 11. 52	8.500	3. 36	11.58 11.67	1. 92 1. 92
	2.88	5.500	11. 52	8. 583	3. 36 3. 36	11.67 11.75	
2.500 2.583	2.88 2.88	5.583	11. 52	8. 667 8. 750	3. 36	11.75 11.83	1. 92 1. 92
2. 583	2.88 2.88	5.667 5.750	11. 52	8.750 8.833	3. 36	11.83 11.92	1. 92
2.750	2.88	5.833	46. 08	6. 633 8. 917	3. 36	11.92	1. 92
2. 833	2.88	5.917	46. 08	9.000	3. 36	12.00	1. 92
2. 917	2.88	6.000	46. 08	9.083	3. 36	12.00	1. 92
3.000	2.88	6.083	126. 72	9. 167	3. 36	12.17	1. 92
3.083	2.88	6.167	126. 72	9. 250	3. 36	1 12.25	1. /2
5.005	2.00	0.107	120.72	1 7. 200	5. 50		

79.06 Max. Eff. Inten. (mm/hr)= 126.72 15.00 over (min) 5.00 Storage Coeff. (min)= 2. 98 (ii) 10. 73 (ii)

Unit Hyd. Tpeak Unit Hyd. peak		5. 00 0. 28	15. 00 0. 09	
	(/			*TOTALS*
PEAK FLOW	(cms)=	0. 42	0.24	0.634 (iii)
TIME TO PEAK	(hrs)=	6. 25	6.33	6. 25
RUNOFF VOLUME	(mm) =	95.00	37. 26	57.47
TOTAL RAINFALL	(mm) =	96.00	96.00	96.00
RUNOFF COEFFICIE	ENT =	0. 99	0.39	0.60
*** WADAII NO CTODA				

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $\begin{array}{ccccc} \text{CN*} &=& 59.0 & \text{I a = Dep. Storage} & \text{(Above)} \\ \text{(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL} \end{array}$

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0041)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0033):	0. 41	0.053	6. 33	43. 25
+ ID2= 2 (0036):	5. 32	0. 631	6. 42	57.47
==============	======		=======	
ID = 3 (0041):	5.73	0. 679	6. 33	56.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0041):	5. 73	0.679	6. 33	56.45
+ ID2= 2 (0037):	2.05	0. 238	6. 33	41.05
=============				
ID = 1 (0041):	7. 78	0. 917	6. 33	52.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.
·	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0041):	7. 78	0. 917	6. 33	52.39
+ ID2= 2 (0040):	3. 43	0.634	6. 25	57.47
======================================				
ID = 3 (0041)	11 21	1 447	6 25	53 94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB									
NASHYD (0039)	Area (ha)=	0.83	Curve Number (CN)= 75.0						
ID= 1 DT= 5.0 min	la (mm)=	10.00	# of Linear Res. (N) = 3.00						
·	U.H. Tp(hrs)=	0.19							

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

 TRANSFORMED	HYETOGRAPH	
THE WILL OF THE E		

		TR	ANSFORMEI) HYETOGI	RAPH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.88	6. 250	126.72	9.33	3.36
0. 167	0.00	3.250	2.88	6. 333	17. 28	9.42	3.36
0.250	0.00	3.333	3.84	6. 417	17. 28	9.50	3.36
0.333	2.40	3.417	3.84	6. 500	17. 28	9. 58	3. 36
0.417	2.40	3.500	3.84	6. 583	17. 28	9. 67	3. 36
0.500	2.40	3.583	3.84	6. 667	17. 28	9. 75	3.36
0.583	2.40	3.667	3.84	6. 750	17. 28	9.83	3. 36
0.667	2.40	3.750	3.84	6. 833	7. 68	9. 92	3. 36
0.750	2.40	3.833	3.84	6. 917	7. 68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7. 68	10.08	3. 36
0. 917	2.40		3.84	7. 083	7.68	10. 17	3. 36
1.000	2.40		3.84	7. 167	7. 68	10. 25	3. 36
1. 083		4.167	3.84	7. 250	7.68	10. 33	1. 92
1. 167	2.40		3.84	7. 333	5. 76	10.42	1. 92
1. 250	2.40		5. 76	7. 417	5. 76	10.50	1. 92
1.333		4.417	5. 76	7. 500	5. 76	10. 58	1. 92
1. 417		4.500	5. 76	7. 583	5. 76		1. 92
1.500	2.40		5. 76	7. 667		10. 75	1. 92
1.583		4.667	5. 76	7. 750			1. 92
1. 667	2.40		5. 76	7. 833			1. 92
1. 750	2.40	4.833	7. 68	7. 917	5. 76	11.00	1. 92
1.833	2.40		7. 68	8. 000	5. 76	11. 08	1. 92
1. 917	2.40		7. 68	8. 083	5. 76	11. 17	1. 92
2.000	2.40		7. 68	8. 167	5. 76	11. 25	1. 92
2.083	2.40	5.167	7.68	8. 250	5. 76	11. 33	1. 92
2. 167	2.40		7. 68	8. 333			1. 92
2. 250	2.40		11. 52	8. 417			1. 92
2. 333	2.88		11. 52	8. 500	3. 36	11. 58	1. 92
2. 417	2.88	5.500	11. 52	8. 583	3. 36	11. 67	1. 92
2.500	2.88	5.583	11. 52	8. 667	3. 36	11. 75	1. 92
2.583	2.88		11. 52	8. 750	3. 36	11.83	1. 92
2. 667	2.88	5.750	11. 52	8. 833	3. 36	11. 92	1. 92
2.750	2.88	5.833	46. 08	8. 917			
2.833	2.88		46. 08	9.000	3. 36		1. 92
2. 917	2.88	6.000	46. 08	9. 083	3. 36	12. 17	1. 92
3.000	2.88		126. 72	9. 167	3. 36	12. 25	1. 92
3.083	2.88	6. 167	126. 72	9. 250	3. 36		

```
Unit Hyd Qpeak (cms)= 0.167
```

PEAK FLOW	(cms)=	0.110 (i)
TIME TO PEAK	(hrs)=	6. 333
RUNOFF VOLUME	(mm) =	43. 235
TOTAL RAINFALL	(mm) =	96.000
RUNOFF COEFFICI	ENT =	0.450

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0032)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.
· 	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0039):	0.83	0. 110	6. 33	43.23
+ ID2= 2 (0041):	11. 21	1.442	6. 25	53.94
=======================================			======	
ID = 3 (0032):	12.04	1. 547	6. 25	53.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION: 2-10yr 12hr 15min SCS **

CALID			
NASHYD (0033)	Area (ha)=	0.41	Curve Number (CN)= 75.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res. (N)= 3.00
	U.H. Tp(hrs)=	0. 20	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1. 98	6. 250	87. 12	9.33	2.31
0.167	0.00	3.250	1. 98	6. 333	11.88	9.42	2.31
0.250	0.00	3.333	2.64	6. 417	11.88	9.50	2. 31
0.333	1.65	3.417	2.64	6. 500	11.88	9. 58	2. 31
0.417	1.65	3.500	2.64	6. 583	11.88	9. 67	2. 31
0.500	1.65	3.583	2.64	6. 667	11.88	9. 75	2.31
0.583	1.65	3.667	2.64	6. 750	11.88	9.83	2. 31
0.667	1.65	3.750	2.64	6. 833	5. 28	9. 92	2.31
0.750	1.65	3.833	2.64	6. 917	5. 28	10.00	2.31
0.833	1.65	3.917	2.64	7. 000	5. 28	10.08	2. 31
0. 917	1.65	4.000	2.64	7. 083	5. 28	10. 17	2.31
1.000	1.65	4.083	2.64	7. 167	5. 28	10. 25	2. 31
1.083	1.65	4.167	2.64	7. 250	5. 28	10.33	1.32
1. 167	1.65	4.250	2.64	7. 333	3. 96	10.42	1.32

```
1.250
       1.65 | 4.333
                       3.96 | 7.417
                                       3. 96 | 10. 50
                                                      1. 32
        1.65 | 4.417
                        3.96 | 7.500
                                       3.96
                                              10.58
1.333
                                                      1. 32
1.417
        1.65
               4.500
                        3.96 | 7.583
                                       3.96
                                              10.67
                                                       1.32
1.500
               4.583
                        3. 96 | 7. 667
                                       3. 96
                                              10.75
        1.65
                                                       1.32
1.583
               4.667
                        3. 96 | 7. 750
                                       3.96
                                              10.83
        1.65
                                                      1.32
1.667
        1.65
               4.750
                        3. 96 | 7. 833
                                       3.96
                                              10.92
                                                      1.32
1.750
        1.65
               4.833
                        5. 28
                               7. 917
                                       3.96
                                              11.00
                                                      1.32
1.833
        1.65
               4.917
                        5. 28
                               8.000
                                       3.96
                                              11.08
                                                      1.32
1. 917
        1.65
               5.000
                        5. 28
                               8.083
                                       3.96
                                              11. 17
                                                       1.32
2.000
        1.65
               5.083
                        5. 28
                               8. 167
                                       3.96
                                              11. 25
                                                      1.32
2.083
               5.167
                        5. 28
                               8. 250
                                       3.96
                                              11.33
                                                       1.32
        1.65
2.167
        1.65
               5.250
                        5. 28
                               8. 333
                                       2.31
                                              11.42
                                                      1.32
2.250
        1.65
               5.333
                        7. 92 İ
                               8. 417
                                       2.31
                                              11.50
                                                       1.32
               5.417
                               8.500
2.333
        1.98
                        7. 92
                                       2.31
                                              11.58
                                                       1.32
2.417
        1.98
               5.500
                        7. 92
                               8.583
                                       2.31
                                              11.67
                                                       1. 32
2.500
        1.98
               5.583
                        7. 92
                               8.667
                                       2.31
                                              11.75
                                                      1.32
2.583
        1.98
               5.667
                        7. 92
                               8.750
                                              11.83
                                                       1.32
                                       2.31
2.667
        1.98
               5.750
                        7. 92
                               8.833
                                       2.31
                                              11.92
                                                       1.32
2.750
        1.98
               5.833
                       31.68
                               8. 917
                                       2.31
                                              12.00
                                                       1.32
2.833
        1.98
               5.917
                       31.68
                               9.000
                                       2.31
                                              12.08
                                                       1.32
2.917
        1.98
               6.000
                       31.68
                               9.083
                                       2.31
                                              12. 17
                                                       1.32
3.000
        1.98
               6.083
                       87. 12 | 9. 167
                                       2.31
                                              12. 25
                                                      1.32
3.083
        1. 98 | 6. 167
                       87. 12 | 9. 250
                                       2. 31
```

PEAK FLOW (cms) = 0.027 (i)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 22.250
TOTAL RAINFALL (mm) = 66.000
RUNOFF COEFFICIENT = 0.337

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----TIME RAIN I' TIME RAIN RAIN | TIME RAIN TIME mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0.00 1. 98 | 6. 250 2.31 0.083 3.167 87.12 9.33 0.00 1. 98 | 6. 333 9.42 0.167 3.250 11.88 2. 31 2.64 | 6.417 0.250 0.00 3.333 11.88 9.50 2.31 2.64 | 6.500 9.58 0.333 1.65 3.417 11.88 2. 31 0.417 1.65 | 3.500 2.64 | 6.583 11.88 | 9.67 2.31

0.500 1.65 | 3.583 2. 64 | 6. 667 | 11. 88 | 9. 75 2. 31 1.65 | 3.667 2. 64 | 6. 750 | 11. 88 | 9. 83 0.583 2.31 0.667 1.65 | 3.750 2.64 | 6.833 5. 28 9.92 2.31 2.64 | 6.917 0.750 1.65 | 3.833 10.00 5. 28 2.31 0.833 1.65 | 3.917 2.64 | 7.000 5. 28 10.08 2.31 0.917 1.65 4.000 2.64 | 7.083 5. 28 10.17 2.31 5. 28 1.000 1.65 4.083 2.64 7.167 10.25 2.31 1.083 1.65 4.167 2.64 | 7.250 5. 28 10.33 1.32 1.167 1.65 4.250 2.64 | 7.333 3.96 10.42 1.32 1.250 1.65 4.333 3. 96 | 7. 417 3.96 10.50 1.32 1.333 1.65 4.417 3.96 7.500 3.96 10.58 1.32 1.417 1.65 4.500 3. 96 7.583 3.96 10.67 1.32 1.500 1.65 4.583 3.96 | 7.667 3.96 10.75 1.32 1.583 7.750 1.65 4.667 3.96 İ 3.96 10.83 1.32 1.667 1.65 4.750 3. 96 7.833 3.96 10.92 1.32 1.750 4.833 7. 917 1.65 5.28 3.96 11.00 1.32 1.833 1.65 4.917 5. 28 8.000 3.96 11.08 1.32 1.917 1.65 5.000 5. 28 8.083 3.96 11. 17 1.32 2.000 1.65 5.083 5.28 8. 167 3.96 11. 25 1.32 2.083 1.65 5.167 5.28 8. 250 3.96 11.33 1.32 2. 167 1.65 5.250 5. 28 8. 333 2.31 11.42 1.32 2.250 1.65 5.333 7. 92 8. 417 2.31 11.50 1.32 2.333 1.98 5.417 7.92 8.500 2.31 11.58 1.32 2.417 1.98 5.500 7.92 8.583 2.31 11.67 1.32 2.500 1.98 5.583 7. 92 | 8. 667 2.31 11.75 1.32 2.583 1.98 İ 5.667 7. 92 | 8. 750 2.31 11.83 1.32 2.667 1.98 5.750 7. 92 | 8. 833 2.31 11. 92 1.32 2.750 1.98 5.833 31. 68 | 8. 917 2.31 12.00 1.32 2.833 1. 98 | 5. 917 31.68 | 9.000 2.31 12.08 1.32 2.917 1.98 | 6.000 31.68 | 9.083 2. 31 | 12. 17 1.32 3.000 1.98 | 6.083 87. 12 | 9. 167 2. 31 | 12. 25 1.32 3.083 1. 98 | 6. 167 87. 12 | 9. 250 2.31

Unit Hyd Qpeak (cms)= 0.356

PEAK FLOW (cms) = 0.118 (i)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 20.887
TOTAL RAINFALL (mm) = 66.000
RUNOFF COEFFICIENT = 0.316

Dep. Storage

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(mm) =

1.00

5.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1. 98	6. 250	87. 12	9.33	2. 31
0. 167	0.00	3.250	1. 98	6. 333	11. 88	9.42	2. 31
0. 250	0.00	3.333	2.64	6. 417	11.88	9.50	2. 31
0.333	1.65	3.417	2.64	6. 500	11.88	9.58	2. 31
0. 417	1.65	3.500	2.64	6. 583	11. 88	9.67	2. 31
0.500	1.65	3.583	2.64	6. 667	11.88	9.75	2. 31
0.583	1.65	3.667	2. 64	6. 750	11. 88	9.83	2. 31
0.667	1.65	3.750	2.64	6. 833	5. 28	9.92	2. 31
0.750	1.65	3.833	2.64	6. 917	5. 28	10.00	2. 31
0.833	1.65	3.917	2.64	7.000	5. 28	10.08	2. 31
0. 917	1.65	4.000	2.64	7. 083	5. 28	10.17	2. 31
1.000	1.65	4.083	2.64	7. 167	5. 28	10.25	2. 31
1.083	1.65	4.167	2.64	7. 250	5. 28	10.33	1. 32
1. 167	1.65	4.250	2.64	7. 333	3. 96	10.42	1. 32
1. 250	1.65	4.333	3. 96 3. 96	7. 417	3. 96 3. 96	10.50 10.58	1. 32 1. 32
1. 333 1. 417	1. 65 1. 65	4.417 4.500	3. 96 3. 96	7. 500 7. 583	3. 96 3. 96	10.58	1. 32
1. 417	1.65	4.583	3. 96	7. 565 7. 667	3. 96	10.67	1. 32
1. 583	1.65	4. 667	3. 96	7. 750	3. 96	10.73	1. 32
1. 667	1.65	4.750	3. 96	7. 730	3. 96	10.03	1. 32
1. 750	1.65	4.730	5. 28	7. 033	3. 96	10.72	1. 32
1. 833	1.65	4.917	5. 28	8.000	3. 96	11.08	1. 32
1. 917	1.65	5.000	5. 28	8. 083	3. 96	11.17	1. 32
2.000	1.65	5.083	5. 28	8. 167	3. 96	11. 25	1. 32
2. 083	1.65	5. 167	5. 28	8. 250	3. 96	11.33	1. 32
2. 167	1.65	5.250	5. 28	8. 333	2. 31	11. 42	1. 32
2.250	1.65	5.333	7. 92	8. 417	2.31	11.50	1.32
2.333	1.98	5.417	7. 92	8. 500	2. 31	11. 58	1.32
2.417	1.98	5.500	7. 92	8. 583	2. 31	11. 67	1.32
2.500	1.98	5.583	7. 92	8. 667	2.31	11. 75	1.32
2.583	1.98	5.667	7. 92	8. 750	2.31	11.83	1.32
2.667	1.98	5.750	7. 92	8. 833	2.31	11. 92	1.32
2.750	1. 98	5.833	31.68	8. 917	2. 31	12.00	1. 32
2.833	1.98	5.917	31. 68	9. 000	2. 31	12.08	1. 32
2. 917	1.98	6.000	31. 68	9. 083	2. 31	12. 17	1. 32
3.000	1. 98	6.083	87. 12	9. 167	2. 31	12. 25	1. 32
3.083	1. 98	6. 167	87. 12	9. 250	2. 31		

Max.Eff.Inten.(mm/hr)= 87.12 38.29 over (min) 15.00 30.00 Storage Coeff. (min)= 15.71 (ii) 28.47 (ii) Unit Hyd. Tpeak (min)= 15.00 30.00

Unit Hyd. peak	(cms)=	0.07	0.04	
				TOTALS
PEAK FLOW	(cms)=	0. 28	0.11	0.355 (iii)
TIME TO PEAK	(hrs)=	6. 33	6.58	6. 33
RUNOFF VOLUME	(mm) =	65.00	19.52	35. 43
TOTAL RAINFALL	(mm) =	66.00	66.00	66.00
RUNOFF COEFFICI	ENT =	0. 98	0.30	0.54

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 Ia = Dep. Storage (Above)

 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) (ha)= 3.43 Area |ID= 1 DT= 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 I MPERVI OUS PERVIOUS (i) Surface Area (ha)= 1.71 1.71 Dep. Storage 1.00 5.00 (mm) =Average Slope 1.00 2.00 (%)= Length (m) =151. 22 40.00 Mannings n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1. 98	6. 250	87. 12	9.33	2. 31
0.167	0.00	3.250	1. 98	6. 333	11. 88	9.42	2. 31
0.250	0.00	3.333	2.64	6. 417	11.88	9.50	2. 31
0.333	1.65	3.417	2.64	6. 500	11. 88	9.58	2. 31
0.417	1.65	3.500	2.64	6. 583	11.88	9.67	2. 31
0.500	1.65	3.583	2.64	6. 667	11. 88	9.75	2. 31
0.583	1.65	3.667	2.64	6. 750	11. 88	9.83	2. 31
0.667	1.65	3.750	2.64	6. 833	5. 28	9.92	2. 31
0.750	1.65	3.833	2.64	6. 917	5. 28	10.00	2. 31
0.833	1.65	3.917	2.64	7.000	5. 28	10.08	2. 31
0. 917	1.65	4.000	2.64	7.083	5. 28	10. 17	2. 31
1.000	1.65	4.083	2.64	7. 167	5. 28	10. 25	2. 31
1.083	1.65	4.167	2.64	7. 250	5. 28	10. 33	1. 32
1. 167	1.65	4.250	2.64	7. 333	3. 96	10.42	1.32
1.250	1.65	4.333	3. 96	7. 417	3. 96	10.50	1. 32
1.333	1.65	4.417	3. 96	7.500	3. 96	10.58	1.32
1. 417	1.65	4.500	3. 96	7. 583	3. 96	10.67	1. 32
1.500	1.65	4.583	3. 96	7. 667	3. 96	10.75	1. 32

1. 583	1.65	4.667	3. 96	7. 750	3.96	10.83	1. 32
1. 667	1.65	4.750	3.96	7. 833	3.96	10. 92	1.32
1. 750	1.65	4.833	5. 28	7. 917	3.96	11.00	1.32
1.833	1.65	4.917	5. 28	8. 000	3.96	11.08	1.32
1. 917	1.65	5.000	5. 28	8. 083	3.96	11. 17	1.32
2.000	1.65	5.083	5. 28	8. 167	3.96	11. 25	1.32
2.083	1.65	5.167	5. 28	8. 250	3.96	11. 33	1.32
2. 167	1.65	5.250	5. 28	8. 333	2.31	11.42	1.32
2. 250	1.65	5.333	7. 92	8. 417	2.31	11.50	1.32
2. 333	1. 98	5.417	7. 92	8. 500	2.31	11.58	1.32
2. 417	1. 98	5.500	7. 92	8. 583	2.31	11.67	1.32
2.500	1. 98	5.583	7. 92	8. 667	2.31	11.75	1.32
2. 583	1. 98	5.667	7. 92	8. 750	2.31	11.83	1.32
2. 667	1. 98	5.750	7. 92	8. 833	2.31	11. 92	1.32
2.750	1. 98	5.833	31.68	8. 917	2.31	12.00	1.32
2.833	1. 98	5.917	31.68	9. 000	2.31	12.08	1.32
2. 917	1. 98	6.000	31.68	9. 083	2.31	12.17	1.32
3.000	1. 98	6.083	87. 12	9. 167	2.31	12. 25	1. 32
3. 083	1. 98	6. 167	87. 12	9. 250	2. 31	İ	
Max.Eff.Inten.(m	m/hr)-	87. 12		38. 29			
over	,	5. 00		15. 00			
Storage Coeff.		3. 46		13.82 (ii)			
Uni t Hyd. Tpeak		5. 00		15.00			
	(cms)=	0. 26		0. 08			
om t nyar poak	(Gillo)	0.20		0.00	*T0	TALS*	
PEAK FLOW	(cms)=	0. 29		0.11		384 (iii)
TIME TO PEAK	(hrs)=	6. 25		6.33	(5. 25	•
RUNOFF VOLUME	(mm) =	65.00		19. 52	3!	5. 43	
TOTAL RAINFALL	(mm) =	66.00	(56.00	60	5. 00	
RUNOFF COEFFICIE	NT =	0. 98		0.30	(0. 54	

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0041)				
1 + 2 = 3 11 + 2 = 3 1D1 = 1 (0033): + 1D2 = 2 (0036):	AREA (ha) 0. 41 5. 32	QPEAK (cms) 0.027 0.355	TPEAK (hrs) 6.33 6.33	R. V. (mm) 22. 25 35. 43
ID = 3 (0041):	5. 73	 0. 382	6. 33	====== 34.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD ( 0041)|
3 + 2 = 1
                      AREA QPEAK TPEAK
                    (ha) (cms) (hrs) (mm)
   ID1= 3 ( 0041): 5.73 0.382
                                   6. 33 34. 49
   + ID2= 2 ( 0037): 2.05 0.118
                                   6. 33 20. 89
     -----
     ID = 1 ( 0041): 7.78 0.500 6.33 30.91
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0041)|
1 + 2 = 3
                     AREA QPEAK TPEAK (ha) (cms) (hrs)
                                          (mm)
    ID1= 1 ( 0041): 7.78 0.500
+ ID2= 2 ( 0040): 3.43 0.384
                                   6. 33 30. 91
6. 25 35. 43
     -----
     ID = 3 (0041): 11.21 0.823
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
CALIB
 NASHYD ( 0039) Area (ha) = 0.83 Curve Number (CN) = 75.0
|ID= 1 DT= 5.0 min | Ia (mm)= 10.00
                                   # of Linear Res. (N) = 3.00
----- U. H. Tp(hrs)= 0.19
      NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
```

TRANSFORMED HYETOGRAPH								
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN	
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr	
0.083	0.00	3.167	1. 98	6. 250	87. 12	9.33	2. 31	
0. 167	0.00	3.250	1. 98	6. 333	11.88	9.42	2. 31	
0.250	0.00	3.333	2.64	6. 417	11.88	9.50	2. 31	
0.333	1.65	3.417	2.64	6. 500	11.88	9. 58	2. 31	
0.417	1.65	3.500	2.64	6. 583	11.88	9.67	2. 31	
0.500	1.65	3.583	2.64	6. 667	11.88	9. 75	2. 31	
0.583	1.65	3.667	2.64	6. 750	11.88	9.83	2. 31	
0.667	1.65	3.750	2.64	6. 833	5. 28	9. 92	2. 31	
0.750	1.65	3.833	2.64	6. 917	5. 28	10.00	2. 31	
0.833	1.65	3.917	2.64	7.000	5. 28	10.08	2. 31	
0. 917	1.65	4.000	2.64	7. 083	5. 28	10.17	2. 31	
1.000	1.65	4.083	2.64	7. 167	5. 28	10. 25	2. 31	
1.083	1.65	4.167	2.64	7. 250	5. 28	10.33	1.32	
1. 167	1.65	4.250	2.64	7. 333	3.96	10.42	1. 32	
1. 250	1.65	4.333	3.96	7. 417	3. 96	10.50	1. 32	

```
3. 96 | 7. 500
                                              3. 96 | 10. 58 1. 32
            1.417 1.65 | 4.500
                                 3. 96 | 7. 583
                                               3. 96 | 10. 67
                                                            1. 32
            1.500
                   1.65 | 4.583
                                 3. 96 | 7. 667
                                               3. 96 | 10. 75
                                                            1.32
                                 3. 96 | 7. 750
            1.583
                   1.65 | 4.667
                                               3. 96 | 10. 83
                                                            1. 32
                   1.65 | 4.750
                                 3. 96 | 7. 833
                                               3. 96 | 10. 92
            1.667
                                                            1. 32
            1. 750 1. 65 | 4. 833
                                 5. 28 | 7. 917
                                               3. 96 | 11. 00
                                 5. 28 | 8. 000
            1.833
                   1.65
                          4.917
                                               3. 96 | 11. 08
            1. 917
                   1.65 | 5.000
                                 5. 28 | 8. 083
                                               3. 96 | 11. 17
                                                            1.32
             2.000
                   1.65 | 5.083
                                 5. 28 | 8. 167
                                               3.96
                                                     11. 25
                                                            1.32
             2.083
                   1.65
                          5.167
                                 5. 28 | 8. 250
                                               3.96
                                                     11. 33
                                                            1.32
             2.167
                   1.65 İ
                          5.250
                                 5. 28 | 8. 333
                                               2. 31 j
                                                     11.42
                                                            1. 32
             2.250
                   1.65
                          5.333
                                 7. 92 | 8. 417
                                               2. 31
                                                     11.50
                                                            1.32
             2.333
                   1.98
                          5.417
                                 7. 92 | 8. 500
                                               2. 31 İ
                                                     11.58
                                                            1.32
             2.417
                   1. 98 İ
                          5.500
                                 7. 92 | 8. 583
                                               2. 31 İ
                                                     11.67
                                                            1.32
             2.500
                   1. 98
                          5.583
                                 7. 92 | 8. 667
                                               2.31
                                                     11. 75
                                                            1. 32
             2.583
                   1. 98 İ
                          5.667
                                 7. 92 | 8. 750
                                                     11.83
                                               2.31
                                                            1. 32
             2.667
                    1. 98 İ
                          5.750
                                 7. 92 | 8. 833
                                               2. 31 İ
                                                     11. 92
                                                            1.32
             2.750
                   1.98
                          5.833
                                 31. 68 | 8. 917
                                               2. 31
                                                     12.00
                                                            1.32
             2.833
                   1.98
                          5.917
                                 31.68 | 9.000
                                               2.31
                                                     12.08
                                                            1.32
             2.917
                    1.98
                          6.000
                                 31.68 | 9.083
                                               2. 31 | 12. 17
                                                            1.32
             3.000
                   1.98 |
                          6.083
                                 87. 12 | 9. 167
                                               2. 31 | 12. 25
                                                            1.32
             3.083
                  1. 98 | 6. 167
                                 87. 12 | 9. 250
                                               2.31
   Unit Hyd Opeak (cms) = 0.167
    PEAK FLOW
                 (cms) = 0.056 (i)
    TIME TO PEAK (hrs) = 6.333
    RUNOFF VOLUME (mm) = 22.242
    TOTAL RAINFALL (mm) = 66.000
    RUNOFF COEFFICIENT = 0.337
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0032)|
 1 + 2 = 3
                        AREA QPEAK
                                      TPEAK
                                             R. V.
                        (ha)
                            (cms)
                                      (hrs)
                                               (mm)
    ID1= 1 ( 0039):
                        0. 83 0. 056
                                      6. 33 22. 24
    + ID2= 2 ( 0041):
                      11. 21 0. 823
                                      6. 25 32. 29
      _____
      ID = 3 ( 0032): 12.04 0.875
                                      6, 25 31, 60
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
_____
***********
** SIMULATION: 3-100yr 24hr 15min SCS Type II **
**********
CALIB |
NASHYD ( 0033) | Area (ha)= 0.41 Curve Number (CN)= 75.0
```

| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 ----- U.H. Tp(hrs)= 0.20

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME) HYETOGI	RAPH	_	
TIME	RAI N	TIME		' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167		12. 250	127. 21	18. 33	2.08
0. 167	0.00	6.250		12. 333	20. 17	18.42	2.08
0.250	0.00	6.333		12. 417	20. 15	18.50	2.08
0.333	1.19	6.417	2. 15	12. 500	20. 15	18. 58	2.01
0.417	1.19	6.500		12. 583	13.72	18. 67	2.01
0.500	1.19	6.583		12. 667	13.72	18. 75	2. 01
0.583	1. 22	6.667		12. 750	13.72	18. 83	1. 93
0.667	1. 22	6.750		12. 833	9.44	18. 92	1. 93
0.750	1. 22	6.833		12. 917	9.44	19.00	1. 93
0.833	1. 25	6.917		13. 000	9. 44	19.08	1.86
0. 917	1. 25	7.000		13. 083	7. 97	19. 17	1.86
1.000	1. 25	7.083		13. 167	7. 97	19. 25	1.86
1. 083	1. 28	7.167		13. 250	7. 97	19.33	1. 79
1. 167	1. 28	7.250		13. 333	6. 75	19.42	1. 79
1. 250	1.28	7.333		13. 417	6. 75	19.50	1. 79
1.333	1.31	7.417		13. 500	6. 75	19.58	1. 71
1. 417	1.31	7.500		13. 583	5. 96	19.67	1.71
1.500	1.31	7.583		13. 667	5. 96	19.75	1.71
1. 583 1. 667	1.34 1.34	7.667 7.750		13. 750 13. 833	5. 96 5. 22	19. 83 19. 92	1. 64 1. 64
1. 667	1.34	7.750		13. 833 13. 917	5. 22 5. 22	19.92	1. 64
1. 730	1. 34	7. oss 7. 917		14. 000	5. 22	20.00	1. 57
1. 033	1.37	8.000		14. 000	4. 66	20.06	1. 57
2.000	1. 37	8.083		14. 063	4. 66	20.17	1. 57
2.083	1. 37	8. 167		14. 167	4. 66	20. 23	1. 52
2. 167	1. 39	8.250		14. 333	4. 25	20.33	1. 52
2. 250	1. 39	8.333		14. 417	4. 25	20. 50	1. 52
2. 333	1.43	8.417		14. 500	4. 25	20.58	1. 51
2. 417	1.43	8.500		14. 583	4. 05	20.67	1. 51
2.500	1.43	8.583		14. 667	4. 05	20.75	1. 51
2.583	1.46			14. 750	4.05	20.83	1.49
2.667	1.46	8.750		14. 833	3.83	20. 92	1.49
2.750	1.46	8.833	3. 33	14. 917	3.83	21.00	1.49
2.833	1.48	8. 917	3. 33	15. 000	3.83	21.08	1.48
2.917	1.48	9.000	3.33	15. 083	3.63	21. 17	1.48
3.000	1.48	9.083	3.61	15. 167	3.63	21. 25	1.48
3.083	1.51	9. 167	3.61	15. 250	3.63	21. 33	1.46
3.167	1.51	9. 250		15. 333	3.42	21.42	1.46
3.250	1.51	9.333		15. 417	3.42	21.50	1.46
3.333	1.55	9.417		15. 500	3.42	21.58	1. 45
3.417	1.55	9.500		15. 583	3. 22	21.67	1. 45
3.500	1.55	9.583		15. 667	3. 22	21.75	1. 45
3.583	1.57	9.667	3.76	15. 750	3. 22	21.83	1.43

TRANCFORMER UVETOCRADU

```
3. 76 | 15. 833
3.667 1.57 | 9.750
                                       3.750 1.57 | 9.833
                        4. 01 | 15. 917
                                        3.01 | 22.00
                                                        1.43
                        4. 01 | 16. 000
3.833
       1.60 | 9.917
                                        3.01 | 22.08
                                                        1.42
3.917
       1.60 | 10.000
                        4. 01 | 16. 083
                                        2. 81 | 22. 17
                                                        1.42
4.000
       1.60 | 10.083
                        4. 46 | 16. 167
                                         2. 81 | 22. 25
                                                        1.42
       1.63 | 10.167
                        4. 46 | 16. 250
                                        2. 81 | 22. 33
4.083
                                                        1.40
       1.63 | 10.250
                        4. 46 | 16. 333
4. 167
                                         2.67
                                               22.42
                                                        1.40
       1.63 | 10.333
4.250
                        5. 07 | 16. 417
                                         2.67
                                               22.50
                                                        1.40
4.333
       1.68 | 10.417
                        5. 07 | 16. 500
                                         2.67
                                               22.58
                                                        1.39
4.417
       1.68 | 10.500
                        5. 07 | 16. 583
                                         2.60
                                               22.67
                                                        1.39
4.500
       1.68 | 10.583
                        5. 75 | 16. 667
                                         2.60 j
                                               22.75
                                                        1.39
4.583
       1.73 | 10.667
                        5. 75 | 16. 750
                                         2.60
                                               22.83
                                                        1.37
       1.73 | 10.750
4.667
                        5. 75 | 16. 833
                                         2.52 İ
                                               22. 92
                                                        1.37
4.750
       1.73 | 10.833
                        6. 73 | 16. 917
                                         2. 52 İ
                                               23.00
                                                        1.37
4.833
       1. 79 | 10. 917
                        6. 73 | 17. 000
                                         2.52
                                                23.08
                                                        1.36
4.917
       1.79 | 11.000
                        6. 73 | 17. 083
                                         2. 45 İ
                                                23. 17
                                                        1.36
5.000
        1.79 | 11.083
                        7. 86 | 17. 167
                                         2. 45 İ
                                                23. 25
                                                        1.36
                        7. 86 | 17. 250
5.083
       1.85 | 11.167
                                         2.45
                                                23.33
                                                         1.35
                        7. 86 | 17. 333
5. 167
        1.85 | 11.250
                                         2.37
                                                23.42
                                                         1.35
        1.85 | 11.333
                        9. 93 | 17. 417
5.250
                                         2.37
                                                23.50
                                                         1.35
5.333
        1. 91 | 11. 417
                        9. 93 | 17. 500
                                         2.37
                                                23.58
                                                         1.33
5.417
        1. 91 | 11. 500
                        9. 93 | 17. 583
                                         2.30
                                                23.67
                                                         1.33
5.500
        1. 91 | 11. 583
                       12.64 | 17.667
                                         2.30
                                                23.75
                                                         1.33
                        12.64 | 17.750
5.583
        1. 97 | 11. 667
                                         2.30
                                                23.83
                                                         1.31
                       12. 64 | 17. 833
5.667
        1. 97 | 11. 750
                                         2. 23
                                               23.92
                                                         1. 31
                       51. 54 | 17. 917
5.750
        1. 97 | 11. 833
                                         2. 22
                                               24.00
                                                         1.31
        2.03 | 11.917
                       51. 54 | 18. 000
5.833
                                         2. 22 | 24. 08
                                                         1.30
5.917
        2.03 | 12.000
                       51. 54 | 18. 083
                                         2. 15 | 24. 17
                                                         1.30
6.000
       2.03 | 12.083 | 127.20 | 18.167
                                         2. 15 | 24. 25
                                                        1.30
6.083
       2. 09 | 12. 167 | 127. 21 | 18. 250
                                         2.15
```

PEAK FLOW (cms)= 0.062 (i) TIME TO PEAK (hrs)= 12.333 RUNOFF VOLUME (mm)= 60.101 TOTAL RAINFALL (mm)= 117.600 RUNOFF COEFFICIENT = 0.511

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME hrs 0. 083 0. 167 0. 250 0. 333 0. 417 0. 500 0. 583 0. 667 0. 750 0. 833 0. 917 1. 000 1. 083 1. 167 1. 250 1. 333 1. 417 2. 000 2. 083 2. 167 2. 250 2. 333 2. 417 2. 500 2. 583 2. 417 2. 500 2. 583 2. 417 2. 500 3. 333 3. 167 3. 250 3. 333 3. 167 3. 250 3. 333 3. 167 3. 250 3. 333 3. 417 3. 500 3. 583	1. 46 1. 48 1. 48 1. 48 1. 51 1. 51 1. 55 1. 55 1. 55	TIME hrs hrs hrs 6.167 6.250 6.333 6.417 6.500 6.583 6.667 7.083 7.167 7.250 7.333 7.417 7.500 7.583 7.667 7.750 7.833 7.417 8.000 8.833 8.167 8.250 8.333 8.417 8.500 8.583 8.667 8.750 9.003 8.917 9.000 9.083 9.167 9.250 9.333 9.417 9.500 9.583 9.667 9.667 9.583 9.667	RAIN mm/hr 2. 09 2. 105 2. 15 2. 15 2. 20 2. 20 2. 20 2. 20 2. 20 2. 26 2. 26 2. 32 2. 38 2. 38 2. 38 2. 38 2. 38 2. 38 2. 44 2. 44 2. 50 2. 50 2. 56 2. 56 2. 56 2. 74 2. 74 3. 02 3. 02 3. 33 3. 33 3. 31 3. 31 3. 61 3. 76 3. 76 3. 76 3. 76 3. 76 3. 76 3. 76 3. 76 3. 76 3. 76 3. 76 3. 76	TIME hrs 12. 250 12. 333 12. 417 12. 500 12. 583 12. 667 12. 750 13. 083 13. 167 13. 250 13. 333 13. 417 13. 500 13. 583 13. 667 14. 250 14. 333 14. 417 14. 500 14. 333 14. 417 14. 500 14. 583 14. 667 14. 750 15. 083 15. 167 15. 500 15. 333 15. 417 15. 500 15. 583 15. 667 15. 750 15. 583 15. 667 15. 750 15.	3. 83 3. 83 3. 63 3. 63 3. 63 3. 42 3. 42 3. 22 3. 22 3. 22	TIME hrs 18. 33 18. 42 18. 50 18. 58 18. 67 18. 75 18. 83 18. 92 19. 00 19. 08 19. 17 19. 25 19. 50 19. 58 19. 67 19. 75 19. 83 19. 92 20. 00 20. 08 20. 17 20. 25 20. 33 20. 42 20. 50 20. 50 20. 50 20. 58 20. 67 20. 75 20. 83 20. 92 21. 00 21. 08 21. 17 21. 25 21. 33 21. 42 21. 50 21. 58 21. 57 21. 58 21. 58 21. 75 21. 83	RAIN mm/hr 2. 08 2. 08 2. 08 2. 01 2. 01 1. 93 1. 93 1. 86 1. 86 1. 79 1. 79 1. 71 1. 71 1. 64 1. 64 1. 64 1. 57 1. 57 1. 57 1. 57 1. 57 1. 51 1. 51 1. 49 1. 48 1. 48 1. 48 1. 48 1. 46 1. 46 1. 46 1. 46 1. 46 1. 46 1. 45 1. 45 1. 43
3. 333 3. 417 3. 500	1.55 1.55 1.55	9.417 9.500 9.583	3. 76 3. 76 3. 76	15. 500 15. 583 15. 667	3. 42 3. 22 3. 22 3. 22 3. 01	21.58 21.67 21.75	1. 45 1. 45 1. 45
4. 000 4. 083 4. 167	1.60 1.63	10.083 10.167 10.250	4. 46 4. 46	16. 167 16. 250 16. 333	2. 81 2. 81	22. 25 22. 33 22. 42	1. 42 1. 40 1. 40

```
2. 67 | 22. 58 1. 39
4. 417 1. 68 | 10. 500
                    5. 07 | 16. 583
                                  2.60 | 22.67
4.500 1.68 10.583
                    5. 75 | 16. 667
                                  2. 60 | 22. 75
                                               1. 39
4. 583 1. 73 | 10. 667
                    5. 75 | 16. 750
                                  2. 60 | 22. 83 1. 37
4. 667 1. 73 | 10. 750
                    5. 75 | 16. 833
                                  2. 52 | 22. 92 1. 37
4. 750 1. 73 | 10. 833
                    6. 73 | 16. 917
                                  2. 52 | 23. 00
                                               1.37
4. 833 1. 79 | 10. 917
                    6. 73 | 17. 000
                                               1. 36
                                  2. 52 | 23. 08
4. 917 1. 79 | 11. 000
                    6. 73 | 17. 083
                                  2. 45 | 23. 17
                                                1.36
5.000 1.79 11.083
                    7. 86 | 17. 167
                                  2. 45 | 23. 25
                                                1.36
5. 083 1. 85 | 11. 167
                    7. 86 | 17. 250
                                  2. 45 | 23. 33
                                                1.35
7. 86 | 17. 333
                                  2. 37 | 23. 42
                                                1.35
                    9. 93 | 17. 417
                                   2. 37 | 23. 50
                                                1.35
5. 333 1. 91 11. 417
                    9. 93 | 17. 500
                                  2. 37 | 23. 58
                                                1.33
5. 417 1. 91 | 11. 500
                    9. 93 | 17. 583
                                   2. 30 | 23. 67
                                                1.33
5. 500 1. 91 | 11. 583
5. 583 1. 97 | 11. 667
                   12. 64 | 17. 667
                                   2. 30 | 23. 75
                                                1.33
                    12. 64 | 17. 750
                                   2. 30 | 23. 83
                                                1.31
2. 23 | 23. 92
                                                1.31
                                   2. 22 | 24. 00
                                                1. 31
2. 22 | 24. 08
                                                1.30
                                   2. 15 | 24. 17
                                                1.30
6.000 2.03 | 12.083 | 127.20 | 18.167
                                   2. 15 | 24. 25
                                                1.30
6. 083 2. 09 | 12. 167 127. 21 | 18. 250
                                   2.15
```

PEAK FLOW (cms) = 0.280 (i) TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 57.370 TOTAL RAINFALL (mm) = 117.600 RUNOFF COEFFICIENT = 0.488

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0036) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	5. 32 50. 00	Dir.	Conn. (%)=	35. 00
		I MPERVI O	US	PERVI OI	JS (i)	
Surface Area	(ha)=	2. 66		2.60	5	
Dep. Storage	(mm) =	1.00		5.00)	
Average Slope	(%)=	1.00		1.00)	
Length	(m)=	188. 33		40.00)	
Mannings n	=	0. 130		0. 250	-	
wannings n	_	0. 130		0. 230	,	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ---TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN

hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	2. 09 2. 09	12. 250	127. 21	18.33	2. 08
0. 167 0. 250	0. 00 0. 00	6.250	2. 09	12. 333 12. 417	20. 17 20. 15	18. 42 18. 50	2. 08 2. 08
0. 333	1. 19	6.417	2. 15	12. 500	20. 15	18.58	2. 01
0. 417	1. 19	6.500	2. 15	12. 583	13. 72	18.67	2. 01
0.500	1. 19	6.583	2. 20	12. 667	13. 72	18.75	2. 01
0.583	1.22	6.667	2. 20	12. 750	13.72	18. 83	1. 93
0.667	1.22	6.750	2. 20	12.833	9.44	18. 92	1. 93
0.750	1.22	6.833	2. 26	12. 917	9.44	19.00	1. 93
0.833	1. 25	6.917	2. 26	13.000	9. 44	19.08	1. 86
0. 917	1. 25	7.000	2. 26	13. 083	7. 97	19.17	1.86
1.000	1. 25 1. 28	7.083 7.167	2. 32 2. 32	13. 167 13. 250	7. 97 7. 97	19. 25 19. 33	1. 86 1. 79
1. 083 1. 167	1. 28	7.167 7.250	2. 32	13. 250	7. 97 6. 75	19. 33 19. 42	1. 79 1. 79
1. 250	1. 28	7.230	2. 38	13. 417	6. 75	19.50	1. 79
1. 333	1. 31	7.417	2. 38	13. 500	6. 75	19.58	1. 71
1.417	1.31	7.500	2.38	13. 583	5. 96	19. 67	1. 71
1.500	1.31	7.583	2.44	13. 667	5. 96	19. 75	1.71
1.583	1.34	7.667	2.44	13. 750	5. 96	19.83	1.64
1. 667	1.34	7.750	2.44	13. 833	5. 22	19. 92	1. 64
1.750	1.34	7.833	2.50	13. 917	5. 22	20.00	1. 64
1.833	1.37	7.917	2.50	14.000	5. 22	20.08	1.57
1. 917 2. 000	1. 37 1. 37	8.000 8.083	2. 50 2. 56	14. 083 14. 167	4. 66 4. 66	20. 17 20. 25	1. 57 1. 57
2. 083	1.37	8.167	2. 56	14. 250	4. 66	20. 23	1. 52
2. 167	1.39	8.250	2. 56	14. 333	4. 25	20.42	1. 52
2. 250	1. 39	8.333	2. 74	14. 417	4. 25	20.50	1. 52
2.333	1.43	8.417	2.74	14. 500	4. 25	20. 58	1. 51
2.417	1.43	8.500	2.74	14. 583	4.05	20.67	1. 51
2.500	1.43	8.583	3.02	14. 667	4. 05	20.75	1. 51
2. 583	1.46	8.667	3. 02	14. 750	4. 05	20.83	1. 49
2.667	1.46	8.750	3. 02	14. 833	3.83		1.49
2. 750 2. 833	1. 46 1. 48	8.833 8.917	3. 33 3. 33	14. 917 15. 000	3. 83 3. 83	21.00 21.08	1. 49 1. 48
2. 917	1.48	9.000	3. 33	15. 083	3. 63	21.00	1. 48
3.000	1. 48	9.083	3. 61	15. 167	3. 63	21. 17	1. 48
3.083	1.51	9.167	3. 61	15. 250	3. 63	21. 33	1. 46
3. 167	1.51	9. 250	3. 61	15. 333	3.42	21.42	1.46
3. 250	1.51	9.333	3.76	15. 417	3.42	21.50	1. 46
3. 333	1.55	9.417	3. 76	15. 500	3. 42	21.58	1. 45
3. 417	1.55	9.500	3. 76	15. 583	3. 22	21.67	1. 45
3.500	1. 55 1. 57	9.583 9.667	3. 76 3. 76	15. 667	3. 22 3. 22	21.75	1. 45
3. 583 3. 667	1.57	9.750	3. 76	15. 750 15. 833	3. 22	21.83 21.92	1. 43 1. 43
3. 750	1.57	9.833	4. 01	15. 917	3. 01	21. 72	1. 43
3. 833	1.60	9.917	4. 01	16. 000	3. 01	22.08	1. 42
3. 917	1.60	10.000	4. 01	16. 083	2. 81	22. 17	1. 42
4.000	1.60	10.083	4.46	16. 167	2.81	22. 25	1.42
4.083	1.63	10.167	4.46	16. 250	2.81	22. 33	1.40
4. 167	1.63	10.250	4.46	16. 333	2.67	22.42	1. 40
4. 250	1.63	10.333	5. 07	16. 417	2. 67	22.50	1. 40

4. 333	10.583 10.667 10.750 10.833 10.917 11.000 11.083 11.167 11.250 11.333 11.417 11.500 11.583 11.667 11.750 11.833 11.917 12.000 12.083	5. 07 16. 500 5. 07 16. 583 5. 75 16. 667 5. 75 16. 833 6. 73 16. 917 6. 73 17. 000 6. 73 17. 083 7. 86 17. 167 7. 86 17. 250 7. 86 17. 333 9. 93 17. 417 9. 93 17. 583 12. 64 17. 583 12. 64 17. 750 12. 64 17. 750 12. 64 17. 917 51. 54 18. 000 51. 54 18. 000 51. 54 18. 083 127. 20 18. 167 127. 21 18. 250	2. 67 2. 60 2. 60 2. 52 2. 52 2. 45 2. 45 2. 37 2. 37 2. 37 2. 30 2. 30 2. 23 2. 22 2. 22 2. 15 2. 15	22. 58 22. 67 22. 75 22. 83 22. 92 23. 00 23. 08 23. 17 23. 25 23. 33 23. 42 23. 50 23. 58 23. 67 23. 75 23. 83 23. 92 24. 00 24. 08 24. 17 24. 25	1. 39 1. 39 1. 39 1. 37 1. 37 1. 36 1. 36 1. 36 1. 35 1. 35 1. 35 1. 33 1. 33 1. 33 1. 31 1. 31 1. 30 1. 30
Max. Eff. Inten. (mm/hr) = over (min) Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) =	127. 20 15. 00 13. 50 15. 00 0. 08	88. 40 25. 00 (ii) 22. 63 (ii) 25. 00 0. 05			
PEAK FLOW (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT =	0. 45 12. 33 116. 60 117. 60 0. 99	0. 30 12. 50 51. 86 117. 60 0. 44	0. 12 74 117	ΓALS* 689 (iii 2. 42 4. 51 7. 60). 63)

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area Total	(ha)= Imp(%)=	3. 43 50. 00	Di r.	Conn. (%)=	35. 00	
Surface Area Dep. Storage Average Slope	(ha) = (mm) = (%) =	I MPERVI 1. 7 1. 0 1. 0	1 0	PERVI 0 1. 7 5. 0 2. 0	1 0		

Length 151. 22 40.00 Mannings n 0.013 0. 250

		TRA	ANSFORME	D HYETOGI	RAPH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0. 083	0.00	6. 167	2.09	12. 250	127. 21	18. 33	2. 08
0. 167	0.00	6.250	2.09	12. 333	20. 17	18. 42	2. 08
0. 250	0.00	6.333	2. 15	12. 417	20. 15	18. 50	2. 08
0. 333	1. 19	6.417	2. 15	12. 500	20. 15	18. 58	2. 01
0. 417	1.19	6.500	2. 15	12. 583	13. 72	18. 67	2. 01
0.500	1. 19	6.583	2. 20	12. 667	13. 72	18. 75	2. 01
0. 583	1. 22	6.667	2. 20	12. 750	13. 72	18. 83	1. 93
0. 667	1. 22	6.750	2. 20	12. 833	9.44	18. 92	1. 93
0.750	1. 22	6.833	2. 26	12. 917	9. 44	19. 00	1. 93
0.833	1. 25	6.917	2. 26	13.000	9.44	19. 08	1. 86
0. 917	1. 25	7.000	2. 26	13. 083	7. 97	19. 17	1. 86
1.000	1. 25	7.083	2. 32	13. 167	7. 97	19. 25	1. 86
1. 083	1. 28	7.167	2. 32	13. 250	7. 97	19. 33	1. 79
1. 167	1. 28	7.250	2. 32	13. 333	6. 75	19. 42	1. 79
1. 250	1. 28	7.333	2. 38	13. 417	6. 75	19.50	1. 79
1. 333	1.31	7.417	2. 38	13.500	6. 75	19. 58	1. 71
1. 417	1.31	7.500	2. 38	13. 583	5. 96	19. 67	1. 71
1.500	1.31	7.583	2.44	13. 667	5. 96	19. 75	1. 71
1. 583	1.34	7.667	2.44	13. 750	5. 96	19.83	1.64
1. 667	1.34	7.750	2.44	13. 833	5. 22	19. 92	1.64
1. 750	1.34	7.833	2.50	13. 917	5. 22	20.00	1.64
1.833	1.37	7.917	2.50	14.000	5. 22	20.08	1.57
1. 917	1.37	8.000	2.50	14. 083	4.66	20. 17	1.57
2.000	1.37	8.083	2.56	14. 167	4.66	20. 25	1.57
2.083	1.39	8.167	2.56	14. 250	4. 66	20. 33	1.52
2. 167	1.39	8.250	2.56	14. 333	4. 25	20. 42	1. 52
2. 250	1.39	8.333	2.74	14. 417	4. 25	20.50	1. 52
2. 333	1.43	8.417	2.74	14. 500	4. 25	20.58	1.51
2. 417	1.43	8.500	2.74	14. 583	4. 05	20.67	1. 51
2.500 2.583	1. 43 1. 46	8.583	3. 02 3. 02	14.667	4. 05 4. 05	20. 75 20. 83	1.51
		8.667		14. 750	3.83		1.49
2. 667	1.46	8.750	3. 02	14. 833		20. 92	1.49
2. 750 2. 833	1. 46 1. 48	8.833	3. 33 3. 33	14. 917 15. 000	3. 83 3. 83	21. 00 21. 08	1. 49 1. 48
2. 833 2. 917	1.48	8.917	3. 33	15. 000 15. 083	3. 63	21.08	1. 48
3.000	1.48	9.000 9.083	3. 33 3. 61	15. 063	3. 63	21. 17	1. 48
3.000	1.48		3. 61	15. 167 15. 250	3. 63	21. 25	1. 48
		9.167					
3. 167 3. 250	1.51	9.250	3. 61 3. 76	15. 333	3. 42 3. 42	21. 42 21. 50	1.46
	1.51	9.333		15. 417			1.46
3. 333	1.55	9.417	3. 76 3. 76	15. 500	3. 42 3. 22	21.58	1.45
3. 417	1.55	9.500		15. 583		21.67	1.45
3.500	1.55	9.583	3. 76	15. 667	3. 22	21.75	1. 45
3. 583	1.57	9.667	3. 76	15. 750	3. 22	21.83	1. 43

	3. 667 3. 757 3. 833 3. 917 4. 000 4. 083 4. 167 4. 250 4. 333 4. 417 4. 500 4. 583 4. 667 4. 750 5. 000 5. 083 5. 167 5. 250 5. 333 5. 417 5. 583 5. 667 5. 750	1. 57 1. 60 1. 60 1. 60 1. 60 1. 63 1. 63 1. 63 1. 63 1. 68 7. 1. 68 7. 1. 68 7. 1. 68 7. 1. 73 1. 73 1. 73 1. 73 1. 73 1. 73 1. 73 1. 73 1. 73 1. 73 1. 73 1. 79 1. 79 1. 85 1. 85 1. 91 1. 91 1. 97 1. 97 1. 97	9.833 9.917 10.000 10.083 10.167 10.250 10.333 10.417 10.500 10.583 10.667 10.750 11.083 11.167 11.250 11.333 11.417 11.500 11.583 11.667 11.750 11.833	4. 01 4. 01 4. 46 4. 46 5. 07 5. 07 5. 75 5. 75 6. 73 6. 73 6. 73 7. 86 7. 86 7. 86 9. 93 9. 93 9. 93 12. 64 12. 64 51. 54	16. 250 16. 333 16. 417 16. 500 16. 583 16. 667 16. 750 16. 833 16. 917 17. 000 17. 083 17. 167 17. 250 17. 333 17. 417 17. 500 17. 583 17. 667 17. 750 17. 833 17. 833 17. 917	3. 01 3. 01 3. 01 2. 81 2. 81 2. 67 2. 67 2. 66 2. 60 2. 52 2. 52 2. 45 2. 45 2. 37 2. 37 2. 30 2. 30 2. 30 2. 23 2. 22 22 22 22 22 2	22. 00 22. 08 22. 17 22. 25 22. 33 22. 42 22. 50 22. 58 22. 75 22. 83 22. 92 23. 00 23. 08 23. 17 23. 25 23. 33 23. 42 23. 50 23. 58 23. 67 23. 75 23. 88 23. 67 23. 75 23. 88 23. 75 24. 88 25. 67 26. 75 27. 75 28. 88 29. 92 29. 90 20. 90	1. 43 1. 42 1. 42 1. 42 1. 40 1. 40 1. 39 1. 37 1. 37 1. 37 1. 36 1. 36 1. 35 1. 35 1. 33 1. 33 1. 33 1. 33
	5. 750	1.97	11.833			2. 22	24.00	1. 31
	5. 833		11.917		18. 000	2. 22	24. 08	1. 30
	5. 917		12.000 12.083		18. 083	2. 15 2. 15	24. 17 24. 25	1. 30 1. 30
	6. 000 6. 083		12.083		18. 167 18. 250	2. 15		1. 30
	0.000	2.07	1.2		1.0.200	2		
	Max. Eff. Inten. (n	,	127. 21		88. 40			
		(mi n)	5.00	(::)	15.00			
	Storage Coeff. Unit Hyd. Tpeak	(mi n) =	2. 97 5. 00	(11)	10.39 (ii) 15.00			
	Unit Hyd. peak		0. 28		0.09			
	, , , , , , , , , , , , , , , , , , ,	()				*T01	TALS*	
	PEAK FLOW	(cms)=	0.42		0. 29		680 (iii)	
	TIME TO PEAK	(hrs)=	12. 25		12.33		2. 25	
	RUNOFF VOLUME TOTAL RAINFALL	(mm) = (mm) =	116. 60 117. 60		51. 86 117. 60		1. 52 7. 60	
	RUNOFF COEFFICIE		0. 99		0.44). 63	
٠.	WADNING CTORAC		IC CHALLE	-D -TUAN	TIME CTEDI			

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

.....

ADD HYD (0041) 1 + 2 = 3	(ha) 0. 41 5. 32 ====== 5. 73	0. 743	(hrs) 12. 33 12. 42 ====================================	(mm) 60.10 74.51 ====== 73.48	
ID1= 3 (0041):	(ha) 5. 73 2. 05 ====== 7. 78	0. 280 ====== 1. 022	(hrs) 12. 42 12. 33 12. 33	(mm) 73.48 57.37 ====== 69.24	
ADD HYD (0041) 1 + 2 = 3 101 = 1 (0041): + 1D2 = 2 (0040): 	3. 43 ===== 11. 21	0. 680 ====== 1. 592	12. 25 ======= 12. 25	74. 52 ====== 70. 85	
CALIB	(mm Tp(hrs)= 10.00)= 0.19	# of Li	near Res	. (N) = 3.00

---- TRANSFORMED HYETOGRAPH ----

RAIN | TIME RAIN | TIME RAIN | TIME

mm/hr | hrs mm/hr | hrs

2. 09 | 12. 250 | 127. 21 | 18. 33

2. 09 | 12. 333 | 20. 17 | 18. 42

2. 15 | 12. 417 | 20. 15 | 18. 50

2. 15 | 12. 500 | 20. 15 | 18. 58

RAIN

mm/hr

2.08

2.08

2.08

2.01

TIME

0.083

0. 167 0. 250

0.333

hrs mm/hr

hrs

0.00 | 6.167

0.00 | 6.250

0.00 | 6.333

1. 19 | 6. 417

```
0.417
       1.19 | 6.500
                         2. 15 | 12. 583 | 13. 72 | 18. 67
                                                           2.01
                         2. 20 | 12. 667
                                          13.72
0.500
        1.19
                6.583
                                                  18. 75
                                                           2.01
0.583
         1.22
                6.667
                         2. 20 | 12. 750
                                          13.72
                                                  18.83
                                                           1.93
                         2. 20 | 12. 833
                                                  18.92
0.667
         1.22
                6.750
                                          9.44
                                                           1.93
0.750
                         2. 26 | 12. 917
                                          9.44
                                                  19.00
        1. 22
                6.833
                                                           1.93
0.833
        1.25
                6.917
                         2. 26 | 13. 000
                                          9.44
                                                  19.08
                                                           1.86
                                                  19.17
0.917
         1.25
                7.000
                         2. 26 | 13. 083
                                          7.97
                                                           1.86
1.000
        1.25
                7.083
                         2. 32 | 13. 167
                                          7.97
                                                  19. 25
                                                           1 86
1.083
        1.28
                7.167
                         2. 32 | 13. 250
                                          7. 97
                                                  19.33
                                                           1.79
1. 167
        1.28
                7.250
                         2. 32 | 13. 333
                                          6.75
                                                  19.42
                                                           1 79
1.250
                7.333
                         2. 38 | 13. 417
                                          6.75
                                                  19.50
                                                           1.79
        1.28
1.333
         1.31
                7.417
                         2. 38 | 13. 500
                                          6.75
                                                  19.58
                                                           1.71
1.417
         1.31
                7.500
                         2. 38 | 13. 583
                                          5.96
                                                  19.67
                                                           1.71
1.500
        1.31
                7.583
                         2.44 | 13.667
                                          5.96
                                                  19.75
                                                           1.71
1.583
         1.34
                7.667
                         2. 44 | 13. 750
                                          5.96
                                                  19.83
                                                           1.64
                         2. 44 | 13. 833
1.667
         1.34
                7.750
                                          5. 22
                                                  19.92
                                                           1.64
1.750
                7.833
                         2.50 | 13.917
         1.34
                                          5. 22
                                                  20.00
                                                           1.64
1.833
         1.37
                7.917
                          2.50 | 14.000
                                          5. 22
                                                  20.08
                                                           1.57
1.917
         1.37
                8.000
                         2.50 | 14.083
                                                  20.17
                                          4.66
                                                           1.57
2.000
         1.37
                8.083
                          2.56 | 14.167
                                           4.66
                                                  20.25
                                                           1.57
2.083
         1.39
                8.167
                          2.56 | 14.250
                                           4.66
                                                  20.33
                                                           1.52
2.167
         1.39
                8.250
                         2.56 | 14.333
                                           4.25
                                                  20.42
                                                           1.52
2.250
         1.39
                8.333
                         2. 74 | 14. 417
                                           4.25
                                                  20.50
                                                           1.52
2.333
         1.43
                8.417
                          2. 74 | 14. 500
                                          4.25
                                                  20.58
                                                           1.51
2.417
                8.500
                         2. 74 | 14. 583
         1.43
                                           4.05
                                                  20.67
                                                           1.51
2.500
                8.583
                         3. 02 | 14. 667
         1.43
                                           4.05
                                                  20.75
                                                           1.51
2.583
         1.46
                8.667
                         3.02 | 14.750
                                          4.05
                                                  20.83
                                                           1.49
2.667
                8.750
                         3. 02 | 14. 833
                                                  20.92
                                                           1.49
         1.46
                                          3.83
2.750
                8.833
                          3. 33 | 14. 917
         1.46
                                          3.83
                                                  21.00
                                                           1.49
2.833
                8.917
                         3. 33 | 15. 000
         1.48
                                          3.83
                                                  21.08
                                                           1.48
2.917
                9.000
                         3. 33 | 15. 083
         1.48
                                          3.63
                                                  21. 17
                                                           1.48
                         3. 61 | 15. 167
3.000
                9.083
         1.48
                                          3.63
                                                  21. 25
                                                           1.48
3.083
         1.51
                9.167
                          3.61 | 15.250
                                          3.63
                                                  21.33
                                                           1.46
3.167
         1.51
                9.250
                          3. 61 | 15. 333
                                          3.42
                                                  21.42
                                                           1 46
3.250
                9.333
                          3. 76 | 15. 417
         1.51
                                          3.42
                                                  21.50
                                                           1 46
3.333
         1.55
                9.417
                          3. 76 | 15. 500
                                          3.42
                                                  21.58
                                                           1.45
3.417
         1.55
                9.500
                          3.76 | 15.583
                                          3.22
                                                  21.67
                                                           1 45
3.500
                          3. 76 | 15. 667
         1.55
                9.583
                                          3. 22
                                                  21.75
                                                           1.45
3.583
         1.57
                9.667
                          3.76 | 15.750
                                          3. 22
                                                  21.83
                                                           1.43
3.667
         1.57
                9.750
                          3. 76 | 15. 833
                                          3.01
                                                  21.92
                                                           1.43
3.750
         1.57
                9.833
                         4. 01 | 15. 917
                                          3.01
                                                  22.00
                                                           1.43
                9.917
                          4. 01 | 16. 000
3.833
         1.60
                                          3.01
                                                  22.08
                                                           1.42
3.917
         1.60 | 10.000
                         4. 01 | 16. 083
                                          2.81
                                                  22.17
                                                           1.42
4.000
         1.60 | 10.083
                         4. 46 | 16. 167
                                          2.81
                                                  22.25
                                                           1.42
4.083
         1.63 | 10.167
                          4.46 | 16.250
                                          2.81
                                                  22.33
                                                           1.40
                          4. 46 | 16. 333
4. 167
         1.63 | 10.250
                                          2.67
                                                  22.42
                                                           1.40
4.250
         1.63 | 10.333
                         5. 07 | 16. 417
                                          2.67
                                                 22.50
                                                           1.40
4.333
         1.68 | 10.417
                          5.07 | 16.500
                                          2.67
                                                  22.58
                                                           1.39
                         5.07 | 16.583
4.417
         1.68 | 10.500
                                          2.60
                                                 22.67
                                                           1.39
                          5. 75 | 16. 667
4.500
         1.68 | 10.583
                                          2.60
                                                 22.75
                                                           1.39
                                                           1.37
4.583
         1.73 | 10.667
                          5. 75 | 16. 750
                                          2.60
                                                 22.83
         1.73 | 10.750
                          5. 75 | 16. 833
                                          2. 52 | 22. 92
4.667
                                                           1.37
```

```
4.750
       1.73 | 10.833
                          6. 73 | 16. 917
                                           2. 52 | 23. 00
        1.79 | 10.917
                          6. 73 | 17. 000
                                           2. 52 | 23. 08
4.833
4.917
         1.79 | 11.000
                          6.73 | 17.083
                                           2.45
                                                  23.17
5.000
         1.79 | 11.083
                          7. 86 | 17. 167
                                           2. 45 | 23. 25
                                                             1 36
         1.85 | 11.167
                          7.86 | 17.250
                                           2. 45 | 23. 33
5.083
                                                             1.35
5.167
         1.85 | 11.250
                          7.86 | 17.333
                                           2.37
                                                  23.42
                                                             1.35
5.250
         1.85 | 11.333
                          9. 93 | 17. 417
                                           2.37
                                                  23.50
                                                             1.35
5.333
         1. 91 | 11. 417
                          9. 93 | 17. 500
                                           2.37
                                                  23.58
                                                             1.33
5.417
         1.91 | 11.500
                          9. 93 | 17. 583
                                           2.30
                                                  23.67
                                                             1.33
                                                  23.75
5.500
         1. 91 | 11. 583
                         12.64 | 17.667
                                           2.30
                                                            1.33
5.583
         1. 97 | 11. 667
                         12.64 | 17.750
                                                  23.83
                                           2.30
                                                             1.31
5.667
         1. 97 | 11. 750
                         12.64 | 17.833
                                           2. 23
                                                  23.92
                                                             1.31
5.750
         1. 97 | 11. 833
                         51. 54 | 17. 917
                                           2. 22 İ
                                                  24.00
                                                             1.31
5.833
         2.03 | 11.917
                         51. 54 | 18. 000
                                           2. 22 İ
                                                  24.08
                                                            1.30
5.917
         2.03 | 12.000 | 51.54 | 18.083
                                           2.15
                                                  24.17
                                                            1.30
         2. 03 | 12. 083 | 127. 20 | 18. 167
                                           2. 15 | 24. 25
6.000
                                                            1.30
6.083
         2. 09 | 12. 167 | 127. 21 | 18. 250
                                           2.15 l
     (cms) = 0.128 (i)
```

PEAK FLOW TIME TO PEAK (hrs) = 12.333RUNOFF VOLUME (mm) = 60.077TOTAL RAINFALL (mm) = 117.600RUNOFF COEFFICIENT = 0.511

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| ADD HYD ( 0032)|
1 + 2 = 3
                    AREA
                          QPEAK
                                TPEAK
                                        R. V.
-----
                    (ha)
                          (cms)
                                (hrs)
                                        (mm)
    ID1= 1 ( 0039):
                         0.128
                    0.83
                               12.33
                                      60.08
   + ID2= 2 ( 0041):
                   11. 21
                         1. 592
                               12. 25
                                      70.85
     _____
     ID = 3 (0032): 12.04 1.716
                               12. 25
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION: 3-10yr 24hr 15min SCS Type II **

| CALIB | NASHYD (0033) Area (ha)= 0.41 Curve Number (CN) = 75.0 |ID= 1 DT= 5.0 min | Ia (mm) = 10.00# of Linear Res. (N) = 3.00 ----- U. H. Tp(hrs) = 0.20

		TR	ANSFORME	D HYETOGR	ΔPH	_	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	1.45	12. 250	88. 27	18. 33	1.44
0. 167	0.00	6.250	1.45	12. 333	13. 99	18. 42	1.44
0.250	0.00	6.333	1.49	12. 417	13. 98	18.50	1.44
0.333	0.83	6.417	1.49	12. 500	13. 98	18. 58	1. 39
0.417	0.83	6.500	1.49	12. 583	9. 52	18. 67	1. 39
0.500	0.83	6.583	1.53	12. 667	9. 52	18. 75	1. 39
0.583	0.85	6.667	1.53	12. 750	9. 52	18.83	1. 34
0. 667	0.85	6.750	1. 53	12. 833	6. 55	18. 92	1. 34
0. 750	0.85	6.833	1. 57	12. 917	6. 55	19. 00	1. 34
0.833	0.87	6.917	1. 57	13.000	6. 55	19. 08	1. 29
0. 917	0.87	7.000	1. 57	13. 083	5.53	19. 17	1. 29
1.000	0.87	7.083	1. 61	13. 167	5. 53	19. 25	1. 29
1.083	0.89	7.167	1.61	13. 250	5. 53	19. 33	1. 24
1. 167	0.89	7.250	1.61	13. 333	4.68	19. 42	1. 24
1. 250	0.89	7.333	1.65	13. 417	4.68	19.50	1. 24
1.333	0.91	7.417	1.65	13. 500	4.68	19.58	1. 19
1. 417	0. 91	7.500	1. 65 1. 69	13. 583 13. 667	4. 13	19.67	1. 19
1. 500 1. 583	0. 91 0. 93	7.583 7.667	1. 69	13. 667	4. 13 4. 13	19. 75 19. 83	1. 19 1. 14
1. 667	0. 93	7.067 7.750	1. 69	13. 730	3. 62	19. 63	1. 14
1. 750	0. 93	7.730	1. 73	13. 633	3. 62	20.00	1. 14
1. 833	0. 95	7.033	1. 73	14. 000	3. 62	20.00	1. 09
1. 917	0. 95	8.000	1. 73	14. 083	3. 23	20. 17	1. 09
2.000	0.95	8.083	1. 77	114. 167	3. 23	20. 25	1. 09
2. 083	0.97	8. 167	1. 77	14. 250	3. 23	20. 33	1. 06
2. 167	0.97	8.250	1. 77	14. 333	2. 95	20. 42	1. 06
2. 250	0.97	8.333	1. 90	14. 417	2. 95	20. 50	1.06
2. 333	0.99	8.417	1. 90	14. 500	2. 95	20. 58	1. 05
2.417	0.99	8.500	1. 90	14. 583	2. 81	20. 67	1.05
2.500	0.99	8.583	2.10	14. 667	2.81	20. 75	1.05
2.583	1.01	8.667	2.10	14. 750	2.81	20.83	1.03
2.667	1.01	8.750	2. 10	14. 833	2.66	20. 92	1.03
2.750	1.01	8.833	2. 31	14. 917	2.66	21.00	1.03
2.833	1.03	8.917	2. 31	15. 000	2.66	21. 08	1. 02
2. 917	1.03	9.000	2. 31	15. 083	2.52	21. 17	1. 02
3.000	1.03	9.083	2. 51	15. 167	2.52	21. 25	1. 02
3.083	1.05	9.167	2. 51	15. 250	2.52	21. 33	1. 02
3. 167	1.05	9.250	2. 51	15. 333	2.37	21.42	1.02
3. 250	1.05	9.333	2. 61	15. 417	2.37	21.50	1.02
3. 333	1.07	9.417	2. 61	15. 500	2.37	21.58	1. 01
3.417	1.07	9.500	2. 61 2. 61	15. 583 15. 667	2. 24 2. 24	21. 67 21. 75	1. 01 1. 01
3. 500 3. 583	1. 07 1. 09	9.583	2. 61	15. 667 15. 750	2. 24	21.75	0. 99
3. 667	1.09	9.750	2. 61	15. 750	2. 24	21. 63	0. 99
3.750	1.09	9.730		15. 633	2.09	21. 92	0. 99
3. 833	1. 11	9.917	2. 78	116. 000	2.09	22.00	0. 98
3. 917	1. 11	10.000	2. 78	16. 083	1. 95	22. 17	0. 98
4.000		10.083		16. 167	1. 95	22. 25	0. 98
		,					

```
4. 167 1. 13 | 10. 250
                        3. 09 | 16. 333 | 1. 85 | 22. 42
                                                         0.97
                        3. 52 | 16. 417
4.250
        1.13 | 10.333
                                        1.85 | 22.50
                                                         0.97
        1.16 | 10.417
                        3. 52 | 16. 500
4.333
                                        1. 85 | 22. 58
                                                         0.96
        1.16 | 10.500
                        3. 52 | 16. 583
4.417
                                        1.80 | 22.67
                                                         0.96
        1.16 | 10.583
                        3. 99 | 16. 667
                                        1. 80 | 22. 75
4.500
                                                         0.96
        1. 20 | 10. 667
                        3. 99 | 16. 750
                                        1. 80 | 22. 83
4.583
                                                         0.95
        1. 20 | 10. 750
                        3. 99 | 16. 833
4.667
                                        1. 75 | 22. 92
                                                         0.95
4.750
       1. 20 | 10. 833
                        4. 67 | 16. 917
                                        1.75 | 23.00
                                                        0.95
        1. 25 | 10. 917
                        4. 67 | 17. 000
4.833
                                        1. 75 | 23. 08
                                                        0.94
4.917
        1. 25 | 11. 000
                        4. 67 | 17. 083
                                        1.70 | 23.17
                                                         0.94
5.000
        1. 25 | 11. 083
                        5. 45 | 17. 167
                                        1. 70 | 23. 25
                                                        0.94
5.083
        1, 28 | 11, 167
                        5. 45 | 17. 250
                                        1.70 | 23.33
                                                         0.93
5. 167
        1. 28 | 11. 250
                        5. 45 | 17. 333
                                        1.65 | 23.42
                                                         0.93
5.250
        1. 28 | 11. 333
                        6. 89 | 17. 417
                                        1.65 | 23.50
                                                         0.93
5.333
        1. 33 | 11. 417
                        6. 89 | 17. 500
                                        1.65 | 23.58
                                                         0.92
5.417
        1.33 | 11.500
                        6. 89 | 17. 583
                                        1.60 | 23.67
                                                         0.92
                        8. 77 | 17. 667
5.500
        1. 33 | 11. 583
                                        1.60 | 23.75
                                                         0.92
                        8. 77 | 17. 750
5.583
        1.37 | 11.667
                                        1.60 | 23.83
                                                         0.91
                        8. 77 | 17. 833
5.667
        1.37 | 11.750
                                        1.54 | 23.92
                                                         0.91
        1.37 | 11.833
5.750
                       35. 76 | 17. 917
                                        1.54 | 24.00
                                                         0.91
5.833
        1.41 | 11.917
                       35. 77 | 18. 000
                                        1.54 | 24.08
                                                         0.90
5. 917
        1.41 | 12.000
                       35. 77 | 18. 083
                                        1.49 | 24.17
                                                         0.90
        1. 41 | 12. 083
6.000
                       88. 26 | 18. 167
                                        1.49 | 24.25
                                                        0.90
                       88. 27 | 18. 250
       1. 45 | 12. 167
6.083
                                        1.49
```

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 32.743
TOTAL RAINFALL (mm)= 81.600
RUNOFF COEFFICIENT = 0.401

----- U. H. Tp(hrs)= 0.22

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.45	12. 250	88. 27	18. 33	1.44
0. 167	0.00	6.250	1. 45	12. 333	13. 99	18.42	1.44
0. 250	0.00	6.333	1. 49	12. 417	13. 98	18.50	1.44

```
0. 333 0. 83 | 6. 417
                       1. 49 | 12. 500 | 13. 98 | 18. 58
                                                        1. 39
0.417
       0.83 | 6.500
                        1.49 | 12.583
                                         9.52
                                                18.67
                                                        1. 39
0.500
        0.83 | 6.583
                        1.53 | 12.667
                                         9.52
                                                18.75
                                                        1.39
                        1. 53 | 12. 750
0.583
         0.85
                                         9. 52 | 18. 83
                6.667
                                                        1 34
0.667
         0.85
                6.750
                        1.53 | 12.833
                                         6. 55 | 18. 92
                                                         1.34
0.750
        0.85
                6.833
                        1. 57 | 12. 917
                                         6.55
                                                19.00
                                                        1.34
                        1.57 | 13.000
0.833
        0.87
                6.917
                                         6.55
                                                19.08
                                                        1. 29
0.917
        0.87
                7.000
                        1. 57 | 13. 083
                                         5.53
                                                19. 17
                                                        1. 29
1.000
        0.87
                7.083
                        1. 61 | 13. 167
                                         5.53
                                                19. 25
                                                        1. 29
1.083
        0.89
                7.167
                         1. 61 | 13. 250
                                         5.53
                                                19.33
                                                         1. 24
1.167
         0.89
                7.250
                         1. 61 | 13. 333
                                         4.68
                                                19.42
                                                         1. 24
1.250
         0.89
                7.333
                        1.65 | 13.417
                                         4. 68 İ
                                                19.50
                                                         1. 24
1.333
         0.91
                7.417
                         1.65 | 13.500
                                         4.68 İ
                                                19. 58
                                                         1. 19
                         1, 65 | 13, 583
1.417
         0.91
                7.500
                                         4. 13 İ
                                                19.67
                                                         1. 19
1.500
        0.91
                7.583
                        1. 69 | 13. 667
                                         4. 13 l
                                                19.75
                                                         1.19
1.583
                         1.69 | 13.750
         0.93
                7.667
                                         4.13
                                                19.83
                                                         1.14
1.667
         0.93
                7.750
                         1, 69 | 13, 833
                                                19.92
                                         3.62
                                                         1. 14
1.750
         0.93
                7.833
                         1. 73 | 13. 917
                                         3.62
                                                20.00
                                                         1. 14
1.833
         0.95
                7.917
                         1.73 | 14.000
                                         3.62
                                                20.08
                                                         1.09
1.917
         0.95
                8.000
                         1.73 | 14.083
                                         3.23
                                                20.17
                                                         1.09
2.000
         0.95
                8.083
                         1. 77 | 14. 167
                                         3. 23
                                                20. 25
                                                         1.09
2.083
         0.97
                8.167
                         1.77 | 14.250
                                         3. 23
                                                20.33
                                                         1.06
2.167
         0.97
                8.250
                         1.77 | 14.333
                                         2.95
                                                20.42
                                                         1.06
2.250
         0.97
                8.333
                         1. 90 | 14. 417
                                         2.95
                                                20.50
                                                          1.06
2.333
         0.99
                8.417
                         1. 90 | 14. 500
                                         2.95
                                                20.58
                                                         1.05
2.417
         0.99
                8.500
                         1. 90 | 14. 583
                                                20.67
                                                          1.05
                                         2.81
2.500
         0.99
                8.583
                         2. 10 | 14. 667
                                         2.81
                                                20.75
                                                         1.05
2.583
         1.01
                8.667
                         2. 10 | 14. 750
                                         2.81
                                                20.83
                                                         1.03
2.667
                8.750
                         2. 10 | 14. 833
                                                20.92
         1.01
                                         2.66
                                                         1.03
2.750
                         2. 31 | 14. 917
                8.833
         1.01
                                         2.66
                                                21.00
                                                         1.03
                         2. 31 | 15. 000
2.833
                8.917
                                                21.08
                                                         1.02
         1.03
                                         2.66
2.917
                9.000
                         2. 31 | 15. 083
         1.03
                                         2.52
                                                21. 17
                                                         1.02
3.000
                         2. 51 | 15. 167
        1.03
                9.083
                                         2.52
                                                21. 25
                                                         1.02
3.083
         1.05
                9.167
                         2. 51 | 15. 250
                                         2.52
                                                21.33
                                                         1.02
3.167
                9.250
                         2.51 | 15.333
                                         2.37
         1.05
                                                21.42
                                                         1.02
3.250
         1.05
                9.333
                         2. 61 | 15. 417
                                         2.37
                                                21.50
                                                         1.02
3.333
         1.07
                9.417
                         2.61 | 15.500
                                         2.37
                                                21.58
                                                         1 01
3.417
                9.500
                         2. 61 | 15. 583
         1.07
                                         2.24
                                                21.67
                                                         1.01
3.500
         1.07
                9.583
                         2. 61 | 15. 667
                                         2. 24 İ
                                                21.75
                                                         1.01
3.583
         1.09
                9.667
                         2. 61 | 15. 750
                                         2.24
                                                21.83
3.667
         1.09 j
                9.750
                         2. 61 | 15. 833
                                         2.09 j
                                                21.92
                                                          0.99
3.750
         1.09 j
                9.833
                         2. 78 | 15. 917
                                         2.09 j
                                                22.00
3.833
        1.11 | 9.917
                         2. 78 | 16. 000
                                         2.09 İ
                                                22.08
        1.11 10.000
3.917
                         2. 78 | 16. 083
                                         1. 95
                                                22.17
        1. 11 | 10. 083
                         3. 09 | 16. 167
4.000
                                         1.95 L
                                                22. 25
                                                          0.98
4.083
        1. 13 | 10. 167
                         3. 09 | 16. 250
                                         1. 95 İ
                                                          0.97
                                                22.33
4. 167
        1.13 | 10.250
                         3.09 | 16.333
                                         1.85 İ
                                                22, 42
                                                          0.97
4.250
        1. 13 | 10. 333
                         3. 52 | 16. 417
                                         1.85 İ
                                                22.50
                                                          0.97
4.333
        1. 16 | 10. 417
                         3. 52 | 16. 500
                                         1.85
                                                22.58
                                                          0.96
         1.16 | 10.500
                         3. 52 | 16. 583
4.417
                                         1.80 | 22.67
                                                          0.96
        1. 16 | 10. 583
                         3. 99 | 16. 667
                                                         0.96
4.500
                                         1.80 | 22.75
4.583
        1. 20 | 10. 667
                         3. 99 | 16. 750
                                         1.80 | 22.83
                                                         0.95
```

```
4.667 1.20 | 10.750 3.99 | 16.833
                                       1.75 | 22.92
4. 750 1. 20 | 10. 833
                        4. 67 | 16. 917
                                         1.75 | 23.00
                         4. 67 | 17. 000
4.833
        1. 25 | 10. 917
                                         1.75 | 23.08
                                                         0.94
        1. 25 | 11. 000
                        4. 67 | 17. 083
4.917
                                         1. 70 | 23. 17
                                                         0.94
                        5. 45 | 17. 167
5.000
        1. 25 | 11. 083
                                         1.70 | 23.25
                                                         0.94
                         5. 45 | 17. 250
5.083
        1. 28 | 11. 167
                                         1.70 | 23.33
                                                         0.93
        1. 28 | 11. 250
                         5. 45 | 17. 333
5. 167
                                         1.65 | 23.42
                                                         0.93
5.250
        1. 28 | 11. 333
                         6. 89 | 17. 417
                                         1.65 | 23.50
                                                         0.93
5.333
        1.33 | 11.417
                         6. 89 | 17. 500
                                         1.65 | 23.58
                                                         0.92
                         6. 89 | 17. 583
5.417
        1. 33 | 11. 500
                                         1.60 | 23.67
                                                         0.92
5.500
        1. 33 | 11. 583
                         8. 77 | 17. 667
                                         1.60 | 23.75
                                                         0.92
5.583
        1. 37 | 11. 667
                         8. 77 | 17. 750
                                         1.60 | 23.83
                                                         0.91
5.667
        1. 37 | 11. 750
                        8. 77 | 17. 833
                                         1.54 | 23.92
                                                         0.91
5.750
        1. 37 | 11. 833
                        35. 76 | 17. 917
                                         1.54 | 24.00
                                                         0.91
5.833
        1.41 | 11.917
                        35. 77 | 18. 000
                                         1.54 | 24.08
                                                         0.90
5. 917
        1.41 | 12.000
                        35. 77 | 18. 083
                                         1. 49 | 24. 17
                                                         0.90
6.000
        1.41 | 12.083
                        88. 26 | 18. 167
                                         1.49 | 24.25
                                                         0.90
1.49
```

PEAK FLOW (cms) = 0.148 (i) TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 30.927 TOTAL RAINFALL (mm) = 81.600 RUNOFF COEFFICIENT = 0.379

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0036) ID= 1 DT= 5.0 min	Area Total	(ha) = 5.32 Imp(%) = 50.00	Dir. Conn. (%)=	35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	2.66	2.66	
Dep. Storage	(mm) =	1.00	5.00	
Average Slope	(%)=	1.00	1.00	
Length	(m) =	188. 33	40.00	
Mannings n	=	0. 130	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0. 083	0.00	6.167	1.45	12. 250	88. 27	18. 33	1.44
). 167	0.00	6.250	1.45	12. 333	13. 99	18.42	1.44
). 250	0.00	6.333	1.49	12. 417	13. 98	18.50	1.44
0. 333	0.83	6.417	1.49	12.500	13. 98	18.58	1. 39
	hrs 0. 083 0. 167 0. 250	hrs mm/hr 0.083 0.00 0.167 0.00 0.250 0.00	hrs mm/hr hrs 0.083 0.00 6.167 0.167 0.00 6.250 0.250 0.00 6.333	hrs mm/hr hrs mm/hr 0.083 0.00 6.167 1.45 0.167 0.00 6.250 1.45 0.250 0.00 6.333 1.49	hrs mm/hr hrs mm/hr hrs 0.083	hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0.083	TIME RAIN TIME RAIN TIME RAIN TIME hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs n.0.00 6.167 1.45 12.250 88.27 18.33 0.167 0.00 6.333 1.49 12.333 13.99 18.42 13.333 0.83 6.417 1.49 12.500 13.98 18.58

```
0.417
        0.83 | 6.500
                        1.49 | 12.583
                                          9. 52 | 18. 67
                                                          1. 39
0.500
         0.83 | 6.583
                         1.53 | 12.667
                                          9.52
                                                  18.75
                                                           1.39
0.583
         0.85
                6.667
                         1.53 | 12.750
                                          9.52
                                                  18.83
                                                           1.34
                6.750
                         1. 53 | 12. 833
                                          6.55
                                                 18. 92
0.667
         0.85
                                                           1.34
0.750
         0.85
                6.833
                         1.57 | 12.917
                                          6.55
                                                 19.00
                                                           1.34
        0.87
0.833
                6.917
                         1.57 | 13.000
                                          6.55
                                                  19.08
                                                           1. 29
0.917
         0.87
                7.000
                         1.57 | 13.083
                                          5.53
                                                  19.17
                                                           1. 29
1.000
         0.87
                7.083
                         1. 61 | 13. 167
                                          5.53
                                                  19. 25
                                                           1. 29
1.083
         0.89
                7.167
                         1. 61 | 13. 250
                                          5.53
                                                  19.33
                                                           1. 24
1. 167
         0.89
                7.250
                         1.61 | 13.333
                                          4.68
                                                  19.42
                                                           1. 24
1.250
         0.89
                7.333
                         1. 65 | 13. 417
                                          4.68
                                                  19.50
                                                           1. 24
1.333
         0.91
                7.417
                         1.65 | 13.500
                                          4.68
                                                  19.58
                                                           1.19
1.417
         0.91
                7.500
                         1, 65 | 13, 583
                                          4.13
                                                  19.67
                                                           1.19
1.500
                         1.69 | 13.667
         0.91
                7.583
                                          4.13
                                                  19.75
                                                           1.19
1.583
         0.93
                7.667
                         1. 69 | 13. 750
                                          4.13
                                                  19.83
                                                           1.14
                7.750
                         1, 69 | 13, 833
1.667
         0.93
                                          3.62
                                                  19.92
                                                           1.14
1.750
         0.93
                7.833
                         1. 73 | 13. 917
                                                  20.00
                                          3.62
                                                           1.14
1.833
         0.95
                7.917
                         1. 73 | 14. 000
                                          3.62
                                                  20.08
                                                           1.09
1.917
         0.95
                8.000
                         1.73 | 14.083
                                          3.23
                                                  20.17
                                                           1.09
2.000
         0.95
                8.083
                         1.77 | 14.167
                                          3.23
                                                  20.25
                                                           1.09
2.083
         0.97
                8.167
                         1.77 | 14.250
                                          3. 23
                                                  20.33
                                                           1.06
2.167
         0.97
                8.250
                         1.77 | 14.333
                                          2.95
                                                  20.42
                                                           1.06
2.250
         0.97
                8.333
                         1. 90 | 14. 417
                                          2.95
                                                  20.50
                                                           1.06
2.333
         0.99
                8.417
                         1. 90 | 14. 500
                                          2.95
                                                  20.58
                                                           1.05
2.417
         0.99
                8.500
                         1. 90 | 14. 583
                                          2.81
                                                 20.67
                                                           1.05
2.500
         0.99
                8.583
                         2. 10 | 14. 667
                                          2.81
                                                  20.75
                                                           1.05
2.583
         1.01
                8.667
                         2. 10 | 14. 750
                                          2.81
                                                 20.83
                                                           1.03
2.667
                8.750
                         2. 10 | 14. 833
                                                  20.92
                                                           1.03
         1.01
                                          2.66
2.750
                8.833
                         2. 31 | 14. 917
         1.01
                                          2.66
                                                 21.00
                                                           1.03
2.833
                8.917
                         2. 31 | 15. 000
         1.03
                                          2.66
                                                 21.08
                                                           1.02
2.917
                9.000
                         2. 31 | 15. 083
                                          2.52
                                                 21. 17
         1.03
                                                           1.02
3.000
                         2. 51 | 15. 167
                9.083
                                          2.52
                                                 21. 25
         1.03
                                                           1.02
3.083
                         2. 51 | 15. 250
         1.05
                9.167
                                          2.52
                                                 21.33
                                                           1.02
3.167
         1.05
                9.250
                         2. 51 | 15. 333
                                          2.37
                                                 21.42
                                                           1.02
3.250
                9.333
                         2. 61 | 15. 417
                                          2.37
         1.05
                                                 21.50
                                                           1.02
3.333
         1.07
                9.417
                         2. 61 | 15. 500
                                          2.37
                                                 21.58
                                                           1.01
                                                 21.67
3.417
         1.07
                9.500
                         2.61 | 15.583
                                          2.24
                                                           1 01
3.500
                         2, 61 | 15, 667
         1.07
                9.583
                                          2. 24
                                                 21.75
                                                           1.01
3.583
         1.09
                9.667
                         2, 61 | 15, 750
                                          2.24
                                                 21.83
                                                           0.99
3.667
         1.09
                9.750
                         2. 61 | 15. 833
                                          2.09
                                                 21.92
                                                           0.99
3.750
         1.09
                9.833
                         2. 78 | 15. 917
                                          2.09
                                                 22.00
                                                           0.99
3.833
                9.917
                         2. 78 | 16. 000
         1.11
                                          2.09
                                                 22.08
                                                           0.98
3.917
         1.11 10.000
                         2. 78 | 16. 083
                                          1.95
                                                  22.17
                                                           0.98
4.000
        1.11 | 10.083
                         3. 09 | 16. 167
                                          1.95
                                                  22.25
                                                           0.98
4.083
        1.13 | 10.167
                         3.09 | 16.250
                                          1.95
                                                 22.33
                                                           0.97
         1. 13 | 10. 250
                         3. 09 | 16. 333
                                                           0.97
4. 167
                                          1.85
                                                 22.42
4.250
        1.13 | 10.333
                         3. 52 | 16. 417
                                          1.85
                                                 22.50
                                                           0.97
                         3. 52 | 16. 500
4.333
         1.16 | 10.417
                                          1.85
                                                 22.58
                                                           0.96
                         3. 52 | 16. 583
4.417
         1.16 | 10.500
                                          1.80
                                                 22.67
                                                           0.96
                         3. 99 | 16. 667
4.500
         1.16 | 10.583
                                          1.80
                                                 22.75
                                                           0.96
                          3. 99 | 16. 750
                                                           0.95
4.583
         1.20 | 10.667
                                          1.80
                                                 22.83
                         3. 99 | 16. 833
4.667
         1.20 | 10.750
                                          1. 75 | 22. 92
                                                           0.95
```

4. 75	0 1.20	10.833	4.67	16. 917	1.75	23.00	0. 95
4. 83	3 1.25	10.917	4.67	17. 000	1. 75	23.08	0.94
4. 91	7 1.25	11.000	4.67	17. 083	1.70	23. 17	0.94
5.00	0 1.25	11.083	5.45	17. 167	1.70	23. 25	0.94
5.08	3 1.28	11. 167	5.45	17. 250	1.70	23.33	0. 93
5. 16	7 1.28	11.250	5.45	17. 333	1.65	23.42	0. 93
5. 25	0 1.28	11.333	6.89	17. 417	1.65	23.50	0. 93
5. 33	3 1.33	11.417	6.89	17. 500	1.65	23.58	0. 92
5. 41		11.500	6.89	17. 583	1.60	23.67	0. 92
5. 50	0 1.33	11.583	8.77	17. 667	1.60	23.75	0. 92
5. 58		11.667	8.77	17. 750	1.60	23.83	0. 91
5. 66		11.750	8. 77	17. 833	1.54	23. 92	0. 91
5. 75		11.833	35. 76	17. 917	1.54	24.00	0. 91
5. 83		11. 917	35. 77	18. 000	1.54	24.08	0. 90
5. 91		12.000	35. 77	18. 083	1. 49	24.17	0. 90
6.00		12.083	88. 26	18. 167	1. 49	24. 25	0. 90
6.08	3 1.45	12.167	88. 27	18. 250	1. 49		
Max. Eff. Inten. (mm/hr)=	88. 26		45. 39			
over	(mi n)	15.00		30.00			
Storage Coeff.	(mi n)=	15. 63	(ii)	27.55 (ii)			
Unit Hyd. Tpeak	(mi n)=	15.00		30.00			
Unit Hyd. peak	(cms)=	0. 07		0.04			
						ΓALS*	
PEAK FLOW	(cms)=	0. 29		0.14		390 (iii))
TIME TO PEAK	(hrs)=	12. 33		12. 58		2. 42	
RUNOFF VOLUME	(mm) =	80.60		28. 31		5. 61	
TOTAL RAINFALL	(mm) =	81.60		81.60		1.60	
RUNOFF COEFFICI	ENT =	0. 99		0. 35	(0. 57	

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	3. 43 50. 00	Dir. Conn. (%)=	35. 00
Surface Area Dep. Storage Average Slope Length Mannings n	(ha) = (mm) = (%) = (m) =	I MPERVI 1. 7 1. 0 1. 0 151. 2 0. 01	1 0 0 2	PERVIOUS (i) 1.71 5.00 2.00 40.00 0.250	

TRANSFORMED HYETOGRAPH								
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN	
hrs	mm/hr	hrs	mm/hr	j' hrs	mm/hr	hrs	mm/hr	
0.083	0.00	6. 167	1.45	12. 250	88. 27	18. 33	1.44	
0. 167	0.00	6.250	1. 45	12. 333	13. 99	18. 42	1.44	
0. 250	0.00	6.333	1. 49	12. 417	13. 98	18. 50	1. 44	
0. 333	0.83	6. 417	1. 49	12. 500	13. 98	18. 58	1. 39	
0. 417	0.83	6.500		12. 583	9. 52	18. 67	1. 39	
0. 417	0.83	6.583		12. 363 12. 667	9. 52	18. 75	1. 39	
0.583	0.85	6.667		12. 750	9. 52	18. 83	1. 34	
0.667	0.85	6.750	1.53	12. 833	6. 55	18. 92	1. 34	
0.750	0.85	6.833	1.57	12. 917	6. 55	19.00	1. 34	
0.833	0.87	6.917	1.57	13.000	6. 55	19. 08	1. 29	
0. 917	0.87	7.000	1.57	13. 083	5.53	19. 17	1. 29	
1.000	0.87	7.083	1. 61	13. 167	5.53	19. 25	1. 29	
1.083	0.89	7.167	1. 61	13. 250	5. 53	19. 33	1. 24	
1. 167	0.89	7. 250	1. 61	13. 333	4. 68	19. 42	1. 24	
1. 250	0.89	7.333		13. 417	4. 68	19.50	1. 24	
1. 333	0. 91	7.417		13. 500	4. 68	19. 58	1. 19	
1. 417	0. 91	7.500		13. 583	4. 13	19. 67	1. 19	
1. 500	0. 91	7.583		13. 667	4. 13	19. 75	1. 19	
						19. 73		
1.583	0.93	7.667		13. 750	4. 13		1. 14	
1. 667	0.93	7.750		13. 833	3.62	19. 92	1. 14	
1. 750	0.93	7.833		13. 917	3.62	20.00	1. 14	
1.833	0.95	7.917	1. 73	14. 000	3.62	20.08	1.09	
1. 917	0.95	8.000		14. 083	3. 23	20. 17	1. 09	
2.000	0.95	8.083	1. 77	14. 167	3. 23	20. 25	1. 09	
2.083	0. 97	8.167	1. 77	14. 250	3. 23	20.33	1. 06	
2.167	0.97	8.250	1. 77	14. 333	2. 95	20.42	1.06	
2.250	0.97	8.333	1. 90	14. 417	2. 95	20.50	1.06	
2.333	0.99	8.417	1. 90	14. 500	2. 95	20.58	1. 05	
2.417	0.99	8.500		14. 583	2. 81	20.67	1.05	
2.500	0.99	8.583		14. 667	2. 81	20. 75	1. 05	
2. 583	1.01	8.667		14. 750	2. 81	20. 83	1. 03	
2. 667	1.01	8.750	2. 10	14. 833	2.66	20. 92	1. 03	
2.750	1.01	8.833	2. 10	14. 917	2.66	21. 00	1. 03	
2. 833	1.01	8.917	2. 31	15. 000	2.66	21.00	1. 03	
							1. 02	
2. 917	1.03	9.000		15. 083	2.52	21. 17		
3.000	1.03	9.083		15. 167	2.52	21. 25	1. 02	
3.083	1.05	9.167		15. 250	2. 52	21. 33	1. 02	
3. 167	1.05	9.250		15. 333	2. 37	21. 42	1. 02	
3. 250	1.05	9.333	2. 61	15. 417	2. 37	21.50	1. 02	
3. 333	1.07	9.417	2. 61	15. 500	2. 37	21. 58	1. 01	
3. 417	1.07	9.500	2. 61	15. 583	2. 24	21.67	1. 01	
3.500	1.07	9.583	2. 61	15. 667	2. 24	21. 75	1. 01	
3.583	1.09	9.667	2. 61	15. 750	2. 24	21.83	0. 99	
3.667	1.09	9.750	2.61	15. 833	2. 09	21. 92	0. 99	
3.750	1.09	9.833		15. 917	2. 09	22.00	0. 99	
3. 833	1. 11	9.917		16. 000	2.09	22. 08	0. 98	
3. 917	1. 11	10.000		16. 083	1. 95	22. 17	0. 98	
4. 000		10.083		16. 167	1. 95	22. 17	0. 98	
4.000	1. 1.1	10.003	5.07	10.107	1.70	22.20	0. 70	

--- TRANSFORMED HYETOGRAPH ----

```
4. 083 1. 13 | 10. 167
                                        0.97
                4. 167
                       1. 13 | 10. 250
                                         3. 09 | 16. 333
                                                       1. 85 | 22. 42
                                                                          0.97
                                         3. 52 | 16. 417
                                                         1.85 | 22.50
                4.250
                        1.13 | 10.333
                                                                          0.97
                        1. 16 | 10. 417
                4.333
                                         3. 52 | 16. 500
                                                         1.85 | 22.58
                                                                          0.96
                        1. 16 | 10. 500
                                         3. 52 | 16. 583
                4.417
                                                         1.80 | 22.67
                                                                          0.96
                        1.16 | 10.583
                                         3. 99 | 16. 667
                                                         1.80 | 22.75
                4.500
                                                                          0.96
                        1. 20 | 10. 667
                                         3. 99 | 16. 750
                4.583
                                                         1.80 | 22.83
                                                                          0.95
                        1. 20 | 10. 750
                                         3. 99 | 16. 833
                4.667
                                                         1. 75 | 22. 92
                                                                          0.95
                4.750
                        1. 20 | 10. 833
                                         4. 67 | 16. 917
                                                         1.75 | 23.00
                                                                          0.95
                        1. 25 | 10. 917
                                         4. 67 | 17. 000
                4.833
                                                         1. 75 | 23. 08
                                                                          0.94
                4.917
                        1. 25 | 11. 000
                                         4. 67 | 17. 083
                                                         1. 70 | 23. 17
                                                                          0.94
                5.000
                        1. 25 | 11. 083
                                         5. 45 | 17. 167
                                                         1. 70 | 23. 25
                                                                          0.94
                5.083
                        1, 28 | 11, 167
                                         5. 45 | 17. 250
                                                         1.70 | 23.33
                                                                          0.93
                5. 167
                        1. 28 | 11. 250
                                         5. 45 | 17. 333
                                                         1.65 | 23.42
                                                                          0.93
                5.250
                        1. 28 | 11. 333
                                         6. 89 | 17. 417
                                                         1.65 | 23.50
                                                                          0.93
                5.333
                        1. 33 | 11. 417
                                         6. 89 | 17. 500
                                                         1.65 | 23.58
                                                                          0.92
                5.417
                         1. 33 | 11. 500
                                         6.89 | 17.583
                                                         1.60 | 23.67
                                                                          0.92
                5.500
                        1. 33 | 11. 583
                                         8. 77 | 17. 667
                                                         1.60 | 23.75
                                                                          0.92
                5.583
                        1.37 | 11.667
                                         8.77 | 17.750
                                                         1.60 | 23.83
                                                                          0.91
                                         8. 77 | 17. 833
                5.667
                        1.37 | 11.750
                                                         1.54
                                                                23.92
                                                                          0.91
                5.750
                        1. 37 | 11. 833
                                        35. 76 | 17. 917
                                                         1.54 | 24.00
                                                                          0.91
                5.833
                        1.41 | 11.917
                                        35. 77 | 18. 000
                                                         1.54 | 24.08
                                                                          0.90
                5. 917
                        1.41 | 12.000
                                        35. 77 | 18. 083
                                                         1.49 | 24.17
                                                                          0.90
                6.000
                        1.41 | 12.083
                                        88. 26 | 18. 167
                                                         1.49 | 24.25
                                                                         0.90
                       1. 45 | 12. 167
                6.083
                                        88. 27 | 18. 250
                                                         1. 49 j
     Max. Eff. Inten. (mm/hr)=
                                 88. 27
                                              48.37
                over (min)
                                  5.00
                                              15.00
     Storage Coeff. (min)=
                                  3.44 (ii) 12.88 (ii)
     Unit Hyd. Tpeak (min)=
                                  5.00
                                              15.00
     Unit Hyd. peak (cms)=
                                  0.26
                                               0.08
                                                            *TOTALS*
     PEAK FLOW
                                  0.29
                                                             0.417 (iii)
                     (cms)=
                                               0.14
     TIME TO PEAK
                   (hrs)=
                                 12.25
                                              12.33
                                                             12.25
    RUNOFF VOLUME
                     (mm) =
                                 80.60
                                              28.31
                                                             46.61
    TOTAL RAINFALL (mm)=
                                 81.60
                                              81.60
                                                              81.60
     RUNOFF COEFFICIENT =
                                  0.99
                                               0.35
                                                              0.57
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN^* = 59.0 Ia = Dep. Storage (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

AREA

(ha)

QPEAK

(cms)

R. V.

(mm)

TPEAK

(hrs)

| ADD HYD (0041)|

1 + 2 = 3

```
ID1= 1 ( 0033):
                     0. 41 0. 033 12. 33 32. 74
                   5. 32 0. 390 12. 42 46. 61
    + ID2= 2 ( 0036):
     ID = 3 ( 0041): 5.73 0.422 12.33 45.62
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
ADD HYD ( 0041)|
 3 + 2 = 1
                                  TPEAK
                      AREA QPEAK
                                         R. V.
                     (ha) (cms)
                                  (hrs)
                                        (mm)
                                  12. 33 45. 62
    ID1= 3 ( 0041):
                    5. 73 0. 422
    + ID2= 2 ( 0037): 2.05 0.148
                                  12. 33 30. 93
     _____
     ID = 1 ( 0041): 7.78 0.570 12.33 41.75
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0041)|
 1 + 2 = 3
                      AREA QPEAK
                                 TPEAK
(hrs)
                     (ha) (cms)
7.78 0.570
                                        (mm)
   ID1= 1 ( 0041):
                                  12. 33 41. 75
    + ID2= 2 ( 0040): 3.43 0.417 12.25 46.61
     ______
     ID = 3 ( 0041): 11.21 0.923 12.25 43.24
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
_____
 CALIB
 NASHYD ( 0039) Area (ha)= 0.83 Curve Number (CN)= 75.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00
----- U. H. Tp(hrs) = 0.19
      NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                       ---- TRANSFORMED HYETOGRAPH ----
                 RAIN | TIME RAIN | TIME RAIN | TIME
            TIME
                        hrs mm/hr ' hrs mm/hr hrs mm/hr
             hrs mm/hr i
                              1. 45 | 12. 250 | 88. 27 | 18. 33
            0.083
                  0.00 | 6.167
                              1. 45 | 12. 333
            0.167
                  0.00 | 6.250
                                          13. 99 | 18. 42
            0.250
                  0.00 | 6.333
                              1. 49 | 12. 417
                                          13. 98 | 18. 50
            0.333
                  0.83 | 6.417
                              1.49 | 12.500
                                           13. 98 | 18. 58
                  0.83 | 6.500
                              1. 49 | 12. 583
                                           9. 52 | 18. 67
            0.417
                  0.83 | 6.583
                              1. 53 | 12. 667
                                            9. 52 | 18. 75
            0.500
                                           9. 52 | 18. 83
            0.583
                  0.85 | 6.667
                               1.53 | 12.750
```

0.85 | 6.750

0.750 0.85 | 6.833

0.667

1. 53 | 12. 833

1. 57 | 12. 917

6. 55 | 18. 92

6.55 | 19.00

1.34

1.34

0.000	0.07	047	4 57	140 000	,	10.00	4 00
0.833	0.87	6.917	1.57	13. 000	6. 55		1. 29
0. 917	0.87	7.000	1.57	13. 083	5. 53	19.17	1. 29
1. 000 1. 083	0. 87 0. 89	7.083 7.167	1. 61 1. 61	13. 167 13. 250	5. 53 5. 53	19. 25 19. 33	1. 29 1. 24
1. 167	0.89	7.167	1. 61	13. 230	5. 55 4. 68	19. 33 19. 42	1. 24
1. 167	0.89	7.230	1. 65	13. 333	4. 68 4. 68	19.42 19.50	1. 24
1. 333	0. 69	7. 333	1. 65	13. 417	4. 68	19.50	1. 24
1. 333	0. 91	7.500	1. 65	13. 583	4. 00	19.56	1. 19
1.500	0. 91	7.583	1. 69	13. 667	4. 13	19.75	1. 19
1. 583	0. 93	7.667	1. 69	13. 750	4. 13	19. 83	1. 14
1. 667	0. 93	7.750	1. 69	13. 833	3. 62	19.92	1. 14
1. 750	0. 93	7.833	1. 73	13. 917	3. 62	20.00	1. 14
1. 833	0. 95	7.917	1. 73	14. 000	3. 62	20.08	1. 09
1. 917	0. 95	8.000	1. 73	14. 083	3. 23	20.17	1. 09
2.000	0. 95	8.083	1. 77	14. 167	3. 23	20. 25	1. 09
2.083	0.97	8.167	1.77	14. 250	3. 23	20.33	1.06
2. 167	0.97	8.250	1.77	14. 333	2. 95	20. 42	1.06
2.250	0.97	8.333	1. 90	14. 417	2. 95	20.50	1.06
2.333	0.99	8. 417	1. 90	14. 500	2. 95	20. 58	1.05
2.417	0.99	8.500	1. 90	14. 583	2.81	20. 67	1.05
2.500	0.99	8.583	2.10	14. 667	2.81	20.75	1.05
2.583	1.01	8.667	2. 10	14. 750	2.81	20.83	1.03
2.667	1.01	8.750	2. 10	14. 833	2.66	20. 92	1.03
2.750	1.01	8.833	2. 31	14. 917	2. 66	21.00	1. 03
2.833	1.03	8.917	2. 31	15. 000	2. 66	21.08	1. 02
2. 917	1.03	9.000	2. 31	15. 083	2.52	21.17	1. 02
3.000	1.03	9.083	2. 51	15. 167	2. 52	21. 25	1. 02
3.083	1.05	9.167	2.51	15. 250	2.52	21.33	1. 02
3. 167 3. 250	1.05	9.250	2. 51	15. 333 15. 417	2. 37 2. 37	21.42 21.50	1. 02 1. 02
3. 250	1. 05 1. 07	9.333	2. 61 2. 61	15. 417	2. 37	21.50	1. 02
3. 333 3. 417	1.07	9.417	2. 61	15. 583	2. 37	21.56	1.01
3.500	1.07	9.583	2. 61	15. 667	2. 24	21.07	1. 01
3. 583	1.07	9.667	2. 61	15. 750	2. 24	21.73	0. 99
3. 667	1. 09	9.750	2. 61	15. 833	2. 09	21. 92	0. 99
3.750	1.09	9.833	2. 78	15. 917	2. 09	22.00	0. 99
3.833	1.11	9.917	2. 78	16. 000	2.09	22. 08	0. 98
3.917	1.11	10.000	2.78	16. 083	1. 95	22. 17	0. 98
4.000	1.11	10.083	3.09	16. 167	1. 95	22. 25	0. 98
4.083	1.13	10.167	3.09	16. 250	1. 95	22. 33	0. 97
4. 167	1.13	10.250	3.09	16. 333	1.85	22.42	0. 97
4. 250	1.13	10.333	3. 52	16. 417	1.85	22.50	0. 97
4. 333	1.16	10.417	3.52	16. 500	1. 85	22.58	0. 96
4. 417	1. 16	10.500	3. 52	16. 583	1.80	22. 67	0. 96
4.500	1.16	10.583	3. 99	16. 667	1.80	22.75	0. 96
4. 583		10.667	3. 99	16. 750	1.80	22.83	0. 95
4.667	1. 20 1. 20	10.750	3. 99 4. 67	16. 833	1. 75 1. 75	22.92	0. 95 0. 95
4. 750 4. 833	1. 20	10.833 10.917	4. 67 4. 67	16. 917 17. 000	1. 75 1. 75	23.00	0. 95
4. 033 4. 917	1. 25	111.000	4. 67	17. 000	1. 73	23.06	0. 94
5.000	1. 25	111.083	5. 45	17. 167	1. 70	23. 17	0. 94
5. 083		111. 167	5. 45	17. 250	1. 70	23. 33	0. 93
	0		20				20

```
5. 250 1. 28 | 11. 333
                                6. 89 | 17. 417
                                             1.65 | 23.50
                                                           0.93
            5.333
                  1.33 | 11.417
                                6.89 | 17.500
                                             1.65 | 23.58
                                                           0.92
                                6. 89 | 17. 583
            5.417
                  1.33 | 11.500
                                             1.60 | 23.67
                                                           0.92
            5.500 1.33 11.583
                                8. 77 | 17. 667
                                             1.60 | 23.75
                                                           0.92
                                8. 77 | 17. 750
            5. 583 1. 37 | 11. 667
                                             1.60 | 23.83
                                                           0.91
            5. 667 1. 37 | 11. 750
                                8. 77 | 17. 833
                                                   23.92
                                             1.54
                                                           0.91
            5. 750 1. 37 | 11. 833
                               35. 76 | 17. 917
                                             1.54 | 24.00
                                                           0.91
                                35. 77 | 18. 000
            5.833
                  1.41 | 11.917
                                             1.54 | 24.08
                                                          0.90
                  1.41 | 12.000
                                35. 77 | 18. 083
                                             1. 49 | 24. 17
            5. 917
                                                           0.90
                                88. 26 | 18. 167
                                             1.49 | 24.25
            6.000 1.41 12.083
                                                          0.90
            6. 083 1. 45 | 12. 167
                                88. 27 | 18. 250
                                             1.49
   Unit Hyd Qpeak (cms)= 0.167
    PEAK FLOW
                (cms) = 0.069 (i)
    TIME TO PEAK
               (hrs)= 12.333
    RUNOFF VOLUME (mm)= 32.730
    TOTAL RAINFALL (mm)= 81.600
   RUNOFF COEFFICIENT = 0.401
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0032)|
 1 + 2 = 3
                       AREA
                           QPEAK
                                     TPEAK
                                           R. V.
                       (ha)
                           (cms)
                                     (hrs)
_____
                                             (mm)
     ID1= 1 ( 0039):
                       0.83 0.069
                                    12. 33 32. 73
    + ID2= 2 ( 0041): 11.21 0.923
                                    12. 25 43. 24
      ______
      ID = 3 ( 0032): 12.04 0.989 12.25 42.51
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
***********
** SIMULATION: 3-25yr 24hr 15min SCS Type II **
**********
| CALIB
 NASHYD ( 0033) | Area (ha)= 0.41 Curve Number (CN)= 75.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00
----- U. H. Tp(hrs) = 0.20
       NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                         ---- TRANSFORMED HYETOGRAPH ----
                    RAIN | TIME RAIN | TIME RAIN | TIME
             TIME
                                                           RAIN
```

mm/hr

0.00 | 6.167

0.083

hrs

1.65 | 23.42

mm/hr | hrs mm/hr | hrs mm/hr

1. 70 | 12. 250 | 103. 84 | 18. 33

0.93

0. 167	0.00	6.250	1.70	12. 333	16.46	18.42	1.70
0. 250	0.00	6.333	1. 75	12. 417	16. 45	18.50	1.70
0. 333	0. 97	6.417	1. 75	12. 500	16. 45	18.58	1. 64
0. 417	0. 97	6.500	1. 75	12. 583	11. 20	18.67	1. 64
0.500	0.97	6.583	1.80	12. 667	11. 20	18.75	1. 64
0. 583	1.00	6.667	1. 80	12. 750	11. 20	18. 83	1. 58
0. 667	1.00	6.750	1.80	12. 833	7.70	18. 92	1. 58
0.750	1.00	6.833	1.85	12. 917	7. 70	19. 00	1. 58
0.833	1.02	6.917	1.85	13.000	7. 70	19.08	1. 52
0. 917	1.02	7.000	1.85	13.083	6. 51	19. 17	1. 52
1.000	1.02	7.083	1. 90	13. 167	6.50	19. 25	1. 52
1.083	1.04	7.167	1. 90	13. 250	6.50	19. 33	1.46
1. 167	1.04	7. 250	1. 90	13. 333	5. 51	19. 42	1. 46
1. 250	1.04	7.333	1. 94	13. 417	5. 51	19.50	1. 46
1. 333	1.07	7.417	1. 94	13. 500	5. 51	19.58	1. 40
1. 417	1.07	7.500	1. 94	13. 583	4. 86	19.67	1. 40
1.500	1.07	7.583	1. 99	13. 667	4. 86	19.75	1. 40
1. 583	1.07	7.667	1. 99	13. 750	4. 86	19.73	1. 34
1. 667	1.09	7.750	1. 99	13.833	4. 26	19.92	1. 34
1.750	1.09	7.833	2.04	13. 917	4. 26	20.00	1. 34
1.833	1.12	7.917	2. 04	14. 000	4. 26	20.08	1. 28
1. 917	1.12	8.000	2.04	14. 083	3.80	20.17	1. 28
2.000	1.12	8.083	2.09	14. 167	3.80	20. 25	1. 28
2.083	1.14	8.167	2.09	14. 250	3.80	20.33	1. 24
2. 167	1.14	8.250	2.09	14. 333	3.47	20.42	1. 24
2.250	1.14	8.333	2.24	14.417	3.47	20.50	1. 24
2.333	1.17	8.417	2.24	14. 500	3.47	20.58	1. 23
2.417	1.17	8.500	2. 24	14. 583	3.30	20.67	1. 23
2.500	1.17	8.583	2.47	14. 667	3.30	20.75	1. 23
2.583	1.19	8.667	2.47	14. 750	3.30	20.83	1. 22
2.667	1.19	8.750	2.47	14. 833	3. 13	20. 92	1. 22
2.750	1.19	8.833	2.72	14. 917	3. 13	21.00	1. 22
2.833	1.21	8.917	2.72	15. 000	3. 13	21.08	1. 21
2. 917	1. 21	9.000	2.72	15. 083	2. 97	21. 17	1. 21
3.000	1. 21	9.083	2. 95	15. 167	2. 97	21. 25	1. 21
3. 083	1. 23	9. 167	2. 95	15. 250	2. 97	21. 23	1. 19
3. 167	1. 23	9. 250	2. 95	15. 333	2. 79	21. 33	1. 19
3. 250	1. 23	9.333	3. 07	15. 417	2. 79	21. 42	1. 19
3. 333	1. 26	9.417	3. 07	15. 500		21.50	
					2. 79		1. 18
3. 417	1.26	9.500	3.07	15. 583	2.63	21.67	1. 18
3.500	1. 26	9.583	3. 07	15. 667	2.63	21.75	1. 18
3.583	1. 28	9.667	3. 07	15. 750	2. 63	21.83	1. 17
3. 667	1. 28	9.750	3. 07	15. 833	2. 46	21. 92	1. 17
3.750	1. 28	9.833	3. 27	15. 917	2.46	22.00	1. 17
3.833	1.31	9.917	3. 27	16. 000	2.46	22.08	1. 16
3. 917	1.31	10.000	3. 27	16. 083	2. 29	22. 17	1. 16
4.000	1.31	10.083	3.64	16. 167	2. 29	22. 25	1. 16
4.083	1.33	10.167	3.64	16. 250	2. 29	22. 33	1. 15
4. 167	1.33	10.250	3.64	16. 333	2. 18	22.42	1. 15
4.250	1.33	10.333	4.14	16. 417	2. 18	22. 50	1. 15
4.333	1.37	10.417	4.14	16. 500	2. 18	22. 58	1. 13
4. 417	1.37	10.500	4. 14	16. 583	2. 12	22.67	1. 13
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4.500 1.37 | 10.583 4.69 | 16.667
                                         2. 12 | 22. 75 1. 13
4. 583 1. 42 | 10. 667
                        4. 69 | 16. 750
                                         2. 12 | 22. 83 1. 12
4. 667 1. 42 | 10. 750
                         4. 69 | 16. 833
                                          2.06 | 22.92
                                                          1. 12
4. 750 1. 42 10. 833
                        5. 49 | 16. 917
                                          2.06 | 23.00
                                                          1. 12
4. 833 1. 46 10. 917
                         5. 49 | 17. 000
                                          2.06 | 23.08
                                                          1. 11
4. 917 1. 46 | 11. 000
                        5. 49 | 17. 083
                                          2.00 | 23.17
                                                          1. 11
5.000 1.46 11.083
                         6. 41 | 17. 167
                                          2.00 | 23.25
                         6. 41 | 17. 250
5. 083 1. 51 | 11. 167
                                          2.00 | 23.33
                                                          1. 10
5. 167 1. 51 11. 250
                         6. 41 | 17. 333
                                          1. 94 | 23. 42
                                                          1. 10
5. 250 1. 51 11. 333
                         8. 11 | 17. 417
                                          1. 94 | 23. 50
                                                           1.10
5. 333 1. 56 | 11. 417
                         8. 11 | 17. 500
                                          1. 94 | 23. 58
                                                           1.09
5. 417 1. 56 | 11. 500
                         8. 11 | 17. 583
                                          1. 88 | 23. 67
                                                           1.09
5. 500 1. 56 11. 583
                        10. 32 | 17. 667
                                          1. 88 | 23. 75
                                                           1.09
5. 583 1. 61 11. 667
                         10. 32 | 17. 750
                                          1. 88 | 23. 83
                                                           1.07
5. 667 1. 61 | 11. 750
                        10. 32 | 17. 833
                                          1. 82 | 23. 92
5. 750 1.61 | 11.833 42.07 | 17.917

5. 833 1.66 | 11.917 42.08 | 18.000

5. 917 1.66 | 12.000 42.08 | 18.083

6.000 1.66 | 12.083 103.84 | 18.167
                                          1.82 | 24.00
                                                           1.07
                                          1.82 | 24.08
                                                           1.06
                                          1. 76 | 24. 17
                                                           1.06
                                          1. 76 | 24. 25
                                                           1.06
1.76
```

(cms) = 0.044 (i)PEAK FLOW TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 43, 253 TOTAL RAINFALL (mm) = 96.000 RUNOFF COEFFICIENT = 0.451

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALLB NASHYD (0037) | Area (ha)= 2.05 Curve Number (CN)= 73.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 ----- U. H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	j' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1.70	12. 250	103.84	18. 33	1.70
0. 167	0.00	6.250	1. 70	12. 333	16. 46	18. 42	1. 70
0.250	0.00	6.333	1. 75	12. 417	16. 45	18.50	1. 70
0.333	0.97	6.417	1. 75	12. 500	16. 45	18.58	1.64
0.417	0.97	6.500	1. 75	12. 583	11. 20	18.67	1.64
0.500	0.97	6.583	1.80	12. 667	11. 20	18.75	1.64
0.583	1.00	6.667	1.80	12. 750	11. 20	18.83	1.58
0.667	1.00	6.750	1.80	12.833	7.70	18. 92	1. 58

0.750	1.00	6.833	1.85	12. 917	7.70	19.00	1. 58
0. 833 0. 917	1. 02 1. 02	6.917 7.000	1. 85 1. 85	13. 000 13. 083	7. 70 6. 51	19. 08 19. 17	1. 52 1. 52
1.000	1.02	7.083	1. 90	13. 167	6. 50	19.17	1. 52
1. 083	1.04	7.167	1. 90	13. 250	6. 50	19.33	1. 46
1. 167	1.04	7. 250	1. 90	13. 333	5. 51	19.42	1. 46
1. 250	1.04	7.333	1. 94	13. 417	5. 51	19.50	1. 46
1.333	1.07	7.417	1. 94	13. 500	5. 51	19. 58	1.40
1. 417	1.07	7.500	1. 94	13. 583	4. 86	19.67	1. 40
1.500	1.07	7.583	1. 99	13. 667	4. 86	19.75	1.40
1. 583 1. 667	1. 09 1. 09	7.667 7.750	1. 99 1. 99	13. 750 13. 833	4. 86 4. 26	19.83 19.92	1. 34 1. 34
1. 750	1.09	7.730	2.04	13. 633	4. 26	20.00	1. 34
1. 833	1. 12	7. 917	2. 04	14. 000	4. 26	20.08	1. 28
1. 917	1. 12	8.000	2.04	14. 083	3.80	20.17	1. 28
2.000	1.12	8.083	2.09	14. 167	3.80	20. 25	1. 28
2.083	1.14	8.167	2.09	14. 250	3.80	20. 33	1. 24
2. 167	1.14	8.250	2.09	14. 333	3. 47	20.42	1. 24
2. 250	1.14	8.333	2. 24	14. 417	3.47	20.50	1. 24
2. 333 2. 417	1. 17 1. 17	8.417	2. 24 2. 24	14.500	3. 47 3. 30	20.58	1. 23 1. 23
2.417	1. 17	8.500 8.583	2. 24 2. 47	14. 583 14. 667	3. 30	20. 67 20. 75	1. 23
2. 583	1. 17	8.667	2.47	14. 750	3. 30	20.73	1. 23
2. 667	1. 19	8.750	2. 47	14. 833	3. 13	20.92	1. 22
2.750	1.19	8.833	2.72	14. 917	3. 13	21.00	1. 22
2.833	1.21	8.917	2.72	15.000	3. 13	21.08	1. 21
2. 917	1.21	9.000	2.72	15. 083	2. 97	21.17	1. 21
3.000 3.083	1. 21 1. 23	9.083	2. 95 2. 95	15. 167 15. 250	2. 97 2. 97	21. 25 21. 33	1. 21 1. 19
3. 167	1. 23	9.167	2. 95	15. 230	2. 79	21.33	1. 19
3. 250	1. 23	9.333	3. 07	15. 417	2. 79	21.50	1. 19
3. 333	1. 26	9.417	3. 07	15. 500	2. 79	21.58	1. 18
3.417	1.26	9.500	3.07	15. 583	2.63	21.67	1. 18
3.500	1. 26	9.583	3.07	15. 667	2.63	21.75	1. 18
3.583	1.28	9.667	3.07	15. 750	2.63	21.83	1. 17
3. 667 3. 750	1. 28 1. 28	9.750 9.833	3. 07 3. 27	15. 833 15. 917	2. 46 2. 46	21.92	1. 17 1. 17
3. 833	1. 20	9.033	3. 27	16. 000	2.46	22.00	1. 17
3. 917	1.31	10.000	3. 27	16. 083	2. 29	22.17	1. 16
4.000	1.31	10.083	3.64	16. 167	2. 29	22. 25	1. 16
4.083	1.33	10.167	3.64	16. 250	2. 29	22. 33	1. 15
4. 167	1.33	10.250	3. 64	16. 333	2. 18	22.42	1. 15
4. 250	1.33	10.333	4. 14	16. 417	2. 18	22.50	1. 15
4. 333 4. 417	1. 37 1. 37	10.417 10.500	4. 14 4. 14	16. 500 16. 583	2. 18 2. 12	22.58 22.67	1. 13 1. 13
4.500	1.37	10.583	4. 69	16. 667	2. 12	22.75	1. 13
4. 583		10.667	4. 69	16. 750	2. 12	22.83	1. 12
4.667	1.42	10.750	4.69	16. 833	2.06	22. 92	1. 12
4.750	1.42	10.833	5. 49	16. 917	2.06	23.00	1. 12
4.833	1.46	10.917	5. 49	17.000	2.06	23.08	1. 11
4. 917	1.46	11.000	5.49	17. 083	2.00	23.17	1. 11
5.000	1.46	11.083	6. 41	17. 167	2.00	23. 25	1. 11

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1. 94 | 23. 42 1. 10
5. 250 1. 51 | 11. 333
                    8. 11 | 17. 417
                                   1. 94 | 23. 50
5. 333 1. 56 11. 417
                    8. 11 | 17. 500
                                   1. 94 | 23. 58
                                                 1.09
5. 417 1. 56 11. 500
                    8. 11 | 17. 583
                                   1. 88 | 23. 67
                                                 1.09
5. 500 1. 56 | 11. 583 10. 32 | 17. 667
                                   1. 88 | 23. 75
                    10. 32 | 17. 750
5. 583 1. 61 11. 667
                                   1. 88 | 23. 83
1. 82 | 23. 92
                                                 1.07
5. 750 1. 61 11. 833 42. 07 17. 917
                                   1.82 | 24.00
                                                 1.07
5. 833 1. 66 | 11. 917 42. 08 | 18. 000
                                   1. 82 | 24. 08
                                                 1.06

      5. 917
      1. 66 | 12.000
      42.08 | 18.083

      6. 000
      1. 66 | 12.083
      103.84 | 18.167

                                   1. 76 | 24. 17
                                                 1.06
                                   1. 76 | 24. 25
1.76
```

PEAK FLOW (cms)= 0.199 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 41.047
TOTAL RAINFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.428

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0036) ID= 1 DT= 5.0 min	Area Total	(ha)= 5.32 Imp(%)= 50.00		35. 00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.66	2. 66	
Dep. Storage	(mm) =	1.00	5.00	
Average SI ope	(%)=	1.00	1.00	
Length	(m)=	188. 33	40.00	
Mannings n	=	0. 130	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	1.70	12. 250	103.84	18. 33	1.70
0.167	0.00	6.250	1.70	12. 333	16.46	18.42	1.70
0.250	0.00	6.333	1.75	12. 417	16. 45	18.50	1.70
0.333	0.97	6.417	1.75	12. 500	16. 45	18.58	1.64
0.417	0.97	6.500	1.75	12. 583	11. 20	18.67	1.64
0.500	0. 97	6.583	1.80	12. 667	11. 20	18. 75	1.64
0.583	1.00	6.667	1.80	12. 750	11. 20	18.83	1.58
0.667	1.00	6.750	1.80	12. 833	7. 70	18. 92	1.58
0.750	1.00	6.833	1.85	12. 917	7.70	19.00	1.58

				140 000			4 50
0.833	1.02	6.917	1. 85	13. 000	7. 70		1. 52
0. 917	1.02	7.000	1. 85	13. 083	6. 51	19. 17	1. 52
1.000	1.02	7.083	1. 90	13. 167	6. 50	19. 25	1. 52
1.083	1.04	7.167	1. 90	13. 250	6.50	19. 33	1.46
1. 167	1.04	7. 250	1. 90	13. 333	5. 51	19. 42	1.46
1. 250	1.04	7.333	1. 94	13. 417	5. 51	19.50	1. 46
1. 333	1.07	7.417	1. 94	13. 500	5. 51	19.58	1. 40
1. 417	1.07	7.500	1. 94	13. 583	4. 86	19.67	1. 40
1. 500	1.07	7.583	1. 99		4. 86	19.07	
				13. 667			1.40
1. 583	1.09	7.667	1. 99	13. 750	4. 86	19.83	1. 34
1. 667	1.09	7.750	1. 99	13. 833	4. 26	19. 92	1. 34
1. 750	1.09	7.833	2.04	13. 917	4. 26	20.00	1. 34
1.833	1.12	7.917	2.04	14.000	4. 26	20.08	1. 28
1. 917	1.12	8.000	2.04	14.083	3.80	20.17	1. 28
2.000	1.12	8.083	2.09	14. 167	3.80	20. 25	1. 28
2.083	1.14	8.167	2.09	14. 250	3.80	20. 33	1. 24
2. 167	1.14	8.250	2.09	14. 333	3. 47	20.42	1. 24
2. 250	1.14	8.333	2. 24	14. 417	3. 47	20.50	1. 24
2. 333	1. 17	8.417	2. 24	14. 500	3. 47	20.58	1. 23
2. 417	1. 17	8.500	2. 24	14. 583	3. 30	20.67	1. 23
2.500	1. 17	8.583	2. 47	14. 667	3. 30	20. 75	1. 23
2. 583	1. 17		2.47				
		8.667		14. 750	3.30	20.83	1. 22
2.667	1.19	8.750	2. 47	14. 833	3. 13	20.92	1. 22
2. 750	1. 19	8.833	2. 72	14. 917	3. 13	21.00	1. 22
2.833	1.21	8.917	2.72	15. 000	3. 13	21.08	1. 21
2. 917	1.21	9.000	2.72	15. 083	2. 97	21. 17	1. 21
3.000	1. 21	9.083	2. 95	15. 167	2. 97	21. 25	1. 21
3.083	1.23	9.167	2. 95	15. 250	2. 97	21.33	1. 19
3. 167	1.23	9.250	2. 95	15. 333	2. 79	21.42	1. 19
3.250	1.23	9.333	3.07	15. 417	2. 79	21.50	1. 19
3.333	1.26	9.417	3.07	15.500	2.79	21.58	1. 18
3.417	1.26	9.500	3.07	15. 583	2.63	21.67	1. 18
3.500	1.26	9.583	3.07	15. 667	2.63	21.75	1. 18
3.583	1.28	9.667	3.07	15. 750	2.63	21.83	1. 17
3. 667	1. 28	9.750	3. 07	15. 833	2. 46	21.92	1. 17
3. 750	1. 28	9.833	3. 27	15. 917	2. 46	22.00	1. 17
3. 833	1. 31	9.917	3. 27	16. 000	2. 46	22.08	1. 16
3. 917	1.31	10.000	3. 27	16. 083	2. 29	22. 17	1. 16
4. 000	1.31	10.083	3. 64	16. 167	2. 29	22.17	1. 16
						22. 23	1. 15
4.083	1.33	10.167	3.64	16. 250	2. 29		
4. 167	1.33	10.250	3. 64	16. 333	2. 18	22.42	1. 15
4. 250	1.33	10.333	4. 14	16. 417	2. 18	22.50	1. 15
4. 333	1.37	10.417	4. 14	16. 500	2. 18	22.58	1. 13
4. 417	1.37	10.500	4. 14	16. 583	2. 12	22.67	1. 13
4.500	1.37	10.583	4. 69	16. 667	2. 12	22. 75	1. 13
4. 583	1.42	10.667	4. 69	16. 750	2. 12	22.83	1. 12
4.667	1.42	10.750	4.69	16.833	2.06	22. 92	1. 12
4.750	1.42	10.833	5.49	16. 917	2.06	23.00	1. 12
4.833	1.46	10.917	5.49	17. 000	2.06	23.08	1. 11
4.917	1.46	11.000	5.49	17. 083	2.00	23. 17	1. 11
5.000	1.46	11.083	6.41	17. 167	2.00	23. 25	1. 11
5.083	1.51	11. 167	6. 41	17. 250	2.00	23. 33	1. 10

5. 167 5. 250 5. 333 5. 417 5. 500 5. 583 5. 667 5. 750 5. 833 5. 917 6. 000 6. 083	1.51 1.56 1.56 1.56 1.61 1.61 1.66 1.66	11. 250 11. 333 11. 417 11. 500 11. 583 11. 667 11. 750 11. 833 11. 917 12. 000 12. 083 12. 167	6. 41 8. 11 8. 11 10. 32 10. 32 10. 32 42. 07 42. 08 42. 08 103. 84 103. 84	17. 333 17. 417 17. 500 17. 583 17. 667 17. 750 17. 833 17. 917 18. 000 18. 083 18. 167 18. 250	1. 94 1. 94 1. 94 1. 88 1. 88 1. 82 1. 82 1. 76 1. 76	23. 42 23. 50 23. 58 23. 67 23. 75 23. 83 23. 92 24. 00 24. 08 24. 17 24. 25	1. 10 1. 10 1. 09 1. 09 1. 07 1. 07 1. 07 1. 06 1. 06
Uni t Hyd. Tpeak Uni t Hyd. peak PEAK FLOW	(mi n) (mi n) = (mi n) = (cms) = (cms) = (hrs) = (mm) = (mm) =	103. 84 15. 00 14. 65 15. 00 0. 08 0. 35 12. 33 95. 00 96. 00 0. 99	(ii)	59. 97 30. 00 25. 31 (ii) 30. 00 0. 04 0. 19 12. 58 37. 26 96. 00 0. 39	0. 12 57 96	TALS* 490 (iii) 2.42 7.47 5.00 0.60	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- $CN^* = 59.0$ Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
- THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

.....

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	(ha)= 3.43 Imp(%)= 50.00	3) Dir. Conn.(%)=	35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	1. 71	1.71	
Dep. Storage	(mm) =	1.00	5.00	
Average Slope	(%)=	1.00	2.00	
Length	(m) =	151. 22	40.00	
Mannings n	=	0. 013	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH									
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	i' hrs	mm/hr	hrs	mm/hr		
0.083	0.00	6.167	1. 70	12. 250	103.84	18. 33	1. 70		

1. 70 | 12. 333 | 16. 46 | 18. 42 0.167 0.00 | 6.250 0.250 0.00 | 6.333 1. 75 | 12. 417 | 16. 45 | 18. 50 0.333 0.97 | 6.417 1. 75 | 12. 500 16. 45 İ 18.58 0.417 0.97 | 6.500 1. 75 | 12. 583 11. 20 | 18. 67 1.64 0.500 0.97 | 6.583 11. 20 | 18. 75 1.80 | 12.667 1.64 1. 80 | 12. 750 18.83 0.583 1.00 | 6.667 11. 20 1.58 1. 80 | 12. 833 18.92 0.667 1.00 6.750 7.70 1.58 0.750 1.00 | 6.833 1.85 | 12.917 7. 70 j 19.00 1.58 0.833 1.02 | 6.917 1.85 | 13.000 7.70 19.08 1.52 0.917 1. 85 | 13. 083 1.02 7.000 6.51 19.17 1.52 1.000 1.02 j 7.083 1. 90 | 13. 167 6.50 19. 25 1.52 1.083 1.04 İ 7.167 1. 90 | 13. 250 6.50 19.33 1.46 1. 167 1.04 İ 7.250 1. 90 | 13. 333 5.51 19.42 1.46 1.250 1. 04 İ 7.333 1. 94 | 13. 417 19.50 5.51 1.46 1.333 1.07 7.417 1. 94 | 13. 500 5.51 19.58 1.40 1.417 1.07 7.500 1. 94 | 13. 583 19.67 4.86 1.40 1.500 1.07 7.583 1. 99 | 13. 667 4.86 19.75 1.40 1.583 1.09 7.667 1. 99 | 13. 750 4.86 19.83 1.34 1.667 1.09 7.750 1.99 | 13.833 4.26 19.92 1.34 1.750 1.09 7.833 2.04 |13.917 4.26 20.00 1.34 1.833 1.12 7.917 2.04 | 14.000 4.26 20.08 1.28 1.917 1.12 8.000 2.04 | 14.083 3.80 20.17 1.28 2.000 1.12 8.083 2.09 | 14.167 3.80 20. 25 1.28 2.083 1.14 8.167 2.09 | 14.250 3.80 20.33 1.24 2.167 8.250 2.09 | 14.333 20.42 1.14 3.47 1.24 2.250 1.14 8.333 2. 24 | 14. 417 20.50 1.24 3.47 2.333 1.17 8.417 2. 24 | 14. 500 3.47 20.58 1.23 2.417 1.17 8.500 2. 24 | 14. 583 3.30 20.67 1.23 2.500 1.17 İ 8.583 2. 47 | 14. 667 3.30 20.75 1.23 2.583 8.667 2. 47 | 14. 750 3.30 20.83 1.22 1.19 2.667 8.750 2. 47 | 14. 833 1.19 3.13 20.92 1.22 2.750 8.833 2. 72 | 14. 917 1.19 3. 13 | 21. 00 1. 22 2.833 1. 21 | 8. 917 2. 72 | 15. 000 3.13 21.08 1.21 2.917 1.21 | 9.000 2. 72 | 15. 083 2. 97 | 21. 17 1.21 3.000 1.21 9.083 2. 95 | 15. 167 2.97 21. 25 1.21 3.083 2. 95 | 15. 250 1.23 9.167 2.97 21.33 1.19 3.167 2. 95 | 15. 333 1.23 | 9.250 2.79 21.42 1.19 2. 79 | 21. 50 3.250 1.23 | 9.333 3.07 | 15.417 1.19 1. 26 | 9. 417 3.333 3.07 | 15.500 2.79 21.58 1.18 3.417 1.26 9.500 3. 07 | 15. 583 2.63 21.67 1.18 3.500 1. 26 | 9. 583 3. 07 | 15. 667 2.63 | 21.75 1.18 3.583 9.667 3.07 | 15.750 1.28 2.63 | 21.83 1.17 3.667 1.28 | 9.750 3.07 | 15.833 2, 46 | 21, 92 1.17 3.750 1. 28 | 9. 833 3. 27 | 15. 917 2.46 | 22.00 1.17 1.31 | 9.917 3. 27 | 16. 000 3.833 2.46 | 22.08 1.16 3. 27 | 16. 083 3.917 1.31 | 10.000 2. 29 | 22. 17 1.16 4.000 1.31 | 10.083 3.64 | 16.167 2. 29 | 22. 25 1.16 4.083 1.33 | 10.167 3. 64 | 16. 250 2. 29 | 22. 33 1.15 4.167 1.33 | 10.250 3. 64 | 16. 333 2. 18 | 22. 42 1. 15 4.250 1. 33 | 10. 333 4. 14 | 16. 417 2. 18 | 22. 50 1.15 4.333 1.37 | 10.417 4. 14 | 16. 500 2. 18 | 22. 58 1.13 4.417 1.37 | 10.500 4. 14 | 16. 583 2. 12 | 22. 67 1.13

```
4.69 | 16.667
           4.500
                  1.37 | 10.583
                                                    2. 12 | 22. 75
                                                                    1.13
           4.583
                   1.42 | 10.667
                                    4.69 | 16.750
                                                    2.12
                                                           22.83
                                                                     1. 12
                                    4. 69 | 16. 833
           4.667
                   1.42 | 10.750
                                                    2.06
                                                           22. 92
                                                                     1. 12
           4.750
                   1. 42 | 10. 833
                                    5. 49 | 16. 917
                                                    2.06
                                                           23.00
                                                                     1. 12
                                    5. 49 | 17. 000
           4.833
                   1.46 | 10.917
                                                    2.06
                                                           23.08
                                                                     1. 11
                   1.46 | 11.000
                                    5. 49 | 17. 083
           4.917
                                                    2.00
                                                           23.17
                                                                     1.11
                   1.46 | 11.083
                                    6. 41 | 17. 167
           5.000
                                                    2.00
                                                           23. 25
                                                                     1. 11
           5.083
                   1.51 | 11.167
                                    6. 41 | 17. 250
                                                    2.00
                                                           23.33
                                                                    1.10
                                    6. 41 | 17. 333
           5. 167
                   1.51 | 11.250
                                                    1.94
                                                            23.42
                                                                     1.10
                   1.51 | 11.333
                                    8. 11 | 17. 417
           5.250
                                                    1.94
                                                            23.50
                                                                     1.10
           5.333
                   1.56 | 11.417
                                    8. 11 | 17. 500
                                                    1.94
                                                           23.58
                                                                     1.09
           5.417
                   1.56 | 11.500
                                    8. 11 | 17. 583
                                                    1.88
                                                           23.67
                                                                     1.09
           5.500
                   1.56 | 11.583
                                   10. 32 | 17. 667
                                                    1.88
                                                           23.75
                                                                     1.09
           5.583
                   1, 61 | 11, 667
                                   10. 32 | 17. 750
                                                           23.83
                                                    1.88
                                                                     1.07
           5.667
                   1.61 | 11.750
                                   10. 32 | 17. 833
                                                    1.82
                                                           23. 92
                                                                     1.07
           5.750
                   1.61 | 11.833
                                   42.07 | 17.917
                                                           24.00
                                                    1.82
                                                                     1.07
           5.833
                    1.66 | 11.917
                                   42.08 | 18.000
                                                    1. 82 İ
                                                           24.08
                                                                     1.06
           5.917
                   1.66 | 12.000
                                   42. 08 | 18. 083
                                                    1.76
                                                           24. 17
                                                                     1.06
           6.000
                   1.66 | 12.083
                                  103.84 | 18.167
                                                    1.76
                                                           24. 25
                                                                     1.06
           6.083
                   1.70 | 12.167
                                 103.84 | 18.250
                                                    1.76
Max. Eff. Inten. (mm/hr)=
                           103.84
                                         63.62
           over (min)
                             5.00
                                         15.00
                             3.23 (ii)
Storage Coeff. (min)=
                                         11.68 (ii)
Unit Hyd. Tpeak (min)=
                             5.00
                                         15.00
Unit Hyd. peak (cms)=
                             0. 27
                                          0.09
                                                       *TOTALS*
PEAK FLOW
                (cms) =
                             0.34
                                          0.20
                                                        0.518 (iii)
TIME TO PEAK
                (hrs)=
                            12.25
                                         12.33
                                                        12.25
RUNOFF VOLUME
                                         37.26
                                                         57.47
                 (mm) =
                            95.00
TOTAL RAINFALL
                                         96.00
                (mm)=
                            96.00
                                                         96.00
RUNOFF COEFFICIENT =
                             0.99
                                          0.39
                                                         0.60
```

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0041) 1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0033):	0.41	0.044	12. 33	43.25
+ ID2= 2 (0036):	5. 32	0.490	12. 42	57.47
===============				
ID = 3 (0041):	5.73	0. 531	12. 33	56.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.									
+ ID2=	3 ()		2.05	0. 199	12. 33	41.05			
		0041):							
NOTE:	PEAK F	LOWS DO NO	T INCLU	DE BASEFLO	OWS IF AN	Υ.			
+ ID2= ==== ID =	3 1 () 2 () ====== 3 ()	 0041):	(ha) 7. 78 3. 43 ====== 11. 21	0. 518 ======= 1. 168	(hrs) 12. 33 12. 25 12. 25	(mm) 52.39 57.47 ====== 53.94			
CALIB									
	T	IME RAI hrs mm/h		TRANSFOR! ME RAI! rs mm/hi			N TIME nr hrs	RAIN mm/hr	

TRANSFORMED HYETOGRAPH									
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	0.00	6.167	1.70	12. 250	103.84	18. 33	1.70		
0. 167	0.00	6.250	1.70	12. 333	16. 46	18. 42	1.70		
0.250	0.00	6.333	1. 75	12. 417	16. 45	18. 50	1.70		
0.333	0.97	6.417	1. 75	12. 500	16. 45	18. 58	1.64		
0.417	0.97	6.500	1. 75	12. 583	11. 20	18. 67	1.64		
0.500	0.97	6.583	1.80	12. 667	11. 20	18. 75	1.64		
0.583	1.00	6.667	1.80	12.750	11. 20	18.83	1.58		
0.667	1.00	6.750	1.80	12. 833	7.70	18. 92	1.58		
0.750	1.00	6.833	1.85	12. 917	7.70	19.00	1.58		
0.833	1.02	6.917	1.85	13.000	7. 70	19. 08	1.52		
0. 917	1.02	7.000	1.85	13. 083	6. 51	19. 17	1.52		
1.000	1.02	7.083	1. 90	13. 167	6.50	19. 25	1.52		
1.083	1.04	7.167	1. 90	13. 250	6. 50	19. 33	1.46		
1. 167	1.04	7. 250	1. 90	13. 333	5. 51	19. 42	1.46		

```
1. 250
       1.04 | 7.333
                         1. 94 | 13. 417
                                          5. 51 | 19. 50
                                                          1.46
                         1. 94 | 13. 500
                                           5.51
1.333
        1.07 | 7.417
                                                  19. 58
                                                           1.40
1.417
         1.07
                7.500
                          1. 94 | 13. 583
                                           4.86
                                                  19.67
                                                           1.40
1.500
                7.583
                          1. 99 | 13. 667
                                                  19.75
         1.07
                                           4.86
                                                           1 40
                          1. 99 | 13. 750
                                                  19.83
1.583
         1.09
                7.667
                                           4.86
                                                           1.34
1.667
         1.09
                7.750
                          1. 99 | 13. 833
                                           4. 26
                                                  19.92
                                                           1.34
1.750
         1.09
                7.833
                          2.04 | 13.917
                                           4.26
                                                  20.00
                                                           1.34
1.833
         1.12
                7.917
                          2.04 | 14.000
                                           4. 26
                                                  20.08
                                                           1. 28
1.917
         1.12
                8.000
                          2.04 | 14.083
                                           3.80
                                                  20.17
                                                           1. 28
2.000
         1.12
                8.083
                          2.09 | 14.167
                                           3.80
                                                  20.25
                                                           1. 28
2.083
                8.167
                          2. 09 | 14. 250
                                                  20.33
         1.14
                                           3.80
                                                           1. 24
2.167
         1.14
                8.250
                          2.09 | 14.333
                                           3.47
                                                  20.42
                                                           1 24
2.250
         1.14
                8.333
                          2. 24 | 14. 417
                                           3.47
                                                  20.50
                                                           1 24
         1.17
2.333
                8.417
                          2. 24 | 14. 500
                                           3.47
                                                  20.58
                                                           1. 23
2.417
         1.17
                8.500
                          2. 24 | 14. 583
                                           3.30
                                                  20.67
                                                           1.23
2.500
         1.17
                8.583
                          2.47 | 14.667
                                           3.30
                                                  20.75
                                                           1.23
2.583
                8.667
                          2. 47 | 14. 750
         1.19
                                           3.30
                                                  20.83
                                                           1. 22
2.667
         1.19
                8.750
                          2. 47 | 14. 833
                                           3.13
                                                  20.92
                                                           1. 22
2.750
         1.19
                8.833
                          2.72 | 14.917
                                           3.13
                                                  21.00
                                                           1. 22
2.833
         1.21
                8.917
                          2.72 | 15.000
                                           3.13
                                                  21.08
                                                           1. 21
2.917
         1.21
                9.000
                          2.72 | 15.083
                                           2.97
                                                  21. 17
                                                           1. 21
3.000
         1.21
                9.083
                          2. 95 | 15. 167
                                           2.97
                                                  21.25
                                                           1. 21
3.083
         1.23
                9.167
                          2. 95 | 15. 250
                                           2.97
                                                  21.33
                                                           1.19
3.167
         1.23
                9.250
                          2.95
                                15.333
                                           2.79
                                                  21.42
                                                           1.19
3.250
                9.333
                          3. 07 | 15. 417
                                           2.79
         1.23
                                                  21.50
                                                           1. 19
3.333
                9.417
                          3. 07 | 15. 500
                                           2.79
         1.26
                                                  21.58
                                                           1. 18
3.417
         1.26
                9.500
                          3. 07 | 15. 583
                                           2.63
                                                  21.67
                                                           1. 18
3.500
                9.583
                          3.07 | 15.667
                                                  21.75
         1.26
                                           2.63
                                                           1. 18
3.583
                9.667
                          3. 07 | 15. 750
         1.28
                                           2.63
                                                  21.83
                                                           1. 17
3.667
                9.750
                          3. 07 | 15. 833
         1.28
                                           2.46
                                                  21. 92
                                                           1. 17
3.750
                9.833
                          3. 27 | 15. 917
         1.28
                                           2.46
                                                  22.00
                                                           1. 17
                9.917
3.833
                          3. 27 | 16. 000
                                           2.46
                                                  22.08
         1. 31
                                                           1. 16
         1.31 | 10.000
3.917
                          3. 27 | 16. 083
                                           2.29
                                                  22.17
                                                           1. 16
4.000
         1. 31 | 10. 083
                          3.64 | 16.167
                                           2. 29
                                                  22. 25
                                                           1 16
4.083
                          3.64 | 16.250
         1.33 | 10.167
                                           2. 29
                                                  22.33
                                                           1 15
                                                  22.42
4.167
         1.33 | 10.250
                          3. 64 | 16. 333
                                           2.18
                                                           1. 15
4.250
         1.33 | 10.333
                          4. 14 | 16. 417
                                           2.18
                                                  22.50
                                                           1. 15
4.333
         1.37 | 10.417
                          4. 14 | 16. 500
                                           2. 18
                                                  22.58
                                                           1. 13
4.417
         1.37 | 10.500
                          4. 14 | 16. 583
                                           2.12
                                                  22.67
                                                           1.13
         1.37 | 10.583
4.500
                          4. 69 | 16. 667
                                           2.12
                                                  22.75
                                                           1.13
4.583
         1.42 | 10.667
                          4. 69 | 16. 750
                                           2.12
                                                  22.83
                                                           1.12
         1.42 | 10.750
                          4. 69 | 16. 833
4.667
                                           2.06
                                                  22.92
                                                           1.12
4.750
         1.42 | 10.833
                          5. 49 | 16. 917
                                           2.06
                                                  23.00
                                                           1.12
4.833
         1.46 10.917
                          5. 49 | 17. 000
                                           2.06
                                                  23.08
                                                           1.11
4.917
         1.46 | 11.000
                          5.49 | 17.083
                                           2.00
                                                  23.17
                                                           1.11
5.000
         1.46 | 11.083
                          6.41 | 17.167
                                           2.00
                                                  23. 25
                                                           1. 11
5.083
         1.51 | 11.167
                          6.41 | 17.250
                                           2.00
                                                  23.33
                                                           1.10
                          6.41 | 17.333
5. 167
         1.51 | 11.250
                                           1.94
                                                  23.42
                                                           1.10
         1.51 | 11.333
                          8. 11 | 17. 417
                                           1.94
5. 250
                                                  23.50
                                                           1. 10
5.333
         1.56 | 11.417
                          8. 11 | 17. 500
                                           1.94
                                                  23.58
                                                           1.09
5.417
         1.56 | 11.500
                          8. 11 | 17. 583
                                           1.88 | 23.67
                                                           1.09
5.500
         1.56 | 11.583
                         10. 32 | 17. 667
                                          1.88 | 23.75
                                                           1 09
```

```
5.583
                     1. 61 | 11. 667 | 10. 32 | 17. 750
                                                   1.88 | 23.83
                      1.61 | 11.750 | 10.32 | 17.833
                                                    1.82 | 23.92
              5.667
              5.750
                      1.61 | 11.833 | 42.07 | 17.917
                                                    1.82 | 24.00
                                                                    1.07
                       1. 66 | 11. 917 | 42. 08 | 18. 000
                                                    1.82 | 24.08
              5.833
                                                                    1.06
                      1.66 | 12.000 | 42.08 | 18.083
              5. 917
                                                    1. 76 | 24. 17
                                                                    1.06
                      1. 66 | 12. 083 | 103. 84 | 18. 167
              6.000
                                                    1. 76 | 24. 25
                                                                    1.06
              6.083
                      1. 70 | 12. 167 | 103. 84 | 18. 250
                                                    1.76
    Unit Hyd Qpeak (cms) = 0.167
                   (cms) = 0.092 (i)
    PEAK FLOW
    TIME TO PEAK
                   (hrs) = 12.333
    RUNOFF VOLUME
                   (mm) = 43.235
    TOTAL RAINFALL (mm) = 96.000
    RUNOFF COEFFICIENT = 0.450
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0032)|
1 + 2 = 3
                          AREA
                                 QPEAK
                                          TPEAK
                                                    R. V.
                           (ha)
                                  (cms)
                                          (hrs)
                                                    (mm)
  ID1 = 1 (0039):
                          0.83
                                 0.092
                                          12.33
                                                  43.23
    + ID2= 2 ( 0041):
                         11. 21
                                 1. 168
                                         12. 25
                                                  53.94
      ______
       ID = 3 ( 0032): 12.04 1.257
                                         12. 25
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
***********
** SIMULATION: 3-2yr 24hr 15min SCS Type II **
**********
LCALIB
 NASHYD ( 0033)|
                                          Curve Number (CN) = 75.0
                     Area
                           (ha)= 0.41
|ID= 1 DT= 5.0 min | Ia
                            (mm) = 10.00
                                          # of Linear Res. (N) = 3.00
                     U. H. Tp(hrs) = 0.20
       NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                             ---- TRANSFORMED HYETOGRAPH ----
               TIME
                       RAIN | TIME
                                     RAIN | TIME
                                                     RAIN | TIME
                                     mm/hr | hrs
                hrs
                      mm/hr
                               hrs
                                                    mm/hr | hrs
                                                                    mm/hr
              0.083
                       0.00 | 6.167
                                     0. 94 | 12. 250
                                                    57. 11 | 18. 33
                                                                    0.93
                                      0. 94 | 12. 333
              0.167
                       0.00 | 6.250
                                                    9. 05 | 18. 42
                                                                    0.93
                       0.00 | 6.333
                                     0. 96 | 12. 417
              0.250
                                                     9.05 | 18.50
                                                                    0.93
              0.333
                       0.54 | 6.417
                                      0.96 | 12.500
                                                     9.05 | 18.58
                                                                    0.90
                                      0.96 | 12.583
                                                                    0.90
              0.417
                       0.54 | 6.500
                                                     6. 16 | 18. 67
              0.500
                       0.54 | 6.583
                                     0. 99 | 12. 667
                                                     6. 16 | 18. 75
                                                                    0.90
```

```
0.583
       0.55 | 6.667
                         0.99 | 12.750
                                          6. 16 | 18. 83
                                                          0.87
0.667
         0.55 | 6.750
                         0. 99 | 12. 833
                                          4.24
                                                 18.92
                                                           0.87
0.750
         0.55
                6.833
                         1.02 | 12.917
                                          4.24
                                                 19.00
                                                           0.87
                         1.02 | 13.000
0.833
         0.56
                6.917
                                                 19.08
                                          4.24
                                                           0.84
0.917
         0.56
                7.000
                         1.02 | 13.083
                                          3.58
                                                 19. 17
                                                           0.84
1.000
         0.56
                7.083
                         1.04 | 13.167
                                          3.58
                                                 19. 25
                                                           0.84
                         1.04 | 13.250
1.083
         0.57
                7.167
                                          3.58
                                                 19.33
                                                           0.80
1.167
         0.57
                7.250
                         1.04 | 13.333
                                          3.03
                                                 19.42
                                                           0.80
1.250
         0.57
                7.333
                         1.07 | 13.417
                                          3.03
                                                 19.50
                                                           0.80
                         1. 07 | 13. 500
1.333
         0.59
                7.417
                                          3.03
                                                 19.58
                                                           0.77
1.417
         0.59
                7.500
                         1. 07 | 13. 583
                                          2.67
                                                 19.67
                                                           0.77
                                                 19.75
1.500
         0.59
                7.583
                         1. 10 | 13. 667
                                          2.67
                                                          0.77
1.583
         0.60
                7.667
                         1. 10 | 13. 750
                                          2.67
                                                 19.83
                                                           0.73
                7.750
                         1. 10 | 13. 833
1.667
         0.60
                                          2.34
                                                 19.92
                                                           0.73
1.750
         0.60
                7.833
                         1. 12 | 13. 917
                                          2.34
                                                 20.00
                                                           0.73
1.833
                7.917
                         1. 12 | 14. 000
         0.61
                                          2.34
                                                 20.08
                                                           0.70
1.917
         0.61
                8.000
                         1. 12 | 14. 083
                                          2.09
                                                 20.17
                                                           0.70
2.000
         0.61
                8.083
                         1. 15 | 14. 167
                                          2.09
                                                 20.25
                                                           0.70
2.083
         0.63
                8.167
                         1.15 | 14.250
                                          2.09
                                                 20.33
                                                           0.68
2.167
         0.63
                8.250
                         1. 15 | 14. 333
                                          1.91
                                                 20.42
                                                           0.68
2.250
         0.63
                8.333
                         1. 23 | 14. 417
                                          1. 91
                                                 20.50
                                                           0.68
2.333
         0.64
                8.417
                         1. 23 | 14. 500
                                          1.91
                                                 20.58
                                                           0.68
2.417
         0.64
                8.500
                         1. 23 | 14. 583
                                          1.82
                                                 20.67
                                                           0.68
2.500
         0.64
                8.583
                         1. 36 | 14. 667
                                          1.82
                                                 20.75
                                                           0.68
                         1. 36 | 14. 750
2.583
         0.65
                8.667
                                                 20.83
                                                           0.67
                                          1.82
2.667
         0.65
                8.750
                         1. 36 | 14. 833
                                                 20.92
                                                           0.67
                                          1.72
                         1. 49 | 14. 917
2.750
         0.65
                8.833
                                          1.72
                                                 21.00
                                                           0.67
                         1.49 | 15.000
2.833
         0.67
                8.917
                                          1.72
                                                 21.08
                                                           0.66
2.917
         0.67
                9.000
                         1.49 | 15.083
                                                 21.17
                                          1.63
                                                           0.66
3.000
         0.67
                9.083
                         1.62 | 15.167
                                          1.63
                                                 21. 25
                                                           0.66
3.083
                         1.62 | 15.250
         0.68
                9.167
                                                 21.33
                                          1.63
                                                           0.66
3.167
                9.250
                         1. 62 | 15. 333
         0.68
                                          1.54
                                                 21.42
                                                           0.66
3.250
                9.333
                         1. 69 | 15. 417
         0.68
                                          1.54
                                                 21.50
                                                           0.66
3.333
         0.69
                9.417
                         1.69 | 15.500
                                          1.54
                                                 21.58
                                                           0.65
3.417
         0.69
                9.500
                         1.69 | 15.583
                                                 21.67
                                          1.45
                                                           0.65
3.500
         0.69
                9.583
                         1. 69 | 15. 667
                                          1.45
                                                 21.75
                                                           0.65
3.583
                         1.69 | 15.750
         0.71
                9.667
                                          1.45
                                                 21.83
                                                           0.64
3.667
         0.71
                9.750
                         1. 69 | 15. 833
                                          1.35
                                                 21. 92
                                                           0.64
3.750
         0.71
                9.833
                         1.80 | 15.917
                                          1.35
                                                 22.00
                                                           0.64
3.833
         0.72
                9.917
                         1.80 | 16.000
                                          1.35
                                                 22.08
                                                           0.64
3.917
         0.72 | 10.000
                         1.80 | 16.083
                                          1.26
                                                 22.17
                                                           0.64
4.000
         0.72 | 10.083
                         2.00 | 16.167
                                                 22. 25
                                          1.26
                                                           0.64
         0.73 | 10.167
4.083
                         2.00 116.250
                                          1.26
                                                 22.33
                                                           0.63
         0.73 | 10.250
                         2.00 16.333
4.167
                                          1.20
                                                 22.42
                                                           0.63
4.250
         0.73 | 10.333
                         2. 28 | 16. 417
                                          1.20
                                                 22.50
                                                           0.63
4.333
         0.75 | 10.417
                         2. 28 | 16. 500
                                                 22.58
                                          1.20 I
                                                           0.62
4.417
         0.75 | 10.500
                         2. 28 | 16. 583
                                          1.17
                                                 22.67
                                                           0.62
4.500
         0.75 | 10.583
                         2.58 | 16.667
                                                 22.75
                                          1.17
                                                           0.62
         0.78 | 10.667
4.583
                         2. 58 | 16. 750
                                          1.17
                                                 22.83
                                                           0.62
         0.78 | 10.750
4.667
                         2.58 | 16.833
                                          1.13
                                                 22.92
                                                           0.62
4.750
         0.78 | 10.833
                          3. 02 | 16. 917
                                          1. 13 | 23. 00
                                                           0.62
4.833
         0.81 | 10.917
                         3.02 | 17.000
                                          1. 13 | 23. 08
                                                           0.61
```

```
4. 917 0. 81 | 11. 000
                         3.02 | 17.083
                                           1. 10 | 23. 17
                                                             0.61
5.000
         0.81 | 11.083
                          3. 53 | 17. 167
                                           1. 10 | 23. 25
5.083
         0.83 | 11.167
                          3.53 | 17.250
                                           1. 10 | 23. 33
                                                             0.60
         0.83 | 11.250
                          3. 53 | 17. 333
                                           1.07 | 23.42
5. 167
                                                             0.60
         0.83 | 11.333
5.250
                          4. 46 | 17. 417
                                           1.07 | 23.50
                                                             0.60
         0.86 | 11.417
                          4.46 17.500
5.333
                                           1.07 | 23.58
                                                             0.60
         0.86 | 11.500
                          4. 46 | 17. 583
                                           1. 03 İ
5.417
                                                  23.67
                                                             0.60
5.500
         0.86 | 11.583
                          5. 68 | 17. 667
                                           1.03 | 23.75
                                                             0.60
5.583
         0.88 | 11.667
                          5. 68 | 17. 750
                                           1.03
                                                  23.83
                                                             0.59
         0.88 | 11.750
                         5. 68 | 17. 833
5.667
                                           1.00
                                                  23.92
                                                             0.59
5.750
         0.88 | 11.833
                         23. 14 | 17. 917
                                           1.00
                                                  24.00
                                                             0.59
5.833
         0. 91 | 11. 917
                         23. 14 | 18. 000
                                           1.00 İ
                                                  24.08
                                                             0.58
5. 917
         0.91 | 12.000
                         23. 14 | 18. 083
                                           0. 97 | 24. 17
                                                             0.58
         0. 91 | 12. 083
                         57. 11 | 18. 167
6.000
                                           0. 97 | 24. 25
                                                             0.58
6.083
         0. 94 | 12. 167 | 57. 11 | 18. 250
                                           0.97
```

PEAK FLOW (cms)= 0.014 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 14.343
TOTAL RAINFALL (mm)= 52.800
RUNOFF COEFFICIENT = 0.272

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	0. 94	12. 250	57.11	18. 33	0. 93
0.167	0.00	6.250	0. 94	12. 333	9.05	18.42	0. 93
0.250	0.00	6.333	0.96	12. 417	9.05	18.50	0. 93
0.333	0.54	6.417	0. 96	12. 500	9.05	18.58	0.90
0.417	0.54	6.500	0. 96	12. 583	6. 16	18.67	0.90
0.500	0.54	6.583	0. 99	12. 667	6. 16	18.75	0.90
0.583	0.55	6.667	0. 99	12. 750	6. 16	18.83	0.87
0.667	0.55	6.750	0. 99	12.833	4. 24	18. 92	0.87
0.750	0.55	6.833	1.02	12. 917	4. 24	19.00	0.87
0.833	0.56	6.917	1.02	13.000	4. 24	19.08	0.84
0. 917	0.56	7.000	1.02	13.083	3.58	19. 17	0.84
1.000	0.56	7.083	1.04	13. 167	3.58	19. 25	0.84
1.083	0.57	7.167	1.04	13. 250	3.58	19.33	0.80

```
1. 167
        0.57 | 7.250
                        1.04 | 13.333
                                          3. 03 | 19. 42
                                                          0.80
1.250
        0.57
                7.333
                         1.07 | 13.417
                                          3.03
                                                 19.50
                                                          0.80
1.333
         0.59
                7.417
                         1.07 | 13.500
                                          3.03
                                                 19.58
                                                          0.77
         0.59
                         1. 07 | 13. 583
1.417
                7.500
                                                 19.67
                                          2.67
                                                          0.77
                                                 19.75
1.500
        0.59
                7.583
                         1. 10 | 13. 667
                                          2.67
                                                          0.77
                         1. 10 | 13. 750
1.583
         0.60
                7.667
                                          2.67
                                                 19.83
                                                          0.73
                         1. 10 | 13. 833
1.667
         0.60
                7.750
                                          2.34
                                                 19.92
                                                          0.73
                                          2.34
1.750
         0.60
                7.833
                         1. 12 | 13. 917
                                                 20.00
                                                          0.73
1.833
         0.61
                7.917
                         1. 12 | 14. 000
                                          2.34
                                                 20.08
                                                          0.70
                         1. 12 | 14. 083
1.917
         0.61
                8.000
                                          2.09
                                                 20.17
                                                          0.70
2.000
         0.61
                8.083
                         1. 15 | 14. 167
                                          2.09
                                                 20. 25
                                                          0.70
2.083
         0.63
                8.167
                         1. 15 | 14. 250
                                          2.09
                                                 20.33
                                                          0.68
2.167
         0.63
                8.250
                         1. 15 | 14. 333
                                          1.91
                                                 20.42
                                                          0.68
2.250
                8.333
                         1, 23 | 14, 417
         0.63
                                          1.91
                                                 20.50
                                                          0.68
2.333
         0.64
                8.417
                         1. 23 | 14. 500
                                          1.91
                                                 20.58
                                                          0.68
2.417
                8.500
                         1. 23 | 14. 583
         0.64
                                          1.82
                                                 20.67
                                                          0.68
2.500
         0.64
                8.583
                         1. 36 | 14. 667
                                                 20.75
                                          1.82
                                                          0.68
2.583
         0.65
                8.667
                         1. 36 | 14. 750
                                          1.82
                                                 20.83
                                                          0.67
2.667
         0.65
                8.750
                         1.36 | 14.833
                                          1.72
                                                 20.92
                                                          0.67
2.750
         0.65
                8.833
                         1.49 | 14.917
                                          1.72
                                                 21.00
                                                          0.67
2.833
         0.67
                8.917
                         1.49 | 15.000
                                          1.72
                                                 21.08
                                                           0.66
2.917
         0.67
                9.000
                         1.49 | 15.083
                                          1.63
                                                 21.17
                                                           0.66
3.000
         0.67
                9.083
                         1.62 | 15.167
                                          1.63
                                                 21. 25
                                                          0.66
3.083
         0.68
                9.167
                         1.62
                               15. 250
                                          1.63
                                                 21.33
                                                          0.66
3.167
         0.68
                9.250
                         1. 62 | 15. 333
                                                 21.42
                                          1.54
                                                          0.66
                         1. 69 | 15. 417
3.250
         0.68
                9.333
                                                 21.50
                                          1.54
                                                          0.66
3.333
         0.69
                9.417
                         1.69 | 15.500
                                          1.54
                                                 21.58
                                                          0.65
3.417
         0.69
                9.500
                         1. 69 | 15. 583
                                          1.45
                                                 21.67
                                                          0.65
3.500
         0.69
                9.583
                         1.69 | 15.667
                                          1.45
                                                 21.75
                                                          0.65
3.583
                         1.69 | 15.750
         0.71
                9.667
                                                 21.83
                                          1.45
                                                          0.64
                9.750
                         1.69 | 15.833
3.667
         0.71
                                                 21.92
                                          1.35
                                                          0.64
3.750
                9.833
                         1. 80 | 15. 917
         0.71
                                          1.35
                                                 22.00
                                                          0.64
3.833
                9.917
                         1.80 | 16.000
         0.72
                                          1.35
                                                 22.08
                                                          0.64
3.917
         0.72 | 10.000
                         1.80 | 16.083
                                          1.26
                                                 22.17
                                                          0 64
4.000
         0.72 | 10.083
                         2.00 | 16.167
                                          1. 26
                                                 22. 25
                                                          0 64
4.083
         0.73 | 10.167
                         2.00 | 16.250
                                          1.26
                                                 22.33
                                                          0.63
         0.73 | 10.250
4.167
                         2.00 | 16.333
                                          1.20
                                                 22.42
                                                          0.63
4.250
         0.73 | 10.333
                         2. 28 | 16. 417
                                          1.20
                                                 22.50
                                                          0.63
4.333
         0.75 | 10.417
                         2. 28 | 16. 500
                                          1.20
                                                 22.58
                                                          0.62
4.417
         0.75 | 10.500
                         2. 28 | 16. 583
                                          1. 17
                                                 22.67
                                                          0.62
4.500
         0.75 | 10.583
                         2. 58 | 16. 667
                                          1.17
                                                 22.75
                                                          0.62
4.583
         0.78 | 10.667
                         2. 58 | 16. 750
                                          1.17
                                                 22.83
                                                          0.62
4.667
         0.78 | 10.750
                         2, 58 | 16, 833
                                          1.13
                                                 22.92
                                                          0.62
4.750
         0. 78 | 10. 833
                         3. 02 | 16. 917
                                          1.13
                                                 23.00
                                                          0.62
4.833
         0.81 | 10.917
                         3. 02 | 17. 000
                                          1.13
                                                 23.08
                                                          0.61
         0.81 | 11.000
                         3. 02 | 17. 083
4.917
                                          1.10
                                                 23. 17
                                                          0.61
5.000
        0.81 | 11.083
                         3.53 | 17.167
                                          1.10 l
                                                 23. 25
                                                          0.61
5.083
         0.83 | 11.167
                         3.53 | 17.250
                                                 23.33
                                          1.10
                                                          0.60
                         3. 53 | 17. 333
                                                 23.42
         0.83 | 11.250
                                          1.07
5. 167
                                                          0.60
5.250
         0.83 | 11.333
                         4.46 | 17.417
                                          1.07
                                                 23.50
                                                          0.60
                         4.46 17.500
                                          1.07
5.333
         0.86 | 11.417
                                                 23.58
                                                          0.60
5.417
         0.86 | 11.500
                         4.46 | 17.583
                                          1.03 | 23.67
                                                          0.60
```

```
5.500
        0.86 | 11.583
                          5. 68 | 17. 667
                                           1.03 | 23.75
                                                             0.60
5.583
         0.88 | 11.667
                          5. 68 | 17. 750
                                           1.03 | 23.83
                                                             0.59
                          5. 68 | 17. 833
5.667
         0.88 | 11.750
                                           1.00 | 23.92
                                                             0.59
         0.88 | 11.833 | 23.14 | 17.917
5.750
                                           1.00 | 24.00
                                                             0.59
         0. 91 | 11. 917
                         23. 14 | 18. 000
5.833
                                           1.00 | 24.08
                                                             0.58
         0. 91 | 12. 000
                        23. 14 | 18. 083
5.917
                                           0. 97 | 24. 17
                                                             0.58
         0. 91 | 12. 083
                         57. 11 | 18. 167
                                           0. 97 | 24. 25
6.000
                                                             0.58
6.083
        0. 94 | 12. 167 | 57. 11 | 18. 250
                                           0.97
```

PEAK FLOW (cms) = 0.061 (i) TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 13.378 TOTAL RAINFALL (mm) = 52.800 RUNOFF COEFFICIENT = 0.253

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0036) ID= 1 DT= 5.0 min	Area Total	(ha) = 5.1 Imp(%) = 50.0	32 00 Dir. Conn.(%)=	35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	2. 66	2.66	
Dep. Storage	(mm) =	1.00	5.00	
Average SI ope	(%)=	1.00	1. 00	
Length	(m) =	188. 33	40.00	
Manni ngs n	=	0. 130	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP

---- TRANSFORMED HYETOGRAPH ----

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	0.94	12. 250	57.11	18. 33	0. 93
0. 167	0.00	6.250	0.94	12. 333	9.05	18. 42	0. 93
0.250	0.00	6.333	0.96	12. 417	9.05	18.50	0. 93
0.333	0.54	6.417	0.96	12. 500	9.05	18. 58	0. 90
0.417	0.54	6.500	0.96	12. 583	6. 16	18.67	0. 90
0.500	0.54	6.583	0.99	12. 667	6. 16	18. 75	0.90
0.583	0.55	6.667	0.99	12. 750	6.16	18.83	0.87
0.667	0.55	6.750	0. 99	12. 833	4. 24	18. 92	0.87
0.750	0.55	6.833	1.02	12. 917	4. 24	19.00	0.87
0.833	0.56	6.917	1.02	13.000	4. 24	19.08	0.84
0. 917	0.56	7.000	1.02	13. 083	3.58	19. 17	0.84
1.000	0.56	7.083	1.04	13. 167	3.58	19. 25	0.84
1.083	0.57	7.167	1.04	13. 250	3.58	19. 33	0.80
1. 167	0.57	7.250	1.04	13. 333	3.03	19. 42	0.80

```
1.250
        0.57 | 7.333
                         1.07 | 13.417
                                          3. 03 | 19. 50
                                                           0.80
1.333
         0.59
                7.417
                         1.07 | 13.500
                                          3.03
                                                  19.58
                                                           0.77
1.417
         0.59
                7.500
                         1.07 | 13.583
                                          2.67
                                                  19.67
                                                            0.77
1.500
         0.59
                7.583
                         1. 10 | 13. 667
                                                  19.75
                                                           0.77
                                          2.67
1.583
                7.667
                         1. 10 | 13. 750
                                                  19.83
                                                           0.73
         0.60
                                          2.67
1.667
         0.60
                7.750
                         1. 10 | 13. 833
                                          2.34
                                                  19.92
                                                           0.73
         0.60
1.750
                7.833
                         1. 12 | 13. 917
                                          2.34
                                                  20.00
                                                           0.73
                         1. 12 | 14. 000
1.833
         0.61
                7.917
                                          2.34
                                                  20.08
                                                           0.70
1.917
         0.61
                8.000
                         1. 12 | 14. 083
                                          2.09
                                                  20.17
                                                           0.70
2.000
         0.61
                8.083
                         1. 15 | 14. 167
                                          2.09
                                                  20.25
                                                           0.70
2.083
                8.167
                         1. 15 | 14. 250
                                          2.09
                                                  20.33
         0.63
                                                           0.68
2.167
         0.63
                8.250
                         1. 15 | 14. 333
                                          1.91
                                                  20.42
                                                           0.68
2.250
         0.63
                8.333
                         1, 23 | 14, 417
                                          1.91
                                                  20.50
                                                           0.68
2.333
         0.64
                8.417
                         1, 23 | 14, 500
                                          1.91
                                                  20.58
                                                           0.68
2.417
         0.64
                8.500
                         1. 23 | 14. 583
                                          1.82
                                                  20.67
                                                           0.68
2.500
                         1. 36 | 14. 667
         0.64
                8.583
                                          1.82
                                                  20.75
                                                           0.68
2.583
         0.65
                8.667
                         1. 36 | 14. 750
                                                  20.83
                                          1.82
                                                           0.67
2.667
         0.65
                8.750
                         1. 36 | 14. 833
                                          1.72
                                                  20.92
                                                           0.67
2.750
         0.65
                8.833
                         1.49 | 14.917
                                          1.72
                                                  21.00
                                                           0.67
2.833
         0.67
                8.917
                          1.49 | 15.000
                                          1.72
                                                  21.08
                                                           0.66
2.917
         0.67
                9.000
                         1.49
                                15.083
                                          1.63
                                                  21. 17
                                                            0.66
3.000
         0.67
                9.083
                         1.62
                                15. 167
                                          1.63
                                                  21. 25
                                                            0.66
3.083
         0.68
                9.167
                          1.62
                                15. 250
                                          1.63
                                                  21.33
                                                            0.66
3.167
         0.68
                9.250
                          1.62
                                15.333
                                          1.54
                                                  21.42
                                                            0.66
3.250
         0.68
                9.333
                                15. 417
                          1.69
                                          1.54
                                                  21.50
                                                            0.66
3.333
         0.69
                9.417
                          1.69
                                115, 500
                                                  21.58
                                          1.54
                                                           0.65
3.417
         0.69
                9.500
                         1.69
                                15.583
                                          1.45
                                                  21.67
                                                           0.65
3.500
         0.69
                9.583
                          1.69 | 15.667
                                          1.45
                                                  21.75
                                                           0.65
3.583
         0.71
                9.667
                          1.69 | 15.750
                                          1.45
                                                  21.83
                                                           0.64
3.667
         0.71
                9.750
                         1.69 | 15.833
                                                 21. 92
                                          1.35
                                                           0.64
3.750
         0.71
                9.833
                         1.80 | 15.917
                                                  22.00
                                          1.35
                                                           0.64
                9.917
                          1.80 | 16.000
3.833
         0.72
                                          1.35
                                                  22.08
                                                           0.64
3.917
         0.72 | 10.000
                          1.80 | 16.083
                                          1.26
                                                  22.17
                                                           0.64
4.000
         0.72 | 10.083
                         2.00 | 16.167
                                          1. 26
                                                  22. 25
                                                           0.64
4.083
         0.73 | 10.167
                         2.00 | 16.250
                                                  22.33
                                          1. 26
                                                           0.63
4.167
         0.73 | 10.250
                         2.00 | 16.333
                                          1.20
                                                  22.42
                                                           0.63
4.250
         0.73 | 10.333
                         2. 28 | 16. 417
                                          1.20
                                                  22.50
                                                           0.63
         0.75 | 10.417
                          2. 28 | 16. 500
4.333
                                          1. 20
                                                  22.58
                                                           0.62
4.417
         0.75 | 10.500
                         2. 28 | 16. 583
                                          1.17
                                                  22.67
                                                            0.62
4.500
         0.75 | 10.583
                          2. 58 | 16. 667
                                          1. 17
                                                  22.75
                                                           0.62
4.583
         0.78 | 10.667
                          2. 58 | 16. 750
                                          1. 17
                                                  22.83
                                                           0.62
         0.78 | 10.750
                         2. 58 | 16. 833
4.667
                                          1.13
                                                  22.92
                                                           0.62
4.750
         0.78 | 10.833
                          3. 02 | 16. 917
                                          1.13
                                                  23.00
                                                           0.62
4.833
         0.81 | 10.917
                          3. 02 | 17. 000
                                          1.13
                                                  23.08
                                                           0.61
4.917
         0.81 | 11.000
                         3.02 | 17.083
                                          1.10
                                                  23. 17
                                                           0.61
5.000
         0.81 | 11.083
                         3. 53 | 17. 167
                                          1.10
                                                 23. 25
                                                           0.61
5.083
         0.83 | 11.167
                         3.53 | 17.250
                                          1.10
                                                 23. 33
                                                           0.60
         0.83 | 11.250
                         3.53 | 17.333
5. 167
                                          1.07
                                                  23.42
                                                           0.60
         0.83 | 11.333
                         4. 46 | 17. 417
5. 250
                                          1.07
                                                 23.50
                                                           0.60
5.333
         0.86 | 11.417
                          4.46 | 17.500
                                          1.07
                                                 23.58
                                                           0.60
                          4.46 17.583
5.417
         0.86 | 11.500
                                          1.03
                                                 23.67
                                                           0.60
5.500
         0.86 | 11.583
                          5. 68 | 17. 667
                                          1.03 | 23.75
                                                           0.60
```

```
5.583
                    0.88 | 11.667
                                     5. 68 | 17. 750
                                                      1.03 | 23.83
                                                                       0.59
                    0.88 | 11.750
                                     5. 68 | 17. 833
                                                      1.00 | 23.92
           5.667
                                                                        0.59
           5.750
                     0.88 | 11.833
                                    23. 14 | 17. 917
                                                      1.00 | 24.00
                                                                        0.59
                    0. 91 | 11. 917
                                    23. 14 | 18. 000
                                                      1.00 | 24.08
                                                                       0.58
           5.833
                    0. 91 | 12. 000 | 23. 14 | 18. 083
           5.917
                                                      0. 97 | 24. 17
                                                                       0.58
                    0. 91 | 12. 083 | 57. 11 | 18. 167
           6.000
                                                      0. 97 | 24. 25
                                                                       0.58
                    0. 94 | 12. 167 | 57. 11 | 18. 250
           6.083
                                                      0.97
Max. Eff. Inten. (mm/hr)=
                             48.62
                                           16.90
           over (min)
                             20.00
                                           40.00
Storage Coeff. (min)=
                             19.84 (ii)
                                           37.54 (ii)
Unit Hyd. Tpeak (min)=
                             20.00
                                           40.00
Unit Hyd. peak (cms)=
                              0.06
                                           0.03
                                                         *TOTALS*
PEAK FLOW
                 (cms) =
                              0.16
                                            0.05
                                                          0.197 (iii)
TIME TO PEAK
                                                           12.42
                (hrs)=
                             12.42
                                           12.75
RUNOFF VOLUME
                             51.80
                                           12.97
                                                           26.56
                 (mm) =
TOTAL RAINFALL
                 (mm) =
                             52.80
                                           52.80
                                                           52.80
RUNOFF COEFFICIENT =
                              0.98
                                           0.25
                                                           0.50
```

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- $CN^* = 59.0$ Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

LCALID

Mannings n

CALIB STANDHYD (0040) ID= 1 DT= 5.0 min	Area Total	,	3. 43 50. 00	Dir. Conn. (%)=	35. 00
		I MPERVI (OUS	PERVIOUS (i)	
Surface Area	(ha)=	1. 7		1. 71	
Dep. Storage	(mm) =	1.00)	5.00	
Average Slope	(%)=	1.00)	2.00	
Lanath	(m) -	151 2)	40.00	

0.013 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----

0.250

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	0.94	12. 250	57. 11	18. 33	0. 93
0.167	0.00	6.250	0.94	12. 333	9.05	18.42	0. 93
0.250	0.00	6.333	0.96	12. 417	9.05	18. 50	0. 93
0.333	0.54	6.417	0.96	12. 500	9.05	18. 58	0.90
0.417	0.54	6.500	0.96	12. 583	6. 16	18. 67	0. 90
0.500	0.54	6.583	0.99	12. 667	6. 16	18. 75	0. 90

```
0.583
        0.55 | 6.667
                         0.99 | 12.750
                                           6. 16 | 18. 83
                                                           0.87
         0.55
                          0.99 | 12.833
                                           4.24
                                                  18.92
0.667
                6.750
                                                            0.87
0.750
         0.55
                6.833
                          1.02 | 12.917
                                           4.24
                                                  19.00
                                                            0.87
                6.917
                          1.02 | 13.000
0.833
         0.56
                                           4.24
                                                  19.08
                                                            0.84
                                                  19.17
0.917
                7.000
                          1.02 | 13.083
                                           3.58
         0.56
                                                            0.84
1.000
         0.56
                7.083
                          1.04 | 13.167
                                           3.58
                                                  19.25
                                                            0.84
1.083
         0.57
                7.167
                          1.04 | 13.250
                                           3.58
                                                  19.33
                                                            0.80
1. 167
         0.57
                7.250
                          1.04 | 13.333
                                           3.03
                                                  19.42
                                                            0.80
1.250
         0.57
                7.333
                          1. 07 | 13. 417
                                           3.03
                                                  19.50
                                                            0.80
1.333
         0.59
                7.417
                          1.07 | 13.500
                                           3.03
                                                  19.58
                                                            0.77
1.417
         0.59
                7.500
                          1. 07 | 13. 583
                                                  19.67
                                           2.67
                                                            0.77
1.500
         0.59
                7.583
                          1. 10 | 13. 667
                                           2.67
                                                  19.75
                                                            0.77
1.583
         0.60
                7.667
                          1. 10 | 13. 750
                                           2.67
                                                  19.83
                                                            0.73
1.667
         0.60
                7.750
                          1. 10 | 13. 833
                                           2.34
                                                  19.92
                                                            0.73
1.750
         0.60
                7.833
                          1. 12 | 13. 917
                                           2.34
                                                  20.00
                                                            0.73
                          1. 12 | 14. 000
1.833
         0.61
                7.917
                                           2.34
                                                  20.08
                                                            0.70
1.917
                8.000
                          1. 12 | 14. 083
                                                  20.17
         0.61
                                           2.09
                                                            0.70
2.000
         0.61
                8.083
                          1. 15 | 14. 167
                                           2.09
                                                  20.25
                                                            0.70
2.083
                8.167
                          1. 15 | 14. 250
                                           2.09
                                                  20.33
         0.63
                                                            0.68
2.167
         0.63
                8.250
                          1. 15 | 14. 333
                                           1.91
                                                  20.42
                                                            0.68
2.250
         0.63
                8.333
                          1. 23 | 14. 417
                                           1.91
                                                  20.50
                                                            0.68
2.333
         0.64
                8.417
                          1. 23 | 14. 500
                                           1.91
                                                  20.58
                                                            0.68
2.417
         0.64
                8.500
                          1. 23 | 14. 583
                                           1.82
                                                  20.67
                                                            0.68
2.500
         0.64
                8.583
                          1. 36 | 14. 667
                                           1.82
                                                  20.75
                                                            0.68
2.583
                8.667
                          1. 36 | 14. 750
         0.65
                                           1.82
                                                  20.83
                                                            0.67
2.667
                8.750
                          1. 36 | 14. 833
                                                  20.92
         0.65
                                           1.72
                                                            0.67
2.750
         0.65
                8.833
                          1.49 14.917
                                           1.72
                                                  21.00
                                                            0.67
2.833
         0.67
                8.917
                          1.49 | 15.000
                                           1.72
                                                  21.08
                                                            0.66
2.917
                9.000
                          1.49 | 15.083
         0.67
                                           1.63
                                                  21. 17
                                                            0.66
3.000
                          1.62 | 15.167
         0.67
                9.083
                                                  21. 25
                                           1.63
                                                            0.66
3.083
                          1.62 | 15.250
         0.68
                9.167
                                           1.63
                                                  21.33
                                                            0.66
3.167
                9.250
                          1.62 | 15.333
                                                  21.42
         0.68
                                           1.54
                                                            0.66
                          1. 69 | 15. 417
3.250
         0.68
                9.333
                                           1.54
                                                  21.50
                                                            0.66
3.333
         0.69
                9.417
                          1.69 | 15.500
                                           1.54
                                                  21.58
                                                            0.65
3.417
                9.500
                          1.69 | 15.583
         0.69
                                           1.45
                                                  21.67
                                                            0.65
3.500
         0.69
                9.583
                          1. 69 | 15. 667
                                           1.45
                                                  21.75
                                                            0.65
3.583
         0.71
                9.667
                          1.69 | 15.750
                                           1.45
                                                  21.83
                                                            0.64
                9.750
                          1.69 | 15.833
3.667
         0.71
                                           1.35
                                                  21.92
                                                            0.64
3.750
         0.71
                9.833
                          1.80 | 15.917
                                           1.35
                                                  22.00
                                                            0.64
3.833
         0.72
                9.917
                          1.80 | 16.000
                                           1.35
                                                  22.08
                                                            0.64
3.917
         0.72 | 10.000
                          1.80 | 16.083
                                           1.26
                                                  22.17
                                                            0.64
4.000
         0.72 | 10.083
                          2.00 | 16.167
                                           1.26
                                                  22. 25
                                                            0.64
4.083
         0.73 | 10.167
                          2.00 | 16.250
                                                  22.33
                                           1. 26
                                                            0.63
4.167
         0.73 | 10.250
                          2.00 | 16.333
                                           1.20
                                                  22.42
                                                            0.63
4.250
         0.73 | 10.333
                          2. 28 | 16. 417
                                           1.20
                                                  22.50
                                                            0.63
         0.75 | 10.417
                          2. 28 | 16. 500
4.333
                                           1.20
                                                  22. 58
                                                            0.62
4.417
         0.75 | 10.500
                          2. 28 | 16. 583
                                           1.17
                                                  22.67
                                                            0.62
         0.75 | 10.583
4.500
                          2.58 | 16.667
                                           1.17
                                                  22.75
                                                            0.62
         0.78 | 10.667
                          2.58 | 16.750
4.583
                                           1.17
                                                  22.83
                                                            0.62
                          2.58 | 16.833
4.667
         0.78 | 10.750
                                           1.13
                                                  22.92
                                                            0.62
4.750
         0.78 | 10.833
                          3.02 | 16.917
                                           1. 13 | 23. 00
                                                            0.62
4.833
         0.81 | 10.917
                          3.02 | 17.000
                                          1. 13 | 23. 08
                                                            0.61
```

```
4.917
                        0.81 | 11.000
                                         3.02 | 17.083
                                                          1. 10 | 23. 17
                                                                           0.61
                5.000
                         0.81 | 11.083
                                         3.53 | 17.167
                                                          1. 10 | 23. 25
                                                                           0.61
                                          3.53 | 17.250
                5.083
                         0.83 | 11.167
                                                          1.10 | 23.33
                                                                           0.60
                         0.83 | 11.250
                                         3. 53 | 17. 333
                5. 167
                                                          1.07 | 23.42
                                                                           0.60
                5.250
                         0.83 | 11.333
                                          4.46 | 17.417
                                                          1.07 | 23.50
                                                                           0.60
                5.333
                         0.86 | 11.417
                                          4.46 | 17.500
                                                          1.07 | 23.58
                                                                           0.60
                5.417
                         0.86 | 11.500
                                          4.46 17.583
                                                          1.03
                                                                 23.67
                                                                           0.60
                5.500
                         0.86 | 11.583
                                         5. 68 | 17. 667
                                                          1.03
                                                                 23.75
                                                                           0.60
                5.583
                         0.88 | 11.667
                                          5.68 | 17.750
                                                          1.03
                                                                 23.83
                                                                           0.59
                5.667
                         0.88 | 11.750
                                         5. 68 | 17. 833
                                                          1.00
                                                                 23.92
                                                                           0.59
                5.750
                         0.88 | 11.833
                                         23. 14 | 17. 917
                                                          1.00
                                                                 24.00
                                                                           0.59
                5.833
                         0. 91 | 11. 917
                                         23. 14 | 18. 000
                                                          1.00
                                                                 24.08
                                                                           0.58
                5.917
                         0.91 | 12.000
                                        23. 14 | 18. 083
                                                          0. 97 İ
                                                                 24. 17
                                                                           0.58
                         0. 91 | 12. 083
                6.000
                                        57. 11 | 18. 167
                                                          0. 97 İ
                                                                 24. 25
                                                                           0.58
                6.083
                         0. 94 | 12. 167
                                        57. 11 | 18. 250
                                                          0.97
     Max. Eff. Inten. (mm/hr)=
                                  57.11
                                               20.54
                over (min)
                                  5.00
                                               20.00
                                  4.10 (ii)
     Storage Coeff. (min)=
                                               17.39 (ii)
     Unit Hyd. Tpeak (min)=
                                  5.00
                                               20.00
     Unit Hyd. peak (cms)=
                                  0. 24
                                                0.06
                                                             *TOTALS*
     PEAK FLOW
                                  0.19
                                                0.05
                                                              0.225 (iii)
                     (cms) =
     TIME TO PEAK
                     (hrs)=
                                  12.25
                                               12.42
                                                              12.25
     RUNOFF VOLUME
                                               12.97
                      (mm) =
                                  51.80
                                                              26.56
     TOTAL RAINFALL
                                  52.80
                                                              52.80
                      (mm) =
                                               52.80
     RUNOFF COEFFICIENT =
                                  0. 98
                                                0. 25
                                                               0.50
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN^* = 59.0 Ia = Dep. Storage (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0041)|
                             AREA
                                     QPEAK
                                               TPEAK
                                                         R. V.
                              (ha)
                                     (cms)
                                               (hrs)
                                                         (mm)
     ID1= 1 ( 0033):
                                    0.014
                                              12. 33
                             0.41
                                                       14.34
     + ID2= 2 ( 0036):
                             5.32
                                    0.197
                                              12.42
                                                       26.56
```

1 + 2 = 3 _____ ID = 3 (0041): 5.73 0.209 12.42 25.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

_____ | ADD HYD (0041)|

```
| 3 + 2 = 1 | AREA OPEAK TPEAK R.V. (ha) (cms) (hrs) (mm)
  ID1= 3 ( 0041): 5.73 0.209 12.42 25.68
  + ID2= 2 ( 0037): 2.05 0.061 12.33 13.38
   ID = 1 ( 0041): 7.78 0.267 12.42 22.44
  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
_____
| ADD HYD ( 0041)|
1 + 2 = 3 | AREA OPEAK TPEAK R.V.
  _____
   ID = 3 ( 0041): 11.21 0.440 12.25 23.70
  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
CALIB
----- U. H. Tp(hrs) = 0.19
```

		TRA	ANSFORME	D HYETOGR	APH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	0.94	12. 250	57.11	18. 33	0. 93
0. 167	0.00	6.250	0.94	12. 333	9.05	18. 42	0. 93
0. 250	0.00	6.333	0. 96	12. 417	9.05	18.50	0. 93
0.333	0.54	6.417	0. 96	12.500	9.05	18. 58	0. 90
0. 417	0.54	6.500	0. 96	12. 583	6. 16	18. 67	0. 90
0.500	0.54	6.583	0. 99	12.667	6. 16	18. 75	0. 90
0.583	0.55	6.667	0. 99	12. 750	6. 16	18.83	0.87
0.667	0.55	6.750	0. 99	12.833	4.24	18. 92	0.87
0.750	0.55	6.833	1.02	12. 917	4.24	19.00	0.87
0.833	0.56	6.917	1.02	13.000	4. 24	19.08	0.84
0. 917	0.56	7.000	1.02	13. 083	3.58	19. 17	0.84
1.000	0.56	7.083	1.04	13. 167	3.58	19. 25	0.84
1.083	0.57	7.167	1.04	13. 250	3.58	19. 33	0.80
1. 167	0.57	7.250	1.04	13. 333	3.03	19.42	0.80
1. 250	0.57	7.333	1.07	13. 417	3.03	19.50	0.80
1. 333	0.59	7.417	1.07	13.500	3.03	19. 58	0.77
1. 417	0.59	7.500	1.07	13. 583	2.67	19. 67	0.77
1.500	0.59	7.583	1. 10	13. 667	2.67	19. 75	0. 77
1.583	0.60	7.667	1. 10	13. 750	2.67	19.83	0.73

1.667	0.60	7.750	1.10	13.833	2.34	19.92	0.73
1.750	0.60	7.833	1. 12	13. 917	2.34	20.00	0.73
1.833	0.61	7.917	1. 12	14.000	2.34	20.08	0.70
1. 917	0.61	8.000	1. 12	14. 083	2. 09	20.17	0. 70
2.000	0.61	8.083	1. 15	14. 167	2. 09	20. 25	0.70
2. 083	0.63	8.167	1. 15	14. 250	2.09	20. 33	0. 68
2. 167	0.63	8.250	1. 15	14. 333	1. 91	20. 33	0. 68
2. 250	0.63	8.333	1. 13	14. 333	1. 91	20. 42	0. 68
2. 333	0.64	8.417	1. 23	14. 500	1. 91	20.58	0.68
2. 333	0.64	8.500	1. 23	14. 583	1. 82	20. 56	0. 68
2. 500	0.64	8.583	1. 23	14. 667	1. 82	20. 07	0. 68
					1. 82		
2.583	0.65	8.667	1. 36	14. 750		20.83	0.67
2.667	0.65	8.750	1.36	14. 833	1.72	20.92	0.67
2.750	0.65	8.833	1.49	14. 917	1.72	21.00	0.67
2.833	0.67	8.917	1.49	15.000	1.72	21.08	0.66
2. 917	0.67	9.000	1.49	15. 083	1.63	21.17	0.66
3.000	0.67	9.083	1.62	15. 167	1.63	21. 25	0.66
3.083	0.68	9.167	1. 62	15. 250	1.63	21.33	0. 66
3. 167	0.68	9.250	1. 62	15. 333	1. 54	21.42	0. 66
3. 250	0.68	9.333	1. 69	15. 417	1.54	21.50	0. 66
3. 333	0.69	9.417	1. 69	15. 500	1.54	21.58	0. 65
3. 417	0.69	9.500	1. 69	15. 583	1. 45	21.67	0. 65
3.500	0.69	9.583	1. 69	15. 667	1. 45	21.75	0. 65
3. 583	0.71	9.667	1. 69	15. 750	1. 45	21.83	0.64
3.667	0.71	9.750	1. 69	15. 833	1. 35	21. 92	0.64
3.750	0.71	9.833	1.80	15. 917	1. 35	22.00	0.64
3.833	0.72	9.917	1.80	16.000	1. 35	22.08	0.64
3. 917	0.72	10.000	1.80	16.083	1. 26	22.17	0.64
4.000	0.72	10.083	2.00	16. 167	1. 26	22. 25	0.64
4.083	0.73	10.167	2.00	16. 250	1. 26	22. 33	0.63
4. 167	0.73	10.250	2.00	16. 333	1.20	22.42	0.63
4. 250	0.73	10.333	2. 28	16. 417	1.20	22.50	0.63
4.333	0.75	10.417	2. 28	16. 500	1. 20	22.58	0.62
4.417	0.75	10.500	2. 28	16. 583	1. 17	22.67	0.62
4.500	0.75	10.583	2.58	16. 667	1. 17	22. 75	0.62
4.583	0.78	10.667	2.58	16. 750	1. 17	22.83	0.62
4.667	0.78	10.750	2.58	16. 833	1.13	22. 92	0.62
4.750	0.78	10.833	3.02	16. 917	1.13	23.00	0.62
4.833	0.81	10.917	3.02	17. 000	1.13	23. 08	0.61
4.917	0.81	11.000	3.02	17. 083	1.10	23. 17	0.61
5.000	0.81	11.083	3. 53	17. 167	1.10	23. 25	0. 61
5. 083	0.83	11. 167	3. 53	17. 250	1. 10	23. 33	0.60
5. 167	0.83	11. 250	3. 53	17. 333	1. 07	23. 42	0.60
5. 250	0.83	11. 333	4. 46	17. 417	1. 07	23.50	0.60
5. 333	0.86	11. 417	4. 46	17. 500	1. 07	23.58	0. 60
5. 417	0.86	11.500	4. 46	17. 583	1. 03	23.67	0.60
5. 500	0.86	111.583	5. 68	17. 667	1.03	23.75	0.60
5. 583	0.88	111.667	5. 68	17. 750	1.03	23. 83	0. 59
5. 667	0.88	11.750	5. 68	17. 833	1.00	23. 92	0.59
5. 750	0.88	111.833	23. 14	17. 033	1.00	24.00	0. 59
5. 833	0.88	11. 033	23. 14	18.000	1.00	24.00	0. 58
5. 917	0. 91	12.000	23. 14	18. 083	0. 97	24.00	0. 58
5. 717	0.71	12.000	20.14	10.000	0.71	27.17	0. 50

```
6. 083 0. 94 | 12. 167 57. 11 | 18. 250 0. 97 |
   Unit Hyd Qpeak (cms)= 0.167
   PEAK FLOW
                (cms) = 0.029 (i)
   TIME TO PEAK (hrs) = 12.333
   RUNOFF VOLUME (mm) = 14.337
   TOTAL RAINFALL (mm) = 52.800
   RUNOFF COEFFICIENT = 0.272
   (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
ADD HYD ( 0032)|
                      AREA QPEAK
                                   TPEAK
 1 + 2 = 3
                                           R. V.
                      (ha)
                           (cms)
                                   (hrs)
                                          (mm)
    ID1= 1 ( 0039):
                      0.83 0.029
                                   12.33
                                         14.34
    + ID2= 2 ( 0041): 11.21 0.440
                                  12. 25 23. 70
     -----
     ID = 3 ( 0032): 12.04 0.467 12.25 23.06
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
_____
***********
** SIMULATION: 3-50yr 24hr 15min SCS Type II **
***********
CALIB
 NASHYD ( 0033)
                 Area (ha)= 0.41 Curve Number (CN)= 75.0
|ID= 1 DT= 5.0 min | Ia (mm)= 10.00
                                  # of Linear Res. (N) = 3.00
----- U. H. Tp(hrs) = 0.20
      NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                        ---- TRANSFORMED HYETOGRAPH ----
            TIME
                   RAIN | TIME
                               RAIN | TIME RAIN | TIME
                               mm/hr | hrs mm/hr | hrs
             hrs
                 mm/hr
                        hrs
                                                         mm/hr
                  0.00 | 6.167
                               1. 92 | 12. 250 | 116. 82 | 18. 33
                                                         1.91
            0.083
            0.167
                  0.00 | 6.250
                               1. 92 | 12. 333
                                           18. 52 | 18. 42
                  0.00 | 6.333
                               1. 97 | 12. 417
            0.250
                                           18. 51 | 18. 50
                                                         1.91
                  1. 10 | 6. 417
                               1. 97 | 12. 500
            0.333
                                           18. 51 | 18. 58
```

1. 97 | 12. 583

2. 02 | 12. 667

2. 02 | 12. 750

2. 02 | 12. 833

2.08 | 12.917

2.08 | 13.000

2.08 | 13.083

12.60 | 18.67

12.60 | 18.75

12.60 | 18.83

8. 67 | 18. 92

8. 67 | 19. 00

8. 67 | 19. 08

7. 32 | 19. 17

1.84

1. 77

1. 77

1.77

1. 71

1.71

0.417

0.500

0.583

0.667

0.750

0.833

1.10 | 6.500

1.10 | 6.583

1.12 | 6.667

1.12 | 6.750

1.12 | 6.833

1.15 | 6.917

0. 917 1. 15 | 7. 000

6.000 0.91 | 12.083 57.11 | 18.167 0.97 | 24.25 0.58

1.083 1.17 7.167 2.13 13.250 7.32 19.33 1.64 1.167 1.17 7.250 2.13 13.333 6.20 19.42 1.64 1.250 1.17 7.333 2.19 13.417 6.19 19.50 1.64 1.333 1.20 7.417 2.19 13.500 6.19 19.50 1.57 1.417 1.20 7.500 2.19 13.583 5.47 19.67 1.57 1.500 1.20 7.583 2.24 13.667 5.47 19.75 1.57 1.583 1.23 7.667 2.24 13.750 5.47 19.83 1.50 1.667 1.23 7.750 2.24 13.833 4.80 19.92 1.50 1.750 1.23 7.833 2.30 13.917 4.80 20.00 1.50 1.833 1.25 7.917 2.30 14.000 4.80 20.08 1.44 1.917 1.25 8.080 2.35 14.167 4.28 20.25 1.44 2.003 1.28 8.167 2.35 14.250 4.28 20.25 1.40 <td< th=""><th>1 000</th><th>1 15</th><th>1 7 002</th><th>2 12</th><th>110 147</th><th>7 22</th><th>10 25</th><th>1 71</th></td<>	1 000	1 15	1 7 002	2 12	110 147	7 22	10 25	1 71
1. 167 1. 17 7. 250 2. 13 13. 333 6. 20 19. 42 1. 64 1. 250 1. 17 7. 333 2. 19 13. 417 6. 19 19. 50 1. 64 1. 333 1. 20 7. 417 2. 19 13. 500 6. 19 19. 58 1. 57 1. 417 1. 20 7. 500 2. 19 13. 583 5. 47 19. 67 1. 57 1. 500 1. 20 7. 583 2. 24 13. 667 5. 47 19. 67 1. 57 1. 583 1. 23 7. 667 2. 24 13. 750 5. 47 19. 83 1. 50 1. 667 1. 23 7. 750 2. 24 13. 833 4. 80 19. 92 1. 50 1. 750 1. 23 7. 833 2. 30 13. 917 4. 80 20.00 1. 50 1. 833 1. 25 7. 917 2. 30 14. 000 4. 80 20. 08 1. 44 2. 000 1. 25 8. 083 2. 35 14. 167 4. 28 20. 27 1. 44 2. 083 1. 28 8. 167 2. 35 14. 250 <td></td> <td></td> <td></td> <td>2. 13</td> <td>13. 167</td> <td></td> <td></td> <td>1.71</td>				2. 13	13. 167			1.71
1. 250 1. 17 7. 333 2. 19 13. 417 6. 19 19. 50 1. 64 1. 333 1. 20 7. 417 2. 19 13. 500 6. 19 19. 58 1. 57 1. 417 1. 20 7. 500 2. 19 13. 583 5. 47 19. 67 1. 57 1. 500 1. 20 7. 583 2. 24 13. 667 5. 47 19. 75 1. 57 1. 583 1. 23 7. 667 2. 24 13. 750 5. 47 19. 83 1. 50 1. 667 1. 23 7. 750 2. 24 13. 833 4. 80 19. 92 1. 50 1. 750 1. 23 7. 833 2. 30 13. 917 4. 80 20.00 1. 50 1. 833 1. 25 7. 917 2. 30 14. 000 4. 80 20. 08 1. 44 1. 917 1. 25 8. 000 2. 30 14. 083 4. 28 20. 17 1. 44 2. 000 1. 25 8. 083 2. 35 14. 167 4. 28 20. 23 1. 44 2. 083 1. 28 8. 167 2. 35 14. 250 4. 28 20. 23 1. 40 2. 167 1. 28 8. 250 2. 35 14. 333 3. 90 20. 42								
1. 333 1. 20 7. 417 2. 19 13. 500 6. 19 19. 58 1. 57 1. 417 1. 20 7. 500 2. 19 13. 583 5. 47 19. 67 1. 57 1. 500 1. 20 7. 583 2. 24 13. 667 5. 47 19. 75 1. 57 1. 583 1. 23 7. 667 2. 24 13. 750 5. 47 19. 83 1. 50 1. 667 1. 23 7. 750 2. 24 13. 833 4. 80 19. 92 1. 50 1. 750 1. 23 7. 833 2. 30 13. 917 4. 80 20. 00 1. 50 1. 833 1. 25 7. 917 2. 30 14. 000 4. 80 20. 08 1. 44 1. 917 1. 25 8. 000 2. 30 14. 083 4. 28 20. 17 1. 44 2. 000 1. 25 8. 083 2. 35 14. 167 4. 28 20. 25 1. 44 2. 083 1. 28 8. 167 2. 35 14. 250 4. 28 20. 33 1. 40 2. 167 1. 28 8. 250 2. 35 14. 333 3. 90 20. 42 1. 40								
1. 417 1. 20 7. 500 2. 19 13. 583 5. 47 19. 67 1. 57 1. 500 1. 20 7. 583 2. 24 13. 667 5. 47 19. 75 1. 57 1. 583 1. 23 7. 667 2. 24 13. 750 5. 47 19. 83 1. 50 1. 667 1. 23 7. 750 2. 24 13. 833 4. 80 19. 92 1. 50 1. 750 1. 23 7. 833 2. 30 13. 917 4. 80 20.00 1. 50 1. 833 1. 25 7. 917 2. 30 14. 000 4. 80 20. 08 1. 44 1. 917 1. 25 8. 000 2. 30 14. 083 4. 28 20. 17 1. 44 2. 000 1. 25 8. 083 2. 35 14. 167 4. 28 20. 25 1. 44 2. 083 1. 28 8. 167 2. 35 14. 250 4. 28 20. 25 3 1. 40 2. 167 1. 28 8. 250 2. 35 14. 333 3. 90 20. 42 1. 40								
1.500 1.20 7.583 2.24 13.667 5.47 19.75 1.57 1.583 1.23 7.667 2.24 13.750 5.47 19.83 1.50 1.667 1.23 7.750 2.24 13.833 4.80 19.92 1.50 1.750 1.23 7.833 2.30 13.917 4.80 20.00 1.50 1.833 1.25 7.917 2.30 14.000 4.80 20.08 1.44 1.917 1.25 8.000 2.30 14.083 4.28 20.17 1.44 2.000 1.25 8.083 2.35 14.167 4.28 20.25 1.44 2.083 1.28 8.167 2.35 14.250 4.28 20.33 1.40 2.167 1.28 8.250 2.35 14.333 3.90 20.42 1.40								
1.583 1.23 7.667 2.24 13.750 5.47 19.83 1.50 1.667 1.23 7.750 2.24 13.833 4.80 19.92 1.50 1.750 1.23 7.833 2.30 13.917 4.80 20.00 1.50 1.833 1.25 7.917 2.30 14.000 4.80 20.08 1.44 1.917 1.25 8.000 2.30 14.083 4.28 20.17 1.44 2.000 1.25 8.083 2.35 14.167 4.28 20.25 1.44 2.083 1.28 8.167 2.35 14.333 3.90 20.42 1.40								
1. 667 1. 23 7. 750 2. 24 13. 833 4. 80 19. 92 1. 50 1. 750 1. 23 7. 833 2. 30 13. 917 4. 80 20. 00 1. 50 1. 833 1. 25 7. 917 2. 30 14. 000 4. 80 20. 08 1. 44 1. 917 1. 25 8. 000 2. 30 14. 083 4. 28 20. 17 1. 44 2. 000 1. 25 8. 083 2. 35 14. 167 4. 28 20. 25 1. 44 2. 083 1. 28 8. 167 2. 35 14. 250 4. 28 20. 33 1. 40 2. 167 1. 28 8. 250 2. 35 14. 333 3. 90 20. 42 1. 40								
1. 750 1. 23 7. 833 2. 30 13. 917 4. 80 20. 00 1. 50 1. 833 1. 25 7. 917 2. 30 14. 000 4. 80 20. 08 1. 44 1. 917 1. 25 8. 000 2. 30 14. 083 4. 28 20. 17 1. 44 2. 000 1. 25 8. 083 2. 35 14. 167 4. 28 20. 25 1. 44 2. 083 1. 28 8. 167 2. 35 14. 250 4. 28 20. 33 1. 40 2. 167 1. 28 8. 250 2. 35 14. 333 3. 90 20. 42 1. 40								
1.833 1.25 7.917 2.30 14.000 4.80 20.08 1.44 1.917 1.25 8.000 2.30 14.083 4.28 20.17 1.44 2.000 1.25 8.083 2.35 14.167 4.28 20.25 1.44 2.083 1.28 8.167 2.35 14.250 4.28 20.33 1.40 2.167 1.28 8.250 2.35 14.333 3.90 20.42 1.40								
1.917 1.25 8.000 2.30 14.083 4.28 20.17 1.44 2.000 1.25 8.083 2.35 14.167 4.28 20.25 1.44 2.083 1.28 8.167 2.35 14.250 4.28 20.33 1.40 2.167 1.28 8.250 2.35 14.333 3.90 20.42 1.40								
2.083 1.28 8.167 2.35 14.250 4.28 20.33 1.40 2.167 1.28 8.250 2.35 14.333 3.90 20.42 1.40	1. 917	1.25	8.000	2.30	14. 083	4. 28	20. 17	1.44
2. 167	2.000	1.25	8.083	2.35	14. 167	4. 28	20. 25	1.44
	2.083	1.28	8. 167	2.35	14. 250	4. 28	20. 33	1.40
2 250	2. 167	1.28	8. 250	2.35	14. 333	3. 90	20.42	1.40
	2. 250	1.28	8.333	2.52	14. 417	3. 90	20.50	1.40
2. 333								
2. 417								
2.500 1.31 8.583 2.78 14.667 3.72 20.75 1.38								
2.583								
2. 667								
2. 750								
2.833								
2.917								
3.083 1.39 9.167 3.32 15.250 3.34 21.23 1.34								
3. 167 1. 39 9. 250 3. 32 15. 333 3. 14 21. 42 1. 34								
3. 250 1. 39 9. 333 3. 46 15. 417 3. 14 21. 50 1. 34								
3. 333								
3. 417								
3.500	3.500	1.42	9.583	3.46	15. 667			1. 33
3. 583	3.583	1.45	9.667	3.46	15. 750	2. 96	21.83	1. 32
3. 667	3.667	1.45	9.750	3.46	15. 833	2.76	21. 92	1. 32
3. 750	3.750			3.68	15. 917			
3. 833								
3. 917								
4.000 1.47 10.083 4.10 16.167 2.58 22.25 1.30								
4.083 1.50 10.167 4.10 16.250 2.58 22.33 1.29								
4. 167								
4. 250								
4. 417								
4.500								
4. 583								
4. 667								
4. 750								
4. 833								
4. 917								
5. 000	5.000	1.65	11.083		17. 167		23. 25	1. 25
5. 083								
5. 167								
5. 250 1. 70 11. 333 9. 12 17. 417 2. 18 23. 50 1. 24	5. 250	1.70	11.333	9. 12	17. 417	2. 18	23. 50	1. 24

```
2. 11 | 23. 67 1. 22
5. 500 1. 76 | 11. 583 11. 61 | 17. 667
                            2. 11 | 23. 75
5. 583 1. 81 | 11. 667 11. 61 | 17. 750
                           2. 11 | 23. 83
                                       1. 21
5. 667 1. 81 | 11. 750 11. 61 | 17. 833
                           2. 04 | 23. 92 1. 21
5. 750 1. 81 | 11. 833 47. 33 | 17. 917
                            2.04 | 24.00 1.21
                           2. 04 | 24. 08
1. 98 | 24. 17
5. 833 1. 86 | 11. 917 47. 34 | 18. 000
1. 19
6. 000 1. 86 | 12. 083 | 116. 82 | 18. 167
                            1. 98 | 24. 25 1. 19
1. 98
```

PEAK FLOW (cms) = 0.054 (i) TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 52.476 TOTAL RAINFALL (mm) = 108.000 RUNOFF COEFFICIENT = 0.486

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1. 92	12. 250	116.82	18. 33	1. 91
0. 167	0.00	6.250	1. 92	12. 333	18. 52	18. 42	1. 91
0.250	0.00	6.333	1. 97	12. 417	18. 51	18. 50	1. 91
0.333	1.10	6.417	1. 97	12. 500	18. 51	18. 58	1.84
0.417	1.10	6.500	1. 97	12. 583	12.60	18. 67	1.84
0.500	1.10	6.583	2.02	12. 667	12.60	18. 75	1.84
0.583	1.12	6.667	2.02	12. 750	12.60	18. 83	1.77
0.667	1.12	6.750	2.02	12.833	8. 67	18. 92	1.77
0.750	1.12	6.833	2.08	12. 917	8. 67	19.00	1.77
0.833	1.15	6.917	2.08	13.000	8. 67	19. 08	1. 71
0. 917	1.15	7.000	2.08	13.083	7. 32	19. 17	1. 71
1.000	1.15	7.083	2. 13	13. 167	7. 32	19. 25	1. 71
1.083	1.17	7.167	2. 13	13. 250	7. 32	19. 33	1.64
1. 167	1.17	7.250	2.13	13. 333	6. 20	19.42	1.64
1. 250	1. 17	7.333	2. 19	13. 417	6. 19	19.50	1.64
1.333	1.20	7.417	2. 19	13. 500	6. 19	19.58	1.57
1.417	1. 20	7.500	2. 19	13. 583	5. 47	19. 67	1.57
1.500	1. 20	7.583	2. 24	13. 667	5. 47	19. 75	1. 57

1.583	1.23	7.667	2. 24	13. 750	5. 47	19.83	1. 50
1.667	1.23	7.750	2.24	13. 833	4.80	19. 92	1.50
1. 750	1. 23	7.833	2. 30	13. 917	4. 80	20.00	1. 50
1. 833	1. 25	7. 917	2. 30	14. 000	4. 80	20.08	1. 44
				1			
1. 917	1. 25	8.000	2. 30	14. 083	4. 28	20.17	1. 44
2.000	1. 25	8.083	2. 35	14. 167	4. 28	20. 25	1.44
2.083	1. 28	8.167	2.35	14. 250	4. 28	20.33	1. 40
2. 167	1. 28	8.250	2.35	14. 333	3. 90	20.42	1.40
2.250	1.28	8.333	2. 52	14. 417	3. 90	20.50	1.40
2.333	1.31	8.417	2.52	14. 500	3. 90	20. 58	1.38
2. 417	1. 31	8.500	2. 52	14. 583	3. 72	20.67	1. 38
2.500	1.31	8.583	2. 78	14. 667	3.72	20.75	1. 38
2. 583	1.34	8.667	2. 78	14. 750	3. 72	20.73	1. 37
				1			
2. 667	1.34	8.750	2. 78	14. 833	3. 52	20. 92	1. 37
2.750	1.34	8.833	3.06	14. 917	3.52	21.00	1. 37
2.833	1.36	8.917	3.06	15.000	3. 52	21.08	1. 36
2. 917	1.36	9.000	3.06	15.083	3.34	21.17	1. 36
3.000	1.36	9.083	3.32	15. 167	3.34	21. 25	1.36
3.083	1.39	9.167	3.32	15. 250	3.34	21. 33	1.34
3. 167	1.39	9. 250	3. 32	15. 333	3. 14	21. 42	1.34
3. 250	1.39	9.333	3. 46	15. 417	3. 14	21.50	1. 34
3. 333	1.42	9.417	3. 46	15. 500	3. 14	21.58	1. 33
3. 417	1.42	9.500	3. 46	15. 583	2. 96	21.67	1. 33
3.500	1.42	9.583	3. 46	15. 667	2. 96	21. 75	1. 33
3. 583	1.45	9.667	3.46	15. 750	2. 96	21.83	1. 32
3.667	1.45	9.750	3.46	15. 833	2.76	21. 92	1. 32
3.750	1.45	9.833	3.68	15. 917	2.76	22.00	1. 32
3.833	1.47	9.917	3.68	16.000	2.76	22.08	1.30
3. 917	1.47	10.000	3.68	16. 083	2. 58	22. 17	1.30
4.000	1.47	10.083	4. 10	16. 167	2.58	22. 25	1.30
4. 083	1.50	10.167	4. 10	16. 250	2. 58	22.33	1. 29
4. 167	1.50	10. 250	4. 10	16. 333	2. 45	22.42	1. 29
4. 250	1.50	10. 230	4. 66	16. 417	2. 45	22. 42	1. 29
4.333	1.54	10.417	4. 66	16. 500	2. 45	22.58	1. 28
4. 417	1.54	10.500	4. 66	16. 583	2. 38	22.67	1. 28
4.500	1.54	10.583	5. 28	16. 667	2. 38	22. 75	1. 28
4. 583	1.59	10.667	5. 28	16. 750	2. 38	22.83	1. 26
4. 667	1.59	10.750	5. 28	16.833	2. 31	22. 92	1. 26
4.750	1.59	10.833	6. 18	16. 917	2. 31	23.00	1. 26
4.833	1.65	10.917	6. 18	17. 000	2. 31	23. 08	1. 25
4.917	1.65	11.000	6. 18	17. 083	2. 25	23. 17	1. 25
5.000	1.65	111.083	7. 21	17. 167	2. 25	23. 25	1. 25
5. 083	1.70	111. 167	7. 21	17. 250	2. 25	23. 23	1. 24
5. 167	1.70	111. 250	7. 21	17. 230	2. 18	23. 33	1. 24
5. 250	1.70	111.333	9. 12	17. 417	2. 18	23.50	1. 24
5. 333	1.76	11.417	9. 12	17. 500	2. 18	23.58	1. 22
5. 417	1.76	11.500	9. 12	17. 583	2. 11	23.67	1. 22
5.500	1.76	11.583	11. 61	17. 667	2. 11	23.75	1. 22
5.583	1.81	11.667	11. 61	17. 750	2.11	23.83	1. 21
5. 667	1.81	11. 750	11. 61	17. 833	2.04	23. 92	1. 21
5. 750	1.81	11.833	47. 33	17. 917	2.04	24.00	1. 21
5. 833		111. 917	47. 34	18. 000	2.04	24.08	1. 19
5.055	1.00	1	77.04	1.0.000	2.04	27.00	1. 17

```
      5. 917
      1. 86 | 12.000
      47. 34 | 18. 083
      1. 98 | 24. 17
      1. 19

      6. 000
      1. 86 | 12.083
      116. 82 | 18. 167
      1. 98 | 24. 25
      1. 19

      6. 083
      1. 92 | 12. 167
      116. 82 | 18. 250
      1. 98 |
      1. 98 |
```

PEAK FLOW (cms) = 0.243 (i) TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 49.69 TOTAL RAINFALL (mm) = 108.000 RUNOFF COEFFICIENT = 0.463

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0036) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	5. 32 50. 00	Dir. Conn. (%)=	35. 00
		IMPERVI	OUS	PERVIOUS (i)	
Surface Area	(ha)=	2. 6	6	2. 66	
Dep. Storage	(mm) =	1.0	0	5.00	
Average Slope	(%)=	1. 0	0	1.00	
Length	(m) =	188. 3	3	40.00	
Mannings n	=	0. 13	0	0. 250	

		TRA	ANSFORME	D HYETOGI	RAPH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1. 92	12. 250	116.82	18. 33	1. 91
0. 167	0.00	6.250	1. 92	12. 333	18. 52	18.42	1. 91
0.250	0.00	6.333	1. 97	12. 417	18. 51	18.50	1. 91
0.333	1.10	6.417	1. 97	12.500	18. 51	18.58	1.84
0.417	1.10	6.500	1. 97	12. 583	12.60	18.67	1.84
0.500	1.10	6.583	2.02	12. 667	12.60	18.75	1.84
0.583	1.12	6.667	2.02	12. 750	12.60	18.83	1. 77
0.667	1.12	6.750	2.02	12. 833	8. 67	18. 92	1.77
0.750	1.12	6.833	2.08	12. 917	8. 67	19.00	1.77
0.833	1.15	6.917	2.08	13.000	8. 67	19.08	1. 71
0. 917	1. 15	7.000	2.08	13.083	7.32	19. 17	1. 71
1.000	1.15	7.083	2. 13	13. 167	7.32	19. 25	1. 71
1.083	1.17	7.167	2. 13	13. 250	7. 32	19.33	1.64
1. 167	1.17	7.250	2. 13	13. 333	6. 20	19.42	1.64
1.250	1.17	7.333	2. 19	13. 417	6. 19	19.50	1.64
1.333	1.20	7.417	2. 19	13. 500	6. 19	19. 58	1. 57
1. 417	1.20	7.500	2. 19	13. 583	5.47	19.67	1. 57
1.500	1.20	7.583	2. 24	13. 667	5.47	19. 75	1. 57
1.583	1.23	7.667	2. 24	13. 750	5. 47	19.83	1.50

1.667	1.23	7.750	2. 24	13.833	4.80	19.92	1.50
1.750	1.23	7.833	2. 30	13. 917	4.80	20.00	1.50
1. 833	1. 25	7.917	2. 30	14.000	4. 80	20.08	1. 44
1. 917		8.000	2. 30	14. 083	4. 28	20. 17	1. 44
2.000			2.35	14. 167	4. 28	20. 17	1. 44
2.083		8.167	2. 35	14. 250	4. 28	20.33	1.40
2. 167	1.28	8.250	2. 35	14. 333	3. 90	20.42	1.40
2. 250	1. 28	8.333	2. 52	14. 417	3. 90	20.50	1. 40
2. 333	1.31	8.417	2.52	14. 500	3. 90	20.58	1. 38
2. 417	1.31	8.500	2.52	14. 583	3.72	20.67	1. 38
2.500	1.31	8.583	2. 78	14. 667	3.72	20.75	1. 38
2. 583	1.34	8.667	2. 78	14. 750	3.72	20.83	1. 37
2.667	1.34	8.750	2. 78	14. 833	3. 52	20. 92	1. 37
2.750	1.34	8.833	3.06	14. 917	3. 52	21.00	1. 37
2.833	1.36	8.917	3.06	15. 000	3.52	21.08	1. 36
2.917	1.36	9.000	3.06	15. 083	3.34	21. 17	1.36
3.000	1.36	9.083	3. 32	15. 167	3.34	21. 25	1.36
3.083	1.39	9.167	3.32	15. 250	3.34	21. 33	1.34
3. 167	1.39	9.250	3.32	15. 333	3.14	21. 42	1.34
3.250	1.39	9.333	3.46	15. 417	3.14	21.50	1.34
3. 333	1.42	9.417	3.46	15. 500	3.14	21.58	1. 33
3. 417	1.42	9.500	3. 46	15. 583	2. 96	21.67	1. 33
3. 500	1.42	9.583	3. 46	15. 667	2. 96	21.75	1. 33
3. 583		9.667	3. 46	15. 750	2. 96	21. 83	1. 32
3. 667	1. 45	9.750	3. 46	15. 833	2. 76	21. 92	1. 32
3.750	1. 45	9.833	3. 68	15. 917	2.76	22.00	1. 32
3. 833	1. 47	9.917	3. 68	16. 000	2.76	22.08	1. 30
3. 917	1.47	10.000	3. 68	16. 083	2. 58	22. 17	1. 30
4.000	1.47	10.083	4. 10	16. 167	2. 58	22. 17	1. 30
4. 083		10.167	4. 10	16. 250	2. 58	22. 23	1. 29
4. 167	1.50	10. 107	4. 10	16. 333	2. 45	22.33	1. 29
4. 250	1.50	10. 230	4. 66	16. 333	2. 45	22. 42	1. 29
4. 333	1.54	10. 333	4. 66	16. 500	2. 45	22.50	1. 28
4. 333 4. 417		1 1					
	1. 54 1. 54	10.500	4.66	16. 583	2. 38	22.67	1. 28
4.500		10.583	5. 28	16. 667	2. 38	22.75	1. 28
4.583	1.59	10.667	5. 28	16. 750	2. 38	22.83	1. 26
4.667	1.59	10.750	5. 28	16. 833	2. 31	22. 92	1. 26
4. 750		10.833	6. 18	16. 917	2. 31	23.00	1. 26
4.833		10.917	6. 18	17.000	2. 31	23.08	1. 25
4. 917		11.000	6. 18	17. 083	2. 25	23. 17	1. 25
5.000	1.65	11.083	7. 21	17. 167	2. 25	23. 25	1. 25
5. 083	1.70	11. 167	7. 21	17. 250	2. 25	23. 33	1. 24
5. 167		11.250	7. 21	17. 333	2. 18	23.42	1. 24
5. 250		11.333	9. 12	17. 417	2. 18	23.50	1. 24
5. 333	1.76	11.417	9. 12	17. 500	2. 18	23.58	1. 22
5. 417	1.76	11.500	9. 12	17. 583	2. 11	23.67	1. 22
5.500	1.76	11.583	11. 61	17. 667	2. 11	23.75	1. 22
5. 583	1.81	11.667	11. 61	17. 750	2. 11	23.83	1. 21
5. 667	1.81	11.750	11. 61	17. 833	2.04	23. 92	1. 21
5.750	1.81	11.833	47.33	17. 917	2.04	24.00	1. 21
5.833	1.86	11. 917	47.34	18. 000	2.04	24.08	1. 19
5. 917	1.86	12.000	47.34	18. 083	1. 98	24. 17	1. 19

	86 12.083 116.8 92 12.167 116.8		1. 98 24. 25
Max. Eff. Inten. (mm/hr)= over (min)	116. 82 15. 00	77. 14 25. 00	
Storage Coeff. (min)= Unit Hyd. Tpeak (min)=	13.97 (ii)	23.61 (ii) 25.00)
Unit Hyd. peak (cms)=		0. 05	***************************************
PEAK FLOW (cms)=		0. 25	*TOTALS* 0.611 (iii)
TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)=		12. 50 45. 21	12. 42 66. 84
TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT =		108. 00 0. 42	108. 00 0. 62

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- $CN^* = 59.0$ Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

Mannings n

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) Area (ha)= 3.43 Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 |ID= 1 DT= 5.0 min | -----IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 1.71 1.71 Dep. Storage 1.00 5.00 (mm) =Average Slope (%)= 1.00 2.00 Length 151. 22 40.00 (m) =

0.013 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME	D HYETOGI	RAPH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1. 92	12. 250	116.82	18. 33	1. 91
0.167	0.00	6.250	1. 92	12. 333	18. 52	18.42	1. 91
0.250	0.00	6.333	1. 97	12. 417	18. 51	18.50	1. 91
0.333	1.10	6.417	1. 97	12.500	18. 51	18.58	1.84
0.417	1.10	6.500	1. 97	12. 583	12.60	18. 67	1.84
0.500	1.10	6.583	2.02	12.667	12.60	18.75	1.84
0.583	1.12	6.667	2.02	12. 750	12.60	18.83	1.77
0.667	1.12	6.750	2.02	12. 833	8. 67	18. 92	1. 77
0.750	1.12	6.833	2.08	12. 917	8. 67	19.00	1.77
0.833	1.15	6.917	2.08	13.000	8. 67	19.08	1. 71
0. 917	1.15	7.000	2.08	13. 083	7. 32	19. 17	1. 71

0. 250

1. 000 1. 083	1. 15 1. 17	7.083 7.167	2. 13 2. 13	13. 167 13. 250	7. 32 7. 32	19. 25 19. 33	1. 71 1. 64
1. 167	1. 17	7. 250	2. 13	13. 333	6. 20	19.42	1. 64
1.250	1.17	7.333	2. 19	13. 417	6. 19	19. 50	1.64
1. 333	1.20	7.417	2. 19	13.500	6. 19	19. 58	1. 57
1. 417	1.20	7.500	2. 19	13. 583	5. 47	19.67	1.57
1. 500 1. 583	1. 20 1. 23	7.583 7.667	2. 24 2. 24	13. 667 13. 750	5. 47 5. 47	19. 75 19. 83	1. 57 1. 50
1. 667	1. 23	7.750	2. 24	13. 730	4. 80	19. 63 19. 92	1.50
1. 750	1. 23	7.833	2. 30	13. 917	4. 80	20.00	1. 50
1.833	1. 25	7. 917	2.30	14. 000	4.80	20.08	1.44
1. 917	1. 25	8.000	2.30	14. 083	4. 28	20. 17	1.44
2.000	1. 25	8.083	2. 35	14. 167	4. 28	20. 25	1. 44
2.083	1. 28	8.167	2. 35	14. 250	4. 28	20.33	1.40
2. 167 2. 250	1. 28 1. 28	8.250 8.333	2. 35 2. 52	14. 333 14. 417	3. 90 3. 90	20.42	1. 40 1. 40
2. 333	1. 31	8.417	2. 52	14. 500	3. 90	20.50	1. 40
2. 417	1. 31	8.500	2. 52	14. 583	3. 72	20.67	1. 38
2.500	1.31	8.583	2. 78	14. 667	3.72	20. 75	1. 38
2. 583	1.34	8.667	2. 78	14. 750	3.72	20.83	1. 37
2.667	1.34	8.750	2. 78	14. 833	3. 52	20.92	1. 37
2.750	1. 34 1. 36	8.833	3.06	14. 917	3.52	21.00	1. 37
2. 833 2. 917	1.36	8.917	3. 06 3. 06	15. 000 15. 083	3. 52 3. 34	21. 08 21. 17	1. 36 1. 36
3. 000	1.36	9.083	3. 32	15. 167	3. 34	21. 17	1. 36
3. 083	1. 39	9. 167	3. 32	15. 250	3. 34	21.33	1. 34
3. 167	1.39	9. 250	3.32	15. 333	3.14	21.42	1.34
3. 250	1.39	9.333	3.46	15. 417	3.14	21.50	1. 34
3. 333	1.42	9.417	3.46	15. 500	3. 14	21.58	1. 33
3. 417 3. 500	1. 42 1. 42	9.500	3. 46 3. 46	15. 583 15. 667	2. 96 2. 96	21.67 21.75	1. 33 1. 33
3.583	1.42	9.583	3. 46	15. 750	2. 96 2. 96	21.75	1. 33
3. 667	1. 45	9.750	3. 46	15. 833	2. 76	21. 92	1. 32
3. 750	1.45	9.833	3. 68	15. 917	2.76	22.00	1. 32
3.833	1.47	9.917	3.68	16. 000	2.76	22.08	1. 30
3. 917	1.47	10.000	3. 68	16. 083	2. 58	22. 17	1. 30
4.000	1.47	10.083	4. 10	16. 167	2.58	22. 25	1. 30 1. 29
4. 083 4. 167	1.50 1.50	10.167 10.250	4. 10 4. 10	16. 250 16. 333	2. 58 2. 45	22.33	1. 29
4. 250	1.50	10. 230	4. 66	16. 417	2. 45	22.50	1. 29
4. 333	1.54	10.417	4. 66	16. 500	2. 45	22.58	1. 28
4.417	1.54	10.500	4.66	16. 583	2.38	22.67	1. 28
4.500	1.54	10.583	5. 28	16. 667	2. 38	22.75	1. 28
4.583	1.59	10.667	5. 28	16. 750	2. 38	22.83	1. 26
4. 667 4. 750	1. 59 1. 59	10.750 10.833	5. 28 6. 18	16. 833 16. 917	2. 31 2. 31	22. 92	1. 26 1. 26
4. 730	1.65	10.833	6. 18	17. 000	2. 31	23.00	1. 25
4. 917	1.65	11.000	6. 18	17. 083	2. 25	23. 17	1. 25
5.000	1.65	11.083	7. 21	17. 167	2. 25	23. 25	1. 25
5.083	1.70	11. 167	7. 21	17. 250	2. 25	23. 33	1. 24
5. 167	1.70	11.250	7. 21	17. 333	2. 18	23.42	1. 24
5. 250	1.70	11.333	9. 12	17. 417	2. 18	23.50	1. 24

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5.333
                     1.76 | 11.417
                                   9. 12 | 17. 500
                                                   2. 18 | 23. 58
                                                                 1. 22
                     1.76 | 11.500
                                    9. 12 | 17. 583
                                                   2. 11 | 23. 67
              5. 417
                                                                  1. 22
              5.500
                     1.76 | 11.583
                                    11.61 | 17.667
                                                   2.11
                                                         23.75
                                                                  1.22
              5.583
                                    11. 61 | 17. 750
                                                   2. 11 | 23. 83
                     1.81 | 11.667
                                                                  1 21
                     1.81 | 11.750
                                    11. 61 | 17. 833
                                                   2.04 İ
                                                         23.92
              5.667
                                                                  1. 21
              5.750
                     1.81 | 11.833
                                    47. 33 | 17. 917
                                                   2.04 İ
                                                         24.00
                                                                  1. 21
                     1.86 | 11.917
                                    47. 34 | 18. 000
              5.833
                                                   2.04
                                                         24.08
                                                                  1 19
              5.917
                     1.86 | 12.000
                                   47. 34 | 18. 083
                                                   1. 98 | 24. 17
                                                                  1. 19
              6.000
                     1. 86 | 12. 083 | 116. 82 | 18. 167
                                                   1. 98 | 24. 25
                                                                  1.19
              6.083
                     1. 92 | 12. 167 | 116. 82 | 18. 250
                                                   1. 98
    Max. Eff. Inten. (mm/hr)=
                            116, 82
                                         77.14
              over (min)
                              5.00
                                         15.00
                              3.08 (ii) 10.91 (ii)
    Storage Coeff. (min)=
    Unit Hyd. Tpeak (min)=
                              5.00
                                         15.00
    Unit Hyd. peak (cms)=
                              0.27
                                          0.09
                                                      *TOTALS*
    PEAK FLOW
                   (cms) =
                              0.39
                                          0.25
                                                       0.606 (iii)
    TIME TO PEAK
                  (hrs)=
                              12.25
                                         12.33
                                                       12.25
    RUNOFF VOLUME
                   (mm) =
                             107.00
                                         45.21
                                                       66.84
    TOTAL RAINFALL
                   (mm) =
                             108.00
                                         108.00
                                                       108.00
    RUNOFF COEFFICIENT =
                              0.99
                                          0.42
                                                        0.62
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN^* = 59.0 Ia = Dep. Storage (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
______
| ADD HYD ( 0041)|
 1 + 2 = 3
                          AREA
                                 OPFAK
                                         TPFAK
                                                   R. V.
                                         (hrs)
                          (ha)
                                 (cms)
                                                   (mm)
-----
     ID1= 1 ( 0033):
                          0.41
                               0.054
                                        12.33
                                                 52.48
     + ID2= 2 ( 0036):
                          5. 32 0. 611
                                        12.42
                                                 66.84
      _____
      ID = 3 (0041):
                          5. 73 0. 658
                                        12. 42 65. 81
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
_____
| ADD HYD ( 0041)|
 3 + 2 = 1
                          AREA
                                 QPEAK
                                                   R. V.
                                         TPEAK
                                 (cms)
                          (ha)
                                         (hrs)
                                                   (mm)
```

5. 73 0. 658

2. 05 0. 243

12.42

12. 33

65.81

49.97

ID1= 3 (0041):

+ ID2= 2 (0037):

```
ID = 1 ( 0041): 7.78 0.900 12.33 61.64
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
| ADD HYD ( 0041)|
                        AREA
1 + 2 = 3
                              QPEAK
                                       TPEAK
                                                R V
-----
                        (ha)
                               (cms)
                                       (hrs)
                                                (mm)
     ID1= 1 ( 0041):
                        7. 78 0. 900
                                      12.33
                                              61.64
    + ID2= 2 ( 0040):
                        3. 43 0. 606
                                      12. 25 66. 84
      _____
      ID = 3 (0041): 11.21 1.408
                                    12, 25
                                           63 23
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
 CALIB
 NASHYD ( 0039)
                        (ha) = 0.83
                                       Curve Number (CN) = 75.0
                   Area
| ID= 1 DT= 5.0 min |
                  Ιa
                          (mm) = 10.00
                                       # of Linear Res. (N) = 3.00
-----
                   U. H. Tp(hrs) = 0.19
       NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                          ---- TRANSFORMED HYETOGRAPH ----
                                  RAIN | TIME RAIN |
              TIME
                     RAIN | TIME
                                                        TIME
                                                               RAIN
                    mm/hr
                            hrs
                                  mm/hr | hrs
                                                mm/hr |
                                                        hrs
               hrs
                                                              mm/hr
             0.083
                                  1. 92 | 12. 250 | 116. 82 |
                     0.00 1
                          6.167
                                                      18.33
                                                              1 91
             0.167
                     0.00 | 6.250
                                  1. 92 | 12. 333
                                               18.52
                                                      18.42
                                                              1.91
             0.250
                     0.00 | 6.333
                                  1. 97 | 12. 417
                                                18. 51
                                                      18.50
                                                              1.91
                     1.10 | 6.417
                                  1. 97 | 12. 500
             0.333
                                                18.51
                                                      18. 58
                                                              1.84
                                  1. 97 | 12. 583
             0.417
                     1.10 | 6.500
                                                12.60
                                                      18.67
                                                              1.84
             0.500
                     1.10 | 6.583
                                  2. 02 | 12. 667
                                                12.60
                                                      18. 75
                                                              1.84
             0.583
                     1.12 | 6.667
                                  2. 02 | 12. 750
                                                12.60
                                                      18.83
                                                              1.77
             0.667
                     1.12
                          6.750
                                  2. 02 | 12. 833
                                                8.67
                                                      18. 92
                                                              1.77
             0.750
                     1.12 | 6.833
                                  2.08 | 12.917
                                                8.67
                                                      19.00
                                                              1.77
             0.833
                     1.15 | 6.917
                                   2.08 | 13.000
                                                8.67
                                                      19.08
                                                              1.71
             0.917
                     1.15 | 7.000
                                   2.08 | 13.083
                                                7. 32 İ
                                                      19.17
                                                              1.71
             1.000
                     1.15 | 7.083
                                   2. 13 | 13. 167
                                                7.32
                                                      19. 25
                                                              1.71
             1.083
                     1.17 | 7.167
                                   2. 13 | 13. 250
                                                7.32
                                                      19.33
                                                              1.64
             1.167
                          7.250
                                   2. 13 | 13. 333
                     1.17
                                                6.20
                                                      19.42
                                                              1.64
             1.250
                     1.17 İ
                          7.333
                                   2. 19 | 13. 417
                                                6. 19 İ
                                                      19.50
                                                              1.64
             1.333
                     1.20
                          7.417
                                   2. 19 | 13. 500
                                                6. 19 | 19. 58
                                                              1.57
```

1.417

1.500

1.583

1.667

1.750

1.833

1.917

2.000

1.20 | 7.500

1. 20 | 7. 583

1. 23 | 7. 667

1.23 | 7.750

1. 23 | 7. 833

1.25 | 7.917

1.25 | 8.000

1.25 | 8.083

2. 19 | 13. 583

2. 24 | 13. 667

2. 24 | 13. 750

2. 24 | 13. 833

2. 30 | 13. 917

2.30 | 14.000

2. 30 | 14. 083

2. 35 | 14. 167

5.47 | 19.67

5. 47 | 19. 75

5. 47 | 19. 83

4.80 | 19.92

4.80 | 20.00

4.80 | 20.08

4. 28 | 20. 17

4. 28 | 20. 25

1.57

1.57

1.50

1.50

1.50

1.44

1.44

1.44

```
2.083
       1. 28 | 8. 167
                         2. 35 | 14. 250
                                          4. 28 | 20. 33
                                                         1. 40
                         2. 35 | 14. 333
                                          3. 90 | 20. 42
2. 167
        1. 28 | 8. 250
                                                          1.40
2.250
        1.28
                8.333
                         2.52 | 14.417
                                          3.90
                                                 20.50
                                                           1.40
2.333
                8.417
                         2. 52 | 14. 500
                                          3. 90 j
                                                 20.58
        1.31 |
                                                           1.38
2.417
        1.31 | 8.500
                         2. 52 | 14. 583
                                          3.72
                                                 20.67
                                                          1.38
2.500
        1.31
                8.583
                         2. 78 | 14. 667
                                          3.72
                                                 20.75
                                                          1.38
2.583
        1.34
                8.667
                         2. 78 | 14. 750
                                          3.72
                                                 20.83
                                                          1.37
2.667
        1.34
                8.750
                         2. 78 | 14. 833
                                          3.52
                                                 20.92
                                                          1.37
2.750
        1.34
                8.833
                         3.06 | 14.917
                                          3.52
                                                 21.00
                                                          1.37
                         3.06 15.000
2.833
        1.36
                8.917
                                          3.52
                                                 21.08
                                                          1.36
2.917
                9.000
                         3.06 | 15.083
                                          3.34
                                                 21.17
         1.36
                                                          1.36
3.000
        1.36
                9.083
                         3. 32 | 15. 167
                                          3.34 İ
                                                 21. 25
                                                          1.36
3.083
         1.39
                9.167
                         3. 32 | 15. 250
                                          3.34
                                                 21.33
                                                          1.34
                9.250
                         3. 32 | 15. 333
3. 167
         1.39
                                          3.14
                                                 21.42
                                                          1.34
3.250
        1.39
                9.333
                         3. 46 | 15. 417
                                          3.14
                                                 21.50
                                                          1.34
                9.417
                         3. 46 | 15. 500
3.333
         1.42
                                          3.14
                                                 21.58
                                                          1.33
3.417
         1.42
                9.500
                         3, 46 | 15, 583
                                          2.96
                                                 21.67
                                                           1.33
3.500
         1.42
                9.583
                         3. 46 | 15. 667
                                          2.96
                                                 21.75
                                                           1.33
3.583
         1.45
                9.667
                         3.46 | 15.750
                                          2.96
                                                 21.83
                                                           1.32
3.667
         1.45
                9.750
                         3.46 | 15.833
                                          2.76
                                                 21.92
                                                           1.32
3.750
         1.45
                9.833
                         3. 68 | 15. 917
                                          2.76
                                                 22.00
                                                           1.32
3.833
         1.47
                9.917
                         3.68 | 16.000
                                          2.76
                                                 22.08
                                                           1.30
3.917
         1.47
               10.000
                         3.68 | 16.083
                                          2.58
                                                 22.17
                                                           1.30
4.000
         1.47
              10.083
                         4. 10 | 16. 167
                                          2.58
                                                 22. 25
                                                           1.30
4.083
         1.50 | 10.167
                         4. 10 | 16. 250
                                          2.58
                                                 22.33
                                                           1. 29
4.167
         1.50 | 10.250
                         4. 10 | 16. 333
                                          2.45
                                                 22.42
                                                           1. 29
4.250
         1.50 | 10.333
                         4.66 16.417
                                          2.45
                                                 22.50
                                                           1. 29
4.333
         1.54 | 10.417
                         4.66 | 16.500
                                          2.45
                                                 22.58
                                                           1. 28
4.417
         1.54 | 10.500
                         4. 66 | 16. 583
                                          2.38
                                                 22.67
                                                           1. 28
4.500
        1.54 | 10.583
                         5. 28 | 16. 667
                                          2.38
                                                 22.75
                                                           1. 28
4.583
         1.59 | 10.667
                         5. 28 | 16. 750
                                          2.38
                                                 22.83
                                                           1. 26
4.667
         1.59 10.750
                         5. 28 | 16. 833
                                                 22.92
                                          2.31
                                                           1. 26
                         6. 18 | 16. 917
4.750
         1.59 | 10.833
                                          2.31
                                                 23.00
                                                           1.26
4.833
         1.65 | 10.917
                         6. 18 | 17. 000
                                          2.31
                                                 23.08
                                                           1. 25
4.917
         1.65 | 11.000
                         6. 18 | 17. 083
                                          2. 25
                                                 23. 17
                                                           1.25
5.000
        1.65 | 11.083
                         7. 21 | 17. 167
                                          2. 25
                                                 23. 25
                                                           1.25
                         7. 21 | 17. 250
5.083
         1.70 | 11.167
                                          2.25
                                                 23.33
                                                           1.24
         1.70 | 11.250
                         7. 21 | 17. 333
5. 167
                                          2. 18
                                                 23.42
                                                           1.24
5.250
         1.70 | 11.333
                         9. 12 | 17. 417
                                          2. 18 İ
                                                 23.50
                                                           1.24
5.333
         1.76 | 11.417
                         9. 12 | 17. 500
                                          2.18
                                                 23.58
                                                           1.22
5.417
         1.76 11.500
                         9. 12 | 17. 583
                                          2.11
                                                 23.67
                                                           1.22
5.500
         1.76 | 11.583
                         11.61 | 17.667
                                          2.11
                                                 23.75
                                                           1.22
5.583
         1.81 | 11.667
                         11.61 | 17.750
                                          2. 11 İ
                                                 23.83
                                                           1. 21
5.667
         1.81 | 11.750
                        11. 61 | 17. 833
                                          2.04
                                                 23.92
                         47. 33 | 17. 917
                                                          1. 21
5.750
         1.81 | 11.833
                                          2.04
                                                 24.00
        1.86 | 11.917
                        47. 34 | 18. 000
                                          2.04 | 24.08
5.833
                                                          1.19
5. 917
         1.86 | 12.000
                        47. 34 | 18. 083
                                          1. 98 | 24. 17
                                                          1.19
        1.86 | 12.083 | 116.82 | 18.167
                                          1. 98 | 24. 25
6.000
                                                          1.19
        1. 92 | 12. 167 | 116. 82 | 18. 250
6.083
                                          1. 98
```

PEAK FLOW (cms) = 0.111 (i)TIME TO PEAK (hrs)= 12.333 RUNOFF VOLUME (mm) = 52.454TOTAL RAINFALL (mm) = 108.000 RUNOFF COEFFICIENT = 0.486 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. ______ -----| ADD HYD (0032)| 1 + 2 = 3 AREA QPEAK TPEAK R. V. (ha) (cms) (hrs) (mm) ID1= 1 (0039): 0. 83 0. 111 12. 33 52.45 + ID2= 2 (0041): 11.21 1.408 12. 25 63.23 _____ ID = 3 (0032): 12.04 1.516 12.25 62.48 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ** SIMULATION: 3-5yr 24hr 15min SCS Type II ** CALIB NASHYD (0033) Area (ha)= 0.41 Curve Number (CN) = 75.0 |ID= 1 DT= 5.0 min | la (mm) = 10.00# of Linear Res. (N) = 3.00 U. H. Tp(hrs) = 0.20_____ NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH						
TIME	RAI N	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1. 23	12. 250	75. 29	18. 33	1. 23
0. 167	0.00	6.250	1. 23	12. 333	11. 93	18. 42	1. 23
0.250	0.00	6.333	1. 27	12. 417	11. 93	18.50	1. 23
0.333	0.71	6.417	1. 27	12. 500	11. 93	18. 58	1. 19
0.417	0.71	6.500	1. 27	12. 583	8. 12	18. 67	1. 19
0.500	0.71	6.583	1.30	12. 667	8. 12	18. 75	1. 19
0.583	0.72	6.667	1.30	12. 750	8. 12	18.83	1.14
0.667	0.72	6.750	1.30	12. 833	5. 59	18. 92	1.14
0.750	0.72	6.833	1.34	12. 917	5.58	19.00	1.14
0.833	0.74	6.917	1.34	13.000	5. 58	19.08	1.10
0. 917	0.74	7.000	1.34	13.083	4.72	19. 17	1.10
1.000	0.74	7.083	1.37	13. 167	4.72	19. 25	1.10
1.083	0.76	7.167	1.37	13. 250	4.72	19. 33	1.06
1. 167	0.76	7.250	1.37	13. 333	3. 99	19. 42	1.06
1. 250	0.76	7.333	1.41	13. 417	3. 99	19.50	1.06
1. 333	0.78	7.417	1.41	13. 500	3. 99	19. 58	1. 01

```
1.417
        0.78 | 7.500
                        1.41 | 13.583
                                          3. 52 | 19. 67
                                                          1.01
1.500
         0.78 | 7.583
                         1.44 | 13.667
                                          3.52
                                                 19.75
                                                           1.01
1.583
         0.79
                7.667
                         1.44 | 13.750
                                          3.52
                                                  19.83
                                                           0.97
         0.79
                         1. 44 | 13. 833
                                                  19. 92
                7.750
                                          3.09
                                                           0.97
1.667
                         1. 48 | 13. 917
                                                 20.00
1.750
         0.79
                7.833
                                          3.09
                                                           0.97
                7.917
                         1.48 | 14.000
1.833
         0.81
                                          3.09
                                                  20.08
                                                           0.93
                8.000
                         1. 48 | 14. 083
1.917
         0.81
                                          2.76
                                                  20.17
                                                           0.93
                                          2.76
2.000
         0.81
                8.083
                         1. 51 | 14. 167
                                                 20. 25
                                                           0.93
2.083
         0.83
                8.167
                         1.51 | 14.250
                                          2.76
                                                  20.33
                                                           0.90
                         1.51 14.333
2.167
         0.83
                8.250
                                          2.51
                                                  20.42
                                                           0.90
2.250
         0.83
                8.333
                         1.62 | 14.417
                                          2.51
                                                  20.50
                                                           0.90
2.333
         0.84
                8.417
                         1.62 | 14.500
                                          2.51
                                                  20.58
                                                           0.89
2.417
         0.84
                8.500
                         1, 62 | 14, 583
                                          2.40
                                                  20.67
                                                           0.89
2.500
         0.84
                8.583
                         1. 79 | 14. 667
                                          2.40
                                                  20.75
                                                           0.89
2.583
         0.86
                8.667
                         1. 79 | 14. 750
                                          2.40
                                                  20.83
                                                           0.88
2.667
                8.750
                         1. 79 | 14. 833
                                                  20.92
         0.86
                                          2.27
                                                           0.88
2.750
         0.86
                8.833
                         1. 97 | 14. 917
                                          2.27
                                                  21.00
                                                           0.88
2.833
         0.88
                8.917
                         1. 97 | 15. 000
                                          2.27
                                                  21.08
                                                           0.87
2.917
         0.88
                9.000
                         1. 97 | 15. 083
                                          2.15
                                                 21. 17
                                                           0.87
                          2. 14 | 15. 167
3.000
         0.88
                9.083
                                          2.15
                                                  21. 25
                                                           0.87
                          2. 14 | 15. 250
3.083
         0.90
                9.167
                                          2.15
                                                  21.33
                                                           0.87
3.167
         0.90
                9.250
                         2. 14 | 15. 333
                                          2.03
                                                  21.42
                                                           0.87
3.250
         0.90
                9.333
                         2. 23 | 15. 417
                                          2.03
                                                  21.50
                                                           0.87
                               15.500
3.333
         0.91
                9.417
                          2.23
                                          2.03
                                                  21.58
                                                           0.86
3.417
                         2. 23 | 15. 583
         0.91
                9.500
                                          1.91
                                                 21.67
                                                           0.86
3.500
         0.91
                9.583
                         2. 23 | 15. 667
                                          1.91
                                                  21.75
                                                           0.86
3.583
         0.93
                9.667
                         2. 23 | 15. 750
                                          1.91
                                                  21.83
                                                           0.85
3.667
         0.93
                9.750
                         2. 23 | 15. 833
                                          1.78
                                                 21.92
                                                           0.85
3.750
         0.93
                9.833
                         2. 37 | 15. 917
                                          1.78
                                                  22.00
                                                           0.85
3.833
                9.917
                         2. 37 | 16. 000
         0.95
                                                  22.08
                                                           0.84
                                          1.78
3.917
         0.95 | 10.000
                         2. 37 | 16. 083
                                                  22.17
                                          1.66
                                                           0.84
4.000
         0.95 | 10.083
                         2. 64 | 16. 167
                                                  22. 25
                                                           0.84
                                          1.66
4.083
         0.96 | 10.167
                          2. 64 | 16. 250
                                          1.66
                                                  22.33
                                                           0.83
         0.96 10.250
4.167
                         2. 64 | 16. 333
                                          1.58
                                                  22.42
                                                           0.83
4.250
         0.96 | 10.333
                         3.00 | 16.417
                                                  22.50
                                                           0.83
                                          1.58
4.333
         0.99 | 10.417
                         3.00 | 16.500
                                          1.58
                                                  22.58
                                                           0.82
4.417
         0.99 10.500
                         3.00 | 16.583
                                          1.54
                                                  22.67
                                                           0.82
4.500
         0.99 | 10.583
                          3. 40 | 16. 667
                                                  22.75
                                          1.54
                                                           0.82
4.583
         1.03 | 10.667
                          3.40 | 16.750
                                          1.54
                                                  22.83
                                                           0.81
4.667
         1.03 | 10.750
                          3. 40 | 16. 833
                                          1.49
                                                  22.92
                                                           0.81
4.750
         1.03 | 10.833
                         3. 98 | 16. 917
                                          1.49
                                                  23.00
                                                           0.81
4.833
         1.06 10.917
                          3. 98 | 17. 000
                                          1.49
                                                  23.08
                                                           0.80
         1.06 11.000
4.917
                          3. 98 | 17. 083
                                          1.45
                                                  23.17
                                                           0.80
         1.06 | 11.083
                         4. 65 | 17. 167
5.000
                                          1.45
                                                  23. 25
                                                           0.80
5.083
         1. 10 | 11. 167
                          4.65 17.250
                                          1.45
                                                  23.33
                                                           0.80
5. 167
         1.10 | 11.250
                         4.65 | 17.333
                                          1.40
                                                 23.42
                                                           0.80
         1. 10 | 11. 333
5.250
                         5. 88 | 17. 417
                                          1.40
                                                 23.50
                                                           0.80
5.333
         1. 13 | 11. 417
                         5. 88 | 17. 500
                                          1.40
                                                  23.58
                                                           0.79
         1.13 | 11.500
                         5. 88 | 17. 583
5.417
                                          1.36
                                                 23.67
                                                           0.79
         1.13 | 11.583
                          7. 48 | 17. 667
5.500
                                          1.36
                                                 23.75
                                                           0.79
5.583
         1.17 | 11.667
                          7.48 | 17.750
                                                           0.78
                                          1. 36 | 23. 83
5.667
         1. 17 | 11. 750
                         7. 48 | 17. 833
                                          1. 32 | 23. 92
                                                           0.78
```

```
5. 750 1. 17 | 11. 833 30. 50 | 17. 917
                                          1.32 | 24.00
                                                            0.78
5.833
        1. 20 | 11. 917
                         30. 51 | 18. 000
                                           1.32 | 24.08
                                                            0.77
         1. 20 | 12. 000
                         30. 51 | 18. 083
5.917
                                           1. 28 | 24. 17
                                                            0.77
        1. 20 | 12. 083
                        75. 28 | 18. 167
6.000
                                           1. 28 | 24. 25
                                                            0.77
        1. 23 | 12. 167
                         75. 29 | 18. 250
6.083
                                           1.28
```

PEAK FLOW (cms) = 0.025 (i)
TIME TO PEAK (hrs) = 12.333
RUNOFF VOLUME (mm) = 24.574
TOTAL RAINFALL (mm) = 69.600
RUNOFF COEFFICIENT = 0.353

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAI N	TIME	RAIN	I' TIME	RAIN	I TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0. 083	0.00	6. 167	1. 23	12. 250	75. 29	18. 33	1. 23
0. 167	0.00	6.250	1. 23	12. 333	11. 93	18. 42	1. 23
0. 250	0.00	6.333	1. 27	12. 417	11. 93	18. 50	1. 23
0. 333	0.71	6.417	1. 27	12. 500	11. 93	18. 58	1. 19
0.417	0.71	6.500	1. 27	12. 583	8. 12	18. 67	1. 19
0.500	0.71	6.583	1.30	12. 667	8. 12	18.75	1. 19
0.583	0.72	6.667	1.30	12. 750	8. 12	18.83	1.14
0.667	0.72	6.750	1.30	12. 833	5. 59	18. 92	1.14
0.750	0.72	6.833	1.34	12. 917	5. 58	19.00	1.14
0.833	0.74	6.917	1.34	13.000	5. 58	19.08	1. 10
0. 917	0.74	7.000	1.34	13. 083	4.72	19. 17	1. 10
1.000	0.74	7.083	1. 37	13. 167	4.72	19. 25	1. 10
1.083	0.76	7.167	1. 37	13. 250	4.72	19.33	1.06
1. 167	0.76	7.250	1. 37	13. 333	3. 99	19.42	1.06
1. 250	0.76	7.333	1. 41	13. 417	3. 99	19.50	1.06
1.333	0.78	7.417	1. 41	13. 500	3. 99	19. 58	1. 01
1. 417	0.78	7.500	1. 41	13. 583	3.52	19. 67	1. 01
1.500	0.78	7.583	1.44	13. 667	3.52	19.75	1. 01
1.583	0.79	7.667	1.44	13. 750	3.52	19.83	0. 97
1.667	0.79	7.750	1.44	13. 833	3.09	19. 92	0. 97
1.750	0.79	7.833	1. 48	13. 917	3.09	20.00	0. 97
1.833	0.81	7.917	1. 48	14.000	3.09	20.08	0. 93
1. 917	0.81	8.000	1. 48	14.083	2.76	20.17	0. 93

```
2.000
         0.81 | 8.083
                          1.51 | 14.167
                                           2.76
                                                  20. 25
                                                            0.93
2.083
         0.83
                8.167
                          1.51 | 14.250
                                           2.76
                                                   20.33
                                                             0.90
                                           2.51
2.167
         0.83
                8.250
                          1.51 | 14.333
                                                   20.42
                                                             0.90
                8.333
2.250
                          1.62 | 14.417
                                           2.51
                                                   20.50
                                                             0.90
         0.83
2.333
                8.417
                          1.62 | 14.500
                                           2.51
                                                   20.58
                                                             0.89
         0.84
2.417
         0.84
                8.500
                          1.62 | 14.583
                                           2.40
                                                   20.67
                                                             0.89
         0.84
2.500
                8.583
                          1. 79 | 14. 667
                                           2.40
                                                   20.75
                                                             0.89
                                           2.40
2.583
         0.86
                8.667
                          1.79 | 14.750
                                                   20.83
                                                             0.88
2.667
         0.86
                8.750
                          1.79 | 14.833
                                           2.27
                                                   20.92
                                                             0.88
         0.86
2.750
                8.833
                          1. 97 | 14. 917
                                           2.27
                                                   21.00
                                                            0.88
2.833
         0.88
                8.917
                          1.97
                                15.000
                                                   21.08
                                                             0.87
                                           2.27
                                                   21.17
2.917
         0.88
                9.000
                          1. 97 | 15. 083
                                           2.15
                                                             0.87
3.000
         0.88
                9.083
                          2. 14 | 15. 167
                                           2.15
                                                   21. 25
                                                            0.87
3.083
                 9.167
                                15. 250
         0.90
                          2.14
                                           2.15
                                                   21.33
                                                             0.87
3.167
         0.90
                9.250
                          2.14
                                15. 333
                                           2.03
                                                   21.42
                                                            0.87
3.250
         0.90
                9.333
                                15. 417
                          2.23
                                           2.03
                                                   21.50
                                                             0.87
3.333
         0.91
                 9.417
                          2.23
                                15.500
                                           2.03
                                                   21.58
                                                             0.86
3.417
         0.91
                9.500
                          2.23
                                15.583
                                           1.91
                                                   21.67
                                                             0.86
3.500
         0.91
                9.583
                          2.23
                                15.667
                                           1.91
                                                   21.75
                                                            0.86
3.583
         0.93
                 9.667
                          2.23
                                 15.750
                                           1.91
                                                   21.83
                                                             0.85
3.667
         0.93
                 9.750
                          2.23
                                15.833
                                           1.78
                                                   21.92
                                                             0.85
3.750
         0.93
                9.833
                          2.37
                                15. 917
                                           1.78
                                                   22.00
                                                             0.85
3.833
         0.95
                9.917
                          2.37
                                 16.000
                                           1.78
                                                   22.08
                                                             0.84
3.917
         0.95
                10.000
                          2.37
                                 16.083
                                           1.66
                                                   22.17
                                                             0.84
4.000
         0.95
               10.083
                          2.64
                                16. 167
                                                   22.25
                                                             0.84
                                           1.66
4.083
         0.96
               10.167
                          2.64
                                 16. 250
                                                   22.33
                                                             0.83
                                           1.66
4.167
         0.96
               10.250
                          2.64
                                 16. 333
                                           1.58
                                                   22.42
                                                             0.83
4.250
         0.96
               10.333
                          3.00
                                16. 417
                                           1.58
                                                   22.50
                                                             0.83
4.333
         0.99
               10.417
                          3.00
                                16. 500
                                           1.58
                                                   22.58
                                                             0.82
         0.99 | 10.500
4.417
                          3.00
                                16.583
                                                   22.67
                                                             0.82
                                           1.54
4.500
         0.99 | 10.583
                          3.40
                                16.667
                                                   22.75
                                           1.54
                                                            0.82
4.583
         1.03 | 10.667
                                16. 750
                          3.40
                                           1.54
                                                   22.83
                                                            0.81
               10.750
                          3. 40 | 16. 833
4.667
         1.03
                                           1.49
                                                   22.92
                                                             0.81
4.750
         1.03 | 10.833
                          3. 98 | 16. 917
                                           1.49
                                                   23.00
                                                             0.81
4.833
         1.06 | 10.917
                          3.98 | 17.000
                                           1.49
                                                   23.08
                                                             0.80
                          3. 98 | 17. 083
4.917
         1.06 | 11.000
                                           1.45
                                                   23.17
                                                             0.80
                          4.65 | 17.167
5.000
         1.06 | 11.083
                                           1.45
                                                   23.25
                                                             0.80
5.083
         1. 10 | 11. 167
                          4.65 | 17.250
                                           1.45
                                                   23.33
                                                             0.80
5.167
         1.10 | 11.250
                          4.65 | 17.333
                                           1.40
                                                   23.42
                                                             0.80
5.250
         1.10 | 11.333
                          5. 88 | 17. 417
                                           1.40
                                                   23.50
                                                             0.80
5.333
         1.13 | 11.417
                          5.88 | 17.500
                                           1.40
                                                   23.58
                                                             0.79
5.417
         1.13 | 11.500
                          5. 88 | 17. 583
                                           1.36
                                                   23.67
                                                             0.79
5.500
         1.13 | 11.583
                          7.48 17.667
                                           1.36
                                                   23.75
                                                             0.79
5.583
         1.17 11.667
                          7.48 | 17.750
                                           1.36
                                                   23.83
                                                             0.78
         1. 17 | 11. 750
                          7. 48 | 17. 833
5.667
                                           1.32
                                                   23.92
                                                             0.78
         1. 17 | 11. 833
5.750
                         30.50 | 17.917
                                           1.32
                                                  24.00
                                                             0.78
5.833
         1.20 | 11.917
                         30.51 | 18.000
                                           1.32
                                                  24.08
                                                             0.77
         1.20 | 12.000
                         30.51 | 18.083
5.917
                                           1. 28
                                                  24. 17
                                                             0.77
                                                  24. 25
6.000
         1.20 | 12.083
                         75. 28 | 18. 167
                                           1. 28
                                                            0.77
6.083
         1.23 | 12.167
                         75. 29 | 18. 250
                                           1.28
```

PEAK FLOW (cms) = 0.109 (i)
TIME TO PEAK (hrs) = 12.333
RUNOFF VOLUME (mm) = 23.104
TOTAL RAINFALL (mm) = 69.600
RUNOFF COEFFICIENT = 0.332

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0036) (ha) = 5.32Area Total Imp(%) = 50.00IID= 1 DT= 5.0 min i Dir. Conn. (%) = 35.00 _____ **IMPERVIOUS** PERVIOUS (i) Surface Area 2.66 2.66 (ha)= Dep. Storage (mm) =1.00 5.00 Average Slope (%)= 1.00 1.00 Length (m) =188.33 40.00 Mannings n 0.130 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----TIME RAI N TIME RAIN | TIME RAIN TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0.083 0.00 1. 23 | 12. 250 75. 29 18.33 1.23 6.167 1. 23 | 12. 333 0.167 0.00 6.250 11.93 18.42 1.23 0.250 1. 27 | 12. 417 0.00 6.333 11.93 18.50 1.23 0.333 6.417 1. 27 | 12. 500 0.71 11.93 18.58 1.19 0.417 6.500 1. 27 | 12. 583 0.71 8. 12 18.67 1.19 0.500 0.71 6.583 1. 30 | 12. 667 8. 12 18.75 1.19 0.583 6.667 1.30 | 12.750 18.83 0.72 8. 12 1.14 0.667 0.72 6.750 1.30 12.833 5.59 18.92 1.14 0.750 12. 917 0.72 6.833 1.34 5.58 19.00 1 14 0.74 0.833 6.917 1.34 | 13.000 5.58 19.08 1.10 0.917 0.74 7.000 1.34 | 13.083 4.72 19.17 1.10 1.000 0.74 7.083 1. 37 | 13. 167 4.72 19.25 1.10 1.083 0.76 7.167 1. 37 | 13. 250 4.72 19.33 1.06 1.167 0.76 7.250 1.37 13. 333 3.99 19.42 1.06 1.250 0.76 7.333 1.41 i 13. 417 3.99 19.50 1.06 1.333 0.78 7.417 1.41 | 13.500 3.99 19.58 1.01 7.500 1.41 | 13.583 1.417 0.78 3.52 19.67 1.01 1.500 0.78 7.583 1.44 | 13.667 3.52 19.75 1.01 1.583 0.79 7.667 1.44 | 13.750 3.52 19.83 0.97 1.667 0.79 7.750 1.44 | 13.833 3.09 19.92 0.97 1. 48 | 13. 917 3.09 1.750 0.79 7.833 20.00 0.97 3.09 1.833 0.81 7.917 1.48 | 14.000 20.08 0.93 1.917 8.000 1.48 | 14.083 0.93 0.81 2.76 20.17 2.000 0.81 | 8.083 1.51 | 14.167 2.76 | 20.25 0.93

2.083	0.83	8.167	1.51	14. 250	2.76	20.33	0. 90
2. 167	0.83	8.250	1.51	114. 333	2.51	20.42	0. 90
2. 250	0.83	8.333	1. 62	14. 417	2.51	20. 42	0. 90
2. 333	0.84	8.417	1. 62	14. 500	2.51	20.58	0. 89
2. 417	0.84	8.500	1. 62	114. 583	2. 40	20. 50	0.89
2.500	0.84	8.583	1. 79	14. 667	2.40	20.07	0.89
2. 583	0.84	8.667	1. 79	14. 750	2.40	20.73	0.88
2. 565	0.86	8.750	1. 79	14. 730	2. 40	20. 63	0.88
2.750	0.86	8.833	1. 73	14. 033	2. 27	20. 92	0.88
2. 730	0.88	8.917	1. 97	15. 000	2. 27	21.00	0.87
2. 033	0.88	9.000	1. 97	15. 083	2. 15	21.00	0.87
3.000	0.88	9.000	2. 14	15. 167	2. 15	21.17	0.87
3.083	0. 86	9.063	2. 14	15. 167	2. 15	21. 23	0.87
			2. 14			21.33	
3. 167 3. 250	0. 90 0. 90	9.250	2. 14	15. 333 15. 417	2.03	21.42	0. 87 0. 87
			2. 23		2.03		
3. 333 3. 417	0. 91 0. 91	9.417	2. 23	15. 500 15. 583	2. 03 1. 91	21.58 21.67	0.86
3. 500	0. 91	9.583	2. 23	15. 667	1. 91	21. 07	0. 86 0. 86
3.583	0. 91	9.667	2. 23	15. 750	1. 91	21.73	0.85
3. 667	0.93	9.750	2. 23	15. 730	1. 71	21.63	0.85
3.750	0. 93	9.833	2. 23	15. 633	1. 78	21.92	0.85
	0.95		2. 37		1. 78	22.00	
3.833	0.95	9.917		16.000			0.84
3. 917	0. 95	10.000	2. 37 2. 64	16. 083 16. 167	1. 66 1. 66	22. 17 22. 25	0. 84 0. 84
4. 000 4. 083	0. 95	10.083 10.167	2. 64	16. 250	1. 66	22. 23	0. 83
4. 167	0. 96	10. 107	2. 64	16. 333	1.58	22. 33	0.83
4. 167	0.96	10. 230	3. 00	16. 333	1. 58	22. 42	0. 83
4. 333	0. 90	10. 333	3.00	16. 500	1. 58	22.50	0.83
4. 333	0. 99	10. 417	3.00	16. 583	1. 54	22. 50	0. 82
4.500	0. 99	10.583	3.40	16. 667	1. 54	22. 75	0. 82
4. 583	1.03	10.667	3.40	16. 750	1. 54	22.73	0. 81
4. 667	1.03	10.750	3. 40	16. 833	1. 49	22. 03	0. 81
4. 750	1.03	10.730	3. 98	16. 917	1.49	23.00	0.81
4. 833	1.06	10.033	3. 98	17. 000	1.49	23.08	0.80
4. 917	1.06	11.000	3. 98	17. 083	1. 45	23. 17	0.80
5.000	1.06	111.083	4. 65	17. 167	1. 45	23. 25	0.80
5. 083	1.10	111.167	4. 65	17. 250	1. 45	23. 23	0.80
5. 167	1. 10	11. 250	4. 65	17. 333	1. 40	23. 42	0.80
5. 250	1. 10	111. 333	5. 88	17. 417	1.40	23. 50	0.80
5. 333	1. 13	111. 417	5. 88	17. 500	1.40	23.58	0. 79
5. 417	1. 13	111.500	5. 88	17. 583	1. 36	23.67	0.79
5. 500	1. 13	111.583	7. 48	17. 667	1. 36	23.75	0.79
5. 583	1. 17	111.667	7.48	17. 750	1. 36	23.73	0.79
5. 667	1. 17	111.750	7.48	17. 833	1. 32	23. 92	0.78
5. 750	1. 17	111.833	30. 50	17. 917	1. 32	24.00	0.78
5. 833	1. 20	111. 917	30. 51	18. 000	1. 32	24.08	0.77
5. 917	1. 20	12.000	30. 51	118. 083	1. 28	24.17	0.77
6.000	1. 20	12.083	75. 28	18. 167	1. 28	24. 25	0.77
6. 083	1. 23	12.167	75. 29	18. 250	1. 28	23	J
5. 000	25	1 .207		1 . 0 . 200	25	ı	

Max. Eff. Inten. (mm/hr) = 64.09 34.25 over (min) 20.00 35.00

Storage Coeff.	(mi n)=	17.77 (ii)	31.10 (ii)	
Unit Hyd. Tpeak	(mi n)=	20.00	35.00	
Unit Hyd. peak	(cms)=	0.06	0.03	
				TOTALS
PEAK FLOW	(cms)=	0. 23	0.10	0.296 (iii)
TIME TO PEAK	(hrs)=	12. 42	12.67	12.42
RUNOFF VOLUME	(mm) =	68.60	21. 45	37.95
TOTAL RAINFALL	(mm) =	69. 60	69. 60	69.60
RUNOFF COFFFICIA	ENT =	0. 99	0. 31	0.55

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 - CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
- THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0040) Area (ha)= 3.43 Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 | ID= 1 DT= 5.0 min | _____ I MPERVI OUS PERVIOUS (i) Surface Area 1.71 1.71 (ha)= Dep. Storage 1.00 5.00 (mm) = Average Slope (%)= 1.00 2.00 Length (m) =151. 22 40.00 Mannings n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1. 23	12. 250	75. 29	18. 33	1. 23
0. 167	0.00	6.250	1. 23	12. 333	11. 93	18. 42	1. 23
0.250	0.00	6.333	1. 27	12. 417	11. 93	18.50	1. 23
0.333	0.71	6.417	1. 27	12. 500	11. 93	18.58	1. 19
0.417	0.71	6.500	1. 27	12. 583	8. 12	18.67	1. 19
0.500	0.71	6.583	1.30	12. 667	8. 12	18.75	1. 19
0.583	0.72	6.667	1.30	12. 750	8. 12	18.83	1.14
0.667	0.72	6.750	1.30	12. 833	5. 59	18. 92	1. 14
0.750	0.72	6.833	1.34	12. 917	5. 58	19.00	1.14
0.833	0.74	6.917	1.34	13.000	5. 58	19.08	1. 10
0. 917	0.74	7.000	1.34	13. 083	4.72	19. 17	1. 10
1.000	0.74	7.083	1. 37	13. 167	4.72	19. 25	1.10
1.083	0.76	7.167	1. 37	13. 250	4.72	19.33	1.06
1.167	0.76	7.250	1. 37	13. 333	3. 99	19.42	1.06
1.250	0.76	7.333	1.41	13. 417	3. 99	19.50	1.06
1.333	0.78	7.417	1.41	13. 500	3. 99	19. 58	1.01

```
1.417
        0.78 | 7.500
                         1.41 | 13.583
                                          3.52 | 19.67
                                                          1.01
                         1.44 | 13.667
                                          3. 52 | 19. 75
1.500
         0.78 | 7.583
                                                           1.01
1.583
         0.79
                7.667
                          1.44 | 13.750
                                          3.52
                                                  19.83
                                                            0.97
         0.79
                7.750
                         1. 44 | 13. 833
                                          3.09
                                                  19.92
1.667
                                                            0.97
1.750
         0.79
                7.833
                         1.48 | 13.917
                                           3.09
                                                  20.00
                                                            0.97
1.833
         0.81
                7.917
                          1.48 | 14.000
                                           3.09
                                                  20.08
                                                            0.93
1.917
         0.81
                8.000
                          1.48 | 14.083
                                           2.76
                                                  20.17
                                                            0.93
2.000
         0.81
                8.083
                          1. 51 | 14. 167
                                           2.76
                                                  20. 25
                                                            0.93
2.083
         0.83
                8.167
                          1.51 | 14.250
                                           2.76
                                                  20.33
                                                            0.90
                                           2.51
2.167
         0.83
                8.250
                          1.51 | 14.333
                                                  20.42
                                                            0.90
2.250
         0.83
                8.333
                          1. 62 | 14. 417
                                                  20.50
                                                            0.90
                                           2.51
2.333
         0.84
                8.417
                          1.62 | 14.500
                                           2.51
                                                  20.58
                                                            0.89
2.417
         0.84
                8.500
                         1, 62 | 14, 583
                                           2.40
                                                  20.67
                                                            0.89
2.500
         0.84
                8.583
                          1. 79 | 14. 667
                                           2.40
                                                  20.75
                                                            0.89
2.583
         0.86
                8.667
                         1. 79 | 14. 750
                                           2.40
                                                  20.83
                                                            0.88
                8.750
                          1. 79 | 14. 833
2.667
         0.86
                                           2.27
                                                  20. 92
                                                            0.88
2.750
         0.86
                8.833
                          1. 97 | 14. 917
                                           2.27
                                                  21.00
                                                            0.88
2.833
         0.88
                8.917
                          1. 97 | 15. 000
                                           2.27
                                                            0.87
                                                  21.08
2.917
         0.88
                9.000
                          1. 97 | 15. 083
                                                  21.17
                                                            0.87
                                           2. 15
3.000
         0.88
                9.083
                          2. 14 | 15. 167
                                           2.15
                                                  21. 25
                                                            0.87
3.083
         0.90
                9.167
                          2. 14 | 15. 250
                                           2.15
                                                  21.33
                                                            0.87
3.167
         0.90
                9.250
                          2. 14 | 15. 333
                                           2.03
                                                  21.42
                                                            0.87
3.250
         0.90
                9.333
                          2. 23 | 15. 417
                                           2.03
                                                  21.50
                                                            0.87
3.333
         0.91
                9.417
                          2. 23 | 15. 500
                                           2.03
                                                  21.58
                                                            0.86
3.417
                9.500
                          2. 23 | 15. 583
         0.91
                                           1. 91
                                                  21.67
                                                            0.86
3.500
         0.91
                9.583
                          2. 23 | 15. 667
                                           1.91
                                                  21.75
                                                            0.86
3.583
         0.93
                9.667
                          2. 23 | 15. 750
                                           1.91
                                                  21.83
                                                            0.85
3.667
         0.93
                9.750
                          2. 23 | 15. 833
                                                  21.92
                                           1. 78
                                                            0.85
3.750
         0.93
                9.833
                          2. 37 | 15. 917
                                                  22.00
                                           1.78
                                                            0.85
3.833
                9.917
                          2. 37 | 16. 000
         0.95
                                           1.78
                                                  22.08
                                                            0.84
3.917
         0.95 | 10.000
                          2. 37 | 16. 083
                                           1.66
                                                  22. 17
                                                            0.84
4.000
         0.95 | 10.083
                          2. 64 | 16. 167
                                                  22. 25
                                           1.66
                                                            0.84
4.083
         0.96 | 10.167
                          2.64 | 16.250
                                           1.66
                                                  22.33
                                                            0.83
4.167
         0.96 | 10.250
                          2. 64 | 16. 333
                                           1.58
                                                  22.42
                                                            0.83
4.250
         0.96 | 10.333
                          3.00 | 16.417
                                           1.58
                                                  22.50
                                                            0.83
4.333
         0.99 | 10.417
                          3.00 | 16.500
                                           1.58
                                                  22.58
                                                            0.82
4.417
         0.99 | 10.500
                          3.00 | 16.583
                                           1.54
                                                  22.67
                                                            0.82
         0.99 | 10.583
4.500
                          3.40 | 16.667
                                           1.54
                                                  22.75
                                                            0.82
4.583
         1.03 | 10.667
                          3.40 | 16.750
                                           1.54
                                                  22.83
                                                            0.81
4.667
         1.03 | 10.750
                          3. 40 | 16. 833
                                           1.49
                                                  22.92
                                                            0.81
4.750
         1.03 | 10.833
                          3. 98 | 16. 917
                                           1.49
                                                  23.00
                                                            0.81
         1.06 10.917
                          3. 98 | 17. 000
4.833
                                           1.49
                                                  23.08
                                                            0.80
4.917
         1.06 | 11.000
                          3. 98 | 17. 083
                                           1.45
                                                  23. 17
                                                            0.80
5.000
         1.06 11.083
                          4.65 | 17.167
                                           1.45
                                                  23. 25
5.083
         1.10 | 11.167
                          4.65 | 17.250
                                           1.45
                                                  23.33
                                                            0.80
         1. 10 | 11. 250
                          4. 65 | 17. 333
5. 167
                                           1.40
                                                  23.42
                                                            0.80
5.250
         1.10 | 11.333
                          5. 88 | 17. 417
                                           1.40 l
                                                  23.50
                                                            0.80
5.333
         1.13 | 11.417
                          5.88 | 17.500
                                           1.40
                                                  23.58
                                                            0.79
         1. 13 | 11. 500
                          5. 88 | 17. 583
5. 417
                                           1.36
                                                  23.67
                                                            0.79
                          7. 48 | 17. 667
5.500
         1.13 | 11.583
                                           1.36
                                                 23.75
                                                            0.79
5.583
         1.17 | 11.667
                          7.48 | 17.750
                                           1. 36 | 23. 83
                                                            0.78
5.667
         1. 17 | 11. 750
                          7. 48 | 17. 833
                                          1. 32 | 23. 92
                                                            0.78
```

```
5. 750 1. 17 | 11. 833 30. 50 | 17. 917
                                                   1.32 | 24.00
                                                                    0.78
                      1. 20 | 11. 917 | 30. 51 | 18. 000
               5.833
                                                    1. 32 | 24. 08
                                                                    0.77
               5. 917
                      1.20 | 12.000
                                     30. 51 | 18. 083
                                                     1. 28 | 24. 17
                                                                    0.77
                     1. 20 | 12. 083 | 75. 28 | 18. 167
               6.000
                                                     1. 28 | 24. 25
                                                                    0.77
              6.083
                      1. 23 | 12. 167 | 75. 29 | 18. 250
                                                     1.28
    Max. Eff. Inten. (mm/hr)=
                               75. 29
                                           34.25
              over (min)
                               5.00
                                           15.00
     Storage Coeff. (min)=
                               3.67 (ii) 14.50 (ii)
     Unit Hyd. Tpeak (min)=
                               5.00
                                           15.00
    Unit Hyd. peak (cms)=
                               0.25
                                           0.08
                                                       *TOTALS*
     PEAK FLOW
                               0.25
                                           0.10
                                                        0.336 (iii)
                   (cms)=
     TIME TO PEAK
                                                        12.25
                  (hrs)=
                               12. 25
                                           12.33
     RUNOFF VOLUME
                   (mm) =
                               68.60
                                           21.45
                                                        37.95
    TOTAL RAINFALL (mm)=
                               69.60
                                           69.60
                                                         69.60
     RUNOFF COEFFICIENT =
                                                         0.55
                               0.99
                                           0.31
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN^* = 59.0 Ia = Dep. Storage (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
| ADD HYD ( 0041)|
1 + 2 = 3
                           AREA
                                 QPEAK
                                          TPEAK
                                                    R. V.
                                 (cms)
                                          (hrs)
-----
                           (ha)
                                                    (mm)
     ID1= 1 ( 0033):
                           0. 41 0. 025
                                          12.33
                                                  24.57
    + ID2= 2 ( 0036):
                           5. 32 0. 296
                                         12.42
                                                  37.95
      ______
      ID = 3 (0041):
                           5. 73 0. 318
                                       12. 42
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0041)|
3 + 2 = 1
                           AREA
                                  QPEAK
                                           TPEAK
                                                    R. V.
                           (ha)
                                  (cms)
                                           (hrs)
                                                    (mm)
```

ID1 = 3 (0041):

+ ID2= 2 (0037):

ID = 1 (0041):

5.73

2.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

7. 78 0. 420

0.318

0.109

12.42

12. 33

12.42

36.99

23.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB | | NASHYD (0039) | Area (ha)= 0.83 Curve Number (CN)= 75.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.19

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME	D HYETOGR	APH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	i' hrs	mm/hr	j hrs	mm/hr
0.083	0.00	6. 167	1. 23	12. 250	75. 29	18. 33	1. 23
0. 167	0.00	6.250	1. 23	12. 333	11. 93	18. 42	1. 23
0.250	0.00	6.333	1. 27	12. 417	11. 93	18.50	1. 23
0.333	0.71	6.417	1. 27	12. 500	11. 93	18. 58	1. 19
0.417	0.71	6.500	1. 27	12. 583	8. 12	18. 67	1. 19
0.500	0.71	6.583	1. 30	12. 667	8. 12	18. 75	1. 19
0. 583	0.72	6.667	1. 30	12. 750	8. 12	18.83	1. 14
0.667	0.72	6.750	1. 30	12.833	5. 59	18. 92	1. 14
0.750	0.72	6.833		12. 917		19. 00	1. 14
0.833	0.74	6. 917		13.000	5. 58	19. 08	1. 10
0. 917	0.74	7.000	1. 34	13. 083	4.72	19. 17	1. 10
1.000	0.74	7.083	1. 37	13. 167		19. 25	1. 10
1. 083	0.76	7. 167		13. 250	4.72	19. 33	1. 06
1. 167	0.76	7. 250	1. 37	13. 333	3. 99	19. 42	1.06
1. 250	0.76	7.333	1. 41	13. 417	3. 99	19. 50	1.06
1. 333	0.78	7.417		13. 500		19. 58	1. 01
1. 417	0.78	7.500		13. 583	3. 52	19. 67	1. 01
1.500	0.78	7.583	1.44	13. 667	3. 52	19. 75	1. 01
1. 583	0.79	7.667		13. 750	3. 52	19.83	0. 97
1. 667	0. 79	7.750		13. 833	3. 09	19. 92	0. 97
1. 750	0.79	7.833	1. 48	13. 917	3. 09	20.00	0. 97
1.833	0.81	7.917	1. 48	14.000	3. 09	20. 08	0. 93
1. 917	0.81	8.000		14. 083	2. 76	20. 17	0. 93
2.000	0.81	8.083		14. 167	2. 76	20. 25	0. 93
2.083	0.83	8. 167	1. 51	14. 250	2. 76	20. 33	0. 90
2. 167	0.83	8.250		14. 333	2. 51	20. 42	0. 90
2. 250	0.83	8.333		14. 417	2.51	20.50	0. 90
2. 333	0.84	8.417		14. 500	2.51	20. 58	0.89
2. 417	0.84	8.500	1. 62	14. 583	2. 40	20. 67	0.89

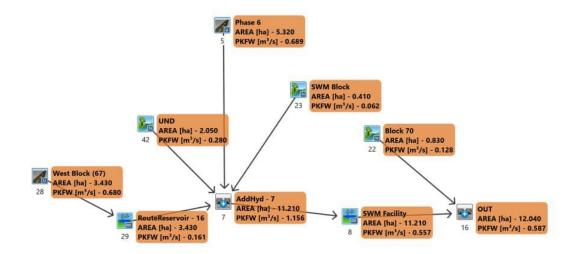
2. 500 2. 583 2. 667 2. 750 2. 833 2. 917 3. 000 3. 083	0. 84 0. 86 0. 86 0. 86 0. 88 0. 88 0. 88 0. 90	8.583 8.667 8.750 8.833 8.917 9.000 9.083 9.167	1. 79 1. 79 1. 79 1. 97 1. 97 1. 97 2. 14 2. 14	14. 667 14. 750 14. 833 14. 917 15. 000 15. 083 15. 167 15. 250	2. 40 2. 40 2. 27 2. 27 2. 27 2. 15 2. 15 2. 15	20. 75 20. 83 20. 92 21. 00 21. 08 21. 17 21. 25 21. 33	0. 89 0. 88 0. 88 0. 87 0. 87 0. 87 0. 87
3. 167	0. 90	9. 250	2. 14	15. 333	2. 03	21. 42	0. 87
3. 250	0. 90	9. 333	2. 23	15. 417	2. 03	21. 50	0. 87
3. 333	0. 91	9. 417	2. 23	15. 500	2. 03	21. 58	0. 86
3. 417	0. 91	9.500	2. 23	15. 583	1. 91	21. 67	0. 86
3. 500	0. 91	9.583	2. 23	15. 667	1. 91	21. 75	0. 86
3. 583	0. 93	9.667	2. 23	15. 750	1. 91	21. 83	0. 85
3. 667	0. 93	9.750	2. 23	15. 833	1. 78	21. 92	0. 85
3. 750	0. 93		2. 37	15. 917	1. 78	22. 00	0. 85
3. 833	0. 95	9.917	2. 37	16. 000	1. 78	22. 08	0. 84
3. 917	0. 95	10.000	2. 37	16. 083	1. 66	22. 17	0. 84
4. 000	0. 95	10.083	2. 64	16. 167	1. 66	22. 25	0. 84
4. 083	0. 96	10. 167	2. 64	16. 250	1. 66	22. 33	0. 83
4. 167	0. 96	10. 250	2. 64	16. 333	1. 58	22. 42	0. 83
4. 250	0. 96	110. 333	3. 00	16. 417	1. 58	22. 50	0. 83
4. 333	0. 99	10.417	3. 00	16. 500	1. 58	22. 58	0. 82
4. 417	0. 99	10.500	3. 00	16. 583	1. 54	22. 67	0. 82
4. 500	0. 99	10.583	3. 40	16. 667	1. 54	22. 75	0. 82
4. 583	1. 03	10.667	3. 40	16. 750	1. 54	22. 83	0. 81
4. 667	1. 03	10.750	3. 40	16. 833	1. 49	22. 92	0. 81
4. 750	1. 03	10.833	3. 98	16. 917	1. 49	23.00	0. 81
4. 833	1. 06	10.917	3. 98	17. 000	1. 49	23.08	0. 80
4. 917	1. 06	11.000	3. 98	17. 083	1. 45	23.17	0. 80
5. 000	1.06	11.083	4. 65	17. 167	1. 45	23. 25	0. 80
5. 083	1.10	11.167	4. 65	17. 250	1. 45	23. 33	0. 80
5. 167	1. 10	11.250	4. 65	17. 333	1. 40	23. 42	0. 80
5. 250	1. 10	11.333	5. 88	17. 417	1. 40	23. 50	0. 80
5. 333	1. 13	11.417	5. 88	17. 500	1. 40	23. 58	0. 79
5. 417	1. 13	11.500	5. 88	17. 583	1. 36	23.67	0. 79
5. 500	1. 13	11.583	7. 48	17. 667	1. 36	23.75	0. 79
5. 583	1. 17	11.667	7. 48	17. 750	1. 36	23.83	0. 78
5. 667	1. 17	11.750	7. 48	17. 833	1. 32	23. 92	0. 78
5. 750	1. 17	11.833	30. 50	17. 917	1. 32	24. 00	0. 78
5. 833	1. 20	11.917	30. 51	18. 000	1. 32	24. 08	0. 77
5. 833 5. 917 6. 000 6. 083	1. 20 1. 20 1. 20 1. 23	11.917 12.000 12.083 12.167	30. 51 30. 51 75. 28 75. 29	18.000 18.083 18.167 18.250	1. 28 1. 28 1. 28 1. 28	24. 08 24. 17 24. 25	0. 77 0. 77 0. 77

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms)= 0.051 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 24.565
TOTAL RAINFALL (mm)= 69.600
RUNOFF COEFFICIENT = 0.353

ADD HYD (0032)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0039):	0.83	0.051	12. 33	24.56
+ ID2= 2 (0041):	11. 21	0.680	12. 25	34.75
===========				
ID = 3 (0032):	12.04	0.729	12. 25	34.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.



NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN I' TIME RAIN | TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0.083 2.45 1.083 13.68 2.083 5.08 3.08 2.85 0.167 2.45 1.167 13. 68 İ 2. 167 5.08 3.17 2.85 0.250 2.76 1.250 71.35 2. 250 4.44 3.25 2.67 0.333 2.76 1.333 71.35 2. 333 4.44 3.33 2.67 0.417 3.17 1.417 17.30 2. 417 3.96 3.42 2.52 0.500 3.17 1.500 17.30 2.500 3.96 3.50 2.52 0.583 3.78 1.583 10.08 l 2. 583 3.59 3.58 2.39 0.667 3.78 1.667 10.08 2.667 3.59 3.67 2.39 0.750 4.76 1.750 7.43 2.750 3.30 3.75 2.27 0.833 1.833 7. 43 | 2. 833 3.30 2.27 4.76 3.83 0.917 1.917 5. 99 | 2. 917 3.05 3.92 6.70 l 2. 16 6.70 | 2.000 1.000 5. 99 | 3. 000 3.05 | 4.00 2. 16

Unit Hyd Opeak (cms) = 0.167

PEAK FLOW (cms) = 0.007 (i)
TIME TO PEAK (hrs) = 1.583
RUNOFF VOLUME (mm) = 4.266
TOTAL RAINFALL (mm) = 31.287
RUNOFF COEFFICIENT = 0.136

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN mm/hr | hrs hrs mm/hr hrs mm/hr | hrs mm/hr 0.083 2.45 | 1.083 13.68 | 2.083 5.08 | 3.08 2.85

0. 167 2. 45 | 1. 167 13. 68 | 2. 167 5.08 | 3.17 0.250 2. 76 | 1. 250 71. 35 | 2. 250 4.44 3.25 0.333 2. 76 | 1. 333 | 71. 35 | 2. 333 4.44 3.33 2.67 0.417 3. 17 | 1. 417 17. 30 | 2. 417 3.96 İ 3.42 2.52 17. 30 | 2. 500 0.500 3.17 | 1.500 3. 96 | 3. 50 2.52 10.08 | 2.583 0.583 3.78 | 1.583 3.59 İ 3.58 2.39 10.08 | 2.667 0.667 3.78 | 1.667 3.59 3.67 2.39 0.750 4.76 | 1.750 7. 43 | 2. 750 3. 30 i 3. 75 2.27 0.833 4.76 | 1.833 7. 43 | 2. 833 3. 30 | 3. 83 2. 27 0.917 6.70 | 1.917 5. 99 | 2. 917 3.05 | 3.92 2.16 1.000 6.70 | 2.000 5. 99 | 3. 000 3.05 | 4.00 2. 16

Unit Hyd Opeak (cms) = 0.078

PEAK FLOW (cms) = 0.004 (i)
TIME TO PEAK (hrs) = 1.583
RUNOFF VOLUME (mm) = 4.268
TOTAL RAINFALL (mm) = 31.287
RUNOFF COEFFICIENT = 0.136

TIME

0.083

0.167

0.250

0.333

0.417

0.500

0.583

0.667

0.750

0.833

0.917

hrs

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

		I MPERVI OUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm) =	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188. 33	40.00
Mannings n	=	0. 130	0. 250

4.76 | 1.833

6.70 | 1.917

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----RAIN | TIME RAIN | TIME RAIN | TIME mm/hr hrs mm/hr | hrs mm/hr | hrs mm/hr 2.45 1.083 13.68 | 2.083 5.08 3.08 2.85 2.45 | 1.167 13.68 | 2.167 5.08 2.85 2.76 | 1.250 71. 35 | 2. 250 4.44 3.25 2.76 | 1.333 4.44 İ 71. 35 | 2. 333 3.33 2.67 3. 17 | 1. 417 17. 30 | 2. 417 3.96 i 3.42 2.52 3. 17 | 1. 500 | 17. 30 | 2. 500 3.96 i 3.50 2.52 3.78 | 1.583 10.08 | 2.583 3.59 İ 3.58 2.39 3.78 | 1.667 10.08 | 2.667 3.59 3.67 2.39 7. 43 | 2. 750 4.76 | 1.750 3.30 | 3.75 2. 27

3.30

3.83

3.05 | 3.92

2. 27

2.16

7. 43 | 2. 833

5. 99 | 2. 917

1.00	6. 70	2.000	5. 99 3. 000	3.05 4.00	2. 16
Max. Eff. Inten. (mm/hr)=	44. 33	5.85		
over	(mi n)	20.00	50.00		
Storage Coeff.	(mi n)=	20. 59	(ii) 47.63 (ii)	1	
Unit Hyd. Tpeak	(mi n)=	20.00	50.00		
Unit Hyd. peak	(cms)=	0.06	0.02		
				TOTALS	
PEAK FLOW	(cms)=	0. 15	0.02	0.153 (iii)	
TIME TO PEAK	(hrs)=	1. 58	2. 25	1.58	
RUNOFF VOLUME	(mm) =	30. 29	4. 61	13.59	
TOTAL RAINFALL	(mm) =	31. 29	31. 29	31. 29	
RUNOFF COEFFICI	ENT =	0. 97	0. 15	0.43	

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0028) ID= 1 DT= 5.0 min	Area Total	(')	3. 43 50. 00	Dir.	Conn. (%)=	35. 00	
		IMPERVIO	US	PERVI OL	JS (i)		
Surface Area	(ha)=	1. 71		1.7	1		
Dep. Storage	(mm) =	1.00		5.00)		
Average SI ope	(%)=	1.00		2.00)		
Length	(m) =	151. 22		40.00)		
Manni ngs n	=	0. 013		0. 250)		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH								
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN	
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr	
0.083	2.45	1.083	13.68	2.083	5.08	3.08	2.85	
0.167	2.45	1.167	13.68	2. 167	5.08	3. 17	2.85	
0.250	2.76	1.250	71. 35	2. 250	4.44	3. 25	2.67	
0.333	2.76	1.333	71. 35	2. 333	4.44	3. 33	2.67	
0.417	3.17	1.417	17.30	2. 417	3.96	3.42	2. 52	
0.500	3.17	1.500	17.30	2.500	3. 96	3.50	2. 52	
0.583	3.78	1.583	10.08	2. 583	3.59	3.58	2.39	
0.667	3.78	1.667	10.08	2. 667	3.59	3.67	2.39	
0.750	4.76	1.750	7.43	2. 750	3.30	3.75	2. 27	
0.833	4.76	1.833	7.43	2.833	3.30	3.83	2. 27	
0. 917	6.70	1.917	5.99	2. 917	3.05	3. 92	2. 16	
1.000	6.70	2.000	5. 99	3.000	3.05	4.00	2. 16	

Max. Eff. Inten. (r	mm/hr)=	71. 35	6.44		
over	(mi n)	5.00	25.00		
Storage Coeff.	(mi n)=	3. 75	(ii) 24.89	(ii)	
Unit Hyd. Tpeak	(mi n)=	5.00	25.00		
Unit Hyd. peak	(cms)=	0. 25	0.05		
• •				*TOTALS	*
PEAK FLOW	(cms)=	0. 22	0.02	0. 228	(iii)
TIME TO PEAK	(hrs)=	1. 33	1. 67	1.33	
RUNOFF VOLUME	(mm) =	30. 29	4. 61	13.60	
TOTAL RAINFALL	(mm) =	31. 29	31. 29	31. 29	
RUNOFF COEFFICIE	ENT =	0. 97	0. 15	0.43	

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 | Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029)	OVERFLOW I	S OFF			
IN= 2> OUT= 1					
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE	
	(cms)	(ha.m.)	(cms)	(ha.m.)	
	0.0000	0.0000	0. 2200	0. 1300	
	0. 1100	0. 0700	0.0000	0.0000	
	ARE	A QPEAK	TPEAK	R. V.	
	(ha) (cms)	(hrs)	(mm)	
INFLOW: ID= 2 (O	028) 3.4	30 0. 2	28 1. 33	13. 60	
OUTFLOW: ID= 1 (0	029) 3.4	30 0.0	35 2.00	13. 55	

PEAK FLOW REDUCTION [Qout/Qin](%) = 15.40
TIME SHIFT OF PEAK FLOW (min) = 40.00
MAXIMUM STORAGE USED (ha.m.) = 0.0224

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ---TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr | hrs mm/hr | hrs mm/hr

```
0.167
                   2.45 | 1.167
                                 13.68 | 2.167
                                               5.08
                                                      3.17
                                                             2.85
             0.250
                   2.76
                          1.250
                                 71. 35 | 2. 250
                                               4.44
                                                      3.25
                                                             2.67
             0.333
                          1.333
                                 71. 35 | 2. 333
                                               4.44
                                                      3.33
                   2.76
                                                             2.67
             0.417
                   3. 17 | 1. 417
                                 17. 30 | 2. 417
                                               3.96
                                                      3.42
                                                             2.52
             0.500
                   3. 17 | 1. 500
                                 17. 30 | 2. 500
                                               3.96
                                                      3.50
                                                             2.52
             0.583
                   3.78
                          1.583
                                 10.08 | 2.583
                                               3.59
                                                      3.58
                                                             2.39
             0.667
                   3.78 | 1.667
                                 10.08 | 2.667
                                               3.59
                                                      3.67
                                                            2.39
             0.750
                   4.76 | 1.750
                                 7. 43 | 2. 750
                                               3.30
                                                     3.75
                                                            2. 27
             0.833
                   4.76
                          1.833
                                 7. 43 | 2. 833
                                               3.30
                                                     3.83
                                                            2. 27
             0.917
                    6.70
                          1.917
                                 5. 99 | 2. 917
                                               3.05 j
                                                     3.92
                                                            2. 16
             1.000
                   6.70 | 2.000
                                 5. 99 | 3. 000
                                               3.05 | 4.00
                                                            2.16
   Unit Hyd Qpeak (cms) = 0.356
    PEAK FLOW
                 (cms) = 0.015 (i)
    TIME TO PEAK
                 (hrs) = 1.667
                 (mm) = 3.927
    RUNOFF VOLUME
    TOTAL RAINFALL (mm) = 31.287
    RUNOFF COEFFICIENT = 0.126
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
ADD HYD ( 0007)|
 1 + 2 = 3
                        AREA
                              QPEAK
                                      TPEAK
                                              R. V.
                              (cms)
                                      (hrs)
_____
                        (ha)
                                              (mm)
     ID1= 1 ( 0023):
                       0.41 0.004
                                      1.58
                                             4.27
    + ID2= 2 ( 0029):
                             0.035
                                      2.00
                                            13.55
                       3.43
      _____
                                     -----
      ID = 3 (0007):
                       3. 84 0. 038
                                      1.83
                                           12.56
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
| ADD HYD ( 0007)|
 3 + 2 = 1
                        AREA
                              QPEAK
                                      TPEAK
                                              R. V.
-----
                        (ha)
                              (cms)
                                      (hrs)
                                              (mm)
     ID1 = 3 (0007):
                       3.84
                             0.038
                                            12.56
                                      1.83
    + ID2= 2 ( 0042):
                             0.015
                                             3.93
      ID = 1 (0007):
                       5. 89 0. 052
                                      1.67
                                             9.55
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
_____
ADD HYD ( 0007)|
 1 + 2 = 3
                        AREA
                              QPEAK
                                      TPEAK
                                              R. V.
```

2. 45 | 1. 083 | 13. 68 | 2. 083

5.08 | 3.08

2.85

0.083

I D1= 1 (0007) + I D2= 2 (0005)	: 5.89 : 5.32	0. 153	1. 58	(mm) 9.55 13.59	
ID = 3 (0007)					
NOTE: PEAK FLOWS					
RESERVOIR(0008) IN= 2> OUT= 1	OVERFLOW I	IS OFF			
DT= 2	OUTFLOW (cms) 0. 0000 0. 0410 0. 0580 0. 0710 0. 0830 0. 0920 0. 1010 0. 2130 0. 2860	(ha.m.) 0.0000 0.0120 0.0253 0.0399 0.0559 0.0732 0.0918 0.1116	(Cn 0.3 0.5 0.6 0.7 0.8 0.8	ns) 3390 8840 5390 6480 7320 8050 8710	STORAGE (ha. m.) 0. 1535 0. 1758 0. 1989 0. 2228 0. 2476 0. 2733 0. 2998 0. 3263 0. 3528
TIME	(ha 07) 11.2 08) 11.2	a) (cr 210 (210 (EDUCTION EAK FLOW	[Qout/Qin] (n	nrs) 1.58 3.00 (%)=36 nin)=85	. 49 . 00
ADD HYD (0016) 1 + 2 = 3 ID1= 1 (0022) + ID2= 2 (0008)	AREA (ha) : 0.83	QPEAK (cms) 0.007 0.075	TPEAK (hrs) 1.58 3.00	R. V. (mm) 4. 27 11. 47	
ID = 3 (0016)				======	
NOTE: PEAK FLOWS					
**************************************		*******			
** SIMULATION: 1-005yr 4	hr 10min Chi	cago **			
CALIB	Area (ha))= 0.83	Curve N	lumber	(CN)= 75.0

(mm) = 10.00 # of Linear Res. (N) = 3.00

| ID= 1 DT= 5.0 min |

Ιa

----- U. H. Tp(hrs)= 0.19

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME) HYETOGRA	APH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.23	1.083	18.09	2. 083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2. 167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2. 250	5.86	3. 25	3.52
0.333	3.63	1.333	94.66	2. 333	5.86	3.33	3. 52
0.417	4.18	1.417	22.88	2. 417	5. 23	3.42	3. 32
0.500	4.18	1.500	22.88	2.500	5. 23	3.50	3. 32
0.583	4.98	1.583	13. 31	2. 583	4.74	3.58	3. 14
0.667	4.98	1.667	13. 31	2. 667	4.74	3.67	3. 14
0.750	6.28	1.750	9.80	2. 750	4.35	3.75	2. 99
0.833	6.28	1.833	9.80	2. 833	4.35	3.83	2. 99
0.917	8.85	1.917	7. 91	2. 917	4.02	3. 92	2.85
1.000	8.85	2.000	7. 91	3.000	4.02	4.00	2.85

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 8.466
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.205

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Area	(ha)=	0.41	Curve Number (CN)= 75.0
Ιa	(mm) =	10.00	# of Linear Res. (N) = 3.00
U. H.	Tp(hrs)=	0. 20	
	Ιa	la (mm)=	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME	D HYETOGRA	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3. 23	1.083	18.09	2.083	6.70	3.08	3.75
0. 167	3. 23	1.167	18.09	2. 167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2. 250	5.86	3. 25	3.52
0.333	3.63	1.333	94.66	2. 333	5.86	3.33	3.52
0.417	4. 18	1.417	22.88	2. 417	5. 23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5. 23	3.50	3.32
0.583	4. 98	1.583	13. 31	2. 583	4.74	3.58	3.14
0.667	4. 98	1.667	13. 31	2. 667	4.74	3.67	3. 14

0 750		0 00 1 0 750			
0. 750	6. 28 1. 750	9.80 2.750	4.35	3.75	2. 99
0.833	6. 28 1. 833	9. 80 2. 833	4.35	3.83	2. 99
0. 917	8.85 1.917	7. 91 2. 917	4.02	3.92	2.85
1.000	8.85 2.000	7. 91 3. 000	4. 02	4.00	2.85

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms) = 0.008 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 8.469
TOTAL RAINFALL (mm) = 41.381
RUNOFF COEFFICIENT = 0.205

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area Total	(ha)= 5.32 Imp(%)= 50.00	Dir. Conn.(%)=	35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	2. 66	2.66	
Dep. Storage	(mm) =	1.00	5.00	
Average SI ope	(%)=	1.00	1.00	
Length	(m)=	188. 33	40.00	
Mannings n	=	0. 130	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0. 167	3.23	1.167	18.09	2. 167	6.70	3. 17	3.75
0.250	3.63	1.250	94.66	2. 250	5.86	3. 25	3. 52
0.333	3.63	1.333	94.66	2. 333	5.86	3.33	3. 52
0.417	4.18	1.417	22.88	2. 417	5. 23	3.42	3. 32
0.500	4.18	1.500	22.88	2.500	5. 23	3.50	3. 32
0.583	4.98	1.583	13. 31	2. 583	4.74	3.58	3. 14
0.667	4.98	1.667	13. 31	2. 667	4.74	3.67	3. 14
0.750	6.28	1.750	9.80	2. 750	4.35	3.75	2. 99
0.833	6.28	1.833	9.80	2. 833	4.35	3.83	2. 99
0. 917	8.85	1.917	7. 91	2. 917	4.02	3.92	2.85
1.000	8.85	2.000	7. 91	3.000	4.02	4.00	2.85

				TOTALS
PEAK FLOW	(cms)=	0. 21	0.04	0.223 (iii)
TIME TO PEAK	(hrs)=	1. 58	2.00	1.58
RUNOFF VOLUME	(mm) =	40. 38	8. 13	19. 41
TOTAL RAINFALL	(mm) =	41. 38	41.38	41.38
RUNOFF COEFFICI	ENT =	0. 98	0. 20	0.47

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Mannings n

CALIB STANDHYD (0028) Area (ha)= 3.43 | ID= 1 DT= 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 I MPERVI OUS PERVIOUS (i) Surface Area (ha)= 1.71 1.71 Dep. Storage (mm) =1.00 5.00 Average Slope (%)= 1.00 2.00 Length (m) =151. 22 40.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

0.013

	TD/	NSEODME	D HALLUCE	\ DH		
RAIN	TIME		l' TIME	RAIN	I TIME	RAIN
mm/hr	hrs	mm/hr	i' hrs	mm/hr	hrs	mm/hr
3. 23	1.083	18.09	2. 083	6.70	3.08	3. 75
3.23	1.167	18.09	2. 167	6.70	3. 17	3.75
3.63	1.250	94.66	2. 250	5. 86	3. 25	3.52
3.63	1.333	94.66	2. 333	5. 86	3. 33	3.52
4.18	1.417	22.88	2. 417	5. 23	3.42	3. 32
4.18	1.500	22.88	2.500	5. 23	3.50	3.32
4.98	1.583	13. 31	2. 583	4.74	3. 58	3.14
4.98	1.667	13. 31	2. 667	4.74	3. 67	3.14
6.28	1.750	9.80	2. 750	4. 35	3.75	2. 99
6. 28	1.833	9.80	2. 833	4. 35	3.83	2.99
8.85	1.917	7. 91	2. 917	4.02	3. 92	2.85
8.85	2.000	7. 91	3.000	4. 02	4.00	2.85
/hr)=	94.66		15. 30			
mi n)	5.00		20.00			
	mm/hr 3. 23 3. 23 3. 63 3. 63 4. 18 4. 18 4. 98 4. 98 6. 28 6. 28 8. 85 8. 85	RAIN TIME mm/hr hrs 3.23 1.083 3.23 1.167 3.63 1.250 3.63 1.333 4.18 1.417 4.18 1.500 4.98 1.583 4.98 1.667 6.28 1.750 6.28 1.833 8.85 1.917 8.85 2.000	RAIN TIME mm/hr hrs mm/hr hrs mm/hr 3.23 1.083 18.09 3.23 1.167 18.09 3.63 1.250 94.66 3.63 1.333 94.66 4.18 1.417 22.88 4.18 1.500 22.88 4.98 1.583 13.31 4.98 1.667 13.31 6.28 1.750 9.80 6.28 1.833 9.80 8.85 1.917 7.91 8.85 2.000 7.91	RAIN TIME RAIN TIME mm/hr hrs mm/hr hrs mm/hr hrs 3.23 1.083 18.09 2.083 3.23 1.167 18.09 2.167 3.63 1.250 94.66 2.250 3.63 1.333 94.66 2.250 3.63 1.333 94.66 2.333 4.18 1.417 22.88 2.417 4.18 1.500 22.88 2.500 4.98 1.583 13.31 2.583 4.98 1.567 13.31 2.667 6.28 1.750 9.80 2.750 6.28 1.833 9.80 2.833 8.85 1.917 7.91 2.917 8.85 2.000 7.91 3.000	mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs	RAIN TIME RAIN TIME mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs 3.23 1.083 18.09 2.083 6.70 3.08 3.23 1.167 18.09 2.167 6.70 3.17 3.63 1.250 94.66 2.250 5.86 3.25 3.63 1.333 94.66 2.250 5.86 3.25 3.63 1.333 94.66 2.333 5.86 3.33 4.18 1.417 22.88 2.417 5.23 3.42 4.18 1.500 22.88 2.500 5.23 3.50 4.98 1.583 13.31 2.583 4.74 3.58 4.98 1.583 13.31 2.583 4.74 3.58 4.98 1.667 13.31 2.667 4.74 3.67 6.28 1.750 9.80 2.750 4.35 3.75 6.28 1.833 9.80 2.833 4.35 3.83 8.85 1.917 7.91 2.917 4.02 3.92 8.85 2.000 7.91 3.000 4.02 4.00

0.250

Max. Eff. Inten. (mm/hr) = 94.66 15.30 over (min) 5.00 20.00 Storage Coeff. (min) 3.35 (ii) 18.30 (ii) Unit Hyd. Tpeak (min) = 5.00 20.00 Unit Hyd. peak (cms) = 0.26 0.06

TOTALS

PEAK FLOW	(cms)=	0.30	0.04	0.315 (iii)
TIME TO PEAK	(hrs)=	1. 33	1.58	1. 33
RUNOFF VOLUME	(mm) =	40. 38	8. 13	19. 41
TOTAL RAINFALL	(mm) =	41. 38	41. 38	41.38
RUNOFF COEFFICI	ENT =	0. 98	0. 20	0.47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0029) OVERFLOW IS OFF IN= 2---> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE -----(cms) (ha.m.) (cms) (ha.m.) 0.0000 0.0000 0. 2200 0.1300 0. 1100 0.0700 0.0000 0.0000 AREA QPEAK **TPEAK** R. V. (ha) (cms) (hrs) (mm) INFLOW: ID= 2 (0028) 3.430 0. 315 1. 33 19.41 OUTFLOW: ID= 1 (0029) 3.430 0.051 2.00 19.37

 PEAK
 FLOW
 REDUCTION
 [Qout/Qin] (%) = 16.14

 TIME
 SHIFT OF PEAK FLOW
 (min) = 40.00

 MAXIMUM
 STORAGE
 USED
 (ha.m.) = 0.0324

	TRA	ANSFORMEI	D HYETOGRA	\PH		
RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
3.23	1.083	18.09	2. 083	6.70	3.08	3. 75
3.23	1.167	18.09	2. 167	6.70	3. 17	3.75
3.63	1.250	94.66	2. 250	5.86	3. 25	3. 52
3.63	1.333	94.66	2. 333	5.86	3. 33	3. 52
4.18	1.417	22.88	2. 417	5. 23	3.42	3. 32
4.18	1.500	22.88	2.500	5. 23	3.50	3. 32
4.98	1.583	13. 31	2. 583	4.74	3.58	3. 14
	RAIN mm/hr 3.23 3.23 3.63 4.18 4.18	RAIN TIME mm/hr hrs 3.23 1.083 3.23 1.167 3.63 1.250 3.63 1.333 4.18 1.417 4.18 1.500	RAIN TIME RAIN mm/hr hrs mm/hr 3.23 1.083 18.09 3.23 1.167 18.09 3.63 1.250 94.66 3.63 1.333 94.66 4.18 1.417 22.88 4.18 1.500 22.88	RAIN TIME RAIN TIME mm/hr hrs mm/hr hrs 3.23 1.083 18.09 2.083	RAIN TIME RAIN TIME RAIN mm/hr hrs mm/hr hrs mm/hr 3. 23 1.083 18.09 2.083 6.70 3. 23 1.167 18.09 2.167 6.70 3. 63 1.250 94.66 2.250 5.86 3. 63 1.333 94.66 2.333 5.86 4.18 1.417 22.88 2.417 5.23 4.18 1.500 22.88 2.500 5.23	3.23 1.083 18.09 2.083 6.70 3.08 3.23 1.167 18.09 2.167 6.70 3.17 3.63 1.250 94.66 2.250 5.86 3.25 3.63 1.333 94.66 2.333 5.86 3.33 4.18 1.417 22.88 2.417 5.23 3.42 4.18 1.500 22.88 2.500 5.23 3.50

```
0. 750 6. 28 | 1. 750
                               9.80 | 2.750
                                            4.35 | 3.75
                                                        2.99
            0.833
                  6. 28 | 1. 833
                               9.80 | 2.833
                                            4. 35 | 3. 83
                                                        2.99
                               7. 91 | 2. 917
                                            4. 02 | 3. 92
            0.917
                  8.85 | 1.917
                                                        2.85
            1.000
                  8.85 | 2.000
                               7. 91 | 3. 000
                                            4.02 | 4.00
                                                         2.85
   Unit Hyd Qpeak (cms) = 0.356
   PEAK FLOW
                (cms) = 0.036 (i)
   TIME TO PEAK (hrs) = 1.583
   RUNOFF VOLUME (mm) = 7.847
   TOTAL RAINFALL (mm) = 41.381
   RUNOFF COEFFICIENT = 0.190
   (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
ADD HYD ( 0007)|
 1 + 2 = 3
                      AREA QPEAK
                                   TPEAK
                                           R. V.
                      (ha)
                           (cms)
                                   (hrs)
                                           (mm)
    ID1= 1 ( 0023):
                      0.41 0.008
                                   1.50
                                          8.47
    + ID2= 2 ( 0029):
                     3. 43 0. 051
                                   2.00 19.37
     _____
     ID = 3 (0007):
                      3.84 0.056
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
_____
| ADD HYD ( 0007)|
 3 + 2 = 1
                      AREA
                            QPEAK
                                   TPEAK
                                          R. V.
                      (ha)
                           (cms)
                                   (hrs)
                                          (mm)
    ID1= 3 ( 0007):
                      3.84 0.056
                                   1. 83 18. 20
    + ID2= 2 ( 0042):
                      2. 05 0. 036
                                   1.58
                                         7.85
     ______
                                  ______
     ID = 1 (0007):
                      5. 89 0. 090
                                   1.58 14.60
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0007)|
 1 + 2 = 3
                      AREA
                            QPEAK
                                           R. V.
                                   TPEAK
                      (ha)
                            (cms)
                                    (hrs)
                                          (mm)
     ID1= 1 ( 0007):
                      5. 89 0. 090
                                   1.58 14.60
                      5. 32 0. 223
                                   1.58 19.41
    + ID2= 2 ( 0005):
     _____
     ID = 3 (0007): 11.21 0.313
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

0.667 4.98 | 1.667 13.31 | 2.667

4.74 | 3.67

3.14

RESERVOIR(0008) IN= 2> OUT= 1	OVERFLOW	IS OFF		
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
	ò. 00ó0	0. 0000	Ò. 3390	0. 1535
	0. 0410	0. 0120	0. 3840	0. 1758
	0. 0580	0. 0253	0. 5390	0. 1989
	0. 0710	0. 0399	0. 6480	0. 2228
	0. 0830	0. 0559 0. 0732	0. 7320	0. 2476
			0.8050	0. 2733
	0. 1010	0. 0918 0. 1116	0. 8710	0. 2998
	0. 2130	0. 1116	0. 9320	0. 3263
	0. 2860	0. 1321	0. 9880	0. 3528
	AR	EA QPEAI	(TPEAK	R. V.
111510111 15 0 ((h	a) (cms)	(hrs)	(mm)
INFLOW: ID= 2 (0007) 11.	210 0. 3	313 1.58	16.88
OUTFLOW: ID= 1 (0008) 11	210 0.0	194 3.33	16. 88
D	EAK FLOW R	EDUCTION TO	out/Qin](%)= 3	20 0E
I M	IME SHIFT OF P AXIMUM STORAG	EAK FLOW	(ha m)-	0.0774
IVI	ANTINUM STURAG	L USLD	(IIa. III.) =	0.0774
ADD HYD (0016)				
1 + 2 = 3	AREA	QPEAK	TPEAK R. \	<i>I</i> .
<u> </u>	(ha)	(cms)	TPEAK R. V (hrs) (mr	n)
ID1= 1 (00.	22): 0.83	0. 017	1.50 8.47	<i>1</i>
+ ID2= 2 (00	08): 11.21	QPEAK (cms) 0.017 0.094	3. 33 16. 88	
ID = 3 (00)	16): 12.04	0. 098	3. 08 16. 30)
NOTE BEAU ELO	WO DO NOT INOL			
NOTE: PEAK FLO	WS DO NOT INCL	UDE BASEFLO	VS IF ANY.	
********	******	*****		
** SIMULATION: 1-010y	r Ahr 10min Ch	i cago **		
***********	***********	******		
CALIB				
NASHYD (0022)	Area (ha)= 0.83	Curve Number	(CN) = 75 0
ID= 1 DT= 5.0 min				
110- 1 01- 3.0 11111			" Si Eilicai i	()
	U.H. Ip(hrs)= (), 19		
	U.H. Tp(hrs)= 0.19		
NOTE: RAIN	U.H. IP(Nrs FALL WAS TRANS		5.0 MIN. TIME	E STEP.

---- TRANSFORMED HYETOGRAPH ---TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN

```
hrs mm/hr | hrs mm/hr | hrs mm/hr
 hrs mm/hr|
0.083
       3. 78 | 1. 083 | 21. 14 | 2. 083
                                      7.85 | 3.08
                                                     4.40
0.167
       3.78 | 1.167
                     21. 14 | 2. 167
                                      7.85
                                             3.17
                                                     4.40
0.250
       4. 26 | 1. 250 | 110. 25 | 2. 250
                                             3. 25
                                      6.86
                                                     4. 13
       4. 26 | 1. 333 | 110. 25 | 2. 333
0.333
                                      6.86
                                             3.33
                                                     4. 13
0.417
       4.90
              1.417
                     26. 74 | 2. 417
                                      6. 13
                                             3.42
                                                     3.89
0.500
       4.90
              1.500
                      26. 74 | 2. 500
                                      6. 13
                                             3.50
                                                     3.89
0.583
       5.83
              1.583
                      15. 57 | 2. 583
                                      5.55
                                             3.58
                                                     3.69
0.667
       5.83
              1.667
                      15. 57 | 2. 667
                                      5.55
                                             3.67
                                                     3.69
0.750
       7.35
              1.750
                      11. 47 | 2. 750
                                      5.09
                                             3.75
                                                     3.50
0.833
       7. 35 İ
              1.833
                      11. 47 | 2. 833
                                      5.09
                                             3.83
                                                     3.50
0. 917 10. 36
              1.917
                       9. 26 | 2. 917
                                      4.72
                                             3.92
                                                     3.34
1.000 10.36 | 2.000
                      9. 26 | 3. 000
                                      4.72 | 4.00
                                                     3.34
```

PEAK FLOW (cms) = 0.026 (i) TIME TO PEAK (hrs) = 1.500 RUNOFF VOLUME (mm) = 11.924 TOTAL RAINFALL (mm) = 48.343 RUNOFF COEFFICIENT = 0.247

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN mm/hr | hrs hrs mm/hr hrs mm/hr | hrs mm/hr 7. 85 | 3. 08 0.083 3.78 | 1.083 21. 14 | 2. 083 4.40 0.167 3.78 | 1.167 21. 14 | 2. 167 7.85 3.17 4.40 0.250 4.26 1.250 110. 25 | 2. 250 6.86 3.25 4.13 0.333 4. 26 | 1. 333 110. 25 | 2. 333 6.86 3.33 4.13 0.417 4.90 1.417 26. 74 | 2. 417 3.42 6.13 3.89 0.500 4.90 | 1.500 26.74 | 2.500 6.13 3.50 3.89 5. 83 | 1. 583 0.583 15. 57 | 2. 583 5.55 5.55 0.667 5.83 1.667 15. 57 | 2. 667 3.67 3.69 0.750 7. 35 | 1. 750 11. 47 | 2. 750 5.09 3.75 3.50 0.833 7. 35 | 1. 833 11. 47 | 2. 833 5. 09 İ 3.83 3.50 0. 917 10. 36 | 1. 917 9. 26 | 2. 917 4.72 | 3.92 3.34 1.000 10.36 | 2.000 9. 26 | 3. 000 4.72 | 4.00 3.34

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms) = 0.012 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 11.928
TOTAL RAINFALL (mm) = 48.343
RUNOFF COEFFICIENT = 0.247

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area Total	(ha)= Imp(%)=	5. 32 50. 00	Dir. Conn.(%)=	35. 00
Surface Area Dep. Storage Average Slope Length Mannings n	(ha) = (mm) = (%) = (m) =	1 MPERVI 0 2. 66 1. 00 1. 00 188. 33 0. 130		PERVIOUS (i) 2.66 5.00 1.00 40.00 0.250	

		TR/	ANSFORME	D HYETOGRA	PH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083		1.083	21. 14	2. 083	7.85	3.08	4.40
0. 167		1.167	21. 14	2. 167	7.85	3. 17	4. 40
0. 250		1.250	110. 25	2. 250	6.86	3. 25	4. 13
0. 333		1.333	110. 25	2. 333	6.86	3. 33	4. 13
0. 417		1.417	26. 74	2. 417	6. 13	3. 42	3. 89
0.500		1.500	26. 74	2.500	6. 13	3.50	3. 89
0. 583		1.583	15. 57	2. 583	5. 55	3. 58	3. 69
0.667		1.667	15. 57	2. 667	5.55	3. 67	3. 69
0.750		1.750	11. 47	2. 750	5.09	3. 75	3. 50
0.833		1.833	11. 47	2.833	5.09	3.83	3.50
0. 917		1.917	9. 26	2. 917	4.72	3. 92	3. 34
1.000	10. 36	2.000	9. 26	3.000	4.72	4. 00	3. 34
Max. Eff. Inten. (m	m/hr)=	82. 41		18. 48			
	(mi n)	15.00		35.00			
Storage Coeff.	(mi n)=	16.07	(ii)	33.14 (ii)			
Uni t Hyd. Tpeak	(mi n)=	15.00		35.00			
Unit Hyd. peak	(cms)=	0.07		0.03			
						ALS*	
	(cms)=	0. 27		0.06		292 (iii))
	(hrs)=	1. 50		1.83		. 50	
RUNOFF VOLUME	(mm) =	47. 34		10. 98		3. 71	
TOTAL RAINFALL	(mm)=	48. 34		48. 34		3. 34	
RUNOFF COEFFICIE	NT =	0. 98		0. 23	C). 49	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 | Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
- THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0028) ID= 1 DT= 5.0 min	Area Total	(ha) = 3.4 Imp(%) = 50.0	3 0 Dir. Conn.(%)=	35. 00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1. 71	1. 71	
Dep. Storage	(mm) =	1.00	5.00	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	151. 22	40.00	
Mannings n	=	0. 013	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRA	ANSFORME	D HYETOGRA	PH	-	
RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
nm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
3.78	1.083	21. 14	2. 083	7.85	3.08	4.40
3.78	1.167	21. 14	2. 167	7.85	3. 17	4.40
4.26	1.250	110. 25	2. 250	6.86	3. 25	4. 13
4.26	1.333	110. 25	2. 333	6.86	3. 33	4. 13
4.90	1.417	26.74	2. 417	6. 13	3.42	3.89
4.90	1.500	26.74	2.500	6. 13	3.50	3.89
5.83	1.583	15. 57	2. 583	5. 55	3.58	3. 69
	1.667		2. 667			3. 69
	1.750					3.50
	1.833					3.50
						3.34
10.36	2.000	9. 26	3.000	4. 72	4. 00	3. 34
	440.05		04 07			
,						
5)=	0.27		0.06	****	TAL C*	
-)	0.27		0.04			
-						
=	0. 98		0. 23	(J. 4 9	
	RAIN mm/hr 3.78 3.78 4.26 4.26 4.90 5.83 5.83 7.35 10.36	RAIN TIME hrs 1.083 1.083 3.78 1.083 1.083 4.26 1.250 4.26 1.333 4.90 1.417 4.90 1.500 5.83 1.583 1.583 1.583 1.583 1.750 7.35 1.750 7.35 1.750 7.35 1.833 10.36 2.000 1.917 0.36 2.000 1.91 5.00 5.00 5.00 5.00 6.50	RAIN TIME RAIN mm/hr hrs mm/hr 3.78 1.083 21.14 4.26 1.250 110.25 4.26 1.333 110.25 4.90 1.417 26.74 4.90 1.500 26.74 4.90 1.500 26.74 4.90 1.500 26.74 4.90 1.503 15.57 5.83 1.667 15.57 7.35 1.750 11.47 7.35 1.833 11.47 0.36 1.917 9.26 0.36 2.000 9.26 0.36 0.27 0.27 0.36 0.27 0.36 0.27 0.36 0.27 0.36 0.27 0.36 0.27 0.36 0.27 0.36 0.27 0.36 0.27 0.36 0.36 0.27 0.36 0.36 0.27 0.27 0.2	RAIN TIME RAIN TIME hrs mm/hr hrs hrs mm/hr hrs 3.78 1.083 21.14 2.083 3.78 1.167 21.14 2.167 4.26 1.250 110.25 2.250 4.26 1.333 110.25 2.250 4.26 1.333 110.25 2.333 4.90 1.417 26.74 2.417 4.90 1.500 26.74 2.500 5.83 1.583 15.57 2.583 5.83 1.667 15.57 2.667 7.35 1.750 11.47 2.750 7.35 1.833 11.47 2.833 10.36 1.917 9.26 2.917 10.36 2.000 9.26 3.000 10.3 1.550 20.00 20.00 3.15 (ii) 16.31 (ii) 10.50 20.00 3.15 (ii) 16.31 (iii) 3.50 0.27 0.06 3.50 0.27 0.06 3.50 0.27 0.06 3.50 0.27 0.06 3.50 0.27 0.06 3.50 0.27 0.06 3.50 0.27 0.06 3.50 0.27 0.98 48.34 48.34 48.34	RAIN TIME	mm/hr hrs mm/hr 'hrs mm/hr hrs 3.78 1.083 21.14 2.083 7.85 3.08 3.78 1.167 21.14 2.167 7.85 3.17 4.26 1.250 110.25 2.250 6.86 3.25 4.26 1.333 110.25 2.333 6.86 3.33 4.90 1.417 26.74 2.417 6.13 3.42 4.90 1.500 26.74 2.500 6.13 3.50 5.83 1.583 15.57 2.583 5.55 3.58 5.83 1.583 15.57 2.583 5.55 3.67 7.35 1.750 11.47 2.750 5.09 3.75 7.35 1.833 11.47 2.833 5.09 3.83 0.36 1.917 9.26 2.917 4.72 3.92 0.36 2.000 9.26 3.000 4.72 4.00 10.25 21.07 0.36 2.000 9.26 3.15 (ii) 16.31 (ii) 0.16 3.15 (iii) 16.31 (iii) 0.16 3.15 3.33 1.58 1.33

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- $CN^* = 59.0$ Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029) IN= 2> 0UT= 1	OVERFLOW I	S OFF		
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
<u> </u>	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0. 2200	0. 1300
	0. 1100	0. 0700	0.0000	0.0000
INFLOW : ID= 2 (OC	ARE (ha 128) 3.4) (cms)	, ,	R. V. (mm) 23.71
OUTFLOW: ID= 1 (OC)29) 3.4	30 0.00	52 2.08	23. 66
9544			. (01 7 (0)	

Area	(ha)=	2.05	Curve Number (CN)= 73.0
Ιa	(mm) =	10.00	# of Linear Res. (N) = 3.00
U. H.	Tp(hrs)=	0.22	
	Ιa	la (mm)=	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGRA	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3.78	1.083	21. 14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2. 167	7.85	3. 17	4.40
0.250	4.26	1.250	110. 25	2. 250	6.86	3. 25	4. 13
0.333	4. 26	1.333	110. 25	2. 333	6.86	3. 33	4. 13
0.417	4.90	1.417	26.74	2. 417	6. 13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6. 13	3.50	3.89
0.583	5.83	1.583	15. 57	2. 583	5. 55	3.58	3.69
0.667	5.83	1.667	15. 57	2. 667	5. 55	3.67	3.69
0.750	7.35	1.750	11. 47	2. 750	5.09	3.75	3.50
0.833	7.35	1.833	11. 47	2.833	5.09	3.83	3.50
0. 917	10.36	1.917	9. 26	2. 917	4.72	3. 92	3.34
1.000	10.36	2.000	9. 26	3.000	4. 72	4. 00	3. 34

Unit Hyd Qpeak (cms) = 0.356

```
PEAK FLOW
               (cms) = 0.053 (i)
   TIME TO PEAK
              (hrs) = 1.583
   RUNOFF VOLUME
               (mm) = 11.099
   TOTAL RAINFALL (mm) = 48.343
   RUNOFF COEFFICIENT = 0.230
   (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
______
ADD HYD ( 0007)|
                     AREA QPEAK
 1 + 2 = 3
                                 TPEAK
                                        R. V.
                     (ha)
                          (cms)
                                 (hrs)
                                       (mm)
    ID1= 1 ( 0023):
                     0.41 0.012
                                 1.50
                                       11.93
    + ID2= 2 ( 0029):
                     3, 43 0, 062
                                 2.08 23.66
     ID = 3 (0007):
                   3. 84 0. 069
                                1.75 22.41
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
_____
ADD HYD ( 0007)|
 3 + 2 = 1
                     AREA
                          QPEAK
                                 TPEAK
                                         R. V.
-----
                     (ha)
                          (cms)
                                 (hrs)
                                         (mm)
    ID1 = 3 (0007):
                     3.84 0.069
                                 1.75
                                       22.41
    + ID2= 2 ( 0042):
                     2. 05 0. 053
                                 1.58
                                      11.10
     _____
     ID = 1 (0007):
                     5. 89 0. 121
                                1. 58 18. 47
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0007)|
 1 + 2 = 3
                     AREA
                                 TPEAK
                                         R. V.
                     (ha)
                          (cms)
                                  (hrs)
                                         (mm)
    ID1 = 1 (0007):
                     5. 89 0. 121
                                 1.58
                                      18.47
    + ID2= 2 ( 0005):
                     5. 32 0. 292
                                      23.71
     ID = 3 (0007):
                    11. 21 0. 408
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 RESERVOIR (0008)
                  OVERFLOW IS OFF
 IN= 2---> OUT= 1
DT= 5.0 min |
                  OUTFLOW
                          STORAGE
                                    OUTFLOW
                                            STORAGE
                   (cms)
                          (ha.m.)
                                    (cms)
                                            (ha.m.)
                  0.0000
                          0.0000
                                    0.3390
                                             0.1535
```

```
0.0410
                                0.0120
                                             0.3840
                                                        0.1758
                       0.0580
                                 0.0253
                                             0.5390
                                                        0.1989
                       0.0710
                                 0.0399
                                             0.6480
                                                        0.2228
                       0.0830
                                 0.0559
                                             0.7320
                                                        0.2476
                                 0.0732
                       0.0920
                                             0.8050
                                                        0.2733
                                                        0.2998
                       0. 1010
                                 0.0918
                                             0.8710
                       0. 2130
                                 0. 1116
                                             0. 9320
                                                        0.3263
                       0. 2860
                                 0. 1321
                                             0.9880
                                                        0.3528
                            AREA
                                    QPEAK
                                              TPFAK
                                                         R. V.
                             (ha)
                                     (cms)
                                              (hrs)
                                                         (mm)
  INFLOW: ID= 2 ( 0007)
                           11.210
                                      0. 408
                                               1. 50
                                                          20.96
  OUTFLOW: ID= 1 ( 0008)
                           11, 210
                                      0. 133
                                                2. 92
                                                          20.95
                 PEAK FLOW REDUCTION [Qout/Qin](%) = 32.64
                 TIME SHIFT OF PEAK FLOW
                                         (min) = 85.00
                MAXIMUM STORAGE USED
                                            (ha. m.) = 0.0975
| ADD HYD ( 0016)|
 1 + 2 = 3
                          AREA
                                QPEAK
                                         TPEAK
                          (ha)
                                 (cms)
                                         (hrs)
                                                  (mm)
     ID1= 1 ( 0022):
                                                11.92
                          0.83
                                0.026
                                         1.50
    + ID2= 2 ( 0008):
                                         2, 92 20, 95
                        11. 21
                                0.133
      ______
      ID = 3 (0016): 12.04 0.139
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
** SIMULATION: 1-025yr 4hr 10min Chicago **
***********
LCALIB
 NASHYD ( 0022)|
                         (ha)= 0.83
                                         Curve Number (CN) = 75.0
                    Area
                           (mm) = 10.00
                                         # of Linear Res. (N) = 3.00
|ID= 1 DT= 5.0 min | la
----- U. H. Tp(hrs)= 0.19
       NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                            ---- TRANSFORMED HYETOGRAPH ----
               TIME
                      RAIN | TIME
                                    RAIN | TIME
                                                   RAIN | TIME
                                                                   RAIN
                     mm/hr
                              hrs
                                   mm/hr | hrs
                                                   mm/hr | hrs
                                                                  mm/hr
              0.083
                      4.44 | 1.083
                                  24.80 | 2.083
                                                   9. 21 | 3. 08
                      4. 44 | 1. 167 | 24. 80 | 2. 167
                                                          3.17
              0.167
                                                   9. 21
                                                                  5.16
                      4. 99 | 1. 250 | 129. 30 | 2. 250
                                                   8.05 | 3.25
              0.250
                                                                  4.84
                      4. 99 | 1. 333 | 129. 30 | 2. 333
              0.333
                                                   8.05 | 3.33
                                                                  4.84
                      5. 75 | 1. 417 | 31. 36 | 2. 417
              0.417
                                                   7. 18 | 3. 42
                                                                  4.56
              0.500
                      5. 75 | 1. 500 | 31. 36 | 2. 500
                                                   7. 19 | 3. 50
                                                                  4.56
```

```
0. 583 6. 84 | 1. 583 18. 26 | 2. 583
                                    6.51 | 3.58
                                                   4.32
0.667 6.84 | 1.667 18.26 | 2.667
                                    6. 51 | 3. 67
                                                    4.32
0.750 8.62 | 1.750
                     13. 46 | 2. 750
                                    5. 97 | 3. 75
                                                    4. 11
0.833 8.62 1.833
                     13. 46 | 2. 833
                                    5. 97 | 3. 83
                                                   4. 11
0. 917 12. 15 | 1. 917
                     10. 86 | 2. 917
                                    5. 53 | 3. 92
                                                   3. 92
1.000 12.15 2.000
                     10. 86 | 3. 000
                                    5.53 | 4.00
                                                   3. 92
```

PEAK FLOW (cms) = 0.038 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 16.562
TOTAL RAINFALL (mm) = 56.700
RUNOFF COEFFICIENT = 0.292

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Aron	(ha)	0.41	Curve Number (CN)= 75.0
NASHTU (0023)	Al ea	(IIa)=	0.41	cui ve Nullibei (CN)= 75.0
ID= 1 DT= 5.0 min	Ιa	(mm) =	10.00	# of Linear Res. (N)= 3.00
	U.H.	Tp(hrs)=	0.20	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH							
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1.083	24.80	2.083	9. 21	3.08	5. 16
0. 167	4.44	1.167	24.80	2. 167	9. 21	3.17	5. 16
0.250	4.99	1.250	129.30	2. 250	8.05	3. 25	4.84
0.333	4.99	1.333	129.30	2. 333	8. 05	3.33	4.84
0.417	5.75	1.417	31. 36	2. 417	7. 18	3.42	4.56
0.500	5.75	1.500	31. 36	2.500	7. 19	3.50	4.56
0.583	6.84	1.583	18. 26	2. 583	6. 51	3.58	4.32
0.667	6.84	1.667	18. 26	2. 667	6. 51	3.67	4. 32
0.750	8.62	1.750	13.46	2. 750	5. 97	3.75	4. 11
0.833	8.62	1.833	13.46	2.833	5. 97	3.83	4. 11
0.917	12.15	1.917	10.86	2. 917	5. 53	3.92	3. 92
1.000	12. 15	2.000	10.86	3.000	5. 53	4.00	3. 92

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms) = 0.018 (i) TIME TO PEAK (hrs) = 1.500 RUNOFF VOLUME (mm) = 16.569 TOTAL RAI NFALL (mm) = 56.700 RUNOFF COEFFICIENT = 0.292

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

OALLD				
CALIB STANDHYD (0005)	Area	(ha)= 5.32		
ID= 1 DT= 5.0 min		,	Dir. Conn.(%)=	35. 00
1				
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.66	2.66	
Dep. Storage	(mm) =	1.00	5.00	
Average Slope	(%)=	1.00	1.00	
Length	(m)=	188. 33	40.00	
Mannings n	=	0. 130	0. 250	

	TR	ANSFORME	D HYETOGRAI	PH		
TIME RA	AIN TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs mm.	/hr hrs	mm/hr	i' hrs	mm/hr	hrs	mm/hr
0.083 4	. 44 1. 083	24.80	2. 083	9. 21	3.08	5. 16
0. 167 4	. 44 1. 167	24.80	2. 167	9. 21	3. 17	5. 16
	. 99 1. 250	129. 30	2. 250	8.05	3. 25	4.84
	. 99 1. 333	129. 30	2. 333	8.05	3. 33	4.84
	. 75 1. 417	31. 36	2. 417	7. 18	3. 42	4. 56
	. 75 1. 500	31. 36	2.500	7. 19	3.50	4. 56
	. 84 1. 583	18. 26	2. 583	6.51	3. 58	4. 32
	. 84 1. 667	18. 26	2. 667	6. 51	3. 67	4. 32
	. 62 1. 750	13. 46	2. 750	5. 97	3. 75	4. 11
	. 62 1. 833	13. 46	2.833	5. 97	3. 83	4. 11
	. 15 1. 917	10. 86	2. 917	5.53	3. 92	3. 92
1.000 12	. 15 2. 000	10. 86	3.000	5.53	4.00	3. 92
Max. Eff. Inten. (mm/hr):	= 96.65		28. 99			
over (min)			30.00			
Storage Coeff. (min)		(ii)	29. 33 (ii)			
Unit Hyd. Tpeak (min)			30.00			
Unit Hyd. peak (cms)			0.04			
on thyu. peak (clis)	- 0.07		0.04	*T0T/	ΔΙ ς*	
PEAK FLOW (cms):	= 0.32		0. 09		368 (iii)	
TIME TO PEAK (hrs):			1. 75		. 50	
RUNOFF VOLUME (mm):			14. 81		. 12	
TOTAL RAINFALL (mm)			56. 70		. 70	
	= 0. 98		0. 26		. 70 . 51	
MONOTT GOLFFFORENT	0.70		0.20	0.		

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB |

CALIB STANDHYD (0028) ID= 1 DT= 5.0 min	Area Total	(ha) = 3.43 Imp(%) = 50.00	Dir. Conn. (%)=	35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	1. 71	1. 71	
Dep. Storage	(mm) =	1.00	5.00	
Average Slope	(%)=	1.00	2.00	
Length	(m) =	151. 22	40.00	
Mannings n	=	0. 013	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGRA	APH	_	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1.083	24.80	2. 083	9. 21	3.08	5. 16
0. 167	4.44	1.167	24.80	2. 167	9. 21	3. 17	5. 16
0.250	4.99	1.250	129.30	2. 250	8.05	3. 25	4.84
0.333	4.99	1.333	129.30	2. 333	8.05	3.33	4.84
0.417	5.75	1.417	31.36	2. 417	7. 18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7. 19	3.50	4.56
0.583	6.84	1.583	18. 26	2. 583	6. 51	3.58	4.32
0.667	6.84	1.667	18. 26	2. 667	6. 51	3.67	4.32
0.750	8.62	1.750	13.46	2. 750	5. 97	3.75	4. 11
0.833	8.62	1.833	13.46	2.833	5. 97	3.83	4. 11
0. 917	12.15	1.917	10.86	2. 917	5. 53	3. 92	3. 92
1.000	12.15	2.000	10.86	3.000	5. 53	4.00	3. 92

Max. Eff. Inten. (r	nm/hr)=	129. 30	28. 99	
over	(mi n)	5.00	15.00	
Storage Coeff.	(mi n)=	2.95 (ii)	14.54 (ii)	
Unit Hyd. Tpeak	(mi n)=	5.00	15.00	
Unit Hyd. peak	(cms)=	0. 28	0.08	
				TOTALS
PEAK FLOW	(cms)=	0.42	0.09	0.461 (iii)
TIME TO PEAK	(hrs)=	1. 33	1.50	1. 33
RUNOFF VOLUME	(mm) =	55. 70	14. 81	29. 12
TOTAL RAINFALL	(mm) =	56. 70	56. 70	56. 70
RUNOFF COEFFICIE	ENT =	0. 98	0. 26	0. 51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029) IN= 2> OUT= 1	OVERFLOW	OVERFLOW IS OFF						
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE				
·	(cms)	(ha.m.)	(cms)	(ha.m.)				
	0.0000	0.0000	0. 2200	0. 1300				
	0. 1100	0. 0700	0.0000	0.0000				
	AR (h		TPEAK (hrs)	R.V. (mm)				
	0028) 3.	430 0. 4 430 0. 0	61 1. 33	29. 12 29. 07				

PEAK FLOW REDUCTION [Qout/Qin] (%) = 16.79

TIME SHIFT OF PEAK FLOW (min) = 40.00

MAXIMUM STORAGE USED (ha.m.) = 0.0492

CALIB				
NASHYD (0042)	Area	(ha)=	2.05	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ιa	(mm) =	10.00	# of Linear Res. (N) = 3.00
<u></u>	U. H.	Tp(hrs)=	0.22	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----

		111	ANDI ORWE		VI II		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.44	1.083	24.80	2. 083	9. 21	3.08	5. 16
0. 167	4.44	1.167	24.80	2. 167	9. 21	3. 17	5. 16
0.250	4.99	1.250	129.30	2. 250	8.05	3. 25	4.84
0.333	4.99	1.333	129.30	2. 333	8.05	3.33	4.84
0.417	5.75	1.417	31. 36	2. 417	7. 18	3.42	4. 56
0.500	5.75	1.500	31.36	2.500	7. 19	3.50	4.56
0.583	6.84	1.583	18. 26	2. 583	6. 51	3.58	4. 32
0.667	6.84	1.667	18. 26	2. 667	6. 51	3.67	4.32
0.750	8.62	1.750	13.46	2. 750	5. 97	3.75	4. 11
0.833	8.62	1.833	13.46	2.833	5. 97	3.83	4. 11
0. 917	12.15	1.917	10.86	2. 917	5. 53	3. 92	3. 92
1.000	12.15	2.000	10.86	3.000	5. 53	4.00	3. 92

Unit Hyd Opeak (cms) = 0.356

PEAK FLOW (cms)= 0.078 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 15.486
TOTAL RAINFALL (mm)= 56.700
RUNOFF COEFFICIENT = 0.273

(i) PEAK FLOW DOES	NOT INCLUDE	BASEFLOW	IF ANY.		
ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0023): + ID2= 2 (0029): 	3. 84	0. 088	1. 75	27.74	:
ADD HYD (0007) 3 + 2 = 1	(ha) 3. 84 2. 05		(hrs) 1.75 1.58	(mm) 27.74 15.49	
NOTE: PEAK FLOWS D	O NOT INCLU	JDE BASEFLO	OWS IF AN	IY. 	
ADD HYD (0007) 1 + 2 = 3 	5. 32 ====================================	0. 368 ======= 0. 528	1. 50 ====== 1. 50	29. 12 ====== 26. 15	
RESERVOIR(0008) IN= 2> OUT= 1 DT= 5.0 min	OVERFLOW I OUTFLOW (cms) 0.0000 0.0410 0.0580 0.0710 0.0830 0.0920 0.1010		OUTF (cn 0.3 0.5 0.6 0.7 0.8 0	FLOW 13390 13840 1390 1480 1320 1320 13710	STORAGE (ha. m.) 0. 1535 0. 1758 0. 1989 0. 2228 0. 2476 0. 2733 0. 2998 0. 3263

	0. 2860	0. 1321	0. 9880	0.3528	
INFLOW : ID= 2 (OUTFLOW: ID= 1 (ARE (ha 0007) 11.2	(CMS) (CMS) (10 0.5 (10 0.2	TPEAK (hrs) (hrs) 208 2.	R. V. (mm) 50 26. 15 50 26. 15	
! !	PEAK FLOW RE TIME SHIFT OF PE MAXIMUM STORAGE	EDUCTION [Qc EAK FLOW E USED	out/Qi n] (%) (mi n) (ha. m.)	= 39.30 = 60.00 = 0.1107	
ADD HYD (0016) 1 + 2 = 3	- AREA	QPEAK	TPEAK	R. V.	
+ ID2= 2 (00	- (na) 022): 0.83 008): 11.21 ========	0. 208	2. 50 26	. 15	
·	016): 12.04 OWS DO NOT INCLU	IDE BASEFLOW			
** SI MULATI ON: 1-050		*****			
CALIB NASHYD (0022) ID= 1 DT= 5.0 min	- Area (ha) Ia (mm) - U.H. Tp(hrs)	= 10.00	Curve Numb # of Linea	er (CN)= 75.0 r Res.(N)= 3.00	
NOTE: RAII	NFALL WAS TRANSF	ORMED TO	5.0 MIN. T	IME STEP.	
h: 0. 0	ME RAIN TI rs mm/hr h	nrs mm/hr 183 27.61	' TIME ' hrs 2.083	RAIN TIME mm/hr hrs 10.27 3.08	mm/hr

 0.917
 13.55
 1.917
 12.12
 2.917
 6.17
 3.92

 1.000
 13.55
 2.000
 12.12
 3.000
 6.17
 4.00

5. 58 | 1. 250 | 143. 50 | 2. 250

5. 58 | 1. 333 | 143. 50 | 2. 333

6. 42 | 1. 500 34. 91 | 2. 500

7. 64 | 1. 583 | 20. 35 | 2. 583

7. 64 | 1. 667 | 20. 35 | 2. 667

9. 62 | 1. 750 | 15. 00 | 2. 750

0.833 9.62 1.833 15.00 2.833

6. 42 | 1. 417 | 34. 91 | 2. 417

0.250

0.333

0.417

0.500

0.583

0.667

0.750

5.76

5.40

5.40

5. 10

5. 10

4.83

4.83

4. 59

4. 59

4. 38 4. 38

8. 98 | 3. 25

8. 98 | 3. 33

8.02 | 3.42

8.02 | 3.50

7. 27 | 3. 67

6. 67 | 3. 75

6. 67 | 3. 83

7. 27 | 3. 58

PEAK FLOW (cms) = 0.048 (i) TIME TO PEAK (hrs) = 1.500 RUNOFF VOLUME (mm) = 20.429 TOTAL RAINFALL (mm) = 63.117 RUNOFF COEFFICIENT = 0.324

----- U. H. Tp(hrs)= 0.20

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----

		IK	ANSFURME	JHILIUGK	APH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.96	1.083	27. 61	2. 083	10. 27	3.08	5.76
0. 167	4.96	1.167	27. 61	2. 167	10. 27	3. 17	5.76
0.250	5.58	1.250	143.50	2. 250	8. 98	3. 25	5.40
0.333	5.58	1.333	143.50	2. 333	8. 98	3.33	5.40
0.417	6.42	1.417	34. 91	2. 417	8. 02	3.42	5. 10
0.500	6.42	1.500	34. 91	2.500	8. 02	3.50	5. 10
0.583	7.64	1.583	20.35	2. 583	7. 27	3.58	4.83
0.667	7.64	1.667	20.35	2. 667	7. 27	3.67	4.83
0.750	9.62	1.750	15.00	2. 750	6. 67	3.75	4. 59
0.833	9.62	1.833	15.00	2.833	6.67	3.83	4.59
0.917	13.55	1.917	12. 12	2. 917	6. 17	3. 92	4.38
1.000	13.55	2.000	12. 12	3.000	6. 17	4.00	4. 38

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms) = 0.023 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 20.437
TOTAL RAINFALL (mm) = 63.117
RUNOFF COEFFICIENT = 0.324

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

.-----

		I MPERVI OUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm) =	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m) =	188. 33	40.00
Mannings n	=	0. 130	0. 250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME	D HYETOGRA	NPH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	s mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3 4.96	1.083	27.61	2. 083	10.27	3.08	5.76
0. 167	7 4.96	1.167	27.61	2. 167	10. 27	3. 17	5. 76
0. 250	5.58	1.250	143.50	2. 250	8. 98	3. 25	5.40
0. 333	5.58	1.333	143.50	2. 333	8. 98	3. 33	5.40
0. 417	6.42	1.417	34. 91	2. 417	8.02	3.42	5. 10
0.500	6.42	1.500	34. 91	2.500	8.02	3.50	5. 10
0. 583		1.583	20. 35	2. 583	7. 27	3.58	4.83
0.667		1.667	20. 35	2. 667	7. 27	3. 67	4.83
0. 750		1.750	15.00	2. 750	6.67	3. 75	4. 59
0. 833		1.833	15.00	2.833	6.67	3.83	4. 59
0. 917		1.917	12. 12	2. 917	6. 17	3. 92	4. 38
1.000	13.55	2.000	12. 12	3.000	6. 17	4.00	4. 38
		407.00		05 /4			
Max. Eff. Inten. (n		107. 30		35. 61			
	(mi n)	15.00	(1.1.)	30.00			
Storage Coeff.	(mi n) =	14. 46	(11)	27.59 (ii)			
Unit Hyd. Tpeak	` '	15. 00		30.00			
Unit Hyd. peak	(CMS)=	0.08		0.04	+		
DEAK ELOW		0.07				ALS*	
PEAK FLOW	(cms)=	0. 37		0. 11		423 (iii)	
TIME TO PEAK	(hrs)=	1.50		1. 75		. 50	
RUNOFF VOLUME	(mm) =	62. 12		18. 01		3. 44	
TOTAL RAINFALL	(mm)=	63. 12		63. 12		3. 12	
RUNOFF COEFFICIE	ENT =	0. 98		0. 29	C). 53	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ la = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

IMPERVIOUS PERVIOUS (i)

Surface Area	(ha)=	1. 71	1. 71
Dep. Storage	(mm) =	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m) =	151. 22	40.00
Mannings n	=	0. 013	0. 250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORM	ED HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	s mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	4.96	1.083	27. 61	2. 083	10. 27	3.08	5. 76
0. 167	4.96	1.167	27.61	2. 167	10. 27	3. 17	5. 76
0. 250	5.58	1.250	143.50	2. 250	8. 98	3. 25	5.40
0. 333		1.333	143.50	2. 333	8. 98	3. 33	5.40
0. 417		1.417	34. 91	2. 417	8.02	3. 42	5. 10
0. 500		1.500	34. 91	2.500	8. 02	3.50	5. 10
0. 583		1.583	20. 35	2. 583	7. 27	3. 58	4. 83
0.667		1.667	20. 35	2.667	7. 27	3. 67	4.83
0. 750		1.750	15.00	2. 750	6. 67	3. 75	4. 59
0. 833			15. 00	2.833	6. 67	3.83	4. 59
0. 917		1.917	12. 12		6. 17	3. 92	4. 38
1.000) 13.55	2.000	12. 12	3.000	6. 17	4.00	4. 38
May Eff Inton (n	nm /h.rs)	142 FO		4E 22			
Max. Eff. Inten. (n		143.50		45. 22			
	(min)	5.00	(::)	15.00	`		
Storage Coeff.	(mi n) =	5. 00	(ii)	12.53 (iii) 15.00)		
Unit Hyd. Tpeak							
Unit Hyd. peak	(CIIIS)=	0. 28		0. 08	*T0T	AI C*	
PEAK FLOW	(cms)=	0. 47		0. 12		als 523 (iii)	١
TIME TO PEAK	(hrs)=	1. 33		1. 50		. 33	,
RUNOFF VOLUME	(III S) = (mm) =	62. 12		18. 01		. 33 . 45	
TOTAL RAINFALL	(IIIII) = (mm) =	63. 12		63. 12		. 43	
RUNOFF COEFFICIE		03. 12		0. 29		. 12	
RUNUII CUEFFICIE	_11 =	0. 90		0.29	U.	. 55	

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
- THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029) IN= 2> OUT= 1	OVERFLOW	IS OFF				
DT= 5.0 min	OUTFLOW	STORAGE		OUTFLOW	STORAGE	
	(cms)	(ha.m.)	j	(cms)	(ha.m.)	
	0.0000	0.000	i	0.2200	0 1300	

```
0. 1100 0. 0700 | 0. 0000
                                                          0.0000
                              AREA
                                      QPEAK
                                                TPEAK
                                                           R. V.
                              (ha)
                                      (cms)
                                                (hrs)
                                                           (mm)
  INFLOW: ID= 2 ( 0028)
                              3.430
                                       0. 523
                                                  1. 33
                                                            33.45
                                       0.089
  OUTFLOW: ID= 1 ( 0029)
                             3.430
                                                  2.00
                                                            33.40
                 PEAK FLOW REDUCTION [Qout/Qin](%) = 17.07
                 TIME SHIFT OF PEAK FLOW
                                             (min) = 40.00
                 MAXIMUM STORAGE USED
                                              (ha. m.) = 0.0569
 CALIB
 NASHYD ( 0042)
                   Area (ha)= 2.05 Curve Number (CN)= 73.0
                    La
                            (mm) = 10.00
                                           # of Linear Res. (N) = 3.00
| ID= 1 DT= 5.0 min |
                   U. H. Tp(hrs) = 0.22
        NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                             ---- TRANSFORMED HYETOGRAPH ----
               TIME
                       RAIN |
                             TIME
                                     RAIN | TIME
                                                     RAIN |
                                                             TIME
                hrs
                      mm/hr
                               hrs
                                     mm/hr
                                               hrs
                                                     mm/hr
                                                              hrs
                                                                    mm/hr
              0.083
                             1.083
                                     27. 61 | 2. 083
                                                    10.27
                                                             3.08
                       4.96
                                                                    5.76
              0.167
                       4.96
                             1.167
                                     27. 61 | 2. 167
                                                    10.27
                                                             3.17
                                                                     5.76
              0.250
                       5.58
                             1. 250 143. 50 | 2. 250
                                                     8. 98
                                                             3.25
                                                                    5.40
              0.333
                       5.58
                             1.333 143.50 | 2.333
                                                     8.98
                                                             3.33
                                                                    5.40
              0.417
                       6. 42 İ
                             1.417
                                     34. 91 | 2. 417
                                                     8.02
                                                             3.42
                                                                    5.10
              0.500
                             1.500
                                     34. 91 | 2. 500
                                                     8.02
                                                             3.50
                       6.42
                                                                    5.10
              0.583
                             1.583
                                     20. 35 | 2. 583
                                                     7.27
                                                             3.58
                       7.64
                                                                    4.83
                             1.667
                                     20. 35 | 2. 667
              0.667
                       7.64
                                                     7.27
                                                             3.67
                                                                    4.83
              0.750
                       9.62 | 1.750
                                     15.00 | 2.750
                                                     6.67
                                                             3.75
                                                                    4.59
              0.833
                      9.62 | 1.833
                                     15.00 | 2.833
                                                     6.67
                                                            3.83
                                                                    4.59
              12. 12 | 2. 917
                                                            3. 92
                                                                    4.38
                                                     6. 17
              1.000 13.55 | 2.000 12.12 | 3.000
                                                     6. 17 | 4. 00
                                                                    4.38
    Unit Hyd Qpeak (cms) = 0.356
    PEAK FLOW
                   (cms) = 0.100 (i)
    TIME TO PEAK
                   (hrs) = 1.500
    RUNOFF VOLUME
                    (mm) = 19.159
    TOTAL RAINFALL
                    (mm) = 63.117
    RUNOFF COEFFICIENT = 0.304
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0007)|
```

AREA

QPEAK

TPEAK

R. V.

1 + 2 = 3

```
-----
                      (ha)
                          (cms)
                                   (hrs)
                                          (mm)
    ID1= 1 ( 0023):
                     0. 41 0. 023
                                   1.50
                                        20.44
    + ID2= 2 ( 0029):
                      3. 43 0. 089
                                   2.00
                                        33.40
     _____
     ID = 3 (0007):
                     3. 84 0. 103
                                  1.67 32.02
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
ADD HYD ( 0007)|
 3 + 2 = 1
                      AREA
                           QPEAK
                                   TPEAK
                                          R. V.
                      (ha)
                           (cms)
                                   (hrs)
                                           (mm)
     ID1= 3 ( 0007):
                     3, 84 0, 103
                                   1.67
                                         32.02
    + ID2= 2 ( 0042):
                     2. 05 0. 100
                                   1.50
                                        19.16
     _____
     ID = 1 (0007):
                     5, 89 0, 200
                                  1.58 27.54
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
ADD HYD ( 0007)|
 1 + 2 = 3
                      AREA
                            QPEAK
                                   TPEAK
                                           R. V.
                      (ha)
                            (cms)
                                   (hrs)
                                           (mm)
     ID1= 1 ( 0007):
                     5.89
                           0.200
                                   1.58
                                         27.54
    + ID2= 2 ( 0005):
                     5. 32 0. 423
                                   1.50
                                        33.44
     ______
                                  -----
     ID = 3 (0007): 11.21 0.619
                                  1.50 30.34
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
                  OVERFLOW IS OFF
RESERVOIR (0008)
 IN= 2---> OUT= 1
DT= 5.0 min
                  OUTFLOW
                           STORAGE
                                     OUTFLOW
                                              STORAGE
                                      (cms)
_____
                   (cms)
                           (ha.m.)
                                              (ha.m.)
                   0.0000
                           0.0000
                                      0.3390
                                               0.1535
                   0.0410
                           0.0120
                                      0.3840
                                               0.1758
                   0.0580
                           0.0253
                                      0.5390
                                               0.1989
                   0.0710
                           0.0399
                                      0.6480
                                               0.2228
                   0.0830
                           0.0559
                                      0.7320
                                               0.2476
                   0.0920
                           0.0732
                                      0.8050
                                               0.2733
                   0. 1010
                           0.0918
                                      0.8710
                                               0. 2998
                   0. 2130
                            0.1116
                                      0.9320
                                               0.3263
                   0. 2860
                                      0.9880
                                               0.3528
                           0. 1321
                        AREA
                               QPEAK
                                       TPEAK
                                                R. V.
                        (ha)
                               (cms)
                                       (hrs)
                                                (mm)
  INFLOW: ID= 2 ( 0007)
                       11.210
                                0.619
                                        1.50
                                                 30.34
 OUTFLOW: ID= 1 ( 0008)
                                0. 252
                                         2.42
                       11.210
                                                 30.34
```

PEAK FLOW REDUCTION [Qout/Qin](%) = 40.68 TIME SHIFT OF PEAK FLOW (min) = 55.00MAXIMUM STORAGE USED (ha. m.) = 0.1226

```
-----
| ADD HYD ( 0016)|
1 + 2 = 3
                  AREA
                      QPEAK
                             TPEAK
                                    R. V.
_____
                  (ha)
                      (cms)
                              (hrs)
                                   (mm)
    ID1= 1 ( 0022):
                  0. 83 0. 048
                              1.50
                                   20.43
   + ID2= 2 ( 0008): 11.21 0.252
                              2. 42 30. 34
    ______
    ID = 3 (0016): 12.04 0.264
                             2, 42 29, 65
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION: 1-100yr 4hr 10min Chicago ** ***********

TIME

0.083

0.167

0.250

0.333

0.417

0.500

0.583

0.667

0.750

0.833

0.917

hrs

CALIB				
NASHYD (0022)	Area	(ha)=	0.83	Curve Number (CN)= 75.0
ID= 1 DT= 5.0 min	Ιa	(mm) =	10.00	# of Linear Res. (N) = 3.00
	U.H. Tp((hrs)=	0.19	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----RAIN | TIME RAIN | TIME RAIN | RAIN TIME mm/hr hrs mm/hr | hrs mm/hr | mm/hr hrs 5.46 1.083 30. 39 | 2. 083 11.31 3.08 6.34 5.46 | 1.167 30. 39 | 2. 167 11. 31 İ 3.17 6.34 6. 14 | 1. 250 | 157. 92 | 2. 250 9.88 5 95 3 25 6. 14 | 1. 333 | 157. 92 | 2. 333 9.88 3.33 5.95 7.06 | 1.417 38. 42 | 2. 417 8.83 3.42 5.61 7.06 | 1.500 38, 42 | 2, 500 8.83 3.50 5.61 8.40 | 1.583 22, 40 | 2, 583 8.00 3.58 5.31 8.40 | 1.667 22.40 | 2.667 8.00 5.31 10.58 | 1.750 16.51 | 2.750 7.34 3.75 5.05 10.58 | 1.833 16. 51 | 2. 833 7.34 3.83 5.05 14. 91 | 1. 917 13. 33 | 2. 917 6.80 3.92 4.82

6.80 | 4.00

4.82

13. 33 | 3. 000

1.000 Unit Hyd Qpeak (cms) = 0.167

14. 91 | 2. 000

PEAK FLOW (cms) = 0.059 (i)TIME TO PEAK (hrs) = 1.500RUNOFF VOLUME (mm) = 24.473TOTAL RAINFALL (mm) = 69.460RUNOFF COEFFICIENT = 0.352

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0023)	Area (ha)=	0.41	Curve Number (CN)= 75.0
ID= 1 DT= 5.0 min	la (mm)=	10.00	# of Linear Res. (N) = 3.00
	U.H. Tp(hrs)=	0.20	• •
	1 \ /		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	APH	-	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	5.46	1.083	30.39	2. 083	11. 31	3.08	6.34
0. 167	5.46	1.167	30.39	2. 167	11. 31	3. 17	6.34
0.250	6.14	1.250	157. 92	2. 250	9.88	3. 25	5. 95
0.333	6.14	1.333	157. 92	2. 333	9.88	3. 33	5. 95
0.417	7.06	1.417	38. 42	2. 417	8.83	3.42	5. 61
0.500	7.06	1.500	38. 42	2.500	8.83	3.50	5. 61
0.583	8.40	1.583	22.40	2. 583	8.00	3. 58	5. 31
0.667	8.40	1.667	22.40	2. 667	8.00	3.67	5. 31
0.750	10.58	1.750	16. 51	2. 750	7.34	3.75	5.05
0.833	10.58	1.833	16. 51	2.833	7.34	3.83	5.05
0. 917	14.91	1.917	13. 33	2. 917	6.80	3. 92	4.82
1.000	14.91	2.000	13. 33	3.000	6.80	4.00	4.82

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.028 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 24,483
TOTAL RAINFALL (mm)= 69,460
RUNOFF COEFFICIENT = 0.352

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area Total	(ha)= 5.32 Imp(%)= 50.00	Dir. Conn. (%)=	35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	2.66	2.66	
Dep. Storage	(mm)=	1.00	5.00	
Average SI ope	(%)=	1.00	1.00	
Length	(m) =	188. 33	40.00	
Manni ngs n	=	0. 130	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME	D HYETOGRA	\PH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	s mm/hr	hrs	mm/hr	i' hrs	mm/hr	hrs	mm/hr
0.083	5.46	1.083	30.39	2. 083	11.31	3.08	6.34
0. 167	7 5.46	1.167	30. 39	2. 167	11. 31	3. 17	6.34
0. 250	6.14	1.250	157. 92	2. 250	9.88	3. 25	5. 95
0. 333	6.14	1.333	157. 92	2. 333	9.88	3. 33	5. 95
0. 417		1.417	38. 42	2. 417	8.83	3.42	5. 61
0.500		1.500	38. 42	2.500	8.83	3.50	5. 61
0. 583	8.40	1.583	22.40	2. 583	8.00	3.58	5. 31
0.667		1.667	22.40	2.667	8.00	3.67	5. 31
0. 750		1.750	16. 51	2. 750	7.34	3. 75	5. 05
0. 833		1.833	16. 51	2.833	7.34	3.83	5. 05
0. 917		1.917	13. 33	2. 917	6.80	3. 92	4.82
1.000) 14.91	2.000	13. 33	3.000	6.80	4.00	4. 82
Max. Eff. Inten. (r	nm/hr)=	118.09		42.74			
over	(mi n)	15.00		30.00			
Storage Coeff.	(mi n)=	13. 91	(ii)	26.12 (ii))		
Unit Hyd. Tpeak	(mi n)=	15.00		30.00			
Unit Hyd. peak	(cms)=	0.08		0.04			
					T0T	ALS	
PEAK FLOW	(cms)=	0. 41		0. 13	0.	481 (iii)	
TIME TO PEAK	(hrs)=	1. 50		1. 75	1	. 50	
RUNOFF VOLUME	(mm) =	68. 46		21. 38		'. 85	
TOTAL RAINFALL	(mm) =	69. 46		69. 46		0. 46	
RUNOFF COEFFICIE	ENT =	0. 99		0. 31	0). 54	

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area Total	(ha)= Imp(%)= 5	3.43 50.00 Dir. Conn.(%)=	35. 00
Surface Area Dep. Storage Average Slope Length Mannings n	(ha) = (mm) = (%) = (m) =	1 MPERVI OU 1. 71 1. 00 1. 00 151. 22 0. 013	PERVIOUS (i) 1.71 5.00 2.00 40.00 0.250	

TRANSFORMED HYETOGRAPH								
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN	
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr	
0.083	5.46	1.083	30. 39	2.083	11. 31	3.08	6.34	
0. 167	5.46	1.167	30. 39	2. 167	11. 31	3.17	6. 34	
0. 250	6.14	1.250	157. 92	2. 250	9.88	3. 25	5. 95	
0. 333	6.14	1.333	157. 92	2. 333	9.88	3.33	5. 95	
0. 417	7.06	1.417	38. 42	2. 417	8.83	3.42	5. 61	
0.500	7.06	1.500	38. 42	2.500	8.83	3.50	5. 61	
0. 583	8.40	1.583	22.40	2. 583	8.00	3.58	5. 31	
0. 667	8.40	1.667	22.40	2. 667	8.00	3.67	5. 31	
0. 750	10. 58	1.750	16. 51	2. 750	7.34	3.75	5.05	
0. 833	10.58	1.833	16. 51	2.833	7.34	3.83	5. 05	
0. 917	14. 91	1.917	13. 33	2. 917	6.80	3. 92	4.82	
1.000	14. 91	2.000	13. 33	3.000	6.80	4.00	4. 82	
Max. Eff. Inten. (mm	/hr)_	157. 92		54. 39				
over (,	5.00		15. 00				
Storage Coeff. ((ii)	11. 73 (iii	`			
)			
Unit Hyd. Tpeak (,	5.00		15.00				
Unit Hyd. peak (CIIIS)=	0. 29		0.09	****	EVI C*		
DEAK FLOW	ama)	0.50		0 14		TALS*		
	cms)=	0.52		0.14		587 (iii)	'	
	hrs)=	1. 33		1.50		1.33		
RUNOFF VOLUME	(mm) =	68. 46		21. 38		7.85		
TOTAL RAINFALL	(mm) =	69. 46		69. 46		9. 46		
RUNOFF COEFFICIEN	=	0. 99		0. 31	(0. 54		

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ la = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| RESERVOIR (0029) | OVERFLOW IS OFF IN= 2---> OUT= 1 DT= 5.0 min | OUTFLOW STORAGE OUTFLOW STORAGE (cms) (ha.m.) (cms) (ha.m.) 0.0000 0.0000 0.2200 0.1300 0. 1100 0.0700 0.0000 0.0000 AREA QPEAK TPEAK R. V. (ha) (cms) (hrs) (mm) INFLOW: ID= 2 (0028) 3.430 0. 587 1. 33 37.85 OUTFLOW: ID= 1 (0029) 3.430 0. 101 2.00 37.81 PEAK FLOW REDUCTION [Qout/Qin] (%) = 17.28

TIME SHIFT OF PEAK FLOW (min) = 40.00

MAXIMUM STORAGE USED (ha.m.) = 0.0645

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----RAIN | TIME RAIN | TIME TIME RAIN | TIME mm/hr hrs mm/hr hrs mm/hr İ hrs hrs mm/hr 0.083 5.46 1.083 30. 39 | 2. 083 11.31 3.08 6.34 0.167 5.46 1.167 30. 39 | 2. 167 11.31 3.17 6.34 0.250 6.14 1.250 157.92 2. 250 9.88 3.25 5.95 0.333 6.14 1.333 157.92 2. 333 9.88 3.33 5.95 0.417 7.06 1.417 38. 42 2. 417 8.83 3.42 5.61 0.500 7.06 1.500 38. 42 2.500 8.83 3.50 5.61 0.583 8.40 1.583 22.40 2.583 8.00 3.58 5.31 0.667 8.40 | 1.667 22. 40 | 2. 667 3.67 8.00 5. 31 0.750 10.58 | 1.750 16.51 | 2.750 7.34 3.75 5.05 0.833 10.58 | 1.833 16. 51 | 2. 833 7.34 3.83 5.05 0.917 14. 91 | 1. 917 13. 33 | 2. 917 6.80 | 3.92 4.82 1.000 14.91 | 2.000 13.33 | 3.000 6.80 | 4.00 4.82

Unit Hyd Qpeak (cms) = 0.356

PEAK FLOW (cms) = 0.123 (i)
TIME TO PEAK (hrs) = 1.500
RUNOFF VOLUME (mm) = 23.016
TOTAL RAINFALL (mm) = 69.460
RUNOFF COEFFICIENT = 0.331

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0007)| 1 + 2 = 3 AREA QPEAK TPEAK R. V. (ha) (cms) (hrs) (mm) ID1= 1 (0023): 0.41 0.028 1.50 24.48 2.00 37.81 + ID2= 2 (0029): 3. 43 0. 101 -----ID = 3 (0007): 3. 84 0. 118 36.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
ADD HYD ( 0007)|
 3 + 2 = 1
                       AREA QPEAK
                                    TPEAK
                                            R. V.
                       (ha) (cms)
                                    (hrs)
                                            (mm)
     ID1= 3 ( 0007):
                       3. 84 0. 118
                                     1. 67
                                            36.39
    + ID2= 2 ( 0042):
                       2. 05 0. 123
                                     1.50 23.02
      -----
      ID = 1 (0007): 5.89 0.238
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
ADD HYD ( 0007)|
 1 + 2 = 3
                       AREA QPEAK
                                     TPEAK
                                             R. V.
                       (ha)
                             (cms)
                                     (hrs)
                                             (mm)
     ID1= 1 ( 0007):
                       5. 89 0. 238
                                     1.58
                                           31.73
    + ID2= 2 ( 0005):
                     5. 32 0. 481
                                     1.50 37.85
      _____
      ID = 3 ( 0007): 11.21 0.715 1.50 34.64
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                    OVERFLOW IS OFF
RESERVOIR (0008)
 IN= 2---> OUT= 1 |
DT= 5.0 min
                    OUTFLOW
                             STORAGE
                                        OUTFLOW
                                                 STORAGE
_____
                     (cms)
                              (ha.m.)
                                         (cms)
                                                  (ha.m.)
                     0.0000
                                         0. 3390
                              0.0000
                                                   0.1535
                     0.0410
                                         0.3840
                                                   0.1758
                              0.0120
                     0.0580
                                         0.5390
                                                   0.1989
                              0.0253
                     0.0710
                              0.0399
                                         0.6480
                                                   0.2228
                     0.0830
                              0.0559
                                         0.7320
                                                   0.2476
                     0.0920
                              0.0732
                                         0.8050
                                                   0.2733
                     0. 1010
                              0.0918
                                         0.8710
                                                   0. 2998
                     0. 2130
                                         0.9320
                                                   0.3263
                              0. 1116
                     0. 2860
                              0. 1321
                                         0.9880
                                                   0.3528
                          AREA
                                 QPEAK
                                          TPEAK
                                                    R. V.
                          (ha)
                                 (cms)
                                          (hrs)
                                                    (mm)
  INFLOW: ID= 2 ( 0007)
                         11.210
                                   0. 715
                                           1. 50
                                                    34.64
  OUTFLOW: ID= 1 ( 0008)
                         11.210
                                   0. 295
                                                     34.63
               PEAK FLOW REDUCTION [Qout/Qin](%) = 41.30
               TIME SHIFT OF PEAK FLOW
                                     (min) = 55.00
               MAXIMUM STORAGE USED
                                        (ha. m.) = 0.1360
```

```
| ADD HYD ( 0016)|
1 + 2 = 3
                  AREA QPEAK
                           TPEAK
                  (ha)
                     (cms)
                             (hrs)
                                  (mm)
   ID1= 1 ( 0022):
                 0.83 0.059
                             1.50 24.47
   + ID2= 2 ( 0008):
                             2. 42 34. 63
                 11. 21 0. 295
    _____
    ID = 3 (0016): 12.04 0.311
  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
**********
** SIMULATION: 2-025yr 12hr 15min SCS **
************
CALIB
NASHYD ( 0022) Area (ha)= 0.83 Curve Number (CN)= 75.0
|ID= 1 DT= 5.0 min | Ia
                   (mm) = 10.00
                             # of Linear Res. (N) = 3.00
----- U.H. Tp(hrs)= 0.19
```

TRANSFORMED HYETOGRAPH							
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.34	6. 250	102.96	9.33	2.73
0. 167	0.00	3.250	2.34	6. 333	14.04	9.42	2.73
0. 250	0.00	3.333	3. 12	6. 417	14.04	9.50	2.73
0.333	1. 95	3.417	3. 12	6. 500	14.04	9.58	2.73
0.417	1. 95	3.500	3. 12	6. 583	14.04	9.67	2.73
0.500	1.95	3.583	3. 12	6. 667	14.04	9.75	2.73
0. 583	1. 95	3.667	3. 12	6. 750	14.04	9.83	2.73
0.667	1. 95	3.750	3. 12	6. 833	6. 24	9. 92	2.73
0.750	1. 95	3.833	3. 12	6. 917	6. 24	10.00	2.73
0.833	1. 95	3.917	3. 12	7.000	6. 24	10.08	2.73
0. 917	1.95	4.000	3. 12	7. 083	6. 24	10. 17	2. 73
1.000	1.95	4.083	3. 12	7. 167		10. 25	2. 73
1. 083	1. 95	4.167	3. 12	7. 250	6. 24	10.33	1. 56
1. 167	1. 95	4.250		7. 333		10.42	1. 56
1. 250	1. 95	4.333		7. 417			1. 56
1. 333	1. 95	4.417	4. 68	7. 500	4. 68	10. 58	1. 56
1. 417	1.95	4.500	4. 68	7. 583		10. 67	1.56
1.500	1. 95	4.583	4. 68	7. 667	4. 68	10. 75	1. 56
1. 583	1. 95	4.667		7. 750			
1. 667	1. 95	4.750	4. 68	7. 833		10. 92	1. 56
1. 750	1. 95	4.833		7. 917		11.00	1. 56
1.833	1. 95	4.917	6. 24	8.000		11.08	1. 56
1. 917	1. 95	5.000	6. 24	8. 083		11. 17	1. 56
2.000	1. 95	5.083	6. 24	8. 167		11. 25	1. 56
2.083	1. 95	5.167	6. 24	8. 250		11. 33	1. 56
2. 167	1. 95					11.42	1. 56
2. 250	1. 95	5.333	9. 36	8. 417	2.73	11.50	1.56

```
2.333
      2.34 | 5.417
                       9. 36 | 8. 500
                                        2. 73 | 11. 58
2.417
       2.34 | 5.500
                       9. 36 | 8. 583
                                        2. 73 | 11. 67
2.500
       2.34
               5.583
                        9. 36 | 8. 667
                                        2. 73 | 11. 75
                        9. 36 | 8. 750
2.583
               5.667
                                        2. 73 | 11. 83
       2.34
                       9. 36 | 8. 833
2.667
       2.34 | 5.750
                                        2. 73 | 11. 92
                                                       1.56
                       37. 44 | 8. 917
2.750
       2.34
               5.833
                                        2. 73 | 12. 00
                       37. 44 | 9. 000
2.833
        2.34
               5.917
                                        2.73
                                              12.08
2.917
       2.34
               6.000
                       37. 44 | 9. 083
                                        2. 73 | 12. 17
                                                       1.56
3.000
       2.34
               6.083 102.96 | 9.167
                                        2. 73 | 12. 25
3.083
       2. 34 | 6. 167 | 102. 96 | 9. 250
                                        2.73
```

PEAK FLOW (cms) = 0.077 (i) TIME TO PEAK (hrs) = 6.333 RUNOFF VOLUME (mm) = 30.217 TOTAL RAINFALL (mm) = 78.000 RUNOFF COEFFICIENT = 0.387

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----RAIN | TIME RAIN TIME RAI N TIME TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0.083 0.00 2. 34 | 6. 250 102. 96 9.33 2.73 3.167 0.167 0.00 3.250 2. 34 | 6. 333 14.04 9.42 2.73 0.250 0.00 3.333 3. 12 | 6. 417 14.04 9.50 2.73 3.417 0.333 3. 12 | 6. 500 1.95 14.04 9.58 2.73 0.417 1.95 3.500 3. 12 | 6. 583 14.04 9.67 2.73 14.04 0.500 1.95 3.583 3. 12 | 6. 667 9.75 2.73 0.583 1. 95 İ 3.667 3. 12 | 6. 750 14.04 9.83 2.73 0.667 1.95 3.750 3. 12 | 6. 833 9.92 6.24 2.73 0.750 1.95 3.833 3. 12 | 6. 917 6.24 10.00 2.73 0.833 1.95 3.917 3. 12 | 7. 000 6.24 10.08 2.73 4.000 0.917 1.95 3. 12 | 7. 083 6.24 10.17 2.73 1.000 1. 95 İ 4.083 3. 12 | 7. 167 10. 25 6.24 2.73 1.083 1. 95 İ 4.167 3. 12 | 7. 250 6. 24 10.33 1.95 4.250 3. 12 | 7. 333 10.42 1. 167 4.68 1.250 1.95 4.333 4. 68 | 7. 417 4.68 10.50 1.333 1.95 4.417 4.68 | 7.500 4.68 10.58 1.56 4.500 4.68 7.583 1.417 1.95 4.68 10.67 1.56 1.500 1.95 | 4.583 4.68 | 7.667 4. 68 | 10. 75 1.56

1. 583 1. 667 1. 750 1. 833 1. 917 2. 000 2. 083 2. 167 2. 250 2. 333 2. 417 2. 500 2. 583 2. 667 2. 750 2. 833	1. 95 1. 95 1. 95 1. 95 1. 95 1. 95 1. 95 1. 95 1. 95 2. 34 2. 34 2. 34 2. 34 2. 34 2. 34 2. 34	4.667 4.750 4.833 4.917 5.000 5.083 5.167 5.250 5.333 5.417 5.500 5.583 5.667 5.750 5.833 5.667 5.750 5.833 5.667 5.750 5.833 5.667 5.750 5.833 5.667 5.750 5.833 5.667 5.590 5.833 5.667 5.590 5.583 5.667 5.590 5.833 5.667 5.590 5.833 5.667 5.590 5.833 5.667 5.590 5.69	4. 68 4. 68 6. 24 6. 24 6. 24 6. 24 6. 24 9. 36 9. 36 9. 36 9. 36 9. 36 37. 44	7. 750 7. 833 7. 917 8. 000 8. 083 8. 167 8. 250 8. 333 8. 417 8. 500 8. 583 8. 667 8. 750 8. 833 8. 917 9. 000	4. 68 4. 68 4. 68 4. 68 4. 68 4. 68 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73	10. 83 10. 92 11. 00 11. 08 11. 125 11. 33 11. 42 11. 50 11. 50 11. 75 11. 83 11. 92 12. 00 12. 08	1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56 1. 56
2.750	2.34	5.833	37.44	8. 917			1.56
3. 083	2.34	6. 167	102. 96	9. 250	2. 73	.2.20	00

Unit Hyd Opeak (cms) = 0.078

PEAK FLOW (cms)= 0.037 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 30.229
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.388

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) Area (ha) = 5.32 || ID= 1 DT= 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 _____ PERVIOUS (i) I MPERVI OUS Surface Area (ha)= 2.66 2.66 Dep. Storage (mm) =1.00 5.00 Average Slope (%)= 1.00 1.00 Length (m) =188.33 40.00 Mannings n 0.130 0.250

TRANSFORMED HYETOGRAPH							
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	j' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.34	6. 250	102.96	9. 33	2.73
0.167	0.00	3.250	2.34	6. 333	14.04	9.42	2.73
0. 250	0.00	3.333	3. 12	6. 417	14.04	9. 50	2.73

0. 667 1. 95 0. 750 1. 95 0. 833 1. 95 0. 917 1. 95 1. 000 1. 95 1. 083 1. 95 1. 167 1. 95 1. 250 1. 95 1. 333 1. 95	3.500	6. 583 6. 667 6. 750 6. 833 6. 917 7. 000 7. 083 7. 167 7. 250 7. 333 7. 417 7. 500 7. 583 7. 667 7. 750 7. 833 7. 917 8. 000 8. 083 8. 167 8. 250 8. 333 8. 417 8. 500 8. 583 8. 667 8. 750 8. 583 8. 833 8. 917 9. 000 9. 083 9. 167	14. 04 14. 04 14. 04 14. 04 14. 04 16. 24 6. 24 6. 24 6. 24 6. 24 6. 24 6. 24 6. 24 6. 26 2. 12 12.	9. 67 9. 75 9. 83 9. 92 10. 00 10. 08 10. 17 10. 25 10. 33 10. 42 10. 50 10. 67 10. 75 10. 83 10. 92 11. 00 11. 08 11. 17 11. 25 11. 33 11. 42 11. 50 11. 58 11. 67 11. 75 11. 83 11. 92 12. 00 12. 08	2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 2. 73 1. 56
Max.Eff.Inten.(mm/hr)= over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)=	102. 96 15. 00 14. 70 (ii) 15. 00 0. 08	51. 58 30. 00 26. 02 (ii) 30. 00 0. 04			
PEAK FLOW (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT =	0. 34 6. 33 77. 00 78. 00 0. 99	0. 16 6. 58 26. 19 78. 00 0. 34	0. 6 43 78	ALS* 447 (iii) 5.33 8.97 8.00 0.56	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0028) (ha)= 3.43 Area | ID= 1 DT= 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 1.71 1.71 Dep. Storage (mm) = 1.00 5.00 Average Slope (%)= 1.00 2.00 Length (m) =151, 22 40.00 Mannings n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME) HYETOGI	RAPH	_	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.34	6. 250	102.96	9.33	2.73
0. 167	0.00	3.250	2.34	6. 333	14.04	9.42	2.73
0. 250	0.00	3.333	3. 12	6. 417	14.04	9.50	2.73
0.333	1. 95	3.417	3. 12	6. 500	14.04	9.58	2.73
0.417	1. 95	3.500	3. 12	6. 583	14.04	9.67	2.73
0.500	1. 95	3.583	3. 12	6. 667	14.04	9.75	2.73
0. 583	1. 95	3.667	3. 12	6. 750	14.04	9.83	2.73
0.667	1. 95	3.750	3. 12	6. 833	6. 24	9. 92	2.73
0.750	1. 95	3.833	3. 12	6. 917	6. 24	10.00	2.73
0.833	1. 95	3.917	3. 12	7.000	6. 24	10. 08	2.73
0. 917	1. 95	4.000	3. 12	7. 083	6. 24	10. 17	2.73
1.000	1. 95	4.083	3. 12	7. 167	6. 24	10. 25	2.73
1. 083	1. 95	4.167	3. 12	7. 250	6. 24	10. 33	1. 56
1. 167	1. 95	4.250	3. 12	7. 333	4. 68	10.42	1. 56
1. 250	1. 95	4.333	4. 68	7. 417	4. 68	10. 50	1. 56
1. 333	1. 95	4.417	4. 68	7. 500	4. 68	10. 58	1. 56
1. 417	1. 95	4.500	4. 68	7. 583	4. 68	10. 67	1. 56
1.500	1.95	4.583	4. 68	7. 667	4. 68	10.75	1. 56
1. 583	1. 95	4.667	4. 68	7. 750	4. 68	10.83	1. 56
1. 667	1. 95	4.750	4. 68	7. 833	4. 68	10. 92	1. 56
1. 750	1.95	4.833	6. 24	7. 917	4. 68	11.00	1. 56
1.833	1. 95	4.917	6. 24	8.000	4. 68	11.08	1. 56
1. 917	1. 95	5.000	6. 24	8. 083	4. 68	11. 17	1. 56
2.000	1.95	5.083	6. 24	8. 167	4. 68	11. 25	1. 56
2.083	1.95	5.167	6. 24	8. 250	4. 68	11.33	1. 56
2. 167	1.95	5.250	6. 24	8. 333	2. 73	11.42	1. 56
2. 250	1.95	5.333	9. 36	8. 417	2.73	11.50	1. 56
2.333	2.34	5.417	9. 36	8.500	2.73	11.58	1.56
2. 417	2.34	5.500	9. 36	8. 583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2. 583	2.34	5.667	9. 36	8. 750	2. 73	11.83	1. 56

```
2.750
                    2.34 | 5.833 37.44 | 8.917
                                                   2. 73 | 12. 00
                                                   2. 73 | 12. 08
              2.833
                     2.34 | 5.917
                                   37.44 | 9.000
                                                                 1.56
                     2.34 | 6.000
                                  37. 44 | 9. 083
                                                   2. 73 | 12. 17
              2.917
                                                                 1.56
                    2. 34 | 6. 083 | 102. 96 | 9. 167
              3.000
                                                   2. 73 | 12. 25
                                                                 1.56
              3.083
                    2.34 | 6.167 | 102.96 | 9.250
                                                   2.73
    Max. Eff. Inten. (mm/hr)=
                            102.96
                                         55.74
              over (min)
                              5.00
                                         15.00
    Storage Coeff. (min)=
                              3. 24 (ii) 12. 15 (ii)
    Unit Hyd. Tpeak (min)=
                              5.00
                                         15.00
    Unit Hyd. peak (cms)=
                              0.27
                                          0.09
                                                     *TOTALS*
    PEAK FLOW
                              0.34
                                                      0.481 (iii)
                  (cms)=
                                          0.16
    TIME TO PEAK
                  (hrs)=
                              6. 25
                                          6.33
                                                       6.25
    RUNOFF VOLUME
                  (mm) =
                             77.00
                                         26.19
                                                       43.97
    TOTAL RAINFALL (mm)=
                             78.00
                                         78.00
                                                       78.00
    RUNOFF COEFFICIENT =
                              0.99
                                          0.34
                                                        0.56
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN^* = 59.0   Ia = Dep. Storage (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
______
RESERVOIR (0029)
                      OVERFLOW IS OFF
 IN= 2---> OUT= 1 |
 DT= 5.0 min
                      OUTFLOW
                                            OUTFLOW
                                                      STORAGE
                                STORAGE
-----
                       (cms)
                                (ha.m.)
                                             (cms)
                                                      (ha.m.)
                       0.0000
                                0.0000
                                             0.2200
                                                        0.1300
                       0.1100
                                0.0700
                                             0.0000
                                                        0.0000
                                    QPEAK
                                              TPFAK
                             AREA
                                                         R. V.
                             (ha)
                                     (cms)
                                              (hrs)
                                                         (mm)
  INFLOW: ID= 2 ( 0028)
                            3.430
                                      0. 481
                                                6. 25
                                                         43.97
  OUTFLOW: ID= 1 ( 0029)
                            3.430
                                      0. 106
                                                6.75
```

PEAK FLOW REDUCTION [Qout/Qin](%) = 22.05

| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00

U. H. Tp(hrs) = 0.22

(min) = 30.00

(ha)= 2.05 Curve Number (CN)= 73.0

(ha. m.) = 0.0675

TIME SHIFT OF PEAK FLOW

MAXIMUM STORAGE USED

Area

CALIB

NASHYD (0042)

9. 36 | 8. 833

2. 73 | 11. 92

1.56

2.667 2.34 | 5.750

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME hrs mm/hr hrs hrs mr hrs hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mr hrs hrs hrs hrs hrs hrs hrs hrs hrs hr			TR	ANSFORMEI) HYETOGI	RAPH	_	
0.083 0.00 3.167 2.34 6.250 102.96 9.33 2.73 0.167 0.00 3.250 2.34 6.333 14.04 9.42 2.73 0.250 0.00 3.333 3.12 6.417 14.04 9.50 2.73 0.333 1.95 3.417 3.12 6.500 14.04 9.67 2.73 0.417 1.95 3.500 3.12 6.583 14.04 9.67 2.73 0.500 1.95 3.583 3.12 6.667 14.04 9.75 2.73 0.583 1.95 3.750 3.12 6.750 14.04 9.83 2.73 0.750 1.95 3.750 3.12 6.833 6.24 10.00 2.73 0.750 1.95 3.833 3.12 7.000 6.24 10.02 2.73 0.917 1.95 4.083 3.12 7.167	TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
0. 167 0. 00 3. 250 2. 34 6. 333 14. 04 9. 42 2. 73 0. 250 0. 00 3. 333 3. 12 6. 417 14. 04 9. 50 2. 73 0. 333 1. 95 3. 500 3. 12 6. 583 14. 04 9. 67 2. 73 0. 500 1. 95 3. 560 3. 12 6. 583 14. 04 9. 67 2. 73 0. 583 1. 95 3. 667 3. 12 6. 750 14. 04 9. 83 2. 73 0. 667 1. 95 3. 750 3. 12 6. 750 14. 04 9. 83 2. 73 0. 667 1. 95 3. 750 3. 12 6. 917 6. 24 10. 00 2. 73 0. 833 1. 95 3. 917 3. 12 7. 000 6. 24 10. 00 2. 73 1. 95 4. 000 3. 12 7. 167 6. 24 10. 25 2. 73 1. 083 1. 95 4. 083 3. 12 7.	hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0. 250 0. 00 3.333 3.12 6. 417 14. 04 9. 50 2. 73 0. 333 1.95 3. 417 3. 12 6. 500 14. 04 9. 58 2. 73 0. 417 1.95 3. 583 3. 12 6. 583 14. 04 9. 67 5 2. 73 0. 500 1.95 3. 583 3. 12 6. 667 14. 04 9. 67 5 2. 73 0. 583 1.95 3. 667 3. 12 6. 750 14. 04 9. 83 2. 73 0. 667 1.95 3. 833 3. 12 6. 833 6. 24 10. 00 2. 73 0. 750 1. 95 3. 833 3. 12 7. 000 6. 24 10. 00 2. 73 0. 833 1. 95 4. 083 3. 12 7. 083 6. 24 10. 08 2. 73 1. 080 1. 95 4. 083 3. 12 7. 250 6. 24 10. 25 2. 73 1. 081	0.083	0.00	3.167	2.34	6. 250		9. 33	2.73
0.333 1.95 3.417 3.12 6.500 14.04 9.58 2.73 0.417 1.95 3.500 3.12 6.583 14.04 9.67 2.73 0.500 1.95 3.583 3.12 6.667 14.04 9.75 2.73 0.583 1.95 3.667 3.12 6.750 14.04 9.83 2.73 0.667 1.95 3.750 3.12 6.833 6.24 9.92 2.73 0.750 1.95 3.833 3.12 6.917 6.24 10.00 2.73 0.833 1.95 3.917 3.12 7.083 6.24 10.08 2.73 1.000 1.95 4.000 3.12 7.083 6.24 10.17 2.73 1.083 1.95 4.167 3.12 7.250 6.24 10.17 2.73 1.083 1.95 4.250 3.12 7.333 4.68 10.42 1.56 1.250 1.95	0. 167	0.00	3.250	2.34	6. 333	14.04	9.42	2.73
0. 417 1. 95 3. 500 3. 12 6. 583 14. 04 9. 67 2. 73 0. 500 1. 95 3. 583 3. 12 6. 667 14. 04 9. 75 2. 73 0. 583 1. 95 3. 667 3. 12 6. 670 14. 04 9. 83 2. 73 0. 667 1. 95 3. 750 3. 12 6. 833 6. 24 9. 92 2. 73 0. 833 1. 95 3. 833 3. 12 6. 917 6. 24 10. 00 2. 73 0. 917 1. 95 4. 000 3. 12 7. 083 6. 24 10. 17 2. 73 1. 000 1. 95 4. 083 3. 12 7. 167 6. 24 10. 25 2. 73 1. 083 1. 95 4. 167 3. 12 7. 250 6. 24 10. 25 2. 73 1. 167 1. 95 4. 250 3. 12 7. 333 4. 68 10. 42 1. 56 1. 250 1. 95 4. 417 4. 68 7. 50 4. 68 10. 50 <	0.250	0.00	3.333	3. 12	6. 417	14.04	9.50	2.73
0.500 1.95 3.583 3.12 6.667 14.04 9.75 2.73 0.583 1.95 3.667 3.12 6.750 14.04 9.83 2.73 0.667 1.95 3.750 3.12 6.833 6.24 9.92 2.73 0.750 1.95 3.833 3.12 6.917 6.24 10.00 2.73 0.833 1.95 3.917 3.12 7.000 6.24 10.08 2.73 0.917 1.95 4.000 3.12 7.083 6.24 10.17 2.73 1.000 1.95 4.083 3.12 7.167 6.24 10.25 2.73 1.083 1.95 4.167 3.12 7.250 6.24 10.33 1.56 1.250 1.95 4.250 3.12 7.333 4.68 10.42 1.56 1.250 1.95 4.250 3.12 7.50 4.68 10.50 1.56 1.250 1.95	0.333	1. 95	3.417		6. 500	14.04	9.58	2.73
0.583 1.95 3.667 3.12 6.750 14.04 9.83 2.73 0.667 1.95 3.750 3.12 6.833 6.24 9.92 2.73 0.750 1.95 3.833 3.12 6.917 6.24 10.00 2.73 0.833 1.95 4.000 3.12 7.000 6.24 10.08 2.73 1.000 1.95 4.083 3.12 7.167 6.24 10.25 2.73 1.083 1.95 4.167 3.12 7.250 6.24 10.33 1.56 1.167 1.95 4.250 3.12 7.250 6.24 10.33 1.56 1.250 1.95 4.250 3.12 7.333 4.68 10.50 1.56 1.333 1.95 4.417 4.68 7.500 4.68 10.50 1.56 1.500 1.95 4.583 4.68 7.503 4.68 10.50 1.56 1.531 1.95					6. 583			
0. 667 1.95 3.750 3.12 6.833 6.24 9.92 2.73 0.750 1.95 3.833 3.12 6.917 6.24 10.00 2.73 0.833 1.95 3.917 3.12 7.000 6.24 10.08 2.73 1.000 1.95 4.083 3.12 7.167 6.24 10.17 2.73 1.083 1.95 4.083 3.12 7.250 6.24 10.33 1.56 1.167 1.95 4.250 3.12 7.333 4.68 10.42 1.56 1.250 1.95 4.333 4.68 7.417 4.68 10.50 1.56 1.333 1.95 4.450 4.68 7.500 4.68 10.50 1.56 1.417 1.95 4.500 4.68 7.500 4.68 10.50 1.56 1.500 1.95 4.583 4.68 7.504 4.68 10.75 1.56 1.503 1.95								
0. 750 1. 95 3. 833 3. 12 6. 917 6. 24 10. 00 2. 73 0. 833 1. 95 3. 917 3. 12 7. 000 6. 24 10. 08 2. 73 0. 917 1. 95 4. 000 3. 12 7. 083 6. 24 10. 17 2. 73 1. 000 1. 95 4. 083 3. 12 7. 167 6. 24 10. 25 2. 73 1. 083 1. 95 4. 167 3. 12 7. 250 6. 24 10. 33 1. 56 1. 167 1. 95 4. 250 3. 12 7. 333 4. 68 10. 42 1. 56 1. 250 1. 95 4. 433 4. 68 7. 417 4. 68 10. 50 1. 56 1. 333 1. 95 4. 417 4. 68 7. 500 4. 68 10. 58 1. 56 1. 500 1. 95 4. 583 4. 68 7. 750 4. 68 10. 58 1. 56 1. 583 1. 95 4. 567 4. 68 7. 750 4. 68 10. 83								
0.833 1.95 3.917 3.12 7.000 6.24 10.08 2.73 0.917 1.95 4.000 3.12 7.083 6.24 10.17 2.73 1.000 1.95 4.083 3.12 7.167 6.24 10.25 2.73 1.083 1.95 4.167 3.12 7.250 6.24 10.25 3.1.56 1.167 1.95 4.250 3.12 7.333 4.68 10.42 1.56 1.250 1.95 4.333 4.68 7.417 4.68 10.50 1.56 1.333 1.95 4.417 4.68 7.500 4.68 10.50 1.56 1.417 1.95 4.500 4.68 7.583 4.68 10.67 1.56 1.500 1.95 4.583 4.68 7.750 4.68 10.75 1.56 1.583 1.95 4.750 4.68 7.7917 4.68 10.92 1.56 1.583 1.95 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
0.917 1.95 4.000 3.12 7.083 6.24 10.17 2.73 1.000 1.95 4.083 3.12 7.167 6.24 10.25 2.73 1.083 1.95 4.167 3.12 7.250 6.24 10.33 1.56 1.167 1.95 4.250 3.12 7.333 4.68 10.42 1.56 1.250 1.95 4.333 4.68 7.500 4.68 10.50 1.56 1.333 1.95 4.417 4.68 7.500 4.68 10.58 1.56 1.417 1.95 4.583 4.68 7.583 4.68 10.67 1.56 1.500 1.95 4.583 4.68 7.750 4.68 10.75 1.56 1.583 1.95 4.667 4.68 7.750 4.68 10.83 1.56 1.750 1.95 4.833 6.24 7.917 4.68 11.08 1.56 1.750 1.95								
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2.833 2.34 5.917 37.44 9.000 2.73 12.08 1.56 2.917 2.34 6.000 37.44 9.083 2.73 12.17 1.56 3.000 2.34 6.083 102.96 9.167 2.73 12.25 1.56	2.667	2.34	5.750	9. 36	8. 833	2.73	11. 92	1.56
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3.000 2.34 6.083 102.96 9.167 2.73 12.25 1.56	2.833	2.34	5.917	37.44		2.73	12.08	1.56
	2. 917	2.34	6.000	37.44	9. 083	2.73	12.17	1.56
2 083	3.000						12. 25	1.56
3. 003 2. 34 0. 107 102. 70 7. 230 2. 73	3.083	2.34	6. 167	102. 96	9. 250	2.73		

Unit Hyd Qpeak (cms) = 0.356

PEAK FLOW (cms)= 0.163 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 28.515
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.366

(i) PEAK FLOW DOES	NOT INCLUDE	E BASEFLOW	IF ANY.			
ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0023): + ID2= 2 (0029): ====================================	========		=======			
NOTE: PEAK FLOWS D	O NOT INCLU	JDE BASEFL	OWS IF AN	IY. 		
ADD HYD (0007) 3 + 2 = 1 ID1= 3 (0007): + ID2= 2 (0042):			=======			
ID = 1 (0007): NOTE: PEAK FLOWS D						
ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0007): + ID2= 2 (0005): ====================================	AREA (ha) 5. 89 5. 32	QPEAK (cms) 0. 291 0. 447	TPEAK (hrs) 6. 33 6. 33	R. V. (mm) 37. 61 43. 97	:	
NOTE: PEAK FLOWS D						
IN= 2> OUT= 1	0. 0000 0. 0410 0. 0580 0. 0710 0. 0830 0. 0920		(cm 0.3 0.3 0.5 0.6 0.7 0.8	ns) 3390 3840 3390 3480 7320 8050	STORAGE (ha. m.) 0. 1535 0. 1758 0. 1989 0. 2228 0. 2476 0. 2733 0. 2998 0. 3263	

```
0. 2860 0. 1321 | 0. 9880
                                               0.3528
                        AREA
                              QPEAK
                                      TPEAK
                                               R. V.
                        (ha)
                               (cms)
                                       (hrs)
                                                (mm)
 INFLOW: ID= 2 ( 0007)
                       11.210
                                0.738
                                       6. 33
                                                40.63
 OUTFLOW: ID= 1 ( 0008)
                       11.210
                                0. 310
                                        7.08
                                                40.62
              PEAK FLOW REDUCTION [Qout/Qin](%) = 42.01
              TIME SHIFT OF PEAK FLOW (min) = 45.00
              MAXIMUM STORAGE USED
                                     (ha. m.) = 0.1419
| ADD HYD ( 0016)|
1 + 2 = 3
                     ARFA
                          QPEAK
                                  TPFAK
                                         R. V.
                     (ha)
                           (cms)
                                   (hrs)
                                          (mm)
   ID1= 1 ( 0022):
                     0. 83 0. 077
                                  6. 33 30. 22
    + ID2= 2 ( 0008): 11.21 0.310
                                  7.08 40.62
     _____
     ID = 3 (0016): 12.04 0.324
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
*********
** SIMULATION: 2-02yr 12hr 15min SCS **
*********
_____
| CALIB
NASHYD ( 0022) | Area (ha) = 0.83
                                  Curve Number (CN) = 75.0
|ID= 1 DT= 5.0 min | Ia (mm)= 10.00
                                  # of Linear Res. (N) = 3.00
----- U. H. Tp(hrs) = 0.19
      NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                       ---- TRANSFORMED HYETOGRAPH ----
            TIME
                  RAIN | TIME
                              RAIN | TIME
                                          RAIN | TIME
             hrs
                 mm/hr i
                        hrs
                              mm/hr i' hrs
                                           mm/hr | hrs
                                                       mm/hr
            0.083
                  0.00 | 3.167
                              1. 30 | 6. 250
                                          57.02 | 9.33
                                                       1.51
            0.167
                  0.00 | 3.250
                              1. 30 | 6. 333
                                           7. 78 | 9. 42
                                                       1.51
```

0.250

0.333

0.417

0.500

0.583

0.667

0.750

0.833

0.917

1.000

1.083

0.00 | 3.333

1.08 | 3.417

1.08 | 3.500

1.08 | 3.583

1.08 | 3.667

1.08 | 3.750

1.08 | 3.833

1.08 | 3.917

1.08 | 4.000

1.08 | 4.083

1.08 | 4.167

1. 73 | 6. 417

1. 73 | 6. 500

1. 73 | 6. 583

1. 73 | 6. 667

1. 73 | 6. 750

1. 73 | 6. 833

1. 73 | 6. 917

1.73 | 7.000

1.73 | 7.083

1. 73 | 7. 167

1. 73 | 7. 250

7. 78 | 9. 50

7. 78 İ 9. 58

7. 78 | 9. 67

7. 78 | 9. 75

7. 78 | 9. 83

3. 46 | 9. 92

3.46 | 10.00

3. 46 | 10. 08

3. 46 | 10. 17

3. 46 | 10. 25

3. 46 | 10. 33

1.51

1.51

1.51

1.51

1.51

1.51

1. 51

1. 51

1.51

1. 51

0.86

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1. 167
      1.08 | 4.250
                      1.73 | 7.333
                                      2.59 | 10.42
                                                     0.86
1.250
       1.08 | 4.333
                       2.59 | 7.417
                                      2.59
                                             10.50
                                                     0.86
1.333
       1.08
              4.417
                       2.59 | 7.500
                                      2.59
                                             10.58
                                                     0.86
1.417
              4.500
                       2.59 | 7.583
                                      2.59
                                             10.67
        1.08
                                                     0.86
1.500
              4.583
                       2.59 | 7.667
                                      2.59
                                             10.75
       1.08
                                                     0.86
1.583
       1.08
              4.667
                       2.59
                              7.750
                                      2.59
                                             10.83
                                                     0.86
1.667
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               4.750
                       2.59
                              7.833
                                      2.59
                                             10.92
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1.750
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              4.833
                       3.46
                              7. 917
                                             11.00
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1.833
       1.08
               4.917
                       3.46
                              8.000
                                      2.59
                                             11.08
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1.917
        1.08
               5.000
                       3.46
                              8.083
                                      2.59
                                             11.17
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2.000
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                              8. 167
                                      2.59
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                              8. 250
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2.167
        1.08
               5.250
                       3.46
                              8.333
                                      1.51
                                             11.42
                                                     0.86
2.250
               5.333
        1.08
                       5. 18
                              8. 417
                                      1.51
                                             11.50
                                                     0.86
2.333
        1.30
               5.417
                       5. 18
                              8.500
                                      1.51
                                             11.58
                                                     0.86
2.417
               5.500
                              8.583
        1.30
                       5. 18
                                      1.51
                                             11.67
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2.500
        1.30
               5.583
                       5. 18
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2.583
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               5.667
                       5. 18
                              8.750
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                                             11.83
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2.667
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               5.750
                       5. 18
                              8.833
                                      1.51
                                             11.92
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2.750
        1.30
               5.833
                      20.74
                              8. 917
                                      1.51
                                             12.00
                                                     0.86
2.833
        1.30
               5.917
                      20.74
                              9.000
                                      1.51
                                            12.08
                                                     0.86
2.917
        1.30
               6.000
                      20.74
                              9.083
                                      1.51
                                            12. 17
                                                     0.86
3.000
        1.30
               6.083
                      57.02
                              9. 167
                                      1.51
                                            12. 25
                                                     0.86
3.083
       1.30
              6.167
                      57.02 | 9.250
                                      1.51
```

PEAK FLOW (cms)= 0.022 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 9.330
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.216

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.30	6. 250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6. 333	7. 78	9.42	1.51
0.250	0.00	3.333	1.73	6. 417	7. 78	9.50	1.51
0.333	1.08	3.417	1.73	6. 500	7.78	9. 58	1. 51

```
0.417 1.08 | 3.500
                       1. 73 | 6. 583
                                       7.78 | 9.67 1.51
0.500
        1.08 | 3.583
                       1.73 | 6.667
                                       7. 78 | 9. 75
0.583
        1.08 | 3.667
                        1.73 | 6.750
                                       7.78
                                               9.83
                        1. 73 | 6. 833
        1.08 | 3.750
                                              9. 92
0.667
                                       3.46
                                                       1 51
0.750
        1.08 | 3.833
                        1.73 | 6.917
                                       3. 46 | 10. 00
                                                       1.51
0.833
        1.08 | 3.917
                        1.73 | 7.000
                                       3.46
                                              10.08
                                                       1.51
                                       3.46
0.917
        1.08
               4.000
                        1.73 | 7.083
                                              10.17
                                                       1.51
1.000
        1.08 | 4.083
                        1. 73 | 7. 167
                                       3.46
                                              10. 25
                                                       1.51
1.083
        1.08
               4.167
                        1. 73 | 7. 250
                                       3.46
                                              10.33
                                                       0.86
1.167
        1.08
               4.250
                        1. 73 | 7. 333
                                       2.59
                                              10.42
                                                       0.86
1.250
        1.08 İ
               4.333
                        2.59
                              7. 417
                                       2.59
                                              10.50
                                                       0.86
1.333
        1.08 İ
               4.417
                        2.59 | 7.500
                                       2.59
                                              10.58
                                                       0.86
1.417
        1.08 İ
               4.500
                       2.59 | 7.583
                                       2.59
                                              10.67
                                                       0.86
1.500
               4.583
                        2.59 i
                              7.667
        1.08 İ
                                       2.59
                                              10.75
                                                       0.86
1.583
        1.08
               4.667
                        2.59
                              7.750
                                       2.59
                                              10.83
                                                       0.86
               4.750
                        2.59
                              7.833
1.667
        1.08
                                       2.59
                                              10.92
                                                       0.86
1.750
        1.08
               4.833
                        3.46 İ
                              7. 917
                                       2.59
                                              11.00
                                                       0.86
1.833
        1.08
               4.917
                        3.46
                              8.000
                                       2.59
                                              11.08
                                                       0.86
1.917
        1.08
               5.000
                        3.46
                              8.083
                                       2.59
                                              11. 17
                                                       0.86
2.000
        1.08
               5.083
                        3.46
                              8. 167
                                       2.59
                                              11. 25
                                                       0.86
2.083
        1.08
               5.167
                        3.46
                              8. 250
                                       2.59
                                              11. 33
                                                       0.86
2.167
        1.08
               5.250
                        3.46
                              8. 333
                                       1.51
                                              11.42
                                                       0.86
2.250
        1.08
               5.333
                        5. 18
                              8. 417
                                       1.51
                                              11.50
                                                       0.86
2.333
        1.30
               5.417
                        5. 18
                              8.500
                                       1.51
                                              11.58
                                                       0.86
2.417
               5.500
                        5. 18 | 8. 583
                                             11.67
        1.30
                                       1.51
                                                       0.86
2.500
               5.583
                        5. 18 | 8. 667
                                              11. 75
        1.30 l
                                       1.51
                                                       0.86
2.583
        1.30
               5.667
                        5. 18 | 8. 750
                                       1.51
                                             11.83
                                                       0.86
2.667
        1.30
               5.750
                       5. 18 | 8. 833
                                       1.51
                                             11. 92
                                                       0.86
2.750
        1.30 | 5.833
                       20. 74 | 8. 917
                                            12.00
                                       1.51
                                                       0.86
        1.30 | 5.917
                       20.74 | 9.000
2.833
                                       1.51 | 12.08
                                                       0.86
        1.30 | 6.000
2.917
                      20.74 | 9.083
                                       1. 51 | 12. 17
                                                       0.86
                      57. 02 | 9. 167
3.000
        1.30 | 6.083
                                       1. 51 | 12. 25
                                                       0.86
3.083
       1.51
```

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms)= 0.011 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 9.333
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.216

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB

Dep. Storage	(mm) =	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188. 33	40.00
Mannings n	=	0. 130	0. 250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME) HYETOGR	APH	_	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	i' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.30	6. 250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6. 333	7. 78	9.42	1.51
0.250	0.00	3.333	1.73	6. 417	7. 78	9.50	1.51
0.333	1.08	3.417	1.73	6. 500	7.78	9. 58	1. 51
0.417	1.08	3.500	1.73	6. 583	7.78	9. 67	1. 51
0.500	1.08	3.583	1.73	6. 667	7.78	9. 75	1. 51
0.583	1.08	3.667	1. 73	6. 750	7. 78	9.83	1. 51
0.667	1.08	3.750	1. 73	6. 833	3.46	9. 92	1. 51
0.750	1.08	3.833	1. 73	6. 917	3.46	10.00	1. 51
0.833	1.08	3.917	1. 73	7.000	3.46	10.08	1. 51
0. 917	1.08	4.000	1. 73	7. 083	3.46	10.17	1. 51
1.000	1.08	4.083	1. 73	7. 167	3.46	10. 25	1. 51
1. 083	1.08	4.167	1. 73	7. 250	3.46	10. 33	0.86
1. 167	1.08	4.250	1. 73	7. 333	2.59	10. 42	0.86
1. 250	1.08	4.333	2.59	7. 417	2.59	10.50	0.86
1. 333	1.08	4.417	2. 59	7.500	2.59	10. 58	0.86
1. 417	1.08	4.500	2. 59	7. 583	2.59	10. 67	0.86
1.500	1.08	4.583	2. 59	7. 667	2.59	10. 75	0.86
1. 583	1.08	4.667	2. 59	7. 750	2.59	10.83	0.86
1. 667	1.08	4.750	2. 59	7. 833	2.59	10. 92	0.86
1. 750	1.08	4.833	3. 46	7. 917	2.59	11.00	0. 86
1.833	1.08	4.917	3. 46	8.000	2.59	11.08	0.86
1. 917	1.08	5.000	3. 46	8. 083	2.59	11. 17	0. 86
2.000	1.08	5.083	3. 46	8. 167	2.59	11. 25	0.86
2.083	1.08	5.167	3.46	8. 250	2.59	11. 33	0.86
2. 167	1.08	5.250	3.46	8. 333	1.51	11. 42	0.86
2. 250	1.08	5.333	5. 18	8. 417	1.51	11.50	0.86
2. 333 2. 417	1. 30 1. 30	5.417 5.500	5. 18 5. 18	8.500	1. 51 1. 51	11. 58 11. 67	0. 86 0. 86
2.417	1.30		5. 18 5. 18	8. 583	- 1		
2.583	1.30	5.583 5.667	5. 18	8. 667 8. 750	1. 51 1. 51	11. 75 11. 83	0. 86 0. 86
2. 565	1.30	5.750	5. 18	8.833	1.51	11. 63	0.86
2.750	1.30	5.833	20. 74	6. 633 8. 917	1.51	12.00	0.86
2. 730	1.30	5.633 5.917	20. 74	9.000	1.51	12.00	0.86
2. 917	1.30	6.000	20. 74	9.083	1.51	12. 00	0.86
3.000	1.30	6.083	57. 02	9. 167	1.51	12. 17	0.86
3.083	1.30	6.167	57.02	9. 250	1.51	12.23	0.00
5.005	1.30	0.107	57.02	7. 230	1.51		

Unit Hyd. Tpeak	(mi n)=	20.00	40.00	
Unit Hyd. peak	(cms)=	0.06	0.03	
				TOTALS
PEAK FLOW	(cms)=	0. 16	0.04	0.184 (iii)
TIME TO PEAK	(hrs)=	6. 42	6.83	6.42
RUNOFF VOLUME	(mm) =	42. 20	8.84	20. 51
TOTAL RAINFALL	(mm) =	43. 20	43. 20	43. 20
RUNOFF COEFFICII	ENT =	0. 98	0. 20	0. 47

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ la = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB Area (ha)= 3.43 Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00 STANDHYD (0028) | ID= 1 DT= 5.0 min | -----IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 1.71 1.71 Dep. Storage 1.00 5.00 (mm) = Average Slope 2.00 (%)= 1.00 Length (m) =40.00 151. 22 Mannings n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH									
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN			
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr			
0.083	0.00	3.167	1.30	6. 250	57.02	9.33	1.51			
0. 167	0.00	3.250	1.30	6. 333	7.78	9.42	1.51			
0. 250	0.00	3.333	1. 73	6. 417	7. 78	9.50	1. 51			
0.333	1.08	3.417	1.73	6. 500	7.78	9.58	1.51			
0.417	1.08	3.500	1. 73	6. 583	7. 78	9.67	1. 51			
0.500	1.08	3.583	1.73	6. 667	7.78	9.75	1.51			
0.583	1.08	3.667	1.73	6. 750	7.78	9.83	1.51			
0.667	1.08	3.750	1. 73	6. 833	3.46	9. 92	1. 51			
0.750	1.08	3.833	1.73	6. 917	3. 46	10.00	1. 51			
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1. 51			
0. 917	1.08	4.000	1. 73	7. 083	3.46	10. 17	1. 51			
1.000	1.08	4.083	1.73	7. 167	3.46	10. 25	1. 51			
1.083	1.08	4.167	1.73	7. 250	3.46	10.33	0.86			
1. 167	1.08	4.250	1.73	7. 333	2.59	10.42	0.86			
1. 250	1.08	4.333	2.59	7. 417	2.59	10.50	0.86			
1. 333	1.08	4.417	2.59	7.500	2.59	10.58	0.86			
1. 417	1.08	4.500	2. 59	7. 583	2.59	10. 67	0.86			

	1.500	1.08	4.583	2. 59	7.667	2.59	10.75	0.86
	1. 583	1.08	4.667	2. 59	7. 750	2. 59	10.83	0. 86
	1. 667	1.08	4.750	2. 59	7. 833	2. 59	10.92	0. 86
	1. 750	1.08	4.833	3. 46	7. 917	2. 59	11.00	0.86
	1.833	1.08	4. 917	3.46	8.000	2.59	11.08	0.86
	1. 917	1.08	5.000	3.46	8. 083	2.59	11. 17	0.86
	2.000	1.08	5.083	3.46	8. 167	2.59	11. 25	0.86
	2.083	1.08	5.167	3.46	8. 250	2.59	11. 33	0.86
	2.167	1.08	5.250	3.46	8. 333	1.51	11.42	0.86
	2. 250	1.08	5.333	5. 18	8. 417	1.51	11.50	0.86
	2. 333	1.30	5.417	5. 18	8. 500	1.51	11.58	0.86
	2. 417	1.30	5.500	5. 18	8. 583	1.51	11. 67	0.86
	2.500	1.30	5.583	5. 18	8. 667	1.51	11. 75	0.86
	2. 583	1.30	5.667	5. 18	8. 750	1.51	11.83	0.86
	2.667	1.30	5.750	5. 18	8.833	1. 51	11. 92	0.86
	2.750	1.30	5.833	20.74	8. 917	1. 51	12.00	0.86
	2.833	1.30	5.917	20. 74	9.000	1. 51	12.08	0. 86
	2. 917	1. 30	6.000	20. 74	9. 083	1. 51	12. 17	0. 86
	3.000	1.30	6.083	57. 02	9. 167	1. 51	12. 25	0. 86
	3. 083	1. 30	6. 167	57. 02	9. 250	1. 51		
Max. Eff. I	nten. (mm/	hr)=	57. 02		17. 16			
	over (m	i n)	5.00		20.00			
Storage C	oeff. (m	i n) =	4. 10	(ii)	18.38 (ii)			
Unit Hyd.	Tpeak (m	i n) =	5.00		20.00			
Unit Hyd.	peak (c	ms)=	0.24		0.06			
						T0	TALS	
PEAK FLOW		ms)=	0. 19		0.04		215 (iii)
TIME TO P		rs)=	6. 25		6. 42		5. 25	
RUNOFF VO	,	mm) =	42. 20		8. 84		0. 52	
TOTAL RAI		mm) =	43. 20		43. 20		3. 20	
RUNOFF CO	EFFI CI ENT	=	0. 98		0. 20	(0. 47	
*** WARNI NG:	STORAGE	COEFF. I	S SMALLE	R THAN	TIME STEP!			

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- $CN^* = 59.0$ Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
- THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029) IN= 2> OUT= 1	OVERFLOW I	S OFF				
DT= 5.0 min	OUTFLOW (cms) 0.0000 0.1100	STORAGE (ha.m.) 0.0000 0.0700	(ha. m.) 0.0000		STORAGE (ha.m.) 0.1300 0.0000	
	ARE (ha			TPEAK (hrs)	R. V. (mm)	

INFLOW: ID= 2 (0028) 3.430 0. 215 6. 25 20.52 OUTFLOW: ID= 1 (0029) 3.430 0.048 6. 75 20.47

> PEAK FLOW REDUCTION [Qout/Qin](%) = 22.32 TIME SHIFT OF PEAK FLOW (min) = 30.00MAXIMUM STORAGE USED (ha. m.) = 0.0306

_____ -----

CALIB NASHYD (0042) Area (ha)= 2.05 Curve Number (CN)= 73.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 ----- U. H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME) HYETOGR	APH	_	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs		' hrs			
0.083	0.00	3.167		6. 250	57.02	9.33	1. 51
0. 167	0.00	3.250	1. 30	6. 333		9.42	1. 51
0.250	0.00	3.333	1. 73	6. 417	7. 78	9.50	1. 51
0.333	1.08	3.417	1. 73	6. 500	7. 78	9.58	1. 51
0.417	1.08	3.500	1. 73	6. 583	7. 78	9.67	1. 51
0.500	1.08	3.583	1. 73	6. 667	7. 78	9.75	1. 51
0.583	1.08	3.667	1. 73	6. 750	7. 78	9.83	1. 51
0.667	1.08	3.750	1. 73	6. 833	3.46	9. 92	1. 51
0.750	1.08	3.833	1. 73	6. 917	3.46	10.00	1. 51
0.833	1.08	3.917	1. 73	7.000	3.46	10.08	1. 51
0. 917	1.08		1. 73	7. 083	3.46	10. 17	1. 51
1.000	1.08	4.083	1. 73	7. 167	3.46	10. 25	1. 51
1.083	1.08	4.167	1. 73	7. 250	3.46	10. 33	0.86
1. 167	1.08	4.250	1. 73	7. 333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7. 417	2.59	10.50	0.86
1.333	1.08	4.417	2. 59	7. 500	2.59	10. 58	0.86
1.417	1.08	4.500	2.59	7. 583	2.59	10.67	0.86
1.500	1.08	4.583	2. 59	7. 667	2.59	10. 75	0.86
1.583	1.08	4.667	2.59	7. 750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7. 833	2.59	10. 92	0.86
1.750	1.08	4.833	3.46	7. 917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1. 917	1.08	5.000	3.46	8. 083	2.59	11. 17	0.86
2.000	1.08	5.083	3. 46	8. 167	2. 59	11. 25	0.86
2.083	1.08	5.167	3.46	8. 250	2.59	11. 33	0.86
2. 167	1.08	5.250	3.46	8. 333	1.51	11.42	0.86
2.250	1.08	5.333	5. 18	8. 417	1.51	11.50	0.86
2.333	1.30		5. 18	8. 500	1.51	11.58	0.86
2.417	1.30	5.500	5. 18	8. 583	1.51	11.67	0.86
2.500	1.30		5. 18	8. 667	1.51	11. 75	0.86
2.583	1.30		5. 18	8. 750	1.51	11.83	0.86
2.667	1.30	5.750	5. 18	8. 833	1.51	11. 92	0.86

```
1. 30 | 5. 917 20. 74 | 9. 000
                                           1.51 | 12.08
                                                        0.86
           2.833
            2.917
                 1.30 | 6.000
                              20.74 | 9.083
                                           1.51 | 12.17
                                                        0.86
            3.000
                 1. 30 | 6. 083 | 57. 02 | 9. 167
                                           1.51 | 12.25
                                                        0.86
           3.083
                 1.51
   Unit Hyd Qpeak (cms) = 0.356
   PEAK FLOW
               (cms) = 0.046 (i)
   TIME TO PEAK (hrs) = 6.333
   RUNOFF VOLUME (mm) = 8.657
   TOTAL RAINFALL (mm) = 43.200
   RUNOFF COEFFICIENT = 0.200
   (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
ADD HYD ( 0007)|
 1 + 2 = 3
                      AREA QPEAK
                                   TPEAK
                                          R. V.
                      (ha)
                           (cms)
                                   (hrs)
                                          (mm)
    ID1= 1 ( 0023):
                     0. 41 0. 011
                                   6.33
                                          9.33
    + ID2= 2 ( 0029):
                     3. 43 0. 048
                                   6. 75 20. 47
     _____
     ID = 3 (0007):
                     3.84 0.054
                                   6. 42 19. 28
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
_____
| ADD HYD ( 0007)|
 3 + 2 = 1
                      AREA
                           QPEAK
                                   TPEAK
                                         R. V.
                      (ha)
                          (cms)
                                   (hrs)
                                          (mm)
    ID1= 3 ( 0007):
                      3.84 0.054
                                   6. 42 19. 28
    + ID2= 2 ( 0042):
                      2. 05 0. 046
                                   6.33
                                        8.66
     _____
                                  ______
     ID = 1 (0007):
                      5. 89 0. 098
                                   6. 33 15. 58
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0007)|
 1 + 2 = 3
                      AREA
                           QPEAK
                                          R. V.
                                   TPEAK
                      (ha)
                            (cms)
                                   (hrs)
                                         (mm)
     ID1 = 1 (0007):
                      5. 89 0. 098
                                   6. 33 15. 58
                      5. 32 0. 184
                                   6. 42 20. 51
    + ID2= 2 ( 0005):
     -----
     ID = 3 ( 0007): 11.21 0.282
                                   6. 42 17. 92
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

1.51 | 12.00

0.86

RESERVOIR(0008) IN= 2> OUT= 1	OVERFLOW	IS OFF			
DT= 5.0 min	OUTFLOW	STORAGE	OUTFL	_OW	STORAGE
	(cms)	(ha.m.)	(cms	,	(ha.m.)
	0.0000	0.0000	0.33		0. 1535
	0. 0410	0. 0120	0.38		0. 1758
	0. 0580 0. 0710	0. 0253 0. 0399	0.53		0. 1989 0. 2228
	0. 0830	0. 0559	0.03		0. 2476
	0. 0920	0. 0732	0. 80		0. 2733
	0. 1010	0. 0918	0.87		0. 2998
	0. 2130	0. 1116	0. 93	320	0. 3263
	0. 2860	0. 1321	0.98	380	0. 3528
	ΛD	EA QPEAH	/ TDI	EAK	R. V.
		a) (cms)			(mm)
INFLOW: ID= 2 (0			282	6 42	17 92
OUTFLOW: ID= 1 (0008) 11.	210 0. 2 210 0. 0	088	7. 67	17. 92
TII	AK FLOW RI MESHIFT OF PI KIMUM STORAGI	EDUCTION [QC EAK FLOW E USED	(mi	n) = 75	5 00
ADD HYD (0016)					
1 + 2 = 3		QPEAK		R. V.	
		(cms)	(hrs)	(mm)	
ID1= 1 (0022	2): 0.83		6. 33	9.33	
+ ID2= 2 (0008	,			17. 92 ======	<u> </u>
ID = 3 (0010)				17.33	
NOTE: PEAK FLOWS	S DO NOT INCL	UDE BASEFLOW	WS IF ANY	Y .	

***********	********	****			
CALIB NASHYD (0022) ID= 1 DT= 5.0 min	Area (ha Ia (mm U.H. Tp(hrs				(CN) = 75.0 es. (N) = 3.00
	0.11. 1p(111.3)= 0.19			

---- TRANSFORMED HYETOGRAPH ----

RAIN | TIME RAIN | TIME RAIN | TIME

TIME

```
mm/hr |' hrs mm/hr | hrs
  hrs mm/hr |
               hrs
                                                      mm/hr
0.083
       0.00
              3.167
                       2.59 | 6.250 114.05 |
                                              9.33
                                                      3.02
0.167
        0.00
              3.250
                       2.59 | 6.333
                                     15.55
                                              9.42
                                                      3.02
0.250
       0.00 | 3.333
                                              9.50
                       3. 46 | 6. 417
                                      15.55
                                                      3.02
                                              9.58
0.333
        2.16 | 3.417
                       3. 46 | 6. 500
                                      15.55
                                                      3.02
        2.16 | 3.500
                       3. 46 | 6. 583
0.417
                                      15.55
                                              9.67
                                                      3.02
               3.583
0.500
       2.16
                       3. 46 | 6. 667
                                      15.55
                                              9.75
                                                      3.02
0.583
        2.16
               3.667
                       3. 46 | 6. 750
                                      15.55
                                              9.83
                                                      3.02
0.667
        2.16
               3.750
                       3. 46 | 6. 833
                                       6. 91
                                              9. 92
                                                      3.02
0.750
                              6. 917
        2.16
               3.833
                       3.46
                                       6. 91
                                              10.00
                                                      3.02
0.833
        2.16
               3.917
                       3.46
                              7.000
                                       6. 91
                                              10.08
                                                      3.02
0.917
        2.16
               4.000
                       3.46
                              7.083
                                       6. 91
                                              10.17
                                                      3.02
1.000
        2.16
               4.083
                       3.46
                              7. 167
                                       6. 91
                                              10. 25
                                                      3.02
1.083
               4.167
                              7. 250
                                              10.33
        2.16
                       3.46
                                       6.91
                                                      1.73
1.167
        2.16
               4.250
                       3. 46
                              7.333
                                       5. 18
                                              10.42
                                                      1.73
1.250
               4.333
                       5. 18
                              7. 417
                                              10.50
        2.16
                                       5. 18
                                                      1.73
1.333
        2.16
               4.417
                        5. 18
                              7.500
                                       5.18
                                              10.58
                                                      1.73
1.417
        2.16
               4.500
                       5. 18
                              7.583
                                       5. 18
                                              10.67
                                                      1.73
               4.583
1.500
        2.16
                       5. 18
                              7.667
                                       5. 18
                                              10.75
                                                      1.73
1.583
        2.16
               4.667
                        5. 18
                              7.750
                                       5. 18
                                              10.83
                                                      1.73
1.667
        2.16
               4.750
                       5. 18
                              7.833
                                       5. 18
                                              10.92
                                                      1.73
1.750
        2.16
               4.833
                       6. 91
                              7. 917
                                       5. 18
                                              11.00
                                                      1.73
1.833
        2.16
               4.917
                       6. 91
                              8.000
                                       5. 18
                                              11.08
                                                      1.73
1.917
        2.16
               5.000
                       6. 91
                              8.083
                                       5. 18
                                              11. 17
                                                      1.73
2.000
        2.16
               5.083
                              8. 167
                                              11. 25
                                                      1.73
                       6. 91
                                       5. 18
2.083
        2.16
               5.167
                       6. 91
                              8. 250
                                       5.18
                                              11.33
                                                      1.73
2.167
        2.16
               5.250
                       6. 91
                              8. 333
                                       3.02
                                              11.42
                                                      1.73
2.250
        2.16
               5.333
                       10.37
                              8. 417
                                       3.02
                                              11.50
                                                      1.73
2.333
        2.59
               5.417
                       10.37
                              8.500
                                       3.02
                                              11.58
                                                      1.73
2.417
                              8. 583
        2.59
               5.500
                       10.37
                                       3.02
                                              11.67
                                                      1.73
2.500
        2.59
               5.583
                       10.37
                              8.667
                                       3.02
                                              11.75
                                                      1.73
2.583
                       10. 37
                              8.750
                                              11.83
        2.59
               5.667
                                       3.02
                                                      1.73
2.667
               5.750
                       10. 37
                              8.833
                                              11.92
        2.59
                                       3.02
                                                      1.73
2.750
        2.59
               5.833
                       41. 47 | 8. 917
                                       3.02
                                             12.00
                                                      1.73
2.833
        2.59
               5.917
                       41. 47 | 9. 000
                                       3.02
                                             12.08
                                                      1.73
2.917
        2.59
               6.000
                      41. 47 | 9. 083
                                       3.02
                                             12.17
                                                      1.73
3.000
        2.59
               6.083
                     114.05 | 9.167
                                       3.02 | 12.25
                                                      1.73
3.083
       2.59 | 6.167 | 114.05 | 9.250
                                       3.02
```

PEAK FLOW (cms) = 0.092 (i)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 36.155
TOTAL RAINFALL (mm) = 86.400
RUNOFF COEFFICIENT = 0.418

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

			ANSFURIME		KAPH		
TIME	RAIN		RAIN	' TIME			RAIN
hrs	mm/hr	hrs	mm/hr	' hrs			mm/hr
0.083	0.00	3.167	2.59		114. 05	9. 33	3. 02
0. 167	0.00	3.250	2.59		15. 55	9. 42	3. 02
0. 250	0.00	3.333	3.46		15. 55	9.50	3. 02
0. 333	2.16	3.417	3.46		15. 55	9. 58	3.02
0.417	2.16	3.500	3.46	6. 583	15. 55	9. 67	3.02
0.500	2.16	3.583	3.46	6. 667	15. 55	9. 75	3.02
0. 583	2.16	3.667	3.46	6. 750	15. 55	9.83	3.02
0.667	2.16	3.750	3.46	6. 833	6. 91	9. 92	3. 02
0.750	2.16	3.833	3.46	6. 917	6. 91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6. 91	10.08	3.02
0. 917	2.16	4.000	3.46	7. 083	6. 91	10. 17	3.02
1.000	2.16	4.083	3.46	7. 167	6. 91	10. 25	3.02
1.083	2.16	4.167	3.46	7. 250	6. 91	10.33	1.73
1. 167	2.16	4.250	3.46	7. 333	5. 18	10.42	1. 73
1. 250	2.16	4.333	5. 18	7. 417	5. 18	10.50	1. 73
1.333	2.16	4.417	5. 18	7. 500	5. 18	10.58	1.73
1. 417	2.16	4.500	5. 18	7. 583	5. 18	10.67	1. 73
1.500	2.16	4.583	5. 18	7. 667	5. 18	10. 75	1.73
1.583	2.16	4.667	5. 18	7. 750	5. 18	10.83	1. 73
1.667	2.16	4.750	5. 18	7. 833	5. 18	10. 92	1.73
1.750	2.16	4.833	6. 91	7. 917	5. 18	11.00	1.73
1.833	2.16	4.917	6. 91	8.000	5. 18	11.08	1. 73
1. 917	2.16	5.000	6. 91	8. 083	5. 18	11. 17	1.73
2.000	2.16	5.083	6. 91	8. 167	5. 18	11. 25	1. 73
2.083	2.16	5.167	6. 91	8. 250	5. 18	11. 33	1.73
2. 167	2.16	5.250	6. 91	8. 333	3.02	11.42	1. 73
2.250	2.16	5.333	10.37	8. 417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8. 500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8. 583	3.02	11. 67	1.73
2.500	2.59	5.583	10.37	8. 667	3.02	11. 75	1.73
2.583	2.59	5.667	10.37	8. 750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8. 833	3.02	11. 92	1.73
2.750	2.59	5.833	41.47	8. 917	3.02	12.00	1.73
2.833	2.59	5.917	41. 47	9. 000	3.02	12.08	1.73
2. 917	2.59	6.000	41. 47	9. 083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9. 167	3.02	12. 25	1.73
3.083	2.59	6.167	114.05	9. 250	3.02		

Unit Hyd Opeak (cms) = 0.078

PEAK FLOW (cms)= 0.044 (i) TIME TO PEAK (hrs)= 6.333 RUNOFF VOLUME (mm) = 36.170 TOTAL RAINFALL (mm) = 86.400 RUNOFF COEFFICIENT = 0.419

Mannings n

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) | Area (ha)= 5.32 |ID= 1 DT= 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 2.66 2.66 Dep. Storage (mm) = 1.00 5.00 Average Slope (%)= 1.00 1.00 Length (m) =188.33 40.00

0.130 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME	HYETOGE	RAPH	-	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.59	6. 250	114.05	9. 33	3.02
0. 167	0.00	3.250	2.59	6. 333	15. 55	9.42	3.02
0.250	0.00	3.333	3.46	6. 417	15. 55	9.50	3.02
0.333	2.16	3.417	3.46	6. 500	15. 55	9. 58	3.02
0.417	2.16	3.500	3.46	6. 583	15. 55	9. 67	3.02
0.500	2.16	3.583	3.46	6. 667	15. 55	9. 75	3.02
0.583	2.16	3.667	3.46	6. 750	15. 55	9.83	3.02
0.667	2.16	3.750	3.46	6. 833	6. 91	9. 92	3.02
0.750	2.16	3.833	3.46	6. 917	6. 91	10.00	3. 02
0.833	2.16	3.917	3.46	7.000	6. 91	10.08	3.02
0. 917	2.16	4.000	3.46	7. 083	6. 91	10. 17	3. 02
1.000	2.16	4.083	3.46	7. 167	6. 91	10. 25	3. 02
1.083	2.16	4.167	3. 46	7. 250	6. 91	10. 33	1. 73
1. 167	2.16	4.250	3. 46	7. 333	5. 18	10.42	1. 73
1. 250	2.16	4.333	5. 18	7. 417	5. 18	10.50	1. 73
1. 333	2.16	4.417	5. 18	7. 500	5. 18	10. 58	1. 73
1. 417	2.16	4.500	5. 18	7. 583	5. 18	10. 67	1. 73
1.500	2.16	4.583	5. 18	7. 667	5. 18	10. 75	1. 73
1. 583	2.16	4.667	5. 18	7. 750	5. 18	10.83	1. 73
1. 667	2.16	4.750	5. 18	7. 833	5. 18	10. 92	1. 73
1. 750	2.16	4.833	6. 91	7. 917	5. 18	11.00	1. 73
1.833	2.16	4.917	6. 91	8. 000	5. 18	11. 08	1. 73
1. 917	2.16	5.000	6. 91	8. 083	5. 18	11. 17	1. 73
2.000	2.16	5.083	6. 91	8. 167	5. 18	11. 25	1. 73
2.083	2.16	5.167	6. 91	8. 250	5. 18	11. 33	1. 73
2. 167	2.16	5.250	6. 91	8. 333	3. 02	11. 42	1. 73
2. 250	2.16	5.333	10. 37	8. 417	3. 02	11.50	1. 73

0.250

2. 333 2. 56 2. 417 2. 59 2. 500 2. 55 2. 583 2. 56 2. 667 2. 55 2. 833 2. 56 2. 750 2. 55 2. 833 2. 56 3. 000 2. 56 3. 083 2. 56	9 5.500 9 5.583 9 5.667 9 5.750 9 5.833 9 5.917 9 6.000 9 6.083	10. 37 8. 500 10. 37 8. 583 10. 37 8. 667 10. 37 8. 750 10. 37 8. 833 41. 47 8. 917 41. 47 9. 000 41. 47 9. 083 114. 05 9. 167 114. 05 9. 250	3.02 11.58 3.02 11.67 3.02 11.75 3.02 11.83 3.02 11.92 3.02 12.00 3.02 12.08 3.02 12.17 3.02 12.25 3.02	1. 73 1. 73 1. 73 1. 73 1. 73 1. 73 1. 73 1. 73
Max. Eff. Inten. (mm/hr)=	114.05	61.59		
over (min)	15. 00	25. 00		
Storage Coeff. (min)=	14. 11	(ii) 24.66 (ii)		
Unit Hyd. Tpeak (min)=	15. 00	25.00		
Unit Hyd. peak (cms)=	0.08	0. 05		
			TOTALS	
PEAK FLOW (cms)=	0.39	0. 20	0.542 (iii)	
TIME TO PEAK (hrs)=	6. 33	6.50	6. 42	
RUNOFF VOLUME (mm)=	85.40	31. 21	50. 18	
TOTAL RAINFALL (mm)=	86. 40	86. 40	86. 40	
RUNOFF COEFFICIENT =	0. 99	0. 36	0. 58	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0028) ID= 1 DT= 5.0 min	Area Total	` '	3.43 0.00 Dir.	Conn. (%)=	35.00
		1 ()		. ,	
		I MPERVI OUS	S PERVIOU	S (i)	
Surface Area	(ha)=	1. 71	1. 71	. ,	
Dep. Storage	(mm) =	1.00	5.00		
Average Slope	(%)=	1.00	2.00		
Length	(m)=	151. 22	40.00		
Mannings n	=	0. 013	0. 250		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORMEI	D HYETOG	RAPH	-	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.59	6. 250	114.05	9. 33	3.02
0. 167	0.00	3.250	2.59	6. 333	15. 55	9.42	3.02
0.250	0.00	3.333	3.46	6. 417	15. 55	9.50	3.02

```
0.417
                   2.16
                          3.500
                                   3.46
                                          6. 583
                                                  15.55
                                                           9.67
                                                                   3.02
          0.500
                   2.16
                          3.583
                                   3.46
                                          6.667
                                                  15.55
                                                           9.75
                                                                   3.02
          0.583
                                          6.750
                                                           9.83
                          3.667
                                                  15.55
                                                                   3.02
                   2.16
                                   3.46
                          3.750
                                                           9. 92
          0.667
                   2.16
                                   3.46 | 6.833
                                                   6.91
                                                                   3.02
          0.750
                   2.16
                          3.833
                                   3.46
                                          6. 917
                                                   6.91
                                                          10.00
                                                                   3.02
                          3.917
          0.833
                   2.16
                                   3.46
                                          7.000
                                                   6.91
                                                          10.08
                                                                   3.02
          0.917
                   2.16
                          4.000
                                   3.46
                                          7.083
                                                   6.91
                                                          10.17
                                                                   3.02
          1.000
                   2.16
                          4.083
                                   3.46
                                          7. 167
                                                   6.91
                                                          10. 25
                                                                   3.02
          1.083
                   2.16
                          4.167
                                   3.46
                                          7. 250
                                                   6.91
                                                          10.33
                                                                   1.73
          1.167
                   2.16
                          4.250
                                   3.46
                                          7.333
                                                   5. 18
                                                          10.42
                                                                   1.73
          1.250
                   2.16
                          4.333
                                   5. 18
                                          7. 417
                                                   5. 18
                                                          10.50
                                                                   1.73
          1.333
                   2.16
                          4.417
                                   5. 18
                                          7.500
                                                   5.18
                                                          10.58
                                                                   1.73
          1.417
                          4.500
                                          7. 583
                                                          10.67
                   2.16
                                   5. 18
                                                   5.18
                                                                   1.73
          1.500
                   2.16
                          4.583
                                   5. 18
                                          7.667
                                                   5. 18
                                                          10.75
                                                                   1.73
          1.583
                          4.667
                                          7.750
                                                          10.83
                   2.16
                                   5. 18
                                                   5. 18
                                                                   1.73
          1.667
                   2.16
                          4.750
                                   5. 18
                                          7.833
                                                   5.18
                                                           10.92
                                                                   1.73
                   2.16
          1.750
                          4.833
                                   6. 91
                                          7. 917
                                                   5. 18
                                                          11.00
                                                                   1.73
          1.833
                   2.16
                          4.917
                                   6. 91
                                          8.000
                                                   5. 18
                                                          11.08
                                                                   1.73
          1.917
                   2.16
                          5.000
                                   6. 91
                                          8.083
                                                   5. 18
                                                          11.17
                                                                   1.73
          2.000
                   2.16
                          5.083
                                   6. 91
                                          8. 167
                                                   5. 18
                                                          11. 25
                                                                   1.73
          2.083
                   2.16
                          5.167
                                   6. 91
                                          8. 250
                                                   5. 18
                                                          11.33
                                                                   1.73
          2.167
                   2.16
                          5.250
                                   6. 91
                                          8. 333
                                                   3.02
                                                          11.42
                                                                   1.73
                                          8. 417
          2.250
                   2.16
                          5.333
                                   10.37
                                                   3.02
                                                          11.50
                                                                   1.73
          2.333
                   2.59
                          5.417
                                  10.37
                                          8.500
                                                   3.02
                                                          11.58
                                                                   1.73
          2.417
                   2.59
                          5.500
                                  10.37
                                          8. 583
                                                   3.02
                                                          11.67
                                                                   1.73
          2.500
                   2.59
                          5.583
                                  10.37
                                          8.667
                                                   3.02
                                                          11.75
                                                                   1.73
          2.583
                   2.59
                          5.667
                                  10.37
                                          8.750
                                                   3.02
                                                          11.83
                                                                   1.73
          2.667
                   2.59
                          5.750
                                  10.37
                                          8.833
                                                   3.02
                                                          11. 92
                                                                   1.73
          2.750
                          5.833
                                          8. 917
                                                          12.00
                   2.59
                                  41.47
                                                   3.02
                                                                   1.73
          2.833
                          5.917
                                          9.000
                                                          12.08
                   2.59
                                  41.47
                                                   3.02
                                                                   1.73
          2.917
                          6.000
                                  41. 47
                                          9.083
                                                          12.17
                   2.59
                                                   3.02
                                                                   1.73
          3.000
                          6.083
                                 114.05
                                          9. 167
                                                                   1.73
                   2.59
                                                   3.02
                                                          12. 25
                                 114.05 9.250
          3.083
                   2.59
                          6.167
                                                   3.02
Max. Eff. Inten. (mm/hr)=
                          114.05
                                        66.34
          over (min)
                            5.00
                                        15.00
Storage Coeff. (min)=
                            3.11 (ii)
                                        11.42 (ii)
Unit Hyd. Tpeak (min)=
                            5.00
                                        15.00
Unit Hyd. peak (cms)=
                            0.27
                                         0.09
                                                     *TOTALS*
PEAK FLOW
                            0.38
                                         0.20
                                                       0.551 (iii)
                (cms) =
TIME TO PEAK
                (hrs)=
                            6. 25
                                         6.33
                                                        6.25
RUNOFF VOLUME
                (mm) =
                           85.40
                                        31.21
                                                       50.18
```

3. 46 | 6. 500

15.55

9.58

3.02

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(mm) =

TOTAL RAINFALL

RUNOFF COEFFICIENT =

0.333

2.16 | 3.417

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

86.40

0.99

86.40

0.36

86.40

0.58

THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029) IN= 2> OUT= 1 DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)		(ha.m.)
TI	(ha 0028) 3.4) (cms) 30 0.5 30 0.5 DUCTION [QCAK FLOW	123 6.75 out/Qin](%) = 2 (min) = 3	(mm) 50. 18 50. 13
CALIB	Area (ha) Ia (mm) U.H. Tp(hrs) ALL WAS TRANSF	= 0.22		
		TRANSFORME	ED HYFTOGRAPH	

		TRA	ANSFORME) HYETOGI	RAPH	-	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.59	6. 250	114.05	9.33	3.02
0. 167	0.00	3.250	2.59	6. 333	15. 55	9.42	3.02
0.250	0.00	3.333	3.46	6. 417	15. 55	9.50	3.02
0.333	2.16	3.417	3.46	6. 500	15. 55	9. 58	3.02
0.417	2.16	3.500	3.46	6. 583	15. 55	9.67	3.02
0.500	2.16	3.583	3.46	6. 667	15. 55	9.75	3.02
0.583	2.16	3.667	3.46	6. 750	15. 55	9.83	3.02
0.667	2.16	3.750	3.46	6. 833	6. 91	9. 92	3.02
0.750	2.16	3.833	3.46	6. 917	6. 91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6. 91	10.08	3. 02
0. 917	2.16	4.000	3.46	7. 083	6. 91	10. 17	3.02
1.000	2.16	4.083	3.46	7. 167	6. 91	10. 25	3. 02
1. 083	2.16	4.167	3.46	7. 250	6. 91	10.33	1. 73
1. 167	2.16	4.250	3.46	7. 333	5. 18	10.42	1.73
1. 250	2.16	4.333	5. 18	7. 417	5. 18	10.50	1. 73
1. 333	2.16	4.417	5. 18	7. 500	5. 18	10.58	1. 73
1. 417	2.16	4.500	5. 18	7. 583	5. 18	10.67	1. 73
1.500	2.16	4.583	5. 18	7. 667	5. 18	10. 75	1. 73

```
1.583
       2.16 | 4.667
                        5. 18 | 7. 750
                                        5. 18 | 10. 83
                                                       1. 73
       2.16 | 4.750
                        5. 18 | 7. 833
                                        5. 18 | 10. 92
1. 667
                                                        1.73
1.750
        2.16 | 4.833
                        6. 91 | 7. 917
                                        5. 18 | 11. 00
                                                        1.73
               4.917
                        6. 91 | 8. 000
1.833
        2.16
                                        5. 18 | 11. 08
                                                        1.73
        2.16 | 5.000
                        6. 91 | 8. 083
                                        5. 18 | 11. 17
1. 917
                                                        1.73
2.000
        2.16 | 5.083
                        6. 91 | 8. 167
                                        5. 18 | 11. 25
                                                        1.73
2.083
        2.16
               5.167
                        6. 91 | 8. 250
                                        5. 18
                                               11.33
                                                        1.73
2. 167
        2.16
               5.250
                        6. 91 | 8. 333
                                        3.02
                                               11, 42
                                                        1.73
2.250
        2.16
               5.333
                       10.37
                               8. 417
                                        3.02
                                               11.50
                                                        1.73
2.333
        2.59
               5.417
                       10.37
                               8.500
                                        3.02
                                               11.58
                                                        1.73
2.417
         2.59
               5.500
                        10.37
                               8.583
                                               11.67
                                        3.02
                                                        1.73
                       10.37
2.500
         2.59
               5.583
                               8.667
                                        3. 02 İ
                                               11.75
                                                        1.73
2.583
         2.59
               5.667
                       10.37
                               8.750
                                        3. 02 İ
                                               11.83
                                                        1.73
               5.750
2.667
         2.59
                       10.37
                               8.833
                                        3. 02 İ
                                               11. 92
                                                        1.73
2.750
        2.59
               5.833
                       41.47
                               8. 917
                                        3.02
                                               12.00
                                                        1.73
               5.917
2.833
         2.59
                       41.47
                               9.000
                                        3.02 |
                                               12.08
                                                        1.73
2.917
         2.59
               6.000
                       41. 47 | 9. 083
                                        3.02 İ
                                               12. 17
                                                        1.73
3.000
        2.59
               6.083 114.05 | 9.167
                                        3. 02 | 12. 25
                                                        1.73
3.083
        2.59 | 6.167 | 114.05 | 9.250
                                        3.02
```

PEAK FLOW (cms) = 0.197 (i)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 34.220
TOTAL RAINFALL (mm) = 86.400
RUNOFF COEFFICIENT = 0.396

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| ADD HYD ( 0007)|
1 + 2 = 3
                    AREA
                         QPEAK
                                TPEAK
                                       R. V.
_____
                    (ha)
                         (cms)
                                (hrs)
                                       (mm)
                                      36.17
    ID1= 1 ( 0023):
                    0.41 0.044
                                6. 33
   + ID2= 2 ( 0029):
                    3. 43 0. 123
                                6. 75 50. 13
     ______
     ID = 3 (0007):
                    3. 84 0. 151
                                6. 42 48. 64
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007) 3 + 2 = 1	AREA (ha) 3.84 2.05	QPEAK (cms) 0.151 0.197	TPEAK (hrs) 6. 42 6. 33	R. V. (mm) 48.64 34.22
======================================	====== 5. 89	 0. 345	6. 33	43.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ______ | ADD HYD (0007)| AREA 1 + 2 = 3 QPEAK TPEAK R. V. -----(ha) (cms) (hrs) (mm) ID1= 1 (0007): 5. 89 0. 345 6. 33 43. 62 + ID2= 2 (0005): 5. 32 0. 542 6. 42 50. 18 ______ ID = 3 (0007): 11.21 0.8836. 33 46. 73 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. RESERVOIR (0008) OVERFLOW IS OFF IN= 2---> OUT= 1 DT= 5.0 min | OUTFLOW STORAGE OUTFLOW STORAGE -----(cms) (ha.m.) (cms) (ha.m.) 0.0000 0.0000 0.3390 0.1535 0.0410 0.0120 0.3840 0.1758 0.0580 0.0253 0.5390 0.1989 0.0710 0.0399 0.6480 0.2228 0.0830 0.0559 0.7320 0.2476 0.0920 0.0732 0.8050 0.2733 0. 1010 0.0918 0.8710 0.2998 0.2130 0. 1116 0. 9320 0.3263 0. 2860 0. 1321 0.9880 0.3528 AREA QPEAK **TPEAK** R. V. (ha) (hrs) (mm) (cms) INFLOW: ID= 2 (0007) 11.210 0.883 6. 33 46.73 OUTFLOW: ID= 1 (0008) 11.210 0. 359 7.00 46.73 PEAK FLOW REDUCTION [Qout/Qin](%) = 40.62 TIME SHIFT OF PEAK FLOW (min) = 40.00MAXIMUM STORAGE USED (ha. m.) = 0.1634| ADD HYD (0016)| 1 + 2 = 3 AREA QPEAK **TPEAK** R. V. (ha) (cms) (hrs) (mm) ID1= 1 (0022): 0.092 0.83 6. 33 36.15 + ID2= 2 (0008): 11. 21 0. 359 7.00 46.73 _____ ID = 3 (0016): 12. 04 0. 377

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN I' TIME RAIN I TIME RAIN mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs 0.083 0.00 3.167 1.73 6. 250 76.03 9.33 2.02 0.167 0.00 3.250 1. 73 İ 6.333 10.37 9.42 2.02 0.250 0.00 3.333 2.30 6. 417 10.37 9.50 2.02 0.333 1.44 3.417 2.30 6.500 10.37 9.58 2.02 0.417 1.44 3.500 2.30 6. 583 10.37 9.67 2.02 0.500 1.44 3.583 2.30 6.667 10.37 9.75 2.02 0.583 1.44 3.667 2.30 6.750 10.37 9.83 2.02 0.667 1.44 3.750 2.30 6.833 9. 92 2.02 4.61 0.750 1.44 3.833 2.30 6. 917 4.61 10.00 2.02 0.833 3.917 7.000 2.02 1.44 2.30 4.61 10.08 0.917 4.000 2.30 7.083 10.17 1.44 4.61 2.02 1.000 1.44 4.083 2.30 7. 167 4.61 10.25 2.02 1.083 4.167 2.30 7. 250 10.33 1.44 4.61 1.15 1.167 4.250 2.30 7. 333 10.42 1.44 3. 46 1. 15 1.250 4.333 7. 417 1.44 3.46 10.50 3. 46 1. 15 1.333 4.417 7.500 1.44 3.46 3.46 10.58 1. 15 1.417 1.44 4.500 7. 583 10.67 3.46 3.46 1. 15 1.500 1.44 4.583 3.46 7.667 3.46 10.75 1.15 1.583 1.44 4.667 3.46 7.750 3.46 10.83 1 15 4.750 7.833 1.667 1.44 3.46 3.46 10.92 1 15 1.750 1.44 4.833 4.61 7. 917 3.46 11.00 1.15 1.833 1.44 4.917 4.61 8.000 3.46 11.08 1.15 1.917 5.000 1.44 4.61 8.083 3.46 11. 17 1 15 2.000 1.44 İ 5.083 4. 61 l 8. 167 3.46 11. 25 1 15 2.083 1.44 5.167 4.61 8. 250 3.46 11.33 1.15 2.167 1.44 5.250 4.61 8. 333 2.02 11.42 1.15 2.250 5.333 6. 91 8. 417 1.44 2.02 11.50 1.15 2.333 1.73 İ 5.417 6. 91 İ 8.500 2.02 11.58 1.15 2.417 1.73 5.500 6. 91 8.583 2.02 11.67 2.500 1.73 5.583 6. 91 8.667 2.02 11. 75 2.583 1.73 | 5.667 6. 91 | 8. 750 2.02 11.83 1.15 2.667 1.73 | 5.750 6. 91 | 8. 833 2.02 İ 11. 92 1.15 2.750 1.73 | 5.833 27.65 | 8.917 12.00 2.02 1.15 5.917 27.65 | 9.000 2.833 1.73 2.02 12.08 1. 15 6.000 2. 02 | 12. 17 2.917 1.73 27.65 | 9.083 1.15 3.000 1.73 | 6.083 76. 03 | 9. 167 2. 02 | 12. 25 1. 15 3.083 1.73 | 6.167 76. 03 | 9. 250 2.02

Unit Hyd Opeak (cms) = 0.167

PEAK FLOW (cms) = 0.043 (i)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 17.090
TOTAL RAINFALL (mm) = 57.600
RUNOFF COEFFICIENT = 0.297

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1. 73	6. 250	76.03	9. 33	2.02
0. 167	0.00	3.250	1. 73	6. 333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6. 417	10. 37	9.50	2.02
0.333	1.44	3.417	2.30	6. 500	10.37	9. 58	2.02
0.417	1.44	3.500	2.30	6. 583	10.37	9. 67	2.02
0.500	1.44	3.583	2.30	6. 667	10.37	9. 75	2.02
0.583	1.44	3.667	2.30	6. 750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6. 833	4.61	9. 92	2.02
0.750	1.44	3.833	2.30	6. 917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7. 083	4.61	10. 17	2.02
1.000	1.44	4.083	2.30	7. 167	4.61	10. 25	2.02
1.083	1.44	4.167	2.30	7. 250	4.61	10.33	1. 15
1. 167	1.44	4.250	2.30	7. 333	3.46	10.42	1. 15
1.250	1.44	4.333	3.46	7. 417	3.46	10.50	1. 15
1.333	1.44	4.417	3.46	7. 500	3.46	10. 58	1. 15
1.417	1.44	4.500	3.46	7. 583	3.46	10.67	1. 15
1.500	1.44	4.583	3.46	7. 667	3.46	10.75	1. 15
1.583	1.44	4.667	3.46	7. 750	3.46	10.83	1. 15
1.667	1.44	4.750	3.46	7. 833	3.46	10. 92	1. 15
1.750	1.44	4.833	4. 61	7. 917	3.46	11.00	1. 15
1.833	1.44	4.917	4. 61	8.000	3.46	11.08	1. 15
1. 917	1.44	5.000	4.61	8. 083	3.46	11. 17	1. 15
2.000	1.44	5.083	4. 61	8. 167	3.46	11. 25	1. 15
2.083	1.44	5.167	4.61	8. 250	3.46	11. 33	1. 15
2.167	1.44	5.250	4. 61	8. 333	2.02	11.42	1. 15
2.250	1.44	5.333	6. 91	8. 417	2.02	11.50	1. 15
2.333	1.73	5.417	6. 91	8. 500	2.02	11. 58	1. 15

```
2. 417 1. 73 | 5. 500
                      6. 91 | 8. 583
                                       2.02 | 11.67 1.15
2.500
       1.73 | 5.583
                       6. 91 | 8. 667
                                       2. 02 | 11. 75
                                                      1. 15
2.583
       1.73 | 5.667
                        6. 91 | 8. 750
                                       2. 02 | 11. 83
                                                      1. 15
       1.73 | 5.750
                       6. 91 | 8. 833
                                       2. 02 | 11. 92
2.667
                                                       1. 15
2.750
                                       2.02 | 12.00
       1.73 | 5.833
                       27.65 | 8.917
                                                      1. 15
                       27. 65 | 9. 000
                                       2.02 | 12.08
2.833
       1.73 | 5.917
                                                      1. 15
                       27. 65 | 9. 083
2.917
       1.73 | 6.000
                                       2. 02 | 12. 17
                                                      1. 15
3.000
       1.73 | 6.083
                       76. 03 | 9. 167
                                       2. 02 | 12. 25
                                                      1. 15
3.083
       1.73 | 6.167
                       76.03 | 9.250
                                       2.02
```

PEAK FLOW (cms) = 0.020 (i)TIME TO PEAK (hrs) = 6.333RUNOFF VOLUME (mm) = 17.097TOTAL RAINFALL (mm) = 57.600 RUNOFF COEFFICIENT = 0.297

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area Total		5. 32 50. 00	Dir. Conn. (%)=	35. 00
		IMPERVI	DUS	PERVIOUS (i)	
Surface Area	(ha)=	2. 6	5	2.66	
Dep. Storage	(mm) =	1.0)	5.00	
Average Slope	(%)=	1.0)	1.00	
Length	(m) =	188. 3	3	40.00	
Mannings n	=	0. 13)	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH									
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	0.00	3.167	1.73	6. 250	76.03	9. 33	2.02		
0. 167	0.00	3.250	1. 73	6. 333	10. 37	9.42	2.02		
0.250	0.00	3.333	2.30	6. 417	10. 37	9.50	2.02		
0.333	1.44	3.417	2.30	6. 500	10. 37	9. 58	2.02		
0.417	1.44	3.500	2.30	6. 583	10. 37	9. 67	2.02		
0.500	1.44	3.583	2.30	6. 667	10. 37	9. 75	2.02		
0.583	1.44	3.667	2.30	6. 750	10. 37	9.83	2.02		
0.667	1.44	3.750	2.30	6. 833	4. 61	9. 92	2.02		
0.750	1.44	3.833	2.30	6. 917	4.61	10.00	2.02		
0.833	1.44	3.917	2.30	7.000	4. 61	10.08	2.02		
0. 917	1.44	4.000	2.30	7. 083	4.61	10. 17	2.02		
1.000	1.44	4.083	2.30	7. 167	4. 61	10. 25	2.02		
1.083	1.44	4.167	2. 30	7. 250	4. 61	10. 33	1. 15		

```
1. 167 1. 44 | 4. 250
                                  2.30 | 7.333
                                                3. 46 | 10. 42 | 1. 15
          1.250
                  1.44 | 4.333
                                  3. 46 | 7. 417
                                                  3. 46 | 10. 50 1. 15
          1.333
                  1.44 | 4.417
                                  3.46 | 7.500
                                                  3. 46 | 10. 58
                                  3. 46 7. 583
          1.417
                   1.44 | 4.500
                                                  3. 46 | 10. 67
                                                                  1 15
          1.500
                  1.44 | 4.583
                                  3. 46 | 7. 667
                                                  3. 46 | 10. 75
                                                                 1. 15
          1.583
                  1.44 | 4.667
                                  3.46 | 7.750
                                                  3. 46 | 10. 83
                                                                 1. 15
                                  3. 46 | 7. 833
                                                  3.46
          1.667
                   1.44
                         4.750
                                                         10.92
          1.750
                  1.44 | 4.833
                                  4. 61 | 7. 917
                                                  3. 46 | 11. 00
                                                                 1. 15
          1.833
                  1.44
                         4.917
                                  4.61 | 8.000
                                                  3.46 İ
                                                         11.08
                                                                  1.15
                                  4. 61 | 8. 083
          1.917
                   1.44
                         5.000
                                                  3.46
                                                         11. 17
                                                                  1 15
          2.000
                   1.44
                         5.083
                                  4. 61 | 8. 167
                                                  3. 46 İ
                                                         11. 25
                                                                  1 15
                                                  3. 46 İ
          2.083
                   1.44 İ
                         5.167
                                  4. 61 | 8. 250
                                                         11.33
                                                                  1.15
          2. 167
                   1.44
                         5.250
                                  4.61 | 8.333
                                                  2.02 | 11.42
                                                                  1.15
          2.250
                         5.333
                                  6. 91 | 8. 417
                   1.44 İ
                                                  2.02 İ
                                                         11.50
                                                                  1.15
          2.333
                   1.73
                         5.417
                                  6. 91 | 8. 500
                                                  2.02
                                                         11.58
                                                                  1.15
          2.417
                   1.73 İ
                         5.500
                                  6. 91 İ
                                         8.583
                                                         11.67
                                                  2.02
                                                                  1.15
          2.500
                   1.73 İ
                         5.583
                                  6. 91
                                         8.667
                                                  2.02
                                                         11. 75
                                                                  1.15
          2.583
                   1.73
                         5.667
                                  6. 91
                                         8.750
                                                  2.02
                                                         11.83
                                                                  1.15
          2.667
                   1.73 | 5.750
                                  6. 91
                                         8.833
                                                  2.02
                                                         11. 92
                                                                  1.15
          2.750
                   1.73
                         5.833
                                  27.65
                                         8. 917
                                                  2.02
                                                         12.00
                                                                  1.15
          2.833
                   1.73 | 5.917
                                  27.65
                                        9.000
                                                  2.02
                                                         12.08
                                                                  1.15
          2.917
                  1.73 | 6.000
                                  27.65 | 9.083
                                                  2. 02 | 12. 17
                                                                  1. 15
          3.000
                  1.73
                         6.083
                                  76. 03 | 9. 167
                                                  2. 02 | 12. 25
                                                                  1. 15
          3.083
                 1.73 | 6.167
                                 76.03 | 9.250
                                                  2.02
Max. Eff. Inten. (mm/hr)=
                           63.94
                                        29.81
          over (min)
                           20.00
                                        35.00
Storage Coeff. (min)=
                           17.78 (ii)
                                       31.88 (ii)
Unit Hyd. Tpeak (min)=
                           20.00
                                        35.00
Unit Hyd. peak (cms)=
                           0.06
                                        0.03
                                                     *TOTALS*
PEAK FLOW
                            0.22
                                        0.08
                                                      0.278 (iii)
               (cms) =
TIME TO PEAK
               (hrs)=
                            6.42
                                        6.75
                                                      6.42
RUNOFF VOLUME
               (mm) =
                           56.60
                                        15. 25
                                                      29.72
TOTAL RAINFALL (mm)=
                           57.60
                                        57.60
                                                      57.60
RUNOFF COEFFICIENT =
                            0.98
                                        0.26
                                                       0.52
 (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN^* = 59.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
```

- THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0028) (ha)= 3.43 Area | ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00

IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 1. 71 1.71

Dep. Storage (mm) = 1.00 5.00 Average Slope (%)= 1.00 2.00 Length (m) =151. 22 40.00 Mannings n 0. 013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORMFI) HYFTOGR	ΔPH	_	
TIME	RAI N	I TIME		l' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	 hrs	mm/hr	i hrs	mm/hr
0.083	0.00	3.167	1. 73	6. 250	76. 03	9. 33	2. 02
0. 167	0.00	3.250	1.73	6. 333	10. 37	9. 42	2.02
0.250	0.00	3.333	2.30	6. 417	10. 37	9.50	2.02
0.333	1.44	3.417	2.30	6. 500	10. 37	9. 58	2.02
0.417	1.44	3.500	2.30	6. 583	10. 37	9. 67	2.02
0.500	1.44	3.583	2.30	6. 667	10. 37	9. 75	2.02
0.583	1.44	3.667	2.30	6. 750	10. 37	9.83	2.02
0.667	1.44	3.750	2.30	6. 833	4. 61	9. 92	2.02
0.750	1.44	3.833	2.30	6. 917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4. 61	10.08	2.02
0. 917	1.44	4.000	2. 30	7. 083	4. 61	10. 17	2. 02
1.000	1.44	4.083	2.30	7. 167	4. 61	10. 25	2.02
1.083	1.44	4.167	2. 30	7. 250	4. 61	10. 33	1. 15
1. 167	1.44	4.250	2. 30	7. 333	3. 46	10. 42	1. 15
1. 250	1.44	4.333	3. 46	7. 417	3. 46	10.50	1. 15
1. 333	1.44	4.417	3. 46	7. 500	3.46	10.58	1. 15
1.417	1.44	4.500	3. 46	7. 583	3.46	10.67	1. 15
1.500	1.44	4.583	3.46	7.667	3. 46	10.75	1. 15
1.583	1.44	4.667	3.46	7. 750	3. 46	10.83	1. 15
1. 667 1. 750	1. 44 1. 44	4.750 4.833	3. 46 4. 61	7.833	3. 46 3. 46	10. 92 11. 00	1. 15 1. 15
1. 750	1.44	4.833 4.917	4. 61	7. 917	3. 46	11.00	1. 15
1. 833	1.44	5.000	4. 61	8. 000 8. 083	3. 46	11.08	1. 15
2.000	1.44	5.083	4. 61	8. 167	3.46	11. 17	1. 15
2.083	1.44	5.063	4. 61	8. 250	3.46	11. 23	1. 15
2. 167	1.44	5. 107	4. 61	8.333	2. 02	11. 42	1. 15
2. 250	1.44	5.333	6. 91	8. 417	2. 02	11. 50	1. 15
2. 333	1.73	5.417	6. 91	8. 500	2.02	11. 58	1. 15
2. 417	1.73	5.500	6. 91	8. 583	2. 02	11. 67	1. 15
2.500	1.73	5.583	6. 91	8. 667	2.02	11. 75	1. 15
2. 583	1.73	5.667	6. 91	8. 750	2. 02	11. 83	1. 15
2. 667	1.73	5.750	6. 91	8. 833	2. 02	11. 92	1. 15
2.750	1.73	5.833	27.65	8. 917	2.02	12.00	1. 15
2.833	1.73	5.917	27.65	9. 000	2. 02	12.08	1. 15
2. 917	1.73	6.000	27.65	9. 083	2.02	12.17	1. 15
3.000	1.73	6.083	76.03	9. 167	2. 02	12. 25	1. 15
3.083	1.73	6.167	76.03	9. 250	2. 02		

76.03 Max. Eff. Inten. (mm/hr)= 29.81 over (min) 5.00 20.00 Storage Coeff. (min)= 3.65 (ii) 15.11 (ii)

Unit Hyd. Tpeak	(mi n)=	5.00	20.00	
Unit Hyd. peak	(cms)=	0. 25	0.07	
				TOTALS
PEAK FLOW	(cms)=	0. 25	0.08	0.306 (iii)
TIME TO PEAK	(hrs)=	6. 25	6.42	6. 25
RUNOFF VOLUME	(mm) =	56.60	15. 25	29.72
TOTAL RAINFALL	(mm) =	57.60	57.60	57.60
RUNOFF COEFFICI	ENT =	0. 98	0. 26	0. 52

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
- THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029) IN= 2> 0UT= 1	OVERFLO	w IS OFF			
DT= 5.0 min	OUTFLOW	STOR	AGE	OUTFLOW	STORAGE
·	(cms)	(ha.	m.)	(cms)	(ha.m.)
	0.0000	0.0	000	0. 2200	0. 1300
	0. 1100	0. 0	700	0.0000	0.0000
INFLOW: ID= 2 (COUTFLOW: ID= 1 (COUTFLOW: ID=	0028)	3. 430	0. 306	(hrs) 6.25	(mm)
TIM	AK FLOW ME SHIFT OF (IMUM STOR <i>A</i>	PEAK FL	OW _	/Qin](%)= 2 (min)= 3 (ha.m.)=	0.00
CALIB	A (1				(ON) 72.0

NASHYD (0042) Area (ha) = 2.05 Curve Number (CN) = 73.0 | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 ----- U. H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME) HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.73	6. 250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6. 333	10. 37	9.42	2.02
0.250	0.00	3.333	2.30	6. 417	10. 37	9.50	2.02
0. 333	1.44	3.417	2.30	6. 500	10. 37	9. 58	2.02

```
0.417 1.44 | 3.500
                     2. 30 | 6. 583 | 10. 37 | 9. 67
                                                   2.02
       1.44 | 3.583
                      2.30 | 6.667
                                     10.37
                                            9.75
                                                    2.02
0.500
0.583
       1.44 | 3.667
                       2.30 | 6.750
                                     10.37
                                             9.83
                                                     2.02
       1.44 | 3.750
                       2. 30 | 6. 833
                                             9.92
0.667
                                      4.61
                                                     2.02
0.750
       1.44 | 3.833
                       2.30 | 6.917
                                            10.00
                                                     2.02
                                      4.61
0.833
       1.44
              3.917
                       2.30 | 7.000
                                      4.61
                                            10.08
                                                     2.02
                       2. 30 | 7. 083
0.917
       1.44
              4.000
                                      4.61
                                            10.17
                                                     2.02
1.000
       1.44
              4.083
                       2. 30 | 7. 167
                                      4.61
                                            10. 25
                                                     2.02
1.083
       1.44
              4.167
                       2.30 | 7.250
                                      4.61
                                            10.33
                                                    1. 15
1. 167
       1.44
              4.250
                       2.30 | 7.333
                                      3.46
                                            10.42
                                                    1. 15
1.250
       1.44
              4.333
                       3.46
                             7.417
                                      3.46
                                             10.50
                                                    1. 15
1.333
       1.44
              4.417
                       3.46 7.500
                                      3.46
                                            10.58
                                                    1. 15
1.417
       1.44
              4.500
                       3.46 | 7.583
                                      3.46
                                            10.67
                                                     1. 15
1.500
       1.44
              4.583
                       3.46 | 7.667
                                      3.46
                                             10.75
                                                    1. 15
1.583
       1.44
              4.667
                       3.46
                             7.750
                                      3.46
                                             10.83
                                                     1. 15
              4.750
1.667
       1.44
                       3.46
                             7.833
                                      3.46
                                             10.92
                                                     1. 15
1.750
       1.44
              4.833
                             7. 917
                       4. 61
                                      3.46
                                            11.00
                                                     1. 15
1.833
       1.44
              4.917
                             8.000
                                      3.46
                                             11.08
                       4.61
                                                     1. 15
1.917
        1.44
              5.000
                             8.083
                                      3.46
                                            11. 17
                       4.61
                                                     1. 15
2.000
        1.44
              5.083
                       4.61
                             8. 167
                                      3.46
                                            11. 25
                                                     1. 15
2.083
        1.44
              5.167
                       4.61
                             8. 250
                                      3.46
                                            11.33
                                                     1. 15
2.167
        1.44
              5.250
                       4.61
                             8. 333
                                      2.02
                                            11.42
                                                     1. 15
2.250
        1.44
              5.333
                       6. 91
                             8. 417
                                      2.02
                                            11.50
                                                     1. 15
2.333
        1.73
              5.417
                       6. 91
                             8.500
                                      2.02
                                            11.58
                                                     1.15
2.417
                             8.583
        1.73
              5.500
                       6. 91
                                      2.02
                                            11.67
                                                     1. 15
2.500
              5.583
                             8.667
        1.73
                       6. 91 l
                                      2.02
                                            11. 75
                                                     1. 15
2.583
        1.73
              5.667
                       6. 91
                             8.750
                                      2.02
                                            11.83
                                                     1. 15
2.667
              5.750
                       6. 91 | 8. 833
                                            11. 92
        1.73
                                      2.02
                                                     1. 15
2.750
        1.73
              5.833
                      27.65 | 8.917
                                      2.02
                                            12.00
                                                     1. 15
2.833
        1.73 | 5.917
                      27.65 | 9.000
                                      2.02 | 12.08
                                                     1. 15
2.917
        1.73 | 6.000
                      27.65 | 9.083
                                      2. 02 | 12. 17
                                                    1. 15
3.000
       1.73 | 6.083
                      76. 03 | 9. 167
                                      2. 02 | 12. 25
                                                    1. 15
                      76. 03 | 9. 250
3.083
       1.73 | 6.167
                                      2.02
```

PEAK FLOW (cms) = 0.089 (i) TIME TO PEAK (hrs) = 6.333 RUNOFF VOLUME (mm) = 15.986 TOTAL RAINFALL (mm) = 57.600 RUNOFF COEFFICIENT = 0.278

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
ID = 3 ( 0007): 3.84 0.082 6.42 28.33
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----
| ADD HYD ( 0007)|
3 + 2 = 1
                     AREA QPEAK
                                 TPEAK
                                         R. V.
_____
                     (ha) (cms)
                                   (hrs) (mm)
  ID1 = 3 (0007):
                    3. 84 0. 082
                                   6. 42 28. 33
   + ID2= 2 ( 0042): 2.05 0.089
                                   6. 33 15. 99
     ID = 1 (0007):
                     5. 89 0. 169
                                   6. 33 24. 03
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0007)|
1 + 2 = 3
                     AREA
                          QPEAK
                                   TPEAK
-----
                      (ha)
                          (cms)
                                   (hrs)
                                          (mm)
   ID1 = 1 (0007):
                     5. 89 0. 169
                                   6. 33
                                         24.03
    + ID2= 2 ( 0005):
                                   6. 42 29. 72
                   5. 32 0. 278
     -----
     ID = 3 (0007): 11.21 0.444
                                   6, 42 26, 73
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
| RESERVOIR ( 0008) |
                   OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
DT= 5.0 min
                   OUTFLOW
                           STORAGE
                                     OUTFLOW
                                             STORAGE
-----
                   (cms)
                           (ha.m.)
                                      (cms)
                                              (ha.m.)
                   0.0000
                           0.0000
                                      0.3390
                                               0.1535
                   0.0410
                            0.0120
                                      0.3840
                                               0.1758
                   0.0580
                            0.0253
                                      0.5390
                                               0.1989
                    0.0710
                            0.0399
                                      0.6480
                                               0.2228
                    0.0830
                            0.0559
                                      0.7320
                                               0.2476
                    0.0920
                            0.0732
                                      0.8050
                                               0.2733
                    0. 1010
                            0. 0918
                                      0.8710
                                               0.2998
                    0.2130
                            0. 1116
                                      0.9320
                                               0.3263
                    0.2860
                            0. 1321
                                      0.9880
                                               0.3528
                        AREA
                               QPEAK
                                       TPFAK
                                                R. V.
                        (ha)
                               (cms)
                                       (hrs)
                                                (mm)
  INFLOW: ID= 2 ( 0007)
                       11.210
                                0.444
                                       6. 42
                                                26.73
  OUTFLOW: ID= 1 ( 0008)
                       11.210
                                0. 164
                                        7. 33
                                                26.72
```

PEAK FLOW REDUCTION [Qout/Qin](%) = 36.93

(min) = 55.00

(ha.m.) = 0.1029

TIME SHIFT OF PEAK FLOW

MAXIMUM STORAGE USED

```
| ADD HYD ( 0016)|
1 + 2 = 3
                  AREA QPEAK
                             TPEAK
                                   R. V.
                  (ha) (cms)
                             (hrs)
                                   (mm)
   ID1= 1 ( 0022):
                 0.83 0.043
                              6. 33 17. 09
   + ID2= 2 ( 0008): 11.21 0.164
                             7. 33 26. 72
    ______
    ID = 3 (0016): 12.04 0.169
                            7. 33 26. 06
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION: 2-100yr 12hr 15min SCS **

CALIB |

| CALIB | | | NASHYD (0022) | Area (ha)= 0.83 Curve Number (CN)= 75.0 | | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | | ------ U.H. Tp(hrs)= 0.19

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----RAIN | TIME RAIN | TIME RAIN | TIME

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	i' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.88	6. 250	126. 72	9. 33	3.36
0.167	0.00	3.250	2.88	6. 333	17. 28	9.42	3.36
0.250	0.00	3.333	3.84	6. 417	17. 28	9.50	3.36
0.333	2.40	3.417	3.84	6. 500	17. 28	9. 58	3.36
0.417	2.40	3.500	3.84	6. 583	17. 28	9. 67	3.36
0.500	2.40	3.583	3.84	6. 667	17. 28	9. 75	3.36
0.583	2.40	3.667	3.84	6. 750	17. 28	9.83	3.36
0.667	2.40	3.750	3.84	6. 833	7.68	9. 92	3.36
0.750	2.40	3.833	3.84	6. 917	7. 68	10.00	3. 36
0.833	2.40	3.917	3.84	7.000	7. 68	10.08	3. 36
0. 917	2.40	4.000	3.84	7. 083	7. 68	10. 17	3. 36
1.000	2.40	4.083	3.84	7. 167	7. 68	10. 25	3. 36
1.083	2.40	4.167	3.84	7. 250	7. 68	10.33	1. 92
1. 167	2.40	4.250	3.84	7. 333	5. 76	10.42	1. 92
1. 250	2.40	4.333	5. 76	7. 417	5. 76	10.50	1. 92
1. 333	2.40	4.417	5.76	7. 500	5. 76	10.58	1. 92
1. 417	2.40	4.500	5. 76	7. 583	5. 76	10. 67	1. 92
1.500	2.40	4.583	5.76	7. 667	5. 76	10.75	1. 92
1.583	2.40	4.667	5.76	7. 750	5.76	10.83	1. 92
1.667	2.40	4.750	5.76	7. 833	5. 76	10. 92	1. 92
1.750	2.40	4.833	7.68	7. 917	5. 76	11.00	1. 92
1.833	2.40	4.917	7.68	8.000	5. 76	11.08	1. 92
1. 917	2.40	5.000	7.68	8. 083	5. 76	11. 17	1. 92

```
2.000 2.40 | 5.083 7.68 | 8.167 5.76 | 11.25 1.92
2. 083 2. 40 | 5. 167 7. 68 | 8. 250
                                       5. 76 | 11. 33 1. 92
2. 167
        2.40 | 5.250
                      7. 68 | 8. 333
                                       2.40 | 5.333 | 11.52 | 8.417
2.250
                                       3. 36 | 11. 50
       2.88 | 5.417 | 11.52 | 8.500
                                       3. 36 | 11. 58
2.333
        2. 88 | 5. 500 | 11. 52 | 8. 583
                                       3. 36 | 11. 67
2.417
       2. 88 | 5. 583 | 11. 52 | 8. 667
                                       3. 36 | 11. 75
2.500
2.583
        2. 88 | 5. 667 | 11. 52 | 8. 750
                                       3. 36 | 11. 83
                                                     1. 92
2.667
        2. 88 | 5. 750 | 11. 52 | 8. 833
                                       3. 36 | 11. 92
                                                     1. 92
       2. 88 | 5. 833 | 46. 08 | 8. 917
2.750
                                       3. 36 | 12. 00
                                                      1. 92
2.833
        2.88 | 5.917 | 46.08 | 9.000
                                       3. 36 | 12. 08
                                                     1. 92
2.917
        2. 88 | 6. 000 | 46. 08 | 9. 083
                                       3. 36 | 12. 17
                                                      1. 92
3.000 2.88 | 6.083 126.72 | 9.167
                                       3. 36 | 12. 25
                                                      1. 92
3. 083 2. 88 | 6. 167 126. 72 | 9. 250
                                       3.36
```

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms)= 0.110 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 43.235
TOTAL RAINFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.450

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	i' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.88	6. 250	126.72	9. 33	3.36
0. 167	0.00	3.250	2.88	6. 333	17. 28	9.42	3.36
0.250	0.00	3.333	3.84	6. 417	17. 28	9.50	3.36
0.333	2.40	3.417	3.84	6. 500	17. 28	9. 58	3.36
0.417	2.40	3.500	3.84	6. 583	17. 28	9.67	3.36
0.500	2.40	3.583	3.84	6. 667	17. 28	9. 75	3.36
0.583	2.40	3.667	3.84	6. 750	17. 28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7. 68	9. 92	3.36
0.750	2.40	3.833	3.84	6. 917	7. 68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0. 917	2.40	4.000	3.84	7. 083	7. 68	10.17	3.36
1.000	2.40	4.083	3.84	7. 167	7. 68	10. 25	3.36
1.083	2.40	4.167	3.84	7. 250	7. 68	10.33	1. 92
1. 167	2.40	4.250	3.84	7. 333	5. 76	10. 42	1. 92

```
1. 250 2. 40 | 4. 333 5. 76 | 7. 417
                                      5. 76 | 10. 50 1. 92
1.333
      2.40 | 4.417
                       5. 76 | 7. 500
                                       5. 76 | 10. 58
                                                      1. 92
       2.40 | 4.500
1.417
                       5. 76 | 7. 583
                                       5. 76 | 10. 67
                                                      1. 92
       2.40 | 4.583
                       5. 76 | 7. 667
                                       5. 76 | 10. 75
1.500
                                                      1. 92
1.583
       2.40 | 4.667
                       5. 76 | 7. 750
                                       5. 76 | 10. 83
                                                      1. 92
       2.40 | 4.750
                       5. 76 | 7. 833
                                       5. 76 | 10. 92
1.667
                                                      1. 92
1.750
               4.833
                       7. 68 | 7. 917
                                       5. 76 | 11. 00
       2.40
                                                      1. 92
       2.40
                       7. 68 | 8. 000
1.833
               4.917
                                       5. 76 | 11. 08
                                                      1. 92
1. 917
       2.40 İ
               5.000
                       7. 68 | 8. 083
                                       5.76
                                              11. 17
                                                      1. 92
2.000
               5.083
                       7. 68 | 8. 167
       2.40
                                       5.76
                                              11. 25
                                                      1. 92
2.083
       2.40
               5.167
                        7. 68 | 8. 250
                                       5.76 İ
                                              11.33
                                                      1. 92
                       7. 68 | 8. 333
2. 167
        2.40
               5.250
                                       3.36
                                              11.42
                                                      1. 92
2.250
       2.40
               5.333
                       11. 52 | 8. 417
                                       3.36 İ
                                              11.50
                                                      1. 92
2.333
       2.88
               5.417
                       11. 52 İ
                               8.500
                                       3. 36 İ
                                              11.58
                                                      1. 92
2.417
       2.88
               5.500
                       11.52
                               8. 583
                                       3.36
                                              11.67
                                                      1. 92
2.500
        2.88
               5.583
                       11. 52 İ
                               8.667
                                              11. 75
                                       3.36
                                                      1. 92
2.583
        2.88
               5.667
                       11. 52
                               8.750
                                       3.36
                                              11.83
                                                      1. 92
2.667
        2.88
               5.750
                       11. 52
                               8.833
                                       3.36
                                              11. 92
                                                      1. 92
2.750
        2.88
               5.833
                       46.08
                               8. 917
                                       3.36
                                              12.00
                                                      1. 92
2.833
        2.88
               5.917
                       46.08 | 9.000
                                       3.36
                                              12.08
                                                      1. 92
2.917
        2.88
               6.000
                       46.08 | 9.083
                                       3. 36 | 12. 17
                                                      1. 92
3.000
        2.88
               6. 083 126. 72 | 9. 167
                                       3. 36 | 12. 25
                                                      1. 92
3.083
        2. 88 | 6. 167 | 126. 72 | 9. 250
                                       3.36
```

PEAK FLOW (cms) = 0.053 (i)
TIME TO PEAK (hrs) = 6.333
RUNOFF VOLUME (mm) = 43.252
TOTAL RAINFALL (mm) = 96.000
RUNOFF COEFFICIENT = 0.451

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	5. 32 50. 00	Dir. Conn.(%)=	35. 00
		1 ()			
		IMPERVI	OUS	PERVIOUS (i)	
Surface Area	(ha)=	2.6	6	2.66	
Dep. Storage	(mm) =	1.0)	5.00	
Average Slope	(%)=	1.0)	1.00	
Length	(m)=	188. 3	3	40.00	
Mannings n	=	0. 13	0	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ---TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN

hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0. 083	0.00	3. 167	2. 88	1 0	126. 72	9.33	3. 36
0. 167	0.00	3. 250	2.88	6. 333	17. 28	9.42	3. 36
0. 250	0.00	3. 333	3. 84	6. 417	17. 28	9.50	3. 36
0. 333	2.40	3.417	3. 84	6. 500	17. 28	9.58	3. 36
0. 417	2.40	3.500	3. 84	6. 583	17. 28	9.67	3. 36
0.500	2.40	3.583	3. 84	6. 667	17. 28	9.75	3. 36
0. 583	2.40	3.667	3. 84	6. 750	17. 28	9.83	3. 36
0. 667	2.40	3.750	3.84	6. 833	7. 68	9. 92	3. 36
0. 750	2.40	3.833	3.84	6. 917	7. 68	10.00	3. 36
0.833	2.40	3.917	3.84	7. 000	7. 68	10.08	3.36
0. 917	2.40	4.000	3.84	7. 083	7. 68	10.17	3. 36
1.000	2.40	4.083	3.84	7. 167	7. 68	10. 25	3. 36
1.083	2.40	4.167	3.84	7. 250	7. 68	10. 33	1. 92
1. 167	2.40	4.250	3.84	7. 333	5.76	10.42	1. 92
1. 250	2.40	4.333	5.76	7. 417	5.76	10.50	1. 92
1. 333	2.40	4.417	5. 76	7.500	5. 76	10. 58	1. 92
1. 417	2.40	4.500	5. 76	7. 583	5. 76	10. 67	1. 92
1.500	2.40	4.583	5. 76	7. 667	5. 76		1. 92
1. 583	2.40	4.667	5. 76	7. 750	5. 76		1. 92
1. 667	2.40	4.750	5. 76	7.833	5. 76		1. 92
1. 750	2.40	4.833	7. 68	7. 917	5. 76	11.00	1. 92
1. 833	2.40	4.917	7. 68	8.000	5. 76		1. 92
1. 917	2.40	5.000	7. 68	8. 083	5. 76		1. 92
2.000	2.40	5.083	7. 68	8. 167	5. 76		1. 92
2.083	2.40	5. 167	7. 68	8. 250	5. 76		1. 92
2. 167	2.40	5.250	7.68	8. 333	3. 36		1. 92
2. 250	2.40	5.333	11. 52	8. 417	3. 36		1. 92
2. 333	2.88	5.417	11. 52	8.500	3. 36		1. 92
2. 417	2.88	5.500	11. 52	8. 583	3. 36		1. 92 1. 92
2. 500 2. 583	2. 88 2. 88	5. 583 5. 667	11. 52 11. 52	8. 667 8. 750	3. 36 3. 36	11. 75 11. 83	1. 92 1. 92
2. 563	2. 88	5.750	11. 52	8.833	3. 36		1. 92
2. 750	2.88	5. 833		8. 917	3. 36		1. 92
2. 833	2.88	5. 917	46. 08	9.000	3. 36		1. 92
2. 917	2.88	6.000	46. 08	9. 083	3. 36	12.00	1. 92
3.000	2.88	6.083	126. 72	9. 167	3. 36	12. 25	1. 92
3. 083	2. 88			9. 250	3. 36	12.20	1. 72
Max. Eff. Inten. (mn	n/hr)=	126. 72		79. 06			
over ((mi n)	15.00		25.00			
Storage Coeff. ((mi n)=	13.53	(ii)	23.07 (ii)		
Unit Hyd. Tpeak (15.00		25.00			
Unit Hyd. peak ((cms)=	0.08		0.05			
						ΓALS*	
PEAK FLOW ((cms)=	0.44		0. 25	0.	631 (iii)	

TIME TO PEAK

RUNOFF VOLUME

TOTAL RAINFALL (mm)=

RUNOFF COEFFICIENT =

(hrs)=

(mm) =

6.33

95.00

96.00

0.99

6.50

37.26

96.00

0.39

6.42

57.47

96.00

0.60

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0028) ID= 1 DT= 5.0 min	Area Total	(ha)= 3 Imp(%)= 50	.43 .00 Dir. Conn.(%)=	= 35.00
		LMDEDVILOUG	DEDVI OUC (:)	
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	1. 71	1. 71	
Dep. Storage	(mm) =	1.00	5.00	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	151. 22	40.00	
	. ,			
Manni ngs n	=	0. 013	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME) HYETOGI	RAPH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	i' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.88	6. 250	126.72	9. 33	3.36
0.167	0.00	3.250	2.88	6. 333	17. 28	9.42	3. 36
0.250	0.00	3.333	3.84	6. 417	17. 28	9.50	3.36
0.333	2.40	3.417	3.84	6. 500	17. 28	9. 58	3. 36
0.417	2.40	3.500	3.84	6. 583	17. 28	9.67	3. 36
0.500	2.40	3.583	3.84	6. 667	17. 28	9. 75	3. 36
0.583	2.40	3.667	3.84	6. 750	17. 28	9.83	3. 36
0.667	2.40	3.750	3.84	6. 833	7.68	9. 92	3. 36
0.750	2.40	3.833	3.84	6. 917	7. 68	10.00	3. 36
0.833	2.40	3.917	3.84	7.000	7. 68	10.08	3. 36
0. 917	2.40	4.000	3.84	7. 083	7. 68	10. 17	3. 36
1.000	2.40	4.083	3.84	7. 167	7. 68	10. 25	
1.083	2.40	4.167	3.84	7. 250	7. 68	10. 33	1. 92
1. 167	2.40	4.250	3.84	7. 333		10.42	1. 92
1. 250		4.333		7. 417	5. 76		1. 92
1. 333	2.40	4.417	5. 76	7. 500		10.58	
1. 417		4.500	5. 76	7. 583	5. 76	10. 67	
1.500	2.40	4.583	5. 76	7. 667	5. 76	10. 75	1. 92
1. 583	2.40	4.667	5. 76	7. 750	5. 76	10.83	1. 92
1. 667	2.40		5. 76	7. 833			1. 92
1. 750	2.40	4.833	7. 68	7. 917			1. 92
1.833	2.40	4.917	7. 68	8.000		11. 08	1. 92
1. 917	2.40	5.000	7. 68	8. 083	5. 76	11. 17	1. 92
2.000	2.40	5.083	7. 68	8. 167	5. 76		1. 92
2.083	2.40		7. 68	8. 250			1. 92
2. 167	2.40		7. 68	8. 333	,		
2. 250	2.40	5.333	11. 52	8. 417	3. 36	11. 50	1. 92

```
2.333 2.88 | 5.417 11.52 | 8.500 3.36 | 11.58 1.92
          2. 417 2. 88 | 5. 500 11. 52 | 8. 583
                                               3. 36 | 11. 67
          2.500
                  2.88 | 5.583 | 11.52 | 8.667
                                                 3. 36 | 11. 75
                  2. 88 | 5. 667 | 11. 52 | 8. 750
          2.583
                                                 3. 36 | 11. 83
                  2. 88 | 5. 750 | 11. 52 | 8. 833
                                                 3. 36 | 11. 92
          2.667
          2.750
                 2.88 | 5.833 | 46.08 | 8.917
                                                 3. 36 | 12. 00
                  2.88 | 5.917 | 46.08 | 9.000
                                                 3. 36 | 12. 08
          2.833
                                                                1. 92
                 2.88 | 6.000 | 46.08 | 9.083
          2.917
                                                 3. 36 | 12. 17
                                                                1. 92
          3.000 2.88 | 6.083 126.72 | 9.167
                                                 3. 36 | 12. 25
                                                                1. 92
          3. 083 2. 88 | 6. 167 126. 72 | 9. 250
                                                 3.36
Max. Eff. Inten. (mm/hr)=
                         126.72
                                       79.06
          over (min)
                          5.00
                                       15.00
Storage Coeff. (min)=
                           2.98 (ii) 10.73 (ii)
Unit Hyd. Tpeak (min)=
                           5.00
                                       15.00
Unit Hyd. peak (cms)=
                           0.28
                                        0.09
                                                    *TOTALS*
PEAK FLOW
               (cms)=
                           0.42
                                        0.24
                                                     0.634 (iii)
TIME TO PEAK
               (hrs)=
                           6. 25
                                        6.33
                                                      6.25
RUNOFF VOLUME
               (mm) =
                           95.00
                                       37.26
                                                     57.47
TOTAL RAINFALL (mm)=
                           96.00
                                       96.00
                                                     96.00
RUNOFF COEFFICIENT =
                           0.99
                                       0.39
                                                      0.60
```

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- $CN^* = 59.0$ Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
- THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029) IN= 2> OUT= 1	OVERFLOW I	S OFF		
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0. 2200	0. 1300
	0. 1100	0. 0700	0.0000	0.0000
INFLOW: ID= 2 (00 OUTFLOW: ID= 1 (00) (cms) 30 0.634	(hrs) 4 6.25	R. V. (mm) 57. 47 57. 42
TIMI	K FLOW RE E SHIFT OF PE IMUM STORAGE		t/Qin](%)= 2 (min)= 3 (ha.m.)=	0.00

| CALIB

```
| NASHYD ( 0042) | Area (ha) = 2.05 Curve Number (CN) = 73.0 | ID = 1 DT = 5.0 min | Ia (mm) = 10.00 # of Linear Res. (N) = 3.00 ------ U.H. Tp(hrs) = 0.22
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 2. 88 | 6. 250 126. 72 0.083 0.00 3.167 9.33 3.36 9.42 0.167 0.00 3.250 2. 88 | 6. 333 17. 28 3.36 0.250 0.00 3.333 3.84 6. 417 17. 28 9.50 3.36 0.333 2.40 3.417 3. 84 İ 6.500 9.58 17. 28 3.36 0.417 2.40 3.500 3.84 6. 583 17. 28 9.67 3.36 0.500 2.40 3.583 6.667 9.75 3.84 17. 28 3.36 0.583 2.40 3.667 3.84 6.750 17. 28 9.83 3.36 0.667 2.40 3.750 3.84 6.833 7.68 9.92 3.36 0.750 3.833 2.40 3.84 6. 917 7.68 10.00 3.36 0.833 2.40 3.917 3.84 7.000 7.68 10.08 3.36 0.917 2.40 4.000 3.84 7.083 7.68 10.17 3.36 1.000 2.40 4.083 3.84 7. 167 7.68 10.25 3.36 1.083 2.40 4.167 3.84 7. 250 7.68 10.33 1. 92 1.167 2.40 4.250 3.84 7.333 5.76 10.42 1.92 1.250 7. 417 2.40 4.333 5.76 5.76 10.50 1. 92 1.333 2.40 4.417 5.76 7.500 5.76 10.58 1.92 1.417 2.40 4.500 5.76 7. 583 5.76 10.67 1.92 5. 76 | 7. 667 1.500 2.40 4.583 5.76 10.75 1.92 1.583 2.40 4.667 5. 76 7.750 5.76 10.83 1.92 1.667 2.40 4.750 5. 76 | 7. 833 5.76 10.92 1. 92 1.750 2.40 4.833 7. 917 7.68 5.76 11.00 1. 92 1.833 2.40 4.917 7.68 8.000 5.76 11.08 1. 92 1.917 2.40 5.000 8.083 11. 17 7.68 5.76 1.92 2.000 2.40 5.083 7.68 8. 167 5.76 11. 25 1.92 2.083 2.40 5.167 7.68 8. 250 5.76 11.33 1. 92 2.167 2.40 5.250 8. 333 7.68 3.36 11.42 1. 92 2.250 2.40 5.333 8. 417 11.52 3.36 11.50 1. 92 2.333 2.88 5.417 11.52 8.500 11.58 3.36 1. 92 2.417 2.88 5.500 11. 52 | 8. 583 3.36 11.67 1.92 2.500 2.88 5.583 11.52 8.667 3.36 11.75 1. 92 2.583 2.88 5.667 11.52 | 8.750 3.36 11.83 1. 92 2.667 2.88 İ 5.750 11.52 8.833 3.36 11.92 1.92 2.750 2.88 İ 5.833 46.08 | 8.917 3.36 12.00 5.917 46.08 | 9.000 12.08 2.833 2.88 3.36 1. 92 2.917 2.88 | 6.000 46.08 | 9.083 3. 36 | 12. 17 1. 92 3.000 2. 88 | 6. 083 | 126. 72 | 9. 167 3. 36 | 12. 25 1. 92 3.083 2. 88 | 6. 167 | 126. 72 | 9. 250 3.36

Unit Hyd Qpeak (cms) = 0.356

PEAK FLOW (cms)= 0.238 (i) TIME TO PEAK (hrs)= 6.333 RUNOFF VOLUME (mm) = 41.047 TOTAL RAINFALL (mm) = 96.000 RUNOFF COEFFICIENT = 0.428

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0007) 1 + 2 = 3	AREA (ba)	QPEAK (cms)	TPEAK (brs)	R. V.	
ID1= 1 (0023): + ID2= 2 (0029):	0. 41 3. 43	0. 053 0. 144	6. 33 6. 75	43. 25 57. 42	
ID = 3 (0007):					
NOTE: PEAK FLOWS DO	NOT INCL	UDE BASEFL	OWS IF AN	NY.	
ADD HYD (0007) 3 + 2 = 1	AREA	QPEAK	TPEAK	R. V.	
ID1= 3 (0007):	(ha) 3.84	(cms) 0.178	(hrs) 6.42	(mm) 55.91	
+ ID2= 2 (0042):	2. 05	0. 238	6. 33	41.05	
ID = 1 (0007):					
NOTE: PEAK FLOWS DO	NOT INCL	UDE BASEFL	OWS IF AN	VV	
				* 1 .	
 ADD HYD (0007)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.	
1 + 2 = 3	AREA (ha) 5.89	QPEAK (cms)	TPEAK	R. V.	
1 + 2 = 3 ID1= 1 (0007): + ID2= 2 (0005):	(ha) 5. 89 5. 32	(cms) 0.411 0.631	TPEAK (hrs) 6.33 6.42	R. V. (mm) 50. 74 57. 47	
1 + 2 = 3	(ha) 5. 89 5. 32	(cms) 0.411 0.631	TPEAK (hrs) 6. 33 6. 42	R. V. (mm) 50.74 57.47	
1 + 2 = 3 ID1= 1 (0007): + ID2= 2 (0005): ====================================	(ha) 5. 89 5. 32 ======= 11. 21	(cms) 0.411 0.631 ===== 1.036	TPEAK (hrs) 6. 33 6. 42	R. V. (mm) 50. 74 57. 47 	
1 + 2 = 3 ID1= 1 (0007): + ID2= 2 (0005): ================== ID = 3 (0007): NOTE: PEAK FLOWS DO	(ha) 5. 89 5. 32 ======= 11. 21	(cms) 0.411 0.631 ===== 1.036	TPEAK (hrs) 6. 33 6. 42	R. V. (mm) 50. 74 57. 47 	
1 + 2 = 3 ID1= 1 (0007): + ID2= 2 (0005): ====================================	(ha) 5.89 5.32 11.21 NOT INCLI OVERFLOW	(cms) 0.411 0.631 1.036 UDE BASEFL	TPEAK (hrs) 6. 33 6. 42 ======6.33	R. V. (mm) 50. 74 57. 47 ===== 53. 93	
1 + 2 = 3 ID1= 1 (0007): + ID2= 2 (0005): ============ ID = 3 (0007): NOTE: PEAK FLOWS DO RESERVOIR (0008) N= 2> OUT= 1 DT= 5.0 min	(ha) 5.89 5.32 11.21 NOT INCLI OVERFLOW OUTFLOW	(cms) 0.411 0.631 1.036 UDE BASEFL IS OFF STORAGE	TPEAK (hrs) 6.33 6.42 ========= 6.33 OWS IF AR	R. V. (mm) 50. 74 57. 47 ====== 53. 93 VY.	STORAGE
1 + 2 = 3 I D1= 1 (0007): + I D2= 2 (0005): ============= I D = 3 (0007): NOTE: PEAK FLOWS DO 	(ha) 5.89 5.32 11.21 NOT INCLI OVERFLOW OUTFLOW (cms)	(cms) 0.411 0.631 1.036 UDE BASEFL IS OFF STORAGE (ha.m.)	TPEAK (hrs) 6.33 6.42 6.33 OWS IF AR	R. V. (mm) 50. 74 57. 47 ====== 53. 93 NY.	ha m)
ID = 3 (0007): NOTE: PEAK FLOWS DO RESERVOIR (0008) IN= 2> OUT= 1 DT= 5.0 min	(ha) 5.89 5.32 11.21 NOT INCLI OVERFLOW (cms) 0.0000 0.0410	(cms) 0.411 0.631 1.036 UDE BASEFL IS OFF STORAGE	TPEAK (hrs) 6.33 6.42 =======6.33 OWS IF AF	R. V. (mm) 50. 74 57. 47 53. 93 NY	STORAGE (ha.m.) 0.1535 0.1758 0.1989

```
0. 0830
                       0. 0559
                                          0.2476
                                  0.7320
                 0.0920
                        0. 0732
                                  0.8050
                                          0.2733
                        0. 0918
                                          0.2998
                 0. 1010
                                  0.8710
                 0. 2130
                        0. 1116
                                  0. 9320
                                          0.3263
                 0. 2860 0. 1321 0. 9880
                                          0.3528
                          QPEAK
                                  TPEAK
                     AREA
                                           R. V.
                     (ha)
                          (cms)
                                  (hrs)
                                           (mm)
 INFLOW: ID= 2 ( 0007)
                     11.210
                           1. 036
                                   6. 33
                                           53.93
 OUTFLOW: ID= 1 ( 0008)
                     11.210
                           0. 456
                                  6. 92
                                           53.92
            PEAK FLOW REDUCTION [Qout/Qin](%) = 44.03
            TIME SHIFT OF PEAK FLOW (min) = 35.00
            MAXIMUM STORAGE USED
                                 (ha. m.) = 0.1870
_____
| ADD HYD ( 0016)|
1 + 2 = 3
                   AREA QPEAK
                               TPEAK
                                    R. V.
-----
                   (ha) (cms)
                               (hrs)
                                      (mm)
    ID1= 1 ( 0022):
                   0. 83 0. 110
                               6. 33 43. 23
   + ID2= 2 ( 0008): 11.21 0.456
                               6. 92 53. 92
     _____
     ID = 3 ( 0016): 12.04 0.480
                              6. 92 53. 19
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
***********
** SIMULATION: 2-10yr 12hr 15min SCS **
*********
CALIB
NASHYD ( 0022) Area (ha)= 0.83 Curve Number (CN)= 75.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00
----- U. H. Tp(hrs) = 0.19
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORMFI	HYFTOGR	APH	_	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1. 98	6. 250	87. 12	9.33	2. 31
0.167	0.00	3.250	1. 98	6. 333	11. 88	9.42	2. 31
0.250	0.00	3.333	2.64	6. 417	11. 88	9.50	2. 31
0.333	1.65	3.417	2.64	6. 500	11. 88	9. 58	2. 31
0.417	1.65	3.500	2.64	6. 583	11. 88	9. 67	2. 31
0.500	1.65	3.583	2.64	6. 667	11. 88	9. 75	2. 31
0.583	1.65	3.667	2.64	6. 750	11. 88	9.83	2. 31
0.667	1.65	3.750	2.64	6. 833	5. 28	9. 92	2. 31
0.750	1.65	3.833	2.64	6. 917	5. 28	10.00	2. 31

0.833	1.65	3.917	2.64	7.000	5. 28	10.08	2. 31
0.917	1.65	4.000	2.64	7. 083	5. 28	10.17	2. 31
1.000	1.65	4.083	2.64	7. 167	5. 28	10. 25	2. 31
1.083	1.65	4.167	2.64	7. 250	5. 28	10.33	1.32
1. 167	1.65	4.250	2.64	7. 333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7. 417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7. 500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7. 583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7. 667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7. 750	3.96	10.83	1.32
1.667	1.65	4.750	3.96	7. 833	3.96	10. 92	1.32
1.750	1.65	4.833	5. 28	7. 917	3.96	11.00	1.32
1.833	1.65	4.917	5. 28	8. 000	3.96	11.08	1.32
1. 917	1.65	5.000	5. 28	8. 083	3.96	11. 17	1.32
2.000	1.65	5.083	5. 28	8. 167	3.96	11. 25	1.32
2.083	1.65	5.167	5. 28	8. 250	3.96	11.33	1.32
2. 167	1.65	5.250	5. 28	8. 333	2. 31	11. 42	1. 32
2.250	1.65	5.333	7. 92	8. 417	2. 31	11.50	1. 32
2.333	1. 98	5.417	7. 92	8. 500	2. 31	11.58	1. 32
2.417	1.98	5.500	7. 92	8. 583	2.31	11.67	1.32
2.500	1. 98	5.583	7. 92	8. 667	2. 31	11. 75	1. 32
2.583	1. 98	5.667	7. 92	8. 750	2. 31	11.83	1. 32
2.667	1.98	5.750	7. 92	8.833	2.31	11. 92	1.32
2.750	1. 98	5.833	31.68	8. 917	2. 31	12.00	1. 32
2.833	1. 98	5.917	31. 68	9.000	2. 31	12.08	1. 32
2. 917	1. 98	6.000	31.68	9. 083	2. 31	12.17	1. 32
3.000	1. 98	6.083	87. 12	9. 167	2. 31	12. 25	1. 32
3.083	1. 98	6.167	87. 12	9. 250	2. 31		

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms) = 0.056 (i) TIME TO PEAK (hrs) = 6.333 RUNOFF VOLUME (mm) = 22.242 TOTAL RAINFALL (mm) = 66.000 RUNOFF COEFFICIENT = 0.337

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ---TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr | hrs mm/hr | hrs mm/hr

```
0.083
       0.00 | 3.167
                       1. 98 | 6. 250 87. 12 | 9. 33
                                                      2. 31
0.167
        0.00 | 3.250
                        1. 98 | 6. 333
                                       11.88
                                               9.42
                                                       2.31
0.250
        0.00
               3.333
                        2.64 | 6.417
                                       11.88
                                               9.50
                                                       2.31
0.333
                        2. 64 | 6. 500
                                               9.58
        1.65
               3.417
                                       11.88
                                                       2.31
               3.500
                        2. 64 | 6. 583
                                               9.67
0.417
        1.65
                                       11.88
                                                       2.31
0.500
        1.65
               3.583
                        2.64
                               6.667
                                       11.88
                                               9.75
                                                       2.31
                               6.750
0.583
        1.65
               3.667
                        2.64
                                       11.88
                                               9.83
                                                       2.31
0.667
        1.65
               3.750
                        2.64
                               6.833
                                       5. 28
                                               9. 92
                                                       2.31
0.750
        1.65
               3.833
                        2.64
                               6. 917
                                       5. 28
                                               10.00
                                                       2.31
0.833
        1.65
               3.917
                        2.64
                               7.000
                                       5. 28
                                               10.08
                                                       2.31
0.917
        1.65
               4.000
                               7.083
                                       5. 28
                                               10.17
                                                       2.31
                        2.64
1.000
        1.65
               4.083
                        2.64
                               7. 167
                                       5. 28
                                              10. 25
                                                       2.31
1.083
        1.65
               4.167
                        2.64
                               7. 250
                                       5. 28
                                              10.33
                                                       1.32
1.167
               4.250
                               7. 333
                                               10.42
        1.65
                        2.64
                                       3.96
                                                       1.32
1.250
        1.65
               4.333
                        3.96
                               7. 417
                                       3.96
                                               10.50
                                                       1.32
1.333
               4.417
                        3.96
                               7.500
                                               10.58
        1.65
                                       3.96
                                                       1.32
1.417
        1.65
               4.500
                        3.96
                               7.583
                                       3.96
                                               10.67
                                                       1.32
1.500
        1.65
               4.583
                        3.96
                               7.667
                                       3.96
                                               10.75
                                                       1.32
1.583
        1.65
               4.667
                        3.96
                               7.750
                                       3.96
                                               10.83
                                                       1.32
1.667
        1.65
               4.750
                        3.96
                               7.833
                                       3.96
                                               10.92
                                                       1.32
1.750
        1.65
               4.833
                        5. 28
                               7. 917
                                       3.96
                                              11.00
                                                       1.32
1.833
        1.65
               4.917
                        5. 28
                               8.000
                                       3.96
                                               11.08
                                                       1.32
1.917
        1.65
               5.000
                        5. 28
                               8.083
                                       3.96
                                               11.17
                                                       1.32
2.000
        1.65
               5.083
                        5. 28
                               8. 167
                                       3.96
                                               11.25
                                                       1.32
2.083
        1.65
               5.167
                        5. 28
                               8. 250
                                              11.33
                                                       1.32
                                       3.96
2.167
        1.65
               5.250
                        5. 28
                               8.333
                                       2.31
                                               11.42
                                                       1.32
               5.333
2.250
        1.65
                        7. 92
                               8. 417
                                       2.31
                                               11.50
                                                       1.32
2.333
        1.98
               5.417
                        7. 92
                               8.500
                                       2.31
                                               11.58
                                                       1.32
2.417
        1.98
               5.500
                        7. 92
                               8.583
                                       2.31
                                              11.67
                                                       1.32
2.500
               5.583
        1.98
                        7. 92
                               8.667
                                       2.31
                                              11.75
                                                       1.32
2.583
                               8.750
        1.98
               5.667
                        7. 92
                                       2.31
                                              11.83
                                                       1.32
2.667
               5.750
                       7.92
                               8.833
                                              11.92
        1.98
                                       2.31
                                                       1.32
2.750
               5.833
                               8. 917
        1.98
                       31.68
                                       2.31
                                              12.00
                                                       1.32
2.833
        1.98
               5.917
                       31. 68 | 9. 000
                                       2.31
                                              12.08
                                                       1.32
2.917
        1.98
               6.000
                       31.68 | 9.083
                                       2. 31
                                              12.17
                                                       1.32
3.000
        1.98
               6.083
                       87. 12 | 9. 167
                                       2. 31 | 12. 25
                                                       1.32
3.083
                       87. 12 | 9. 250
       1. 98 | 6. 167
                                       2.31
```

PEAK FLOW (cms) = 0.027 (i) TIME TO PEAK (hrs) = 6.333 RUNOFF VOLUME (mm) = 22.250 TOTAL RAINFALL (mm) = 66.000 RUNOFF COEFFICIENT = 0.337

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | STANDHYD (0005) | Area (ha)= 5.32

|ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn. (%)= 35.00 -----I MPERVI OUS PERVIOUS (i) 2.66 Surface Area (ha)= 2.66 Dep. Storage 1.00 5.00 (mm) =Average Slope (%)= 1.00 1.00 Length (m) =188.33 40.00 Mannings n 0.130 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	l' TIME	RAIN	TIME	RAIN
hrs		hrs		I .	mm/hr	1	
0.083	0.00	3.167	1. 98	6. 250	87. 12	9.33	2. 31
0. 167	0.00	3.250	1. 98	6. 333	11.88	9.42	2. 31
0.250	0.00	3.333	2.64	6. 417	11. 88	9.50	2. 31
0.333	1.65	3.417	2.64	6. 500	11. 88	9.58	2. 31
0.417	1.65	3.500	2.64	6. 583	11. 88	9.67	2. 31
0.500	1.65	3.583	2.64	6. 667	11. 88	9.75	2. 31
0.583	1.65	3.667	2.64	6. 750	11. 88	9.83	2. 31
0.667	1.65	3.750	2.64	6. 833	5. 28	9. 92	2. 31
0.750	1.65	3.833	2.64	6. 917	5. 28	10.00	2. 31
0.833	1.65	3.917	2.64	7. 000	5. 28	10.08	2. 31
0.917	1.65	4.000	2.64	7. 083	5. 28	10.17	2. 31
1.000	1.65	4.083	2.64	7. 167	5. 28	10. 25	2. 31
1.083	1.65	4.167	2.64	7. 250	5. 28	10.33	1.32
1. 167	1.65	4.250	2.64	7. 333	3. 96	10.42	1.32
1. 250	1.65	4.333	3.96	7. 417	3. 96	10.50	1.32
1.333	1.65	4.417	3.96	7. 500	3. 96	10.58	1.32
1. 417	1.65	4.500	3. 96	7. 583	3. 96	10.67	1. 32
1.500	1.65		3. 96	7. 667	3. 96	10. 75	1. 32
1.583	1.65	4.667	3. 96	7. 750	3. 96	10. 83	1. 32
1.667	1.65	4.750	3. 96	7. 833	3. 96	10. 92	1. 32
1. 750	1.65	4.833	5. 28	7. 917	3. 96	11.00	1. 32
1.833	1.65	4.917	5. 28	8.000	3. 96	11.08	1. 32
1. 917	1.65	5.000	5. 28	8. 083	3. 96	11. 17	1. 32
2.000		5.083	5. 28	8. 167			1. 32
2.083	1.65	5. 167	5. 28	8. 250	3. 96		
2. 167	1.65	5.250	5. 28	8. 333			
2. 250	1.65	5.333	7. 92	8. 417	2. 31	11.50	1. 32
2. 333	1. 98	5.417	7. 92	8. 500	2. 31	11.58	1. 32
2. 417	1. 98	5.500	7. 92	8. 583	2. 31	11. 67	1. 32
2.500	1. 98	5.583	7. 92	8. 667	2. 31	11. 75	1. 32
2. 583	1. 98	5.667	7. 92	8. 750	2. 31	11.83	1. 32
2. 667	1. 98	5.750	7. 92	8. 833	2. 31		1. 32
2.750	1. 98	5.833	31. 68	8. 917			1. 32
2.833	1. 98	5.917	31. 68	9.000	2. 31		
2. 917	1. 98	6.000	31. 68	9. 083	2. 31	12. 17	1. 32
3.000	1. 98	6.083	87. 12	9. 167	2. 31	12. 25	1. 32
3.083	1. 98	6.167	87. 12	9. 250	2. 31		

Max. Eff. Inten. (r	mm/hr)=	87. 12	38. 29	
over	(mi n)	15.00	30.00	
Storage Coeff.	(mi n)=	15. 71 ((ii) 28.47 (ii)
Unit Hyd. Tpeak	(mi n)=	15.00	30.00	
Unit Hyd. peak	(cms)=	0.07	0.04	
				TOTALS
PEAK FLOW	(cms)=	0. 28	0. 11	0.355 (iii)
TIME TO PEAK	(hrs)=	6. 33	6. 58	6. 33
RUNOFF VOLUME	(mm) =	65.00	19. 52	35. 43
TOTAL RAINFALL	(mm) =	66.00	66.00	66.00
RUNOFF COEFFICIE	ENT =	0. 98	0. 30	0. 54

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0028) ID= 1 DT= 5.0 min	Area Total	(ha)= 3. Imp(%)= 50.	43 00 Dir. Conn. (%)=	35. 00
		I MPERVI OUS	PERVIOUS (i)	
Surface Area	(ha)=	1. 71	1. 71	
Dep. Storage	(mm) =	1.00	5. 00	
Average Slope	(%)=	1.00	2.00	
Length	(m) =	151. 22	40.00	
Mannings n	=	0. 013	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN mm/hr hrs mm/hr hrs mm/hr | hrs mm/hr hrs 9.33 0.083 0.00 3.167 1. 98 | 6. 250 87.12 | 2.31 0.167 0.00 3.250 1. 98 | 6. 333 11.88 9.42 2.31 0.250 0.00 3.333 2. 64 | 6. 417 11.88 9.50 2.31 0.333 1.65 3.417 2.64 | 6.500 11.88 0.417 1.65 3.500 2. 64 | 6. 583 11.88 2.31 0.500 1.65 3.583 2.64 | 6.667 11.88 9.75 2.31 0.583 3.667 2. 64 | 6. 750 1.65 11.88 9.83 2.31 0.667 1.65 3.750 2.64 | 6.833 5. 28 9. 92 2.31 0.750 3.833 2.64 | 6.917 10.00 1.65 5. 28 2.31 0.833 1.65 3.917 2.64 7.000 5. 28 10.08 2. 31 0.917 1.65 4.000 2.64 | 7.083 5. 28 10.17 2.31 1.000 4.083 10. 25 1.65 2.64 | 7.167 5. 28 2.31 1.083 1.65 | 4.167 2.64 | 7.250 5. 28 | 10. 33 1.32

1. 167 1. 250 1. 333 1. 417 1. 500 1. 583 1. 667 1. 750 1. 833 1. 917 2. 000 2. 083 2. 167 2. 250 2. 333 2. 417 2. 500 2. 583 2. 667 2. 750	1. 65 1. 65 1. 65 1. 65 1. 65 1. 65 1. 98 1. 98 1. 98 1. 98 1. 98 1. 98	4. 333 4. 417 4. 500 4. 583 4. 667 4. 750 4. 833 4. 917 5. 000 5. 083 5. 167 5. 250 5. 333 5. 417 5. 500 5. 583 5. 667 5. 750 5. 833	3. 96 3. 96 3. 96 3. 96 3. 96 5. 28 5. 28 5. 28 5. 28 7. 92 7. 92 7. 92 7. 92 7. 92 31. 68	7. 667 7. 750 7. 833 7. 917 8. 000 8. 083 8. 167 8. 250 8. 333 8. 417 8. 500 8. 583 8. 667 8. 750 8. 833 8. 917	3. 96 3. 96 3. 96 3. 96 3. 96 3. 96 3. 96 3. 96 3. 96 3. 96 2. 31 2. 31 2. 31 2. 31 2. 31 2. 31 2. 31	10.50 10.58 10.67 10.75 10.83 10.92 11.00 11.25 11.33 11.42 11.50 11.58 11.67 11.75 11.83 11.83 11.92 12.00	1. 32 1. 32 1. 32 1. 32 1. 32 1. 32 1. 32 1. 32 1. 32 1. 32 1. 32 1. 32 1. 32 1. 32
2. 833 2. 917 3. 000	1.98	6.000 6.083	31. 68 87. 12	9. 000 9. 083 9. 167	2. 31 2. 31 2. 31	12. 17 12. 25	1. 32 1. 32 1. 32
3. 083	1. 98	6. 167	87. 12	9. 250	2. 31		
Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. peak (min) min)= min)=	87. 12 5. 00 3. 46 5. 00 0. 26	(ii)	38. 29 15. 00 13. 82 (ii) 15. 00 0. 08			
TIME TO PEAK (RUNOFF VOLUME	cms)= hrs)= (mm)= (mm)= T =	0. 29 6. 25 65. 00 66. 00 0. 98		0. 11 6. 33 19. 52 66. 00 0. 30	0. 3! 66	TALS* . 384 (iii) 6. 25 5. 43 6. 00 0. 54)
* WARNING: STORAGE	COEFF. I	IS SMALLE	R THAN	TIME STEP!			
(i) CN PROCEDUR CN* = 59		ED FOR PE = Dep. S		LOSSES: (Above)			

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0029) OVERFLOW IS OFF IN= 2---> OUT= 1 | DT= 5.0 min |

OUTFLOW STORAGE OUTFLOW STORAGE (cms) (ha.m.) (cms) (ha.m.) 0. 2200 0.0000 0.0000 0.1300

0. 1100 0. 0700 | 0. 0000 0.0000 AREA QPEAK TPEAK R. V. (ha) (cms) (hrs) (mm) INFLOW: ID= 2 (0028) 3.430 0. 384 6. 25 35.43 OUTFLOW: ID= 1 (0029) 3.430 0.085 6. 75 35.39 PEAK FLOW REDUCTION [Qout/Qin](%) = 22.03 TIME SHIFT OF PEAK FLOW (min) = 30.00

MAXIMUM STORAGE USED

(ha. m.) = 0.0540

| CALIB

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0.083 9.33 0.00 3.167 1. 98 | 6. 250 87. 12 | 2.31 0.167 0.00 3.250 1. 98 | 6. 333 9.42 11.88 2.31 0.250 0.00 3.333 2.64 | 6.417 11.88 9.50 2.31 0.333 1.65 3.417 2.64 | 6.500 9.58 2.31 11.88 0.417 3.500 2. 64 | 6. 583 1.65 11.88 9.67 2.31 0.500 3.583 1.65 2.64 6.667 11.88 9.75 2.31 0.583 3.667 6.750 9.83 1.65 2.64 11.88 2.31 0.667 3.750 2.64 6.833 9. 92 1.65 5. 28 2. 31 6. 917 0.750 1.65 3.833 2.64 5. 28 10.00 2.31 0.833 1.65 3.917 2.64 | 7.000 5. 28 10.08 2.31 0.917 4.000 2.64 | 7.083 1.65 5. 28 10.17 2.31 1.000 1.65 4.083 2. 64 | 7. 167 5. 28 10.25 2.31 1.083 1.65 4.167 2.64 | 7.250 5. 28 10.33 1.32 4.250 2.64 | 7.333 1. 167 1.65 3.96 10.42 1.250 1.65 4.333 3. 96 | 7. 417 3.96 10.50 1.333 1.65 4.417 3.96 | 7.500 3.96 10.58 1.417 1.65 4.500 3. 96 | 7. 583 3.96 10.67 4.583 3. 96 | 7. 667 1.500 1.65 3.96 10.75 1.583 1.65 4.667 3.96 | 7.750 3.96 10.83 1.667 1.65 4.750 3. 96 | 7. 833 3.96 10.92 1.750 1.65 4.833 5. 28 | 7. 917 3.96 4.917 5. 28 | 8. 000 1.833 1.65 l 3.96 11. 08 1.917 1.65 | 5.000 5, 28 | 8, 083 3.96 İ 11. 17 5.083 3.96 İ 2.000 1.65 l 5. 28 | 8. 167 11. 25 5.167 5. 28 | 8. 250 3.96 2.083 1.65 11. 33 1. 32 2.167 1.65 | 5.250 5. 28 | 8. 333 2. 31 | 11. 42 1.32 1.65 | 5.333 2.250 7. 92 | 8. 417 2. 31 | 11. 50 1. 32 2.333 1. 98 | 5. 417 7. 92 | 8. 500 2. 31 | 11. 58 1.32

```
2. 31 | 11. 67 1. 32
            2.500 1.98 | 5.583
                                7. 92 | 8. 667
                                              2. 31 | 11. 75 1. 32
             2.583
                   1.98 | 5.667
                                 7. 92 | 8. 750
                                              2. 31 | 11. 83
                    1. 98 | 5. 750
                                7. 92 | 8. 833
                                              2. 31 | 11. 92
             2.667
             2.750
                   1. 98 | 5. 833 | 31. 68 | 8. 917
                                              2. 31 | 12. 00
                                                           1.32
             2.833
                   1. 98 | 5. 917 31. 68 | 9. 000
                                              2. 31 | 12. 08
                                                          1.32
             2.917
                   1. 98 | 6. 000 31. 68 | 9. 083
                                              2. 31 | 12. 17
                                                          1.32
             3.000
                   1. 98 | 6. 083 | 87. 12 | 9. 167
                                             2. 31 | 12. 25
                                                          1. 32
             3.083
                  1. 98 | 6. 167 87. 12 | 9. 250
                                             2.31
    Unit Hyd Qpeak (cms) = 0.356
    PEAK FLOW
                 (cms) = 0.118 (i)
    TIME TO PEAK
                (hrs)= 6.333
    RUNOFF VOLUME (mm) = 20.887
    TOTAL RAINFALL (mm) = 66.000
    RUNOFF COEFFICIENT = 0.316
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0007)|
1 + 2 = 3
                       AREA
                            QPEAK
                                     TPEAK
_____
                       (ha)
                             (cms)
                                     (hrs)
                                             (mm)
    ID1= 1 ( 0023):
                       0. 41 0. 027
                                     6. 33 22. 25
    + ID2= 2 ( 0029):
                       3. 43 0. 085
                                     6. 75 35. 39
     _____
      ID = 3 ( 0007): 3.84 0.102
                                     6. 42 33. 99
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
| ADD HYD ( 0007)|
3 + 2 = 1
                       AREA
                            QPEAK
                                     TPFAK
                       (ha)
                            (cms)
                                     (hrs)
                                             (mm)
     ID1= 3 ( 0007):
                       3, 84 0, 102
                                     6. 42 33. 99
    + ID2= 2 ( 0042):
                       2. 05 0. 118
                                     6. 33 20. 89
      _____
     ID = 1 (0007):
                       5. 89 0. 218
                                     6. 33 29. 43
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0007)|
1 + 2 = 3
                       AREA
                             QPEAK
                                     TPEAK
                                             R. V.
                       (ha)
                             (cms)
                                     (hrs)
                                             (mm)
 ID1= 1 ( 0007):
                           0. 218
                       5.89
                                     6.33
                                           29.43
```

5. 32 0. 355

6. 33 35. 43

+ ID2= 2 (0005):

ID = 3 (0007): 11.21 0.573 6.33 32.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME mm/hr mm/hr | hrs mm/hr | hrs mm/hr hrs hrs 2. 09 | 12. 250 | 127. 21 | 18. 33 0.083 0.00 6.167 2.08 2. 09 | 12. 333 18.42 0.167 0.00 6.250 20. 17 2.08 0.250 0.00 i 6.333 2. 15 | 12. 417 20. 15 | 18. 50 2.08 0.333 1.19 İ 6.417 2. 15 | 12. 500 20.15 18.58 2.01 2. 15 | 12. 583 0.417 1.19 6.500 13.72 18.67 2.01 0.500 1.19 6.583 2. 20 | 12. 667 13.72 18.75 2.01 0.583 1.22 6.667 2. 20 | 12. 750 13.72 18.83 1.93 18.92 0.667 1. 22 İ 6.750 2. 20 | 12. 833 9.44 1.93 0.750 6.833 2. 26 | 12. 917 9.44 19.00 1. 22 İ 1.93 0.833 1.25 6.917 2. 26 | 13. 000 9.44 19.08 1.86 0.917 1.25 7.000 2. 26 | 13. 083 7.97 19.17 1.86 1.000 1.25 7.083 2. 32 | 13. 167 7.97 19.25 1.86 1.083 1.28 7.167 2. 32 | 13. 250 7.97 19.33 1.79 1.167 1.28 7.250 2. 32 | 13. 333 6.75 19.42 1.79 1.250 1.28 7.333 2.38 | 13.417 6.75 19.50 1.79 1.333 1.31 7.417 2.38 | 13.500 6.75 19.58 1.71 1.417 1.31 7.500 2. 38 | 13. 583 5.96 19.67 1.71 1.500 1.31 7.583 2.44 | 13.667 5.96 19.75 1.71 1.583 1.34 7.667 2.44 | 13.750 5.96 19.83 1.64 1.667 7.750 2.44 | 13.833 19.92 1.34 5. 22 1.64 1.750 7.833 2.50 113.917 5. 22 20.00 1.34 1.64 1.833 1.37 7.917 2.50 | 14.000 5. 22 20.08 1.57 1.917 1.37 8.000 2.50 | 14.083 4.66 20.17 1.57 2.000 1.37 8.083 2. 56 | 14. 167 20. 25 1.57 4.66 2.083 1.39 8.167 2.56 | 14.250 20.33 1.52 4.66 2.167 8.250 1.39 2.56 | 14.333 4.25 20.42 1.52 2.250 1.39 8.333 2. 74 | 14. 417 4. 25 20.50 1.52 2.333 8.417 2.74 | 14.500 1.43 4. 25 20.58 1.51 2.417 1.43 | 8.500 2. 74 | 14. 583 4.05 20.67 1.51 2.500 1.43 8.583 3. 02 | 14. 667 4.05 20.75 1.51 2.583 3.02 | 14.750 1.46 8.667 4.05 20.83 1.49 3. 02 | 14. 833 2.667 1.46 | 8.750 3.83 20.92 1.49 2.750 1.46 | 8.833 3. 33 | 14. 917 3.83 | 21.00 1.49 2.833 1.48 | 8.917 3. 33 | 15. 000 3.83 | 21.08 1.48 2.917 1.48 | 9.000 3. 33 | 15. 083 3.63 | 21.17 1.48 3.000 1.48 | 9.083 3. 61 | 15. 167 3.63 | 21.25 1.48 3.083 1.51 | 9.167 3. 61 | 15. 250 3.63 | 21.33 1.46 3.167 1.51 | 9.250 3, 61 | 15, 333 3.42 | 21.42 1.46 3.250 1.51 | 9.333 3. 76 | 15. 417 3.42 | 21.50 1.46 3.333 1.55 | 9.417 3.76 | 15.500 3.42 | 21.58 1.45 3.417 1.55 | 9.500 3. 76 | 15. 583 3. 22 | 21. 67 1.45 1.55 | 9.583 3.500 3. 76 | 15. 667 3. 22 | 21. 75 1.45 3.583 1.57 | 9.667 3. 76 | 15. 750 3. 22 | 21. 83 1.43 1.57 | 9.750 3. 76 | 15. 833 3.667 3. 01 | 21. 92 1.43 1.57 | 9.833 4. 01 | 15. 917 3.750 3.01 | 22.00 1.43 4. 01 | 16. 000 3.833 1.60 | 9.917 3.01 | 22.08 1.42

4. 01 | 16. 083

2. 81 | 22. 17

1.42

3.917

1.60 | 10.000

```
4. 46 | 16. 167
4.000 1.60 | 10.083
                                       2. 81 | 22. 25 1. 42
4. 083 1. 63 | 10. 167
                       4. 46 | 16. 250
                                        2. 81 | 22. 33 1. 40
                        4. 46 | 16. 333
                                        2. 67 | 22. 42
4. 167
       1.63 | 10.250
                                                        1.40
4.250
      1.63 | 10.333
                        5. 07 | 16. 417
                                        2. 67 | 22. 50
                                                        1.40
4. 333 1. 68 10. 417
                        5. 07 | 16. 500
                                        2. 67 | 22. 58
                                                        1. 39
4. 417 1. 68 | 10. 500
                        5. 07 | 16. 583
                                        2.60 | 22.67
                                                        1.39
4.500 1.68 10.583
                        5. 75 | 16. 667
                                         2.60 | 22.75
      1.73 | 10.667
                        5. 75 | 16. 750
4.583
                                        2.60 | 22.83
                                                        1.37
4. 667 1. 73 | 10. 750
                        5. 75 | 16. 833
                                        2.52 | 22.92
                                                        1.37
4. 750 1. 73 | 10. 833
                        6. 73 | 16. 917
                                         2.52
                                                23.00
                                                        1.37
       1. 79 | 10. 917
4.833
                        6. 73 | 17. 000
                                         2. 52 j
                                                23.08
                                                        1.36
       1.79 | 11.000
4.917
                        6. 73 | 17. 083
                                         2. 45 | 23. 17
                                                        1.36
5.000 1.79 11.083
                        7. 86 | 17. 167
                                         2. 45 | 23. 25
                                                        1.36
5. 083 1. 85 11. 167
                        7. 86 | 17. 250
                                         2. 45 İ
                                                23.33
                                                        1.35
5. 167
       1.85 | 11.250
                        7. 86 | 17. 333
                                         2. 37 j
                                                23.42
                                                        1.35
5.250
       1.85 | 11.333
                        9. 93 | 17. 417
                                                23.50
                                         2.37
                                                        1.35
                        9. 93 | 17. 500
                                                23.58
5.333
        1. 91 | 11. 417
                                         2.37 İ
                                                         1.33
                       9. 93 | 17. 583
5.417
        1. 91 | 11. 500
                                         2.30
                                                23.67
                                                         1.33
       1. 91 | 11. 583 | 12. 64 | 17. 667
5.500
                                         2.30
                                                23.75
                                                         1.33
        1. 97 | 11. 667
                       12.64 | 17.750
5.583
                                         2.30
                                                23.83
                                                         1.31
                       12. 64 | 17. 833
5.667
        1. 97 | 11. 750
                                         2.23
                                                23. 92
                                                         1. 31
5.750
        1. 97 | 11. 833
                        51. 54 | 17. 917
                                         2. 22 | 24. 00
                                                         1.31
5.833
        2.03 | 11.917
                        51. 54 | 18. 000
                                         2. 22 | 24. 08
                                                         1.30
                       51. 54 | 18. 083
5. 917
        2.03 | 12.000
                                         2. 15 | 24. 17
                                                         1.30
        2. 03 | 12. 083 | 127. 20 | 18. 167
6.000
                                         2. 15 | 24. 25
                                                        1.30
6.083
       2. 09 | 12. 167 | 127. 21 | 18. 250
                                         2.15 İ
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PEAK FLOW (cms) = 0.128 (i) TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 60.077 TOTAL RAINFALL (mm) = 117.600 RUNOFF COEFFICIENT = 0.511

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----RAIN | TIME RAIN | TIME RAIN | TIME TIME RAIN mm/hr | hrs mm/hr | hrs mm/hr hrs mm/hr hrs 2. 09 | 12. 250 | 127. 21 | 18. 33 2.08 0.083 0.00 | 6.167 0.167 0.00 | 6.250 2. 09 | 12. 333 | 20. 17 | 18. 42 2.08

0.230	0.00	0.333	2.13	12.41/	20. 13	10.50	2.00
0.333	1.19	6.417	2. 15	12.500	20. 15	18.58	2.01
0. 417		6.500	2. 15	12. 583	13. 72	18. 67	2. 01
0.500	1. 19	6.583	2. 20	12. 667	13. 72	18. 75	2. 01
0.583	1.22	6.667	2. 20	12. 750	13.72	18.83	1. 93
0.667	1. 22	6.750	2. 20	12. 833	9. 44	18. 92	1. 93
0. 750	1. 22	6.833	2. 26	12. 917	9.44	19. 00	1. 93
0.833	1. 25	6.917	2. 26	13.000	9.44	19. 08	1. 86
0. 917	1.25	7.000	2. 26	13. 083	7. 97	19. 17	1.86
1.000	1. 25	7.083		13. 167	7. 97	19. 25	1. 86
1. 083		7.167		13. 250	7. 97	19. 33	1. 79
1. 167	1. 28	7.250	2. 32	13. 333	6. 75	19.42	1. 79
1. 250	1.28	7.333	2 38	13. 417	6. 75	19.50	1. 79
1. 333	1.31				6. 75	19.58	
		7.417		13. 500			1. 71
1. 417	1.31	7.500	2. 38	13. 583	5. 96	19. 67	1. 71
1.500	1.31	7.583	2.44	13.667	5. 96	19.75	1. 71
1.583	1.34	7.667	2.44	13. 750	5.96	19. 83	1.64
1. 667		1	2.44		5. 22	19. 92	1. 64
1. 750	1.34	7.833	2.50	13. 917	5. 22	20.00	1. 64
1.833	1.37	7.917	2.50	14.000	5. 22	20.08	1. 57
1. 917	1.37	8.000	2.50	14. 083	4.66	20. 17	1.57
	1.37			14. 167			
2.000		8.083				20. 25	1. 57
2.083		8.167		14. 250		20.33	1. 52
2. 167	1.39	8.250	2.56	14. 333	4. 25	20.42	1.52
2.250	1.39	8.333	2.74	14. 417	4. 25	20.50	1.52
2. 333	1.43	8.417	2.74	14. 500	4. 25	20.58	1. 51
2. 417	1.43	8.500	2.74		4.05	20.67	1. 51
2.500	1.43	8.583	3.02	14.667	4.05	20.75	1. 51
2.583	1.46	8.667	3. 02	14. 750	4.05	20.83	1.49
2. 667		8.750	3. 02			20.92	1. 49
2.750	1.46	8.833	3. 33		3.83	21.00	1. 49
2.833	1.48	8.917	3.33	15.000	3.83	21.08	1. 48
2.917	1.48	9.000	3. 33	15. 083	3.63	21. 17	1.48
3.000	1.48	9.083	3. 61	15. 167	3. 63	21. 25	1. 48
				115. 107			
3.083	1.51	9.167	3. 61	15. 250	3.63	21.33	1. 46
3. 167	1.51	9.250	3. 61	15. 333	3. 42	21.42	1. 46
3.250	1.51	9.333	3.76	15. 417	3.42	21.50	1.46
3. 333		9.417		15. 500	3.42	21.58	1. 45
3. 417	1.55	9.500	3. 76	15. 583		21.67	1. 45
3.500	1.55	9.583		15. 667		21.75	1. 45
3.583	1.57	9.667	3.76	15. 750	3. 22	21.83	1.43
3.667	1.57	9.750	3.76	15. 833	3.01	21. 92	1.43
3. 750	1.57	9.833	4. 01	15. 917	3. 01	22.00	1. 43
3.833		9.917		16. 000	3.01	22.08	1. 42
3.917	1.60	10.000	4.01	16.083	2.81	22.17	1.42
4.000	1.60	10.083	4.46	16. 167	2.81	22. 25	1.42
4. 083		10.167					1. 40
			4. 46			22.33	
4. 167		10.250	4.46	16. 333		22.42	1. 40
4.250	1.63	10.333	5.07	16. 417	2.67	22.50	1.40
4.333		10.417	5.07	16. 500		22. 58	1.39
4. 417		10.500		16. 583	2.60		1. 39
			5.07	10.003	2.00		
4.500	1.68	10.583	5.75	16. 667	2.60	22.75	1. 39

```
5. 75 | 16. 750
4. 583 1. 73 | 10. 667
                                        2.60 | 22.83 1.37
4. 667 1. 73 | 10. 750
                        5. 75 | 16. 833
                                         2.52 | 22.92
                                                        1.37
                        6. 73 | 16. 917
4.750
       1.73 | 10.833
                                         2.52
                                                23.00
                                                         1.37
       1.79 | 10.917
                        6. 73 | 17. 000
4.833
                                         2. 52 | 23. 08
                                                         1.36
4.917
       1.79 | 11.000
                        6. 73 | 17. 083
                                         2. 45 | 23. 17
                                                         1.36
       1. 79 | 11. 083
                        7. 86 | 17. 167
                                                23. 25
5.000
                                         2.45
                                                         1.36
        1. 85 | 11. 167
                        7. 86 | 17. 250
                                         2. 45
5.083
                                                23.33
                                                         1.35
       1.85 | 11.250
                        7. 86 | 17. 333
5. 167
                                         2.37
                                                23.42
                                                         1.35
5.250
       1.85 | 11.333
                        9. 93 | 17. 417
                                         2.37
                                                23.50
                                                         1.35
       1. 91 | 11. 417
                        9. 93 | 17. 500
5.333
                                         2.37
                                                23.58
                                                         1.33
5.417
       1. 91 | 11. 500
                        9. 93 | 17. 583
                                         2. 30 İ
                                                23.67
                                                         1.33
5.500
       1. 91 | 11. 583
                        12.64 | 17.667
                                         2.30
                                                23.75
                                                         1.33
5.583
        1.97 | 11.667
                        12.64 | 17.750
                                         2.30 İ
                                                23.83
                                                         1.31
        1. 97 | 11. 750
                        12.64 | 17.833
                                         2. 23 İ
                                                23. 92
5.667
                                                         1.31
                                         2. 22
5.750
        1. 97 | 11. 833
                        51. 54 | 17. 917
                                                24.00
                                                         1.31
5.833
        2.03 | 11.917
                        51. 54 | 18. 000
                                                24.08
                                         2.22
                                                         1.30
5.917
         2.03 | 12.000
                       51. 54 | 18. 083
                                         2. 15 | 24. 17
                                                         1.30
6.000
        2.03 | 12.083 | 127.20 | 18.167
                                         2. 15 | 24. 25
                                                         1.30
        2. 09 | 12. 167 | 127. 21 | 18. 250
6.083
                                         2.15
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PEAK FLOW (cms) = 0.062 (i) TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 60.101 TOTAL RAINFALL (mm) = 117.600 RUNOFF COEFFICIENT = 0.511

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) Area (ha)= 5.32 |ID= 1 DT= 5.0 min | Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 _____ PERVIOUS (i) I MPERVI OUS Surface Area (ha)= 2.66 2.66 Dep. Storage (mm) =1.00 5.00 Average Slope (%)= 1.00 1.00 Length (m)= 188.33 40.00 Mannings n 0.130 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----RAIN | TIME RAIN | TIME RAIN | TIME RAIN TIME mm/hr mm/hr | hrs mm/hr | hrs mm/hr hrs hrs 2.08 0.083 0.00 | 6.167 2. 09 | 12. 250 | 127. 21 | 18. 33 0.00 | 6.250 2. 09 | 12. 333 20. 17 | 18. 42 2.08 0.167 0.250 0.00 | 6.333 2. 15 | 12. 417 | 20. 15 | 18. 50 2.08

0. 333	1. 19	6.417	2. 15	12. 500	20. 15	18. 58	2. 01
0.417	1. 19	6.500	2. 15	12. 583	13. 72	18. 67	2. 01
0.500	1. 19	6.583	2. 20	12.667	13. 72	18. 75	2.01
0.583	1.22	6.667	2.20	12. 750	13.72	18.83	1. 93
0.667	1.22	6.750	2. 20	12. 833	9.44	18. 92	1. 93
0. 750	1. 22	6.833	2. 26	12. 917	9.44	19.00	1. 93
0.833	1. 25	6.917	2. 26	13. 000	9.44	19.08	1. 86
0. 033	1. 25	7.000	2. 26	13. 083	7. 97	19. 17	1. 86
	1. 25				7. 97	19.17	
1.000		7.083	2. 32	13. 167			1.86
1.083	1. 28	7.167	2. 32	13. 250	7. 97	19.33	1. 79
1. 167	1. 28	7.250	2. 32	13. 333	6. 75	19.42	1. 79
1. 250	1. 28	7.333	2. 38	13. 417	6. 75	19. 50	1. 79
1. 333	1.31	7.417	2. 38	13. 500	6. 75	19. 58	1. 71
1. 417	1. 31	7.500	2.38	13. 583	5. 96	19.67	1. 71
1.500	1.31	7.583	2.44	13. 667	5. 96	19.75	1. 71
1.583	1.34	7.667	2.44	13. 750	5. 96	19.83	1.64
1.667	1.34	7.750	2.44	13. 833	5. 22	19. 92	1.64
1.750	1.34	7.833	2.50	13. 917	5. 22	20.00	1.64
1.833	1.37	7.917	2.50	14. 000	5. 22	20.08	1.57
1. 917	1. 37	8.000	2. 50	14. 083	4. 66	20.17	1. 57
2.000	1.37	8.083	2. 56	14. 167	4. 66	20. 25	1. 57
2. 083	1. 39	8. 167	2. 56	14. 250	4. 66	20.33	1. 52
2. 167		8. 250	2. 56	14. 333	4. 25	20.33	1. 52
2. 167	1. 39	8.333	2. 74	14. 333	4. 25	20.42	1. 52
	1. 43		2. 74				
2. 333		8.417		14. 500	4. 25	20.58	1. 51
2. 417	1.43	8.500	2.74	14. 583	4.05	20.67	1. 51
2.500	1.43	8.583	3. 02	14. 667	4. 05	20.75	1. 51
2. 583	1.46	8.667	3. 02	14. 750	4. 05	20.83	1. 49
2. 667	1.46	8.750	3. 02	14. 833	3.83	20.92	1. 49
2.750	1.46	8.833	3. 33	14. 917	3.83	21.00	1. 49
2.833	1.48	8.917	3. 33	15.000	3. 83	21.08	1. 48
2. 917	1.48	9.000	3. 33	15. 083	3. 63	21. 17	1. 48
3.000	1.48	9.083	3. 61	15. 167	3.63	21. 25	1. 48
3.083	1.51	9.167	3.61	15. 250	3.63	21.33	1.46
3. 167	1.51	9.250	3.61	15. 333	3.42	21.42	1.46
3.250	1.51	9.333	3.76	15. 417	3.42	21.50	1.46
3.333	1.55	9.417	3.76	15. 500	3.42	21.58	1.45
3.417	1.55	9.500	3.76	15. 583	3. 22	21.67	1.45
3.500	1.55	9.583	3.76	15. 667	3. 22	21.75	1. 45
3. 583	1.57	9.667	3. 76	15. 750	3. 22	21.83	1. 43
3. 667	1.57	9.750	3. 76	15. 833	3. 01	21. 92	1. 43
3. 750	1.57	9.833	4. 01	15. 917	3. 01	22.00	1. 43
3. 833	1.60	9.917	4. 01	16. 000	3. 01	22.08	1. 42
3. 917	1.60	10.000	4. 01	16. 083	2. 81	22.00	1. 42
4. 000	1.60	10.083	4. 46	16. 167	2. 81	22.17	1. 42
4. 083	1.63		4. 46		2. 81	22. 23	1. 42
		10.167		16. 250			
4. 167		10. 250	4. 46	16. 333	2.67	22.42	1.40
4. 250	1.63	10.333	5. 07	16. 417	2.67	22.50	1.40
4. 333	1.68	10.417	5. 07	16. 500	2. 67	22.58	1. 39
4. 417		10.500	5. 07	16. 583	2.60	22.67	1. 39
4.500		10.583	5. 75	16. 667	2. 60	22.75	1. 39
4. 583	1.73	10.667	5. 75	16. 750	2. 60	22.83	1. 37

4. 66 4. 75 4. 83 4. 91	1. 73 3 1. 79 7 1. 79	10.833 10.917 11.000	5. 75 6. 73 6. 73 6. 73	16. 833 16. 917 17. 000 17. 083	2. 52 2. 52 2. 52 2. 45	22.92 23.00 23.08 23.17	1. 37 1. 37 1. 36 1. 36
5. 00 5. 08 5. 16 5. 25 5. 33 5. 41 5. 50	1.85 7 1.85 0 1.85 3 1.91 7 1.91	11.083 11.167 11.250 11.333 11.417 11.500 11.583	7. 86 7. 86 7. 86 9. 93 9. 93 9. 93 12. 64	17. 167 17. 250 17. 333 17. 417 17. 500 17. 583 17. 667	2. 45 2. 45 2. 37 2. 37 2. 37 2. 30 2. 30	23. 25 23. 33 23. 42 23. 50 23. 58 23. 67 23. 75	1. 36 1. 35 1. 35 1. 35 1. 33 1. 33
5. 58: 5. 66 5. 75(5. 83: 5. 91' 6. 00(3 1.97 7 1.97 0 1.97 3 2.03 7 2.03 0 2.03	11. 667 11. 750 11. 833 11. 917 12. 000 12. 083	12. 64 12. 64 51. 54 51. 54 51. 54 127. 20	17. 750 17. 833 17. 917 18. 000 18. 083 18. 167	2. 30 2. 23 2. 22 2. 22 2. 15 2. 15	23. 83 23. 92 24. 00 24. 08 24. 17 24. 25	1. 31 1. 31 1. 31 1. 30 1. 30 1. 30
6.08: Max. Eff. Inten. (i over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak	nm/hr)= (mi n) (mi n)= (mi n)=	12. 167 127. 20 15. 00 13. 50 15. 00 0. 08	127. 21 (ii)	18. 250 88. 40 25. 00 22. 63 (ii) 25. 00 0. 05	2. 15		
PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICII	(cms)= (hrs)= (mm)= (mm)= ENT =	0. 45 12. 33 116. 60 117. 60 0. 99	·	0. 30 12. 50 51. 86 117. 60 0. 44	0. 12 74 117	ΓALS* 689 (iii) 2. 42 4. 51 7. 60). 63)

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0028) (ha) = 3.43Area IID= 1 DT= 5.0 min | Total Imp(%) = 50.00Dir. Conn. (%) = 35.00 I MPERVI OUS PERVIOUS (i) Surface Area (ha)= 1.71 1.71 Dep. Storage (mm) =1.00 5.00 2.00 Average Slope (%)= 1.00 Length (m) =151. 22 40.00 Mannings n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN mm/hr mm/hr | hrs hrs mm/hr |' hrs hrs mm/hr 0.083 0.00 6.167 2. 09 | 12. 250 | 127. 21 | 18. 33 2.08 2. 09 | 12. 333 0.167 0.00 6.250 20.17 18.42 2.08 0.250 0.00 6.333 2. 15 | 12. 417 20. 15 18.50 2.08 0.333 1.19 6.417 2. 15 | 12. 500 20. 15 18.58 2.01 2. 15 | 12. 583 0.417 1.19 6.500 13.72 18.67 2.01 0.500 1.19 6.583 2. 20 | 12. 667 13.72 18.75 2.01 0.583 1.22 6.667 2. 20 | 12. 750 13.72 18.83 1.93 0.667 1.22 6.750 2. 20 | 12. 833 9.44 18.92 1.93 0.750 6.833 2. 26 | 12. 917 1.22 9.44 19.00 1.93 0.833 1.25 6.917 2. 26 | 13. 000 9.44 19.08 1.86 0.917 7.000 2. 26 | 13. 083 7.97 1.25 19.17 1.86 1.000 1.25 7.083 2.32 13. 167 7.97 19.25 1.86 1.083 1.28 7.167 2.32 13. 250 7.97 19.33 1.79 1.167 1.28 7.250 2.32 13.333 6.75 19.42 1.79 1.250 1.28 7.333 2.38 13.417 6.75 19.50 1.79 1.333 1.31 7.417 2.38 |13.500 6.75 19.58 1.71 1.417 1.31 7.500 2.38 13.583 5.96 19.67 1.71 1.500 1.31 7.583 2.44 13.667 5.96 19.75 1.71 1.583 1.34 7.667 2.44 | 13.750 5.96 19.83 1.64 1.667 7.750 2.44 | 13.833 19.92 1.34 5. 22 1.64 1.750 7.833 2.50 113.917 5. 22 20.00 1.34 1.64 1.833 1.37 7.917 2.50 | 14.000 5. 22 20.08 1.57 1.917 1.37 8.000 2.50 | 14.083 20.17 1.57 4.66 2.000 1.37 8.083 2. 56 | 14. 167 20. 25 1.57 4.66 2.083 8.167 2.56 | 14.250 20.33 1.39 4.66 1.52 8.250 2.167 1.39 2.56 | 14.333 4. 25 20.42 1.52 2.250 8.333 2.74 | 14.417 1.39 4. 25 20.50 1.52 2.333 8.417 2.74 | 14.500 1.43 4.25 20.58 1.51 2.417 1.43 8.500 2.74 | 14.583 4.05 20.67 1.51 2.500 8.583 3.02 | 14.667 20.75 1.43 4.05 1.51 2.583 1.46 8.667 3.02 | 14.750 4.05 20.83 1.49 2.667 1.46 8.750 3.02 | 14.833 3.83 20.92 1.49 2.750 8.833 3. 33 | 14. 917 1.46 3.83 21.00 1.49 2.833 1.48 8.917 3. 33 | 15. 000 3.83 21.08 1.48 2.917 1.48 9.000 3. 33 | 15. 083 3.63 21.17 1.48 3.000 1.48 9.083 3. 61 | 15. 167 3.63 21. 25 1.48 3.083 9.167 15. 250 1.51 3.61 3.63 21.33 1.46 3.167 1.51 9.250 3.61 i 15. 333 3.42 21.42 1.46 3.250 1.51 9.333 3. 76 | 15. 417 3.42 21.50 1.46 3.76 | 15.500 3.333 1.55 9.417 3.42 21.58 1.45 3. 76 | 15. 583 3.417 1.55 9.500 3. 22 I 21.67 1.45 3.500 1.55 İ 9.583 3.76 | 15.667 3. 22 | 21. 75 1.45 3.583 3.76 | 15.750 1.57 9.667 3. 22 21.83 1.43 9.750 3.76 | 15.833 3.667 1.57 3. 01 | 21. 92 1.43 3.750 1.57 9.833 4.01 | 15.917 3.01 | 22.00 1.43 9.917 4.01 | 16.000 3.833 1.60 3.01 | 22.08 1.42

4.01 | 16.083

2. 81 | 22. 17

1.42

3.917

1.60 | 10.000

--- TRANSFORMED HYETOGRAPH ----

```
4.000
                   1.60 | 10.083
                                    4. 46 | 16. 167
                                                     2. 81 | 22. 25
                                                                     1.42
           4.083
                   1.63 | 10.167
                                    4.46 | 16.250
                                                     2.81
                                                            22.33
                                                                      1.40
           4.167
                    1.63 | 10.250
                                    4.46 | 16.333
                                                     2.67
                                                             22.42
                                                                      1.40
                    1.63 10.333
                                                            22.50
           4.250
                                     5. 07 | 16. 417
                                                     2.67
                                                                      1.40
           4.333
                    1.68 | 10.417
                                     5.07 | 16.500
                                                            22. 58
                                                     2.67
                                                                      1.39
           4.417
                    1.68 | 10.500
                                     5.07 | 16.583
                                                     2.60
                                                             22.67
                                                                      1.39
                                                             22.75
           4.500
                    1.68 | 10.583
                                     5. 75 | 16. 667
                                                     2.60
                                                                      1 39
           4.583
                    1.73 | 10.667
                                    5. 75 | 16. 750
                                                     2.60
                                                            22.83
                                                                      1.37
           4.667
                    1.73 | 10.750
                                    5. 75 | 16. 833
                                                     2.52
                                                             22.92
                                                                      1.37
           4.750
                    1.73 | 10.833
                                    6. 73 | 16. 917
                                                     2.52
                                                             23.00
                                                                      1.37
           4.833
                    1.79 | 10.917
                                     6. 73 | 17. 000
                                                             23.08
                                                     2.52
                                                                      1 36
           4.917
                    1.79 | 11.000
                                    6. 73 | 17. 083
                                                     2.45
                                                             23. 17
                                                                      1.36
                                    7. 86 | 17. 167
           5.000
                   1.79 111.083
                                                     2.45
                                                             23. 25
                                                                      1.36
                                     7. 86 | 17. 250
           5.083
                    1.85 111.167
                                                     2.45
                                                             23.33
                                                                      1.35
           5.167
                    1.85
                          11. 250
                                     7. 86 | 17. 333
                                                     2.37
                                                             23.42
                                                                      1.35
                          i 11. 333
                                     9. 93 | 17. 417
           5.250
                    1.85
                                                     2.37
                                                             23.50
                                                                      1.35
           5.333
                    1.91
                          i 11. 417
                                     9. 93 | 17. 500
                                                             23.58
                                                     2.37
                                                                      1.33
           5.417
                    1.91
                          11.500
                                    9. 93 | 17. 583
                                                             23.67
                                                                      1.33
                                                     2.30
           5.500
                    1.91
                          111.583
                                    12.64 | 17.667
                                                             23.75
                                                                      1.33
                                                      2.30
           5.583
                    1.97
                          11.667
                                    12.64
                                          17.750
                                                      2.30
                                                             23.83
                                                                      1.31
           5.667
                    1.97
                          111.750
                                    12.64 | 17.833
                                                      2.23
                                                             23.92
                                                                      1.31
           5.750
                    1.97
                          11.833
                                    51.54 | 17.917
                                                      2.22
                                                             24.00
                                                                      1.31
           5.833
                    2.03
                          111.917
                                    51.54 | 18.000
                                                     2.22
                                                             24.08
                                                                      1.30
                          12.000
           5.917
                    2.03
                                    51. 54 | 18. 083
                                                      2.15
                                                            24. 17
                                                                      1.30
           6.000
                    2.03 | 12.083
                                   127. 20 | 18. 167
                                                     2. 15
                                                            24. 25
                                                                      1.30
           6.083
                    2.09 | 12.167
                                  127, 21 | 18, 250
                                                     2. 15
Max. Eff. Inten. (mm/hr)=
                            127.21
                                          88.40
           over (min)
                             5.00
                                          15.00
                                          10.39 (ii)
Storage Coeff. (min)=
                             2.97 (ii)
Unit Hyd. Tpeak (min)=
                                          15.00
                             5.00
Unit Hyd. peak (cms)=
                             0. 28
                                           0.09
                                                        *TOTALS*
PEAK FLOW
                (cms) =
                             0.42
                                           0 29
                                                         0.680 (iii)
TIME TO PEAK
                (hrs)=
                             12.25
                                          12.33
                                                         12.25
RUNOFF VOLUME
                 (mm) =
                            116.60
                                          51.86
                                                          74.52
TOTAL RAINFALL
                 (mm) =
                            117.60
                                         117.60
                                                         117.60
RUNOFF COEFFICIENT =
                             0.99
                                           0.44
                                                           0.63
```

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

.....

 -----(cms) (ha.m.) (cms) (ha.m.) 0.0000 0.0000 0. 2200 0.1300 0.1100 0.0700 0.0000 0.0000 AREA QPEAK **TPEAK** R. V. (ha) (cms) (hrs) (mm) INFLOW: ID= 2 (0028) 3.430 0.680 12. 25 74.52 OUTFLOW: ID= 1 (0029) 3.430 0. 161 12.67 74.47

 PEAK
 FLOW
 REDUCTION
 [Qout/Qin] (%) = 23.64

 TIME
 SHIFT OF PEAK FLOW
 (min) = 25.00

 MAXIMUM
 STORAGE
 USED
 (ha.m.) = 0.0977

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----TIME RAIN TIME RAIN | TIME RAIN RAIN | TIME hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0.083 0.00 6.167 2.09 | 12.250 | 127.21 | 18.33 2.08 0.167 6.250 2.09 | 12.333 20.17 18.42 2.08 0.00 0.250 6.333 2. 15 | 12. 417 2.08 0.00 20. 15 18.50 0.333 6.417 2. 15 | 12. 500 2.01 1.19 20. 15 18.58 0.417 6.500 2. 15 | 12. 583 2.01 1.19 13.72 18.67 6.583 0.500 2. 20 | 12. 667 13.72 18.75 2.01 1.19 0.583 2. 20 | 12. 750 1.22 6.667 13.72 18.83 1.93 0.667 1.22 6.750 2. 20 | 12. 833 9.44 18.92 1 93 0.750 6.833 2. 26 | 12. 917 9.44 19.00 1.93 1.22 0.833 1.25 6.917 2. 26 | 13. 000 9.44 19.08 1.86 0.917 1.25 7.000 2. 26 | 13. 083 7.97 19.17 1 86 1.000 1. 25 7.083 2. 32 | 13. 167 7. 97 19, 25 1.86 1.083 1.28 7.167 2. 32 | 13. 250 7.97 19.33 1.79 1.167 1.28 7.250 2. 32 | 13. 333 6.75 19.42 1.79 1.250 1.28 7.333 2. 38 | 13. 417 6.75 19.50 1.79 1.333 7.417 2.38 | 13.500 1.31 6.75 19.58 1.71 1.417 1. 31 İ 7.500 2. 38 | 13. 583 5.96 19.67 1.71 1.500 1.31 7.583 2.44 | 13.667 5.96 19.75 1.71 1.583 1.34 7.667 2.44 | 13.750 5.96 19.83 1.64 1.34 | 7.750 2.44 | 13.833 1.667 5. 22 I 19. 92 1.64 1.750 1.34 | 7.833 2.50 | 13.917 5. 22 I 20.00 1.64 7.917 2.50 | 14.000 20.08 1.833 1.37 l 5. 22 I 1.57 1.917 8.000 2.50 | 14.083 1.37 4.66 20. 17 1.57 2.000 1.37 8.083 2.56 | 14.167 4.66 | 20.25 1.57 2.083 2.56 | 14.250 1.39 8.167 4.66 | 20.33 1.52 2.167 1.39 | 8.250 2.56 | 14.333 4. 25 | 20. 42 1.52

```
2. 250 1. 39 | 8. 333
                        2.74 | 14.417
                                         4. 25 | 20. 50 1. 52
                         2.74 | 14.500
2.333
       1.43 | 8.417
                                         4. 25 | 20. 58
                                                         1. 51
2.417
        1.43 | 8.500
                         2.74 | 14.583
                                         4.05
                                                20.67
                                                          1.51
        1.43 | 8.583
                                         4.05 | 20.75
2.500
                         3.02 | 14.667
                                                         1 51
                         3. 02 | 14. 750
                                         4.05 | 20.83
2.583
        1.46 | 8.667
                                                         1.49
2.667
        1.46 | 8.750
                         3. 02 | 14. 833
                                         3.83
                                                20.92
                                                          1.49
2.750
        1.46
                8.833
                         3. 33 | 14. 917
                                         3.83
                                                21.00
2.833
        1.48
                8.917
                         3. 33 | 15. 000
                                         3.83
                                                21.08
                                                         1.48
2.917
        1.48
                9.000
                         3. 33 | 15. 083
                                         3.63
                                                21. 17
                                                          1.48
3.000
        1.48
                9.083
                         3. 61 | 15. 167
                                         3.63
                                                21. 25
                                                          1.48
3.083
                9.167
                         3. 61 | 15. 250
        1.51
                                         3.63
                                                21.33
                                                          1.46
3.167
        1.51
                9.250
                         3. 61 | 15. 333
                                         3.42
                                                21.42
                                                          1.46
3.250
        1.51
                9.333
                         3. 76 | 15. 417
                                         3.42
                                                21.50
                                                          1 46
                         3. 76 | 15. 500
3.333
        1.55
                9.417
                                         3.42
                                                21.58
                                                          1 45
3.417
        1.55
                9.500
                         3. 76 | 15. 583
                                         3. 22
                                                21.67
                                                          1.45
                         3. 76 | 15. 667
3.500
        1.55
                9.583
                                         3.22
                                                21.75
                                                         1.45
3.583
        1.57
                9.667
                         3. 76 | 15. 750
                                         3. 22
                                                21.83
                                                          1.43
3.667
        1.57
                9.750
                         3. 76 | 15. 833
                                         3.01
                                                21.92
                                                          1.43
3.750
        1.57
                9.833
                         4.01 | 15.917
                                         3.01
                                                22.00
                                                          1.43
3.833
         1.60
                9.917
                         4.01 | 16.000
                                         3.01
                                                 22.08
                                                          1.42
3.917
         1.60 | 10.000
                         4.01 | 16.083
                                         2.81
                                                 22. 17
4.000
        1.60 | 10.083
                         4. 46 | 16. 167
                                         2.81
                                                 22. 25
                                                         1.42
4.083
         1.63 110.167
                         4.46 | 16.250
                                         2.81
                                                 22.33
                                                          1.40
4.167
         1.63 | 10.250
                         4. 46 | 16. 333
                                          2.67
                                                 22.42
                                                          1.40
4.250
         1.63 | 10.333
                         5. 07 | 16. 417
                                         2.67
                                                22.50
                                                          1.40
4.333
         1.68 10.417
                         5.07 | 16.500
                                         2.67
                                                22. 58
                                                          1.39
4.417
         1.68 | 10.500
                         5. 07 | 16. 583
                                         2.60
                                                22.67
                                                          1.39
4.500
        1.68 | 10.583
                         5. 75 | 16. 667
                                                22.75
                                         2.60
                                                          1. 39
4.583
         1.73 | 10.667
                         5. 75 | 16. 750
                                         2.60
                                                22.83
                                                          1.37
        1.73 | 10.750
                         5. 75 | 16. 833
4.667
                                         2.52
                                                22. 92
                                                          1.37
4.750
        1.73 | 10.833
                         6. 73 | 16. 917
                                         2.52
                                                23.00
                                                          1.37
        1.79 | 10.917
                         6. 73 | 17. 000
4.833
                                                23.08
                                         2.52
                                                          1.36
                         6. 73 | 17. 083
4.917
        1.79 | 11.000
                                         2.45
                                                23. 17
                                                          1.36
5.000
        1.79 | 11.083
                         7. 86 | 17. 167
                                         2.45
                                                23. 25
                                                          1 36
5.083
        1.85 | 11.167
                         7. 86 | 17. 250
                                         2.45
                                                23.33
                                                          1.35
5.167
        1.85 | 11.250
                         7. 86 | 17. 333
                                         2.37
                                                23.42
                                                          1.35
                         9. 93 | 17. 417
5.250
        1.85 | 11.333
                                         2.37
                                                23.50
                                                          1.35
                         9. 93 | 17. 500
5.333
        1.91 | 11.417
                                         2.37 I
                                                23.58
                                                          1.33
5.417
        1. 91 | 11. 500
                         9. 93 | 17. 583
                                         2.30 İ
                                                23.67
                                                          1.33
                        12.64 | 17.667
5.500
        1. 91 | 11. 583
                                         2.30
                                                23.75
5.583
        1. 97 | 11. 667
                        12.64 | 17.750
                                         2.30
                                                23.83
        1. 97 | 11. 750
                        12.64 | 17.833
5.667
                                         2.23
                                                23.92
5.750
        1. 97 | 11. 833
                        51. 54 | 17. 917
                                         2. 22 j
                                                24.00
5.833
        2.03 111.917
                        51. 54 | 18. 000
                                         2. 22 | 24. 08
5.917
         2.03 | 12.000
                        51.54 | 18.083
                                         2. 15 | 24. 17
                                                          1.30
        2.03 | 12.083 | 127.20 | 18.167
6.000
                                         2. 15 | 24. 25
6.083
        2. 09 | 12. 167 | 127. 21 | 18. 250
                                         2.15
```

PEAK FLOW (cms)= 0.280 (i) TIME TO PEAK (hrs)= 12.333

TOTAL RAINFALL (mm) = 117.600 RUNOFF COEFFICIENT = 0.488 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. -----| ADD HYD (0007)| 1 + 2 = 3 AREA QPEAK **TPEAK** R. V. (ha) (cms) (hrs) (mm) ID1= 1 (0023): 0.41 0.062 12. 33 60.10 + ID2= 2 (0029): 3, 43 0, 161 12.67 74.47 ______ ID = 3 (0007): 3. 84 0. 201 12. 42 72. 94 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0007)| 3 + 2 = 1 AREA QPEAK **TPEAK** R. V. (ha) (cms) (hrs) (mm) ID1 = 3 (0007): 3.84 0. 201 12.42 72.94 + ID2= 2 (0042): 2.05 0.280 12. 33 57.37 ______ ID = 1 (0007): 5. 89 0. 476 12. 33 67. 52 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0007)| 1 + 2 = 3 AREA QPEAK TPEAK R. V. (ha) (cms) (hrs) (mm) -----ID1 = 1 (0007): 5.89 0.476 12.33 67.52 + ID2= 2 (0005): 5. 32 0. 689 12.42 74.51 ID = 3 (0007): 11.21 1.156 12. 33 70. 84 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | RESERVOIR(0008)| OVERFLOW IS OFF | IN= 2---> OUT= 1 | DT= 5.0 min | OUTFLOW STORAGE OUTFLOW STORAGE -----(cms) (ha.m.) (cms) (ha.m.) 0.0000 0.0000 0.3390 0.1535

0.0410

0.0580

0.0710

0.0120

0.0253

0.0399

0.3840

0.5390

0.6480

0.1758

0.1989

0.2228

RUNOFF VOLUME (mm) = 57.370

```
0.0920
                           0.0732
                                      0.8050
                                               0.2733
                           0. 0918
                                               0.2998
                   0. 1010
                                      0.8710
                   0. 2130
                           0. 1116
                                      0.9320
                                               0.3263
                   0. 2860
                           0. 1321
                                      0.9880
                                               0.3528
                              QPEAK
                                      TPEAK
                        AREA
                                                R. V.
                        (ha)
                              (cms)
                                       (hrs)
                                                (mm)
  INFLOW: ID= 2 ( 0007)
                       11.210
                               1. 156
                                        12. 33
                                                70.84
  OUTFLOW: ID= 1 ( 0008)
                       11.210
                                0. 557
                                        12.83
                                                70.83
              PEAK FLOW REDUCTION [Qout/Qin](%) = 48.20
              TIME SHIFT OF PEAK FLOW (min) = 30.00
              MAXIMUM STORAGE USED
                                     (ha. m.) = 0.2032
______
ADD HYD ( 0016)|
 1 + 2 = 3
                      AREA QPEAK
                                   TPEAK
                                         R. V.
                      (ha)
                           (cms)
                                   (hrs)
                                           (mm)
    ID1= 1 ( 0022):
                     0. 83 0. 128
                                  12.33
                                         60.08
    + ID2= 2 ( 0008):
                    11. 21 0. 557
                                  12.83
                                        70.83
     _____
     ID = 3 ( 0016): 12.04 0.587 12.83 70.09
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
______
************
** SIMULATION: 3-10yr 24hr 15min SCS Type II **
************
CALIB
 NASHYD ( 0022) Area (ha)= 0.83 Curve Number (CN)= 75.0
| ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00
----- U. H. Tp(hrs) = 0.19
      NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                       ---- TRANSFORMED HYETOGRAPH ----
            TIME
                  RAIN | TIME
                              RAIN | TIME
                                          RAIN | TIME
                              mm/hr | hrs mm/hr | hrs
                 mm/hr
                        hrs
             hrs
                              1. 45 | 12. 250 | 88. 27 | 18. 33
            0.083
                  0.00 | 6.167
                              1. 45 | 12. 333
            0.167
                  0.00 | 6.250
                                          13. 99 | 18. 42
            0.250
                  0.00 | 6.333
                              1. 49 | 12. 417
                                          13. 98 | 18. 50
                                                        1.44
            0.333
                 0.83 | 6.417
                              1.49 | 12.500
                                          13. 98 | 18. 58
```

0. 0559

0.7320

0.2476

0.0830

0.417

0.500

0.583

0.667

0.83 | 6.500

0.83 | 6.583

0.85 | 6.667

0.85 | 6.750

0.750 0.85 | 6.833

1. 49 | 12. 583

1.53 | 12.667

1.53 | 12.750

1. 53 | 12. 833

1. 57 | 12. 917

9. 52 | 18. 67

9. 52 | 18. 75

9. 52 | 18. 83

6. 55 | 18. 92

6. 55 | 19. 00

1.39

1.34

1.34

1.34

```
1. 65 | 23. 42 0. 93
5. 250 1. 28 | 11. 333 6. 89 | 17. 417
                                1.65 | 23.50
                                             0. 93
5. 333 1. 33 11. 417
                  6. 89 | 17. 500
                                1. 65 | 23. 58
                                              0. 92
5. 417 1. 33 | 11. 500
                  6. 89 | 17. 583
                                1.60 | 23.67
                                             0. 92
5. 500 1. 33 | 11. 583 8. 77 | 17. 667
                                1.60 | 23.75
                                             0. 92
5. 583 1. 37 11. 667
                  8. 77 | 17. 750
                                1.60 | 23.83
                                             0. 91
5. 667 1. 37 11. 750
                  8. 77 | 17. 833
                                1. 54 | 23. 92
                                             0. 91
5. 750 1. 37 | 11. 833 35. 76 | 17. 917
                                1.54 | 24.00
                                             0. 91
5. 833 1. 41 | 11. 917 35. 77 | 18. 000
                                1.54 | 24.08
                                             0.90
1. 49 | 24. 17
                                             0.90
6.000 1.41 | 12.083 88.26 | 18.167
                                1. 49 | 24. 25
                                             0.90
1.49
```

PEAK FLOW (cms) = 0.069 (i) TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 32.730 TOTAL RAINFALL (mm) = 81.600 RUNOFF COEFFICIENT = 0.401

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	1. 45	12. 250	88. 27	18. 33	1.44
0. 167	0.00	6.250	1.45	12. 333	13. 99	18. 42	1.44
0.250	0.00	6.333	1.49	12. 417	13. 98	18.50	1.44
0.333	0.83	6.417	1.49	12. 500	13. 98	18. 58	1. 39
0.417	0.83	6.500	1.49	12. 583	9.52	18. 67	1.39
0.500	0.83	6.583	1.53	12. 667	9. 52	18. 75	1.39
0.583	0.85	6.667	1.53	12. 750	9. 52	18.83	1.34
0.667	0.85	6.750	1.53	12. 833	6. 55	18. 92	1.34
0.750	0.85	6.833	1.57	12. 917	6.55	19.00	1.34
0.833	0.87	6.917	1.57	13. 000	6.55	19.08	1. 29
0.917	0.87	7.000	1.57	13.083	5.53	19.17	1. 29
1.000	0.87	7.083	1.61	13. 167	5.53	19. 25	1. 29
1.083	0.89	7.167	1.61	13. 250	5.53	19. 33	1. 24
1. 167	0.89	7. 250	1.61	13. 333	4.68	19. 42	1. 24
1.250	0.89	7.333	1.65	13. 417	4.68	19.50	1. 24
1. 333	0.91	7.417	1. 65	13. 500	4. 68	19. 58	1. 19

1. 417	0. 91	7.500	1. 65	13. 583	4. 13	19.67	1. 19
1.500	0. 91	7.583	1. 69	13. 667	4. 13	19.75	1. 19
1. 583	0. 93	7.667	1. 69	13. 750	4. 13	19.83	1. 14
1. 667	0. 93	7.750	1. 69	13. 833	3. 62	19.92	1. 14
1. 750	0.93	7.833	1. 73	13. 917	3. 62	20.00	1. 14
1.833	0.95	7.917	1.73	14. 000	3. 62	20.08	1.09
1. 917	0.95	8.000	1.73	14. 083	3. 23	20. 17	1.09
2.000	0.95	8.083	1.77	14. 167	3. 23	20. 25	1.09
2.083	0.97	8.167	1.77	14. 250	3. 23	20.33	1.06
2. 167	0.97	8.250	1. 77	14. 333	2. 95	20.42	1. 06
2. 250	0.97	8.333	1. 90	14. 417	2. 95	20.50	1.06
2.333	0.99	8.417	1. 90	14. 500	2. 95	20.58	1.05
2. 417	0.99	8.500	1. 90	14. 583	2.81	20.67	1.05
2.500 2.583	0. 99 1. 01	8.583 8.667	2. 10 2. 10	14. 667 14. 750	2. 81 2. 81	20. 75 20. 83	1. 05 1. 03
2. 565	1.01	8.750	2. 10	14. 730	2. 66	20.63 20.92	1. 03
2.750	1.01	8.833	2. 10	14. 033	2.66	20. 72	1. 03
2. 833	1.03	8.917	2. 31	15. 000	2.66	21.08	1. 02
2. 917	1.03	9.000	2. 31	15. 083	2. 52	21. 17	1. 02
3.000	1.03	9.083	2. 51	15. 167	2. 52	21. 25	1. 02
3.083	1.05	9. 167	2. 51	15. 250	2.52	21. 33	1.02
3. 167	1.05	9.250	2.51	15. 333	2.37	21.42	1.02
3.250	1.05	9.333	2. 61	15. 417	2.37	21.50	1.02
3. 333	1.07	9.417	2. 61	15. 500	2. 37	21.58	1. 01
3. 417	1.07	9.500	2. 61	15. 583	2. 24	21.67	1. 01
3.500	1.07	9.583	2. 61	15. 667	2. 24	21.75	1. 01
3.583	1.09	9.667	2. 61	15. 750	2. 24	21.83	0. 99
3.667	1.09	9.750	2.61	15. 833	2.09	21. 92	0. 99
3. 750 3. 833	1. 09 1. 11	9.833 9.917	2. 78 2. 78	15. 917 16. 000	2. 09 2. 09	22.00 22.08	0. 99 0. 98
3. 033 3. 917	1. 11	10.000	2. 78	16. 083	2. 09 1. 95	22.06	0. 98
4. 000	1. 11	10.083	3. 09	16. 167	1. 95	22. 17	0. 98
4. 083	1. 13	10.167	3. 09	16. 250	1. 95	22. 33	0. 97
4. 167	1. 13	10. 250	3. 09	16. 333	1. 85	22.42	0. 97
4. 250	1.13	10.333	3. 52	16. 417	1.85	22.50	0. 97
4.333	1.16	10.417	3.52	16. 500	1.85	22. 58	0. 96
4.417	1.16	10.500	3.52	16. 583	1.80	22. 67	0. 96
4.500	1.16	10.583	3. 99	16. 667	1. 80	22.75	0. 96
4. 583	1.20	10.667	3. 99	16. 750	1.80	22.83	0. 95
4. 667	1.20	10.750	3. 99	16. 833	1. 75	22.92	0. 95
4.750	1.20	10.833	4.67	16. 917	1. 75	23.00	0. 95
4. 833 4. 917	1. 25 1. 25	10.917 11.000	4. 67 4. 67	17. 000 17. 083	1. 75 1. 70	23. 08 23. 17	0. 94 0. 94
5.000	1. 25	111.083	5. 45	17. 063	1. 70	23. 17	0. 94
5. 083	1. 28	111. 167	5. 45	17. 250	1. 70	23. 23	0. 93
5. 167	1. 28	11. 250	5. 45	17. 333	1. 65	23.42	0. 93
5. 250		11.333	6. 89	17. 417	1. 65	23.50	0. 93
5. 333	1.33	11.417	6.89	17. 500	1. 65	23. 58	0. 92
5. 417	1.33	11.500	6.89	17. 583	1.60	23. 67	0. 92
5.500	1.33	11.583	8.77	17. 667	1.60	23. 75	0. 92
5. 583	1.37	11.667	8. 77	17. 750	1.60	23.83	0. 91
5. 667	1.37	11.750	8. 77	17. 833	1.54	23. 92	0. 91

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    5. 750
    1. 37 | 11. 833
    35. 76 | 17. 917
    1. 54 | 24. 00
    0. 91

    5. 833
    1. 41 | 11. 917
    35. 77 | 18. 000
    1. 54 | 24. 08
    0. 90

    5. 917
    1. 41 | 12. 000
    35. 77 | 18. 083
    1. 49 | 24. 17
    0. 90

    6. 000
    1. 41 | 12. 083
    88. 26 | 18. 167
    1. 49 | 24. 25
    0. 90

    6. 083
    1. 45 | 12. 167
    88. 27 | 18. 250
    1. 49 |
    1. 49 |
```

PEAK FLOW (cms) = 0.033 (i) TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 32.743 TOTAL RAINFALL (mm) = 81.600 RUNOFF COEFFICIENT = 0.401

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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IMPERVIOUS PERVIOUS (i) (ha)= Surface Area 2.66 2.66 Dep. Storage (mm) = 1.00 5.00 1.00 Average Slope (%)= 1.00 Length (m) = 40.00 188.33 Mannings n 0.130 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH									
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN		
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr		
0.083	0.00	6.167	1. 45	12. 250	88. 27	18. 33	1.44		
0.167	0.00	6.250	1.45	12. 333	13. 99	18.42	1.44		
0.250	0.00	6.333	1. 49	12. 417	13. 98	18.50	1.44		
0.333	0.83	6.417	1. 49	12.500	13. 98	18. 58	1. 39		
0.417	0.83	6.500	1. 49	12. 583	9. 52	18. 67	1. 39		
0.500	0.83	6.583	1.53	12.667	9. 52	18. 75	1. 39		
0.583	0.85	6.667	1.53	12. 750	9. 52	18.83	1.34		
0.667	0.85	6.750	1.53	12. 833	6. 55	18. 92	1.34		
0.750	0.85	6.833	1.57	12. 917	6. 55	19.00	1.34		
0.833	0.87	6.917	1. 57	13.000	6. 55	19.08	1. 29		
0. 917	0.87	7.000	1.57	13. 083	5.53	19. 17	1. 29		
1.000	0.87	7.083	1. 61	13. 167	5.53	19. 25	1. 29		
1.083	0.89	7.167	1. 61	13. 250	5.53	19. 33	1. 24		
1. 167	0.89	7.250	1. 61	13. 333	4.68	19. 42	1. 24		
1. 250	0.89	7.333	1. 65	13. 417	4. 68	19.50	1. 24		
1.333	0.91	7.417	1. 65	13. 500	4. 68	19. 58	1. 19		
1. 417	0.91	7.500	1. 65	13. 583	4. 13	19. 67	1. 19		

3. 083 1. 05 9. 167 2. 51 15. 250 2. 52 21. 33 1. 02 3. 167 1. 05 9. 250 2. 51 15. 333 2. 37 21. 42 1. 02 3. 250 1. 05 9. 333 2. 61 15. 417 2. 37 21. 50 1. 02 3. 333 1. 07 9. 417 2. 61 15. 500 2. 37 21. 58 1. 01 3. 417 1. 07 9. 500 2. 61 15. 583 2. 24 21. 67 1. 01 3. 500 1. 07 9. 583 2. 61 15. 667 2. 24 21. 75 1. 01 3. 583 1. 09 9. 667 2. 61 15. 833 2. 09 21. 92 0. 99 3. 667 1. 09 9. 750 2. 61 15. 833 2. 09 21. 92 0. 99 3. 667 1. 09 9. 750 2. 61 15. 833 2. 09 21. 92 0. 99 3. 750 1. 09 9. 833 2. 78 15. 917 2. 09 22. 00 0. 99 3. 833 1. 11 9. 917 2. 78 16. 000 2. 09 22. 08 0. 98 3. 917 1. 11 10. 000 2. 78 16. 083 1. 95 22. 17 0. 98 4. 083 1. 13 10. 250 3. 09 16. 250 1. 95 22. 25 0. 94 4. 250 1.	3. 167 1. 05 9. 250 2. 51 15. 333 2. 37 21. 42 1. 02 3. 250 1. 05 9. 333 2. 61 15. 417 2. 37 21. 50 1. 02 3. 333 1. 07 9. 417 2. 61 15. 500 2. 37 21. 58 1. 01 3. 417 1. 07 9. 583 2. 61 15. 583 2. 24 21. 67 1. 01 3. 583 1. 09 9. 667 2. 61 15. 667 2. 24 21. 92 0. 99 3. 667 1. 09 9. 750 2. 61 15. 833 2. 09 21. 92 0. 99 3. 833 1. 11 9. 917 2. 78 16. 000 2. 09 22. 00 0. 99 3. 750 1. 09 9. 833 2. 78 15. 917 2. 09 22. 00 0. 99 3. 917 1. 11 10. 000 2. 78 16. 083 1. 95 22. 17 0. 98 4. 000 1. 11 10. 083 3. 09 16. 250 1. 95 22. 25 0. 98 4. 167 1. 13 10. 250 3. 09 16. 50	1. 500 1. 583 1. 667 1. 750 1. 833 1. 917 2. 000 2. 083 2. 167 2. 250 2. 333 2. 417 2. 500 2. 583 2. 667 2. 750 2. 833 2. 917 3. 000	0.91 0.93 0.93 0.95 0.95 0.97 0.97 0.97 0.99 0.99 1.01 1.01 1.03 1.03	7.583 7.667 7.750 7.833 7.917 8.000 8.083 8.167 8.250 8.333 8.417 8.500 8.583 8.667 8.750 8.833 8.917 9.000 9.083	1. 69 1. 69 1. 69 1. 73 1. 73 1. 77 1. 77 1. 77 1. 90 1. 90 2. 10 2. 10 2. 31 2. 31 2. 31 2. 51	13. 667 13. 750 13. 833 13. 917 14. 000 14. 083 14. 167 14. 250 14. 333 14. 417 14. 500 14. 583 14. 667 14. 750 14. 833 14. 917 15. 000 15. 083 15. 167	4. 13 4. 13 3. 62 3. 62 3. 23 3. 23 3. 23 2. 95 2. 95 2. 81 2. 81 2. 66 2. 66 2. 66 2. 52 2. 52	19. 75 19. 83 19. 92 20. 00 20. 08 20. 17 20. 25 20. 33 20. 42 20. 50 20. 58 20. 67 20. 75 20. 78 20. 92 21. 00 21. 08 21. 08 21. 17	1. 19 1. 14 1. 14 1. 19 1. 09 1. 09 1. 06 1. 06 1. 05 1. 05 1. 05 1. 03 1. 03 1. 03 1. 02 1. 02
3. 417 1. 07 9. 500 2. 61 15. 583 2. 24 21. 67 1. 01 3. 500 1. 07 9. 583 2. 61 15. 667 2. 24 21. 75 1. 01 3. 583 1. 09 9. 667 2. 61 15. 750 2. 24 21. 83 0. 99 3. 667 1. 09 9. 750 2. 61 15. 833 2. 09 21. 92 0. 99 3. 750 1. 09 9. 833 2. 78 15. 917 2. 09 22. 00 0. 99 3. 833 1. 11 9. 917 2. 78 16. 000 2. 09 22. 08 0. 98 4. 000 1. 11 10. 003 3. 09 16. 167 1. 95 22. 25 0. 98 4. 083 1. 13 10. 167 3. 09 16. 250 1. 95 22. 25 0. 98 4. 250 1. 13 10. 250 3. 09 16. 333 1. 85 22. 42 0. 97 4. 333 1. 16 10. 417 3. 52 16. 500 1. 85 22. 50 0. 97 4. 353 1. 16 10. 583 3. 99 16.	3. 417 1. 07 9. 500 2. 61 15. 583 2. 24 21. 67 1. 01 3. 500 1. 07 9. 583 2. 61 15. 667 2. 24 21. 75 1. 01 3. 583 1. 09 9. 667 2. 61 15. 750 2. 24 21. 83 0. 99 3. 667 1. 09 9. 750 2. 61 15. 833 2. 09 21. 92 0. 99 3. 750 1. 09 9. 833 2. 78 15. 917 2. 09 22. 00 0. 99 3. 833 1. 11 19. 917 2. 78 16. 000 2. 09 22. 08 0. 98 3. 917 1. 11 10. 000 2. 78 16. 083 1. 95 22. 17 0. 98 4. 000 1. 11 10. 083 3. 09 16. 167 1. 95 22. 25 0. 98 4. 083 1. 13 10. 167 3. 09 16. 250 1. 95 22. 25 0. 97 4. 250 1. 13 10. 333 3. 52 16. 417 1. 85 22. 50 0. 97 4. 333 1. 16 10. 503 3. 52 16.	3. 167 3. 250	1. 05 1. 05	9.250	2. 51 2. 61	15. 333 15. 417	2. 37 2. 37	21. 42 21. 50	1. 02 1. 02
3. 750 1. 09 9. 833 2. 78 15. 917 2. 09 22. 00 0. 99 3. 833 1. 11 9. 917 2. 78 16. 000 2. 09 22. 08 0. 98 3. 917 1. 11 10. 000 2. 78 16. 083 1. 95 22. 21 0. 98 4. 000 1. 11 10. 083 3. 09 16. 167 1. 95 22. 25 0. 98 4. 083 1. 13 10. 167 3. 09 16. 250 1. 95 22. 23 0. 97 4. 167 1. 13 10. 250 3. 09 16. 333 1. 85 22. 42 0. 97 4. 250 1. 13 10. 333 3. 52 16. 417 1. 85 22. 50 0. 97 4. 333 1. 16 10. 417 3. 52 16. 500 1. 85 22. 58 0. 96 4. 417 1. 16 10. 583 3. 99 16. 667 1. 80 22. 75 0. 96 4. 530 1. 16 10. 583 3. 99 16. 677 1. 80 2	3. 750 1. 09 9. 833 2. 78 15. 917 2. 09 22. 00 0. 99 3. 833 1. 11 9. 917 2. 78 16. 000 2. 09 22. 08 0. 98 3. 917 1. 11 10. 000 2. 78 16. 083 1. 95 22. 21 0. 98 4. 000 1. 11 10. 083 3. 09 16. 167 1. 95 22. 25 0. 98 4. 083 1. 13 10. 167 3. 09 16. 250 1. 95 22. 23 0. 97 4. 167 1. 13 10. 250 3. 09 16. 333 1. 85 22. 42 0. 97 4. 250 1. 13 10. 333 3. 52 16. 500 1. 85 22. 55 0. 97 4. 333 1. 16 10. 503 3. 52 16. 583 1. 85 22. 58 0. 96 4. 500 1. 16 10. 583 3. 99 16. 667 1. 80 22. 75 0. 96 4. 583 1. 20 10. 667 3. 99 16. 750 1. 80 2	3. 417 3. 500 3. 583	1.07 1.07 1.09	9.500 9.583 9.667	2. 61 2. 61 2. 61	15. 583 15. 667 15. 750	2. 24 2. 24 2. 24	21. 67 21. 75 21. 83	1. 01 1. 01 0. 99
4. 083 1. 13 10. 167 3. 09 16. 250 1. 95 22. 33 0. 97 4. 167 1. 13 10. 250 3. 09 16. 333 1. 85 22. 42 0. 97 4. 250 1. 13 10. 333 3. 52 16. 417 1. 85 22. 55 0. 97 4. 333 1. 16 10. 500 3. 52 16. 580 1. 85 22. 58 0. 96 4. 417 1. 16 10. 503 3. 52 16. 583 1. 80 22. 67 0. 96 4. 500 1. 16 10. 583 3. 99 16. 667 1. 80 22. 75 0. 96 4. 583 1. 20 10. 667 3. 99 16. 750 1. 80 22. 83 0. 95 4. 667 1. 20 10. 750 3. 99 16. 833 1. 75 22. 92 0. 95 4. 750 1. 20 10. 833 4. 67 16. 917 1. 75 23. 00 0. 95 4. 833 1. 25 10. 917 4. 67 17. 000 1. 75 23. 18 0. 94 4. 917 1. 25 11. 000 4. 67 <t< td=""><td>4. 083 1. 13 10. 167 3. 09 16. 250 1. 95 22. 33 0. 97 4. 167 1. 13 10. 250 3. 09 16. 333 1. 85 22. 42 0. 97 4. 250 1. 13 10. 333 3. 52 16. 417 1. 85 22. 50 0. 97 4. 333 1. 16 10. 417 3. 52 16. 500 1. 85 22. 58 0. 96 4. 417 1. 16 10. 500 3. 52 16. 583 1. 80 22. 67 0. 96 4. 500 1. 16 10. 583 3. 99 16. 667 1. 80 22. 75 0. 96 4. 583 1. 20 10. 667 3. 99 16. 750 1. 80 22. 83 0. 95 4. 667 1. 20 10. 750 3. 99 16. 833 1. 75 22. 92 0. 95 4. 833 1. 25 10. 917 4. 67 17. 000 1. 75 23. 00 0. 95 4. 833 1. 25 11. 000 4. 67 17. 083 1. 70 <td< td=""><td>3. 750 3. 833 3. 917</td><td>1. 09 1. 11 1. 11</td><td>9.833 9.917 10.000</td><td>2. 78 2. 78 2. 78</td><td> 15. 917 16. 000 16. 083</td><td>2. 09 2. 09 1. 95</td><td>22. 00 22. 08 22. 17</td><td>0. 99 0. 98 0. 98</td></td<></td></t<>	4. 083 1. 13 10. 167 3. 09 16. 250 1. 95 22. 33 0. 97 4. 167 1. 13 10. 250 3. 09 16. 333 1. 85 22. 42 0. 97 4. 250 1. 13 10. 333 3. 52 16. 417 1. 85 22. 50 0. 97 4. 333 1. 16 10. 417 3. 52 16. 500 1. 85 22. 58 0. 96 4. 417 1. 16 10. 500 3. 52 16. 583 1. 80 22. 67 0. 96 4. 500 1. 16 10. 583 3. 99 16. 667 1. 80 22. 75 0. 96 4. 583 1. 20 10. 667 3. 99 16. 750 1. 80 22. 83 0. 95 4. 667 1. 20 10. 750 3. 99 16. 833 1. 75 22. 92 0. 95 4. 833 1. 25 10. 917 4. 67 17. 000 1. 75 23. 00 0. 95 4. 833 1. 25 11. 000 4. 67 17. 083 1. 70 <td< td=""><td>3. 750 3. 833 3. 917</td><td>1. 09 1. 11 1. 11</td><td>9.833 9.917 10.000</td><td>2. 78 2. 78 2. 78</td><td> 15. 917 16. 000 16. 083</td><td>2. 09 2. 09 1. 95</td><td>22. 00 22. 08 22. 17</td><td>0. 99 0. 98 0. 98</td></td<>	3. 750 3. 833 3. 917	1. 09 1. 11 1. 11	9.833 9.917 10.000	2. 78 2. 78 2. 78	15. 917 16. 000 16. 083	2. 09 2. 09 1. 95	22. 00 22. 08 22. 17	0. 99 0. 98 0. 98
4. 333 1. 16 10. 417 3. 52 16. 500 1. 85 22. 58 0. 96 4. 417 1. 16 10. 500 3. 52 16. 583 1. 80 22. 67 0. 96 4. 500 1. 16 10. 583 3. 99 16. 667 1. 80 22. 75 0. 96 4. 583 1. 20 10. 667 3. 99 16. 750 1. 80 22. 83 0. 95 4. 667 1. 20 10. 750 3. 99 16. 833 1. 75 22. 92 0. 95 4. 750 1. 20 10. 833 4. 67 16. 917 1. 75 23. 00 0. 95 4. 833 1. 25 10. 917 4. 67 17. 000 1. 75 23. 20 0. 94 4. 917 1. 25 11. 000 4. 67 17. 083 1. 70 23. 27 0. 94 5. 000 1. 25 11. 083 5. 45 17. 167 1. 70 23. 23 0. 93 5. 083 1. 28 11. 167 5. 45 17. 250 1. 70 23. 23 0. 93	4. 333 1. 16 10. 417 3. 52 16. 500 1. 85 22. 58 0. 96 4. 417 1. 16 10. 500 3. 52 16. 583 1. 80 22. 67 0. 96 4. 500 1. 16 10. 583 3. 99 16. 667 1. 80 22. 75 0. 96 4. 583 1. 20 10. 667 3. 99 16. 750 1. 80 22. 28 0. 95 4. 67 1. 20 10. 750 3. 99 16. 833 1. 75 22. 92 0. 95 4. 750 1. 20 10. 917 4. 67 16. 917 1. 75 23. 08 0. 95 4. 833 1. 25 10. 917 4. 67 17. 000 1. 75 23. 08 0. 94 4. 917 1. 25 11. 083 5. 45 17. 167 1. 70 23. 25 0. 94 5. 000 1. 25 11. 083 5. 45 17. 250 1. 70 23. 33 0. 94 5. 167 1. 28 11. 1.67 5. 45 17. 250 1. 70 23. 33 0. 93 5. 250 1. 28 11. 333 6. 89 <t< td=""><td>4. 083 4. 167</td><td>1. 13 1. 13</td><td> 10.167 10.250</td><td>3. 09 3. 09</td><td>16. 250 16. 333</td><td>1. 95 1. 85</td><td>22. 33 22. 42</td><td>0. 97 0. 97</td></t<>	4. 083 4. 167	1. 13 1. 13	10.167 10.250	3. 09 3. 09	16. 250 16. 333	1. 95 1. 85	22. 33 22. 42	0. 97 0. 97
4. 667 1. 20 10. 750 3. 99 16. 833 1. 75 22. 92 0. 95 4. 750 1. 20 10. 833 4. 67 16. 917 1. 75 23. 00 0. 95 4. 833 1. 25 10. 917 4. 67 17. 000 1. 75 23. 08 0. 94 4. 917 1. 25 11. 000 4. 67 17. 083 1. 70 23. 17 0. 94 5. 000 1. 25 11. 083 5. 45 17. 167 1. 70 23. 27 0. 94 5. 083 1. 28 11. 167 5. 45 17. 250 1. 70 23. 33 0. 93	4. 667 1. 20 10. 750 3. 99 16. 833 1. 75 22. 92 0. 95 4. 750 1. 20 10. 833 4. 67 16. 917 1. 75 23. 00 0. 95 4. 833 1. 25 10. 917 4. 67 17. 000 1. 75 23. 08 0. 94 4. 917 1. 25 11. 000 4. 67 17. 083 1. 70 23. 17 0. 94 5. 000 1. 25 11. 083 5. 45 17. 167 1. 70 23. 25 0. 94 5. 083 1. 28 11. 167 5. 45 17. 250 1. 70 23. 32 0. 93 5. 167 1. 28 11. 250 5. 45 17. 333 1. 65 23. 42 0. 93 5. 250 1. 28 11. 333 6. 89 17. 417 1. 65 23. 50 0. 93 5. 333 1. 33 11. 417 6. 89 17. 500 1. 65 23. 58 0. 92	4. 333 4. 417 4. 500	1. 16 1. 16 1. 16	10.417 10.500 10.583	3. 52 3. 52 3. 99	16. 500 16. 583 16. 667	1. 85 1. 80 1. 80	22. 58 22. 67 22. 75	0. 96 0. 96 0. 96
5. 000 1. 25 11. 083 5. 45 17. 167 1. 70 23. 25 0. 94 5. 083 1. 28 11. 167 5. 45 17. 250 1. 70 23. 33 0. 93	5. 000 1. 25 11. 083 5. 45 17. 167 1. 70 23. 25 0. 94 5. 083 1. 28 11. 167 5. 45 17. 250 1. 70 23. 33 0. 93 5. 167 1. 28 11. 250 5. 45 17. 333 1. 65 23. 42 0. 93 5. 250 1. 28 11. 333 6. 89 17. 417 1. 65 23. 50 0. 93 5. 333 1. 33 11. 417 6. 89 17. 500 1. 65 23. 58 0. 92	4. 667 4. 750	1. 20 1. 20	10. 750 10. 833	3. 99 4. 67	16. 833 16. 917	1. 75 1. 75	22. 92 23. 00	0. 95 0. 95
	5. 250 1. 28 11. 333 6. 89 17. 417 1. 65 23. 50 0. 93 5. 333 1. 33 11. 417 6. 89 17. 500 1. 65 23. 58 0. 92	5.000 5.083	1. 25 1. 28	11. 083 11. 167	5. 45 5. 45	17. 167 17. 250	1. 70 1. 70	23. 25 23. 33	0. 94 0. 93

5. 833	3 1.41	11.917	35.77	18.000	1.54 24.08	0.90
5. 91	7 1.41	12.000	35.77	18. 083	1.49 24.17	0.90
6.000	1.41	12.083	88. 26	18. 167	1.49 24.25	0.90
6.083	3 1.45	12. 167	88. 27	18. 250	1. 49	
Max. Eff. Inten. (r	nm/hr)=	88. 26		45. 39		
	(mi n)	15. 00		30.00		
Storage Coeff.	(mi n)=	15. 63	(ii)	27.55 (ii)		
Unit Hyd. Tpeak	(mi n)=	15.00		30.00		
Unit Hyd. peak	(cms)=	0.07		0.04		
					TOTALS	
PEAK FLOW	(cms)=	0. 29		0.14	0.390 (iii)	
TIME TO PEAK	(hrs)=	12. 33		12. 58	12.42	
RUNOFF VOLUME	(mm) =	80.60		28. 31	46.61	
TOTAL RAINFALL	(mm) =	81.60		81.60	81.60	
RUNOFF COEFFICIE	ENT =	0. 99		0.35	0.57	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB Area (ha)= 3.43 Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00 STANDHYD (0028) | ID= 1 DT= 5.0 min | ·----IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 1.71 1.71 1.00 5.00 Dep. Storage (mm) = Average Slope (%)= 1.00 2.00 Length (m) = 151. 22 40.00 Mannings n 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH											
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN				
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr				
0.083	0.00	6.167	1.45	12. 250	88. 27	18. 33	1.44				
0.167	0.00	6.250	1.45	12. 333	13. 99	18. 42	1.44				
0.250	0.00	6.333	1.49	12. 417	13. 98	18.50	1.44				
0.333	0.83	6.417	1.49	12. 500	13. 98	18. 58	1.39				
0.417	0.83	6.500	1.49	12. 583	9. 52	18. 67	1.39				
0.500	0.83	6.583	1.53	12. 667	9. 52	18. 75	1.39				
0.583	0.85	6.667	1.53	12. 750	9. 52	18.83	1.34				
0.667	0.85	6.750	1.53	12. 833	6. 55	18. 92	1.34				
0.750	0.85	6.833	1. 57	12. 917	6. 55	19.00	1. 34				

0 000	0.07		4 57	140 000	,	10.00	4 00
0.833	0.87	6.917	1.57	13.000	6. 55	19.08	1. 29
0. 917	0.87	7.000	1. 57	13. 083	5. 53	19.17	1. 29
1.000	0.87	7.083	1. 61	13. 167	5. 53	19. 25	1. 29
1. 083	0.89	7.167	1. 61	13. 250	5. 53	19. 33	1. 24
1. 167	0.89	7.250	1. 61	13. 333	4. 68	19. 42	1. 24
1. 250	0.89	7.333	1. 65	13. 417	4. 68	19. 50	1. 24
1. 333	0. 91	7.417	1. 65	13. 500	4. 68	19. 58	1. 19
1. 417	0. 91	7.500	1. 65	13. 583	4. 13	19. 67	1. 19
1.500	0.91	7.583	1. 69	13. 667	4. 13	19. 75	1. 19
1. 583	0. 93	7.667	1. 69	13. 750	4. 13	19. 83	1. 14
1. 667	0.93	7.750	1. 69	13.833	3.62	19. 92	1. 14
1. 750	0.93	7.833	1.73	13. 917	3.62	20.00	1. 14
1.833	0.95	7.917	1.73	14.000	3.62	20.08	1.09
1. 917	0.95	8.000	1.73	14.083	3. 23	20.17	1.09
2.000	0.95	8.083	1.77	14. 167	3. 23	20. 25	1.09
2.083	0.97	8.167	1.77	14. 250	3. 23	20.33	1.06
2. 167	0.97	8.250	1.77	14. 333	2. 95	20.42	1.06
2. 250	0.97	8.333	1. 90	14. 417	2. 95	20.50	1.06
2.333	0.99	8.417	1. 90	14.500	2. 95	20.58	1.05
2.417	0.99	8.500	1. 90	14. 583	2.81	20.67	1.05
2.500	0.99	8.583	2. 10	14. 667	2.81	20. 75	1.05
2.583	1.01	8.667	2. 10	14. 750	2.81	20.83	1.03
2.667	1.01	8.750	2. 10	14.833	2.66	20.92	1.03
2.750	1.01	8.833	2. 31	14. 917	2.66	21.00	1.03
2.833	1.03	8.917	2. 31	15.000	2.66	21.08	1.02
2.917	1.03	9.000	2. 31	15. 083	2. 52	21. 17	1.02
3.000	1.03	9.083	2. 51	15. 167	2. 52	21. 25	1.02
3.083	1.05	9.167	2. 51	15. 250	2. 52	21.33	1.02
3. 167	1.05	9.250	2. 51	15. 333	2. 37	21.42	1. 02
3.250	1.05	9.333	2. 61	15. 417	2. 37	21.50	1. 02
3.333	1.07	9.417	2. 61	15. 500	2. 37	21.58	1.01
3. 417	1.07	9.500	2. 61	15. 583	2. 24	21.67	1. 01
3.500	1.07	9.583	2. 61	15. 667	2. 24	21.75	1. 01
3.583	1.09	9.667	2. 61	15. 750	2. 24	21.83	0. 99
3.667	1.09	9.750	2. 61	15. 833	2.09	21. 92	0. 99
3.750	1.09	9.833	2. 78	15. 917	2. 09	22.00	0. 99
3.833	1.11	9.917	2. 78	16.000	2.09	22.08	0. 98
3. 917	1.11	10.000	2. 78	16. 083	1. 95	22. 17	0. 98
4.000	1.11	10.083	3.09	16. 167	1. 95	22. 25	0. 98
4.083	1.13	10.167	3.09	16. 250	1. 95	22.33	0. 97
4. 167	1.13	10.250	3. 09	16. 333	1. 85	22.42	0. 97
4. 250	1.13	10.333	3. 52	16. 417	1.85	22.50	0. 97
4. 333	1.16	10.417	3.52	16. 500	1.85	22.58	0. 96
4. 417	1.16	10.500	3. 52	16. 583	1.80	22.67	0. 96
4.500	1.16	10.583	3. 99	16. 667	1.80	22.75	0. 96
4. 583	1.20	10.667	3. 99	16. 750	1.80	22.83	0. 95
4. 667	1.20	10.750	3. 99	16. 833	1. 75	22. 92	0. 95
4.750	1.20	10.833	4.67	16. 917	1.75	23.00	0. 95
4.833	1. 25	10.917	4. 67	17.000	1. 75	23.08	0. 94
4. 917	1.25	11.000	4.67	17. 083	1.70	23.17	0. 94
5.000	1. 25	11.083	5. 45	17. 167	1.70	23. 25	0. 94
5. 083	1. 28	11. 167	5. 45	17. 250	1. 70	23.33	0. 93

5. 167	1.28	11.250	5. 45	17. 333	1.65	23. 42	0. 93
5. 250		11. 333	6.89	17. 417	1.65	23.50	0. 93
5. 333	1.33	11. 417	6.89	17. 500	1.65	23.58	0. 92
5. 417	1.33	11.500	6.89	17. 583	1.60	23.67	0. 92
5. 500	1.33	11.583	8.77	17. 667	1.60	23.75	0. 92
5. 583	1.37	11.667	8.77	17. 750	1.60	23.83	0. 91
5. 667		11.750	8.77	17. 833	1.54	23. 92	0. 91
5. 750		11.833	35. 76		1.54	24.00	0. 91
5. 833		11.917	35. 77		1.54	24. 08	0. 90
5. 917		12.000	35. 77		1.49		0. 90
6.000		12.083			1.49	24. 25	0. 90
6. 083	1.45	12.167	88. 27	18. 250	1.49		
May Eff Inton (mm/h	-)	00.27		40.27			
Max.Eff.Inten.(mm/hi over (mii		88. 27 5. 00		48. 37 15. 00			
Storage Coeff. (mi)				12.88 (ii)			
Unit Hyd. Tpeak (mi)			` '	15.00			
Unit Hyd. peak (cm		0. 26		0. 08			
om t riya. peak (em	-	0.20		0.00	*T0T	ALS*	
PEAK FLOW (cms	5)=	0. 29		0.14		417 (iii)	
TIME TO PEAK (hrs		12. 25		12. 33		2. 25	
	n)=	80.60		28. 31	46	. 61	
TOTAL RAINFALL (mr	n) =	81.60		81.60	81	. 60	
RUNOFF COEFFICIENT	=	0. 99		0.35	C). 57	
*** WARNING: STORAGE CO	DEFF.	IS SMALLE	R THAN	TIME STEP!			
(i) CN PROCEDURE							
$CN^* = 59.0$							
(ii) TIME STEP (DT)	SHOU	LD BE SMA	ALLER OF	R EQUAL			

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

OVERFLOW IS OFF RESERVOIR (0029) IN= 2---> OUT= 1 | DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE -----(cms) (ha.m.) (cms) (ha.m.) 0.0000 0.0000 0.2200 0.1300 0.1100 0.0700 0.0000 0.0000 AREA **QPEAK TPEAK** R. V. (ha) (cms) (hrs) (mm) 0.417 INFLOW: ID= 2 (0028) 3.430 12.25 46.61 OUTFLOW: ID= 1 (0029) 3.430 0.095 12.67 46.57 PEAK FLOW REDUCTION [Qout/Qin](%) = 22.71 TIME SHIFT OF PEAK FLOW (min) = 25.00MAXIMUM STORAGE USED (ha.m.) = 0.0603

CALIB NASHYD (0042)| Area (ha)= 2.05 Curve Number (CN)= 73.0 (mm) = 10.00# of Linear Res. (N) = 3.00 |ID= 1 DT= 5.0 min | Ιa U. H. Tp(hrs) = 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0.083 0.00 6.167 1. 45 | 12. 250 88.27 I 18. 33 1.44 1. 45 | 12. 333 0.167 0.00 6.250 13.99 18.42 1.44 0.250 0.00 6.333 1. 49 | 12. 417 13.98 18.50 1.44 6.417 1.49 | 12.500 0.333 0.83 13.98 18.58 1.39 0.417 0.83 6.500 1. 49 | 12. 583 9.52 18.67 1.39 0.500 0.83 6.583 1.53 | 12.667 9.52 18.75 1.39 0.583 0.85 6.667 1.53 | 12.750 9.52 18.83 1.34 0.667 0.85 6.750 1.53 | 12.833 6.55 18.92 1.34 0.750 0.85 6.833 1.57 |12. 917 6.55 19.00 1.34 0.833 0.87 6.917 1.57 13.000 6.55 19.08 1.29 0.917 0.87 7.000 1.57 13.083 5.53 19.17 1.29 1.000 0.87 7.083 1.61 13. 167 5.53 19.25 1.29 1.083 7.167 13. 250 19.33 0.89 1.61 5.53 1.24 1.167 7.250 113. 333 19.42 0.89 1.61 4.68 1.24 1.250 0.89 7.333 1.65 | 13.417 4.68 19.50 1.24 1.333 0.91 7.417 1.65 | 13.500 19.58 1.19 4.68 1.417 0.91 7.500 1.65 | 13.583 19.67 4.13 1.19 7.583 1.500 0.91 1.69 | 13.667 19.75 4.13 1.19 1.583 0.93 7.667 1.69 | 13.750 19.83 4.13 1.14 7.750 1.69 | 13.833 1.667 0.93 19.92 3.62 1.14 1.750 7.833 1. 73 | 13. 917 0.93 3.62 20.00 1.14 1.833 0.95 7.917 1.73 | 14.000 3.62 20.08 1.09 1.917 0.95 8.000 1.73 | 14.083 20.17 1.09 3.23 2.000 0.95 8.083 1. 77 | 14. 167 3. 23 20.25 1.09 2.083 0.97 8.167 1.77 | 14.250 3.23 20.33 1.06 2.167 0.97 İ 8.250 1. 77 | 14. 333 2.95 20.42 1.06 2.250 0.97 8.333 1. 90 | 14. 417 2.95 20.50 1.06 2.333 0.99 8.417 1. 90 | 14. 500 2.95 20.58 1.05 2.417 0.99 8.500 1. 90 | 14. 583 2.81 20.67 1.05 2.500 0.99 8.583 2. 10 | 14. 667 2.81 20.75 1.05 2.583 1.01 İ 8.667 2. 10 | 14. 750 2.81 1.03 2.667 1.01 8.750 2. 10 | 14. 833 2.66 20.92 1.03 2.750 8.833 2. 31 | 14. 917 1.01 2.66 | 21.00 1.03 2. 31 | 15. 000 2.833 1.03 | 8.917 1.02 2.66 | 21.08 2.917 1.03 İ 9.000 2.31 | 15.083 2. 52 | 21. 17 1.02 3.000 9.083 2.51 | 15.167 2. 52 | 21. 25 1.03 l 1.02 3.083 1.05 9.167 2. 51 | 15. 250 2. 52 | 21. 33 1.02 3.167 1.05 9.250 2.51 | 15.333 2.37 | 21.42 1.02 9.333 3.250 2. 61 | 15. 417 1.05 2. 37 | 21. 50 1.02 3.333 1.07 | 9.417 2. 61 | 15. 500 2. 37 | 21. 58 1.01

```
3. 417 1. 07 | 9. 500
                       2. 61 | 15. 583
                                        2. 24 | 21. 67
                                                         1. 01
       1.07 | 9.583
                        2. 61 | 15. 667
3.500
                                         2. 24 | 21. 75
                                                         1.01
3.583
       1.09 | 9.667
                         2.61 | 15.750
                                         2. 24 | 21. 83
                                                          0.99
                         2. 61 | 15. 833
                                         2.09 | 21.92
       1.09 | 9.750
                                                          0.99
3.667
3.750
       1.09 | 9.833
                         2. 78 | 15. 917
                                         2.09 | 22.00
                                                          0.99
3.833
       1.11 | 9.917
                         2. 78 | 16. 000
                                         2.09
                                                22.08
                                                          0.98
                                         1. 95
3.917
       1.11 10.000
                         2. 78 | 16. 083
                                                22.17
                                                          0.98
4.000
       1. 11 | 10. 083
                         3. 09 | 16. 167
                                         1.95
                                                22, 25
                                                          0.98
4.083
        1. 13 | 10. 167
                         3. 09 | 16. 250
                                         1. 95
                                                22.33
                                                          0.97
4.167
        1. 13 | 10. 250
                         3. 09 | 16. 333
                                         1.85
                                                22.42
                                                          0.97
4.250
        1. 13 | 10. 333
                         3. 52 | 16. 417
                                         1.85 İ
                                                22.50
                                                          0.97
4.333
        1.16 | 10.417
                         3. 52 | 16. 500
                                         1.85 İ
                                                22.58
                                                          0.96
4.417
       1.16 110.500
                         3, 52 | 16, 583
                                         1.80 İ
                                                22.67
                                                          0.96
4.500
        1.16 10.583
                         3. 99 | 16. 667
                                         1.80 İ
                                                22.75
                                                          0.96
4.583
        1. 20 | 10. 667
                         3. 99 | 16. 750
                                         1.80 İ
                                                 22.83
                                                          0. 95
        1. 20 | 10. 750
                         3. 99 | 16. 833
4.667
                                         1.75 L
                                                22.92
                                                          0. 95
4.750
        1. 20 | 10. 833
                         4, 67 | 16, 917
                                         1.75 İ
                                                          0.95
                                                23.00
4.833
        1. 25 | 10. 917
                         4.67 17.000
                                         1.75
                                                23.08
                                                          0.94
4.917
        1.25 | 11.000
                         4.67 | 17.083
                                         1.70
                                                23.17
                                                          0.94
5.000
        1.25 | 11.083
                         5. 45 | 17. 167
                                          1.70
                                                 23. 25
                                                          0.94
5.083
        1. 28 | 11. 167
                         5. 45 | 17. 250
                                          1.70
                                                 23.33
                                                          0. 93
5. 167
        1. 28 | 11. 250
                         5. 45 | 17. 333
                                          1.65
                                                23.42
                                                          0.93
5.250
        1. 28 | 11. 333
                         6. 89 | 17. 417
                                          1.65
                                                 23.50
                                                          0.93
                         6.89 | 17.500
5.333
        1.33 | 11.417
                                          1.65
                                                 23.58
                                                          0.92
5.417
        1.33 | 11.500
                         6. 89 | 17. 583
                                                          0.92
                                          1.60
                                                23.67
        1.33 | 11.583
                         8. 77 | 17. 667
                                                          0.92
5.500
                                          1.60 l
                                                23.75
                         8. 77 | 17. 750
5.583
        1.37 | 11.667
                                         1.60
                                                23.83
                                                          0.91
5.667
        1. 37 | 11. 750
                         8. 77 | 17. 833
                                                23.92
                                                          0.91
                                         1.54
5.750
        1. 37 | 11. 833
                        35. 76 | 17. 917
                                                          0.91
                                         1.54 | 24.00
                        35. 77 | 18. 000
        1.41 | 11.917
                                                          0.90
5.833
                                         1.54 | 24.08
                        35. 77 | 18. 083
        1.41 | 12.000
                                                          0.90
5. 917
                                         1.49 | 24.17
       1.41 | 12.083
                        88. 26 | 18. 167
                                         1. 49 | 24. 25
                                                          0.90
6.000
       1. 45 | 12. 167
                        88. 27 | 18. 250
6.083
                                         1.49
```

PEAK FLOW (cms)= 0.148 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 30.927
TOTAL RAINFALL (mm)= 81.600
RUNOFF COEFFICIENT = 0.379

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
ADD HYD ( 0007)|
1 + 2 = 3
                       AREA
                             QPEAK
                                      TPEAK
                                               R. V.
                              (cms)
                       (ha)
                                     (hrs)
                                             (mm)
   ID1= 1 ( 0023):
                       0.41 0.033
                                     12. 33 32. 74
   + ID2= 2 ( 0029):
                       3. 43 0. 095
                                     12. 67 46. 57
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ID = 3 ( 0007): 3.84 0.117 12.42 45.09
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----
| ADD HYD ( 0007)|
3 + 2 = 1
                       AREA QPEAK TPEAK
                                           R. V.
_____
                      (ha) (cms)
                                   (hrs) (mm)
  ID1 = 3 (0007):
                     3. 84 0. 117
                                   12. 42 45. 09
    + ID2= 2 ( 0042):
                     2. 05 0. 148
                                   12. 33 30. 93
     ID = 1 (0007):
                       5, 89 0, 263 12, 33 40, 16
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0007)|
1 + 2 = 3
                       AREA QPEAK
                                    TPEAK
                       (ha)
                           (cms)
                                    (hrs)
                                            (mm)
   ID1 = 1 (0007):
                       5. 89 0. 263
                                   12. 33 40. 16
    + ID2= 2 ( 0005): 5.32 0.390
                                   12. 42 46. 61
     -----
      ID = 3 ( 0007): 11.21 0.651 12.33 43.22
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| RESERVOIR ( 0008) |
                    OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
DT= 5.0 min
                    OUTFLOW
                             STORAGE
                                       OUTFLOW
                                                STORAGE
-----
                    (cms)
                             (ha.m.)
                                        (cms)
                                                (ha.m.)
                    0.0000
                             0.0000
                                        0.3390
                                                 0.1535
                    0.0410
                             0.0120
                                        0.3840
                                                 0.1758
                     0.0580
                             0.0253
                                        0.5390
                                                 0.1989
                     0.0710
                             0.0399
                                        0.6480
                                                 0.2228
                     0.0830
                             0.0559
                                        0.7320
                                                 0.2476
                     0.0920
                             0.0732
                                        0.8050
                                                 0.2733
                     0. 1010
                             0. 0918
                                        0.8710
                                                 0.2998
                     0.2130
                             0. 1116
                                        0.9320
                                                  0.3263
                     0.2860
                             0. 1321
                                        0.9880
                                                  0.3528
                         ARFA
                                OPFAK
                                         TPFAK
                                                  R. V.
                         (ha)
                                 (cms)
                                         (hrs)
                                                   (mm)
  INFLOW: ID= 2 ( 0007)
                        11.210
                                  0.651
                                          12. 33
                                                   43. 22
  OUTFLOW: ID= 1 ( 0008)
                        11.210
                                  0. 275
                                          13. 08
                                                   43. 22
```

PEAK FLOW REDUCTION [Qout/Qin](%) = 42.25

(min) = 45.00

(ha.m.) = 0.1292

TIME SHIFT OF PEAK FLOW

MAXIMUM STORAGE USED

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

CALIB

---- TRANSFORMED HYETOGRAPH ----

			THOI OITHE	DITTLIGG	WIII		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	1. 70	12. 250	103.84	18. 33	1. 70
0.167	0.00	6.250	1.70	12. 333	16. 46	18.42	1.70
0.250	0.00	6.333	1. 75	12. 417	16. 45	18.50	1.70
0.333	0.97	6.417	1. 75	12.500	16. 45	18.58	1.64
0.417	0.97	6.500	1. 75	12. 583	11. 20	18. 67	1.64
0.500	0.97	6.583	1.80	12. 667	11. 20	18. 75	1.64
0.583	1.00	6.667	1.80	12. 750	11. 20	18.83	1.58
0.667	1.00	6.750	1.80	12. 833	7.70	18. 92	1.58
0.750	1.00	6.833	1.85	12. 917	7.70	19.00	1.58
0.833	1.02	6.917	1.85	13.000	7.70	19.08	1.52
0. 917	1.02	7.000	1.85	13. 083	6. 51	19. 17	1.52
1.000	1.02	7.083	1. 90	13. 167	6.50	19. 25	1.52
1.083	1.04	7.167	1. 90	13. 250	6.50	19.33	1.46
1. 167	1.04	7.250	1. 90	13. 333	5. 51	19.42	1.46
1.250	1.04	7.333	1. 94	13. 417	5. 51	19.50	1.46
1.333	1.07	7.417	1.94	13.500	5. 51	19.58	1.40
1. 417	1.07	7.500	1. 94	13. 583	4.86	19.67	1.40
1.500	1.07	7.583	1. 99	13. 667	4.86	19.75	1.40
1.583	1.09	7.667	1. 99	13. 750	4.86	19.83	1.34
1.667	1.09	7.750	1. 99	13. 833	4. 26	19. 92	1.34
1.750	1.09	7.833	2.04	13. 917	4. 26	20.00	1.34
1.833	1.12	7. 917	2.04	14. 000	4. 26	20. 08	1. 28
1. 917	1.12	8.000	2.04	14. 083	3.80	20. 17	1. 28

2. 000 2. 083 2. 167 2. 250 2. 333 2. 417 2. 500 2. 583 2. 667 2. 750 2. 833 2. 917 3. 000 3. 083 3. 167 3. 250 3. 333 3. 417 3. 500 3. 583 3. 667 3. 750 4. 083 4. 167 4. 250 4. 333 4. 4167 4. 250 4. 333 4. 417 4. 500 4. 583 4. 667 4. 750 4. 833 4. 667 4. 750 4. 833 4. 667 4. 750 4. 833 4. 667 4. 750 4. 833 4. 667 4. 750 4. 833 4. 667 4. 750 4. 833 4. 667 4. 750 4. 833 4. 667 5. 667 5. 667 5. 667 5. 667 5. 667 667 667 667 667 667 667 667 667 667	1. 33 1. 33 1. 33 1. 37 1. 37 1. 37 1. 42 1. 42 1. 42 1. 46 1. 46 1. 46 1. 51	8.083 8.167 8.250 8.333 8.417 8.508 8.583 8.667 8.750 8.883 8.917 9.000 9.083 9.167 9.250 9.333 9.417 9.500 9.583 9.9583 9.917 10.000 10.033 10.167 10.500 10.583 10.667 10.750 10.833 10.167 10.750 10.833 11.000 11.083 11.167 11.250 11.333	2. 09 2. 09 2. 24 2. 24 2. 24 2. 47 2. 47 2. 72 2. 72 2. 72 2. 72 2. 95 3. 07 3. 07 3. 07 3. 07 3. 27 3. 27 3. 27 3. 27 3. 64 4. 14 4. 14 4. 14 4. 69 4. 69 5. 49 5. 49 6. 41 6. 42	14. 167 14. 250 14. 333 14. 417 14. 500 14. 583 14. 667 14. 750 14. 833 14. 667 15. 000 15. 083 15. 167 15. 500 15. 583 15. 667 15. 750 16. 833 16. 167 16. 083 16. 167 16. 500 16. 833 16. 417 16. 500 16. 833 16. 417 16. 500 16. 833 16. 417 17. 000 16. 833 16. 417 17. 000 17. 083 17. 167 17. 250 17. 333 17. 417	3. 80 3. 80 3. 47 3. 47 3. 30 3. 30 3. 13 3. 13 3. 13 2. 97 2. 97 2. 79 2. 79 2. 79 2. 63 2. 63 2. 63 2. 63 2. 46 2. 29 2. 29 2. 18 2. 18 2. 18 2. 18 2. 18 2. 12 2. 12 2. 12 2. 06 2. 00 3. 00 3.	20. 25 20. 33 20. 42 20. 50 20. 58 20. 67 20. 75 20. 83 20. 92 21. 00 21. 08 21. 17 21. 25 21. 33 21. 42 21. 58 21. 67 21. 75 21. 83 22. 20 22. 08 22. 17 22. 25 22. 33 22. 42 22. 50 22. 50 22. 50 22. 58 22. 75 22. 83 22. 92 23. 00 23. 08 23. 17 24. 25 25. 83 26. 92 27. 75 28. 83 29. 92 29. 92 29. 92 29. 92 29. 92 29. 92 29. 92 29. 92 20. 92 20. 92 20. 92 21. 50 22. 50 22. 50 22. 50 22. 50 23. 00 23. 08 24. 17 25. 26. 27 26. 27 27. 50 28. 28. 28. 29. 29. 29. 20. 20. 20. 20. 20. 20. 20. 20. 20. 20	1. 28 1. 24 1. 24 1. 23 1. 23 1. 23 1. 22 1. 22 1. 21 1. 19 1. 19 1. 19 1. 18 1. 18 1. 17 1. 17 1. 16 1. 16 1. 16 1. 15 1. 15 1. 13
4. 833 4. 917 5. 000 5. 083 5. 167	1. 46 1. 46 1. 46 1. 51 1. 51 1. 56 1. 56 1. 66 1. 66 1. 66 1. 66	10.917 11.000 11.083 11.167 11.250	5. 49 5. 49 6. 41 6. 41 6. 41	17. 000 17. 083 17. 167 17. 250 17. 333	2. 06 2. 00 2. 00 2. 00 1. 94	23. 08 23. 17 23. 25 23. 33 23. 42	1. 11 1. 11 1. 11 1. 10 1. 10

Unit Hyd Qpeak (cms) = 0.167

```
PEAK FLOW (cms) = 0.092 (i)
TIME TO PEAK (hrs) = 12.333
RUNOFF VOLUME (mm) = 43.235
TOTAL RAINFALL (mm) = 96.000
RUNOFF COEFFICIENT = 0.450
```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | | NASHYD (0023) | Area (ha)= 0.41 Curve Number (CN)= 75.0 | | ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res. (N)= 3.00 | U.H. Tp(hrs)= 0.20

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr 0.083 0.00 6.167 1. 70 | 12. 250 | 103. 84 18. 33 1.70 0.167 0.00 6.250 1. 70 | 12. 333 16.46 18.42 1.70 0.250 0.00 6.333 1. 75 | 12. 417 18.50 16.45 1.70 0.333 0.97 6.417 1. 75 | 12. 500 18.58 16.45 1.64 0.417 0.97 6.500 1. 75 | 12. 583 11.20 18.67 1.64 0.500 0.97 6.583 1.80 | 12.667 11.20 18.75 1.64 0.583 1.00 6.667 1.80 | 12.750 11.20 18.83 1.58 0.667 1.00 6.750 1.80 | 12.833 7.70 18.92 1.58 0.750 1.85 | 12.917 1.00 6.833 7.70 19.00 1.58 0.833 6.917 1.85 | 13.000 19.08 1.02 7.70 1.52 0.917 7.000 1.85 | 13.083 19.17 1.02 6.51 1.52 6.50 1.000 1.02 7.083 1. 90 | 13. 167 19. 25 1.52 1.083 1.04 7.167 1. 90 | 13. 250 19.33 6.50 1.46 1.167 1. 90 | 13. 333 1.04 7.250 5. 51 19.42 1.46 1.250 1. 94 | 13. 417 1.04 7.333 5.51 19.50 1.46 1.333 1.07 7.417 1. 94 | 13. 500 5.51 19.58 1.40 1.417 1.07 7.500 1. 94 | 13. 583 4.86 19.67 1.40 1.500 1.07 7.583 1. 99 | 13. 667 4.86 19.75 1.40 1.583 1.09 7.667 1. 99 | 13. 750 4.86 19.83 1.667 1.09 7.750 1. 99 | 13. 833 19.92 4.26 1.750 1.09 7.833 2.04 13.917 4.26 20.00 2.04 14.000 1.833 1.12 7.917 4.26 20.08 8.000 2.04 | 14.083 1.917 1.12 3.80 20.17 2.000 1.12 | 8.083 2. 09 | 14. 167 20. 25 3.80 2.083 1.14 8.167 2.09 | 14.250 3.80 20.33 2.167 1.14 8.250 2.09 | 14.333 3.47 20.42 2. 24 | 14. 417 2.250 8.333 3.47 20.50 1.14 1.24 3.47 2.333 1.17 8.417 2. 24 | 14. 500 20.58 1.23 2.417 8.500 2. 24 | 14. 583 20.67 1.17 3.30 1.23 2.500 1.17 | 8.583 2. 47 | 14. 667 3. 30 | 20. 75 1.23

2.583	8. 667 8. 750 8. 833 8. 8317 9. 000 9. 083 9. 167 9. 250 9. 333 9. 417 9. 500 9. 583 9. 667 9. 750 9. 833 10. 167 10. 000 10. 083 10. 167 10. 550 10. 583 10. 667 10. 750 11. 333 11. 147 11. 250 11. 333 11. 167 11. 583 11. 667 11. 750 11. 583 11. 667 11. 750 11. 750 11. 750 11. 750 11. 750 11. 750 11. 750 11. 750 11. 750 11. 750 11. 750 11. 750 11. 750	2. 47 2. 47 2. 72 2. 72 2. 95 2. 95 3. 07 3. 07 3. 07 3. 07 3. 27 3. 27 3. 64 4. 14 4. 14 4. 69 4. 69 4. 69 5. 49 5. 49 6. 41 8. 11 8. 11 10. 32 10. 32 10. 32 10. 32	14. 750 14. 833 14. 917 15. 000 15. 083 15. 167 15. 250 15. 333 15. 417 15. 500 15. 583 15. 667 15. 750 16. 000 16. 083 16. 167 16. 250 16. 333 16. 167 16. 583 16. 667 17. 083 17. 167 17. 083 17. 083 17. 417 17. 250 17. 333 17. 417 17. 500 17. 750 17. 833 17. 667 17. 750 17. 833 17.	3. 30 3. 13 3. 13 3. 13 3. 13 2. 97 2. 97 2. 79 2. 79 2. 79 2. 63 2. 63 2. 46 2. 46 2. 46 2. 29 2. 29 2. 18 2. 12 2. 12 2. 12 2. 12 2. 06 2. 06 2. 06 2. 00 2. 00 2. 00 1. 94 1. 94 1. 88	20. 83 20. 92 21. 08 21. 17 21. 25 21. 32 21. 42 21. 50 21. 58 21. 67 21. 75 21. 83 21. 92 22. 00 22. 08 22. 17 22. 25 22. 33 22. 42 22. 50 22. 58 22. 67 22. 75 22. 83 22. 42 23. 50 23. 58 23. 17 23. 25 23. 33 23. 42 23. 50 23. 58 23. 75 23. 83 23. 92 24. 00	1. 22 1. 22 1. 22 1. 21 1. 21 1. 19 1. 19 1. 18 1. 18 1. 18 1. 17 1. 17 1. 17 1. 16 1. 16 1. 16 1. 15 1. 15 1. 13 1. 13 1. 13 1. 13 1. 13 1. 13 1. 11 1. 10
5. 583 1. 61 5. 667 1. 61 5. 750 1. 61	11.667 11.750 11.833	10. 32 10. 32 42. 07	17. 750 17. 833 17. 917	1. 88 1. 82 1. 82	23. 83 23. 92 24. 00	1. 07 1. 07 1. 07
5. 833 1. 66 5. 917 1. 66 6. 000 1. 66 6. 083 1. 70	11.917 12.000 12.083 12.167	42. 08 42. 08 103. 84 103. 84	18. 000 18. 083 18. 167 18. 250	1. 82 1. 76 1. 76 1. 76	24. 08 24. 17 24. 25	1. 06 1. 06 1. 06

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms)= 0.044 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 43.253
TOTAL RAINFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.451

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	5. 32 50. 00	Dir.	Conn. (%)=	35. 00	
		IMPERVI	ous i	PERVI OU	S (i)		
Surface Area	(ha)=	2.6	6	2.66			
Dep. Storage	(mm) =	1.0)	5.00			
Average Slope	(%)=	1. 0)	1.00			
Length	(m)=	188. 3		40.00			
3	()						
Mannings n	=	0. 13	J	0. 250			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME	D HYETOGI	RAPH	_	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	1.70	12. 250	103.84	18. 33	1.70
0.167	0.00	6.250	1.70	12. 333	16.46	18. 42	1.70
0.250	0.00	6.333	1. 75	12. 417	16. 45	18. 50	1.70
0.333	0.97	6.417	1.75	12. 500	16. 45	18. 58	1.64
0.417	0.97	6.500	1.75	12. 583	11. 20	18. 67	1.64
0.500	0.97	6.583	1.80	12. 667	11. 20	18. 75	1.64
0.583	1.00	6.667	1.80	12. 750	11. 20	18.83	1.58
0.667	1.00	6.750	1.80	12. 833	7.70	18. 92	1. 58
0.750	1.00	6.833	1.85	12. 917	7.70	19.00	1. 58
0.833	1.02	6.917	1.85	13.000	7.70	19.08	1.52
0. 917	1.02	7.000	1.85	13. 083	6. 51	19. 17	1. 52
1.000	1.02	7.083	1. 90	13. 167	6.50	19. 25	1. 52
1. 083	1.04	7.167	1. 90	13. 250	6. 50	19. 33	1. 46
1. 167	1.04	7.250	1. 90	13. 333	5. 51	19. 42	1.46
1. 250	1.04	7.333	1. 94	13. 417	5. 51	19. 50	1. 46
1. 333	1.07	7.417	1. 94	13. 500	5. 51	19. 58	1. 40
1. 417	1.07	7.500	1. 94	13. 583	4. 86	19. 67	1. 40
1.500	1.07	7.583	1. 99	13. 667	4. 86	19. 75	1. 40
1. 583	1.09	7.667	1. 99	13. 750	4. 86	19. 83	1. 34
1. 667	1.09	7.750	1. 99	13. 833	4. 26	19. 92	1. 34
1. 750	1.09	7.833	2.04	13. 917	4. 26	20.00	1. 34
1.833	1.12	7.917	2.04	14.000	4. 26	20.08	1. 28
1. 917	1. 12	8.000	2.04	14. 083	3. 80	20.17	1. 28
2.000	1.12	8.083	2.09	14. 167	3. 80	20. 25	1. 28
2.083	1.14	8.167	2. 09	14. 250	3. 80	20.33	1. 24
2. 167	1.14	8.250	2. 09	14. 333	3. 47	20.42	1. 24
2. 250	1.14	8.333	2. 24	14. 417	3. 47	20.50	1. 24
2. 333	1.17	8.417	2. 24	14. 500	3. 47	20.58	1. 23
2. 417	1.17	8.500	2. 24	14. 583	3.30	20.67	1. 23
2.500	1.17	8.583	2.47	14. 667	3. 30	20.75	1. 23
2. 583	1. 19	8.667	2. 47	14. 750	3. 30	20.83	1. 22

2. 667 1. 19 2. 750 1. 19 2. 833 1. 21 2. 917 1. 21 3. 000 1. 21 3. 083 1. 23 3. 167 1. 23 3. 250 1. 23 3. 500 1. 26 3. 583 1. 28 3. 667 1. 28 3. 750 1. 28 3. 833 1. 31 4. 000 1. 31 4. 083 1. 33 4. 167 1. 33 4. 250 1. 33 4. 333 1. 37 4. 500 1. 37 4. 583 1. 42 4. 667 1. 42 4. 750 1. 42 4. 833 1. 46 5. 000 1. 46 5. 083 1. 51 5. 167 1. 51 5. 250 1. 51 5. 333 1. 56	8. 833 2. 72 8. 917 2. 72 9. 000 2. 72 9. 000 2. 95 9. 167 2. 95 9. 250 2. 95 9. 250 3. 07 9. 583 3. 07 9. 583 3. 07 9. 583 3. 27 9. 667 3. 07 9. 750 3. 27 10. 000 3. 27 10. 000 3. 27 10. 083 3. 64 10. 167 3. 64 10. 250 3. 64 10. 583 4. 14 10. 583 4. 14 10. 583 4. 69 10. 750 4. 69 10. 750 4. 69 10. 750 4. 69 10. 750 4. 69 10. 750 4. 69 11. 000 5. 49 11. 000 6. 41 11. 250 6. 41 11. 250 6. 41 11. 250 6. 41 11. 250 6. 41 11. 250 6. 41 11. 250 6. 41 11. 250 6. 41 11. 250 6. 41 11. 250 6. 41 11. 250 6. 41 11. 333 8. 11 11. 417 8. 11 11. 500 8. 11	14. 917 15. 000 15. 083 15. 167 15. 250 15. 333 15. 417 15. 500 15. 583 15. 667 15. 750 15. 833 15. 917 16. 000 16. 083 16. 167 16. 250 16. 333 16. 417 16. 500 16. 583 16. 667 16. 750 16. 833 16. 917 17. 000 17. 083 17. 167 17. 500 17. 583	3. 13 3. 13 3. 13 3. 13 3. 13 4. 2. 97 2. 97 2. 79 2. 79 2. 63 2. 63 2. 63 2. 46 2. 24 4. 2. 29 2. 29 2. 29 2. 18 2. 12 2. 12 2. 12 2. 12 2. 12 2. 12 2. 10 2. 00 1. 94 1. 88 1. 88	20. 92 21. 00 21. 08 21. 17 21. 25 21. 33 21. 42 21. 50 21. 58 21. 67 21. 75 21. 83 21. 92 22. 00 22. 08 22. 17 22. 25 22. 33 22. 42 22. 50 22. 58 22. 67 22. 58 22. 67 22. 75 22. 83 22. 92 23. 00 23. 08 23. 17 23. 25 24. 22 25. 25 26. 33 27. 42 28. 33 29. 42 29. 33 29. 42 29. 33 29. 42 29. 33 29. 42 29. 33 29. 42 29. 30 29. 31 29. 32 29. 33 29. 34 29. 35 29	1. 22 1. 22 1. 21 1. 21 1. 21 1. 19 1. 19 1. 18 1. 18 1. 18 1. 17 1. 17 1. 17 1. 16 1. 16 1. 15 1. 15 1. 15 1. 13 1. 13 1. 13 1. 12 1. 12 1. 12 1. 11 1. 11 1. 10
5. 333 1. 56 5. 417 1. 56 5. 500 1. 56 5. 583 1. 61 5. 667 1. 61 5. 750 1. 61 5. 833 1. 66 5. 917 1. 66 6. 000 1. 66	11. 417 8. 11	17. 500 17. 583 17. 667 17. 750 17. 833 17. 917 18. 000 18. 083 18. 167	1. 94	23.58	1.09
Max.Eff.Inten.(mm/hr) = over (min) Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) =	103.84 15.00 14.65 (ii) 15.00 0.08	59. 97 30. 00 25. 31 (ii) 30. 00 0. 04	*T0T.	AI S *	
PEAK FLOW (cms)= TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)=	0. 35 12. 33 95. 00	0. 19 12. 58 37. 26	0. 12	490 (iii) . 42 . 47	

TOTAL RAINFALL (mm)= 96.00 96.00 96.00 RUNOFF COEFFICIENT = 0.99 0.39 0.60

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 59.0 Ia = Dep. Storage (Above)

 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Area	,			
Total	Imp(%)=	50.00	Dir. Conn.(%)=	35.00
	LMDEDVI	0110	DEDVI OUG (1)	
	IMPERVI	005	PERVIOUS (I)	
(ha)=	1.7	1	1. 71	
(mm) =	1.0	0	5.00	
(%)=	1.0	0	2.00	
(m) =	151. 2	2	40.00	
=	0. 01	3	0. 250	
	Total (ha) = (mm) = (%) =	Total Imp (%) = IMPERVI (ha) = 1.7 (mm) = 1.0 (%) = 1.0 (m) = 151.2	Total Imp(%) = 50.00 IMPERVIOUS (ha) = 1.71 (mm) = 1.00 (%) = 1.00	Total $Imp(\%) = 50.00$ Dir. Conn. (%) = IMPERVIOUS PERVIOUS (i) (ha) = 1.71 1.71 (mm) = 1.00 5.00 (%) = 1.00 2.00 (m) = 151.22 40.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

 TRANSFORMED	HYETOGRAPH	

			WOI OIWIL				
TIME	RAI N		RAIN	' TIME		TIME	
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	1. 70	12. 250	103.84	18. 33	1. 70
0.167	0.00	6.250	1.70	12. 333	16. 46	18. 42	1. 70
0.250	0.00	6.333	1. 75	12. 417	16. 45	18. 50	1. 70
0.333	0.97	6.417	1. 75	12. 500	16. 45	18. 58	1.64
0.417	0.97	6.500	1. 75	12. 583	11. 20	18. 67	1.64
0.500	0.97	6.583	1.80	12. 667	11. 20	18. 75	1.64
0.583	1.00	6.667	1.80	12. 750	11. 20	18.83	1.58
0.667	1.00	6.750	1.80	12. 833	7. 70	18. 92	1.58
0.750	1.00	6.833	1.85	12. 917	7.70	19.00	1.58
0.833	1.02	6.917	1.85	13.000	7. 70	19. 08	1.52
0.917	1.02	7.000	1.85	13. 083	6. 51	19. 17	1.52
1.000	1.02	7.083	1. 90	13. 167	6. 50	19. 25	1.52
1.083	1.04	7.167	1. 90	13. 250	6. 50	19. 33	1.46
1. 167	1.04	7.250	1. 90	13. 333	5. 51	19. 42	1.46
1.250	1.04	7.333	1. 94	13. 417	5. 51	19.50	1.46
1.333	1.07	7.417	1. 94	13. 500	5. 51	19. 58	1.40
1.417	1.07	7.500	1. 94	13. 583	4.86	19. 67	1.40
1.500	1.07	7.583	1. 99	13. 667	4.86	19. 75	1.40
1.583	1.09	7.667	1. 99	13. 750	4. 86	19.83	1.34
1.667	1.09	7.750	1. 99	13. 833	4. 26	19. 92	1.34
1.750	1.09	7.833	2.04	13. 917	4. 26	20.00	1.34
1.833	1.12	7. 917	2.04	14. 000	4. 26	20. 08	1. 28
1. 917	1.12	8.000	2.04	14. 083	3.80	20. 17	1. 28

							4 00
2.000	1.12	8.083	2.09	14. 167	3.80	20. 25	1. 28
2.083	1.14	8.167	2.09	14. 250	3.80	20.33	1. 24
2. 167	1.14	8.250	2.09	14. 333	3.47	20.42	1. 24
2. 250	1.14	8.333	2. 24	14. 417	3. 47	20.50	1. 24
2. 333	1. 17	8.417	2. 24	14. 500	3. 47	20.58	1. 23
2. 417	1. 17	8.500	2. 24	14. 583	3. 30	20.67	1. 23
2.500	1.17	8.583	2. 47	14. 667	3. 30	20.75	1. 23
2.583	1.19	8.667	2.47	14. 750	3. 30	20.83	1. 22
2. 667	1.19	8.750	2.47	14. 833	3. 13	20.92	1. 22
2.750	1.19	8.833	2.72	14. 917	3. 13	21.00	1. 22
2.833	1. 21	8.917	2.72	15.000	3. 13	21.08	1. 21
2. 917	1.21	9.000	2. 72	15. 083	2. 97	21. 17	1. 21
3.000	1. 21 1. 23	9.083	2. 95 2. 95	15. 167	2. 97	21. 25	1. 21 1. 19
3.083		9.167		15. 250	2. 97	21.33	1. 19
3. 167 3. 250	1. 23 1. 23	9.250	2. 95 3. 07	15. 333 15. 417	2. 79 2. 79	21. 42 21. 50	1. 19
3. 333	1. 23	9.333	3. 07	15. 417	2. 79	21.50	1. 19
3. 417	1. 26	9.417	3. 07	15. 583	2. 79	21.56	1. 18
3.500	1. 26	9.583	3. 07	15. 667	2.63	21.07	1. 18
3. 583	1. 28	9.667	3. 07	15. 750	2.63	21.73	1. 17
3. 667	1. 28	9.750	3. 07	15. 833	2. 46	21.03	1. 17
3. 750	1. 28	9.833	3. 27	15. 917	2. 46	22.00	1. 17
3. 833	1. 31	9.917	3. 27	16. 000	2.46	22.08	1. 16
3. 917	1. 31	10.000	3. 27	16. 083	2. 29	22. 17	1. 16
4.000	1. 31	10.083	3. 64	16. 167	2. 29	22. 25	1. 16
4. 083	1. 33	10. 167	3. 64	16. 250	2. 29	22.33	1. 15
4. 167	1.33	10. 250	3. 64	16. 333	2. 18	22. 42	1. 15
4. 250	1.33	10.333	4. 14	16. 417	2. 18	22.50	1. 15
4.333	1.37	10.417	4. 14	16. 500	2. 18	22. 58	1. 13
4.417	1.37	10.500	4. 14	16. 583	2.12	22. 67	1. 13
4.500	1.37	10.583	4.69	16. 667	2.12	22. 75	1. 13
4.583	1.42	10.667	4. 69	16. 750	2. 12	22.83	1. 12
4.667	1.42	10.750	4. 69	16.833	2.06	22. 92	1. 12
4.750	1.42	10.833	5. 49	16. 917	2.06	23.00	1. 12
4.833	1.46	10.917	5. 49	17.000	2.06	23.08	1. 11
4. 917	1.46	11.000	5. 49	17. 083	2.00	23. 17	1. 11
5.000	1.46	11.083	6. 41	17. 167	2.00	23. 25	1. 11
5. 083	1.51	11. 167	6. 41	17. 250	2.00	23.33	1. 10
5. 167	1.51	11.250	6. 41	17. 333	1. 94	23.42	1. 10
5. 250	1.51	11.333	8. 11	17. 417	1. 94	23.50	1. 10
5. 333	1.56	11.417	8. 11	17. 500	1. 94	23.58	1.09
5. 417	1.56	11.500	8. 11	17. 583	1.88	23.67	1.09
5.500	1.56	11.583	10. 32	17. 667	1.88	23.75	1.09
5.583	1.61	11.667	10. 32	17. 750	1.88	23.83	1.07
5. 667 5. 750	1. 61 1. 61	11.750 11.833	10. 32 42. 07	17.833	1. 82 1. 82	23. 92 24. 00	1.07
5. 833	1.66	11.833	42.07	17. 917 18. 000	1.82	24.00	1. 07 1. 06
5. 633 5. 917	1.66	11.917	42.08	118. 083	1. 62	24.06	1.06
6.000	1.66	12.000	103. 84	18. 167	1. 76	24. 17	1.06
6. 083		12.063	103. 84	18. 250	1. 76	<u>4</u> 7.23	1.00
0.003	1.70	12.107	103.04	10.230	1.70	I	

Max. Eff. Inten. (mm/hr) = 103.84 63.62

over	(mi n)	5. 00	15.00	
Storage Coeff.	(mi n)=	3.23 (ii)	11.68 (ii)	
Unit Hyd. Tpeak	(mi n)=	5.00	15. 00	
Unit Hyd. peak	(cms)=	0. 27	0.09	
	, ,			*TOTALS*
PEAK FLOW	(cms)=	0.34	0. 20	0.518 (iii)
TIME TO PEAK	(hrs)=	12. 25	12. 33	12. 25
RUNOFF VOLUME	(mm) =	95.00	37. 26	57.47
TOTAL RAINFALL	(mm) =	96.00	96.00	96.00
RUNOFF COEFFICE	ENT =	0. 99	0.39	0.60
**** WARNING: STORA	GE COEFF. I	S SMALLER THA	AN TIME STEP!	
(i) CN PROCED	URE SELECTE	D FOR PERVIOL	JS LOSSES:	
CN* =	59.0 la	= Dep. Storag	ge (Above)	
(ii) TIME STEP	(DT) SHOUL	D BE SMALLER	OR EQUAL	
THAN THE	STORAGE COE	FFICIENT.		

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0029) IN= 2> OUT= 1	OVERFLOW	IS OFF				
DT= 5.0 min	OUTFLOW	STORAGE		OUTFLOW	STORAGE	
	(cms)	(ha.m.)	i	(cms)	(ha.m.)	
	0.0000	0.0000	ı İ	0. 2200	0.1300	
	0. 1100	0. 0700	· [0.0000	0.0000	
	-		EAK ms)	TPEAK (hrs)	R.V. (mm)	
INFLOW: ID= 2 (OUTFLOW: ID= 1 (0028)	430	0. 518 0. 119	12. 25 12. 67	57. 47 57. 42	

PEAK FLOW REDUCTION [Qout/Qin](%) = 22.97

TIME SHIFT OF PEAK FLOW (min) = 25.00

MAXIMUM STORAGE USED (ha.m.) = 0.0749

CALIB			
NASHYD (0042)	Ιa	10.00	Curve Number (CN)= 73.0 # of Linear Res. (N)= 3.00

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRA	NSFORMED HYETO	GRAPH		
TIME	RAIN TIME	RAIN TIM	IE RAIN	TIME	RAIN
hrs	mm/hr hrs	mm/hr hr	s mm/hr	hrs	mm/hr
	0.00 6.167				
0. 167	0.00 6.250	1. 70 12. 333	16.46	18. 42	1.70

0. 250	6.333 6.417 6.500 6.583 6.667 6.750 6.833 6.917 7.000 7.083 7.167 7.250 7.333 7.417 7.500 7.583 7.667 7.750 7.833 7.667 8.250 8.333 8.417 8.500 8.583 8.417 8.500 8.583 8.417 9.250 9.833 9.167 9.250 9.333 9.167 9.500 9.583 9.667 9.750 9.583 9.667 9.750 9.583 9.917 9.750 9.833 9.917 10.000	1. 75 1. 75 1. 80 1. 80 1. 80 1. 85 1. 85 1. 90 1. 90 1. 94 1. 94 1. 94 1. 99 1. 99 2. 04 2. 04 2. 09 2. 09 2. 09 2. 09 2. 09 2. 09 2. 24 2. 24 2. 24 2. 24 2. 24 2. 24 2. 27 2. 72 2. 72 2. 72 2. 72 2. 72 2. 72 2. 73 3. 07 3. 07 3. 07 3. 07 3. 07 3. 27 3. 27	12. 417 12. 500 12. 583 12. 667 12. 750 12. 833 12. 917 13. 000 13. 083 13. 167 13. 250 13. 333 13. 417 13. 550 13. 833 13. 583 13. 583 14. 067 14. 020 14. 083 14. 167 14. 583 14. 417 15. 000 15. 083 15. 167 15. 500 15. 583 15. 667 15. 750 15. 583 15. 667 15. 750 15. 833 15. 167 16. 000 16. 003 16. 000 16. 003	16. 45 16. 45 11. 20 11. 20 11. 20 11. 20 7. 70 7. 70 6. 51 6. 50 6. 50 6. 50 5. 51 5. 51 5. 51 5. 51 3. 80 3. 80 3. 80 3. 47 3. 47 3. 30 3. 30 3. 30 3. 31 3. 13	18. 50 18. 58 18. 67 18. 75 18. 83 18. 92 19. 00 19. 58 19. 42 19. 50 19. 58 19. 67 20. 08 20. 17 20. 25 20. 33 20. 42 20. 50 20. 50 20. 58 20. 67 20. 75 20. 33 20. 42 21. 50 21. 17 21. 25 21. 33 21. 42 21. 50 21. 50 21. 75 21. 83 21. 92 22. 00 22. 08 22. 17 23. 58	1. 70 1. 64 1. 64 1. 64 1. 58 1. 58 1. 52 1. 52 1. 52 1. 52 1. 46 1. 46 1. 40 1. 40 1. 34 1. 28 1. 28 1. 28 1. 22 1. 22 1. 22 1. 1. 22 1. 1. 21 21 21 21 21 21 21 21 21 21 21 21 21 2
3. 667 1. 28	9.750	3. 07	15. 833	2. 46	21. 92	1. 17
3. 750 1. 28	9.833	3. 27	15. 917	2. 46	22. 00	1. 17
3. 833 1. 31	9.917	3. 27	16. 000	2. 46	22. 08	1. 16

```
4.583
       1.42 | 10.667
                        4.69 | 16.750
                                         2. 12 | 22. 83 1. 12
       1.42 | 10.750
                        4.69 | 16.833
                                         2.06 | 22.92
4.667
                                                         1. 12
4.750
        1.42 | 10.833
                         5. 49 | 16. 917
                                          2.06 | 23.00
                         5. 49 | 17. 000
        1.46 | 10.917
                                         2.06 | 23.08
4.833
                                                          1 11
        1.46 | 11.000
                         5.49 | 17.083
                                         2.00 | 23.17
4. 917
                                                          1. 11
5.000
        1.46 | 11.083
                         6. 41 | 17. 167
                                          2.00
                                                23. 25
                                                          1 11
                                                23.33
5.083
        1.51 | 11.167
                         6.41 | 17.250
                                          2.00
                                                          1.10
5. 167
        1.51 | 11.250
                         6. 41 | 17. 333
                                         1. 94 İ
                                                23.42
                                                          1.10
5.250
       1.51 | 11.333
                         8. 11 | 17. 417
                                         1.94
                                                23.50
                                                          1.10
5.333
        1.56 11.417
                         8. 11 | 17. 500
                                         1.94
                                                23.58
                                                          1 09
5.417
        1.56 | 11.500
                         8. 11 | 17. 583
                                                23.67
                                         1.88
                                                          1 09
5.500
        1.56 | 11.583
                        10. 32 | 17. 667
                                         1.88 İ
                                                23.75
                                                          1.09
5.583
        1.61 111.667
                        10. 32 | 17. 750
                                         1.88 İ
                                                23.83
                                                          1.07
        1, 61 | 11, 750
                        10. 32 | 17. 833
5.667
                                         1.82 İ
                                                23.92
                                                          1.07
5.750
        1.61 | 11.833
                        42.07 | 17.917
                                         1.82 İ
                                                24.00
                                                          1.07
        1.66 | 11.917
                        42.08 | 18.000
5.833
                                         1.82 | 24.08
                                                          1.06
5.917
        1.66 | 12.000
                        42.08 | 18.083
                                         1. 76 | 24. 17
                                                          1.06
6.000
        1.66 | 12.083 | 103.84 | 18.167
                                         1. 76 | 24. 25
6.083
        1. 70 | 12. 167 | 103. 84 | 18. 250
                                         1.76
     (cms) = 0.199 (i)
```

Unit Hyd Qpeak (cms) = 0.356

PEAK FLOW TIME TO PEAK (hrs) = 12.333RUNOFF VOLUME (mm) = 41.047TOTAL RAINFALL (mm) = 96.000 RUNOFF COEFFICIENT = 0.428

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| ADD HYD ( 0007)|
 1 + 2 = 3
                     AREA
                          QPEAK
                                 TPEAK
                                         R. V.
                     (ha)
                          (cms)
                                 (hrs)
                                        (mm)
    ID1= 1 ( 0023):
                    0.41 0.044
                                12.33
                                      43.25
   + ID2= 2 ( 0029):
                    3. 43 0. 119
                                12. 67 57. 42
     ______
     ID = 3 (0007):
                    3. 84 0. 147
                                12. 42 55. 91
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)| 3 + 2 = 1 AREA QPEAK TPEAK R. V. (ha) (cms) (hrs) (mm) 3. 84 0. 147 ID1= 3 (0007): 12. 42 55.91 + ID2= 2 (0042): 2. 05 0. 199 12.33 41.05 _____ ID = 1 (0007): 5. 89 0. 343 12. 33 50. 74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. -----| ADD HYD (0007)| AREA 1 + 2 = 3 QPEAK TPEAK R. V. -----(ha) (cms) (hrs) (mm) ID1 = 1 (0007): 5. 89 0. 343 12. 33 50.74 + ID2= 2 (0005): 5. 32 0. 490 12. 42 57. 47 ______ ID = 3 (0007): 11.21 0.830 12.33 53.93 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. RESERVOIR (0008) OVERFLOW IS OFF IN= 2---> OUT= 1 DT= 5.0 min | OUTFLOW STORAGE OUTFLOW STORAGE -----(cms) (ha.m.) (cms) (ha.m.) 0.0000 0.0000 0.3390 0.1535 0.0410 0.0120 0.3840 0.1758 0.0580 0.0253 0.5390 0.1989 0.0710 0.0399 0.6480 0.2228 0.0830 0.0559 0.7320 0.2476 0.0920 0.0732 0.8050 0.2733 0. 1010 0.0918 0.8710 0.2998 0.2130 0. 1116 0.9320 0.3263 0. 2860 0.9880 0. 1321 0.3528 AREA QPEAK **TPEAK** R. V. (ha) (mm) (cms) (hrs) INFLOW: ID= 2 (0007) 11.210 0.830 12. 33 53.93 OUTFLOW: ID= 1 (0008) 11.210 0.350 13.00 53.92 PEAK FLOW REDUCTION [Qout/Qin](%) = 42.16 TIME SHIFT OF PEAK FLOW (min) = 40.00MAXIMUM STORAGE USED (ha. m.) = 0.1591| ADD HYD (0016)| 1 + 2 = 3 AREA QPEAK **TPEAK** R. V. (ha) (cms) (hrs) (mm) ID1= 1 (0022): 0.092 0.83 12. 33 + ID2= 2 (0008): 11. 21 0. 350 13.00 53.92 _____ ID = 3 (0016): 12. 04 0. 366 12. 92 53. 19 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

*********** ** SIMULATION: 3-2yr 24hr 15min SCS Type II **

CALIB NASHYD (0022)

(ha) = 0.83Curve Number (CN) = 75.0 Area || ID= 1 DT= 5.0 min | | Ia (mm) = 10.00# of Linear Res. (N) = 3.00 -----U. H. Tp(hrs) = 0.19

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMER HYETOCRADII

		TRA	ANSFORME	D HYETOGR	APH	-	
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	0.94	12. 250	57. 11	18. 33	0. 93
0. 167	0.00	6.250	0.94	12. 333	9. 05	18. 42	0. 93
0. 250	0.00	6.333	0. 96	12. 417	9.05	18.50	0. 93
0. 333	0.54	6.417		12. 500	9.05	18. 58	0. 90
0.417	0.54	6.500	0.96	12. 583	6. 16	18. 67	0. 90
0.500	0.54	6.583	0. 99	12. 667	6. 16	18. 75	0. 90
0. 583	0.55	6.667	0. 99	12. 750	6. 16	18. 83	0.87
0.667	0.55	6.750		12.833	4. 24	18. 92	0.87
0.750	0.55	6.833		12. 917	4. 24	19.00	0.87
0.833	0.56	6.917		13. 000	4. 24	19. 08	0.84
0. 917	0.56	7.000		13. 083	3. 58	19. 17	0.84
1.000	0.56	7.083		13. 167	3. 58	19. 25	0.84
1.083	0.57	7.167	1.04	13. 250	3. 58	19. 33	0.80
1. 167	0.57	7.250		13. 333	3. 03	19. 42	0.80
1. 250	0.57	7.333		13. 417	3. 03	19.50	0.80
1. 333	0.59	7.417		13.500	3. 03	19. 58	0. 77
1. 417	0.59	7.500		13. 583	2. 67	19. 67	0. 77
1.500	0.59	7.583		13. 667	2. 67	19. 75	0.77
1. 583	0.60	7.667		13. 750	2. 67	19. 83	0. 73
1. 667	0.60	7.750		13. 833	2. 34	19. 92	0.73
1.750	0.60	7.833		13. 917	2.34	20.00	0.73
1.833	0.61	7.917		14.000	2.34	20.08	0.70
1. 917	0.61	8.000		14. 083	2.09	20. 17	0.70
2.000	0.61	8.083		14. 167	2.09	20. 25	0.70
2.083	0.63	8.167		14. 250	2.09	20. 33	0.68
2. 167	0.63	8.250		14. 333	1. 91	20. 42	0.68
2. 250 2. 333	0.63	8.333		14. 417	1. 91 1. 91	20. 50 20. 58	0. 68
2. 333 2. 417	0.64	8.417		14. 500 14. 583	1. 91		0. 68
2.417	0.64	8.500		14. 583 14. 667	1. 82	20. 67 20. 75	0. 68 0. 68
2.500	0.64	8.583		14. 667 14. 750	1. 82	20. 75	0. 68
2. 565	0. 65 0. 65	8.667 8.750		14. 730	1. 62	20. 63	0.67
2.750	0.65		1. 49	14. 633 14. 917	1. 72	20. 92	0.67
2. 750	0.65	8.833 8.917		15. 000	1. 72	21.00	0.66
		9.000		15.000		21.00	
2. 917 3. 000	0. 67 0. 67	9.000		15. 083 15. 167	1. 63 1. 63	21. 17	0. 66 0. 66
3.083	0.68	9.063		15. 167	1.63		0.66
5.005	0.00	7.107	1.02	13. 230	1.03	21.33	0.00

```
3. 167
        0.68 | 9.250
                         1.62 | 15.333
                                          1.54 | 21.42
                                                           0.66
3.250
         0.68 | 9.333
                         1. 69 | 15. 417
                                          1.54 | 21.50
                                                           0.66
3.333
         0.69
                9.417
                         1.69 | 15.500
                                          1.54
                                                 21.58
                                                           0.65
                         1. 69 | 15. 583
3.417
         0.69 | 9.500
                                          1. 45 | 21. 67
                                                           0.65
3.500
         0.69 | 9.583
                         1.69 | 15.667
                                          1. 45 | 21. 75
                                                           0.65
                         1. 69 | 15. 750
3.583
         0.71 | 9.667
                                          1.45 | 21.83
                                                           0.64
                         1. 69 | 15. 833
                                          1. 35 İ
3.667
         0.71 | 9.750
                                                 21.92
                                                           0.64
3.750
         0.71 | 9.833
                         1. 80 | 15. 917
                                          1. 35 | 22. 00
                                                           0.64
3.833
         0.72 | 9.917
                         1.80 | 16.000
                                          1.35
                                                 22.08
                                                           0.64
                         1.80 | 16.083
3.917
         0.72 | 10.000
                                          1. 26
                                                 22.17
                                                           0.64
4.000
         0.72 | 10.083
                         2.00 | 16.167
                                          1. 26 j
                                                 22. 25
                                                           0.64
4.083
         0.73 | 10.167
                         2.00 | 16.250
                                          1. 26
                                                 22.33
                                                           0.63
4. 167
         0.73 | 10.250
                         2.00 | 16.333
                                          1. 20 İ
                                                 22, 42
                                                           0.63
4.250
         0.73 | 10.333
                         2. 28 | 16. 417
                                          1. 20 İ
                                                 22.50
                                                           0.63
4.333
         0.75 | 10.417
                         2. 28 | 16. 500
                                          1.20
                                                 22.58
                                                           0.62
4.417
         0.75 | 10.500
                         2. 28 | 16. 583
                                          1. 17
                                                 22.67
                                                           0.62
4.500
         0.75 | 10.583
                         2. 58 | 16. 667
                                          1.17
                                                 22.75
                                                           0.62
4.583
         0.78 | 10.667
                         2. 58 | 16. 750
                                          1. 17
                                                 22.83
                                                           0.62
4.667
         0.78 | 10.750
                         2. 58 | 16. 833
                                          1.13
                                                 22.92
                                                           0.62
4.750
         0.78 | 10.833
                          3.02 | 16.917
                                          1.13
                                                 23.00
                                                           0.62
4.833
         0.81 | 10.917
                          3. 02 | 17. 000
                                          1.13
                                                 23.08
                                                           0.61
4.917
         0.81 | 11.000
                          3.02 | 17.083
                                          1.10
                                                 23. 17
                                                           0.61
5.000
         0.81 | 11.083
                          3.53 | 17.167
                                          1.10
                                                 23. 25
                                                           0.61
5.083
         0.83 | 11.167
                          3.53 | 17.250
                                          1.10
                                                 23.33
                                                           0.60
5.167
         0.83 | 11.250
                         3.53 | 17.333
                                          1.07
                                                 23.42
                                                           0.60
5.250
         0.83 | 11.333
                          4.46 17.417
                                          1.07
                                                 23.50
                                                           0.60
5.333
         0.86 | 11.417
                         4.46 17.500
                                          1.07
                                                 23.58
                                                           0.60
5.417
         0.86 | 11.500
                         4.46 17.583
                                          1.03
                                                 23.67
                                                           0.60
5.500
         0.86 | 11.583
                         5. 68 | 17. 667
                                                 23.75
                                          1.03
                                                           0.60
         0.88 | 11.667
                          5. 68 | 17. 750
5.583
                                          1.03 | 23.83
                                                           0.59
         0.88 | 11.750
                         5. 68 | 17. 833
5.667
                                          1.00
                                                23.92
                                                           0.59
         0.88 | 11.833
                        23. 14 | 17. 917
                                                24.00
5.750
                                          1.00
                                                           0.59
         0. 91 | 11. 917
                        23. 14 | 18. 000
5.833
                                          1.00
                                                24.08
                                                           0.58
5.917
         0.91 | 12.000
                        23. 14 | 18. 083
                                          0. 97 | 24. 17
                                                           0.58
6.000
         0.91 | 12.083
                        57. 11 | 18. 167
                                          0. 97 | 24. 25
                                                           0.58
        0. 94 | 12. 167 | 57. 11 | 18. 250
6.083
                                          0.97
```

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms) = 0.029 (i)TIME TO PEAK (hrs) = 12.333RUNOFF VOLUME (mm) = 14.337TOTAL RAINFALL (mm) = 52.800RUNOFF COEFFICIENT = 0.272

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
CALIB
 NASHYD ( 0023)
                        (ha)= 0.41 Curve Number (CN)= 75.0
                   Area
                          (mm) = 10.00 # of Linear Res. (N) = 3.00
| ID= 1 DT= 5.0 min |
                  Ιa
```

----- U. H. Tp(hrs) = 0.20

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TRA	ANSFORME) HYETOGR	APH		
TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167		12. 250	57. 11		0. 93
0. 167	0.00	6.250		12. 333	9.05	18. 42	0. 93
0. 250	0.00	6.333		12. 417	9.05	18. 50	0. 93
0. 333	0.54	6.417		12. 500	9.05	18. 58	0. 90
0. 417	0.54	6.500		12. 583	6. 16	18. 67	0. 90
0.500	0.54	6.583		12. 667	6. 16	18. 75	0. 90
0.583	0.55	6.667		12. 750	6. 16	18.83	0.87
0.667	0.55	6.750		12. 833	4. 24 4. 24	18. 92	0.87
0.750	0. 55 0. 56	6.833		12. 917 13. 000	4. 24	19. 00 19. 08	0.87
0. 833 0. 917	0.56	6.917 7.000		13. 000 13. 083			0.84
1.000	0.56	7.000 7.083		13. 083 13. 167	3. 58 3. 58	19. 17	0. 84 0. 84
1.083	0.56	7.063 7.167		13. 167	3.58	19. 23	0.84
1. 167	0.57	7. 167		13. 230	3.03	19. 42	0.80
1. 250	0.57	7.230		13. 333 13. 417	3.03	19. 42	0.80
1. 333	0.57	7. 333 7. 417		13. 417	3. 03	19. 58	0. 30
1. 417	0.59	7.500		13. 583	2.67	19. 67	0.77
1.500	0.59	7.583		13. 667	2. 67	19. 75	0.77
1. 583	0.60	7.667		13. 750	2. 67	19. 83	0.73
1. 667	0.60	7.750		13. 833	2. 34	19. 92	0. 73
1. 750	0.60	7.833		13. 917	2. 34	20.00	0.73
1.833	0.61	7. 917	1. 12	14. 000	2.34	20.08	0.70
1. 917	0.61	8.000	1. 12	14. 083	2.09	20.17	0.70
2.000	0.61	8.083	1. 15	14. 167	2. 09	20. 25	0.70
2.083	0.63	8.167	1. 15	14. 250	2.09	20.33	0.68
2.167	0.63	8.250		14. 333	1. 91	20.42	0.68
2.250	0.63	8.333		14. 417	1. 91	20.50	0.68
2.333	0.64	8.417		14. 500	1. 91	20.58	0.68
2.417	0.64	8.500		14. 583	1.82	20.67	0.68
2.500	0.64	8.583		14. 667	1.82	20. 75	0. 68
2.583	0.65	8.667		14. 750	1.82	20. 83	0. 67
2. 667		8.750		14. 833	1.72	20. 92	0. 67
2. 750	0.65	8.833		14. 917	1.72	21.00	0. 67
2.833	0.67	8.917		15.000	1.72	21.08	0.66
2. 917	0.67	9.000		15. 083	1.63	21. 17	0.66
3.000	0.67	9.083		15. 167	1.63	21. 25	0.66
3. 083 3. 167	0.68	9.167 9.250		15. 250	1. 63 1. 54	21. 33 21. 42	0.66
3. 250	0. 68 0. 68	9.333		15. 333 15. 417	1.54	21. 42	0. 66 0. 66
3. 333	0.69	9.333 9.417		15. 417	1.54	21. 50	0.65
3. 417	0.69	9.417		15. 500	1. 34	21. 56	0.65
3.500	0.69	9.583		15. 667	1.45	21. 75	0.65
3. 583	0. 03	9.667		15. 750	1. 45	21. 73	0.64
3. 667	0.71	9.750		15. 730	1. 35	21. 92	0.64
3.007	0. 7 1	, , , , , , ,	1.07	1 . 5 . 555	1.00	-1. /2	О. ОТ

```
3. 750 0. 71 | 9. 833 1. 80 | 15. 917
                                         1.35 | 22.00
3. 833 0. 72 | 9. 917
                         1.80 | 16.000
                                          1.35 | 22.08
                          1. 80 | 16. 083
3. 917
         0.72 | 10.000
                                           1. 26 | 22. 17
                                                            0.64
        0. 72 | 10. 083
                          2. 00 | 16. 167
4.000
                                           1. 26 | 22. 25
                                                            0.64
        0. 73 | 10. 167
                          2.00 | 16.250
4.083
                                           1. 26 | 22. 33
                                                            0.63
         0.73 | 10.250
                          2.00 | 16.333
4. 167
                                           1. 20 | 22. 42
                                                            0.63
        0.73 | 10.333
                          2. 28 | 16. 417
4.250
                                           1. 20 | 22. 50
                                                            0.63
        0. 75 | 10. 417
4.333
                          2. 28 | 16. 500
                                           1. 20 | 22. 58
                                                            0.62
        0.75 | 10.500
4.417
                          2. 28 | 16. 583
                                           1. 17 | 22. 67
                                                            0.62
        0. 75 | 10. 583
                          2. 58 | 16. 667
4.500
                                           1. 17 | 22. 75
                                                            0.62
                          2. 58 | 16. 750
4.583
         0.78 | 10.667
                                           1. 17 | 22. 83
                                                            0.62
4.667
         0.78 | 10.750
                          2. 58 | 16. 833
                                           1. 13 | 22. 92
                                                            0.62
4.750
        0. 78 | 10. 833
                          3. 02 | 16. 917
                                           1. 13 | 23. 00
                                                            0.62
4.833
         0.81 | 10.917
                          3. 02 | 17. 000
                                           1. 13 | 23. 08
                                                            0.61
4.917
         0.81 | 11.000
                          3. 02 | 17. 083
                                           1. 10 İ
                                                  23.17
                                                            0.61
5.000
         0.81 | 11.083
                          3. 53 | 17. 167
                                           1. 10 | 23. 25
                                                            0.61
                          3. 53 | 17. 250
5.083
         0.83 | 11.167
                                           1. 10 İ
                                                  23.33
                                                            0.60
                          3. 53 | 17. 333
5. 167
         0.83 | 11.250
                                           1.07
                                                  23.42
                                                            0.60
5.250
         0.83 | 11.333
                          4.46 | 17.417
                                           1.07
                                                  23.50
                                                            0.60
                          4.46 | 17.500
5.333
         0.86 | 11.417
                                           1.07
                                                  23.58
                                                            0.60
5.417
         0.86 | 11.500
                          4. 46 | 17. 583
                                           1.03 | 23.67
                                                            0.60
5.500
         0.86 | 11.583
                          5. 68 | 17. 667
                                           1.03 | 23.75
                                                            0.60
5.583
         0.88 | 11.667
                          5. 68 | 17. 750
                                           1.03 | 23.83
                                                            0.59
                          5. 68 | 17. 833
5.667
         0.88 | 11.750
                                           1.00
                                                 23.92
                                                            0.59
         0.88 | 11.833
                         23. 14 | 17. 917
5.750
                                           1.00 | 24.00
                                                            0.59
         0. 91 | 11. 917
                         23. 14 | 18. 000
5.833
                                           1.00 | 24.08
                                                            0.58
         0.91 | 12.000
                         23. 14 | 18. 083
5. 917
                                           0. 97 | 24. 17
                                                            0.58
        0. 91 | 12. 083
6.000
                         57. 11 | 18. 167
                                           0. 97 | 24. 25
                                                           0.58
6.083
        0. 94 | 12. 167 | 57. 11 | 18. 250
                                           0. 97
```

Unit Hyd Opeak (cms) = 0.078

PEAK FLOW (cms)= 0.014 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 14.343
TOTAL RAINFALL (mm)= 52.800
RUNOFF COEFFICIENT = 0.272

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area Total	,	32 00 Dir. Conn. (%)=	35. 00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.66	2. 66	
Dep. Storage	(mm) =	1.00	5.00	
Average Slope	(%)=	1.00	1. 00	
Length	(m)=	188. 33	40.00	
Manni ngs n	=	0. 130	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR/	ANSFORME	D HYETOGR	APH	_	
TIME	RAIN	I TIME	RAIN	l' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	0.94	12. 250	57. 11	18.33	0. 93
0. 167	0.00	6. 250	0.94	12. 333	9.05	18. 42	0. 93
0. 250	0.00	6.333	0. 96	12. 417	9.05	18. 50	0. 93
0.333	0.54	6.417	0. 96	12. 500	9. 05	18.58	0. 90
0. 417	0.54	6.500	0. 96	12. 583	6. 16	18. 67	0. 90
0.500	0.54	6.583	0. 99	12. 667	6. 16	18. 75	0. 90
0. 583	0.55	6.667	0. 99	12. 750	6. 16	18.83	0. 87
0.667	0.55	6.750	0. 99	12. 833	4. 24	18. 92	0. 87
0.750	0.55	6.833	1. 02	12. 917	4. 24	19.00	0.87
0.833	0.56	6.917	1.02	13. 000	4. 24	19.08	0.84
0. 917	0.56	7.000	1.02	13. 083	3. 58	19. 17	0.84
1.000	0.56	7.083	1.04	13. 167	3. 58	19. 25	0.84
1.083	0.57	7.167	1.04	13. 250	3. 58	19. 33	0.80
1. 167	0.57	7. 250	1.04	13. 333	3.03	19.42	0.80
1.250	0.57	7.333	1.07	13. 417	3.03	19.50	0.80
1.333	0.59	7.417	1.07	13. 500	3.03	19. 58	0.77
1.417	0.59	7.500	1.07	13. 583	2.67	19. 67	0.77
1.500	0.59	7.583	1.10	13. 667	2.67	19. 75	0.77
1.583	0.60	7.667	1.10	13. 750	2.67	19.83	0.73
1.667	0.60	7.750	1. 10	13. 833	2. 34	19. 92	0.73
1.750	0.60	7.833	1. 12	13. 917	2.34	20.00	0.73
1.833	0.61	7.917	1. 12	14. 000	2. 34	20.08	0.70
1. 917	0.61	8.000	1. 12	14. 083	2.09	20.17	0.70
2.000	0.61	8.083	1. 15	14. 167	2.09	20. 25	0.70
2.083	0.63	8. 167	1. 15	14. 250	2.09	20.33	0.68
2. 167	0.63	8. 250	1. 15	14. 333	1. 91	20.42	0.68
2. 250	0.63	8.333	1. 23	14. 417	1. 91	20.50	0. 68
2. 333	0.64	8.417	1. 23	14.500	1. 91	20.58	0. 68
2. 417	0.64	8.500	1. 23	14. 583	1.82	20.67	0. 68
2.500	0.64	8.583	1. 36	14. 667	1.82	20.75	0. 68
2.583	0.65	8.667	1. 36	14. 750	1.82	20.83	0. 67
2. 667	0.65	8.750	1. 36	14. 833	1.72	20.92	0. 67
2.750	0.65	8.833	1. 49	14. 917	1.72	21.00	0. 67
2.833	0.67	8.917	1. 49	15.000	1.72	21.08	0.66
2. 917	0.67	9.000	1.49	15. 083	1.63	21.17	0.66
3.000	0.67	9.083	1.62	15. 167	1.63	21. 25	0.66
3.083	0.68	9.167	1.62	15. 250	1.63	21.33	0.66
3. 167	0.68	9.250	1.62	15. 333	1.54	21.42	0.66
3. 250	0.68	9.333	1.69	15. 417	1.54	21.50	0.66
3. 333	0.69	9.417	1.69	15. 500	1.54	21.58	0.65
3. 417 3. 500	0. 69 0. 69	9.500	1. 69 1. 69	15. 583 15. 667	1. 45 1. 45	21.67 21.75	0. 65 0. 65
3. 500	0. 69	9.583 9.667	1. 69	15. 667 15. 750	1. 45	21.75	0. 65
3. 583 3. 667	0.71	9.007	1. 69	15. 750 15. 833	1. 45	21.83	0. 64
3.750	0.71	9.730	1. 80	15. 633 15. 917	1. 35	21.92	0. 64
3. 730	U. / I	7.033	1.00	13.711	1. 33	22.00	0.04

3. 833		9.917	1.80		1. 35	22.08	0.64
3. 917	0.72	10.000	1.80	16. 083	1. 26	22.17	0.64
4. 000 4. 083	0. 72 0. 73	10.083 10.167	2. 00 2. 00	16. 167 16. 250	1. 26 1. 26	22. 25 22. 33	0. 64 0. 63
4. 167	0.73	10. 107	2.00		1. 26 1. 20		0.63
4. 250	0.73	10.333	2. 28		1. 20		0.63
4. 333	0.75	10. 417	2. 28		1. 20	22. 58	0. 62
4. 417	0.75	10.500	2. 28		1. 17		0.62
4.500	0.75	10.583	2. 58		1.17	22. 75	0.62
4. 583	0.78	10.667	2. 58 2. 58	16. 750	1.17	22.83	0.62
4. 667 4. 750	0. 78 0. 78	10.750 10.833	3. 02	16. 833 16. 917	1. 13 1. 13	22. 92 23. 00	0. 62 0. 62
4. 833	0. 70	10. 917	3. 02	17. 000	1. 13		0. 61
4. 917	0.81	11.000	3. 02		1. 10	23. 17	0. 61
5.000	0.81	11.083	3. 53		1.10		0. 61
5. 083	0.83	11. 167	3.53	17. 250	1. 10	23.33	0.60
5. 167 5. 250	0.83	11. 250	3.53	17. 333	1.07		0.60
5. 333	0. 83 0. 86	11.333 11.417	4. 46 4. 46		1. 07 1. 07		0. 60 0. 60
5. 417	0.86	111.500	4. 46	17. 583	1.03	23.67	0.60
5. 500	0.86	11.583	5. 68		1.03		0.60
5. 583	0.88	11.667	5. 68		1.03		0. 59
5. 667	0.88	11.750	5. 68	17. 833	1.00		0. 59
5. 750 5. 833	0. 88 0. 91	11.833 11.917	23. 14 23. 14		1. 00 1. 00		0. 59 0. 58
5. 917	0. 91	12.000	23. 14		0. 97		0. 58
6.000	0. 91	12.083	57. 11	18. 167	0. 97		0. 58
6.083	0.94	12. 167	57. 11	18. 250	0. 97	İ	
Max. Eff. Inten. (mm/	hr)=	48. 62		16. 90			
over (m		20.00		40.00			
	i n) =	19. 84	(ii)	37.54 (ii)			
Unit Hyd. Tpeak (m		20.00		40.00			
Unit Hyd. peak (c	ms)=	0.06		0. 03	*T0	ΓALS*	
PEAK FLOW (c	ms)=	0. 16		0. 05		197 (iii)	
TIME TO PEAK (h	rs)=	12.42		12. 75		2. 42 ` ´	
,	mm) =	51.80		12. 97		5. 56	
,	mm) =	52.80		52.80		2.80	
RUNOFF COEFFICIENT	=	0. 98		0. 25	(0. 50	
(I.) OH BB00==::==	05155	FD FOD	-0.4.01	100050			
(i) CN PROCEDURE CN* = 59.				LOSSES: (Above)			
(ii) TIME STEP (D	T) SHOU	LD BE SMA	ALLER O				
THAN THE STO				N IE ANV			
(III) PEAK FLOW DO	ES NUI	INCLUDE D	DASEFLU	WIF ANY.			

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | STANDHYD (0028)| Area (ha)= 3.43

IMPERVIOUS PERVIOUS (i)	ID= 1 DT= 5.0 min	Total	Imp(%) = 5	0.00 Di	ir. Conn.((%)= 35.00
Mannings n = 0.013 0.250	Dep. Storage Average Slope Length	(mm) =	1. 71 1. 00 1. 00 151. 22	! : 4(1. 71 5. 00 2. 00 0. 00	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED	HYETOGRAPH	
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TIME	DALM	IN/ TIME	RAIN			I TIME	RAIN
TIME	RAIN	ı		TIME	RAIN	TIME	
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	0. 94	12. 250		18. 33	0. 93
0. 167	0.00	6.250	0. 94	12. 333	9.05	18. 42	0. 93
0. 250	0.00	6.333	0. 96	12. 417	9. 05	18. 50	0. 93
0. 333	0.54	6.417		12.500	9. 05	18. 58	0. 90
0.417	0.54	6.500	0. 96	12. 583	6. 16	18. 67	0. 90
0.500	0.54	6.583		12. 667	6. 16	18. 75	0. 90
0.583	0.55	6.667	0. 99	12. 750	6. 16	18. 83	0.87
0.667	0.55	6.750		12. 833	4. 24	18. 92	0.87
0.750	0.55	6.833		12. 917	4. 24	19. 00	0.87
0.833	0.56	6.917	1. 02	13.000	4. 24	19. 08	0.84
0. 917	0.56	7.000	1.02	13.083	3. 58	19. 17	0.84
1.000	0.56	7.083	1.04	13. 167	3. 58	19. 25	0.84
1.083	0.57	7.167		13. 250	3. 58	19. 33	0.80
1. 167	0.57	7.250		13. 333	3.03	19. 42	0.80
1. 250	0.57	7.333	1. 07	13. 417	3.03	19.50	0.80
1.333	0.59	7.417	1.07	13.500	3.03	19.58	0.77
1. 417	0.59	7.500	1.07	13. 583	2.67	19. 67	0.77
1.500	0.59	7.583	1. 10	13.667	2.67	19. 75	0.77
1.583	0.60	7.667	1. 10	13. 750	2.67	19.83	0.73
1.667	0.60	7.750	1. 10	13. 833	2.34	19. 92	0.73
1.750	0.60	7.833		13. 917	2.34	20.00	0.73
1.833	0.61	7.917	1. 12	14.000	2.34	20.08	0.70
1. 917	0.61	8.000	1. 12	14. 083	2.09	20. 17	0.70
2.000	0.61	8.083	1. 15	14. 167	2.09	20. 25	0.70
2.083	0.63	8.167	1. 15	14. 250	2.09	20. 33	0.68
2. 167	0.63	8.250	1. 15	14. 333	1. 91	20.42	0.68
2.250	0.63	8.333	1. 23	14. 417	1. 91	20.50	0.68
2.333	0.64	8.417	1. 23	14. 500	1. 91	20. 58	0.68
2.417	0.64	8.500	1. 23	14. 583	1.82	20.67	0.68
2.500	0.64	8.583	1.36	14. 667	1.82	20.75	0.68
2.583	0.65	8.667	1.36	14. 750	1.82	20.83	0.67
2.667	0.65	8.750	1.36	14. 833	1.72	20. 92	0.67
2.750	0.65	8.833	1.49	14. 917	1.72	21.00	0.67
2.833	0.67	8.917	1.49	15. 000	1. 72	21.08	0.66
2.917	0.67	9.000	1.49	15. 083	1.63	21. 17	0.66
3.000	0.67	9.083	1.62	15. 167	1.63	21. 25	0.66
3.083	0.68	9. 167	1.62	15. 250	1.63	21. 33	0.66

3. 167	0.68	9.250	1. 62	15. 333	1.54	21.42	0. 66
3. 250	0.68	9.333	1. 69	15. 417	1.54	21.50	0.66
3. 333	0.69	9.417	1. 69	15. 500	1.54	21.58	0. 65
3. 417		9.500	1. 69	15. 583	1. 45	21.67	0. 65
3. 500		9.583	1. 69	15. 667	1. 45		0.65
3. 583	0.71	9.667	1. 69	15. 750	1.45	21.83	0.64
3.667	0.71	9.750	1. 69	15. 833	1. 35	21.92	0.64
3.750		9.833	1.80	15. 917	1.35	22.00	0.64
3.833		9.917	1.80	16.000	1.35	22.08	0.64
3. 917	0. 72 0. 72	10.000	1. 80 2. 00	16. 083	1. 26 1. 26	22.17 22.25	0.64
4. 000 4. 083		10.083 10.167	2.00	16. 167 16. 250	1. 26	22. 25	0. 64 0. 63
4. 167		10. 167	2.00	16. 230	1. 20		0.63
4. 167		10. 230	2. 28	16. 333	1. 20	22.42	0.63
4. 333		10. 333	2. 28	16. 500	1. 20		0.62
4. 417		10.500	2. 28	16. 583	1. 17	22.67	0.62
4. 500	0.75	10.583	2. 58	16. 667	1. 17	22.75	0.62
4. 583		10.667	2. 58	16. 750	1. 17		0. 62
4. 667		10.750	2. 58	16. 833	1. 13	22.92	0. 62
4. 750	0.78	10.833	3. 02	16. 917	1. 13	23.00	0.62
4. 833		10.917	3.02	17. 000	1.13		0.61
4. 917	0.81	11.000	3.02	17. 083	1.10	23. 17	0.61
5.000	0.81	11.083	3.53	17. 167	1.10	23. 25	0.61
5. 083	0.83	11. 167	3.53	17. 250	1.10	23. 33	0.60
5. 167		11.250	3. 53	17. 333	1.07		0.60
5. 250		11.333	4.46	17. 417	1.07	23.50	0.60
5. 333		11.417	4.46	17. 500	1.07	23.58	0.60
5. 417		11.500	4. 46	17. 583	1.03	23.67	0.60
5. 500		11.583	5. 68	17. 667	1.03		0. 60
5. 583		111.667	5. 68	17. 750	1.03		0.59
5. 667		111.750	5. 68	17. 833	1.00	23.92	0. 59
5. 750		111.833	23. 14	17. 917	1.00		0.59
5. 833 5. 917		11.917 12.000	23. 14 23. 14	18. 000 18. 083	1. 00 0. 97		0. 58 0. 58
6. 000		12.083	57. 11	18. 167	0. 97	24.17	0. 58
6. 083		12. 167	57. 11	18. 250	0. 97		0. 56
Max. Eff. Inten. (mm	n/hr)=	57. 11		20. 54			
over (5.00		20.00			
Storage Coeff. (min)=	4. 10	(ii)	17.39 (ii)			
Unit Hyd. Tpeak (min)=	5.00		20.00			
Unit Hyd. peak (cms)=	0. 24		0.06			
						TALS*	
	(cms)=	0. 19		0. 05		225 (iii)	
	(hrs)=	12. 25		12. 42		2. 25	
DINOEE VOLUME	(mm) _	51 20		12 07	24	5 56	

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(mm) =

RUNOFF VOLUME

TOTAL RAINFALL (mm)=

RUNOFF COEFFICIENT =

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

51.80

52.80

0. 98

12.97

52.80

0.25

26.56

52.80

0.50

CN* = 59.0 | Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

_____ | RESERVOIR(0029)| OVERFLOW IS OFF IN= 2---> OUT= 1 DT= 5.0 min OUTFLOW STORAGE | OUTFLOW STORAGE (cms) -----(cms) (ha.m.) (ha.m.) 0.0000 0.0000 0. 2200 0.1300 0. 1100 0. 0700 | 0. 0000 0.0000 AREA QPEAK **TPEAK** R. V. (ha) (cms) (hrs) (mm) INFLOW: ID= 2 (0028) 0. 225 3.430 12. 25 26.56 OUTFLOW: ID= 1 (0029) 0. 052 3.430 12. 75 PEAK FLOW REDUCTION [Qout/Qin](%) = 23.24

PEAK FLOW REDUCTION [Qout/Qin](%) = 23.24
TIME SHIFT OF PEAK FLOW (min) = 30.00
MAXIMUM STORAGE USED (ha.m.) = 0.0333

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

	TRANSFORMED HYETOGRAPH									
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN			
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr			
0.083	0.00	6.167	0.94	12. 250	57.11	18. 33	0. 93			
0. 167	0.00	6.250	0.94	12. 333	9.05	18. 42	0. 93			
0.250	0.00	6.333	0.96	12. 417	9.05	18.50	0. 93			
0.333	0.54	6.417	0.96	12. 500	9.05	18. 58	0. 90			
0.417	0.54	6.500	0.96	12. 583	6. 16	18. 67	0. 90			
0.500	0.54	6.583	0. 99	12.667	6. 16	18. 75	0. 90			
0.583	0.55	6.667	0. 99	12. 750	6. 16	18.83	0.87			
0.667	0.55	6.750	0. 99	12.833	4. 24	18. 92	0.87			
0.750	0.55	6.833	1.02	12. 917	4. 24	19.00	0.87			
0.833	0.56	6.917	1.02	13.000	4. 24	19. 08	0.84			
0. 917	0.56	7.000	1.02	13.083	3.58	19. 17	0.84			
1.000	0.56	7.083	1.04	13. 167	3.58	19. 25	0.84			
1.083	0.57	7.167	1.04	13. 250	3.58	19. 33	0.80			
1. 167	0.57	7.250	1.04	13. 333	3.03	19. 42	0.80			
1. 250	0.57	7.333	1.07	13. 417	3.03	19. 50	0.80			
1. 333	0.59	7.417	1.07	13.500	3.03	19. 58	0.77			

1. 417	0. 59	7.500	1. 07	13. 583	2. 67	19.67	0. 77
1. 500	0. 59	7.583	1. 10	13. 667	2. 67	19.75	0. 77
1. 583	0. 60	7.667	1. 10	13. 750	2. 67	19.83	0. 73
1. 667	0. 60	7.750	1. 10	13. 833	2. 34	19.92	0. 73
1. 750	0. 60	7.833	1. 12	13. 917	2. 34	20.00	0. 73
1. 833 1. 917 2. 000 2. 083	0. 61 0. 61 0. 61 0. 63	7.917 8.000 8.083 8.167	1. 12 1. 12 1. 12 1. 15 1. 15	14. 000 14. 083 14. 167 14. 250	2. 34 2. 09 2. 09 2. 09	20. 08 20. 17 20. 25 20. 33	0. 70 0. 70 0. 70 0. 70 0. 68
2. 167 2. 250 2. 333 2. 417 2. 500	0. 63 0. 63 0. 64 0. 64 0. 64	8.250 8.333 8.417 8.500 8.583	1. 15 1. 23 1. 23 1. 23 1. 36	14. 333 14. 417 14. 500 14. 583 14. 667	1. 91 1. 91 1. 91 1. 82 1. 82	20.42 20.50 20.58 20.67 20.75	0. 68 0. 68 0. 68
2. 583 2. 667 2. 750 2. 833	0. 65 0. 65 0. 65 0. 67	8.667 8.750 8.833 8.917	1. 36 1. 36 1. 49 1. 49	14. 750 14. 833 14. 917 15. 000	1. 82 1. 82 1. 72 1. 72 1. 72	20.75 20.83 20.92 21.00 21.08	0. 68 0. 67 0. 67 0. 67 0. 66
2. 917	0. 67	9.000	1. 49	15. 083	1. 63	21. 17	0. 66
3. 000	0. 67	9.083	1. 62	15. 167	1. 63	21. 25	0. 66
3. 083	0. 68	9.167	1. 62	15. 250	1. 63	21. 33	0. 66
3. 167	0. 68	9.250	1. 62	15. 333	1. 54	21. 42	0. 66
3. 250	0. 68	9.333	1. 69	15. 417	1. 54	21. 50	0. 66
3. 250 3. 333 3. 417 3. 500 3. 583	0. 69 0. 69 0. 69 0. 71	9. 417 9. 500 9. 583 9. 667	1. 69 1. 69 1. 69 1. 69	15. 417 15. 500 15. 583 15. 667 15. 750	1. 54 1. 45 1. 45 1. 45	21.50 21.58 21.67 21.75 21.83	0. 65 0. 65 0. 65 0. 64
3. 667	0. 71	9.750	1. 69	15. 833	1. 35	21.92	0. 64
3. 750	0. 71	9.833	1. 80	15. 917	1. 35	22.00	0. 64
3. 833	0. 72	9.917	1. 80	16. 000	1. 35	22.08	0. 64
3. 917	0. 72	10.000	1. 80	16. 083	1. 26	22.17	0. 64
4. 000	0. 72	110.083	2. 00	16. 167	1. 26	22.25	0. 64
4. 083 4. 167 4. 250 4. 333	0. 73 0. 73 0. 73 0. 73 0. 75	10. 063 10. 167 10. 250 10. 333 10. 417	2. 00 2. 00 2. 00 2. 28 2. 28	16. 167 16. 250 16. 333 16. 417 16. 500	1. 26 1. 20 1. 20 1. 20 1. 20	22. 23 22. 33 22. 42 22. 50 22. 58	0. 63 0. 63 0. 63 0. 62
4. 417	0.78	10.500	2. 28	16. 583	1. 17	22. 67	0. 62
4. 500		10.583	2. 58	16. 667	1. 17	22. 75	0. 62
4. 583		10.667	2. 58	16. 750	1. 17	22. 83	0. 62
4. 667		10.750	2. 58	16. 833	1. 13	22. 92	0. 62
4. 750	0. 78	10.833	3. 02	16. 917	1. 13	23.00	0. 62
4. 833	0. 81	10.917	3. 02	17. 000	1. 13	23.08	0. 61
4. 917	0. 81	11.000	3. 02	17. 083	1. 10	23.17	0. 61
5. 000	0. 81	11.083	3. 53	17. 167	1. 10	23.25	0. 61
5. 083	0. 83	11.167	3. 53	17. 250	1. 10	23.33	0. 60
5. 167	0. 83	11.250	3. 53	17. 333	1. 07	23. 42	0. 60
5. 250	0. 83	11.333	4. 46	17. 417	1. 07	23. 50	0. 60
5. 333	0. 86	11.417	4. 46	17. 500	1. 07	23. 58	0. 60
5. 417	0. 86	11.500	4. 46	17. 583	1. 03	23. 67	0. 60
5. 500		11.583	5. 68	17. 667	1. 03	23. 75	0. 60
5. 583		11.667	5. 68	17. 750	1. 03	23. 83	0. 59
5. 667		11.750	5. 68	17. 833	1. 00	23. 92	0. 59

```
5. 833 0. 91 | 11. 917 23. 14 | 18. 000
                                           1.00 | 24.08
                                                        0.58
                 0. 91 | 12. 000 | 23. 14 | 18. 083
            5.917
                                           0. 97 | 24. 17
                                                        0.58
            6.000 0.91 12.083 57.11 18.167
                                           0. 97 | 24. 25
                                                        0.58
            6.083
                 0. 94 | 12. 167 | 57. 11 | 18. 250
                                           0.97
   Unit Hyd Qpeak (cms) = 0.356
   PEAK FLOW
               (cms) = 0.061 (i)
   TIME TO PEAK (hrs) = 12.333
   RUNOFF VOLUME (mm) = 13.378
   TOTAL RAINFALL (mm) = 52.800
   RUNOFF COEFFICIENT = 0.253
   (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
ADD HYD ( 0007)|
 1 + 2 = 3
                      AREA QPEAK
                                  TPEAK
                                          R. V.
                      (ha) (cms)
                                  (hrs)
                                          (mm)
    ID1= 1 ( 0023):
                     0. 41 0. 014
                                  12.33
                                        14.34
    + ID2= 2 ( 0029):
                    3. 43 0. 052
                                  12. 75 26. 51
     _____
     ID = 3 ( 0007): 3.84 0.061 12.42 25.21
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
_____
| ADD HYD ( 0007)|
 3 + 2 = 1
                      AREA QPEAK
                                  TPEAK
                                         R. V.
                      (ha)
                          (cms)
                                  (hrs)
                                           (mm)
    ID1= 3 ( 0007):
                      3. 84 0. 061
                                  12. 42 25. 21
    + ID2= 2 ( 0042):
                      2. 05 0. 061
                                  12. 33 13. 38
     _____
     ID = 1 (0007):
                      5. 89 0. 120 12. 33 21. 09
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0007)|
 1 + 2 = 3
                      AREA
                           QPEAK
                                           R. V.
                                   TPEAK
                      (ha)
                          (cms)
                                  (hrs)
                                         (mm)
     ID1 = 1 (0007):
                      5. 89 0. 120
                                  12. 33 21. 09
                      5. 32 0. 197
                                  12. 42 26. 56
    + ID2= 2 ( 0005):
     _____
     ID = 3 ( 0007): 11.21 0.315 12.42 23.69
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

5. 750 0. 88 | 11. 833 23. 14 | 17. 917

1.00 | 24.00

0.59

RESERVOIR(0008)	OVERFL	.OW IS OFF			
IN= 2> OUT= 1					
DT= 5.0 min	OUTFLO		1	OUTFLOW	STORAGE
	(cms) 0.000	•	, ,	(cms) 0.3390	(ha.m.) 0.1535
	0. 041		120	0. 3340	0. 1333
	0. 058			0. 5390	0. 1989
	0. 071	0 0.0	399	0. 6480	0. 2228
	0. 083		559	0. 7320	0. 2476
	0. 092 0. 101		732 918	0. 8050 0. 8710	0. 2733 0. 2998
	0. 101			0. 8710	0. 3263
		0. 1	321	0. 9880	0. 3528
		AREA	QPEAK	TPEAK	R. V.
		(ha)	(cms)	(hrs) 12.42	(mm)
INFLOW: ID= 2 (
OUTFLOW: ID= 1 (0008)	11.210	0. 094	13. 75	23. 68
ADD HYD (0016) 1 + 2 = 3		REA QPE	AK TPF	AK R. V	
		na) (cm	s) (hr	rs) (mm)
ID1= 1 (00				3 14.34	
+ ID2= 2 (00		21 0.09			
ID = 3 (00			7 13. 5		
NOTE: PEAK FLO	I TON OO SW	NCLUDE DA	CEELOWC I		
NOIL. ILAK IL	W3 D0 N01 1	NCLUDE DA	SEFLOWS I	F ANY.	
***********				F ANY.	
	******	******	*****	F ANY.	
**************************************	******	******	*****	F ANY.	
*******	**************************************	******** SCS Type	***** ** *****		(CN)= 75.0
**************************************	24hr 15mir ************************************	SCS Type ****** (ha)= 0 (mm)= 10	***** ***** *****	ve Number	(CN)= 75.0 es.(N)= 3.00
**************************************	**************************************	********* SCS Type ******* (ha)= C (mm)= 1C hrs)= C	****** II ** ****** . 83 Cur . 00 # c	ve Number f Linear R	es. (N) = 3.00
**************************************	24hr 15mir ************************************	********* SCS Type ******* (ha)= C (mm)= 1C hrs)= C	****** II ** ****** . 83 Cur . 00 # c	ve Number f Linear R	es. (N) = 3.00

---- TRANSFORMED HYETOGRAPH ---TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN

```
mm/hr|' hrs mm/hr| hrs
  hrs mm/hr |
                  hrs
                                                           mm/hr
0.083
        0.00
                         1. 92 | 12. 250 | 116. 82 |
                                                           1.91
                6.167
                                                 18. 33
0.167
         0.00
                6.250
                         1. 92 | 12. 333
                                         18.52
                                                 18.42
                                                           1.91
                6.333
                         1. 97 | 12. 417
0.250
         0.00
                                         18. 51
                                                 18.50
                                                           1.91
0.333
         1.10
                6.417
                         1. 97 | 12. 500
                                         18. 51
                                                 18.58
                                                           1.84
                         1. 97 | 12. 583
0.417
         1.10
                6.500
                                         12.60
                                                 18.67
                                                           1.84
0.500
        1.10
                6.583
                         2. 02 | 12. 667
                                         12.60
                                                 18.75
                                                          1.84
0.583
        1.12
                6.667
                         2. 02 | 12. 750
                                         12.60
                                                 18.83
                                                          1.77
0.667
        1.12
                6.750
                         2.02 | 12.833
                                          8.67
                                                 18.92
                                                          1.77
0.750
        1.12
                6.833
                         2.08 | 12.917
                                          8.67
                                                 19.00
                                                          1.77
0.833
        1.15
                6.917
                         2.08 | 13.000
                                          8.67
                                                 19.08
                                                          1.71
0.917
         1.15
                7.000
                         2.08 | 13.083
                                          7.32
                                                 19.17
                                                          1.71
1.000
        1.15
                7.083
                         2. 13 | 13. 167
                                          7.32
                                                 19. 25
                                                          1.71
1.083
                7.167
                         2. 13 | 13. 250
         1.17
                                          7.32
                                                 19.33
                                                          1 64
1.167
         1.17
                7.250
                         2. 13 | 13. 333
                                          6.20
                                                 19.42
                                                          1.64
1.250
         1.17
                7.333
                         2. 19 | 13. 417
                                          6. 19
                                                 19.50
                                                          1.64
1.333
         1.20
                7.417
                         2. 19 | 13. 500
                                          6.19
                                                 19.58
                                                          1.57
1.417
         1.20
                7.500
                         2. 19 | 13. 583
                                          5.47
                                                 19.67
                                                           1.57
1.500
         1.20
                7.583
                         2. 24 | 13. 667
                                          5.47
                                                 19.75
                                                          1.57
1.583
         1.23
                7.667
                         2. 24 | 13. 750
                                          5.47
                                                 19.83
                                                           1.50
1.667
         1.23
                7.750
                         2. 24
                               13.833
                                          4.80
                                                 19. 92
                                                           1.50
1.750
         1.23
                7.833
                         2.30
                               13. 917
                                          4.80
                                                 20.00
                                                           1.50
1.833
         1.25
                7.917
                         2.30
                               14.000
                                          4.80
                                                 20.08
                                                           1.44
1.917
         1.25
                8.000
                         2.30
                               14.083
                                          4.28
                                                 20.17
                                                           1.44
2.000
                8.083
                         2. 35 | 14. 167
                                                 20.25
         1.25
                                          4. 28
                                                           1.44
2.083
         1.28
                8.167
                         2.35
                               114, 250
                                                 20.33
                                          4. 28
                                                           1.40
2.167
         1.28
                8.250
                         2.35
                               14.333
                                          3.90
                                                 20.42
                                                           1.40
2.250
         1.28
                8.333
                         2. 52 | 14. 417
                                          3.90
                                                 20.50
                                                           1.40
2.333
         1.31
                8.417
                         2. 52 | 14. 500
                                          3.90
                                                 20.58
                                                           1.38
2.417
                         2.52 14.583
                8.500
                                          3.72
                                                 20.67
                                                           1.38
         1.31
2.500
                8.583
                         2. 78 | 14. 667
                                          3.72
                                                 20.75
         1.31
                                                           1.38
2.583
                         2. 78 | 14. 750
         1.34
                8.667
                                          3.72
                                                 20.83
                                                           1.37
2.667
                8.750
                         2. 78 | 14. 833
        1.34
                                          3.52
                                                 20.92
                                                           1.37
2.750
         1.34
                8.833
                         3.06 14.917
                                          3.52
                                                 21.00
                                                          1.37
2.833
                8.917
                         3.06 | 15.000
                                          3.52
                                                 21.08
         1.36
                                                           1.36
2.917
                         3.06 | 15.083
         1.36
                9.000
                                          3.34
                                                 21. 17
                                                           1.36
3.000
                         3. 32 | 15. 167
         1.36
                9.083
                                          3.34
                                                 21. 25
                                                           1.36
3.083
                9.167
                         3. 32 | 15. 250
         1.39
                                          3.34
                                                 21.33
                                                           1.34
3.167
         1.39
                9.250
                         3. 32 | 15. 333
                                          3.14
                                                 21.42
                                                           1.34
3.250
         1.39
                9.333
                         3. 46 | 15. 417
                                          3.14
                                                 21.50
                                                           1.34
3.333
         1.42
                9.417
                         3.46 | 15.500
                                          3.14
                                                 21.58
                                                           1.33
3.417
                9.500
                         3. 46 | 15. 583
                                          2.96
                                                 21.67
         1.42
                                                           1.33
3.500
        1.42
                9.583
                         3. 46 | 15. 667
                                          2.96
                                                 21.75
                                                           1.33
                         3. 46 | 15. 750
3.583
         1.45
                9.667
                                          2.96
                                                 21.83
                                                          1.32
                9.750
                         3. 46 | 15. 833
3.667
         1.45
                                          2.76
                                                 21.92
                                                          1.32
3.750
         1.45
                9.833
                         3. 68 | 15. 917
                                                 22.00
                                          2.76
                                                          1.32
3.833
        1.47 l
                9.917
                         3.68 | 16.000
                                          2.76
                                                 22.08
                                                          1.30
3.917
         1.47 | 10.000
                         3.68 | 16.083
                                          2.58
                                                 22. 17
                                                          1.30
                                                 22. 25
4.000
        1.47 | 10.083
                         4. 10 | 16. 167
                                          2.58
                                                          1.30
4.083
         1.50 | 10.167
                         4. 10 | 16. 250
                                          2.58
                                                 22.33
                                                          1. 29
                         4. 10 | 16. 333
4.167
         1.50 | 10.250
                                          2.45
                                                 22.42
                                                          1. 29
4.250
         1.50 | 10.333
                         4.66 | 16.417
                                          2. 45 | 22. 50
                                                          1. 29
```

```
4.333
        1.54 | 10.417
                          4.66 | 16.500
                                           2. 45 | 22. 58
                                                            1. 28
4.417
         1.54 | 10.500
                          4.66 | 16.583
                                           2. 38 | 22. 67
4.500
         1.54 | 10.583
                          5. 28 | 16. 667
                                           2.38
                                                   22.75
         1.59 10.667
                          5. 28 | 16. 750
4.583
                                                  22.83
                                           2.38
                                                             1.26
         1.59 | 10.750
                          5. 28 | 16. 833
                                           2. 31 | 22. 92
4.667
                                                             1.26
         1.59 | 10.833
                          6. 18 | 16. 917
4.750
                                           2.31
                                                  23.00
                                                             1.26
         1.65 | 10.917
                          6. 18 | 17. 000
4.833
                                           2.31
                                                   23.08
                                                             1.25
4.917
         1.65 | 11.000
                          6. 18 | 17. 083
                                           2.25
                                                   23. 17
                                                             1.25
5.000
         1.65 | 11.083
                          7. 21 | 17. 167
                                           2. 25
                                                   23. 25
                                                            1. 25
         1.70 | 11.167
                          7. 21 | 17. 250
5.083
                                           2.25
                                                   23.33
                                                             1.24
5.167
         1.70 | 11.250
                          7. 21 | 17. 333
                                           2.18
                                                   23.42
                                                             1.24
5.250
         1.70 | 11.333
                          9. 12 | 17. 417
                                           2.18
                                                   23.50
                                                             1.24
5.333
         1.76 111.417
                          9. 12 | 17. 500
                                           2.18
                                                   23.58
                                                             1.22
         1.76 | 11.500
                          9. 12 | 17. 583
5.417
                                           2.11
                                                   23.67
                                                             1.22
5.500
         1.76 | 11.583
                         11. 61 | 17. 667
                                           2.11
                                                   23.75
                                                             1.22
5.583
         1.81 | 11.667
                         11.61 | 17.750
                                           2.11
                                                   23.83
                                                             1.21
                         11. 61 | 17. 833
5.667
         1.81 | 11.750
                                           2.04
                                                   23.92
                                                             1.21
                         47. 33 | 17. 917
5.750
         1.81 | 11.833
                                           2.04
                                                  24.00
                                                             1.21
5.833
         1.86 | 11.917
                         47. 34 | 18. 000
                                           2.04
                                                  24.08
                                                             1.19
         1.86 | 12.000
                         47. 34 | 18. 083
5.917
                                           1. 98
                                                  24. 17
                                                             1.19
6.000
         1. 86 | 12. 083 | 116. 82 | 18. 167
                                           1.98
                                                  24. 25
                                                            1.19
6.083
        1. 92 | 12. 167 | 116. 82 | 18. 250
                                           1. 98
```

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms)= 0.111 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 52.454
TOTAL RAINFALL (mm)= 108.000
RUNOFF COEFFICIENT = 0.486

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

U. H. Tp(hrs) = 0.20

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1. 92	12. 250	116.82	18.33	1. 91
0.167	0.00	6.250	1. 92	12. 333	18. 52	18.42	1. 91
0.250	0.00	6.333	1. 97	12. 417	18. 51	18.50	1. 91
0.333	1.10	6.417	1. 97	12.500	18. 51	18.58	1.84
0.417	1.10	6.500	1. 97	12. 583	12.60	18.67	1.84
0.500	1.10	6.583	2.02	12.667	12.60	18.75	1.84

```
0.583
        1.12 | 6.667
                         2. 02 | 12. 750
                                         12.60 | 18.83
                                                          1.77
                6.750
                         2.02 | 12.833
                                           8.67
                                                  18.92
0.667
         1.12
                                                            1.77
0.750
         1.12
                6.833
                          2.08 | 12.917
                                           8.67
                                                  19.00
                                                            1.77
0.833
                6.917
                          2.08 | 13.000
                                                  19.08
         1.15
                                           8.67
                                                            1.71
0.917
                7.000
                         2.08 | 13.083
                                           7.32
                                                  19.17
         1.15
                                                            1.71
1.000
         1.15
                7.083
                          2. 13 | 13. 167
                                           7.32
                                                  19. 25
                                                            1.71
         1.17
                          2. 13 | 13. 250
1.083
                7.167
                                           7.32
                                                  19.33
                                                            1.64
1.167
         1.17
                7.250
                         2. 13 | 13. 333
                                           6.20
                                                  19.42
                                                           1.64
1.250
         1.17
                7.333
                          2. 19 | 13. 417
                                           6. 19
                                                  19.50
                                                           1.64
                                           6. 19
1.333
         1.20
                7.417
                          2. 19 | 13. 500
                                                  19.58
                                                           1.57
1.417
         1.20
                7.500
                          2. 19 | 13. 583
                                           5.47
                                                  19.67
                                                            1.57
1.500
         1.20
                7.583
                          2. 24 | 13. 667
                                           5.47
                                                  19.75
                                                           1.57
1.583
         1.23
                7.667
                          2. 24 | 13. 750
                                           5.47
                                                  19.83
                                                           1.50
                7.750
                          2. 24 | 13. 833
1.667
         1.23
                                           4.80
                                                  19.92
                                                            1.50
1.750
         1.23
                7.833
                          2. 30 | 13. 917
                                           4.80
                                                  20.00
                                                            1.50
1.833
                7.917
                          2.30 | 14.000
         1.25
                                           4.80
                                                  20.08
                                                            1.44
1.917
         1.25
                 8.000
                          2.30
                                114.083
                                                  20.17
                                           4. 28
                                                            1.44
2.000
         1.25
                8.083
                          2.35
                                14. 167
                                           4.28
                                                  20. 25
                                                            1.44
2.083
         1.28
                8.167
                          2.35
                                14.250
                                           4.28
                                                  20.33
                                                            1.40
2.167
         1.28
                8.250
                          2.35
                                14.333
                                           3.90
                                                  20.42
                                                            1.40
2.250
         1.28
                8.333
                          2.52
                                14.417
                                           3.90
                                                  20.50
                                                            1.40
2.333
         1.31
                8.417
                          2.52
                                14.500
                                           3.90
                                                  20.58
                                                            1.38
2.417
         1.31
                8.500
                          2.52
                                14.583
                                           3.72
                                                  20.67
                                                            1.38
2.500
         1.31
                8.583
                          2.78
                                14.667
                                           3.72
                                                  20.75
                                                            1.38
2.583
                8.667
                          2.78
                                14.750
                                           3.72
                                                  20.83
                                                            1.37
         1.34
2.667
                8.750
                          2.78
                                114.833
                                                  20.92
                                                            1.37
         1.34
                                           3.52
2.750
         1.34
                8.833
                          3.06 14.917
                                           3.52
                                                  21.00
                                                            1.37
2.833
         1.36
                8.917
                          3.06 15.000
                                           3.52
                                                  21.08
                                                            1.36
2.917
         1.36
                9.000
                          3.06 | 15.083
                                                  21.17
                                           3.34
                                                            1.36
3.000
                          3. 32 | 15. 167
                9.083
                                                  21.25
         1.36
                                           3.34
                                                            1.36
3.083
                          3. 32 | 15. 250
                9.167
                                                  21.33
         1.39
                                           3.34
                                                            1.34
3.167
                9.250
                          3. 32 | 15. 333
         1.39
                                           3.14
                                                  21.42
                                                            1.34
3.250
                9.333
                          3. 46 | 15. 417
         1.39
                                           3.14
                                                  21.50
                                                            1.34
3.333
         1.42
                9.417
                          3. 46 | 15. 500
                                           3.14
                                                  21.58
                                                            1.33
3.417
                9.500
                          3.46 | 15.583
         1.42
                                           2.96
                                                  21.67
                                                            1.33
3.500
         1.42
                9.583
                          3. 46 | 15. 667
                                           2.96
                                                  21.75
                                                            1.33
                          3.46 | 15.750
3.583
         1.45
                9.667
                                           2.96
                                                  21.83
                                                            1.32
3.667
                9.750
                          3.46 | 15.833
         1.45
                                           2.76
                                                  21.92
                                                            1.32
3.750
         1.45
                9.833
                          3.68 | 15.917
                                           2.76
                                                  22.00
                                                            1.32
3.833
         1.47
                9.917
                          3.68 | 16.000
                                           2.76
                                                  22.08
                                                            1.30
3.917
         1.47 | 10.000
                          3. 68 | 16. 083
                                           2.58
                                                  22.17
                                                            1.30
4.000
         1.47 10.083
                          4. 10 | 16. 167
                                                  22.25
                                           2.58
                                                            1.30
4.083
         1.50 | 10.167
                          4. 10 | 16. 250
                                           2.58
                                                  22.33
                                                            1.29
4.167
         1.50 | 10.250
                          4. 10 | 16. 333
                                           2.45
                                                  22.42
                                                            1.29
4.250
         1.50 | 10.333
                          4.66 | 16.417
                                           2.45
                                                  22.50
                                                            1.29
4.333
         1.54 | 10.417
                          4.66 | 16.500
                                           2.45
                                                  22.58
                                                            1.28
4.417
         1.54 | 10.500
                          4.66 | 16.583
                                           2.38
                                                  22.67
                                                            1.28
         1.54 | 10.583
                                           2.38
4.500
                          5. 28 | 16. 667
                                                  22.75
                                                            1.28
4.583
         1.59 10.667
                          5. 28 | 16. 750
                                           2.38
                                                  22.83
                                                            1.26
                                           2.31
4.667
         1.59 | 10.750
                          5. 28 | 16. 833
                                                  22.92
                                                            1.26
                          6. 18 | 16. 917
4.750
         1.59 | 10.833
                                           2.31
                                                  23.00
                                                            1.26
4.833
         1.65 | 10.917
                          6. 18 | 17. 000
                                           2. 31 | 23. 08
                                                           1. 25
```

```
4.917
        1.65 | 11.000
                          6. 18 | 17. 083
                                            2. 25 | 23. 17
                                                             1. 25
5.000
         1.65 | 11.083
                          7. 21 | 17. 167
                                            2.25
                                                   23. 25
5.083
         1.70 | 11.167
                           7. 21 | 17. 250
                                            2. 25
                                                   23.33
                                                              1.24
         1.70 | 11.250
                          7. 21 | 17. 333
                                                   23.42
5.167
                                            2.18
                                                              1.24
         1.70 | 11.333
5.250
                          9. 12 | 17. 417
                                            2. 18 | 23. 50
                                                              1.24
         1.76 | 11.417
                          9. 12 | 17. 500
5.333
                                            2.18
                                                   23.58
                                                              1.22
         1.76 | 11.500
                          9. 12 | 17. 583
5.417
                                            2.11
                                                    23.67
                                                              1.22
5.500
         1.76 | 11.583
                         11. 61 | 17. 667
                                            2. 11
                                                   23.75
                                                              1.22
5.583
         1.81 | 11.667
                         11. 61 | 17. 750
                                            2.11
                                                   23.83
                                                              1.21
                         11. 61 | 17. 833
5.667
         1.81 | 11.750
                                            2.04
                                                   23.92
                                                              1.21
5.750
         1.81 | 11.833
                         47. 33 | 17. 917
                                            2.04
                                                   24.00
                                                              1.21
5.833
         1.86 | 11.917
                         47. 34 | 18. 000
                                            2.04
                                                   24.08
                                                              1.19
5.917
         1.86 | 12.000
                        47. 34 | 18. 083
                                            1. 98 İ
                                                   24. 17
                                                              1.19
         1. 86 | 12. 083 | 116. 82 | 18. 167
6.000
                                            1. 98 İ
                                                   24. 25
                                                              1.19
6.083
         1. 92 | 12. 167 | 116. 82 | 18. 250
                                            1. 98
```

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms) = 0.054 (i)
TIME TO PEAK (hrs) = 12.333
RUNOFF VOLUME (mm) = 52.476
TOTAL RAINFALL (mm) = 108.000
RUNOFF COEFFICIENT = 0.486

| CALIB

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
STANDHYD ( 0005)
                          (ha) = 5.32
                    Area
                    Total Imp(\%) = 50.00
                                        Dir. Conn. (%) = 35.00
-----
                                      PERVIOUS (i)
                          I MPERVI OUS
    Surface Area
                   (ha)=
                             2.66
                                         2.66
                             1.00
    Dep. Storage
                   (mm) =
                                         5.00
    Average Slope
                    (%)=
                             1.00
                                         1.00
    Length
                    (m) =
                            188.33
                                         40.00
    Mannings n
                             0.130
                                        0.250
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN mm/hr hrs mm/hr |' hrs mm/hr hrs mm/hr hrs 0.083 1. 92 | 12. 250 | 116. 82 | 0.00 6.167 18.33 1.91 0.167 0.00 6.250 1. 92 | 12. 333 18. 52 18.42 1.91 0.250 0.00 6.333 1. 97 | 12. 417 18.51 18.50 1.91 1.10 6.417 1. 97 | 12. 500 0.333 18. 51 18. 58 1.84 1. 97 | 12. 583 0.417 1.10 6.500 12.60 18.67 1.84 0.500 6.583 2.02 | 12.667 1.10 12.60 18.75 1.84 0.583 1.12 | 6.667 2. 02 | 12. 750 12.60 | 18.83 1.77

```
0.667
        1.12 | 6.750
                         2.02 | 12.833
                                          8. 67 | 18. 92
                                                          1.77
0.750
        1.12 | 6.833
                         2.08 | 12.917
                                           8.67
                                                  19.00
                                                           1.77
0.833
         1.15
                6.917
                          2.08 | 13.000
                                           8.67
                                                  19.08
                                                            1.71
0.917
                7.000
                         2.08 | 13.083
                                           7.32
                                                  19.17
         1.15
                                                            1.71
1.000
                7.083
                         2. 13 | 13. 167
                                           7.32
                                                  19. 25
         1.15
                                                            1.71
1.083
         1.17
                7.167
                          2. 13 | 13. 250
                                           7.32
                                                  19.33
                                                            1.64
                          2. 13 | 13. 333
1.167
         1.17
                7.250
                                           6.20
                                                  19.42
                                                           1.64
1.250
         1.17
                7.333
                         2. 19 | 13. 417
                                           6. 19
                                                  19.50
                                                           1.64
1.333
         1.20
                7.417
                          2. 19 | 13. 500
                                           6. 19
                                                  19.58
                                                           1.57
                                           5.47
1.417
         1.20
                7.500
                          2. 19 | 13. 583
                                                  19.67
                                                           1.57
1.500
         1.20
                7.583
                          2. 24 | 13. 667
                                           5.47
                                                  19.75
                                                           1.57
1.583
         1.23
                7.667
                          2. 24 | 13. 750
                                           5.47
                                                  19.83
                                                           1.50
1.667
         1.23
                7.750
                         2. 24 | 13. 833
                                           4.80
                                                  19.92
                                                           1.50
1.750
                7.833
                         2. 30 | 13. 917
         1.23
                                           4.80
                                                  20.00
                                                           1.50
1.833
         1.25
                7.917
                          2.30 | 14.000
                                           4.80
                                                  20.08
                                                           1.44
1.917
                8.000
                                14.083
         1.25
                          2.30
                                           4.28
                                                  20.17
                                                            1.44
2.000
         1.25
                8.083
                          2.35
                                114, 167
                                                  20.25
                                           4. 28
                                                            1.44
2.083
         1.28
                8.167
                          2.35
                                14.250
                                           4.28
                                                  20.33
                                                            1.40
2.167
         1.28
                8.250
                          2.35
                                14.333
                                           3.90
                                                  20.42
                                                            1.40
2.250
         1.28
                8.333
                          2.52
                                14.417
                                           3.90
                                                  20.50
                                                            1.40
2.333
         1.31
                8.417
                          2.52
                                14.500
                                           3.90
                                                  20.58
                                                            1.38
2.417
         1.31
                8.500
                         2.52
                                14.583
                                           3.72
                                                  20.67
                                                            1.38
2.500
         1.31
                8.583
                          2.78
                                14.667
                                           3.72
                                                  20.75
                                                            1.38
2.583
         1.34
                8.667
                          2.78
                                14.750
                                           3.72
                                                  20.83
                                                            1.37
2.667
                8.750
                          2.78
                                14.833
                                                  20.92
         1.34
                                           3.52
                                                            1.37
2.750
                8.833
                          3.06
                                114, 917
                                                  21.00
         1.34
                                           3.52
                                                            1.37
2.833
         1.36
                8.917
                          3.06
                                15.000
                                           3.52
                                                  21.08
                                                            1.36
2.917
         1.36
                9.000
                          3.06 | 15.083
                                                  21.17
                                           3.34
                                                            1.36
3.000
                9.083
                          3. 32 | 15. 167
                                                  21.25
         1.36
                                           3.34
                                                            1.36
3.083
                9.167
                          3. 32 | 15. 250
         1.39
                                           3.34
                                                  21.33
                                                            1.34
                          3. 32 | 15. 333
3.167
                9.250
         1.39
                                           3.14
                                                  21.42
                                                            1.34
3.250
                9.333
                          3. 46 | 15. 417
         1.39
                                                  21.50
                                           3.14
                                                            1.34
                9.417
                          3.46 | 15.500
3.333
         1.42
                                           3.14
                                                  21.58
                                                            1.33
3.417
         1.42
                9.500
                          3. 46 | 15. 583
                                           2.96
                                                  21.67
                                                            1.33
3.500
                9.583
                          3.46 | 15.667
         1.42
                                           2.96
                                                  21.75
                                                            1.33
3.583
         1.45
                9.667
                          3. 46 | 15. 750
                                           2.96
                                                  21.83
                                                            1.32
                          3. 46 | 15. 833
3.667
         1.45
                9.750
                                           2.76
                                                  21.92
                                                            1.32
3.750
                9.833
                          3. 68 | 15. 917
         1.45
                                           2.76
                                                  22.00
                                                            1.32
                          3.68 | 16.000
3.833
         1.47
                9.917
                                           2.76
                                                  22.08
3.917
         1.47 | 10.000
                          3. 68 | 16. 083
                                           2.58
                                                  22.17
4.000
         1.47 10.083
                          4. 10 | 16. 167
                                           2.58
                                                  22.25
                                                            1.30
4.083
         1.50 | 10.167
                          4. 10 | 16. 250
                                           2.58
                                                  22.33
                                                            1.29
4.167
         1.50 | 10.250
                          4. 10 | 16. 333
                                           2.45
                                                  22.42
         1.50 10.333
4.250
                          4. 66 | 16. 417
                                           2.45
                                                  22.50
4.333
         1.54 | 10.417
                          4.66 | 16.500
                                           2.45
                                                  22.58
4.417
         1.54 | 10.500
                          4.66 | 16.583
                                           2.38
                                                  22.67
4.500
         1.54 | 10.583
                          5. 28 | 16. 667
                                           2.38
                                                  22.75
         1.59 | 10.667
                          5. 28 | 16. 750
                                           2.38
4.583
                                                  22.83
4.667
         1.59 | 10.750
                          5. 28 | 16. 833
                                           2. 31
                                                  22. 92
                                                            1.26
                                           2.31
                                                  23.00
4.750
         1.59 | 10.833
                          6. 18 | 16. 917
                                                            1.26
                          6. 18 | 17. 000
4.833
         1.65 | 10.917
                                           2.31
                                                 23.08
                                                            1.25
4.917
         1.65 | 11.000
                          6. 18 | 17. 083
                                           2. 25 | 23. 17
                                                           1. 25
```

```
5.000
                   1.65 | 11.083
                                     7. 21 | 17. 167
                                                      2. 25 | 23. 25
           5.083
                    1.70 | 11.167
                                     7. 21 | 17. 250
                                                      2. 25 | 23. 33
                                                      2. 18 İ
           5.167
                    1.70 | 11.250
                                     7. 21 | 17. 333
                                                              23.42
                    1.70 | 11.333
           5.250
                                     9. 12 | 17. 417
                                                             23.50
                                                      2.18
                                                                        1.24
                                     9. 12 | 17. 500
           5.333
                    1.76 | 11.417
                                                      2. 18 | 23. 58
                                                                        1. 22
                                     9. 12 | 17. 583
           5.417
                    1.76 | 11.500
                                                      2.11
                                                             23.67
                                                                        1.22
                    1.76 | 11.583
           5.500
                                    11. 61 | 17. 667
                                                      2.11
                                                              23.75
                                                                        1.22
           5.583
                    1.81 | 11.667
                                    11. 61 | 17. 750
                                                      2. 11
                                                              23.83
                                                                        1.21
           5.667
                    1.81 | 11.750
                                    11. 61 | 17. 833
                                                      2.04
                                                              23.92
                                                                        1. 21
                    1.81 | 11.833
                                    47. 33 | 17. 917
           5.750
                                                      2.04
                                                              24.00
                                                                        1. 21
           5.833
                    1.86 | 11.917
                                    47. 34 | 18. 000
                                                      2.04
                                                             24.08
                                                                        1 19
           5.917
                    1.86 | 12.000
                                   47. 34 | 18. 083
                                                      1. 98 İ
                                                             24. 17
                                                                       1. 19
           6.000
                    1. 86 | 12. 083 | 116. 82 | 18. 167
                                                      1. 98 İ
                                                             24. 25
                                                                        1.19
                    1. 92 | 12. 167 | 116. 82 | 18. 250
           6.083
                                                      1. 98 İ
Max. Eff. Inten. (mm/hr)=
                            116.82
                                           77.14
           over (min)
                             15.00
                                           25.00
                             13.97 (ii)
Storage Coeff. (min)=
                                           23.61 (ii)
Unit Hyd. Tpeak (min)=
                             15.00
                                           25.00
Unit Hyd. peak (cms)=
                              0.08
                                            0.05
                                                         *TOTALS*
PEAK FLOW
                 (cms)=
                              0.41
                                            0.25
                                                           0.611 (iii)
TIME TO PEAK
                 (hrs)=
                             12.33
                                           12.50
                                                           12.42
RUNOFF VOLUME
                  (mm) =
                            107.00
                                           45.21
                                                           66.84
TOTAL RAINFALL
                            108.00
                                                          108.00
                 (mm) =
                                          108.00
RUNOFF COEFFICIENT =
                              0.99
                                            0.42
                                                            0.62
```

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY

| CALIB STANDHYD (0028) (ha) = 3.43Area Total Imp(%) = 50.00 Dir. Conn. (%) = 35.00 -----I MPERVI OUS PERVIOUS (i) Surface Area (ha)= 1.71 1.71 Dep. Storage 1.00 5.00 (mm) =Average Slope (%)= 1.00 2.00 Length (m) =151.22 40.00 0.013 Mannings n 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ---TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN

hrs 0.083	mm/hr 0.00	hrs 6.167	mm/hr 1.92	' hrs 12. 250	mm/hr 116.82	hrs 18.33	mm/hr 1.91
0. 167	0.00	6. 250	1. 92	12. 230	18. 52	18. 42	1. 91
0. 250	0.00	6.333	1.97	12. 417	18. 51	18.50	1. 91
0. 333 0. 417	1. 10 1. 10	6. 417 6. 500	1. 97 1. 97	12. 500 12. 583	18. 51 12. 60	18.58 18.67	1. 84 1. 84
0. 500	1. 10	6.583	2. 02	12. 667	12.60	18.75	1. 84
0.583	1.12	6.667	2.02	12. 750	12.60	18.83	1. 77
0. 667 0. 750	1. 12 1. 12	6.750 6.833	2. 02 2. 08	12. 833 12. 917	8. 67 8. 67	18. 92 19. 00	1. 77 1. 77
0. 833	1. 15	6.917	2.08	13. 000	8. 67	19.08	1. 71
0. 917	1.15	7.000	2.08	13. 083	7. 32	19. 17	1. 71
1. 000 1. 083	1. 15 1. 17	7.083 7.167	2. 13 2. 13	13. 167 13. 250	7. 32 7. 32	19. 25 19. 33	1. 71 1. 64
1. 167	1. 17	7.167	2. 13	13. 230	6. 20	19. 33	1. 64
1. 250	1.17	7.333	2. 19	13. 417	6. 19	19. 50	1.64
1. 333 1. 417	1.20	7.417	2. 19	13. 500	6. 19 5. 47	19.58	1.57
1. 417	1. 20 1. 20	7.500 7.583	2. 19 2. 24	13. 583 13. 667	5. 47 5. 47	19. 67 19. 75	1. 57 1. 57
1. 583	1. 23	7.667	2. 24	13. 750	5. 47	19.83	1. 50
1.667	1.23	7.750	2. 24	13. 833	4.80	19. 92	1.50
1. 750 1. 833	1. 23 1. 25	7.833 7.917	2. 30 2. 30	13. 917 14. 000	4. 80 4. 80	20.00 20.08	1. 50 1. 44
1. 917	1. 25	8.000	2. 30	14. 083	4. 28	20.00	1. 44
2.000	1. 25	8.083	2. 35	14. 167	4. 28	20. 25	1.44
2. 083 2. 167	1. 28 1. 28	8.167 8.250	2. 35 2. 35	14. 250 14. 333	4. 28 3. 90	20. 33 20. 42	1. 40 1. 40
2. 167	1. 28	8.333	2. 53	14. 333	3. 90	20.42	1. 40
2. 333	1. 31	8.417	2.52	14. 500	3. 90	20. 58	1. 38
2. 417	1.31	8.500	2.52	14. 583	3.72	20.67	1. 38
2.500 2.583	1. 31 1. 34	8.583 8.667	2. 78 2. 78	14. 667 14. 750	3. 72 3. 72	20. 75 20. 83	1. 38 1. 37
2. 667	1.34	8.750	2. 78	14. 833	3. 52	20.92	1. 37
2.750	1.34	8.833	3.06	14. 917	3. 52	21.00	1. 37
2. 833 2. 917	1. 36 1. 36	8.917 9.000	3. 06 3. 06	15. 000 15. 083	3. 52 3. 34	21. 08 21. 17	1. 36 1. 36
3. 000	1. 36	9.083	3. 32	15. 167	3. 34	21. 17	1. 36
3.083	1.39	9. 167	3. 32	15. 250	3.34	21. 33	1. 34
3. 167 3. 250	1. 39 1. 39	9.250	3. 32 3. 46	15. 333 15. 417	3. 14 3. 14	21.42 21.50	1. 34 1. 34
3. 333	1. 39	9.333	3.46	15. 417	3. 14	21.50	1. 34
3. 417	1.42	9.500	3. 46	15. 583	2. 96	21.67	1. 33
3.500	1.42	9.583	3.46	15. 667	2. 96	21.75	1. 33
3. 583 3. 667	1. 45 1. 45	9.667 9.750	3. 46 3. 46	15. 750 15. 833	2. 96 2. 76	21.83 21.92	1. 32 1. 32
3. 750	1. 45	9.833	3. 68	15. 917	2.76	22.00	1. 32
3.833	1.47	9.917	3. 68	16.000	2. 76	22.08	1. 30
3. 917 4. 000	1. 47 1. 47	10.000 10.083	3. 68 4. 10	16. 083 16. 167	2. 58 2. 58	22. 17 22. 25	1. 30 1. 30
4.083	1. 50	10.063	4. 10	16. 250	2. 58	22. 23	1. 29
4. 167		10. 250	4. 10	16. 333	2. 45	22. 42	1. 29
4. 250	1.50	10.333	4. 66	16. 417	2. 45	22.50	1. 29

```
4.333
                   1.54 | 10.417
                                     4.66 | 16.500
                                                      2. 45 | 22. 58
                                                                       1. 28
           4.417
                    1.54 | 10.500
                                     4.66 | 16.583
                                                      2. 38 | 22. 67
                                                                       1. 28
                                                      2.38 j
           4.500
                    1.54 | 10.583
                                     5. 28 | 16. 667
                                                             22.75
                                                                       1.28
           4.583
                    1.59 | 10.667
                                     5. 28 | 16. 750
                                                             22.83
                                                      2.38
                                                                       1.26
                    1.59 | 10.750
                                     5. 28 | 16. 833
                                                      2. 31 | 22. 92
           4.667
                                                                       1.26
           4.750
                    1.59 | 10.833
                                     6. 18 | 16. 917
                                                      2.31
                                                             23.00
                                                                       1.26
                    1.65 | 10.917
                                     6. 18 | 17. 000
           4.833
                                                      2.31
                                                             23.08
                                                                       1.25
           4.917
                    1.65 | 11.000
                                     6. 18 | 17. 083
                                                      2. 25
                                                             23.17
                                                                       1.25
           5.000
                    1.65 | 11.083
                                     7. 21 | 17. 167
                                                      2.25
                                                             23. 25
                                                                       1. 25
                    1.70 | 11.167
                                     7. 21 | 17. 250
           5.083
                                                      2.25
                                                             23.33
                                                                       1.24
           5.167
                    1.70 | 11.250
                                     7. 21 | 17. 333
                                                      2.18
                                                             23.42
                                                                       1.24
           5.250
                    1.70 | 11.333
                                     9. 12 | 17. 417
                                                      2.18
                                                             23.50
                                                                       1.24
           5.333
                    1.76 | 11.417
                                     9. 12 | 17. 500
                                                      2. 18 İ
                                                             23.58
                                                                       1.22
                    1.76 | 11.500
                                     9. 12 | 17. 583
           5.417
                                                      2. 11 İ
                                                             23.67
                                                                       1.22
           5.500
                    1.76 | 11.583
                                    11. 61 | 17. 667
                                                      2.11
                                                             23.75
                                                                       1.22
                    1.81 | 11.667
                                    11. 61 | 17. 750
           5.583
                                                      2.11
                                                             23.83
                                                                       1.21
           5.667
                    1.81 | 11.750
                                    11. 61 | 17. 833
                                                      2.04
                                                             23.92
                                                                       1. 21
           5.750
                    1.81 | 11.833
                                    47. 33 | 17. 917
                                                      2.04
                                                             24.00
                                                                       1.21
           5.833
                    1.86 | 11.917
                                    47. 34 | 18. 000
                                                      2.04
                                                             24.08
                                                                       1.19
           5.917
                    1.86 | 12.000
                                    47. 34 | 18. 083
                                                      1. 98
                                                             24. 17
                                                                       1.19
           6.000
                    1. 86 | 12. 083 | 116. 82 | 18. 167
                                                      1.98
                                                             24. 25
                                                                       1. 19
           6.083
                    1. 92 | 12. 167 | 116. 82 | 18. 250
                                                      1. 98
Max. Eff. Inten. (mm/hr)=
                            116.82
           over (min)
                              5.00
                                           15.00
Storage Coeff. (min)=
                              3.08 (ii)
                                           10.91 (ii)
Unit Hyd. Tpeak (min)=
                              5.00
                                           15.00
Unit Hyd. peak (cms)=
                              0.27
                                           0.09
                                                         *TOTALS*
PEAK FLOW
                              0.39
                                                          0.606 (iii)
                                           0.25
                 (cms) =
TIME TO PEAK
                (hrs)=
                             12.25
                                                          12.25
                                           12.33
RUNOFF VOLUME
                 (mm) =
                            107.00
                                           45.21
                                                          66.84
TOTAL RAINFALL
                (mm) =
                            108.00
                                          108.00
                                                          108.00
RUNOFF COEFFICIENT =
                              0.99
                                           0.42
                                                           0.62
```

**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

0.0000

0.1100

0.0000

0.0700

0.2200

0.0000

0.1300

0.0000

AREA QPEAK TPEAK R. V. (ha) (cms) (hrs) (mm) INFLOW: ID= 2 (0028) 3. 430 0. 606 12. 25 66.84 OUTFLOW: ID= 1 (0029) 3.430 0. 142 12. 67 66.79

> PEAK FLOW REDUCTION [Qout/Qin](%) = 23.39 TIME SHIFT OF PEAK FLOW (min) = 25.00 MAXIMUM STORAGE USED (ha.m.) = 0.0874

-----CALIB

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1. 92	12. 250	116.82	18. 33	1. 91
0.167	0.00	6.250	1. 92	12. 333	18. 52	18.42	1. 91
0.250	0.00	6.333	1. 97	12. 417	18. 51	18.50	1. 91
0.333	1.10	6.417	1. 97	12.500	18. 51	18.58	1.84
0.417	1.10	6.500	1. 97	12. 583	12.60	18. 67	1.84
0.500	1.10	6.583	2.02	12.667	12.60	18.75	1.84
0.583	1.12	6.667	2.02	12.750	12.60	18.83	1.77
0.667	1.12	6.750	2.02	12.833	8. 67	18. 92	1.77
0.750	1.12	6.833	2.08	12. 917	8. 67	19.00	1.77
0.833	1.15	6.917	2.08	13. 000	8. 67	19.08	1. 71
0. 917	1.15	7.000	2.08	13.083	7.32	19. 17	1.71
1.000	1.15	7.083	2. 13	13. 167	7. 32	19. 25	1. 71
1.083	1. 17	7.167	2. 13	13. 250	7.32	19. 33	1.64
1. 167	1.17	7.250	2. 13	13. 333	6. 20	19. 42	1.64
1. 250	1.17	7.333	2. 19	13. 417	6. 19	19.50	1.64
1. 333	1. 20	7.417	2. 19	13. 500	6. 19	19. 58	1. 57
1. 417	1. 20	7.500	2. 19	13. 583	5.47	19. 67	1. 57
1.500	1. 20	7.583	2. 24	13. 667	5. 47	19. 75	1. 57
1.583	1.23	7.667	2. 24	13. 750	5. 47	19.83	1.50
1. 667	1.23	7.750	2. 24	13.833	4.80	19. 92	1.50
1. 750	1. 23	7.833	2.30	13. 917	4.80	20.00	1. 50
1.833	1. 25	7.917	2. 30	14. 000	4.80	20.08	1.44
1. 917	1. 25	8.000	2. 30	14. 083	4. 28	20. 17	1.44
2.000	1. 25	8.083	2. 35	14. 167	4. 28	20. 25	1.44
2.083	1. 28	8. 167	2. 35	14. 250	4. 28	20. 33	1. 40
2. 167	1. 28	8.250	2.35	14. 333	3. 90	20.42	1.40
2. 250	1. 28	8.333	2. 52	14. 417	3. 90	20.50	1. 40
2. 333	1. 31	8.417	2. 52	14. 500	3. 90	20. 58	1. 38
2. 417	1. 31	8.500	2. 52	14. 583	3. 72	20. 67	1. 38
2.500	1. 31	8.583	2. 78	14. 667	3.72	20. 75	1. 38

2. 583 2. 667 2. 750 2. 833	1. 34 1. 34 1. 34 1. 36	8.667 8.750 8.833 8.917	2. 78 2. 78 3. 06 3. 06	14. 750 14. 833 14. 917 15. 000	3. 72 3. 52 3. 52 3. 52	20. 83 20. 92 21. 00 21. 08	1. 37 1. 37 1. 37 1. 36
2. 917	1.36	9.000	3. 06	15. 083	3. 34	21. 17	1. 36
3.000	1.36	9.083	3. 32	15. 167	3. 34	21. 25	1. 36
3. 083	1.39	9.167	3. 32	15. 250	3. 34	21. 33	1. 34
3. 167	1.39	9. 250	3.32	15. 333	3. 14	21.42	1.34
3.250	1.39	9.333	3.46	15. 417	3. 14	21.50	1.34
3. 333	1.42	9.417	3.46	15. 500	3. 14	21. 58	1. 33
3. 417	1.42	9.500	3.46	15. 583	2. 96	21. 67	1. 33
3.500	1.42	9.583	3.46	15. 667	2. 96	21. 75	1. 33
3.583	1.45	9.667	3.46	15. 750	2. 96	21.83	1. 32
3.667	1.45	9.750	3.46	15. 833	2. 76	21. 92	1. 32
3. 750	1.45	9.833	3. 68	15. 917	2. 76	22.00	1. 32
3.833	1.47	9.917	3. 68	16.000	2.76	22. 08	1. 30
3. 917	1.47	10.000	3. 68	16. 083	2.58	22. 17	1.30
4.000	1.47	10.083	4. 10	16. 167	2.58	22. 25	1.30
4.083	1.50	10.167	4. 10	16. 250	2.58	22. 33	1. 29
4. 167	1.50	10.250	4. 10	16. 333	2.45	22. 42	1. 29
4. 250	1.50	10.333	4.66	16. 417	2. 45	22.50	1. 29
4. 333 4. 417	1.54 1.54	10.417 10.500	4. 66 4. 66	16. 500 16. 583	2. 45 2. 38	22. 58 22. 67	1. 28 1. 28
4. 417	1.54	10.500	4. 66 5. 28	16. 583	2. 38	22. 67	1. 28
4. 583	1.54	10.565	5. 28	16. 750	2. 38	22. 73	1. 26
4. 667	1.59	10.750	5. 28	16. 833	2. 31	22. 92	1. 26
4. 750	1.59	10.730	6. 18	16. 917	2. 31	23. 00	1. 26
4. 833	1.65	10.917	6. 18	17. 000	2. 31	23. 08	1. 25
4. 917	1.65	11.000	6. 18	17. 083	2. 25	23. 17	1. 25
5.000	1.65	11.083	7. 21	17. 167	2. 25	23. 25	1. 25
5. 083	1.70	11. 167	7. 21	17. 250	2. 25	23. 33	1. 24
5. 167	1.70	11. 250	7. 21	17. 333	2. 18	23.42	1. 24
5. 250	1.70	11.333	9. 12	17. 417	2. 18	23.50	1. 24
5.333	1.76	11. 417	9. 12	17. 500	2. 18	23. 58	1. 22
5.417	1.76	11.500	9. 12	17. 583	2. 11	23. 67	1. 22
5.500	1.76	11.583	11. 61	17. 667	2. 11	23.75	1. 22
5. 583	1.81	11.667	11. 61	17. 750	2. 11	23.83	1. 21
5.667	1.81	11.750	11. 61	17. 833	2.04	23. 92	1. 21
5. 750	1.81	11.833	47. 33	17. 917	2.04	24.00	1. 21
5. 833	1.86	11.917	47. 34	18.000	2. 04	24. 08	1. 19
5. 917	1.86	12.000	47. 34	18. 083	1. 98	24. 17	1. 19
6.000	1.86	12.083	116.82	18. 167	1. 98	24. 25	1. 19
6.083	1. 92	12.167	116. 82	18. 250	1. 98		

Unit Hyd Qpeak (cms)= 0.356

PEAK FLOW (cms) = 0.243 (i)TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 49.969 TOTAL RAINFALL (mm) = 108.000 RUNOFF COEFFICIENT = 0.463

(i) PEAK FLOW DOES	NOT INCLUDE	E BASEFLOW	IF ANY.		
ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0023): + ID2= 2 (0029): ============ ID = 3 (0007): NOTE: PEAK FLOWS I	0. 41 3. 43 	0. 177	12. 33 12. 67 ====== 12. 42	52. 48 66. 79 65. 26	
ADD HYD (0007) 3 + 2 = 1	5. 89	0. 415	12. 33	59. 94) -
ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0007) : ID2= 2 (0005) : ID = 3 (0007) :	5. 32 ====================================	0. 611 ====== 1. 018	12. 42 ======= 12. 33	66.84 63.21	
RESERVOIR (0008) IN= 2> OUT= 1 DT= 5.0 min	OVERFLOW OUTFLOW (cms)	STORAGE (ha.m.) 0.0000 0.0120 0.0253 0.0399 0.0559 0.0732 0.0918	OUTF (cn 0.3 0.5 0.6 0.7		STORAGE (ha.m.) 0. 1535 0. 1758 0. 1989 0. 2228 0. 2476 0. 2733 0. 2998 0. 3263

```
0. 2860 0. 1321 | 0. 9880
                                         0.3528
                     AREA
                         QPEAK
                                 TPEAK
                                          R. V.
                    (ha)
                          (cms)
                                          (mm)
                                  (hrs)
 INFLOW: ID= 2 ( 0007)
                   11. 210
                          1. 018
                                 12. 33
                                          63.21
 OUTFLOW: ID= 1 ( 0008)
                   11.210
                          0. 452
                                 12. 92
                                          63. 21
            PEAK FLOW REDUCTION [Qout/Qin](%) = 44.44
            TIME SHIFT OF PEAK FLOW (min) = 35.00
            MAXIMUM STORAGE USED
                                (ha. m.) = 0.1861
| ADD HYD ( 0016)|
1 + 2 = 3
                AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm)
                                    (mm)
   ID1= 1 ( 0022):
   _____
     ID = 3 ( 0016): 12.04 0.474 12.92 62.47
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----
*********
** SIMULATION: 3-5yr 24hr 15min SCS Type II **
**********
_____
| CALIB
NASHYD ( 0022) Area (ha)= 0.83 Curve Number (CN)= 75.0
|ID= 1 DT= 5.0 min | Ia (mm)= 10.00
                              # of Linear Res. (N) = 3.00
----- U. H. Tp(hrs) = 0.19
     NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
```

TRANSFORMED HYETOGRAPH										
TIME	RAI N	TIME	RAIN	TIME	RAIN	TIME	RAIN			
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr			
0.083	0.00	6.167	1. 23	12. 250	75. 29	18. 33	1. 23			
0. 167	0.00	6.250	1. 23	12. 333	11. 93	18.42	1. 23			
0.250	0.00	6.333	1. 27	12. 417	11. 93	18.50	1. 23			
0.333	0.71	6.417	1. 27	12. 500	11. 93	18.58	1. 19			
0.417	0.71	6.500	1. 27	12. 583	8. 12	18.67	1. 19			
0.500	0.71	6.583	1.30	12. 667	8. 12	18.75	1. 19			
0.583	0.72	6.667	1.30	12. 750	8. 12	18.83	1. 14			
0.667	0.72	6.750	1.30	12.833	5. 59	18. 92	1.14			
0.750	0.72	6.833	1.34	12. 917	5. 58	19.00	1.14			
0.833	0.74	6.917	1.34	13.000	5. 58	19.08	1. 10			
0. 917	0.74	7.000	1.34	13. 083	4.72	19. 17	1. 10			
1.000	0.74	7.083	1.37	13. 167	4.72	19. 25	1. 10			
1.083	0.76	7.167	1. 37	13. 250	4. 72	19. 33	1.06			

```
1. 167
       0.76 | 7.250
                        1. 37 | 13. 333
                                         3. 99 | 19. 42
                                                         1.06
1.250
        0.76 | 7.333
                         1.41 | 13.417
                                          3.99
                                                 19.50
                                                          1.06
1.333
         0.78 | 7.417
                         1.41 | 13.500
                                          3.99
                                                 19.58
                                                          1.01
         0.78 | 7.500
                         1. 41 | 13. 583
1.417
                                          3.52
                                                19.67
                                                          1.01
1.500
         0.78 | 7.583
                         1.44 | 13.667
                                          3.52
                                                19.75
                                                          1.01
                         1. 44 | 13. 750
1.583
         0.79
                7.667
                                          3.52
                                                 19.83
                                                          0.97
                         1. 44 | 13. 833
1.667
         0.79
                7.750
                                          3.09
                                                 19.92
                                                          0.97
1.750
        0.79
                7.833
                         1. 48 | 13. 917
                                          3.09
                                                 20.00
                                                          0.97
1.833
         0.81
                7.917
                         1.48 | 14.000
                                          3.09
                                                 20.08
                                                          0.93
                         1. 48 | 14. 083
1.917
         0.81
                8.000
                                          2.76
                                                 20.17
                                                          0.93
2.000
         0.81
                8.083
                         1. 51 | 14. 167
                                          2.76
                                                 20. 25
                                                          0.93
2.083
         0.83
                8.167
                         1.51 | 14.250
                                          2.76
                                                 20.33
                                                          0.90
2.167
         0.83
                8.250
                         1.51 114.333
                                          2. 51 İ
                                                 20.42
                                                          0.90
2.250
                8.333
         0.83
                         1, 62 | 14, 417
                                          2.51
                                                 20.50
                                                          0.90
2.333
         0.84
                8.417
                         1.62 | 14.500
                                          2.51
                                                 20.58
                                                          0.89
2.417
                8.500
                         1.62 | 14.583
         0.84
                                          2.40
                                                 20.67
                                                          0.89
2.500
         0.84
                8.583
                         1. 79 | 14. 667
                                          2.40
                                                 20.75
                                                          0.89
2.583
         0.86
                8.667
                         1. 79 | 14. 750
                                          2.40
                                                 20.83
                                                          0.88
2.667
         0.86
                8.750
                         1.79 | 14.833
                                          2.27
                                                 20.92
                                                          0.88
2.750
         0.86
                8.833
                         1. 97 | 14. 917
                                          2.27
                                                 21.00
                                                          0.88
2.833
         0.88
                8.917
                         1. 97 | 15. 000
                                          2.27
                                                 21.08
                                                          0.87
2.917
         0.88
                9.000
                         1. 97 | 15. 083
                                          2.15
                                                 21. 17
                                                          0.87
3.000
         0.88
                9.083
                         2. 14 | 15. 167
                                          2.15
                                                 21. 25
                                                          0.87
3.083
         0.90
                9.167
                         2. 14 | 15. 250
                                          2.15
                                                 21.33
                                                          0.87
3.167
         0.90
                9.250
                         2. 14 | 15. 333
                                          2.03
                                                 21.42
                                                          0.87
3.250
         0.90
                9.333
                         2. 23 | 15. 417
                                          2.03
                                                 21.50
                                                          0.87
3.333
         0.91
                9.417
                         2. 23 | 15. 500
                                          2.03
                                                 21.58
                                                          0.86
3.417
         0.91
                9.500
                         2. 23 | 15. 583
                                          1.91
                                                 21.67
                                                          0.86
3.500
         0.91
                9.583
                         2. 23 | 15. 667
                                          1.91
                                                 21.75
                                                          0.86
3.583
                         2. 23 | 15. 750
         0.93
                9.667
                                          1.91
                                                 21.83
                                                          0.85
                9.750
                         2. 23 | 15. 833
3.667
         0.93
                                                 21. 92
                                                          0.85
                                          1.78
3.750
         0.93
                9.833
                         2. 37 | 15. 917
                                          1.78
                                                 22.00
                                                          0.85
3.833
         0.95
                9.917
                         2. 37 | 16. 000
                                          1.78
                                                 22.08
                                                          0.84
         0.95 | 10.000
3.917
                         2. 37 | 16. 083
                                          1.66
                                                 22. 17
                                                          0.84
4.000
         0.95 | 10.083
                         2. 64 | 16. 167
                                          1.66
                                                 22. 25
                                                          0.84
         0.96 | 10.167
4.083
                         2. 64 | 16. 250
                                          1.66
                                                 22.33
                                                          0.83
         0.96 | 10.250
4.167
                         2.64 | 16.333
                                          1.58
                                                 22.42
                                                          0.83
4.250
         0.96 | 10.333
                         3.00 | 16.417
                                          1.58 l
                                                 22.50
                                                          0.83
4.333
         0.99 | 10.417
                         3.00 | 16.500
                                          1.58 İ
                                                 22.58
                                                          0.82
4.417
         0.99 | 10.500
                         3.00 | 16.583
                                          1.54
                                                 22.67
                                                          0.82
4.500
         0. 99 | 10. 583
                         3. 40 | 16. 667
                                          1.54
                                                 22.75
                                                          0.82
4.583
         1.03 | 10.667
                         3. 40 | 16. 750
                                          1.54
                                                 22.83
                                                          0.81
4.667
         1.03 | 10.750
                         3, 40 | 16, 833
                                          1.49
                                                 22.92
                                                          0.81
4.750
         1.03 | 10.833
                         3. 98 | 16. 917
                                          1.49
                                                 23.00
                                                          0.81
4.833
         1.06 10.917
                         3. 98 | 17. 000
                                          1.49
                                                 23.08
                                                          0.80
4.917
         1.06 | 11.000
                         3. 98 | 17. 083
                                                 23. 17
                                                          0.80
                                          1.45 I
         1.06 | 11.083
5.000
                         4.65 | 17.167
                                          1.45
                                                 23. 25
                                                          0.80
5.083
         1. 10 | 11. 167
                         4.65 17.250
                                          1.45
                                                 23.33
                                                          0.80
                         4. 65 | 17. 333
5.167
         1. 10 | 11. 250
                                          1.40
                                                23.42
                                                          0.80
         1. 10 | 11. 333
                         5. 88 | 17. 417
5.250
                                          1.40 | 23.50
                                                          0.80
5.333
         1.13 | 11.417
                         5.88 | 17.500
                                          1.40 | 23.58
                                                          0.79
5.417
        1.13 | 11.500
                         5. 88 | 17. 583
                                          1. 36 | 23. 67
                                                          0.79
```

```
5. 500 1. 13 | 11. 583 7. 48 | 17. 667
                                           1. 36 | 23. 75
                                                             0.79
5.583
       1.17 | 11.667
                          7. 48 | 17. 750
                                           1. 36 | 23. 83
                          7. 48 | 17. 833
5.667
         1.17 | 11.750
                                           1. 32 | 23. 92
                                                             0.78
        1. 17 | 11. 833
                         30. 50 | 17. 917
5.750
                                           1. 32 | 24. 00
                                                             0.78
        1. 20 | 11. 917
                         30. 51 | 18. 000
5.833
                                           1. 32 | 24. 08
                                                             0.77
        1. 20 | 12. 000
                        30. 51 | 18. 083
5. 917
                                           1. 28 | 24. 17
                                                             0.77
        1. 20 | 12. 083
                         75. 28 | 18. 167
6.000
                                           1. 28 | 24. 25
                                                            0.77
6.083
       1. 23 | 12. 167 | 75. 29 | 18. 250
                                           1. 28
```

Unit Hyd Qpeak (cms) = 0.167

PEAK FLOW (cms) = 0.051 (i) TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 24.565 TOTAL RAINFALL (mm) = 69.600 RUNOFF COEFFICIENT = 0.353

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME RAIN | TIME DAIN | TIME CALL

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1. 23	12. 250	75. 29	18. 33	1. 23
0.167	0.00	6.250	1. 23	12. 333	11. 93	18.42	1. 23
0.250	0.00	6.333	1. 27	12. 417	11. 93	18.50	1. 23
0.333	0.71	6.417	1. 27	12. 500	11. 93	18.58	1. 19
0.417	0.71	6.500	1. 27	12. 583	8. 12	18.67	1. 19
0.500	0.71	6.583	1.30	12. 667	8. 12	18.75	1. 19
0.583	0.72	6.667	1.30	12. 750	8. 12	18.83	1. 14
0.667	0.72	6.750	1.30	12. 833	5. 59	18. 92	1.14
0.750	0.72	6.833	1.34	12. 917	5.58	19.00	1.14
0.833	0.74	6.917	1.34	13. 000	5. 58	19.08	1.10
0. 917	0.74	7.000	1.34	13. 083	4.72	19. 17	1. 10
1.000	0.74	7.083	1.37	13. 167	4.72	19. 25	1. 10
1.083	0.76	7.167	1.37	13. 250	4.72	19. 33	1.06
1. 167	0.76	7.250	1.37	13. 333	3. 99	19.42	1.06
1.250	0.76	7.333	1.41	13. 417	3. 99	19.50	1.06
1.333	0.78	7.417	1.41	13. 500	3. 99	19.58	1.01
1. 417	0.78	7.500	1.41	13. 583	3.52	19. 67	1. 01
1.500	0.78	7.583	1.44	13.667	3.52	19. 75	1.01
1.583	0.79	7.667	1.44	13. 750	3.52	19.83	0. 97
1.667	0.79	7.750	1.44	13. 833	3.09	19. 92	0. 97

```
1.750 0.79 | 7.833 1.48 | 13.917
                                        3.09 | 20.00
                                                         0.97
1.833
       0.81 | 7.917
                        1. 48 | 14. 000
                                         3.09
                                                20.08
                                                          0.93
                         1. 48 | 14. 083
1.917
         0.81 | 8.000
                                         2.76
                                                20. 17
                                                          0.93
2.000
        0.81 | 8.083
                         1. 51 | 14. 167
                                         2. 76 | 20. 25
                                                          0.93
2.083
        0.83 | 8.167
                         1.51 | 14.250
                                         2. 76 | 20. 33
                                                          0.90
                8.250
                         1. 51 | 14. 333
2. 167
        0.83
                                         2.51
                                                 20.42
                                                          0.90
                8.333
                         1. 62 | 14. 417
2.250
        0.83
                                          2.51
                                                 20.50
                                                          0.90
2.333
        0.84
                8.417
                         1.62 | 14.500
                                         2.51
                                                 20.58
                                                          0.89
2.417
        0.84
                8.500
                         1. 62 | 14. 583
                                          2.40
                                                 20.67
                                                          0.89
                8.583
                         1. 79 | 14. 667
2.500
        0.84
                                          2.40
                                                 20.75
                                                          0.89
2.583
         0.86
                8.667
                         1. 79 | 14. 750
                                          2.40
                                                 20.83
                                                          0.88
2.667
         0.86
                8.750
                         1. 79 | 14. 833
                                          2. 27
                                                 20.92
                                                          0.88
2.750
        0.86
                8.833
                         1. 97 | 14. 917
                                          2. 27 İ
                                                21.00
                                                          0.88
2.833
                8.917
                         1. 97 | 15. 000
        0.88
                                          2. 27 İ
                                                 21.08
                                                          0.87
2.917
         0.88
                9.000
                         1. 97 | 15. 083
                                          2.15
                                                 21. 17
                                                          0.87
3.000
         0.88
                9.083
                         2. 14 | 15. 167
                                                 21. 25
                                          2.15
                                                          0.87
3.083
         0.90
                9.167
                         2. 14 | 15. 250
                                          2. 15 İ
                                                 21.33
                                                          0.87
3.167
                         2. 14 | 15. 333
         0.90
                9.250
                                          2.03
                                                21.42
                                                          0.87
3.250
                9.333
         0.90
                         2. 23 | 15. 417
                                          2.03
                                                21.50
                                                          0.87
3.333
         0.91
                9.417
                         2. 23 | 15. 500
                                          2.03
                                                 21.58
                                                          0.86
3.417
         0.91
                9.500
                         2. 23 | 15. 583
                                          1. 91
                                                 21.67
                                                          0.86
3.500
         0.91
                9.583
                         2. 23 | 15. 667
                                          1.91
                                                 21.75
                                                          0.86
3.583
         0.93
                9.667
                         2. 23 | 15. 750
                                          1.91
                                                 21.83
                                                          0.85
                         2. 23 | 15. 833
3.667
         0.93
                9.750
                                          1.78
                                                 21.92
                                                          0.85
3.750
         0.93
                9.833
                         2. 37 | 15. 917
                                          1.78
                                                22.00
                                                          0.85
3.833
         0.95
                9.917
                         2. 37 | 16. 000
                                          1.78
                                                 22.08
                                                          0.84
3.917
         0.95 | 10.000
                         2. 37 | 16. 083
                                          1.66
                                                 22.17
                                                          0.84
4.000
         0.95 | 10.083
                         2. 64 | 16. 167
                                          1.66
                                                 22. 25
                                                          0.84
4.083
         0.96 | 10.167
                         2.64 | 16.250
                                                 22.33
                                                          0.83
                                          1.66
         0.96 | 10.250
                         2.64 | 16.333
4.167
                                                 22.42
                                                          0.83
                                          1.58
4.250
         0.96 | 10.333
                         3.00 | 16.417
                                                 22.50
                                                          0.83
                                          1.58
4.333
         0. 99 | 10. 417
                         3.00 | 16.500
                                                 22.58
                                         1.58
                                                          0.82
4.417
         0.99 | 10.500
                         3.00 | 16.583
                                                 22.67
                                          1.54
                                                          0.82
         0. 99 | 10. 583
4.500
                         3. 40 | 16. 667
                                          1.54
                                                 22.75
                                                          0.82
4.583
         1.03 | 10.667
                         3.40 | 16.750
                                                 22.83
                                         1.54
                                                          0.81
         1.03 | 10.750
                         3. 40 | 16. 833
4.667
                                         1.49
                                                 22.92
                                                          0.81
4.750
         1.03 | 10.833
                         3. 98 | 16. 917
                                          1.49
                                                 23.00
                                                          0.81
4.833
         1.06 | 10.917
                         3. 98 | 17. 000
                                          1.49 İ
                                                 23.08
                                                          0.80
4.917
         1.06 | 11.000
                         3. 98 | 17. 083
                                          1. 45 İ
                                                 23. 17
                                                          0.80
5.000
        1.06 | 11.083
                         4.65 | 17.167
                                          1.45
                                                 23. 25
                                                          0.80
5.083
        1. 10 | 11. 167
                         4. 65 | 17. 250
                                          1.45
                                                 23.33
                                                          0.80
5.167
         1. 10 | 11. 250
                         4. 65 | 17. 333
                                          1.40
                                                 23.42
                                                          0.80
        1. 10 | 11. 333
5.250
                         5. 88 | 17. 417
                                          1.40 İ
                                                 23.50
                                                          0.80
        1. 13 | 11. 417
                         5. 88 | 17. 500
5.333
                                         1.40
                                                 23.58
                                                          0.79
5.417
        1. 13 | 11. 500
                         5. 88 | 17. 583
                                          1.36
                                                 23.67
                                                          0.79
        1. 13 | 11. 583
5.500
                         7. 48 | 17. 667
                                                23.75
                                                          0.79
                                         1.36
5.583
        1. 17 | 11. 667
                         7.48 | 17.750
                                         1.36
                                                23.83
                                                          0.78
5.667
        1. 17 | 11. 750
                         7. 48 | 17. 833
                                         1.32
                                                23.92
                                                          0.78
        1. 17 | 11. 833
                        30. 50 | 17. 917
5.750
                                         1.32
                                                24.00
                                                          0.78
                         30. 51 | 18. 000
5.833
        1.20 | 11.917
                                         1.32 | 24.08
                                                          0.77
                         30. 51 | 18. 083
5.917
        1. 20 | 12. 000
                                         1. 28 | 24. 17
                                                          0.77
        1. 20 | 12. 083
6.000
                        75. 28 | 18. 167
                                         1. 28 | 24. 25
                                                          0.77
```

Unit Hyd Qpeak (cms) = 0.078

PEAK FLOW (cms) = 0.025 (i) TIME TO PEAK (hrs) = 12.333 RUNOFF VOLUME (mm) = 24.574 TOTAL RAINFALL (mm) = 69.600 RUNOFF COEFFICIENT = 0.353

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	5. 32 50. 00	Dir. Conn. (%)=	35. 00
		IMPERVI	OUS	PERVIOUS (i)	
Surface Area	(ha)=	2. 6	6	2.66	
Dep. Storage	(mm) =	1.0	0	5.00	
Average Slope	(%)=	1.0	0	1.00	
Length	(m) =	188. 3	3	40.00	
Mannings n	=	0. 13	0	0. 250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1. 23	12. 250	75. 29	18. 33	1. 23
0. 167	0.00	6.250	1. 23	12. 333	11. 93	18.42	1. 23
0.250	0.00	6.333	1. 27	12. 417	11. 93	18.50	1. 23
0.333	0.71	6.417	1. 27	12. 500	11. 93	18.58	1. 19
0.417	0.71	6.500	1. 27	12. 583	8. 12	18. 67	1. 19
0.500	0.71	6.583	1.30	12. 667	8. 12	18.75	1. 19
0.583	0.72	6.667	1.30	12. 750	8. 12	18.83	1.14
0.667	0.72	6.750	1.30	12. 833	5. 59	18. 92	1.14
0.750	0.72	6.833	1.34	12. 917	5. 58	19.00	1.14
0.833	0.74	6. 917	1.34	13. 000	5. 58	19.08	1.10
0. 917	0.74	7.000	1.34	13. 083	4.72	19. 17	1. 10
1.000	0.74	7.083	1.37	13. 167	4.72	19. 25	1.10
1.083	0.76	7.167	1.37	13. 250	4.72	19.33	1.06
1. 167	0.76	7. 250	1.37	13. 333	3. 99	19.42	1.06
1. 250	0.76	7.333	1.41	13. 417	3. 99	19.50	1.06
1.333	0.78	7.417	1.41	13. 500	3. 99	19.58	1.01
1. 417	0.78	7.500	1.41	13. 583	3.52	19.67	1.01
1.500	0.78	7.583	1.44	13. 667	3. 52	19.75	1.01
1.583	0.79	7.667	1.44	13. 750	3.52	19.83	0.97
1.667	0.79	7.750	1.44	13. 833	3. 09	19. 92	0. 97
1.750	0.79	7.833	1.48	13. 917	3. 09	20.00	0. 97

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1.833
        0.81 | 7.917
                        1.48 | 14.000
                                          3.09 | 20.08
                                                           0.93
1.917
         0.81 | 8.000
                         1.48 | 14.083
                                          2.76
                                                  20.17
                                                           0.93
2.000
         0.81
                8.083
                         1.51 | 14.167
                                          2.76
                                                  20. 25
                                                           0.93
2.083
         0.83
                8.167
                         1.51 | 14.250
                                          2.76
                                                 20.33
                                                           0.90
2.167
         0.83
                8.250
                         1.51 | 14.333
                                          2.51
                                                 20.42
                                                           0.90
2.250
         0.83
                8.333
                         1.62 | 14.417
                                          2.51
                                                  20.50
                                                           0.90
                         1.62 14.500
2.333
         0.84
                8.417
                                          2.51
                                                  20.58
                                                           0.89
                                          2.40
2.417
         0.84
                8.500
                         1. 62 | 14. 583
                                                  20.67
                                                           0.89
2.500
         0.84
                8.583
                         1. 79 | 14. 667
                                          2.40
                                                  20.75
                                                           0.89
2.583
         0.86
                8.667
                         1. 79 | 14. 750
                                          2.40
                                                  20.83
                                                           0.88
2.667
         0.86
                8.750
                         1. 79 | 14. 833
                                          2.27
                                                  20.92
                                                           0.88
2.750
         0.86
                8.833
                         1. 97 | 14. 917
                                          2.27
                                                  21.00
                                                           0.88
2.833
         0.88
                8.917
                         1. 97 | 15. 000
                                          2.27
                                                 21.08
                                                           0.87
2.917
                9.000
                         1. 97 | 15. 083
         0.88
                                          2.15
                                                  21. 17
                                                           0.87
3.000
         0.88
                9.083
                         2. 14 | 15. 167
                                          2.15
                                                  21. 25
                                                           0.87
3.083
                9.167
                          2. 14 | 15. 250
         0.90
                                          2.15
                                                  21.33
                                                           0.87
3.167
         0.90
                9.250
                         2. 14 | 15. 333
                                          2.03
                                                  21.42
                                                           0.87
3.250
         0.90
                9.333
                         2. 23 | 15. 417
                                          2.03
                                                  21.50
                                                           0.87
3.333
         0.91
                9.417
                          2. 23 | 15. 500
                                          2.03
                                                  21.58
                                                           0.86
3.417
         0.91
                9.500
                          2.23
                               15.583
                                          1.91
                                                  21.67
                                                           0.86
3.500
         0.91
                9.583
                          2. 23
                               15.667
                                           1.91
                                                  21.75
                                                           0.86
3.583
         0.93
                9.667
                          2. 23
                               15.750
                                          1.91
                                                  21.83
                                                           0.85
3.667
         0.93
                9.750
                         2. 23
                               15.833
                                          1.78
                                                  21.92
                                                           0.85
3.750
         0.93
                9.833
                          2.37
                                15. 917
                                           1.78
                                                  22.00
                                                           0.85
3.833
         0.95
                9.917
                          2.37
                               16.000
                                                  22.08
                                          1.78
                                                           0.84
3.917
         0.95
               10.000
                         2.37
                               16.083
                                                  22.17
                                          1.66
                                                           0.84
4.000
         0.95 | 10.083
                         2.64
                               16. 167
                                          1.66
                                                  22. 25
                                                           0.84
4.083
         0.96 10.167
                          2.64
                               16. 250
                                                  22.33
                                                           0.83
                                          1.66
4.167
         0.96 | 10.250
                         2.64
                               16. 333
                                                  22.42
                                                           0.83
                                          1.58
4.250
         0.96 | 10.333
                          3.00 | 16.417
                                                  22.50
                                                           0.83
                                          1.58
         0.99 | 10.417
4.333
                          3.00 | 16.500
                                                  22.58
                                                           0.82
                                          1.58
4.417
         0.99 | 10.500
                         3.00 | 16.583
                                          1.54
                                                  22.67
                                                           0.82
         0.99 | 10.583
4.500
                          3.40 | 16.667
                                          1.54
                                                  22.75
                                                           0.82
4.583
         1.03 | 10.667
                          3.40 | 16.750
                                          1.54
                                                  22.83
                                                           0.81
4.667
         1.03 | 10.750
                          3.40 | 16.833
                                          1.49
                                                  22.92
                                                           0.81
4.750
         1.03 | 10.833
                         3. 98 | 16. 917
                                          1.49
                                                  23.00
                                                           0.81
                          3. 98 | 17. 000
4.833
         1.06 | 10.917
                                          1.49
                                                  23.08
                                                           0.80
4.917
         1.06 | 11.000
                          3. 98 | 17. 083
                                          1.45
                                                  23. 17
                                                           0.80
5.000
         1.06 | 11.083
                         4.65 | 17.167
                                          1.45
                                                  23. 25
                                                           0.80
5.083
         1. 10 | 11. 167
                          4.65 17.250
                                          1.45
                                                  23.33
                                                           0.80
5.167
         1. 10 | 11. 250
                         4. 65 | 17. 333
                                          1.40
                                                  23.42
                                                           0.80
5.250
         1. 10 | 11. 333
                          5. 88 | 17. 417
                                          1.40
                                                  23.50
                                                           0.80
5.333
         1. 13 | 11. 417
                          5. 88 | 17. 500
                                          1.40
                                                  23.58
                                                           0.79
         1.13 | 11.500
                          5. 88 | 17. 583
5.417
                                           1.36
                                                  23.67
                                                           0.79
        1.13 | 11.583
5.500
                          7.48 | 17.667
                                          1.36
                                                  23.75
                                                           0.79
5.583
        1. 17 | 11. 667
                          7.48 | 17.750
                                          1.36
                                                 23.83
                                                           0.78
5.667
         1.17 | 11.750
                         7. 48 | 17. 833
                                          1.32
                                                 23. 92
                                                           0.78
5.750
         1. 17 | 11. 833
                         30.50 | 17.917
                                          1.32
                                                  24.00
                                                           0.78
         1. 20 | 11. 917
                         30. 51 | 18. 000
                                          1.32
5.833
                                                 24. 08
                                                           0.77
                         30. 51 | 18. 083
5.917
         1.20 | 12.000
                                          1.28
                                                 24. 17
                                                           0.77
         1. 20 | 12. 083
                         75. 28 | 18. 167
                                          1. 28 | 24. 25
                                                           0.77
6.000
                         75. 29 | 18. 250
6.083
         1. 23 | 12. 167
                                          1. 28
```

```
Max. Eff. Inten. (mm/hr)=
                           64.09
                                        34.25
          over (min)
                           20.00
                                         35.00
                           17.77 (ii)
                                        31.10 (ii)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
                           20.00
                                        35.00
Unit Hyd. peak (cms)=
                            0.06
                                         0.03
                                                      *TOTALS*
PEAK FLOW
                (cms) =
                            0.23
                                         0.10
                                                       0.296 (iii)
TIME TO PEAK
               (hrs)=
                           12.42
                                        12.67
                                                       12.42
RUNOFF VOLUME
                (mm) =
                           68.60
                                        21.45
                                                       37.95
TOTAL RAINFALL
               (mm) =
                           69.60
                                        69.60
                                                       69.60
RUNOFF COEFFICIENT =
                            0.99
                                         0.31
                                                        0.55
```

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 59.0$ I a = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

		I MPERVI OUS	PERVIOUS (i)
Surface Area	(ha)=	1. 71	1. 71
Dep. Storage	(mm) =	1.00	5.00
Average SI ope	(%)=	1.00	2.00
Length	(m) =	151. 22	40.00
Mannings n	=	0. 013	0. 250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ----

TIME	RAI N	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6. 167	1. 23	12. 250	75. 29	18. 33	1. 23
0. 167	0.00	6.250	1. 23	12. 333	11. 93	18.42	1. 23
0.250	0.00	6.333	1. 27	12. 417	11. 93	18.50	1. 23
0.333	0.71	6.417	1. 27	12. 500	11. 93	18.58	1. 19
0.417	0.71	6.500	1. 27	12. 583	8. 12	18. 67	1. 19
0.500	0.71	6.583	1.30	12. 667	8. 12	18.75	1. 19
0.583	0.72	6.667	1.30	12. 750	8. 12	18.83	1.14
0.667	0.72	6.750	1.30	12. 833	5. 59	18. 92	1.14
0.750	0.72	6.833	1.34	12. 917	5. 58	19.00	1.14
0.833	0.74	6.917	1.34	13.000	5. 58	19.08	1.10
0.917	0.74	7.000	1.34	13. 083	4.72	19. 17	1.10
1.000	0.74	7.083	1.37	13. 167	4.72	19. 25	1.10
1.083	0.76	7.167	1.37	13. 250	4.72	19.33	1.06

```
1. 167
         0.76 | 7.250
                         1. 37 | 13. 333
                                          3.99
                                                 19. 42
                                                           1.06
                7.333
                          1.41 | 13.417
                                          3.99
1.250
         0.76
                                                  19.50
                                                           1.06
1.333
         0.78
                7.417
                          1.41 | 13.500
                                          3.99
                                                  19.58
                                                           1.01
                7.500
                          1.41 | 13.583
1.417
         0.78
                                          3.52
                                                  19.67
                                                           1.01
                7.583
                                                  19.75
1.500
         0.78
                          1.44 | 13.667
                                          3.52
                                                           1.01
1.583
         0.79
                7.667
                          1.44 | 13.750
                                          3.52
                                                  19.83
                                                           0.97
1.667
         0.79
                7.750
                          1.44 | 13.833
                                          3.09
                                                  19.92
                                                           0.97
1.750
         0.79
                7.833
                          1. 48 | 13. 917
                                          3.09
                                                  20.00
                                                           0.97
1.833
         0.81
                7.917
                          1.48 | 14.000
                                          3.09
                                                  20.08
                                                           0.93
1.917
         0.81
                8.000
                          1.48 | 14.083
                                          2.76
                                                  20.17
                                                           0.93
2.000
         0.81
                8.083
                          1.51 | 14.167
                                                  20.25
                                          2.76
                                                           0.93
2.083
         0.83
                8.167
                          1.51 | 14.250
                                          2.76
                                                  20.33
                                                           0.90
2.167
         0.83
                8.250
                         1.51 114.333
                                          2.51
                                                  20.42
                                                           0.90
2.250
         0.83
                8.333
                         1, 62 | 14, 417
                                          2.51
                                                  20.50
                                                           0.90
2.333
         0.84
                8.417
                          1.62 14.500
                                          2.51
                                                  20.58
                                                           0.89
                                          2.40
2.417
         0.84
                8.500
                          1.62 | 14.583
                                                  20.67
                                                            0.89
2.500
                 8.583
                          1. 79
                               114.667
         0.84
                                           2.40
                                                  20.75
                                                           0.89
2.583
                 8.667
                          1.79
                               14.750
                                          2.40
                                                  20.83
                                                           0.88
         0.86
2.667
         0.86
                8.750
                          1.79
                               14.833
                                           2.27
                                                  20.92
                                                           0.88
2.750
         0.86
                8.833
                          1.97
                               14.917
                                           2.27
                                                  21.00
                                                            0.88
2.833
         0.88
                 8.917
                          1. 97
                               |15.000
                                           2.27
                                                  21.08
                                                            0.87
2.917
         0.88
                 9.000
                          1.97
                               15.083
                                          2.15
                                                  21.17
                                                            0.87
3.000
         0.88
                 9.083
                          2.14
                               15. 167
                                           2.15
                                                  21.25
                                                            0.87
3.083
         0.90
                 9.167
                          2.14
                               15. 250
                                           2.15
                                                  21.33
                                                            0.87
3.167
                               15. 333
         0.90
                 9.250
                          2.14
                                           2.03
                                                  21.42
                                                            0.87
3.250
         0.90
                 9.333
                          2. 23
                               115, 417
                                          2.03
                                                  21.50
                                                            0.87
3.333
         0.91
                9.417
                          2. 23
                               15.500
                                          2.03
                                                  21.58
                                                            0.86
3.417
         0.91
                9.500
                               15.583
                                                  21.67
                          2. 23
                                           1. 91
                                                            0.86
3.500
         0.91
                          2. 23
                               15. 667
                9.583
                                          1. 91
                                                  21.75
                                                            0.86
3.583
                               15.750
         0.93
                9.667
                          2. 23
                                          1. 91
                                                  21.83
                                                            0.85
3.667
                9.750
                               15.833
         0.93
                         2. 23
                                          1.78
                                                  21.92
                                                            0.85
                               15. 917
3.750
         0.93
                9.833
                          2.37
                                                  22.00
                                          1. 78
                                                           0.85
3.833
         0.95
                9.917
                          2.37
                               16.000
                                          1.78
                                                  22.08
                                                            0.84
3.917
         0.95
               10.000
                          2.37
                               |16.083
                                          1.66
                                                  22.17
                                                            0.84
4.000
         0.95
              10.083
                          2.64
                               |16. 167
                                          1.66
                                                  22. 25
                                                            0.84
4.083
         0.96
               10.167
                          2.64
                               16. 250
                                          1.66
                                                  22.33
                                                            0.83
4.167
         0.96 | 10.250
                          2.64
                               |16.333
                                          1.58
                                                  22.42
                                                            0.83
4.250
         0.96 | 10.333
                          3.00 | 16.417
                                          1.58
                                                  22.50
                                                            0.83
4.333
         0.99 | 10.417
                          3.00 | 16.500
                                          1.58
                                                  22.58
                                                            0.82
4.417
         0.99 | 10.500
                          3.00 | 16.583
                                           1.54
                                                  22.67
                                                            0.82
4.500
         0.99 | 10.583
                          3.40 | 16.667
                                           1.54
                                                  22.75
                                                            0.82
                          3.40 | 16.750
4.583
         1.03 | 10.667
                                          1.54
                                                  22.83
                                                            0.81
4.667
         1.03 | 10.750
                          3.40 | 16.833
                                          1.49
                                                  22.92
                                                            0.81
4.750
         1.03 | 10.833
                          3. 98 | 16. 917
                                           1.49
                                                  23.00
                                                            0.81
                                           1.49
4.833
         1.06 | 10.917
                          3.98 | 17.000
                                                  23.08
                                                            0.80
         1.06 | 11.000
4.917
                          3. 98 | 17. 083
                                           1.45
                                                  23.17
                                                            0.80
5.000
         1.06 | 11.083
                          4.65 | 17.167
                                           1.45
                                                  23. 25
                                                            0.80
5.083
         1.10 | 11.167
                          4.65 | 17.250
                                           1.45
                                                  23.33
                                                            0.80
5. 167
         1.10 | 11.250
                          4.65 | 17.333
                                          1.40
                                                  23.42
                                                            0.80
5.250
         1.10 | 11.333
                          5.88 | 17.417
                                          1.40
                                                 23.50
                                                            0.80
5.333
         1.13 | 11.417
                          5.88 | 17.500
                                          1.40
                                                 23.58
                                                           0.79
5.417
         1.13 | 11.500
                          5.88 | 17.583
                                          1.36 | 23.67
                                                           0.79
```

```
5.500
                        1.13 | 11.583
                                         7. 48 | 17. 667
                                                          1. 36 | 23. 75
                                                                          0.79
                         1.17 | 11.667
                                         7.48 | 17.750
                5. 583
                                                          1. 36 | 23. 83
                                                                           0.78
                5.667
                         1.17 | 11.750
                                         7.48 | 17.833
                                                          1.32
                                                                23.92
                                                                           0.78
                         1. 17 | 11. 833
                                        30.50 | 17.917
                5.750
                                                          1. 32 | 24. 00
                                                                          0.78
                         1. 20 | 11. 917
                                        30. 51 | 18. 000
                5.833
                                                          1. 32 | 24. 08
                                                                          0.77
                5.917
                         1.20 | 12.000
                                        30. 51 | 18. 083
                                                          1. 28 | 24. 17
                                                                          0.77
                6.000
                         1. 20 | 12. 083
                                        75. 28 | 18. 167
                                                          1. 28
                                                                24. 25
                                                                          0.77
                6.083
                         1. 23 | 12. 167
                                        75. 29 | 18. 250
                                                          1. 28
     Max. Eff. Inten. (mm/hr)=
                                 75. 29
                                               34.25
                over (min)
                                  5.00
                                               15.00
     Storage Coeff. (min)=
                                  3.67 (ii)
                                              14.50 (ii)
     Unit Hyd. Tpeak (min)=
                                  5.00
                                               15.00
     Unit Hyd. peak (cms)=
                                  0.25
                                               0.08
                                                             *TOTALS*
                     (cms)=
     PEAK FLOW
                                  0.25
                                               0.10
                                                              0.336 (iii)
     TIME TO PEAK
                                 12.25
                                                              12.25
                     (hrs)=
                                               12.33
     RUNOFF VOLUME
                                 68.60
                                               21.45
                                                              37.95
                      (mm) =
     TOTAL RAINFALL
                      (mm) =
                                                              69.60
                                 69.60
                                               69.60
     RUNOFF COEFFICIENT =
                                  0.99
                                               0.31
                                                               0.55
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN^* = 59.0 Ia = Dep. Storage (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
 RESERVOIR (0029)
                         OVERFLOW IS OFF
 IN= 2---> OUT= 1
DT= 5.0 min
                         OUTFLOW
                                     STORAGE
                                                  OUTFLOW
                                                             STORAGE
                                     (ha.m.)
-----
                          (cms)
                                                   (cms)
                                                             (ha.m.)
                          0.0000
                                     0.0000
                                                   0.2200
                                                               0.1300
                          0.1100
                                     0.0700
                                                   0.0000
                                                               0.0000
```

AREA **QPEAK TPEAK** R. V. (ha) (cms) (hrs) (mm) INFLOW: ID= 2 (0028) 3.430 0.336 12. 25 37.95 OUTFLOW: ID= 1 (0029) 3.430 0.076 12.75 37.91

 PEAK
 FLOW
 REDUCTION
 [Qout/Qin] (%) =
 22.68

 TIME
 SHIFT
 OF
 PEAK
 FLOW
 (min) =
 30.00

 MAXIMUM
 STORAGE
 USED
 (ha.m.) =
 0.0486

----- U. H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

		TR	ANSFORME	D HYETOGR	APH		
TIME	RAI N	TIME	RAIN	' TIME		TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	6.167	1. 23	12. 250	75. 29	18. 33	1. 23
0. 167	0.00	6.250	1. 23	12. 333	11. 93	18. 42	1. 23
0. 250	0.00	6.333	1. 27	12. 417	11. 93	18.50	1. 23
0.333	0.71	6.417	1. 27	12.500	11. 93	18. 58	1. 19
0. 417	0.71	6.500	1. 27	12. 583	8. 12	18. 67	1. 19
0. 500 0. 583	0. 71 0. 72	6.583 6.667	1. 30 1. 30	12. 667 12. 750	8. 12 8. 12	18. 75 18. 83	1. 19 1. 14
0. 563	0.72	6.750	1. 30	12. 730	5. 59	18. 92	1. 14
0.750	0.72	6.833	1. 34	12. 917	5. 58	19. 00	1. 14
0.833	0.74	6.917	1. 34	13. 000	5. 58	19. 08	1. 10
0. 917	0.74	7.000	1.34	13. 083	4.72	19. 17	1. 10
1.000	0.74	7.083	1.37	13. 167	4.72	19. 25	1.10
1.083	0.76	7.167	1. 37	13. 250	4.72	19. 33	1.06
1. 167	0.76	7.250	1. 37	13. 333	3. 99	19.42	1.06
1. 250	0.76	7.333	1. 41	13. 417	3. 99	19. 50	1.06
1. 333	0.78	7.417	1.41	13. 500	3. 99	19. 58	1.01
1. 417	0.78	7.500	1. 41 1. 44	13. 583	3. 52 3. 52	19. 67	1. 01
1. 500 1. 583	0. 78 0. 79	7.583 7.667	1. 44	13. 667 13. 750	3.52	19. 75 19. 83	1. 01 0. 97
1. 667	0.79	7.007 7.750	1. 44	13. 730	3. 09	19. 92	0. 97
1. 750	0.79	7. 833	1. 48	13. 033	3.09	20. 00	0. 97
1. 833	0.81	7.917	1. 48	14. 000	3.09	20. 08	0. 93
1. 917	0.81	8.000	1. 48	14. 083	2. 76	20. 17	0. 93
2.000	0.81	8.083	1.51	14. 167	2.76	20. 25	0. 93
2.083	0.83	8.167	1.51	14. 250	2.76	20.33	0. 90
2. 167	0.83	8.250	1. 51	14. 333	2. 51	20.42	0. 90
2. 250	0.83	8.333	1. 62	14. 417	2. 51	20.50	0. 90
2. 333	0.84	8.417	1. 62	14. 500	2.51	20. 58	0.89
2. 417	0.84	8.500	1.62	14. 583	2.40	20. 67	0.89
2. 500 2. 583	0. 84 0. 86	8.583 8.667	1. 79 1. 79	14. 667 14. 750	2. 40 2. 40	20. 75 20. 83	0. 89 0. 88
2. 565	0.86	8.750	1. 79	14. 730	2.40	20. 63	0. 88
2. 750	0.86	8.833	1. 77	14. 033	2. 27	21. 00	0.88
2.833	0.88	8.917	1. 97	15.000	2. 27	21. 08	0.87
2. 917	0.88	9.000	1. 97	15. 083	2. 15	21. 17	0.87
3.000	0.88	9.083	2.14	15. 167	2. 15	21. 25	0.87
3.083	0.90	9.167	2.14	15. 250	2. 15	21.33	0.87
3. 167	0.90	9.250	2.14	15. 333	2.03	21.42	0.87
3. 250	0. 90	9.333	2. 23	15. 417	2.03	21.50	0. 87
3. 333	0. 91	9.417	2. 23	15. 500	2.03	21. 58	0.86
3. 417	0.91	9.500	2. 23	15. 583	1. 91	21. 67	0.86
3.500	0. 91	9.583	2. 23	15. 667	1. 91	21. 75	0.86
3.583	0. 93 0. 93	9.667 9.750	2. 23 2. 23	15. 750 15. 833	1. 91 1. 78	21. 83 21. 92	0. 85 0. 85
3.667	0.93	9.750	2. 23	10. 833	1.78	21.92	U. 83

```
3.750 0.93 | 9.833 2.37 | 15.917
                                         1.78 | 22.00
                                                            0.85
3.833
        0. 95 | 9. 917
                          2. 37 | 16. 000
                                          1.78 | 22.08
                                                            0.84
         0.95 | 10.000
                          2. 37 | 16. 083
3.917
                                           1.66 | 22.17
                                                            0.84
         0. 95 | 10. 083
4.000
                          2. 64 | 16. 167
                                           1.66 | 22.25
                                                            0.84
         0.96 | 10.167
                          2. 64 | 16. 250
4.083
                                           1.66 | 22.33
                                                            0.83
         0.96 | 10.250
                          2. 64 | 16. 333
4. 167
                                           1.58 | 22.42
                                                            0.83
         0. 96 | 10. 333
                          3. 00 | 16. 417
4.250
                                           1.58
                                                  22.50
                                                            0.83
         0. 99 | 10. 417
4.333
                          3.00 | 16.500
                                           1.58 | 22.58
                                                            0.82
4.417
         0.99 | 10.500
                          3.00 | 16.583
                                           1.54
                                                  22.67
                                                            0.82
         0. 99 | 10. 583
                          3. 40 | 16. 667
4.500
                                           1.54
                                                  22.75
                                                            0.82
4.583
         1.03 | 10.667
                          3. 40 | 16. 750
                                           1. 54 İ
                                                  22.83
                                                            0.81
4.667
         1.03 | 10.750
                          3. 40 | 16. 833
                                           1.49
                                                  22.92
                                                            0.81
                                           1. 49 İ
4.750
        1.03 | 10.833
                          3. 98 | 16. 917
                                                  23.00
                                                            0.81
4.833
        1.06 | 10.917
                          3. 98 | 17. 000
                                           1. 49 l
                                                  23.08
                                                            0.80
4.917
         1.06 | 11.000
                          3. 98 | 17. 083
                                           1. 45 İ
                                                  23.17
                                                            0.80
5.000
        1.06 | 11.083
                          4. 65 | 17. 167
                                           1.45
                                                  23. 25
                                                            0.80
5.083
         1. 10 | 11. 167
                          4.65 | 17.250
                                           1.45
                                                  23.33
                                                            0.80
5. 167
         1. 10 | 11. 250
                          4.65 | 17.333
                                           1.40
                                                  23.42
                                                            0.80
5.250
        1.10 | 11.333
                          5. 88 | 17. 417
                                           1.40
                                                  23.50
                                                            0.80
         1. 13 | 11. 417
5.333
                          5.88 | 17.500
                                           1.40
                                                  23.58
                                                            0.79
5.417
         1.13 | 11.500
                          5. 88 | 17. 583
                                           1.36
                                                  23.67
                                                            0.79
5.500
         1.13 | 11.583
                          7. 48 | 17. 667
                                           1.36
                                                  23.75
                                                            0.79
5.583
         1.17 | 11.667
                          7. 48 | 17. 750
                                           1.36
                                                  23.83
                                                            0.78
                          7. 48 | 17. 833
5.667
         1. 17 | 11. 750
                                           1.32
                                                  23.92
                                                            0.78
         1. 17 | 11. 833
                         30. 50 | 17. 917
5.750
                                           1. 32 | 24. 00
                                                            0.78
5.833
         1. 20 | 11. 917
                         30.51 | 18.000
                                           1. 32 | 24. 08
                                                            0.77
5.917
         1. 20 | 12. 000
                         30. 51 | 18. 083
                                           1. 28 | 24. 17
                                                            0.77
6.000
        1. 20 | 12. 083
                         75. 28 | 18. 167
                                           1. 28 | 24. 25
                                                           0.77
6.083
        1. 23 | 12. 167
                         75. 29 | 18. 250
                                           1.28
```

Unit Hyd Opeak (cms) = 0.356

PEAK FLOW (cms)= 0.109 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 23.104
TOTAL RAINFALL (mm)= 69.600
RUNOFF COEFFICIENT = 0.332

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| ADD HYD ( 0007)|
1 + 2 = 3
                       AREA
                             QPEAK
                                     TPEAK
                                             R. V.
                       (ha)
                             (cms)
                                     (hrs)
                                             (mm)
     ID1= 1 ( 0023):
                       0.41
                           0.025
                                    12.33
                                           24.57
   + ID2= 2 ( 0029):
                       3.43
                           0.076
                                    12.75
                                          37.91
     _____
     ID = 3 (0007):
                       3.84 0.093
                                    12.42
                                          36.48
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0007) | AREA QPEAK TPEAK R.V. | (ha) (cms) (hrs) (mm) | ID1= 3 (0007): 3.84 0.093 12.42 36.48 | + ID2= 2 (0042): 2.05 0.109 12.33 23.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ID = 1 (0007): 5.89 0.200 12.33 31.83

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008)	OVERFLOW	IS OFF		
IN= 2> OUT= 1				
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0. 3390	0. 1535
	0.0410	0. 0120	0. 3840	0. 1758
	0.0580	0. 0253	0.5390	0. 1989
	0. 0710	0. 0399	0.6480	0. 2228
	0. 0830	0. 0559	0.7320	0. 2476
	0. 0920	0. 0732	0.8050	0. 2733
	0. 1010	0. 0918	0.8710	0. 2998
	0. 2130	0. 1116	0. 9320	0. 3263
	0. 2860	0. 1321	0. 9880	0. 3528
	AR	EA QPEAK	TPEAK	R. V.
	(h	a) (cms)	(hrs)	(mm)
INFLOW: ID= 2 (0	0007) 11.	210 0.49	91 12. 42	34.73
OUTFLOW: ID= 1 (C	0008) 11.	210 0. 19	99 13. 25	34. 73

PEAK FLOW REDUCTION [Qout/Qin] (%) = 40.60
TIME SHIFT OF PEAK FLOW (min) = 50.00
MAXIMUM STORAGE USED (ha.m.) = 0.1093

ADD HYD (0016)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0022):	0.83	0.051	12. 33	24.56
+ ID2= 2 (0008):	11. 21	0. 199	13. 25	34.73
==============				
ID = 3 (0016):	12.04	0. 207	13. 17	34.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

APPENDIX G WATER BALANCE

McINTOSH PERRY

CCO-13-9668-01 - PERTHMORE SUBDIVISION - Water Balance Information - Monthly Review

The site exhibits five primary types of pervious land use / soil combinations:

	V	alues from Tho	rnthwaite-M	lather Table 10	Table 10 Values Applied to Site Conditions			
		Available	Root Zone	Applicable Soil Moisture	Available Average	Soil Moisture Retention	Values to	
Pre-development / Post-development	Soil Type	Water (mm)	(m)	Rentention Table	Soil Depth (m)	Table Given Soil Depth (mm)	use (mm)	
Pasture overtopping sandy soils (class B soils)	Sandy Loam	150	1	150	0.6	90	100	
Pasture overtopping sandy soils (class C soils)	Silty/Clay Loam	250	1	250	0.6	150	150	
Forest overtopping sandy soils (class B soils)	Sandy Loam	150	2	300	0.6	180	200	
Forest overtopping sandy soils (class C soils)	Silty/Clay Loam	250	1.6	400	0.6	240	250	

Summary of data below:

Soil Moisture Storage	Surplus
75	398
100	391
125	387
150	384
200	380
250	377
350	373
400	371

Soil Moisture Storage Data

							75	mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	$\Delta P = P$ -			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		217	0	0	0	0	11	0	11	228
February	-8.1	0	0	54	54		271	0	0	0	0	5	0	5	276
March	-2.3	0	0	64	64		336	0	0	0	0	2	0	2	338
April	6.3	1.4	32	75	43		75	0	32	0	43	22	26	48	166
May	13.3	4.4	79	80	2		75	0	79	0	2	12	117	129	206
June	18.5	7.2	112	93	-19	-19	57	-18	111	1	0	6	59	65	122
July	21	8.8	133	92	-41	-60	33	-24	116	17	0	3	29	32	65
August	19.8	8.0	114	86	-29	-88	22	-11	97	18	0	2	15	17	39
September	15	5.3	73	90	17		39	17	73	0	0	1	7	8	47
October	8	2.0	34	86	52		75	36	34	0	17	9	4	13	105
November	1.5	0.2	5	82	77		75	0	5	0	77	43	2	45	197
December	-6.2	0	0	76	76		151	0	0	0	0	22	1	23	174
		37.4	580	944				0	545	35	138	138	260	398	

Monthly T and P from Environment Canada

Table 25 - 75mm soil moisture retention in Thornthwaite [1957]

Heat Index (I) 37.4 a: 1.06

							100)mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	$\Delta P = P$ -			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		241	0	0	0	0	11	0	11	252
February	-8.1	0	0	54	54		296	0	0	0	0	5	0	5	301
March	-2.3	0	0	64	64		360	0	0	0	0	2	0	2	362
April	6.3	1.4	32	75	43		100	0	32	0	43	22	26	48	191
May	13.3	4.4	79	80	2		100	0	79	0	2	12	117	129	231
June	18.5	7.2	112	93	-19	-19	82	-18	111	1	0	6	59	65	147
July	21	8.8	133	92	-41	-60	54	-28	120	13	0	3	29	32	86
August	19.8	8.0	114	86	-29	-88	40	-14	100	15	0	2	15	17	57
September	15	5.3	73	90	17		57	17	73	0	0	1	7	8	65
October	8	2.0	34	86	52		100	43	34	0	10	5	4	9	119
November	1.5	0.2	5	82	77		100	0	5	0	77	41	2	43	220
December	-6.2	0	0	76	76		176	0	0	0	0	21	1	22	198
		37.4	580	944				0	552	28	131	131	260	391	

Monthly T and P from Environment Canada Heat Index (I) Table 26 - 100mm soil moisture retention in Thornthwaite [1957]

a: 37.4

							125	mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	$\Delta P = P$ -			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		267	0	0	0	0	10	0	10	277
February	-8.1	0	0	54	54		321	0	0	0	0	5	0	5	326
March	-2.3	0	0	64	64		386	0	0	0	0	2	0	2	388
April	6.3	1.4	32	75	43		125	0	32	0	43	23	26	49	217
May	13.3	4.4	79	80	2		125	0	79	0	2	12	117	129	256
June	18.5	7.2	112	93	-19	-19	106	-19	112	0	0	6	59	65	171
July	21	8.8	133	92	-41	-60	76	-30	122	11	0	3	29	32	108
August	19.8	8.0	114	86	-29	-88	61	-15	101	14	0	2	15	17	78
September	15	5.3	73	90	17		78	17	73	0	0	1	7	8	86
October	8	2.0	34	86	52		125	47	34	0	6	3	4	7	138
November	1.5	0.2	5	82	77		125	0	5	0	77	40	2	42	244
December	-6.2	0	0	76	76		201	0	0	0	0	20	1	21	222
		37.4	580	944				0	556	24	127	127	260	387	

Monthly T from Environment Canada Heat Index (I) 37.4 Table 27 - 100mm soil moisture retention in Thornthwaite [1957]

a: 1.06

							150)mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	$\Delta P = P$ -			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		292	0	0	0	0	10	0	10	302
February	-8.1	0	0	54	54		346	0	0	0	0	5	0	5	351
March	-2.3	0	0	64	64		411	0	0	0	0	2	0	2	413
April	6.3	1.4	32	75	43		150	0	32	0	43	23	26	49	242
May	13.3	4.4	79	80	2		150	0	79	0	2	12	117	129	281
June	18.5	7.2	112	93	-19	-19	132	-18	111	1	0	6	59	65	197
July	21	8.8	133	92	-41	-60	100	-32	124	9	0	3	29	32	132
August	19.8	8.0	114	86	-29	-88	83	-17	103	12	0	2	15	17	100
September	15	5.3	73	90	17		100	17	73	0	0	1	7	8	108
October	8	2.0	34	86	52		150	50	34	0	3	2	4	6	159
November	1.5	0.2	5	82	77		150	0	5	0	77	39	2	41	268
December	-6.2	0	0	76	76		226	0	0	0	0	19	1	20	246
		37.4	580	944				0	559	21	124	124	260	384	

Monthly T from Environment Canada

Table 28 - 150mm soil moisture retention in Thornthwaite [1957]

Heat Index (I) 37.4 a: 1.06

							200)mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	$\Delta P = P$ -			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		341	0	0	0	0	10	0	10	351
February	-8.1	0	0	54	54		396	0	0	0	0	5	0	5	401
March	-2.3	0	0	64	64		460	0	0	0	0	2	0	2	462
April	6.3	1.4	32	75	43		200	0	32	0	43	22	26	48	291
May	13.3	4.4	79	80	2		200	0	79	0	2	12	117	129	331
June	18.5	7.2	112	93	-19	-19	182	-18	111	1	0	6	59	65	247
July	21	8.8	133	92	-41	-60	148	-34	126	7	0	3	29	32	180
August	19.8	8.0	114	86	-29	-88	128	-20	106	9	0	2	15	17	145
September	15	5.3	73	90	17		145	17	73	0	0	1	7	8	153
October	8	2.0	34	86	52		198	52	34	0	0	0	4	4	202
November	1.5	0.2	5	82	77		200	2	5	0	75	38	2	40	315
December	-6.2	0	0	76	76		276	0	0	0	0	19	1	20	296
		37.4	580	944				0	564	16	120	120	260	380	

Monthly T from Environment Canada Heat Index (I) 37.4 Table 29 - 200mm soil moisture retention in Thornthwaite [1957]

Heat Index (I) 37.4 a: 1.06

							250)mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	$\Delta P = P$ -			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		392	0	0	0	0	9	0	9	401
February	-8.1	0	0	54	54		446	0	0	0	0	5	0	5	451
March	-2.3	0	0	64	64		511	0	0	0	0	2	0	2	513
April	6.3	1.4	32	75	43		250	0	32	0	43	23	26	49	342
May	13.3	4.4	79	80	2		250	0	79	0	2	12	117	129	381
June	18.5	7.2	112	93	-19	-19	231	-19	112	0	0	6	59	65	296
July	21	8.8	133	92	-41	-60	196	-35	127	6	0	3	29	32	228
August	19.8	8.0	114	86	-29	-88	175	-21	107	8	0	2	15	17	192
September	15	5.3	73	90	17		192	17	73	0	0	1	7	8	200
October	8	2.0	34	86	52		245	52	34	0	0	0	4	4	249
November	1.5	0.2	5	82	77		250	5	5	0	72	36	2	38	360
December	-6.2	0	0	76	76		326	0	0	0	0	18	1	19	345
		37.4	580	944				0	567	13	117	117	260	377	

Monthly T from Environment Canada

37.4

Table 30 - 250mm soil moisture retention in Thornthwaite [1957]

Heat Index (I) 1.06

							350)mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	$\Delta P = P$ -			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		492	0	0	0	0	9	0	9	501
February	-8.1	0	0	54	54		546	0	0	0	0	4	0	4	550
March	-2.3	0	0	64	64		611	0	0	0	0	2	0	2	613
April	6.3	1.4	32	75	43		350	0	32	0	43	23	26	49	442
May	13.3	4.4	79	80	2		350	0	79	0	2	12	117	129	481
June	18.5	7.2	112	93	-19	-19	331	-19	112	0	0	6	59	65	396
July	21	8.8	133	92	-41	-60	294	-37	129	4	0	3	29	32	326
August	19.8	8.0	114	86	-29	-88	271	-23	109	6	0	2	15	17	288
September	15	5.3	73	90	17		288	17	73	0	0	1	7	8	296
October	8	2.0	34	86	52		341	52	34	0	0	0	4	4	345
November	1.5	0.2	5	82	77		350	9	5	0	68	34	2	36	454
December	-6.2	0	0	76	76		426	0	0	0	0	17	1	18	444
		37.4	580	944				0	571	9	113	113	260	373	

Monthly T from Environment Canada Heat Index (I)

37.4

1.06 a:

Table 32 - 350mm soil moisture retention in Thornthwaite [1957]

							400	mm							
								ΔS = Soil			Soil	Water			Total
		Heat		P = Total	$\Delta P = P$ -			Moisture		Soil Moisture	Moisture	Runoff	Snow Melt		Moisture
Month	Temperature	Index	PET	Precipitation	PET	Acc Pot WL	ST= Storage	Storage	AET	Deficit (D)	Surplus (S)	RO	Runoff	Total Runoff	Detention
January	-10.3	0	0	65	65		542	0	0	0	0	8	0	8	550
February	-8.1	0	0	54	54		596	0	0	0	0	4	0	4	600
March	-2.3	0	0	64	64		661	0	0	0	0	2	0	2	663
April	6.3	1.4	32	75	43		400	0	32	0	43	23	26	49	492
May	13.3	4.4	79	80	2		400	0	79	0	2	12	117	129	531
June	18.5	7.2	112	93	-19	-19	381	-19	112	0	0	6	59	65	446
July	21	8.8	133	92	-41	-60	344	-37	129	4	0	3	29	32	376
August	19.8	8.0	114	86	-29	-88	320	-24	110	5	0	2	15	17	337
September	15	5.3	73	90	17		337	17	73	0	0	1	7	8	345
October	8	2.0	34	86	52		390	52	34	0	0	0	4	4	394
November	1.5	0.2	5	82	77		400	10	5	0	66	33	2	35	501
December	-6.2	0	0	76	76		476	0	0	0	0	17	1	18	494
_		37.4	580	944		_		0	572	8	111	111	260	371	

Monthly T from Environment Canada

Table 33 - 450mm soil moisture retention in Thornthwaite [1957]

Heat Index (I) 37.4 a: 1.06

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - PRE-DEVELOPMENT Water Balance / Water Budget Assessment

Water Balance / Water Budget Assessment											
	Development Lands to Perth Long Swamp (A1)										
Land Use	Fore	est	Pastu	ire							
Soil (HSG)	С	В	С	В							
	Silt/Clay	Sandy	Silt/Clay	Sandy	Gravel	Asphalt	Total				
Soil Characterization	Loam	Loam	Loam	Loam		'					
	(250)	(200)	(150)	(100)							
Area (m²)	34300	15600	17600	54500	_	_	122000				
Pervious Area (m²)	34300	15600	17600	54500	-	-	122000				
Impervious Area (m²)	-	-	-	-	_	_	-				
importious / ii ou (iii)	Infiltratio	n Facto									
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	-	-					
Soil Infiltration Factor	0.15	0.2	0.15	0.2	-	-					
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	-	-					
MOE infiltration Factor	0.522	0.572	0.422	0.472	-	-					
Actual Infiltration Factor	0.522	0.572	0.422	0.472	-	-					
Run-off Coefficient	0.478	0.428	0.578	0.528	-	-					
Runoff from Impervious Surfaces*	0	0	0	0	-	-					
	Inputs (pe										
Precipitation (mm/year)	944	944	944	944	-	-	944				
Run-on (mm/year)	0	0	0	0	-	-	0				
Other Inputs (mm/year)	0	0	0	0	-	-	0				
Total Inputs (mm/year)	944	944	944	944	-	-	944				
Precipitation Surplus (mm/year)	Outputs (pe	380	384	391	_	_	385				
Net Surplus (mm/year)	377	380	384	391	-	-	385				
Evapotranspiration (mm/year)	567	564	560	553	-	-	559				
Infiltration (mm/year)	197	217	162	185	-	-	189				
Rooftop Infiltration (mm/year)	0	0	0	0	-	-	0				
Total Infiltration (mm/year)	197	217	162	185	-	-	189				
Runoff Pervious Areas	180	163	222	206	-	-	771				
Runoff Impervious Areas	0	0	0	0	-	-	0				
Total Runoff (mm/year)	180	163	222	206	-	-	196				
Total Outputs (mm/year)	944	944	944	944	-	-	944				
Difference (Inputs - Outputs)	0	0	0	0	-	-	0				
2	Inputs ((Volume))	ı							
Precipitation (m³/year)	32379	14726	16614	51448	-	-	115168				
Run-on (m³/year)	0	0	0	0	-	-	0				
Other Inputs m³/year)	0	0	0	0	-	-	0				
Total Inputs (m ³ /year)	32379	14726	16614	51448	-	-	115168				
	Outputs	(Volume	e)								
Precipitation Surplus (m³/year)	12931	5928	6758	21310	-	-	46927				
Net Surplus (m³/year)	12931	5928	6758	21310	-	-	46927				
Evapotranspiration (m ³ /year)	19448	8798	9856	30139	-	-	68241				
Infiltration (m ³ /year)	6750	3391	2852	10058	-	-	23051				
Rooftop infiltration (m ³ /year)	0	0	0	0	-	-	0				
Total Infiltration (m³/year)	6750	3391	2852	10058	-	-	23051				
Runoff Pervious Areas (m³/year)	6181	2537	3906	11251	-	-	23876				
Runoff Impervious Areas (m³/year)	0	0	0	0	_	_	0				
Total Runoff (m ³ /year)						-					
Total Outputs (m ³ /year)	6181	2537	3906	11251	-	-	23876				
	32379	14726	16614	51448	-	-	115168				
Difference (Inputs - Outputs)	0	0	0	0	-	-	0				

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - POST-DEVELOPMENT

Water Balance / Water Budget Assessment		70171																						
Water Building / Water Budget / 183683/Hone	Devel	opment	Lands to Pe				SWM Blo	ck,			Undeveloped Lands to Perth Long Swamp (UND)													
Landling	Foro	o.t		ial Lots an	d Roadv	vay)			Ford		ment Lands					-	Fore					- ' '		-
Land Use Soil (HSG)	Fore	B B	C	Pasture B	1			1	Fore	B B	C	Pasture B					Forest Pasture C B C B							
30II (H3G)	C	Ь	C	D		 				Ь	C	D					C	D	C	D				i 17
Soil Characterization	Silt/Clay Loam (250)	Sandy Loam (200)	Silt/Clay Loam (150)	Sandy Loam (100)	Sand (75)	Gravel	Asphalt	Total	Silt/Clay Loam (250)	Sandy Loam (200)	Silt/Clay Loam (150)	Sandy Loam (100)	Sand (75)	Gravel	Asphalt	Total	Silt/Clay Loam (250)	Sandy Loam (200)	Silt/Clay Loam (150)	Sandy Loam (100)	Sand (75)	Gravel	Asphalt	Total
Area (m²)	8300	0	17400	13300	0	0	26600	65600	0	0	0	17150	0	0	17150	34300	20500	0	0	0	0	0	0	20500
Pervious Area (m ²)	8300	0	17400	13300	0	-	-	39000	0	0	0	17150	0	-	-	17150	20500	0	0	0	0	-	-	20500
Impervious Area (m²)	-	-	-	-	-	0	26600	26600	-	-	-	-	-	0	17150	17150	-	-	-	-	-	0	0	0
									Infilt	tration Fa	ctors													
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0		0.172	0.172	0.172	0.172	0.12	0.12	0		0.172	0.172	0.172	0.172	0.12	0.12	0	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.35	0.05	0		0.15	0.2	0.15	0.2	0.3	0.05	0		0.15	0.2	0.15	0.2	0.3	0.05	0	j l
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0		0.2	0.2	0.1	0.1	0.1	0.05	0		0.2	0.2	0.1	0.1	0.1	0.05	0	j l
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0.1	1	0.522	0.572	0.422	0.472	0.52	0.22	0		0.522	0.572	0.422	0.472	0.52	0.22	0	<u> </u>
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0	1	0.522	0.572	0.422	0.472	0.52	0.22	0		0.522	0.572	0.422	0.472	0.52	0.22	0	<u> </u>
Run-off Coefficient	0.478	0.428	0.578	0.528	0.43	0.78	0.9	<u> </u>	0.478	0.428	0.578	0.528	0.48	0.78	0.9		0.478	0.428	0.578	0.528	0.48	0.78	0.9	ı I
Runoff from Impervious Surfaces*	0	0	0	0	0	0.78	0.9		0	0	0	0	0	0.78	0.9		0	0	0	0	0	0.78	0.9	
Decelellation (complete)	044	044	0.44	0.1.1	044	0.4.4	0.44	1 044 1		(per Uni	,	044	0.4.4	0.4.4	044	044	044	044	0.44	044	044		044	044
Precipitation (mm/year)	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944
Run-on (mm/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Inputs (mm/year)	944	944	944	944	0	0	944	0	944	944	944	944	944	944	0	0	944	944	944	944	944	0 944	0 944	0
Total Inputs (mm/year)	944	944	944	944	944	944	944	944		ts (per Un		944	944	944	944	944	944	944	944	944	944	944	944	944
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	573	377	380	384	391	398	398	850	620	377	380	384	391	398	398	850	377
Net Surplus (mm/year)	377	380	384	391	398	398	850	573	377	380	384	391	398	398	850	620	377	380	384	391	398	398	850	377
Evapotranspiration (mm/year)	567	564	560	553	546	546	94	371	567	564	560	553	546	546	94	324	567	564	560	553	546	546	94	567
Infiltration (mm/year)	197	217	162	185	227	88	85	140	197	217	162	185	207	88	0	92	197	217	162	185	207	88	0	197
Rooftop and Trench Infiltration (mm/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Infiltration (mm/year)	197	217	162	185	227	88	85	140	197	217	162	185	207	88	0	92	197	217	162	185	207	88	0	197
Runoff Pervious Areas	180	163	222	206	171	0	0	942	180	163	222	206	191	0	0	962	180	163	222	206	191	0	0	962
Runoff Impervious Areas	0	0	0	0	0	310	765	1075	0	0	0	0	0	310	850	1160	0	0	0	0	0	310	850	1160
Total Runoff (mm/year)	180	163	222	206	171	310	765	434	180	163	222	206	191	310	850	528	180	163	222	206	191	310	850	180
Total Outputs (mm/year)	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
									Inp	uts (Volu	me)													
Precipitation (m ³ /year)	7835	0	16426	12555	0	0	25110	61926	0	0	0	16190	0	0	16190	32379	19352	0	0	0	0	0	0	19352
Run-on (m³/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Inputs m ³ /year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Inputs (m³/year)	7835	0	16426	12555	0	0	25110	61926	0	0	0	16190	0	0	16190	32379	19352	0	0	0	0	0	0	19352
		1							Out	puts (Vol	ume)													
Precipitation Surplus (m³/year)	3129	0	6682	5200	0	0	22599	37610	0	0	0	6706	0	0	14571	21276	7729	0	0	0	0	0	0	7729
Net Surplus (m³/year)	3129	0	6682	5200	0	0	22599	37610	0	0	0	6706	0	0	14571	21276	7729	0	0	0	0	0	0	7729
Evapotranspiration (m³/year)	4706	0	9744	7355	0	0	2511	24316	0	0	0	9484	0	0	1619	11103	11624	0	0	0	0	0	0	11624
Infiltration (m³/year)	1633	0	2820	2455	0	0	2260	9168	0	0	0	3165	0	0	0	3165	4034	0	0	0	0	0	0	4034
Rooftop and Trench Infiltration (m³/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Infiltration (m³/year)	1633	0	2820	2455	0	0	2260	9168	0	0	0	3165	0	0	0	3165	4034	0	0	0	0	0	0	4034
Runoff Pervious Areas (m³/year)	1496	0	3862	2746	-	0	0	8103	0	0	0	3541	0	0	0	3541	3694	0	0	0	0	0	0	3694
Runoff Impervious Areas (m³/year)	1	+	1		0					_											-	ļ -		
	0	0	0	0	0	0	20339	20339	0	0	0	0	0	0	14571	14571	0	0	0	0	0	0	0	0
Total Runoff (m³/year)	1496	0	3862	2746	0	0	20339	28443	0	0	0	3541	0	0	14571	18111	3694	0	0	0	0	0	0	3694
Total Outputs (m³/year)	7835	0	16426	12555	0	0	25110	61926	0	0	0	16190	0	0	16190	32379	19352	0	0	0	0	0	0	19352
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - MITIGATION REQUIRED

Water Balance / Water Budget Assessment

	Data Input
944	mm of precipitation per year avg.
118.4	days with precipitation per year avg.
10	mm design rainfall event

1981 to 2010 Canadian Climate Normals station data

Days with Rainfall

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
>= 0.2 mm	4.4	3.9	6.7	10.9	13.4	13.2	11.9	11	12.3	13.7	11	6	118.4	Α
>= 5 mm	1.6	1.2	2.1	4	4.9	5.8	5.4	4.8	5.1	5	4.2	2.3	46.5	A
>= 10 mm	0.87	0.57	1	2	2.7	2.9	3.1	2.8	3.2	2.7	2.1	1.2	25.2	A
>= 25 mm	0.13	0.07	0.10	0.33	0.47	0.73	0.77	0.67	0.60	0.47	0.43	0.13	4.9	Α

Environment Canada	Days exceeding rainfall noted	Days per section	Minimum volume of rain (mm)
0.2 mm	118.4	71.9	14
5 mm	46.5	21.3	107
10 mm	25.2	25.2	252
		Total	373

^{*}Example - Days per section over 5mm = 46.5 - 25.2 = 21.3 days (which are more than 5 mm but, less than 10 mm).

^{21.3} days x 5 mm = 107 mm

	Development Lands to Perth Long	Development Lands to
	Swamp (Block 70, SWM Block,	Perth Long Swamp (West
	Residential Lots and Roadway)	Block #67)
Area of Asphalt (m ²)	26600	17150
Asphalt Runoff Coefficient	0.9	0.9
Volume of Runoff in 5 mm Event	120	77
(m³) to be infiltrated	120	11
Mitigation Required (m³/year)	2873	1852
Annual Volume to be infiltrated	2897	1868
by designing for 5 mm Event	2071	1000

By installing trenches sized for the 5 mm event, the annual volume to be infiltrated will exceed that of the mitigation required by the water balance mitigation.

For 0.5m depth	For 0.75m depth
120 m³	120 m ³
0.5 m ³	0.75 m ³
0.4	0.4
600 m²	400 m ²
For 0.5m depth	For 0.75m depth
108 m³	108 m ³
0.5 m³	0.75 m ³
0.4	0.4
540 m²	360 m ²
	120 m ³ 0.5 m ³ 0.4 600 m ² For 0.5m depth 108 m ³ 0.5 m ³ 0.4

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - POST-DEVELOPMENT WITH MITIGATION

Water Balance / Water Budget Assessment																								
v	Develo	opment L	ands to	Perth Lo	ng Swar	np (Block	70, SWM	1 Block,				da ta Dau		C	Mast Dissi	۸				d d - D -		- C	INID)	
		•		ential Lot				1		Jevelopn	nent Lan	as to Per	tn Long	swamp (West Block	()		UI	naevelop	bea to Pe	ertn Long	g Swamp (l	(טאנ)	
Land Use	Foi	rest	Pas	ture					Fo	rest	Pas	ture					Fo	rest	Pas	sture				
Soil (HSG)	С	В	С	В					С	В	С	В					С	В	С	В				
	SiIt/CI	Sandy	Silt/Cl	Sandy					SiIt/CI	Sandy	SiIt/CI	Sandy					SiIt/CI	Sandy	Silt/Cl	Sandy				
Soil Characterization	ay	Loam	ay	Loam	Sand	Gravel	Asphalt	Total	ay	Loam	ay	Loam	Sand	Gravel	Asphalt	Total	ay	Loam	ay	Loam	Sand	Gravel	Asphalt	Total
3011 Gridi deterization	Loam	(200)	Loam	(100)	(75)				Loam	(200)	Loam	(100)	(75)				Loam	(200)	Loam	(100)	(75)			
	(250)	(200)	(150)						(250)	(200)	(150)	(100)					(250)	(200)	(150)	(100)				4
Area (m²)	8300	0	17400	13300	0	0	26600	65600	0	0	0	17150	0	0	17150	34300	20500	0	0	0	0	0	0	20500
Pervious Area (m ²)	8300	0	17400	13300	0	-	-	39000	0	0	0	17150	0	-	-	17150	20500	0	0	0	0	-	-	20500
Impervious Area (m ²)	-	-	-	-	-	0	26600	26600	-	-	-	-	-	0	17150	17150	-	-	-	-	-	0	0	0
		•				•		-	Infilt	ration Fa	ctors				•					•	•			
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0		0.172	0.172	0.172	0.172	0.12	0.12	0		0.172	0.172	0.172	0.172	0.12	0.12	0	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.35	0.05	0		0.15	0.2	0.15	0.2	0.35	0.05	0		0.15	0.2	0.15	0.2	0.35	0.05	0]
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0	<u> </u>	0.2	0.2	0.1	0.1	0.1	0.05	0		0.2	0.2	0.1	0.1	0.1	0.05	0	<u> </u>
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0.1	. I	0.522	0.572	0.422	0.472	0.57	0.22	0.1		0.522	0.572	0.422	0.472	0.57	0.22	0.1	<u> </u>
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0	. I	0.522	0.572	0.422	0.472	0.57	0.22	0		0.522		0.422	0.472	0.57	0.22	0	<u> </u>
Run-off Coefficient	0.478	0.428	0.578	0.528	0.43	0.78	0.9	1 1	0.478	0.428	0.578	0.528	0.43	0.78	0.9		0.478		0.578		0.43	0.78	0.9	<u>↓</u>
Runoff from Impervious Surfaces*	0	0	0	0	0	0.78	0.9		0	0	0	0	0	0.78	0.9		0	0	0	0	0	0.78	0.9	
Draginitation (mm/year)	044	T 044	044	944	944	044	044	1 044		(per Uni		044	044	044	044	044	044	044	044	T 044	044	044	944	044
Precipitation (mm/year)	944	944	944	0	0	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	0	944
Run-on (mm/year) Other Inputs (mm/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Inputs (mm/year)	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944
Total inputs (min/year)	Outputs (per Unit Area)																							
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	573	377	380	384	391	398	398	850	620	377	380	384	391	398	398	850	377
Net Surplus (mm/year)	377	380	384	391	398	398	850	573	377	380	384	391	398	398	850	620	377	380	384	391	398	398	850	377
Evapotranspiration (mm/year)	567	564	560	553	546	546	94	371	567	564	560	553	546	546	94	324	567	564	560	553	546	546	94	567
Infiltration (mm/year)	197	217	162	185	227	88	85	140	197	217	162	185	227	88	85	135	197	217	162	185	227	88	85	197
Rooftop and Infiltration Basin (mm/year)	0	0	0	0	0	0	108	44	0	0	0	0	0	0	108	54	0	0	0	0	0	0	0	0
Total Infiltration (mm/year)	197	217	162	185	227	88	193	184	197	217	162	185	227	88	193	189	197	217	162	185	227	88	85	197
Runoff Pervious Areas	180	163	222	206	171	0	0	942	180	163	222	206	171	0	0	942	180	163	222	206	171	0	0	942
Runoff Impervious Areas	0	0	0	0	0	310	657	967	0	0	0	0	0	310	657	967	0	0	0	0	0	310	765	1075
Total Runoff (mm/year)	180	163	222	206	171	310	657	390	180	163	222	206	171	310	657	432	180	163	222	206	171	310	765	180
Total Outputs (mm/year)	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	lnn	uts (Volu	0 ma)	0	0	0	0	0	0	0	0	0	0	0	0	0
Precipitation (m ³ /year)	7835	0	16426	12555	0	0	25110	61926	0	0	0	16190	0	0	16190	32379	19352	0	0	0	0	0	0	19352
Run-on (m³/year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Inputs m ³ /year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Inputs (m³/year)	7835	0	16426			0	25110	61926	0	0	0	16190	0	0	16190	32379	19352		0	0	0	0	0	19352
Total inputs (iii 7 year)	7033	1 0	10420	12333	<u> </u>		23110	01920		outs (Volu		10190	0	0	10190	32319	19352	1 0	1 0	1 0	U	U		19332
Precipitation Surplus (m ³ /year)	3129	0	6682	5200	0	0	22599	37610	0	0	0	6706	0	0	14571	21276	7729	0	0	0	0	0	0	7729
Net Surplus (m³/year)	3129	0	6682	5200	0	0	22599	37610	0	0	0	6706	0	0	14571	21276	7729	0	0	0	0	0	0	7729
Evapotranspiration (m³/year)	4706	0	9744	7355	0	0	2511	24316	0	0	0	9484	0	0	1619	11103	11624		0	0	0	0	0	11624
Infiltration (m³/year)	1633	0	2820	2455	0	0	2260	9168	0	0	0	3165	0	0	1457	4622	4034	0	0	0	0	0	0	4034
Rooftop and Trench Infiltration (m ³ /year)	0	0	0	0	0	0	2873	2873	0	0	0	0	0	0	1852	1852	0	0	0	0	0	0	0	0
Total Infiltration (m³/year)	1633	0	2820	2455	0	0	5133	12040	0	0	0	3165	0	0	3309	6474	4034	0	0	0	0	0	0	4034
Runoff Pervious Areas (m³/year)										_											-	_		
	1496	0	3862	2746	0	0	0	8103	0	0	0	3541	0	0	0	3541	3694	0	0	0	0	0	0	3694
Runoff Impervious Areas (m³/year)	1404	0	0	0	0	0	17467	17467	0	0	0	0	0	0	11261	11261	0	0	0	0	0	0	0	0
Total Runoff (m³/year)	1496	0	3862	2746	0	0	17467	25570	0	0	0	3541	0	0	11261	14802	3694	0	0	0	0	0	0	3694
Total Outputs (m³/year)	7835	0	16426	12555		0	25110	61926	0	0	0	16190	0	0	16190	32379	19352		0	0	0	0	0	19352
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	U	0	0

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - SUMMARY

Water Balance / Water Budget Assess	sment				
I	Phase 6, West Blo	ock and Undevelo	oped lands to Pe	erth Long Swamp	
		Pre =			
Characteristic	Pre-	Post-	Change	Post-Development	Change (Pre- to Post-with
orial actoristic	Development	Development	(Pre- to Post)	with Mitigation	Mitigation
		Inputs (V	olumes)		
Precipitation (m³/year)	115168	113658	-1%	113658	-1%
Run-on (m³/year)	0	0	0%	0	0%
Other Inputs m³/year)	0	0	0%	0	0%
Total Inputs (m³/year)	115168	113658	-1%	113658	-1%
		Outputs (\	/olumes)		
Precipitation Surplus (m³/year)	46927	66615	42%	66615	42%
Net Surplus (m³/year)	46927	66615	42%	66615	42%
Evapotranspiration (m³/year)	68241	47042	-31%	47042	-31%
Infiltration (m³/year)	23051	16367	-29%	17824	-23%
Rooftop infiltration (m³/year)	0	0	0%	4725	0%
Total Infiltration (m³/year)	23051	16367	-29%	22549	-2%
Runoff Pervious Areas (m³/year)	23876	15338	-36%	15338	-36%
Runoff Impervious Areas (m³/year)	0	34910	0%	28728	0%
Total Runoff (m³/year)	23876	50248	110%	44066	85%
Total Outputs (m³/year)	115168	113658	-1%	113658	-1%