The Regional Municipality of York

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7

Drainage and Stormwater Management Report

December 13, 2021

FINAL REV. 1

wsp

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Drainage and Stormwater Management Report

The Regional Municipality of York

FINAL Rev. 1

Project No.: 16M-01457-01
Date: December 13, 2021

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Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page iii

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Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7   WSP
Project No. 16M-01457-01   December 2021
The Regional Municipality of York   Page iv

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Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page v

TABLE OF CONTENTS

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page vi

TABLES

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page vii

FIGURES

EXHIBITS (At the End of the Report)

APPENDICES

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7   WSP
Project No. 16M-01457-01   December 2021
The Regional Municipality of York   Page viii

1 INTRODUCTION

1.1 Project Description and Purpose

The Regional Municipality of York (hereafter referred to as "York Region") retained WSP to undertake the Municipal Class Environmental Assessment (EA) Study of Langstaff Road from the west of Weston Road to Highway 7 in the City of Vaughan. The proposed works involve widening of Langstaff Road from two / four lanes to six lanes between Weston Road and Dufferin Street. The study limits are bounded by Weston Road to the west and Highway 7 to the east. The Don River West Branch, Westminster Creek and Black Creek are the most prominent natural features within the study limits. The study area is shown in **Figure 1**.

The proposed improvements on Langstaff Road include:

— Widening of Langstaff Road up to six lanes from Weston Road to Dufferin Street
— A connection across the CN MacMillan Rail Yard from Creditstone Road to Keele Street
— Construction of a grade separation at Metrolinx GO Transit Barrie Line
— Implementation of intersection improvements
— Improvement of pedestrian and cycling facilities, and provision for transit amenities

Between Weston Road and Highway 7, Langstaff Road is an east-west arterial road under the jurisdiction of York Region. The existing road is a four-lane urban arterial road to the west of the CN MacMillan Rail Yard and a two-lane rural arterial to the east of the (CN) MacMillan Rail Classification Yard with a posted speed of 60 km/hr. Land uses adjacent to the Langstaff Road corridor are mostly light industrial and commercial areas, with some residential, as well as parks and open areas. Residential areas are largely located near the westerly and easterly study limits. Most of the area is heavily urbanized, including large areas of industrial and commercial buildings with flat roofs surrounded by paved areas for parking and driveways.

Three watercourses were identified within the study area along Langstaff Road. The watercourses include Black Creek (a tributary to Humber River), West Don River (a west branch of Don River) and Westminster Creek (a tributary to West Don River).

While the EA Study initially considered potential improvements to the interchange at Highway 400 and Langstaff Road, following extensive consultation with MTO, it was concluded that the planning of the improvements to the interchange will be subject to a future corridor study due to the extended scope of work along the Highway 400 corridor. As such, this drainage report considers Langstaff Road at Highway 400 (i.e. overpass) as 4-lanes under the proposed condition assessments and does not include any assessment related to Highway 400 access ramps. Drainage assessment associated with the Highway 400 interchange will be developed as part of the future corridor study.
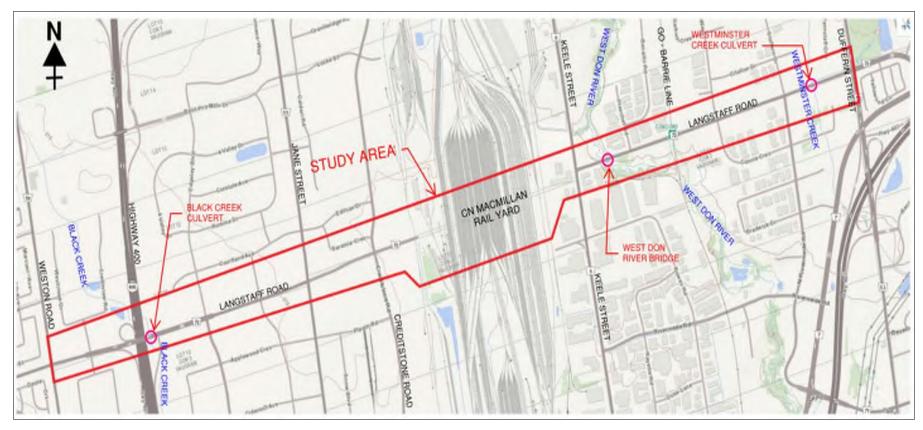
Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 1

Figure 1:   Study Area

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 2

Based on the prevailing policy framework, the following broad design objectives have been established to minimize the potential impacts of the proposed roadway improvements on the surrounding environment:

— Provide an effective / efficient drainage system
— Minimize risk to public safety
— Maintain flow paths for upstream lands
— Maintain or enhance the quality of storm runoff
— Maintain or reduce flood risk for lands within and surrounding the transportation corridor
— Minimize future maintenance requirements
— Promote stormwater management measures on lands available in the transportation corridor.

1.2 Study Purpose – Drainage and Stormwater Management

The purpose of the Drainage and Stormwater Management (SWM) Report is to provide a clear and traceable decision making process with respect to the proposed watercourse crossing design and stormwater management design concept to support seeking 'approval in principle' for various aspects of the design from the relevant regulatory agencies such as the Toronto and Region Conservation Authority (TRCA) and Ontario Ministry of Natural Resources and Forestry (MNRF), for watercourse crossing structures and stormwater management associated with the preliminary design.

This Drainage and Stormwater Management Report documents the hydrologic and hydraulic analyses undertaken, addresses the existing drainage characteristics, identifies issues related to drainage and stormwater management conditions, determines acceptable opening sizes of major crossing structures and proposes a feasible stormwater management strategy for the proposed roadways.

1.3 Scope of Work

The scope of work entails the following:

— Understand thoroughly the characteristics of the existing drainage system, its flow pattern, constraints and design requirements based on the latest standards and policies.
— Hydraulic analyses of the watercourse crossings to assess the impacts of proposed works and culvert replacements.
— Hydrologic assessments of road corridor to determine the increase in flow due to proposed improvements.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 3

— Design of stormwater quality treatment facilities to achieve an enhanced Level of water quality treatment for the roadway runoff.

— Design of quantity control measures to control the post-development flows to existing conditions flows as required by the reviewing agency.

— Provide erosion and sediment control recommendations as required.

— The constraints and recommendations related to the watercourse crossings provided in the preliminary design will be incorporated in the assessment and design of the proposed drainage system.

1.4 Background Information

WSP obtained relevant drainage information and mapping from TRCA and York Region. The following reports were reviewed for the background and used in the assessments and analyses of this study:

— Don River Hydrology Update, PCSWMM Model and Report, TRCA, prepared by AECOM, December 2018.

This report was prepared by AECOM for TRCA and provides an update on Don River hydrology using the PCSWMM platform using the latest available land use and cover, topographic and soil information. The hydrology update model has defined flows for Regional Storm (Hurricane Hazel) and design storm flows for both existing and future land use conditions at each subwatershed or node points.

The original model of the Don River was updated in the 1990s using the HYMO hydrologic model. This model was further updated in 2004 by Marshall Macklin Monaghan by using Visual OTTHYMO model.

— Hydrology Update, Toronto and Region Conservation Authority, prepared by Marshall Macklin Monaghan, 2004

— Don River Watershed Plan – Surface Water Hydrology / Hydraulics and Stormwater Management, Report on Current Conditions, TRCA, 2009

— Don River Watershed Plan – Baseflow and Water Use Assessment, Report on Current Conditions, TRCA, 2009

— Don River Watershed Plan – Fluvial Geomorphology – Report on Current Conditions, TRCA, 2009

— Humber River Hydrology Update, Final Report, TRCA, Prepared by CIVICA, June 2015.

— West Don River HEC-RAS models (Basin 5) and related Floodplain maps received from TRCA

— TRCA Stormwater Management Criteria, 2012

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 4

— Municipal Structure Inspection Report of Bowes Bridge (West Don River Bridge at Langstaff Road, Structure # 72-20 B0150 and Westminster Creek Culvert, Structure # 72-20 C1670, completed by AECOM, Nov 2014

— GO Transit Barrie Line Hydraulic Analysis Memo (2015) prepared by MMM Group for Metrolinx

— As built drawings of Langstaff Road received from York Region

1.5 Site Investigation

A field investigation of the study area and existing drainage features was conducted by WSP in April 2018. There are two watercourse crossing culverts and one bridge structure within the study area along Langstaff Road. The bridge structure is located over West Don River. In addition to two watercourse crossing culverts, there are three drainage culverts conveying roadway runoff across Langstaff Road.

Recently in June 2021, WSP Team visited the site to investigate the drainage features in the vicinity of Langstaff Road immediately west of CN MacMillan Rail Yard and to understand the drainage conditions of the area thoroughly. Immediately west of CN MacMillan Rail Yard, an outlet of a 1650 mm dimeter storm sewer exists on the southside of Langstaff Road and the storm sewer outlets to a ditch which drains to one of the City of Vaughan's stormwater management pond located south-west of CN MacMillan Rail Yard. This SWM Pond is refereed in this report as SWM Pond C and shown in **Exhibits 3-10** and **3-20**.

Regarding two watercourse crossing culverts and bridge, a review of relevant background information was conducted before proceeding with the hydraulic analysis of these structures.

Photographic inventory of the site investigation is provided in **Appendix A**.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 5

2 DESIGN CRITERIA AND STANDARD

Stormwater management and hydraulic structure criteria were selected on the nature of the proposed works. Guidelines and criteria from all regulatory bodies were considered. Relevant criteria were selected based on the location of structures within the study limits.

2.1 Design Criteria - Crossing Structure

The design and hydraulic performance criteria adopted in this study that relates to the crossing structure design includes design flows, minimum freeboard, vertical clearance, allowable overtopping frequency, and flow depth at culvert inlets. Langstaff Road, after the improvement, will be considered as an Urban Arterial. The following criteria were extracted from the Ontario Ministry of Transportation (MTO) Highway Drainage Design Standards (2008):

— **WC-1 Design Flows (Bridges and Culverts):** This standard identifies the minimum design flows for the sizing of structures for flow conveyance on regulated and non-regulated watercourses.

  — On an Urban Arterial road, a watercourse crossing with a span of less than or equal to 6.0 m should be designed to convey the flow generated during a 50-year design storm. For structures with spans greater than 6.0 m a 100-year flow shall be used.

  — On Regulated Watercourses the Regulatory Flow (Regional Flow) shall be calculated in all cases where floodline mapping is available, where there is a potential risk to public safety, or where there is potential damage to adjacent properties. For these watercourses, the Regulatory Flows are determined with the Hurricane Hazel storm event.

— **WC-2 Freeboard and Clearance at Bridge Crossings:** This standard identifies the soffit clearance and freeboard for bridges over water bodies. For the roadway, the soffit clearance and freeboard for the design flow should be 1.0 m or higher.

  — A _Desirable Freeboard_ is measured vertically from the Energy Grade Line elevation for the design flow to the edge of the travelled lane at the low point. This freeboard is a recommended value although it is recognized that, due to site-specific considerations, it is not always feasible to provide this amount.

  — A _Minimum Freeboard_ of 1.0 m is measured vertically from the high-water level for the design flow to the edge of the travelled lane at the low point.

— **WC-7 Culvert Crossings on a Watercourse:** This standard identifies the minimum freeboard, minimum clearance and the maximum flood depth at culvert crossings.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 6

- **Overtopping Criterion:** There should be no overtopping of the road during the 100-year storm event at the lowest point on the road profile of all culvert crossings. If possible, the overtopping in the Regional Storm Event will also be avoided.

- **Flood Depth at Culverts**: The standard recommends a maximum flood depth (or head water elevation) at the upstream face of the culvert of 1.5 times the diameter or rise of the culvert (HW/D) for a culvert with a diameter or rise less than 3 metres. For a culvert with a rise between 3.0 metres and 4.5 metres, the flood depth at the upstream face must be equal to or less than 4.5 times the diameter or rise of the culvert. This standard applies to closed-footing culverts and open-footing culverts with non-erodible bottoms.

- **SD-1 Design Flow for Surface Drainage Systems**: This standard identifies the minimum design flows that shall be used for the sizing of road surface drainage systems (minor and major drainage systems such as piped and surface systems). For an arterial road, and collector road the minor system shall be designed for the 10-year design flow and the major system shall be designed for the 100-year design flow.

Table 2-1 provides a summary of the MTO Drainage Design Standards applied to this assessment.

Table 2-1:   MTO Drainage Design Standards for Culverts and Bridge

Item	Design Standard	Description	Standard	Section
1	Design Flow Storm	50-Year (for existing structure with total spans ≤ 6 m)	WC-1	1.1.1
		100-Year (for spans > 6 m)		
2	Top of Road Freeboard (Min.)	>1.0 m (Top of Road Elevation at Low Point - Design Flow Water Surface Elevation)	WC-7	3.1.2
3	Top of Road Freeboard (Desired)	>1.0 m (Top of Road Elevation at Low Point - Design Flow Energy Grade Line Elevation)	WC-7	3.1.1
4	Relief Flow (Max. Depth over roadway)	Max. depth over roadway should not exceed 0.3 m for Regulatory Storm	WC-13	3.2.1
5	Relief Flow (Velocity x Depth)	Velocity x Depth should not exceed 0.8 m^2/s for Regulatory Storm	WC-13	3.2.2
6	Flood Depth (Culvert)	HW/D <= 1.5	WC-7	3.5
6	Clearance (Bridge)	Design Flow Water Surface Elevation – Soffit Elevation ≥1.0 m	WC-2	3.2.2

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 7

2.2 Design Criteria - Stormwater Management (SWM)

Based on the standards and criteria provided by the Regulatory agencies, general stormwater management objectives and practices have been identified to minimize the impacts of the proposed Langstaff Road Improvements. The identified objectives are to maintain, where feasible, the existing drainage pattern, minimize peak flow increases and potential roadway overtopping and provide quantity and quality control of runoff for all new pavement areas.

The MTO *Drainage Management Manual* (1997), TRCA SWM Criteria (2012), Ministry of the Environment (MOE) *Stormwater Management Planning and Design Manual* (2003) (note: MOE is now Ministry of the Environment, Conservation and Parks) and York Region Design Guidelines (2020) provided the guidelines and policies for the selection and design of the stormwater management measures required to mitigate the impacts of the proposed works.

Based on TRCA SWM Criteria (2012), the followings are requirements relevant to the Langstaff Road EA Study:

Don River Watershed:

— The Don River Watershed includes the West Don River and Westminster Creek within the project area.

— Control post-development peak flows to pre-development levels for all storms up to and including the 100-year storm (i.e. 2, 5, 10, 25, 50, and 100-year storms).

— Unit flow rates have been established and should be used for all sites located north of Steeles Avenue that are greater than 5 ha.

Humber River Watershed:

— Includes Black Creek within the project area.

— Control post-development peak flows to pre-development levels for all storms up to and including the 100-year storm (i.e., 2, 5, 10, 25, 50, and 100-year storms) except for the main branches of the Lower, Main, East, Upper and West Humber where no quantity control is required.

— Unit flow relationships have been established and should be used for all other sites located in the Humber River Watershed not discharging to the main channels listed above.

The unit flow control requirements (Quantity Control Release Rate) of the Don River and Humber River is provided in **Appendix B.**

The following stormwater management criteria were considered in the preliminary design:

— **Water Quality Control Criterion:** Ideally, a target of a long-term removal of 80% of total suspended solids (TSS) on an average annual basis will be implemented as

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 8

city streets are a major contributor of water quality contaminants. However, the linear nature of city streets and the configuration of existing infrastructure may inhibit the ability to retrofit Langstaff Road to provide this level of TSS treatment.

— **SWM Quantity Control Criterion:** Any localized increase in flows due to the proposed project should be controlled to the unit flow rate for both the Humber and Don River watersheds.

— **Water Balance:** Based on *TRCA SWM Criteria (2012), Figure C 10: Recharge Area Classification within TRCA Area*, Langstaff Road and its surrounding area falls under the category Low Volume Recharge Area (LGRA). The project area does not fall under Wellhead Protection Areas (WHPA). A 5 mm storm event would be held on-site and discharged through infiltration, evapotranspiration or potentially, rainwater reuse.

— **Erosion Control:** Based on *TRCA SWM Criteria (2012, Section 4.2),* on-site retention of 5 mm is required for erosion control.

The Wet Weather Flow Management Guideline has also indicated that for small sites (site area <2 ha) the on-site minimum runoff retention from a small design rainfall event (typically 5 mm) considered under the Water Balance Criteria will be sufficient, as the on-site retention reduces the erosive energy of the flow.

2.3   Design Storm

The rainfall Intensity-Duration-Frequency (IDF) parameters and storm distributions used for the hydrologic analysis are summarized below. Detailed information is included in **Appendix B.**

For the Don River Watershed, the Soil Conservation Service (SCS) 12-hour storm distribution of York Region IDF was used in the analysis to generate the peak flows for the roadway drainage. The SCS 12-hour storm distribution is the governing storm event, as per "Stormwater Management Criteria" from TRCA dated August 2012.

For the Humber River Watershed, the Atmospheric Environmental Service (AES) 6-hour and 12-hour storm distributions are the governing storm event, as per "Stormwater Management Criteria" from TRCA dated August 2012. The AES 12-hour storm distribution was used to generate the pre-development flows for the 2-year to 100-year storm events to provide consistency across the study area.

Table 2-2 shows a comparison between rainfall depths between York Region IDF and AES storm files of the Humber River watershed.

The comparison shows that York Region IDF rainfall values are slightly higher for 12-hour; therefore, rainfall values from the York Region IDF, was carried forward in the analysis.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 9

Table 2-2:   Rainfall Depths Comparison

Rainfall Depth (mm)						
Distribution / IDF Source	**2-yr**	**5-yr**	**10-yr**	**25-yr**	**50-yr**	**100-yr**
12-hour TRCA	42.0	54.4	62.7	73.1	80.8	88.5
12-hour York Region IDF	40.9	53.0	63.2	73.7	81.5	89.4
6-hour TRCA	36.0	47.8	55.7	65.6	73.0	80.3
6-hour York Region IDF	36.2	46.9	56.2	65.1	72.2	79.2

Note: 12-hour and 6-hour AES Storm files were obtained from the Humber River Hydrology Update. Rainfall depths were extracted from the storm files.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 10

3 HYDROLOGICAL ANALYSES

This section discusses the existing soil, land use, drainage, and hydrological assessments for pre- and post-development conditions.

The study area straddles two watersheds. These are the Don River watershed and Humber River watershed.

For the Langstaff Road EA Study, a Visual OTTHYMO (VO5) hydrologic model was used to estimate localized runoff generated from the roadway and to calculate storage requirements to control flows from widened road sections to the required levels as per unit flow rates. This is to ensure that there will be no impact to the overall watershed hydrology for both Humber River and West Don River watersheds.

Unit flow rate details of the West Don River watershed and Humber River watershed are included in **Appendix B**.

3.1 Existing Drainage Condition

The study area lies within the watersheds of the Humber River (Black Creek tributary) and West Don River. There are three watercourses that cross Langstaff Road, which are Black Creek (tributary of Humber River), West Don River (tributary of Don River) and Westminster Creek (tributary of West Don River). **Figure 1** shows the extent of the study area and location of the existing crossing structures.

3.1.1 West Don River (West Branch of Don River)

The West Don River flows in a south-southeasterly direction towards Lake Ontario and crosses Langstaff Road approximately 250 meters east of Keele Street. The West Don River valley is classified as a Greenbelt Urban River Valley, as per the Ontario Provincial Greenbelt Act. The West Don River has its headwaters atop the Oak Ridges Moraine, specifically, the Maple Spur, approximately eight kilometres northwest of the study area.

3.1.2 Westminster Creek

A small and mainly channelized warm water creek which flows north to south and crosses Langstaff Road approximately 300 meters west of Dufferin Street. This creek originated from approximately 2.8 km north of Langstaff Road. Roadside ditches of Langstaff Road from both east and west sides drains to this creek. The Westminster Creek crosses Langstaff Road by a 2-cell (each 3.7 m span) concrete box culvert.

3.1.3 Black Creek

Black Creek, a tributary to the Humber River, flows through the western portion of the study area in the proximity of Highway 400, in a north to south direction. The headwaters of Black Creek are located northwest of the intersection of Rutherford Road

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 11

and Weston Road, which is now under residential development. Black Creek flows through a mainly channelized corridor south-southeast through the study area; however, certain reaches have been re-naturalized. Black Creek crosses Langstaff Road within the existing Highway 400 interchange by a 3-cell concrete box culvert, whereby the creek flows through a wide ditch with wetland vegetation beyond Langstaff Road ROW. Black Creek has been identified as a warm water creek within the Langstaff EA study area. The drainage divides between Black Creek (Humber River Watershed) and the Don River West (Don River Watershed) at Langstaff Road lies close to Jane Street.

3.1.4 Existing Drainage along Langstaff Road

The flows from the Langstaff Road area between Jane Street to the west study limits at Weston Road falls under the Humber River Watershed. The study area east of Jane Street falls under the West Don River Watershed. **Exhibits 3-1** to **3-10** illustrate existing conditions drainage mosaic of Langstaff Road corridor. All exhibits are included at the end of the report before appendices**.**

The minor system runoff from the roadway area west of Highway 400, Catchments 105 (drainage area of 1.63 ha) and 110 (drainage area of 1.49 ha), will be collected via storm sewers and directed to the existing storm sewer that runs southerly along Silmar Drive and Jevlan Drive, and ultimately discharges to the existing SWM Pond. The major storm runoff drains overland and ultimately drains by existing storm sewer.

Between Millway Avenue and Highway 400, the existing Langstaff Road (Catchments 115, 120, 125 and 130) drains toward Edgeley Boulevard and are collected by an existing 1200 mm diameter storm sewer. The storm sewer runs westerly from the south side of the road and outlets to Black Creek just south of Langstaff Road. The runoff from Jane Street and Millway Avenue is collected in an existing storm sewer that runs North to South side of Langstaff Road along Millway Avenue.

Runoff from Catchments 135 and 140 is conveyed by storm sewers and connected to the Storm Sewer C at Creditstone Road which runs southerly. This storm sewer discharges to SWM Pond C and drains to one of the tributaries of West Don River on the westside of the CN MacMillan Rail Yard.

Runoff from external Catchments 300 and 305 is conveyed by Storm Sewer D which outlets to the south-east of Langstaff Road and CN MacMillan Rail Yard Access Road. The outflow from this storm sewer discharges to SWM Pond C. More detailed discussion of external drainage is provided in **Section 3.2.1.**

Catchments 145 and 150 mostly include the area of the CN MacMillan Rail Yard. Overland flow from these catchments drain to a tributary of West Don River.

East of Keele Street, runoff from Catchments 155 and 160 will be conveyed by storm sewer which outlets to the West Don River on the downstream of the bridge from the west side.

Between Planchet Road and Connie Crescent, Langstaff Road has a rural road cross section (i.e. shoulders and ditches). Roadway area drains to roadside ditches on both the north and south side. Runoff from Catchment 190 and 180 drains the northside ditch

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 12

which convey the flow westerly up to Station 6+335. The existing 500 mm diameter culvert located at this station conveys the north side ditch flow to the southside ditch. The southside ditch starts from Catchment 195 and drains westerly collecting runoff from Catchment 185 and flows from the existing culvert. The ditch further drains westerly up to Station 6+220 and then it is conveyed by a storm sewer towards the West Don River. This storm sewer also collects runoff from Catchments 165 and 170 and ultimately outlets to the West Don River on the downstream of the bridge from the existing outlet located on the east bank of the river. There is no runoff quality and quantity control measures under existing conditions.

An existing storm sewer along Spinnaker Way that runs from the north side of Langstaff Road turns east on Langstaff Road and approximately 240 m east of Spinnaker Way (Station 7+140), this storm sewer (1050 mm diameter) runs southerly to Connie Crescent. This storm sewer turns east on Connie Crescent and then again run south along North Rivermede Road discharging ultimately to Westminster Creek. Between Connie Crescent and North Rivermede Road, Langstaff Road has a rural road cross section and drainage from the roadway is conveyed by ditches. The flow from the north side ditch of Catchment 205 is directed to the south side ditch via a twin 900 mm dimeter CSP culvert. The southside ditch drains easterly up to station approximately 7+140 which is then directed to a 1050 mm dimeter (42 inch) storm sewer (as per constructed drawing of December 12, 1979, Drawing# 77-104-8, 77-104-9, Sheet 3 of 5) which runs southerly.

Runoff from Catchments 215 and 220 drains by north and south side ditches, respectively and discharges into Westminster Creek from the west side.

Runoff from Catchment 225 is conveyed by the north side ditch and discharges into Westminster Creek. Two existing storm sewers (1650 mm dimeter and 750 mm diameter) from Dufferin Street outlets to northside ditch at north-west corner of Langstaff road and Dufferin Street. One of the storm sewers is the storm outlet of the SWM facility located north-east of Dufferin Street and Langstaff Road intersection. Runoff from Catchment 230 is conveyed by the southside ditch to Westminster Creek.

3.1.5 Surface Soil and Land Use

Land use along the study area is highly urbanized consisting of a dense mix of commercial and industrial businesses, with only a small percentage of green areas (less than 10%) remaining in a relatively natural state. East of Dufferin Street and west of Weston Road, land use transitions to residential with some recreational / parkland east of Dufferin Street.

Land use features are summarized below:

— Lands adjacent to Langstaff Road between Weston Road and Dufferin Street are designated for employment

— Lands east of Dufferin Street are designated residential

— Core features of the Natural Heritage System are identified in three locations: within the Highway 400 / Langstaff Road Interchange; along the valley crossing

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 13

just east of Keele Street; and at the woodland located in the northeast quadrant of Langstaff Road and Dufferin Street.

Based on the Soil Survey Report No. 19 (Soils Survey of York County) of the Ontario Soil Survey, the predominant soils within the study area are Silt loam, interspersed with Clay with sand spots.

According to the Ontario Soil Mapping, these soils were classified as hydrologic soil groups (HSG) "BC" and "C", which represents soils with moderate to low runoff potential.

3.1.6 Existing Conditions Hydrologic Modelling

The hydrologic analysis is carried out by using Visual OTTHYMO (VO5) model which is a single event hydrologic model used to simulate hydrographs by modelling rainfall, infiltration, runoff and routing through a watershed. This model uses the Soil Conservation Service Curve Number (CN) Method of estimating runoff characteristics in combination with instantaneous unit hydrograph routines to produce storm hydrographs.

The hydrologic response for drainage areas with a directly connected impervious land use greater than 20 percent was obtained using the STANDHYD instantaneous unit hydrograph and NASH instantaneous unit hydrograph (NASHYD) is considered for impervious land use less than 20 percent.

The existing conditions hydrological parameters including the Curve Number (CN), Initial Abstraction (I_a), and the Time to Peak (T_p) are provided in **Appendix B**. In this preliminary design an initial abstraction (I_a) value of 2 mm is used for the hydrological analysis. As TRCA requires 1 mm of initial abstraction for impervious area, it is recommended to use 1 mm value of Ia during the detailed design phase.

Table 3-1 shows the results of the hydrologic simulation for the roadway area within the Humber River Watershed using AES 12-hour storm distribution. The Visual OTTHYMO schematics and summary of output files for existing conditions are included in **Appendix B**.

Table 3-1:   Existing Conditions Flows for Roadway Area within Humber River Watershed

Nodes / Catchments	Peak Flow Rate (m³/s)					
	2-year	**5-year**	**10-year**	**25-year**	**50-year**	**100-year**
105	0.065	0.090	0.107	0.129	0.145	0.162
110	0.060	0.084	0.100	0.121	0.136	0.153
400 (105+110)	0.125	0.174	0.207	0.249	0.281	0.315
115	0.035	0.049	0.060	0.073	0.083	0.093
120	0.048	0.066	0.079	0.096	0.108	0.120
410 (115+120)	0.083	0.115	0.139	0.168	0.190	0.212
125	0.081	0.112	0.136	0.165	0.187	0.209
130	0.072	0.101	0.123	0.150	0.170	0.190

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 14

405 (125+130)	0.153	0.214	0.259	0.315	0.357	0.399
420 (410+405)	0.236	0.329	0.399	0.483	0.547	0.611

As per the results shown in **Table 3-1,** Hydrograph 400 drains to the existing storm sewer that runs along Silmar Drive and Jevlan Drive, and ultimately outlets to the SWM facility located north -east of Chrislea Road and Jevlan Drive. Hydrograph 420, which is the sum of Catchments 115, 120, 125 and 130 drains to Black Creek via existing storm sewers.

Table 3-2 shows the results of hydrologic simulation for the roadway catchment areas within the West Don River Watershed. As mentioned above, the SCS 12-hour storm distribution is used for the analysis within the West Don River Watershed.

Table 3-2:   **Existing Conditions Flows for Roadway Area within West Don River Watershed**

Nodes / Catchments	Peak Flow Rate (m³/s)					
	2-year	5-year	10-year	25-year	50-year	100-year
135	0.078	0.116	0.141	0.174	0.198	0.234
140	0.081	0.115	0.139	0.168	0.196	0.222
420 (135+140)	0.158	0.231	0.280	0.342	0.394	0.456
145	0.218	0.299	0.365	0.438	0.493	0.550
425 (420+145)	0.377	0.530	0.645	0.780	0.887	1.006
155	0.038	0.055	0.066	0.080	0.091	0.102
160	0.034	0.047	0.057	0.068	0.078	0.087
430 (155+160)	0.072	0.102	0.123	0.149	0.169	0.189
150	0.397	0.515	0.601	0.699	0.774	0.849
180	0.036	0.054	0.067	0.082	0.094	0.107
185	0.030	0.041	0.051	0.062	0.070	0.079
445	0.065	0.095	0.118	0.144	0.164	0.186
165	0.036	0.054	0.065	0.080	0.091	0.103
170	0.035	0.048	0.057	0.069	0.079	0.087
450 (445+165+170)	0.136	0.197	0.240	0.293	0.334	0.376
190	0.048	0.068	0.086	0.105	0.119	0.134
195	0.048	0.071	0.086	0.105	0.120	0.135
455	0.096	0.139	0.172	0.210	0.238	0.269
458 (450+455)	0.232	0.335	0.412	0.503	0.573	0.645

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 15

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 16

Nodes / Catchments	Peak Flow Rate (m³/s)					
	2-year	**5-year**	**10-year**	**25-year**	**50-year**	**100-year**
205	0.062	0.089	0.114	0.140	0.160	0.181
210	0.058	0.082	0.103	0.126	0.144	0.162
460	0.120	0.171	0.217	0.266	0.305	0.344
215	0.042	0.058	0.071	0.085	0.095	0.107
220	0.042	0.061	0.074	0.09	0.102	0.115
470	0.084	0.119	0.145	0.175	0.197	0.221
225	0.062	0.086	0.106	0.128	0.145	0.162
230	0.049	0.068	0.081	0.100	0.112	0.126
475	0.111	0.154	0.187	0.228	0.257	0.287
480 (470+475)	0.195	0.272	0.332	0.402	0.454	0.508

3.2   Proposed Drainage Condition

Under the proposed (ultimate) conditions, Langstaff Road will be widened to 6-lane urban cross-section between Weston Road and Dufferin Street. However, as noted in Section 1, while the EA Study initially considered potential improvements to the interchange at Highway 400 and Langstaff Road, following extensive consultation with MTO, it was concluded that the planning of the improvements to the interchange will be subject to a future corridor study due to the extended scope of work along the Highway 400 corridor. For the purpose of this Class EA Study, Langstaff Road at Highway 400 (i.e. overpass) is assumed as 4-lanes for the proposed condition assessments and it also does not include any assessment related to Highway 400 access ramps. Drainage assessment associated with the Highway 400 interchange will be developed as part of the future corridor study.

The existing drainage pattern of the subwatershed will be maintained under the proposed improvement works.

Exhibits 3-11 to **3-20** (included at the end of the report) illustrate the proposed conditions drainage mosaics along the roadway which are prepared to estimate localized runoff generated from the roadway. Storage pipe (super pipe) and dry SWM pond facilities are provided at different locations to control the flows from the roadway to the pre-development conditions or unit flows, whichever is applicable, for the receiving storm sewers and watercourses.

The proposed drainage related works involve the following:

— A new culvert (LC1) at Station 4+390
— A dry SWM pond to control the peak flow based on the release rate of the Don River subwatershed unit flow

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 17

— A Wet SWM pond to control the peak flow based on the release rate of the Don River subwatershed unit flow and to provide enhanced level of water quality treatment

— Pipe storage pipe facilities for peak flow control

— Oil and grit separator units at the outlet of storage pipe facilities for runoff quality control

— Infiltration galleries for water balance as a LID measure

— Other Drainage improvements as required

3.2.1 Proposed Drainage Along Langstaff Road

The following is considered for the roadway drainage of Langstaff Road between Jane Street and the westerly study limit at Weston Road within the Humber River Watershed:

— The major and minor system runoff from the roadway area west of Highway 400, Catchments 105 and 110 will be collected via storm sewers. The runoff will be controlled to the existing condition 10-year flow through a pipe storage system (HSP-1A and HSP-1B) and the outflow from these storage pipes will be discharged to the existing storm sewer that runs from Silmar Drive / Jevlan Drive as in existing conditions and ultimately discharged to existing SWM Pond. Two OGS will be provided at the outlet of the pipe storage systems for additional quality measures.

— Between Highway 400 and Jane Street, both major and minor system runoff from the roadway Catchments 115 and 120, as well as Catchments 125 and 130 will be conveyed by storm sewers and will be controlled by a pipe storage system (HSP-2 and HSP-3). The runoff catchments on Langstaff Road between Millway Avenue and Jane Street are draining towards Millway Avenue and it is proposed to be diverted to the West towards Edgeley Blvd and a storage facility of HSP-3. Under existing conditions, a 1200 mm diameter storm sewer runs westerly from Edgeley Boulevard to Black Creek from the southside of Langstaff Road and discharges into Black Creek uncontrolled in term of both quality and quantity. Therefore, the proposed pipe storage system will control the flow from the post-development to the pre-development level to maintain the existing drainage pattern. An OGS will be provided downstream of the pipe storage system for the quality treatment of runoff.

The following is considered for the roadway drainage of Langstaff Road between Jane Street and Dufferin Street within the West Don River Watershed:

— The major and minor system runoff from the 2.70 ha roadway area east of Jane Street, Catchments 135 and 140, will be collected via storm sewers. The runoff will be controlled through a pipe storage (DSP-1) then discharged to a dry SWM facility (DDP-1).

— The major and minor system runoff from the 3.05 ha of Catchment 145 (including pond area) and outflow flows from pipe storage DSP-1 will be conveyed by storm sewers and will discharge to the dry SWM facility (DDP-1) located on the north-east corner, at approximate Sta. 4+200, of the proposed overpass of Langstaff Road

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 18

across CN MacMillan Rail Yard (on the west side of the yard). This SWM facility will provide quantity control of peak flow based on the unit flow release rate (Sub-basin 6) and the controlled outflow will be discharged to the upstream of proposed Culvert LC1, located just east of Creditstone Road. An OGS will be provided for quality control.

A detailed investigated has been carried out to confirm the drainage area draining to proposed Langstaff Culvert (LC1). For this purpose, drainage boundary prepared for the PCSWMM Hydrologic Model has been reviewed, conducted site visit to confirm the drainage condition and collected the storm sewer information from the York Region to determine the actual sewershed area since the area upstream of the Langstaff Road is all developed.

Based on the storm sewer information received from York Region, as well as from the information gathered from the site investigation in 14 June 2021, **Exhibit 3-20** has been prepared which illustrates the drainage pattern of the area. This exhibit illustrates the following:

— Catchment A does not completely drain to SWM Pond A. Only Area A1 drains to Pond A and remaining almost half of the area (Area A2) drains to Pond B via Storm Sewer E. Controlled flow from Pond A is conveyed by Storm Sewer A to the outlet point at West Don River as shown in **Exhibit 3-20**. Outflow from Pond B also discharges to the West Don River.

— Similarly, Catchment B is divided in three segments.

     — Area B1 is drained by Storm Sewer A and outlets to the West Don River.

     — Runoff from Area B2 is conveyed by Storm Sewer C which runs southerly along Creditstone Road and directed to SWM Pond C.

     — Runoff from Area B3 is conveyed by Storm Sewer D which runs southerly and discharged south of Langstaff Road and east of CN MacMillan Rail Yard Access Road by a 1650 mm diameter storm sewer. Therefore, Area B3, drainage area of 26.5 ha (Catchment 325) contributes to Culvert LC1.

— Catchment C is divided into two segments.

     — Runoff from Area C1 is conveyed by Storm Sewer C and directed to SWM Pond C.

     — Runoff from Area C2 is conveyed by Storm Sewer D which was continued from Area B3 and discharges just south of Langstaff Road as discussed above.

— Catchment D is divided into three segments.

     — Runoff from Area D1 is conveyed by Storm Sewer B and directed to SWM Pond B for runoff quality and quantity control.

     — Runoff from Area D2 together with Area C2, total drainage area 21.7 ha (Catchment 300) contributes drainage to Culvert LC1.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 19

—   Runoff from Area D3 is conveyed by existing culverts and channel to Pond C as shown in Figure 2.

Therefore, as discussed above, Catchment 300 (drainage area 21.7 ha, Area C2 +Area D2) and Catchment 325 (drainage area 26.5 ha, Area B3) contribute runoff to Culvert LC1. The total drainage area draining to Culvert LC1 from the northside of Langstaff Road will be 48.2 ha. These areas are drained by a 1650 mm diameter sewer (Storm Sewer D) and discharged south of Langstaff Road and east of CN MacMillan Rail Yard Access Road. The outflow from this storm sewer ultimately drains to SWM Pond C for runoff quality and quantity control via existing ditch.

At Sta. 4+320, the new alignment of Langstaff Road crosses CN MacMillan Rail Yard Access Road by a bridge. Due to this bridge crossing, it will not be possible to convey the road runoff by a storm sewer from Sta. 4+670 westerly to Sta. 4+295. Road runoff will be drained overland in this stretch of the roadway and will be captured by catch basins just west of CN Access Road Bridge and will be directed to dry SWM facility DDP-1. Because of this constraint, it will not meet the minimum spread requirement. Therefore, during the detailed design phase, it is recommended to explore the possibility of utilizing the City of Vaughan SWM pond (SWM Pond C) located just south of the CNR overpass so that road runoff can be conveyed by a storm sewer and discharged into the SWM Pond C.

—   A wet pond SWM pond facility (DWP-1) is proposed at the north-west corner of the proposed overpass of Langstaff Road across the CN MacMillan Rail Yard and Keele Street. This SWM facility will collect major and minor system runoff from Catchments 150 (drainage area of 3.81 ha) and controls flows based on the Don River unit flow release rate (Sub-basin 1). This wet SWM facility will provide an enhanced level of quality treatment. The controlled outflow will be conveyed by a storm sewer which will be connected to the existing storm sewer on the east side of Keele Street and outlets to West Don River via existing outlet. This facility will be overcontrolled to balance as much as possible the uncontrolled flow from Catchments 155 and 160. Runoff from Catchments 155 and 160 will be conveyed by storm sewer and discharged to the West Don River as in existing conditions.

—   The major and minor system runoff from the new urbanized roadway including Catchments 165, 170, 180 and 185 will be conveyed by storm sewers to a pipe storage facility. This pipe storage facility (DSP-2) will control the flows based on the Don River unit flow release (Sub-basin 5) and the controlled outflows will be discharged to the downstream side of the bridge utilizing the existing outlet. Since no quantity control is proposed for runoff from Catchments 155 and 160 this pipe storage will also be over controlled to account for the uncontrolled flows. The quality treatment for the catchment will be provided by an OGS before discharging to the receiving watercourse.

—   Due to the proposed overpass of GO Transit Barrie Line, runoff from Catchments 190 and 195 can not be directed to the existing outlet location, i.e. downstream of

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 20

the West Don River Bridge. The major and minor system runoff from the roadway area between the GO Transit Barrie Line and North Rivermede Road, i.e. Catchments 190, 195, 205 and 210 will be discharged to two separate storage pipe system (DSP-3A and DSP-3B). The storage pipe will control the combined flow equivalent to the 10-year flow of Catchments 205 and 210 to maintain the existing flow conditions at the outlet. The controlled outflow from the storage pipe will be conveyed to the existing 1050 mm pipe that runs southerly between Connie Crescent and north Rivermede Road (approximate Sta. 7+140) and conveys the flow maintaining the existing drainage pattern.

— The major and minor system runoff from the new urbanized roadway of Catchment 215 and 220 will be conveyed by storm sewers and will discharge to a pipe storage (DSP-4) located on the east side of Staffern Drive. This SWM facility will provide quantity control of peak flow based on the unit flow release rate (Sub-basin 8A) and the controlled outflow will be discharged to the downstream side of Langstaff Road culvert at Westminster Creek. An OGS will be provided for runoff quality control.

— Similarly, runoff from Catchment 225 and 230 will be discharged to a pipe storage facility (DSP-5) located to the west of Dufferin Street which will provide peak flow control of the roadway runoff. This linear facility will control the flows based on the Don River unit flow release rate (Sub-basin 8A) and the controlled outflow will be discharged on the downstream of Langstaff Road culvert at Westminster Creek. An OGS will be provided for quality control.

— Under existing conditions, the north side ditch located between Westminster Creek and Dufferin Street used to convey the flow from the two existing storm sewers (1650 mm dimeter and 750 mm diameter) from Dufferin Street. During the interim 4-lane scenario, the existing ditch will be maintained. For the ultimate 6-lane scenario, to accommodate the widened road section, ditch section will be modified with retaining wall along the side of Langstaff Road; however, the existing capacity of the ditch will be maintained.

As per the survey information, the existing channel has a bottom width of 0.42 m, side slope 2.67H:1V and channel slope 0.67%. Within the maximum allowable depth of 1.0 m, the maximum capacity of the existing channel is 5.44 m³/s.

The proposed modification of the channel section includes 2.5H:1V side slope on the north side and vertical wall on the side of Langstaff Road, bottom width 1.75 m and channel slope 0.67% (existing). Within the maximum allowable depth of 1.0 m, the maximum capacity of the channel would be 5.46 m³/s.

The analysis of existing and proposed channel is provided in **Appendix E**.

3.2.2 Proposed Conditions Hydrologic Modelling

As noted in **Section 2.3**, the hydrologic assessments of the roadway corridor were carried out using the SCS 12-hour and AES 12-hour storm distributions.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 21

For the proposed Langstaff Road Improvements preliminary design study, a Visual OTTHYMO hydrologic model is developed to estimate the localized runoff generated from the roadway and to calculate storage requirements to control flows from the widened road sections to the pre-development levels or unit flow release rate to ensure that there will be no impact to the overall watershed hydrology due to the road widening.

The hydrologic parameters for proposed conditions, VISUAL OTTHYMO schematics and output files for post-development conditions are included in **Appendix B**. In the preliminary design as part of the EA Study, an initial abstraction (I_a) value of 2 mm is used for the proposed conditions hydrological analysis. As TRCA requires 1 mm of initial abstraction for impervious area, it is recommended to use 1 mm value of I_a during the detailed design phase.

Table 3-3 summarizes the results of the proposed conditions hydrologic modelling for the road corridor located within the Humber River Watershed. The analysis is based on the AES 12-hour storm distribution.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York
WSP
December 2021
Page 22

Table 3-3:   Proposed Conditions Flows for Roadway Area within Humber River Watershed

Nodes / Catchments	Peak Flow Rate (m³/s) (AES 12-hour)					
	2-year	5-year	10-year	25-year	50-year	100-year
105	0.069	0.094	0.111	0.133	0.149	0.166
520 (HSP-1A)	0.050	0.075	0.091	0.110	0.124	0.139
110	0.067	0.091	0.108	0.129	0.144	0.161
525 (HSP-1B)	0.048	0.073	0.087	0.106	0.120	0.135
115	0.041	0.055	0.066	0.079	0.089	0.100
120	0.055	0.074	0.087	0.104	0.116	0.129
410 (115+120)	0.095	0.130	0.154	0.183	0.205	0.229
510 (HSP-2)	0.056	0.067	0.074	0.081	0.084	0.087
125	0.100	0.136	0.16	0.19	0.212	0.235
130	0.096	0.129	0.151	0.178	0.199	0.219
405 (125+130)	0.196	0.265	0.311	0.368	0.411	0.454
505 (HSP-3)	0.171	0.227	0.261	0.288	0.306	0.325
420 (510+505)	0.226	0.293	0.334	0.369	0.389	0.411

Table 3-4 summarizes the results of the proposed conditions hydrologic modelling for the road corridor located within the West Don River Watershed. The analysis is based on the SCS 12-hour storm distribution.

Table 3-4:   Proposed Conditions Flows for the Roadway Area within West Don River Watershed

Nodes / Catchments	Peak Flow Rate (m³/s) (SCS 12-hour)					
	2-year	5-year	10-year	25-year	50-year	100-year
135	0.144	0.188	0.22	0.258	0.285	0.317
140	0.121	0.160	0.188	0.220	0.246	0.274
420 (135+140)	0.265	0.348	0.408	0.478	0.531	0.590
530 (DSP-1)	0.012	0.028	0.039	0.044	0.048	0.052
145	0.251	0.337	0.403	0.479	0.536	0.611
425 (420+145)	0.261	0.348	0.415	0.498	0.565	0.653
512 (DDP-1)	0.028	0.052	0.064	0.074	0.080	0.086
155	0.057	0.075	0.087	0.102	0.113	0.124
160	0.045	0.058	0.068	0.079	0.087	0.096
430 (155+160)	0.102	0.133	0.155	0.181	0.200	0.220

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 23

Nodes / Catchments	Peak Flow Rate (m³/s) (SCS 12-hour)					
	2-year	5-year	10-year	25-year	50-year	100-year
150	0.399	0.517	0.603	0.700	0.776	0.851
515 (DWP-1)	0.008	0.009	0.010	0.010	0.011	0.011
440 (430+515)	0.108	0.140	0.163	0.189	0.209	0.229
180	0.045	0.064	0.077	0.093	0.105	0.118
185	0.039	0.052	0.063	0.076	0.085	0.094
445	0.084	0.116	0.141	0.169	0.190	0.212
165	0.052	0.070	0.084	0.099	0.111	0.123
170	0.045	0.059	0.068	0.080	0.088	0.097
450	0.182	0.245	0.293	0.348	0.389	0.431
520 (DSP-2)	0.016	0.019	0.020	0.021	0.022	0.022
190	0.059	0.081	0.099	0.119	0.134	0.150
195	0.069	0.093	0.11	0.131	0.147	0.162
455	0.128	0.174	0.209	0.250	0.280	0.312
555 (DSP-3A)	0.026	0.055	0.080	0.112	0.135	0.158
205	0.096	0.129	0.152	0.181	0.203	0.225
210	0.084	0.112	0.133	0.157	0.177	0.196
460	0.180	0.241	0.285	0.338	0.38	0.421
525 (DSP-3B)	0.074	0.103	0.136	0.173	0.201	0.228
465 (555+525)	0.010	0.156	0.216	0.285	0.336	0.386
215	0.054	0.072	0.085	0.100	0.111	0.122
220	0.052	0.073	0.086	0.104	0.117	0.130
470	0.106	0.144	0.171	0.204	0.228	0.252
535 (DSP-4)	0.010	0.011	0.012	0.015	0.017	0.020
225	0.062	0.086	0.106	0.128	0.145	0.162
230	0.054	0.073	0.087	0.106	0.119	0.134
475	0.116	0.159	0.193	0.234	0.263	0.296
540 (DSP-5)	0.022	0.026	0.028	0.032	0.037	0.041
480 (535+540)	0.032	0.037	0.041	0.047	0.054	0.061

As discussed in Section 3.2.1, Catchment 300 (drainage area 21.7 ha) and Catchment 325 (drainage area 26.5 ha) contribute runoff to Culvert LC1. In addition to this flow, runoff from Catchment 350 as well as outflow from Dry Pond DDP-1 also drain to this culvert. For the external area (Catchments 300, 325 and 350) PCSWMM hydrologic modelling is used to determine the flow in which the parameters are taken from the Don River PCSWMM model. The outflow from the dry pond is added to the flow from these catchments to generate the overall flow for Culvert LC1.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 24

The proposed conditions peak flow for the new Culvert LC1, located just east of Creditstone Road, Station 4+390 is summarized in **Table 3-5**.

Table 3-5:   Proposed Conditions Flows for Culvert LC1

Catchment	Flows (m^3/s)					
	2-year	5-year	10-year	25-year	50-year	100-year
300, 325 and 350 (PCSWMM)	1.326	1.782	2.086	2.464	2.817	3.128
Outflow from DDP-1 (HYD 512, (Table 3-4)	0.028	0.052	0.064	0.074	0.080	0.086
Flow to Culvert LC1	1.351	1.834	2.150	2.538	2.897	3.214

Table 3-6 provides a comparison of flows between existing and proposed conditions within the Humber River watershed with the SWM facility in-place.

Table 3-6:   Comparison of Pre- and Post-Development Flows within the Humber River Watershed

Description	NHYD	12-hour AES Storm Flows (m^3/s)					
		2-year	5-year	10-year	25-year	50-year	100-year
Existing Conditions (Ex)	105	0.065	0.090	0.107	0.129	0.145	0.162
Proposed – Uncontrolled	105	0.069	0.094	0.111	0.133	0.149	0.166
Proposed with Pipe Storage HSP-1A (Pr)	520	0.050	0.075	0.091	0.110	0.124	0.139
Difference (Pr - Ex)		-0.015	-0.015	-0.016	-0.019	-0.021	-0.023
Existing Conditions (Ex)	110	0.060	0.084	0.100	0.121	0.136	0.153
Proposed– Uncontrolled	110	0.067	0.091	0.108	0.129	0.144	0.161
Proposed with Pipe Storage HSP-1B (Pr)	525	0.048	0.073	0.087	0.106	0.120	0.135
Difference (Pr - Ex)		-0.13	-0.012	-0.011	-0.013	-0.015	-0.016
Existing (Includes Catchments 115, 120, 125 and 130) (Ex)	420	0.236	0.329	0.399	0.483	0.547	0.611
Proposed – Uncontrolled (Includes Catchments 115, 120, 125 and 130)	420	0.291	0.393	0.463	0.550	0.614	0.680
Proposed with SWM FacilityPipe Storage HSP-2 and HSP-3 (Pr)	420	0.226	0.293	0.334	0.369	0.389	0.411
Difference (Pr - Ex)		-0.010	-0.036	-0.065	-0.114	-0.158	-0.200

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 25

Table 3-7 provides a comparison of flows between existing and proposed conditions within the Don River watershed with the SWM facility in-place.

Table 3-7: **Comparison of Pre- and Post-Development Flows within the Don River Watershed**

Description	NHYD	12-hour SCS Storm Flows (m³/s)					
		2-year	5-year	10-year	25-year	50-year	100-year
Existing Conditions (Includes Catchments 135, 140 and 145) (Ex)	425	0.377	0.530	0.645	0.780	0.887	1.006
Proposed - Uncontrolled (Includes Catchments 135, 140 and 145)	425	0.516	0.685	0.811	0.957	1.067	1.202
Proposed with SWM Facility Dry pond DDP-1 (Pr)	512	0.028	0.052	0.064	0.074	0.080	0.086
Difference (Pr - Ex)		-0.349	-0.478	-0.581	-0.706	-0.807	-0.920
Unit Flow Sub-basin 6		0.019	0.036	0.052	0.066	0.078	0.094
Difference (Pr – Unit Flow)		0.009	0.016	0.012	0.006	0.002	-0.008
Existing (Ex) (Includes Catchments 150)	150	0.397	0.515	0.601	0.699	0.774	0.849
Proposed – Uncontrolled (Includes Catchments 150)	150	0.399	0.517	0.603	0.700	0.776	0.851
Proposed with SWM Facility Pond DWP-1 (over controlled to account the uncontrolled flows of Catchments 155 and 160) (Pr)	515	0.008	0.009	0.010	0.010	0.011	0.011
Difference (Pr - Ex)		-0.389	-0.506	-0.591	-0.689	-0.763	-0.838
Unit Flow Sub-basin 1		0.013	0.020	0.026	0.031	0.044	0.055
Difference (Pr – Unit Flow)		-0.005	-0.011	-0.016	-0.021	-0.033	-0.044
Existing (Includes Catchments 165, 170, 180 and 185) (Ex)	450	0.136	0.197	0.240	0.293	0.334	0.376
Proposed - Uncontrolled		0.266	0.361	0.434	0.517	0.579	0.643
Proposed with Pipe Storage system DSP-2 (Pr)	520	0.016	0.019	0.020	0.021	0.022	0.022
Difference (Pr - Ex)		-0.120	-0.178	-0.220	-0.272	-0.312	-0.354
Unit Flow Sub-basin 1		0.008	0.016	0.022	0.028	0.034	0.04
Difference (Pr – Unit Flow)		0.008	0.003	-0.002	-0.007	-0.012	-0.018

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 26

Description	NHYD	12-hour SCS Storm Flows (m³/s)					
		2-year	5-year	10-year	25-year	50-year	100-year
Existing (Includes Catchments 205 and 210) (Ex)	460	0.120	0.171	0.217	0.266	0.305	0.344
Proposed – Uncontrolled (Includes Catchments 190, 195 and 205 and 210)	465	0.308	0.415	0.494	0.588	0.660	0.733
Proposed with Pipe Storage systems DSP-3A and DSP-3B (Pr) (Control to 10-year flow)	465	0.010	0.156	0.216	0.285	0.336	0.386
Difference (Pr - Ex)		-0.110	-0.015	-0.001	0.019	0.031	0.042
Existing (Includes Catchments 215, 220, 225 and 230) (Ex)	480	0.195	0.272	0.332	0.402	0.454	0.508
Proposed – Uncontrolled (Includes Catchments 215, 220, 225 and 230)	480	0.032	0.304	0.365	0.438	0.491	0.548
Proposed with Pipe Storage system DSP-5 (Pr)	480	0.032	0.037	0.041	0.047	0.054	0.061
Difference (Pr - Ex)		-0.163	-0.235	-0.291	-0.355	-0.400	-0.447
Unit Flow Sub-basin 8A		0.013	0.025	0.035	0.045	0.054	0.065
Difference (Pr – Unit Flow)		0.019	0.012	0.006	0.002	0.000	-0.004

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 27

4   HYDRAULIC ANALYSIS

As noted in previous sections, the study area lies within the watersheds of the Humber River (Black Creek tributary) and Don River (West Don River and Westminster Creek). There are three watercourses that cross Langstaff Road within the study area at three locations: Black Creek (tributary of Humber River), West Don River (tributary of Don River) and Westminster Creek (tributary of West Don River).

The widening of Langstaff Road is not expected to have a direct impact to the Black Creek crossing and Westminster Creek crossing. Therefore, only the existing conditions water levels are provided for these crossings.

4.1   Black Creek Crossing

Black Creek, a tributary to the Humber River, flows through the western portion of the study area, in a north to south direction. Black Creek crosses Langstaff Road within the existing interchange with Highway 400 by a 3-cell concrete culvert, whereby the creek flows through a wide ditch with wetland vegetation.

The existing culvert at Langstaff Road consists of a 3-cell culvert, the size of each is 2.4 m span x 2.4 m rise x 60 m long. All three cells are of equal size.

A HEC-RAS model and the floodplain map (Sheet No. 13C) was received from the TRCA for this watercourse.

Table 4-1 provides the existing conditions flow for Black Creek Culvert at Langstaff Road which is extracted from the HEC-RAS model.

Table 4-1:   Flow for Black Creek Culvert at Langstaff Road

Storm Event	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	Regional
Flow (m^3/s)	3.07	4.07	4.85	5.93	6.83	7.62	47.8

Tables 4-2 illustrates the hydraulic performance assessment of the existing Black Creek Culvert at Langstaff Road.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 28

Table 4-2: **Hydraulic Performance Analysis of Existing Black Creek Culvert at Langstaff Road**

Structure Description (Upstream Face, Section 46.392)	50-Year	100-Year	Regional
Clear Opening	3-cell, 2.4 m span each	3-cell, 2.4 m span each	3-cell, 2.4 m span each
Water Surface Elevation (m)	203.60	203.76	206.54
Energy Grade Line Elevation (m)	203.63	203.78	206.55
Top of Road Elevation at Low Point (m)	211.5	211.5	211.5
Upstream Invert Elevation (m)	202.5	202.5	202.5
Top of Road Freeboard (Minimum)	7.90	7.74	4.96
Top of Road Freeboard (Desired)	7.87	7.72	4.95
Soffit Elevation (Upstream)	204.90	204.90	204.90
Flood Depth ((H/D Ratio)	0.15	0.17	0.56

Results provided in **Table 4-2** show that the existing culvert meets all hydraulic requirements. The Regional Storm does not overtop Langstaff Road.

The road widening is not expected to directly impact this culvert; therefore, the proposed conditions hydraulic assessment is not carried out.

The existing conditions hydraulic analysis output for the Black Creek culvert is provided in **Appendix C.**

4.2 West Don River Crossing

The West Don River is the west branch of the Don River which flows in a south-southeasterly direction towards Lake Ontario and crosses Langstaff Road approximately 200 meters east of Keele Street. The location of the existing bridge on Langstaff Road is shown in **Figure 1**.

The existing West Don River bridge at Langstaff Road has a size of 11.4 m span x 2.25 m rise. This bridge is also identified as Bowes Bridge. Downstream of the Langstaff Road crossing, the river crosses through the newly constructed 3-span GO Transit Barrie Line bridge (total span length 32 m from center of the abutments).

It is identified that the proposed widening of Langstaff Road will require a replacement of the existing West Don River crossing.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 29

A Technical Memorandum was submitted to the TRCA on May 28, 2020, which documented the hydraulic assessment undertaken to determine the need of the bridge replacement and the sizing of the replacement bridge to reduce the potential impacts to the West Don River water levels. TRCA has given consensus on the hydraulic assessment memorandum on June 15, 2020. All the details of the memorandum are included in this report.

WSP has reviewed HEC-RAS hydraulic modelling data (Basin 5) received from TRCA for the West Don River. The model does not include the new GO Transit Barrie Line crossing located downstream of Langstaff Road crossing, which was recently constructed. In consultation with TRCA, WSP has used the model prepared in 2015 for Metrolinx which included the newly constructed GO Transit Barrie Line crossing structure at the West Don River and the model is further updated for the Langstaff Road crossing.

4.2.1 Flow Update on Hydraulic Model

The Don River hydrology model has been updated by using the new PCSWMM hydrological model which was approved by TRCA in 2019. Based on this update, the flows in the HEC-RAS model of West Don River, Basin 5, is required to be updated. **Table 4-3** summarizes the flows at the node points related to the hydraulic model and also provides a comparison with the previous flows. As per the "read-me first" note provided with the model, the 2-year to the 100-year flows are based on the existing condition with controlled scenario; and the Regional Storm flow is based on future conditions with the uncontrolled scenario.

Table 4-3: Summary of Flows for the West Don River HEC-RAS Model

Flow Node	HEC-RAS Section	Hydrology	Flow (m^3/s)						
			2-year	5-year	10-year	25-year	50-year	100-year	Regional
5.3	**5.53**	**2019 Flows**	**5.89**	**7.83**	**9.04**	**10.55**	**12.69**	**15.60**	**198.16**
	5.53	2004 Flows	9.47	13.86	17.75	28.48	36.72	44.26	110.88
C346	**5.44**	**2019 Flows**	**10.32**	**13.25**	**14.82**	**16.70**	**18.87**	**21.08**	**252.81**
	5.44	2004 Flows	12.15	17.04	22.50	33.16	42.22	50.26	252.39
J584	**5.43**	**2019 Flows**	**11.20**	**14.39**	**16.21**	**18.42**	**20.93**	**23.42**	**259.19**
	5.43	2004 Flows	12.15	17.04	22.50	33.16	42.22	50.26	252.39
J272 / J584	**5.21**	**2019 Flows**	**11.43**	**14.67**	**16.74**	**18.98**	**21.45**	**24.08**	**259.19**
	5.21	2004 Flows	14.51	20.81	26.91	36.81	47.82	62.78	282.53

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 30

Flow Node	HEC-RAS Section	Hydrology	Flow (m³/s)						
			2-year	5-year	10-year	25-year	50-year	100-year	Regional
5.1	**5.155**	**2019 Flows**	**14.49**	**18.33**	**20.78**	**23.55**	**26.60**	**30.07**	**293.08**
	5.155	2004 Flows	16.90	24.63	31.38	40.51	53.51	75.50	313.13
7.2	**5.00**	**2019 Flows**	**20.37**	**26.16**	**30.41**	**35.81**	**40.95**	**46.62**	**365.39**
	5.00	2004 Flows	16.90	24.63	31.38	40.51	53.51	75.50	313.13
J159	**50.44**	**2019 Flows**	**0.89**	**1.18**	**1.37**	**1.61**	**1.84**	**2.34**	**27.60**
	50.44	2004 Flows	1.92	2.87	3.49	6.22	8.99	14.26	20.17
J216	**50.30**	**2019 Flows**	**1.67**	**2.27**	**2.66**	**3.16**	**3.69**	**4.42**	**36.24**
	50.28	2004 Flows	3.00	4.48	5.47	9.73	14.06	22.31	31.55
J612	**50.20**	**2019 Flows**	**2.63**	**3.07**	**3.34**	**3.80**	**4.56**	**5.22**	**62.64**
	50.20	2004 Flows	4.75	7.10	8.67	15.42	17.05	35.36	50.02
8.1	**50.10**	**2019 Flows**	**2.72**	**3.19**	**3.46**	**3.94**	**4.71**	**5.42**	**63.27**
	50.10	2004 Flows	5.25	7.85	9.58	17.05	17.91	39.10	55.30

As per **Table 4-3**, the 2019 frequency storm flows (2-year to 100-year) are lower than the 2004 flows; however, the 2019 Regional storm flow is higher in most cases.

At Node J272, the Regional Storm flow, as per the PCSWMM hydrological model, is 255.52 m³/s which is less then that of the upstream Node J584. Therefore, for HEC-RAS Section 5.21, the 2-year to the 100-year flows are based on Node J272 and the Regional storm flow is based on the Node J584 to get the conservative result.

4.2.2   Existing Conditions Hydraulic Analysis of Bowes Bridge

The HEC-RAS hydraulic model Basin 5 was obtained from TRCA. This model does not include the newly constructed bridge at GO Transit Barrie Line which is located just downstream of the Langstaff Road crossing. In consultation with TRCA, WSP used the model prepared in 2015 for Metrolinx which included the newly constructed GO Transit Barrie Line crossing structure and the model is further updated by adding additional cross-sections upstream of the Langstaff Road based on new survey information. The updated "Basin5_ExRev2_Apr2020" model is considered the existing conditions model for the hydraulic modelling of the Langstaff Road crossing.

The following updates are included for the existing conditions hydraulic modelling:

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 31

— Three sections 5.425, 5.43 and 5.435 are added on the upstream of Langstaff Road to properly reflect the topography.

— Existing road profile of Langstaff Road is updated in the model per available survey information.

— Section 5.39 on the downstream is removed as it appears to be too close to Section 5.40 and affecting the proposed conditions modelling.

The hydraulic performance summary of the existing bridge structure is provided in **Table 4-4**. The low point elevation of the existing road is 199.45 m and located approximately 50 m east of the existing bridge. The lowest point of the soffit of the existing bridge is 198.45 m.

Table 4-4:   Hydraulic Performance Analysis of Existing Bowes Bridge

Structure Description (At Upstream Face, Section 5.41)	50-Year	100-Year	Regional
Clear opening (m)	11.40	11.40	11.40
Water Surface Elevation (m)	196.69	196.77	200.55
Energy Grade Line Elevation (m)	196.88	196.97	200.63
Top of Road Elevation at Low Point (m)	199.45	199.45	199.45
Top of Road Freeboard (Minimum) (m)	2.76	2.68	-1.10
Top of Road Freeboard (Desired) (m)	2.57	2.45	n/a
Soffit Elevation (Upstream) (m)	198.45	198.45	198.45
Soffit Clearance (m)	1.76	1.68	n/a

The results provided in **Table 4-4** show that the existing bridge meets the freeboard requirement for the 100-year storm event; however, the Regional Storm overtops Langstaff Road by 1.10 m. The existing bridge also meets the soffit clearance requirement of 1.0 m for the 100-year storm event.

4.2.3   Proposed Conditions Hydraulic Analysis of Bowes Bridge

Under proposed conditions, Langstaff Road will be widened to six lanes with a Multi-Use Path (MUP) on both sides of the bridge. To accommodate the widened road and to improve the flooding conditions upstream of Langstaff Road, the existing structure is proposed to be replaced by a new 30 m (clear perpendicular opening) single span bridge. For the proposed conditions model, the revised existing conditions model is further updated to reflect the proposed bridge. Two immediately upstream cross-sections 5.41 and 5.42 will be removed to accommodate the widened road. The updated "*Basin5_Pr_Opt4_Apr2020*" model is considered as the proposed conditions model for the hydraulic modelling of the Langstaff Road crossing. A comparison of

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 32

hydraulic modelling results between the existing conditions and proposed conditions is provided in **Table 4-5**.

The results in **Table 4-5** illustrates that:

— The proposed bridge has a positive impact to the upstream water levels. The water levels decreased for the 2-year to the 100-year flows and for the Regional Storm flow upstream of the structure. The 50-year water level, the 100-year design water level and the Regional Storm water level decreased by 0.24 m, 0.26 m and 0.31 m, respectively.

— The decrease in water level extends approximately 1.0 km upstream. The water levels are close to the existing conditions upstream of Section 5.45.

— At the downstream face of the structure, water levels are very close to existing conditions and further downstream, the proposed conditions water levels are the same as the existing conditions water levels.

Table 4-5: Comparison of Hydraulic Modelling Results

River Station	Profile	Flow (m³/s)	Existing Conditions		Proposed Conditions		Comparison	
			W. S. Elev. (m)	Flow Velocity (m/s)	W. S Elev. (m)	Flow Velocity (m/s)	W. S. Elev. (m)	Flow Velocity (m/s)
			(A)	(B)	(C)	(D)	(C-A)	(D-B)
5.47	2 Year	5.89	198.23	1.52	198.22	1.53	-0.01	0.01
5.47	5 Year	7.83	198.33	1.66	198.33	1.67	0.00	0.01
5.47	10 Year	9.04	198.38	1.75	198.38	1.76	0.00	0.01
5.47	25 Year	10.55	198.42	1.93	198.42	1.92	0.00	-0.01
5.47	50 Year	12.69	198.50	2.03	198.49	2.06	-0.01	0.03
5.47	100 Year	15.60	198.58	2.16	198.57	2.19	-0.01	0.03
5.47	Regional	198.16	201.06	1.94	201.05	1.95	-0.01	0.01
5.46	2 Year	5.89	197.64	1.15	197.65	1.13	0.01	-0.02
5.46	5 Year	7.83	197.76	1.24	197.76	1.23	0.00	-0.01
5.46	10 Year	9.04	197.82	1.28	197.82	1.27	0.00	-0.01
5.46	25 Year	10.55	197.93	1.25	197.92	1.27	-0.01	0.02
5.46	50 Year	12.69	197.98	1.38	198.00	1.34	0.02	-0.04
5.46	100 Year	15.60	198.07	1.49	198.09	1.45	0.02	-0.04
5.46	Regional	198.16	200.90	2.31	200.88	2.32	-0.02	0.01
5.45	2 Year	5.89	196.92	1.58	196.90	1.63	-0.02	0.05
5.45	5 Year	7.83	197.04	1.66	197.02	1.72	-0.02	0.06
5.45	10 Year	9.04	197.10	1.73	197.08	1.80	-0.02	0.07
5.45	25 Year	10.55	197.18	1.72	197.15	1.86	-0.03	0.14
5.45	50 Year	12.69	197.27	1.70	197.23	1.84	-0.04	0.14
5.45	100 Year	15.60	197.34	1.79	197.29	1.96	-0.05	0.17
5.45	Regional	198.16	200.73	1.67	200.72	1.68	-0.01	0.01

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York
WSP
December 2021
Page 33

River Station	Profile	Flow (m³/s)	Existing Conditions		Proposed Conditions		Comparison	
			W. S. Elev. (m)	Flow Velocity (m/s)	W. S Elev. (m)	Flow Velocity (m/s)	W. S. Elev. (m)	Flow Velocity (m/s)
			(A)	(B)	(C)	(D)	(C-A)	(D-B)
5.44	2 Year	10.32	196.90	0.46	196.89	0.47	-0.01	0.01
5.44	5 Year	13.25	197.03	0.53	197.01	0.54	-0.02	0.01
5.44	10 Year	14.82	197.09	0.56	197.06	0.57	-0.03	0.01
5.44	25 Year	16.70	197.15	0.59	197.13	0.60	-0.02	0.01
5.44	50 Year	18.87	197.23	0.62	197.19	0.64	-0.04	0.02
5.44	100 Year	21.08	197.30	0.65	197.26	0.68	-0.04	0.03
5.44	Regional	252.81	200.70	1.44	200.68	1.44	-0.02	0.00
5.435	2 Year	10.32	196.81	0.87	196.79	0.91	-0.02	0.04
5.435	5 Year	13.25	196.92	0.95	196.89	0.99	-0.03	0.04
5.435	10 Year	14.82	196.98	0.99	196.94	1.04	-0.04	0.05
5.435	25 Year	16.70	197.04	1.03	197.00	1.08	-0.04	0.05
5.435	50 Year	18.87	197.11	1.06	197.06	1.13	-0.05	0.07
5.435	100 Year	21.08	197.18	1.09	197.11	1.18	-0.07	0.09
5.435	Regional	252.81	200.65	1.47	200.63	1.48	-0.02	0.01
5.43	2 Year	11.20	196.70	0.62	196.65	0.70	-0.05	0.08
5.43	5 Year	14.39	196.83	0.64	196.76	0.71	-0.07	0.07
5.43	10 Year	16.21	196.89	0.65	196.82	0.73	-0.07	0.08
5.43	25 Year	18.42	196.96	0.67	196.89	0.74	-0.07	0.07
5.43	50 Year	20.93	197.04	0.68	196.95	0.76	-0.09	0.08
5.43	100 Year	23.42	197.12	0.69	197.02	0.78	-0.10	0.09
5.43	Regional	259.19	200.64	1.05	200.63	1.06	-0.01	0.01
5.425	2 Year	11.20	196.51	0.99	196.26	1.47	-0.25	0.48
5.425	5 Year	14.39	196.64	1.06	196.41	1.46	-0.23	0.40
5.425	10 Year	16.21	196.70	1.11	196.48	1.48	-0.22	0.37
5.425	25 Year	18.42	196.78	1.15	196.56	1.52	-0.22	0.37
5.425	50 Year	20.93	196.87	1.18	196.63	1.56	-0.24	0.38
5.425	100 Year	23.42	196.96	1.20	196.70	1.61	-0.26	0.41
5.425	Regional	259.19	200.60	1.45	200.29	2.54	-0.31	1.09
5.405	**Langstaff Road Bridge**							
5.40	2 Year	11.20	196.18	1.15	196.18	1.02	0.00	-0.13
5.40	5 Year	14.39	196.34	1.25	196.35	1.08	0.01	-0.17
5.40	10 Year	16.21	196.42	1.32	196.43	1.12	0.01	-0.20
5.40	25 Year	18.42	196.49	1.41	196.50	1.18	0.01	-0.23
5.40	50 Year	20.93	196.55	1.52	196.57	1.26	0.02	-0.26

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 34

River Station	Profile	Flow (m³/s)	Existing Conditions		Proposed Conditions		Comparison	
			W. S. Elev. (m)	Flow Velocity (m/s)	W. S Elev. (m)	Flow Velocity (m/s)	W. S. Elev. (m)	Flow Velocity (m/s)
			(A)	(B)	(C)	(D)	(C-A)	(D-B)
5.40	100 Year	23.42	196.61	1.62	196.64	1.33	0.03	-0.29
5.40	Regional	259.19	199.89	2.85	199.89	2.81	0.00	-0.04
5.38	2 Year	11.20	195.99	1.32	195.99	1.32	0.00	0.00
5.38	5 Year	14.39	196.18	1.34	196.18	1.34	0.00	0.00
5.38	10 Year	16.21	196.26	1.37	196.26	1.37	0.00	0.00
5.38	25 Year	18.42	196.33	1.43	196.33	1.43	0.00	0.00
5.38	50 Year	20.93	196.40	1.50	196.40	1.50	0.00	0.00
5.38	100 Year	23.42	196.46	1.55	196.46	1.55	0.00	0.00
5.38	Regional	259.19	199.93	1.51	199.93	1.51	0.00	0.00

The hydraulic performance summary of the proposed bridge structure is provided in **Table 4-6**. The proposed road profile is raised in the proximity of the bridge to avoid flooding of Langstaff Road during the Regional Storm flow. The proposed road low point elevation after the improvement is 200.40 m. The lowest point of the soffit for the proposed bridge is 199.10 m.

Table 4-6:   Hydraulic Performance Analysis of Proposed Bowes Bridge

Structure Description (At Upstream Face, Section 5.41)	50-Year	100-Year	Regional
Clear opening (m)	30.0	30.0	30.0
Water Surface Elevation (m)	196.63	196.70	200.29
Energy Grade Line Elevation (m)	196.76	196.83	200.56
Top of Road Elevation at Low Point (m)	200.40	200.40	200.40
Top of Road Freeboard (Minimum)	3.77	**3.70**	**0.11**
Top of Road Freeboard (Desired)	3.64	3.57	n/a
Soffit Elevation (Upstream) (m)	199.10	199.10	n/a
Soffit Clarence (m)	2.47	**2.40**	n/a

The results provided in **Table 4-6** show that the proposed replacement bridge meets the freeboard and soffit clearance requirements for the 100-year storm event. The road low point for the Langstaff Road profile will be raised to 200.40 m to avoid overtopping by the Regional Storm.

The results conclude that the proposed **30 m single span bridge** is hydraulically efficient and meets all the hydraulic performance requirements. The Regional Storm is not expected to overtop Langstaff Road. The proposed general arrangement drawing of the Langstaff Road Bridge at West Don River (Bowes Bridge) is shown in **Exhibit 4-1**, included at the end of the report before appendices.

The hydraulic analysis outputs for existing and proposed conditions for the West Don River Bridge and Langstaff Road (Bowes Bridge) are provided in **Appendix C**.

4.2.4   Regional Flood Line Map of West Don River

Regional Flood Line maps and HEC-RAS cross-section locations for the West Don River at Langstaff Road location are prepared as per the April 2020 hydraulic modelling update and included in **Exhibits 4-2** and **4.3**. The existing and proposed conditions flood line maps are based on the updated 2019 flows for Don River. The maps illustrate the following:

— The Existing Regional Flood Line is based on the updated existing conditions model with new sections at the Langstaff Road bridge location and the newly constructed GO Transit Barrie Line bridge.

— Future Regional Flood Line is based on the proposed 30 m span bridge at Langstaff Road and the proposed profile raise.

— The map also incorporates the Regional water levels based on the new bridge at GO Transit Barrie Line, located downstream of Bowes Bridge. The general arrangement drawing of West Don River Bridge at GO Transit Barrie Line is also included in this report.

— The map also shows the Regional Flood Line (Old), which is approximately drawn from the Floodplain Map provided by TRCA and represents the Regional Flood Line before the GO Transit Barrie Line construction in 2015 / 2016.

4.3 Westminster Creek Crossing

Westminster Creek is within the West Don River Watershed. It is a small and mainly channelized warm water creek which flows north to south and crosses Langstaff Road approximately 300 meters west of Dufferin Street. This creek originates approximately 2.8 km north of Langstaff Road. Roadside ditches of Langstaff Road from both east and west side drain to this creek. Westminster Creek crosses Langstaff Road by a 2-cell each 3.7 m span x 1.8 m rise concrete box culvert.

This is a tributary of the West Don River and this tributary confluence to the West Don River approximately 1.4 km south of Langstaff Road just north of Highway 7.

The HEC-RAS model for Basin 5 also includes Westminster Creek. The flows at Westminster Creek were also updated based on the updated Don River hydrology model by using the new PCSWMM hydrological model. Based on this update, the flows in the HEC-RAS model of Basin 5 for Westminster Creek tributary were updated.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 36

The hydraulic analysis memo submitted to the TRCA on May 28, 2020 also includes flows and HEC-RAS cross-section locations where the flows are to be applied. It is relevant to include a portion of **Table 4-3**, which shows the updated flows for Westminster Creek, as shown in **Table 4.7** below.

Table 4-7 : Summary of Flows for the HEC-RAS Model at Westminster Creek Tributary

Flow Node	HEC-RAS Section	Hydrology	Flow (m³/s)						
			2-year	5-year	10-year	25-year	50-year	100-year	Regional
J159	50.44	2019 Flows	0.89	1.18	1.37	1.61	1.84	2.34	27.60
	50.44	2004 Flows	1.92	2.87	3.49	6.22	8.99	14.26	20.17
J216	50.30	2019 Flows	1.67	2.27	2.66	3.16	3.69	4.42	36.24
	50.28	2004 Flows	3.00	4.48	5.47	9.73	14.06	22.31	31.55
J612	50.20	2019 Flows	2.63	3.07	3.34	3.80	4.56	5.22	62.64
	50.20	2004 Flows	4.75	7.10	8.67	15.42	17.05	35.36	50.02
8.1	50.10	2019 Flows	2.72	3.19	3.46	3.94	4.71	5.42	63.27
	50.10	2004 Flows	5.25	7.85	9.58	17.05	17.91	39.10	55.30

The hydraulic performance summary of the existing culvert structure is provided in **Table 4-8**. The low point elevation of the existing road is 204.41 m and located approximately 25 m east of the existing culvert.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 37

Table 4-8:   Hydraulic Performance Analysis of Existing Westminster Creek Culvert

Structure Description (At Upstream Face, Section 50.18)	50-Year	100-Year	Regional
Clear opening (m)	2-cell 3.7 m span	2-cell 3.7 m span	2-cell 3.7 m span
Water Surface Elevation (m)	200.44	200.50	204.60
Energy Grade Line Elevation (m)	200.49	200.56	204.66
Top of Road Elevation at Low Point (m)	204.41	204.41	204.41
Top of Road Freeboard (Minimum)	3.97	3.91	-0.19
Top of Road Freeboard (Desired)	3.92	3.85	n/a
Relief Flow Depth (Maximum Depth over roadway)	n/a	n/a	0.19
Top of Road Flow Velocity (m/s)	n/a	n/a	0.50
Relief Flow (Velocity x Depth)	n/a	n/a	0.09
Flood Depth (HW/D Ratio)	0.49	0.52	n/a

Note: The hydraulic model has considered twin 3.6 m span, which is likely to consider the opening area reduction due to the hunch of the culvert

The total span of the culvert is more than 6.0 m, therefore, the design flow for the culvert is 100-year.

The results provided in **Table 4-8** show that the existing culvert meets the freeboard and Headwater over Depth requirement for the 100-year storm event.

The Regional Storm overtops Langstaff Road by 0.190 m. However, it meets the relief flow depth (less than 0.30 m) and relief flow (less than 0.8 m^2/s) requirements.

The proposed road widening is not expected to impact this culvert, therefore proposed conditions analysis is not carried out. The proposed road profile has also maintained the same low point elevation as the existing profile.

The existing conditions hydraulic analysis output for Westminster Creek culvert is provided in the **Appendix C**.

4.4   West Don Tributary Culvert (LC1) Crossing

The design standards for the hydraulic assessment of culverts are based on the MTO HDDS (February 2008), discussed in **Section 2.1**. The CulvertMaster hydraulic modelling tool was used to estimate the headwater depth and to assess the hydraulic capacity of the proposed Culvert LC1 at the proposed connection of Langstaff Road from Creditstone Road to Keele Street Station 4+390.

The CulvertMaster modelling software was selected because it has the following capabilities:

— Evaluates inlet and outlet-controlled headwater depths

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 38

- Implements the procedures recommended by the MTO
- Simulates the hydraulic performance of culverts based on user-specified flows
- Considers variable tailwater depths based on either outlet channel geometry or user specified depth discharge rating curves

CulvertMaster requires the peak design flow, culvert shape and material (Manning's 'n'), the upstream and downstream culvert invert elevations, the inlet conditions (e.g. headwall, projecting), and the tailwater conditions. When this input is provided, CulvertMaster generates the water elevation at the inlet of the culvert (i.e. headwater).

In accordance with MTO Standard WC-1, the 50-year storm was used as the design storm and the 100-year storm was used as an additional check storm for all culverts. The CulvertMaster model input includes the design and check flows, which were calculated using the hydrological assessment in **Section 3.2.2**. The hydraulic analysis involves comparing the headwater elevation to the elevation at which water would spill onto the highway to determine if the existing culvert meets the applicable freeboard and flood depth criterion. **Table 4-9** summarizes hydraulic assessment result of Culvert LC1.

Currently, there is no survey information available in the vicinity of Culvert LC1 and CN MacMillan Rail Yard. The elevation of Langstaff Road near CN MacMillan Rail Yard Access Road is close to 108 m. Based on the revised flows, the proposed size for Culvert LC1 is 2.40 m span x 1.50 m rise, which will give HWL of 206.24 m and 206.30 m for the 50-year and 100-year storm events, respectively. Therefore, the flooding impact in the vicinity of the culvert is not expected; however, it is recommended to review the flooding impact with detailed survey in the vicinity of Culvert LC1 during the detailed design phase of the CN MacMillan Rail Yard overpass design, and if required, culvert size will be revised accordingly during the detailed design.

CulvertMaster output files for the existing culverts are included in **Appendix C**.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 39

Table 4-9:   Hydraulic Performance Evaluation of Proposed Culvert within the West Don River Watershed

Culvert No.	Chainage (m)	Culvert Size and Type	Culvert Parameters			Spill Elevation (m)	Flow (m³/s)		Headwater Elevation, HGL (m)		Velocity (m/s)	
			U/S Invert (m)	D/S Invert (m)	Length (m)		Design (50-yr)	Check (100-yr)	50-yr	100-yr	50-yr	100-yr
LC1	4+390	2.4 and Jevlan m span x 1.5 m rise Concrete Box	205.35	205.10	68	219.50	2.897	3.214	206.24	206.30	2.35	2.43

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 40

5 FLUVIAL GEOMORPHOLOGY

Fluvial geomorphological assessment for the Langstaff Road Municipal Class Environmental Assessment Study was carried out by GeoMorphix Ltd. The details of the geomorphological assessments are included in the Geomorphological Erosion and Meander Belt Width Assessment Report, which was submitted by GeoMorphix in June 2017. The report is included in **Appendix D**. The text below, which is extracted from the geomorphology report, provides some key recommendations for reference.

Culvert crossings are evaluated in the context of limiting or mitigating impact to creek form and function. Crossings should achieve the following:

— *Address potential channel migration*

— *Maintain sediment transport processes for frequent storm events*

— *Provide a span that is respectful of potential future channel erosion / migration*

— *Maintain velocity differentials through the culvert for frequent storm events*

— *Be placed away from actively migrating meanders*

— *Be placed along a stable and straight length of channel at a perpendicular angle to the watercourse.*

Given these considerations, for Black Creek and Westminster Creek, we recommend the existing crossing spans of 7.2 m and 6.8 m, respectively, be maintained at a minimum. The current crossing sizes are appropriate as both streams are straight and armoured with gabion baskets and/or concrete meshing, and therefore are not expected to migrate laterally. Furthermore, the crossings are in good condition and fully encompass the existing average channel bankfull widths.

With regards to the West Branch of Don River, present channel alignment did not suggest any further planimetric adjustment towards the road. We recommend the current crossing span of 11 m be improved upon to a minimum of 15 m in width. The additional 4 m would provide a buffer against any potential erosion issues to the crossing footings, as the channel currently contacts both walls of the existing crossing. The addition of an overbank buffer would also permit passage for terrestrial wildlife beneath Langstaff Road.

It is important to note that further amendment to the recommended crossing spans is possible. In the case where only a portion of the suggested width can be provided due to other design considerations (e.g., the presence of subsurface infrastructure or the shallowness of the road), the incorporation of channel bioengineering may also help to reduce a given crossing span while maintaining channel form and function.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 41

6 STORMWATER MANAGEMENT

6.1 Overview

The proposed improvement of Langstaff Road will result in an increase in impervious area compared to the existing land use. Increased pavement areas as a result of the widened road are proposed to be addressed by stormwater quality treatment and quantity control measures designed according to the requirements for the West Don River and Humber River in their respective watersheds. Runoff from the new urbanized roadway will be conveyed by a new storm sewer system located within the road right-of-way.

Storage BMPs such as wet pond and dry pond can be effective in providing combined quality treatment and/or quantity control where drainage areas are sufficient, and space is available. Storage pipe system can be effective for a small drainage area and in the case of unavailability of space for other storage BMPs.

Within the study area, runoff from the proposed roadway will ultimately discharge to the existing watercourses via storm sewers. The roadway areas result in a significant increase in impervious area which eventually will result in a larger potential for erosion, flood risk, and water quality degradation along the receiving watercourses. Therefore, road runoff needs to be treated before discharging into the receiving watercourses.

The overall objective of the stormwater management plan is to implement measures to enhance the quality of runoff, satisfy the quantity control targets will be provided for post to pre-development control, and to reduce erosion potential. Under existing drainage conditions there is no stormwater management measure in place within the study area.

The following sections discuss the proposed stormwater management strategy for the Langstaff Road improvements.

6.2 Impact of the Proposed Roadway

The proposed road improvement of Langstaff Road will increase runoff from the road corridor due to an increase in impervious areas.

Table 6-1: provides a comparison of impervious area under existing and proposed conditions. The proposed conditions impervious calculation is based on ultimate 6-lane widening. The table also shows the peak flow increase due to the increase in impervious areas within the ROW.

As shown in the table below, due to increase in imperviousness, the 100-year peak flow increases up to 24% from existing along Langstaff Road. Therefore, to reduce the impacts of sediment loading as well as increased peak flow into the receiving watercourses, stormwater management measures are required for runoff quality and quantity control. The proposed measures are discussed in **Section 6.3**.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 42

Table 6-1: Impervious Area Comparison

Catchment	Station (From - To)	Total Area (ha)	Existing Impervious Area		Proposed Impervious Area		Increase in Impervious (ha)	% Increase	100-year Peak Flow Increase
			(ha)	%	(ha)	%			
105	1+510 to 2+188	1.63	0.99	0.61	1.12	0.69	0.13	13	2%
110		1.49	0.85	0.57	1.04	0.70	0.19	23	5%
115	2+188 to 2+664	1.00	0.46	0.46	0.63	0.63	0.17	37	8%
120		1.24	0.71	0.57	0.91	0.73	0.20	28	8%
125	2+664 to 3+465	2.27	1.20	0.53	1.75	0.77	0.54	45	12%
130		2.08	1.06	0.51	1.71	0.82	0.64	61	15%
135	3+465 to 3+974	1.43	0.56	0.39	1.41	0.99	0.85	152	35%
140		1.27	0.66	0.52	1.16	0.91	0.50	76	23%
145	3+974 to 4+690	3.05	1.89	0.62	2.3	0.76	0.41	21	11%
150	4+690 to 5+790	3.81	3.58	0.94	3.62	0.95	0.04	1	0.20%
155	5+790 to 6+048	0.53	0.24	0.45	0.49	0.93	0.25	107	22%
160		0.46	0.26	0.56	0.44	0.95	0.18	70	22%
165	6+048 to 6+305	0.60	0.24	0.4	0.43	0.72	0.19	80	19%
170		0.43	0.25	0.57	0.42	0.98	0.18	72	11%
180	6+305 to 6+544	0.65	0.21	0.33	0.34	0.52	0.12	58	10%
185		0.47	0.23	0.48	0.34	0.72	0.11	50	19%
190	6+544 to 6+889	0.86	0.36	0.42	0.49	0.57	0.13	36	12%
195		0.79	0.33	0.42	0.59	0.75	0.26	79	20%
205	6+889 to 7+360	1.10	0.42	0.38	0.85	0.77	0.43	103	24%
210		0.96	0.42	0.44	0.75	0.78	0.33	77	21%
215	7+360 to 7+620	0.58	0.33	0.57	0.47	0.81	0.14	42	14%
220		0.65	0.30	0.46	0.43	0.66	0.13	43	13%
225	7+620 to 7+938	0.90	0.48	0.53	0.48	0.53	0.00	0	0%
230		0.70	0.40	0.57	0.46	0.66	0.06	16	6%

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 43

6.3 Proposed SWM Strategy

The proposed stormwater management strategy will consist of pipe storage systems and SWM dry pond to control peak flow as well as oil and grit separators for quality control. **Table 6-2** summarizes the proposed SWM strategy for the Langstaff Road widening within the study limit. The details of the proposed SWM facilities are provided in **Section 6.3.1**.

Table 6-2:   SWM Strategy for the Roadway Runoff

Road Area within ROW (ha)				Runoff Quality and Quantity Control		Comments
From	To	Total Area	Paved Area	Quantity Control By	Quality Control By	
Humber River Watershed						
1+510	1.805	1.63	1.13	Pipe Storage (HSP-1A)	Directed to Existing Storm Sewer at Silmar Drive and Jevlan Drive. Two OGS (OGS 1 & 2) for additional quality measure.	Runoff from Catchments 105 and 110 will be controlled by two separate pipe storage systems. The post development flow is controlled to the 10-year existing conditions level to connect into existing storm sewer system. The out flow from the storage system further directed to existing SWM Pond.
1+805	2+190	1.58	1.11	Pipe Storage (HSP-1B)		
2+190	2+660	2.24	1.53	Pipe Storage (HSP-2)	OGS-3-1 is downstream of HSP-2 and OGS-3-2 is downstream of HSP-3. From those OGS it goes through OGS-3	Runoff from roadway area (Catchments 115 and 120) is conveyed by storm sewer and peak flow is controlled by a pipe storage system to the pre-development condition. An OGS is provided at the outlet of pipe storage.
2+660	3+460	4.35	3.45	Pipe Storage (HSP-3)		Runoff from roadway area (Catchments 125 and 130) is conveyed by storm sewer and peak flow is controlled by a pipe storage system to the pre-development condition. An OGS is provided at the outlet of pipe storage.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 44

Road Area within ROW (ha)				Runoff Quality and Quantity Control		Comments
From	To	Total Area	Paved Area	Quantity Control By	Quality Control By	
Don River Watershed						
3+460	3+975	2.70	2.57	Pipe Storage (DSP-1)	Outflow from Pipe Storage is directed to Proposed Dry Pond	Runoff from Catchment 135 (including pond area) and 140 is conveyed by proposed storm sewers and discharged to the proposed pipe storage system DSP-1.
3+975	4+690	3.05	1.89	Dry SWM Pond DDP- 1	OGS-4	The controlled outflow from pipe storage DSP-1 and runoff from Catchment 145 (including dry pond area) are conveyed by proposed storm sewers and discharged to the proposed dry SWM Pond DDP-1. Outflows from the SWM facility will be controlled based on the Don River unit flow release rate and discharged to the upstream side of the proposed Culvert LC1.
4+690	5+790	3.81	3.62	Wet Pond SWM Pond DWP-1	Wet SWM Pond	Runoff from Catchment 150 is conveyed by proposed storm sewers and discharged to the proposed wet SWM Pond DWP-1. Outflows from the SWM facility will be controlled based on the Don River unit flow release rate and discharged to the West Don River utilizing existing outlet. Some overcontrol will be provided to compensate uncontrolled flow from Catchments 155 and 160.
5+790	6+000	0.99	0.93	-	OGS-5	No peak flow control is provided for Catchments 155 and 160. Overcontrol is provided in wet Pond DWP-1 and pipe storage system DSP-2. Quality control is provided by OGS-4 to provide quality control for Catchments 155 and 160.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 45

Road Area within ROW (ha)				Runoff Quality and Quantity Control		Comments
From	To	Total Area	Paved Area	Quantity Control By	Quality Control By	
6+00	6+545	2.15	1.53	Pipe Storage (DSP-2)	OGS-6	Flows from Catchment 165, 170, 180 and 185 will be controlled based on the Don River unit release rate flow by a pipe storage system DSP-2. This pipe storage also provides some overcontrol to account for the uncontrolled flow from Catchments 155 and 160. An OGS will be provided before discharging to the watercourse. Outflow from the OGS is directed to the downstream end of the West Don River Bridge.
6+545	6+890	1.65	1.08	Pipe Storage (DSP-3A)	OGS-7	Runoff from Catchment 190 and 195, 205 and 210 are conveyed by storm sewers and directed to two separate proposed pipe storage systems DSP-3A and DSP-3B to control peak flows to the10-year level (equivalent to the flow generated from Catchments 205 and 210 under existing conditions). Outflows from the SWM facility will be directed to a 1050 mm (42") diameter existing trunk storm sewer.
6+890	7+360	2.06	1.60	Pipe Storage (DSP-3B)	OGS-8	
7+360	7+620	1.23	0.89	Pipe Storage (DSP-4)	OGS-9	Runoff from Catchments 220 and 215 will be controlled by a pipe storage system DSP-4 based on the Don River unit flow release rate before discharging to Westminster Creek. An OGS will be provided for quality treatment.
7+620	7.940	1.60	0.94	Pipe Storage (DSP-5)	OGS-10	Runoff Catchments 225 and 230 will be controlled by pipe storage system DSP-5 based on the Don River unit flow release rate before discharging to Westminster Creek. An OGS will be provided for quality treatment.

6.3.1   Proposed SWM Facilities

The following section discusses in detail of the proposed SWM facilities. It includes three pipe storage systems within Humber River watershed (HSP), two dry SWM ponds in the West Don River watershed (DDP) and five pipe storage systems within the West Don River watershed (DSP).

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 46

Stage Storage Analysis of Proposed SWM facilities are included in **Appendix E.**

1. Pipe Storage HSP-1A and HSP-1B:

Two underground Pipe Storage Systems HSP-1A and HSP-1B, are proposed on Langstaff Road to control the flow from Catchments 105 and 110, respectively. The both pipe storage facilities will control the peak flows from post- to 10-year pre-development level. The outflow from the Pipe Storage facilities HSP-1A and HSP-1B will be directed to the existing storm sewer which runs southerly from Langstaff Road via Silmar Drive and Jevlan Drive. The HSP-1A and HSP-1B facilities will service 3.21 ha of right-of-way area of Langstaff Road. Two oil and grit separators (OGS-1 and OGS-2) will be provided before discharging into the existing storm sewer for additional quality measure.

Following are the features of these pipe storage systems:

— They will be two separate 90 m long and 2400 mm x 1200 mm concrete box storage pipe, which will be installed at slope 0.20%. The outlet invert of HSP-1A and HSP-1B will be approximately 204.12 m and 205.35 m, respectively. The inverts are estimated only and depending upon the invert of the existing connecting sewer, the invert, width and length of the pipe storage facility can be adjusted during the detailed design phase.

— The controlling features for the HSP-1A consist of a 100 mm diameter orifice at an invert elevation of 204.12 m and a 250 mm diameter orifice at invert elevation of 204.91 m.

— The controlling features for the HSP-1B consist of a 100 mm diameter orifice at an invert elevation of 205.35 m and a 250 mm diameter orifice at invert elevation of 206.14 m.

— The 10-year storage volume for HSP-1A and HSP-1B will be approximately 257 m^3 and 252 m^3 while the 10-year WSL will be approximately 205.31 m and 206.52, respectively.

2. Pipe Storage HSP-2:

An underground Pipe Storage System HSP-2, is proposed on Langstaff Road to control the flow from Catchments 115 and 120. The pipe storage facility will control the peak flows from post- to pre- development levels before discharging to the downstream of the Black Creek culvert at Langstaff Road. The facility will service 2.24 ha of right-of-way area of Langstaff Road. An OGS will be provided (OGS-3) before discharging the outflow to Black Creek. An additional OGS (OGS-3-1) is going to be added directly downstream of pipe storage HSP-2.

Following are the features of this pipe storage system:

— It will be a 180 m long and 3000 mm x 1200 mm concrete box storage pipe which will be installed at slope 0.20%. The estimated inlet and outlet inverts of pipe storage will be 204.81 m and 204.44 m, respectively, which need to confirm and adjusted during the detailed design phase.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 47

- The controlling features consist of a 200 mm diameter orifice at an invert elevation of 204.44 m and a 310 mm diameter orifice at invert elevation of 205.51 m.
- The 100-year storage volume for this facility will be approximately 640 m³ and the 100-year WSL will be approximately 205.62 m.

3. Pipe Storage HSP-3:

An underground Pipe Storage System HSP-3, is proposed on Langstaff Road to control the flow from Catchments 125 and 130. The pipe storage facility will control the peak flows from post- to pre- development level condition before discharging to the downstream of the Black Creek culvert at Langstaff Road. The facility will service 4.35 ha of right-of-way of Langstaff Road. OGS-3 will provide quality treatment of controlled runoff from HSP-2 and HSP-3 before discharging the outflows to Black Creek. An additional OGS (OGS-3-2) is going to be added directly downstream of pipe storage HSP-3.

The outflow from the Pipe Storage facility HSP-2 and HSP-3 will be discharged to Black Creek downstream of Langstaff Road culvert from the existing outlet.

Following are the features of this pipe storage system:

- It will be a 220 m long and 3000 mm x 1200 mm box concrete storage pipe at slope 0.20%. The estimated inlet and outlet inverts of pipe storage will be 204.44 m and 204.00 m, respectively, which need to confirm and adjusted during the detailed design phase.
- The controlling features consist of a 160 mm diameter orifice at an invert elevation of 204.00 m and a 400 mm diameter orifice at invert elevation of 204.35.
- The 100-year storage volume for this facility will be approximately 792 m³ and the 100-year WSL will be approximately 205.20 m.

4. Pipe Storage DSP-1:

An underground Pipe Storage System DSP-1, is proposed by the oversized storm sewers on Langstaff Road to control the flow from Catchments 135 and 140 before discharging to dry SWM pond DDP-1. The facility will service 2.70 ha of the right-of-way area of Langstaff Road.

Following are the features of this pipe storage system:

- It will be a twin 3000 mm x 1200 mm concrete box pipe, 222 m long and which will be installed at slope of 0.10%. The estimated inlet and outlet inverts of the pipe storage will be 208.20 m and 207.98 m, respectively, which need to confirm and adjusted during the detailed design phase.
- The controlling features consist of an 82 mm diameter orifice at an invert elevation of 207.98 m and a 170 mm diameter orifice at an invert elevation of 208.73 m.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 48

- The 100-year storage volume for this facility will be approximately 1598 m^3 and the 100-year WSL will be approximately 209.18 m.
- The outlet of the storage pipe will be connected to the dry SWM pond DDP-1 to further control the flow as per the unit flow release rate of Don River.

5. Dry SWM Pond DDP-1:

This dry pond will be located on the northside of the proposed Langstaff Road overpass across CN MacMillan Rail Yard, approximately between St. 4+200 and St. 4+300 and provide the peak flow control of roadway Catchments 145 and outflow from the pipe storage DSP-1 based on the unit flow release rate of Don River Sub-basin 6. An OGS (OGS-4) will be provided at the inlet before discharging into the dry pond to reduce the frequency of pond maintenance.

Following are the control features of the SWM pond:

- The outflow from the SWM facility will discharge to the upstream of the proposed Culvert LC1 crossing at Langstaff Road. The outlet pipe from the pond will be a 450 mm diameter pipe and 1200 mm control maintenance hole configured with two 80 mm and 180 mm diameter orifice at elevations 205.60 m and 206.65 m, respectively.
- The pond will have 3H:1V side slope. The 100-year storage volume for this pond will be approximately 1898 m^3 and the 100-year water surface elevation (WSL) will be 207.70 m.
- Approximately 76 m long retaining wall is required on the south-west side of the pond to maintain the roadway grading. The top elevation of the retaining wall will be 211.50 m.
- An overflow weir has been set at an elevation of 208.00 m to function during large rainfall events. The weir will have a 1.2 m crest width with 5H:1V side slopes.
- The outflow from the SWM facility will be discharged to the upstream side of proposed Culvert LC1.

6. Wet SWM Pond DWP-1:

A wet SWM facility is proposed on the north-east corner of proposed Langstaff Road / CN MacMillan Rail Yard overpass and Keele Street intersection, at approximate Sta. 5+535 to 5+640. The facility will provide the peak flow control of roadway Catchment 150 based on the unit flow release rate of Don River Sub-basin 1. Pond DWP-1 will service a total roadway area of 3.81 ha of Catchment 150 with an approximate imperviousness of 88%. The SWM pond will provide an enhanced level of quality treatment of road runoff. Outflow from the SWM pond will be connected to the existing storm sewer of Langstaff Road just east of Keele Street and will be discharged to West Don River the utilizing existing outlet. An OGS (OGS-5) will also be provided before discharging the outflow to the West Don River after collecting the runoff from uncontrolled Catchments 150 and 160.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 49

Following are the features of the SWM pond:

— The require permanent pool volume is about 1000 m^3. The provided permanent pool volume is above 3000 m^3. The permanent pool elevation will be approximately 206.40 m and bottom of the pond will 205.30 m, which provides a depth of permanent pool as 1.10 m.

— The outflow from this SWM facility will discharge to the West Don River tributary crossing Langstaff Road west of Keele Street. The outlet pipe from the pond will be a 450 mm diameter pipe and 1200 mm control maintenance hole configured with 80 mm diameter orifice at elevations 206.40 m.

— The pond will have 3H:1V side slopes and bottom elevation of 205.30 m. A 0.30 m freeboard is considered above the 100-year pond level.

— The SWM facility will be used to provide over control of the peak flows as much as possible to balance the controlled flow from Catchments 155 and 160.

— The 100-year storage volume for this facility will be approximately 3004 m^3 and the 100-year WSL will be approximately 207.20 m.

7. Pipe Storage DSP-2:

An underground Pipe Storage System DSP-2, is proposed by the oversized storm sewers on Langstaff Road to control the flow from Catchments 165, 170, 180 and 185. The storage pipe will be slightly overcontrolled to account for the uncontrolled flows of Catchments 155 and 160. The pipe storage facility will control the peak flows based on the unit flow release rate of Don River Sub-basin 5 before discharging to the downstream end of the West Don River Bridge. The facility will service 2.15 ha of right-of-way area of Langstaff Road. An OGS (OGS-6) will be provided before discharging the outflow to West Don River.

Following are the features of this pipe storage system:

— It will be a twin 3000 mm x 1200 mm concrete box pipe, 160 m long and which will be installed at slope 0.20%. The estimated inlet and outlet inverts of the pipe storage will be 197.90 m and 197.58 m, respectively, which need to confirm and adjusted during the detailed design phase.

— The controlling features consist of a 100 mm diameter orifice at an invert elevation of 197.58 m and a 400 mm diameter orifice at invert elevation of 198.70 m.

— The 100-year storage volume for this facility will be approximately 1152 m^3 and the 100-year WSL will be approximately 198.78 m.

— An existing outlet structure will be used to discharge the controlled flow to the West Don River.

8. Pipe Storage DSP-3A and DSP-3B:

Two underground Pipe Storage Systems DSP-3A and DSP3-B, are proposed on Langstaff Road to control the flow from Catchments 190, 195, 205 and 210. The pipe storage facility will control the peak flows equivalent to the 10-year pre-development

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 50

flow of Catchments 205 and 210 to maintain the existing conditions flow rates before connecting to the 1050 mm (42") diameter existing storm sewer (as per existing contract DWG.77-104-9 & 77-104-8) which is located between Connie Crescent and North Rivermede Road and runs southerly from Langstaff Road. A thorough investigation of connection feasibility to the existing storm sewer is recommended at the detailed design stage. The facility will service 3.72 ha of right-of-way area of Langstaff Road. Two OGS units (OGS-7 and OGS-8) will be provided before discharging the outflow from these SWM systems to the existing storm sewer for additional quality measure.

Following are the features of pipe storage systems DSP-3A and DSP3-B:

— Pipe Storage Systems DSP-3A and DSP3-B will be 2400 mm x 1200 mm concrete box storage pipe with 125 m and 130 m long, respectively, and which will be installed at slope 0.20% for both SWM facilities. The estimated inlet and outlet inverts of the pipe storage DSP-3A will be 202.00 m and 201.76 m, respectively and for DSP3-B, the estimated inverts will be 202.76 m and 202.50 m, respectively. These inverts need to confirm and adjusted during the detailed design phase.

— The controlling features for the DSP-3A consist of a 115 mm diameter orifice at an invert elevation of 301.76 m and a 250 mm diameter orifice at invert elevation of 202.67 m.

— The controlling features for the DSP-3B consist of a 205 mm diameter orifice at an invert elevation of 205.50 m and a 270 mm diameter orifice at invert elevation of 203.41 m.

— The 10-year storage volume for this DSP-3A will be approximately 346 m^3 and the 10-year WSL will be approximately 202.95 m.

— The 10-year storage volume for this DSP-3B will be approximately 361 m^3 and the 10-year WSL will be approximately 203.67 m.

9. Pipe Storage DSP-4:

An underground Pipe Storage System DSP-4, is proposed on Langstaff Road to control the flow from Catchments 220 and 215. The pipe storage facility will control the peak flows based on the unit flow release rate of Don River Sub-basin 8A before discharging to the downstream end of the Westminster Creek culvert. The facility will service 1.23 ha of right-of-way area of Langstaff Road. An OGS (OGS-9) will be provided before discharging the outflow to Westminster Creek.

Following are the features of this pipe storage system:

— It will be a twin 2400 mm x 1200 mm box concrete storage pipe, 110 m long and at a 0.20% slope. The estimated inlet and outlet inverts of the pipe storage will be 202.65 m and 202.43 m, respectively, which need to confirm and adjusted during the detailed design phase.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York
WSP
December 2021
Page 51

- The controlling features consist of an 80 mm diameter orifice at an invert elevation of 202.43 m and a 140 mm diameter orifice at invert elevation of 203.54 m.
- The 100-year storage volume for this facility will be approximately 632 m^3 and the 100-year WSL will be approximately 203.52 m.

10. Pipe Storage DSP-5:

An underground Pipe Storage System DSP-5, is proposed on Langstaff Road to control the flow from Catchments 225 and 230. The pipe storage facility will control the peak flows based on the unit flow release rate Don River Sub-basin 8A before discharging to the downstream end of the Westminster Creek culvert. The facility will service 1.23 ha of right-of-way of Langstaff Road. An OGS (OGS-10) will be provided before discharging the outflow to Westminster Creek.

Following are the features of this pipe storage system:

- It will be twin 2400 mm x 1200 mm box concrete storage pipe, 111 m long and at slope 0.20%. The inlet and outlet inverts of the pipe storage will be 202.27 m and 202.05 m, respectively.
- The controlling features consist of a 123 mm diameter orifice at an invert elevation of 202.05 m and a 230 mm diameter orifice at invert elevation of 203.13 m.
- The 100-year storage volume for this facility will be approximately 553 m^3 and the 100-year WSL will be approximately 203.25 m.

6.3.2   Oil and Grit Separators

Oil and grit separators (OGS) are provided for the quality control at the outlet point of the pipe storage systems.

- OGS-1 and OGS-2 will be provided at the outlet of Pipe Storage systems HSP-1A and HSP-1B near Silmar Drive before discharging to the existing storm sewer.
- OGS-3 will be provided at the outlet of Pipe Storage systems HSP-2 and HSP-3 at approximate Sta. 2+500 before discharging to the downstream of the Black Creek culvert. OGS-3-1 and OGS-3-2 are directly downstream from the Pipe storage systems HSP-2 and HSP-3. The location and full details will be addressed during the detail design. Runoff will go through OGS-3-1 and OGS-3-2 first before going through OGS-3.
- OGS-4 will be provided at the inlet of Dry SWM Pond (DDP-1) at approximate Sta. 4+220 before discharging into the proposed dry pond (DDP-1) to reduce the amount of maintenance.
- OGS-5 will be provided at approximate Sta. 5+980 at the storm sewer that conveyed runoff from Pond (DWP-1) and Catchments 155 and 160 before discharging to the West Don River.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 52

- OGS-6 will be provided at the outlet of Pipe Storage systems DSP-2 at approximate Sta. 6+1040 before discharging to the downstream of the West Don River bridge at Langstaff Road.
- OGS-7 and OGS-8 will be provided at the outlet of Pipe Storage systems DSP-3A and DSP-3B at approximate Sta. 7+110 and 7+130 before directing to the existing 1050 mm (42") trunk storm sewer.
- OGS-9 will be provided at the outlet of Pipe Storage DSP-4 at approximate Sta. 7+605 before discharging to the downstream end of the Westminster Creek culvert.
- OGS-10 will be provided at the outlet of Pipe Storage DSP-5 at approximate Sta. 7+640 before discharging to the downstream end of the Westminster Creek culvert.

It is understood that OGS will not provide enhanced level of quality treatment; however, due to urbanization and property constraints, other treatment train approaches are not practically feasible. In some cases, the existing storm sewer drains to existing SWM facilities which provide additional quality measure (west of Highway 400, outflow from dry pond DDP-1 to SWM Pond C via Culvert LC1 and proposed one wet SWM facility DWP-1) for the enhanced level of quality treatment. Detailed sizing of OGS will be carried out during the detailed design phase.

6.4 Water Balance and Low Impact Development Measures

The water balance requirement is to retain a minimum of 5 mm of runoff from the site. Most of the proposed roadway will have an urban section with storm sewer systems to convey storm runoff. Therefore, it is not feasible to retain 5 mm of runoff at every section of the proposed roadway. However, measures will be provided wherever feasible using infiltration galleries and exfiltration trenches. Infiltration galleries are subject to soils and groundwater table conditions.

The Preliminary Geotechnical Investigation Report prepared by Thurber Engineering Limited was reviewed for the borehole information to find potential the depth of groundwater table. In one location, i.e. east of Creditstone Road, Sta 4+160, the groundwater table is located approximately 2.0 m below the ground surface. In this section of the road, an infiltration gallery is not feasible, as there will be not enough clearance. In other locations, groundwater table was not encountered within the borehole depth of 3.7 m, which will provide above 1.0 m separation from the bottom of infiltration galleries to the groundwater table. It is recommended to further review on the seasonally high groundwater table and adjust the depth of infiltration gallery accordingly during the detailed design phase. A table of subsurface soil conditions and depth of groundwater table based on Preliminary Geotechnical Investigation Report. This table is included in **Appendix E** of this report.

Based on the preliminary assessment, proposed LID measures may potentially be located within the boulevard between the multi-use path and cycle track. **Table 6-3**

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 53

provides the potential LID measures which will be further investigated during the detailed design phase.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 54

Table 6-3: SWM Strategy for the Roadway Runoff

ID	Catchment ID	Drainage Area (ha)	Proposed LID Features/ Comment	Volume for 5 mm Runoff Retention (m³)	Size of Proposed LID Features (m) x W (m) x D (m)	Provided Volume* (m³)
IG01	105	1.63	Infiltration Gallery	81.5	40 x 1.5 x 1.0	24.0
IG02	110	1.49	Infiltration Gallery	74.5	50 x1.5 x 1.0	30.0
IG03	115	1.00	Infiltration Gallery	50.0	100 x 1.5 x 1.0	24.0
IG04	120	1.24	Infiltration Gallery	62.0	40 x 1.5 x 1.0	24.0
IG05 IG06 IG07 IG08	125	2.27	Infiltration Gallery	113.5	40 x 1.5 x 1.0 42 x 1.5 x 1.0 65 x 1.5 x 1.0 60 x 1.5 x 1.0	124
-	130	2.08	Utility conflict	104.0	-	-
IG09 IG10 IG11	135	2.08	Infiltration Gallery	104.0	65 x 1.5 x 1.0 50 x 1.5 x 1.0 60 x 1.5 x 1.0	105.0
IG12 IG13 IG14 IG15	140	1.61	Infiltration Gallery	80.5	30 x 1.5 x 1.0 55 x1.5 x 1.0 70 x1.5 x 1.0 40 x1.5 x 1.0	117.0
	145	2.70 (roadway)	Infiltration Gallery	135		
ET17	150	3.81	Exfiltration Trench	190.5	100 x 1.5 x 1.0	60.0
-	155	0.53	Steep Road Profile	26.5	-	-
-	160	0.46	Steep Road Profile	23.0	-	-
-	165	0.60	Utility conflict	30.0	-	-
IG18 IG19	170	0.43	Infiltration Gallery	21.5	40 x 1.5 x 1.0 50 x1.5 x 1.0	54.0
-	180	0.65	Potential overpass structure	32.5	-	-
-	185	0.47	Potential overpass structure	23.5	-	-
-	190	0.86	Potential overpass structure	43.0	-	-

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 55

ID	Catchment ID	Drainage Area (ha)	Proposed LID Features/ Comment	Volume for 5 mm Runoff Retention (m³)	Size of Proposed LID Features (m) x W (m) x D (m)	Provided Volume* (m³)
-	195	0.79	Potential overpass structure	39.5	-	-
IG20	205	1.10	Utility conflict	55.0	-	-
-	210	0.96	Utility conflict	48.0	-	-
IG21	215	0.58	Infiltration Gallery	29.0	55 x 1.5 x 1.0	33.0
-	220	0.65	Utility conflict	32.5	-	-
IG22	225	0.90	Infiltration Gallery	45.0	65 x 1.5 x 1.0	39.0
-	230	0.70	Utility conflict	35.0	-	-
Total		29.59		1479		670

*Note: Provided volume is based on 40% void Ratio.

As illustrated in **Table 6-3**, the require volume for 5 mm runoff retention is 1479 m³. Based on preliminary assessment, an approximate volume of 670 m³ could be potentially provided avoiding conflicts with existing utilities.

The following will be reviewed further during the detailed design phase:

— Detailed investigation and design of all low impact development and water balance measures. Based on seasonal groundwater table and soil conditions, locations and sizes of LID water balance measures could vary.

— Review conflict with existing and new utilities.

— The potential increase of the footprint of infiltration galleries to maximize retention volume in an effort to get additional retention volume.

— Field testing of hydrogeological conditions such as site-specific percolation rates, depth of bed rock, depth of seasonally high groundwater table, etc.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 56

7 SEDIMENT AND EROSION CONTROL

Uncontrolled erosion and sedimentation occurring during construction can result in a loss of topsoil, a disruption of nearby watercourses and a degradation of downstream water quality. During construction, erosion and sedimentation control measures should be implemented to prevent the migration of soils from the site. The following recommendations should be considered when developing the detailed Erosion and Sedimentation Control drawings:

General

— Daily inspections are to be carried out particularly after rain events and repairs.
— Any in-water work that is necessary must be conducted in dry conditions within the appropriate fisheries timing window indicated by the TRCA.

Vegetative

— All areas not subject to active construction 30 days after area grading should be top soiled and seeded as per Special Provision 572S01 (OPSS 572) immediately after completion of such grading.
— Immediately following seed application, a straw erosion control blanket should be installed on any exposed slopes adjacent to sensitive features, as per OPSS 572.05.07, 572.05.08 and 572.07.04.05.
— The erosion control matting / blankets shall be fully biodegradable.
— Finished slopes will be graded to an acceptable slope and planted according to applicable TRCA Guidelines. Large cuts should be terraced to minimize surface erosion.

Structural

— As construction proceeds, diversion swales should be graded where needed along the right-of-way boundaries to intercept drainage from external areas and direct it away from exposed surfaces.
— The locations of sediment / dewatering traps should be confirmed in the field by the on-site inspector and environmental inspector.
— Temporary sedimentation traps should be sized based on 125 m^3/ha of drainage area.
— The integrity of all sediment trapping devices will be monitored regularly (at least weekly, and immediately following rain events) and properly maintained; such structures will be removed only after the soils of the construction areas have been stabilized and then only after the trapped sediments have been removed.
— The contractor will identify a contingency plan for accidental sediment release.
— All culvert work should be conducted "in the dry" and inside MNRF's timing window for fisheries where applicable.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 57

- — All dewatering for culvert installation should be directed to a sediment / dewatering trap.
- — Straw bale flow and/or rock checks should be provided in roadside ditches, especially in all ditches immediately upstream of their discharge into a watercourse.
- — Additional erosion control works may be required during the course of construction. These may consist of silt fences, swales, and/or diversion berms. The location and need for these works will need to be established in the field.

Temporary silt fencing should be installed:

- — Around sensitive vegetative features.
- — Approximately 2 m from the final toe-of-slope for the roadway embankment widening areas.
- — Runoff from excavated areas or unvegetated soil will not be permitted to discharge off site or directly into active or temporary watercourses or any natural areas.
- — Heavy duty silt fence should be used at crossings locations where rare species are present.
- — The contractor should abide by the requirements set out in the *Greater Golden Horseshoe Area Conservation Authorities Erosion and Sediment Guideline for Urban Construction* (December 2006).

The integration of these measures will minimize the impacts of erosion and sedimentation during the construction of Langstaff Road within project limits.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 58

8   CONCLUSIONS AND RECOMMENDATIONS

Based on the preceding assessments and findings for Langstaff Road from Weston Road easterly to Dufferin Street, the following conclusions can be made:

1. The proposed road improvements include the widening of Langstaff Road to ultimate 6-lanes from Weston Road easterly to Dufferin Street, adding on street cycling facilities, sidewalk, connection across the CN MacMillan Rail Yard from Creditstone Road to Keele Street, grade separation at GO Transit Barrie Line, intersection improvements, streetscape and new storm sewer system.

2. The study area lies within two major watersheds which are the Humber River and Don River. There are three watercourses that cross Langstaff Road within the study area: Black Creek (Tributary of Humber River), West Don River (West branch of Don River) and Westminster Creek (a tributary of West Don River).

3. Hydrological analysis of the roadway corridor is carried out using the Visual OTTHYMO hydrological model with the following storm distributions:

    — The SCS 12-hour storm distribution of the York Region IDF was used in the analysis to generate the peak flows for the West Don River watershed.

    — The AES 12-hour storm distribution of the York Region IDF was used in the analysis to generate the peak flows for the Humber River watershed.

    — For proposed conditions, hydrologic assessments include the proposed stormwater management facilities in place.

    — There is a requirement of unit flow rate control for the proposed work within both the Humber River and Don River watersheds.

4. Hydraulic performance of existing watercourse crossing structures was performed using the HEC-RAS model. HEC-RAS models for the West Don River, Westminster Creek and Black Creek were provided by TRCA in 2017.

    — The existing Black Creek culvert at Langstaff Road consists of a 3-cell 2.4 m span x 2.4 m rise x 60 m long. All three cells are of equal size. The hydraulic analysis results show that the existing culvert meets all hydraulic requirements.

    — The HEC-RAS hydraulic model of the West Don River Bridge at Langstaff Road (Bowes Bridge) is updated with the 2019 flows obtained from the TRCA utilizing the PCSWMM model. The existing HEC-RAS model is also updated with revised sections and road profile based on latest survey information. The existing bridge has a span of 11.4 m. The results of existing conditions hydraulic assessment show that the existing bridge meets freeboard and soffit clearance requirements for the 100-year design storm, but the Regional Storm overtops Langstaff Road by 1.10 m.

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 59

- The existing conditions HEC-RAS models of Westminster Creek is a part of the West Don River Model (River 2, Reach 1). The flows for this reach were also updated based on the 2019 flows. Westminster Creek crosses Langstaff Road by a 2-cell each 3.7 m span x 1.8 m rise concrete box culvert. Based on the new flows, the existing culvert meets the freeboard requirement for the 100-year storm. The Regional Storm overtops Langstaff Road by 0.19 m; however, it meets the relief flow depth and relief flow criteria.

5. Under proposed conditions, the widening of Langstaff Road is not expected to directly impact Black Creek and Westminster Creek culverts. Therefore, proposed conditions hydraulic assessments for these two culverts is not required.

6. For the West Don River bridge at Langstaff Road (Bowes Bridge), a 30 m single span structure is proposed to replace the existing structure. The proposed conditions hydraulic assessment illustrated that the proposed 30 m single span bridge is hydraulically efficient and meets all hydraulic performance requirements. The Regional storm does not overtop Langstaff Road.

7. A new culvert is proposed (Culvert LC1) just east of Creditstone Road to facilitate the drainage for an unnamed tributary of the West Don River. The proposed size of the culvert is 2.4 m span by 1.5 m rise.

8. Under existing conditions, there is no SWM facilities for runoff quantity and quality control. The existing storm sewers and roadside ditches convey both major and minor storm runoff to the receiving watercourses.

9. Under proposed conditions various stormwater systems are provided for runoff quality control and peak flow control.

   - Two dry SWM ponds and eight pipe storage systems for peak flow control.
   - Twelve oil grit separators are proposed for runoff quality treatment.
   - Infiltration galleries are provided in various location for LID and water balance measures.

Based on the preceding assessments and conclusions, following SWM strategy recommendations are made for the Langstaff Road widening:

1. A 30 m single span bridge to be installed to replace the existing Bowes Bridge.

2. A new Culvert LC1 sized 2.4 m span by 1.50 m rise be installed to the east of Creditstone Road at Sta. 4+390.

3. A new SWM Dry pond facility (DDP-1) be implemented within the West Don River watershed east of Creditstone Road for peak flow control (to be controlled to the unit flow release rate). Approximately 76 m long retaining wall is required on the south-west side of the pond to maintain the roadway grading. The top elevation of the retaining wall will be 211.50 m.

4. A new wet SWM pond facility (DWP-1) be implemented within the West Don River watershed at the north-west quadrant of Keele Street and Langstaff Road

Municipal Class Environmental Assessment Study – Langstaff Road from Weston Road to Highway 7
Project No. 16M-01457-01
The Regional Municipality of York

WSP
December 2021
Page 60
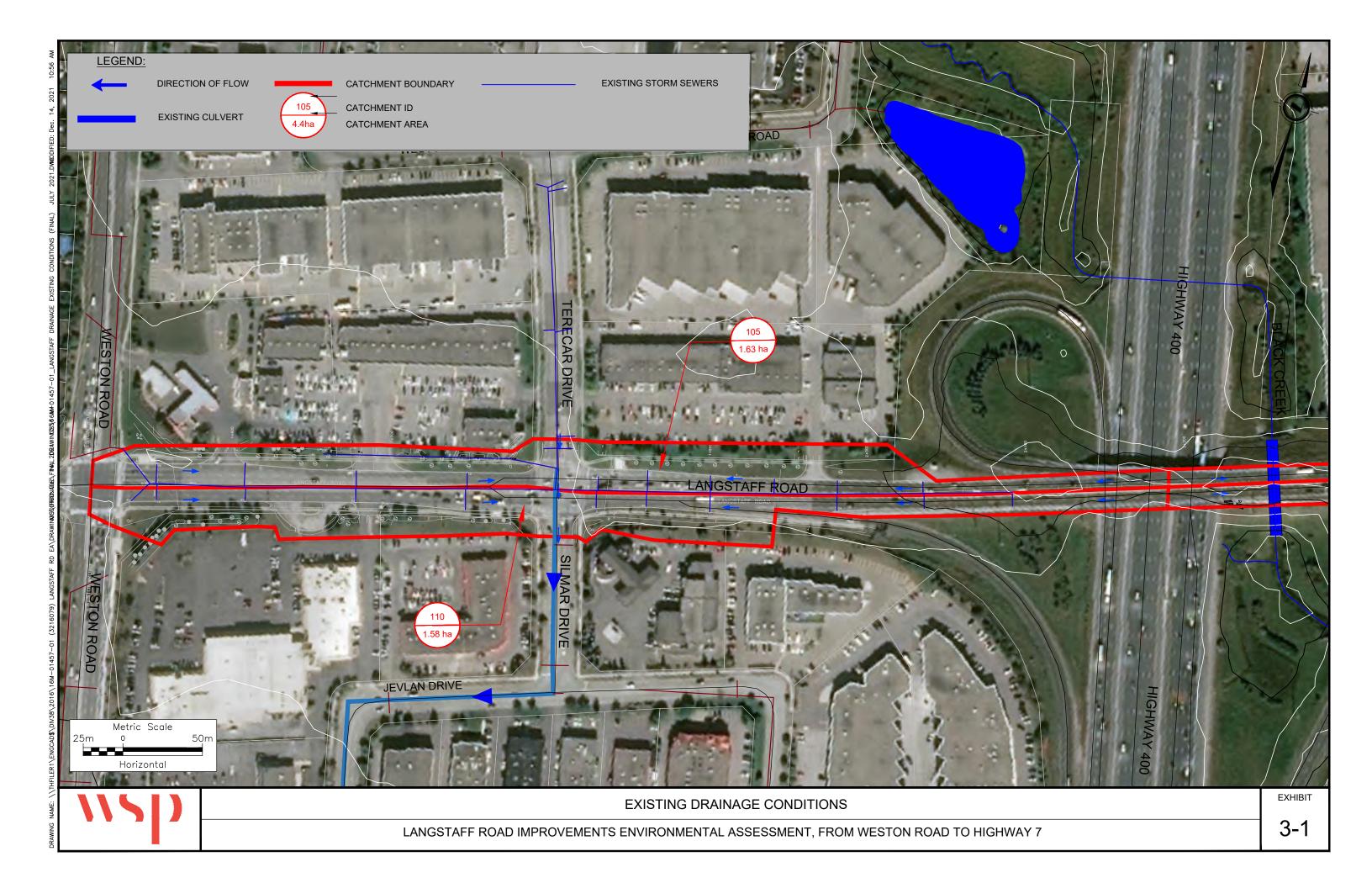
intersection (i.e. at the east end of the CN MacMillan Rail Yard crossing) for peak flow control (to be controlled to the unit flow release rate).

5.   Four pipe storage systems HSP-1A, HSP1-B, HSP-2 and HSP-3 be installed within the Humber River watershed. HSP-1A and HSP1-B controls the flow to the 10-year level to maintain the existing conditions flow rate and the outflow will be connected to the existing storm sewer. HSP-2 and HSP-3 will control the flow from post- to pre- development levels as in existing conditions.

6.   A pipe storage system DSP-1 be installed within the West Don River watershed west of Creditstone Road and the outflow will be discharged to the SWM dry pond facility (DDP-1).

7.   A pipe storage system DSP-2 be installed within the West Don River watershed between Keele Street and the GO Transit Barrie Line which will provide peak flow control based on the unit flow release rate.

8.   A pipe system DSP-3A and DSP-3B be installed within the West Don River watershed between the GO Transit Barrie Line and North Rivermede Road which will control to the existing 10-year flow rate and the outflow be connected to the existing 1050 mm sewer. A detailed investigation of the existing 1050 mm sewer and its conditions must be reviewed in the detailed design phase.

9.   Two pipe storage system DSP-4 and DSP-5 be installed within the West Don River watershed on both west and east sides of Westminster Creek, respectively, which will provide peak flow control based on the unit flow release rate.

10. Twelve Oil-grit separators be implemented at different locations for runoff quality control. The sizing of OGS will be confirmed during the detailed design phase.

11. Infiltration galleries and/or exfiltration trenches be implemented at 20 locations as a preliminary recommendation for water balance requirement. However, the location and size of all infiltration galleries depend on the soil and groundwater conditions and utility conflicts which will be further reviewed during the detailed design phase.

12. During the detailed design phase, it is recommended to explore the possibility of utilizing the City of Vaughan SWM Pond C located just south of the CNR overpass so that runoff of Langstaff Road from the east of CNR Access Road to the high point at CNR overpass can be conveyed by a storm sewer and discharged into the City of Vaughan's SWM pond to reduce the road spread.
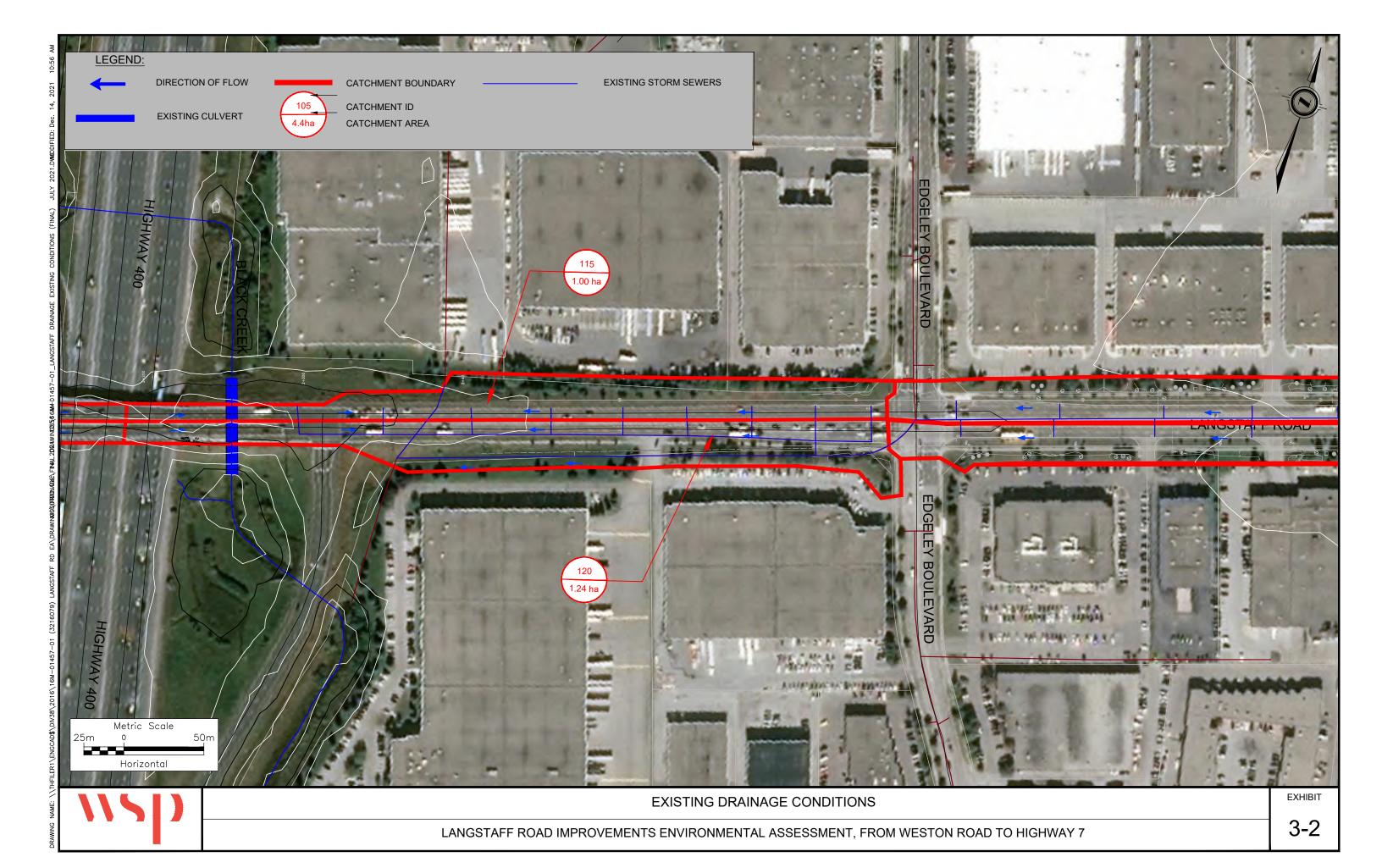
Following commitments are carried forward for the detailed design phase:
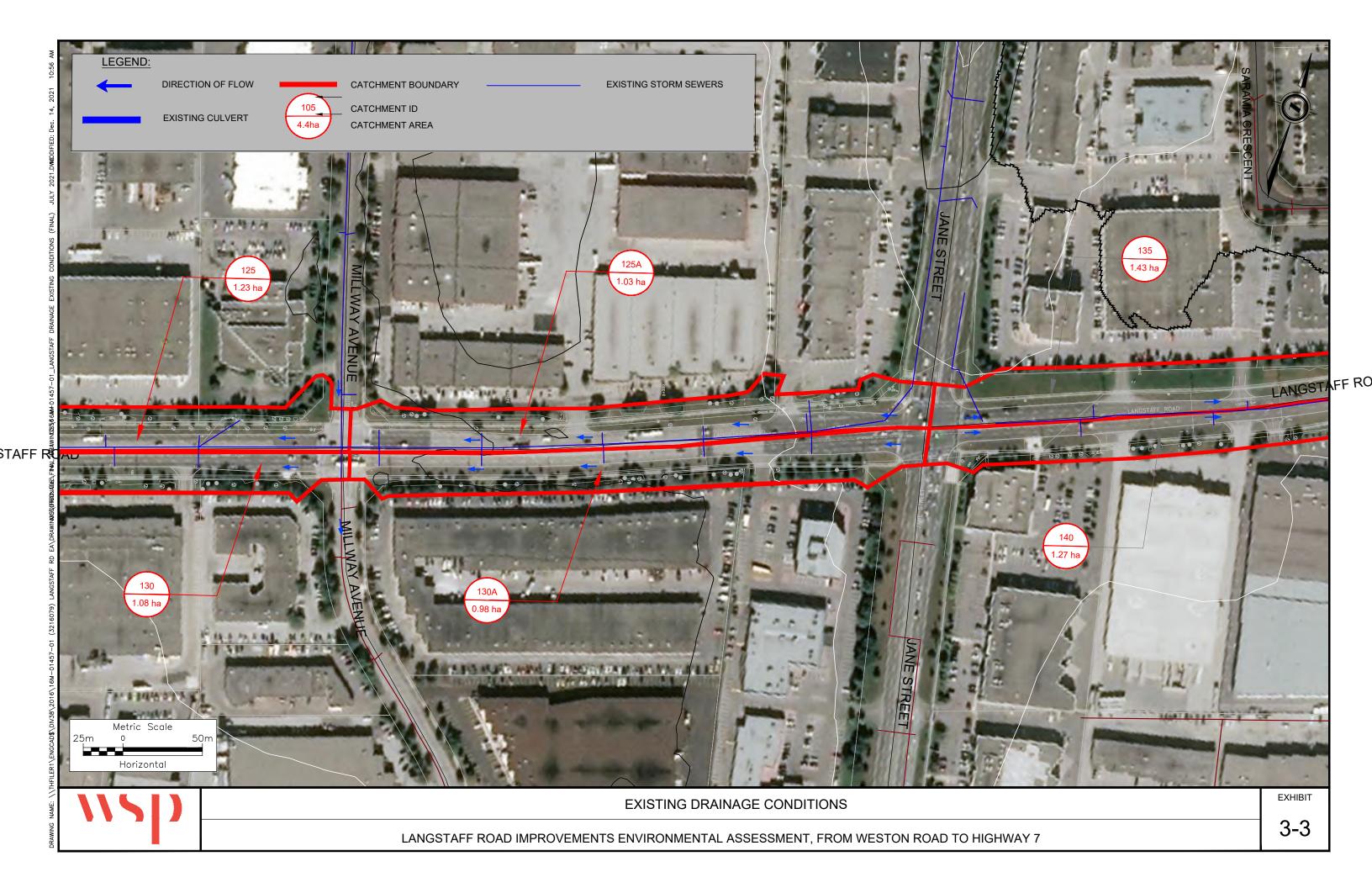
— The hydraulic modelling of all crossings will be updated as per the TRCA's updated hydraulics models available at that time.

— In the existing and proposed conditions hydrologic modelling of the road corridor, an initial abstraction value of 1.0 mm for impervious areas will be used.
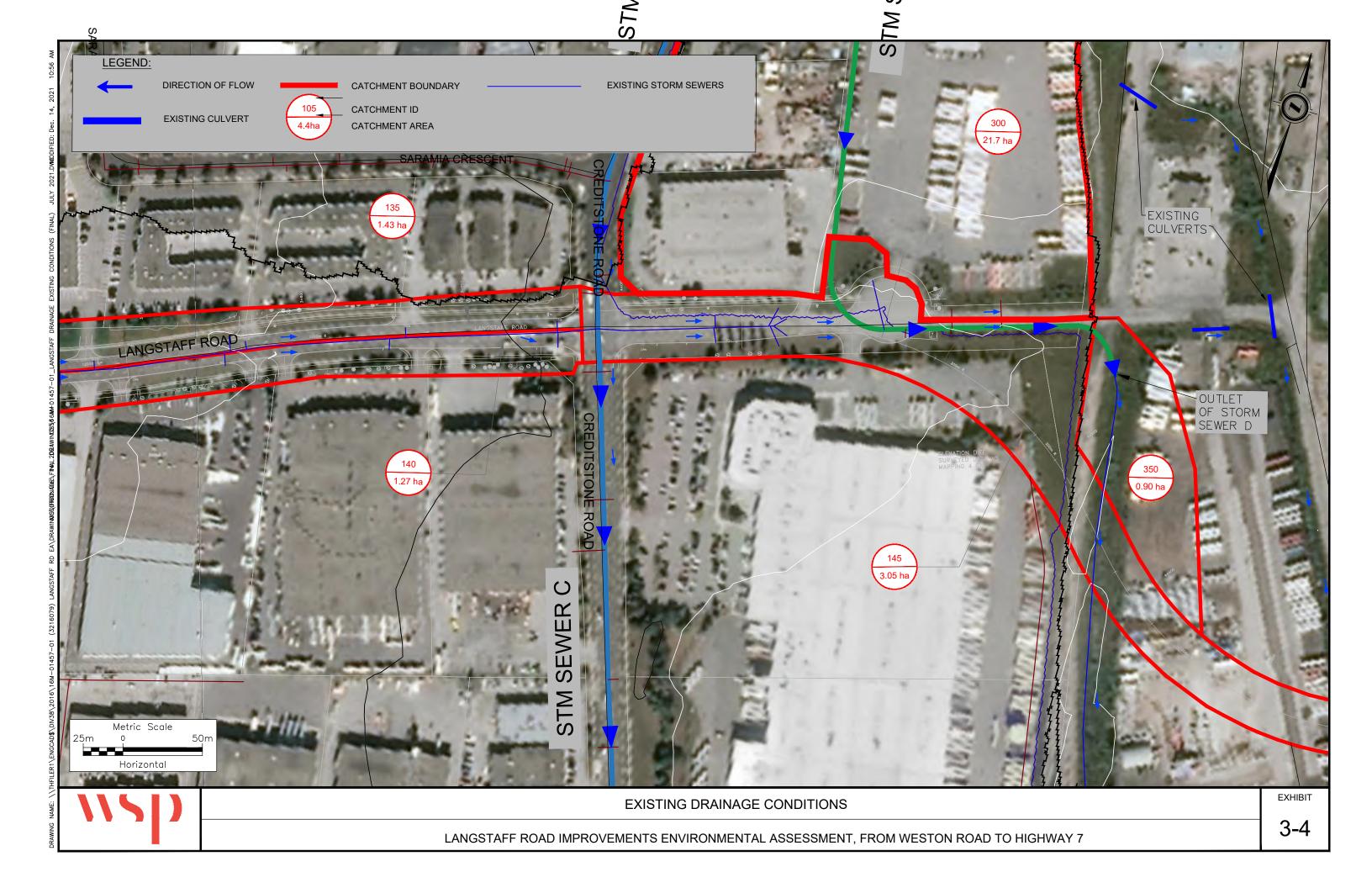
— While determining the size (length, width and depth) of infiltration galleries and / or exfiltration trenches, seasonal groundwater table, infiltration test and conflict with utilities will be further reviewed.

— Investigate the drainage area and capacity of existing SWM Pond C (under jurisdiction of City of Vaughan) located south of the Langstaff Road overpass to determine if it is feasible to convey runoff from a portion of Langstaff Road overpass bridge to the SWM pond.

— During the overpass bridge construction, review of the flooding impact of proposed Culvert LC1 will be completed with detailed survey in the vicinity of Culvert LC1. The proposed size of Culvert LC1 will be updated accordingly.

Exhibits

LEGEND:

← DIRECTION OF FLOW

▬▬ CATCHMENT BOUNDARY

▬▬ EXISTING CULVERT

─── EXISTING STORM SEWERS

⬭ 105 / 4.4ha — CATCHMENT ID / CATCHMENT AREA

WESTON ROAD

TERECAR DRIVE

SILMAR DRIVE

JEVLAN DRIVE

LANGSTAFF ROAD

HIGHWAY 400

BLACK CREEK

105 / 1.63 ha

110 / 1.58 ha

Metric Scale

25m   0   50m

Horizontal

wsp

EXISTING DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-1

LEGEND:

→ DIRECTION OF FLOW

▬▬ CATCHMENT BOUNDARY

— EXISTING STORM SEWERS

▬ EXISTING CULVERT

105 / 4.4ha CATCHMENT ID / CATCHMENT AREA

115 / 1.00 ha

120 / 1.24 ha

HIGHWAY 400

BLACK CREEK

EDGELEY BOULEVARD

LANGSTAFF ROAD

Metric Scale
25m   0   50m
Horizontal

EXISTING DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-2

wsp

LEGEND:

→ DIRECTION OF FLOW

▬▬ CATCHMENT BOUNDARY

─── EXISTING STORM SEWERS

▬▬ EXISTING CULVERT

105 / 4.4ha CATCHMENT ID / CATCHMENT AREA

125 1.23 ha

125A 1.03 ha

135 1.43 ha

130 1.08 ha

130A 0.98 ha

140 1.27 ha

MILLWAY AVENUE

JANE STREET

SARAMIA CRESCENT

LANGSTAFF ROAD

Metric Scale

25m — 0 — 50m

Horizontal

EXISTING DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-3

wsp

LEGEND:

←	DIRECTION OF FLOW	▬▬	CATCHMENT BOUNDARY	———	EXISTING STORM SEWERS
▬▬	EXISTING CULVERT	(105 / 4.4ha)	CATCHMENT ID / CATCHMENT AREA		

SARAMIA CRESCENT

CREDITSTONE ROAD

LANGSTAFF ROAD

STM SEWER C

CREDITSTONE ROAD

135
1.43 ha

300
21.7 ha

140
1.27 ha

145
3.05 ha

350
0.90 ha

EXISTING CULVERTS

OUTLET OF STORM SEWER D

Metric Scale
25m   0   50m
Horizontal

EXISTING DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-4

wsp

LEGEND:

←	DIRECTION OF FLOW	▬▬▬	CATCHMENT BOUNDARY	─────── EXISTING STORM SEWERS
▬▬	EXISTING CULVERT	(105 / 4.4ha)	CATCHMENT ID / CATCHMENT AREA	

CN MACMILLAN YARD

150
3.81 ha

Metric Scale
25m   0   50m
Horizontal

wsp

EXISTING DRAINAGE CONDITIONS

Langstaff Road Improvements Environmental Assessment, From Weston Road to Highway 7

EXHIBIT

3-5

LEGEND:

← DIRECTION OF FLOW

━━━ (blue) EXISTING CULVERT

━━━ (red) CATCHMENT BOUNDARY

⊙ 105 / 4.4ha — CATCHMENT ID / CATCHMENT AREA

━━━ (blue) EXISTING STORM SEWERS

Metric Scale
25m 0 50m
Horizontal

KEELE STREET

WESTON RIVER

LANGSTAFF ROAD

WEST L

155 / 0.53 ha

160 / 0.46 ha

105 / 4.4ha

wsp

EXISTING CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-6

LEGEND:

← DIRECTION OF FLOW
━━ CATCHMENT BOUNDARY
─── EXISTING STORM SEWERS
━━ EXISTING CULVERT

⬤ 105 / 4.4ha — CATCHMENT ID / CATCHMENT AREA

165 / 0.60 ha
180 / 0.65 ha
190 / 0.86 ha
170 / 0.43 ha
185 / 0.47 ha
195 / 0.79 ha

WEST DON RIVER
PLANCHET ROAD
LANGSTAFF ROAD
GO-BARRIE LINE

Metric Scale
25m   0   50m
Horizontal

EXISTING DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-7

LEGEND:

← DIRECTION OF FLOW

━━ (red) CATCHMENT BOUNDARY

━━ (blue) EXISTING STORM SEWERS

━━ (blue) EXISTING CULVERT

(105 / 4.4ha) CATCHMENT ID / CATCHMENT AREA

Catchments shown on map:
- 180 / 0.65 ha
- 190 / 0.86 ha
- 185 / 0.47 ha
- 195 / 0.79 ha

GO-BARRIE LINE

CITRON COURT

SPINNAKER WAY

CONNIE CRESCENT

LANGSTAFF ROAD

EXHIBIT 10

Metric Scale
25m   0   50m
Horizontal

EXISTING DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-8

wsp

LEGEND:

← DIRECTION OF FLOW

▬▬ CATCHMENT BOUNDARY

─── EXISTING STORM SEWERS

▬▬ EXISTING CULVERT

⊙ 105 / 4.4ha — CATCHMENT ID / CATCHMENT AREA

205 / 1.10 ha

210 / 0.96 ha

215 / 0.58 ha

220 / 0.65 ha

225 / 0.90 ha

230 / 0.70 ha

CITATION DRIVE

STAFFERN DRIVE

N. RIVERMEDE ROAD

LANGSTAFF ROAD

WESTMINSTER CREEK

DUFFERIN STREET

CONNIE CRESCENT

YELLOWOOD CIR

Metric Scale
25m   0   50m
Horizontal

EXISTING DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-9

wsp

LEGEND:

←	DIRECTION OF FLOW	▬	CATCHMENT BOUNDARY
▬	EXISTING CULVERT	⬭ 105 / 4.4ha	CATCHMENT ID / CATCHMENT AREA
		———	EXISTING STORM SEWERS

WEST DON RIVER

SWM POND B

SWM POND A

STM SEWER D

STM SEWER C

SWM POND C

EXISTING CULVERTS

OUTLET OF STORM SEWER D

CN MACMILLAN

Metric Scale
75m 0 150m
Horizontal

EXISTING DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT
FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT
3-10

LEGEND:

- → DIRECTION OF FLOW
- ▬ PROPOSED CULVERT
- (LC1) PROPOSED CULVERT ID
- ▬ INFILTRATION GALLERY
- ▬ EXISTING CULVERT
- → PROPOSED STORM SEWER LAYOUT
- ▭○ PIPE STORAGE
- ⊗ OIL GRIT SEPARATOR (OGS)
- ▬ CATCHMENT BOUNDARY
- 105 CATCHMENT ID
- 4.4ha CATCHMENT AREA
- ✕ CULVERT TO BE REMOVED
- ▬ EXISTING STORM SEWERS

WESTON RD

TERECAR DRIVE

HIGHWAY 400

BLACK CREEK

105
1.63 ha

INFILTRATION GALLERY (IG01)

INFILTRATION GALLERY (IG02)

HSP-1A: STORAGE PIPE (SUPER PIPE)
SYSTEM FOR QUANTITY CONTROL
2.4m x 1.2m BOX PIPE @0.20% SLOPE
PIPE LENGTH = 90 m
INVERT AT U/S = 204.30 m
INVERT AT D/S = 204.12 m
10-YR WSL = 205.31 m
10-YR STORAGE VOLUME = 257 m³
QUALITY CONTROL BY OGS-1

HSP-1B: STORAGE PIPE (SUPER PIPE)
SYSTEM FOR QUANTITY CONTROL
2.4m x 1.2m BOX PIPE @0.20% SLOPE
PIPE LENGTH = 90 m
INVERT AT U/S = 205.53 m
INVERT AT D/S = 205.35 m
10-YR WSL = 206.52 m
10-YR STORAGE VOLUME = 252 m³
QUALITY CONTROL BY OGS-2

SILMAR DRIVE

JEVLAN DRIVE

110
1.58 ha

Metric Scale
25m 0 50m
Horizontal

wsp

PROPOSED DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-11

LEGEND:

←	DIRECTION OF FLOW	⊏⊐—○	PIPE STORAGE	———	EXISTING STORM SEWERS	
▬	PROPOSED CULVERT	⊗	OIL GRIT SEPARATOR (OGS)			
(LC1)	PROPOSED CULVERT ID	▬▬	CATCHMENT BOUNDARY			
▬	INFILTRATION GALLERY	(105 / 4.4ha)	CATCHMENT ID / CATCHMENT AREA			
▬	EXISTING CULVERT					
←	PROPOSED STORM SEWER LAYOUT	✕	CULVERT TO BE REMOVED			

HIGHWAY 400

BLACK CREEK

HIGHWAY 400

BLACK CREEK

EDGELEY BLVD

LANGSTAFF ROAD

125 / 2.27 ha

115 / 1.00 ha

120 / 1.24 ha

130 / 2.08 ha

INFILTRATION GALLERY (IG03)

INFILTRATION GALLERY (IG04)

INFILTRATION GALLERY (IG05)

INFILTRATION GALLERY (IG06)

HSP-2: STORAGE PIPE (SUPER PIPE)
SYSTEM FOR QUANTITY CONTROL
3.0m x 1.2m BOX PIPE @0.20% SLOPE
PIPE LENGTH = 180 m
INVERT AT U/S = 204.81 m
INVERT AT D/S = 204.44 m
100-YR WSL = 205.62 m
100-YR STORAGE VOLUME = 640 m³
QUALITY CONTROL BY OGS-3

HSP-3: STORAGE PIPE (SUPER PIPE)
SYSTEM FOR QUANTITY CONTROL
3.0m x 1.2m BOX PIPE @0.20% SLOPE
PIPE LENGTH = 220 m
INVERT AT U/S = 204.44 m
INVERT AT D/S = 204.00 m
100-YR WSL = 205.20 m
100-YR STORAGE VOLUME = 792 m³
QUALITY CONTROL BY OGS-3

Metric Scale
25m 0 50m
Horizontal

WSP

PROPOSED DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-12

LEGEND:

Symbol	Description	Symbol	Description	Symbol	Description
⇐	DIRECTION OF FLOW	⊶○	PIPE STORAGE	—	EXISTING STORM SEWERS
▬	PROPOSED CULVERT	⊗	OIL GRIT SEPARATOR (OGS)		
LC1	PROPOSED CULVERT ID	▬	CATCHMENT BOUNDARY		
▬	INFILTRATION GALLERY	105	CATCHMENT ID		
▬	EXISTING CULVERT	4.4ha	CATCHMENT AREA		
←	PROPOSED STORM SEWER LAYOUT	✕	CULVERT TO BE REMOVED		

Dec. 14, 2021 1:12 PM

DRAWING NAME: \\THFILER1\ENGCAD$\DIV38\2016\16M−01457−01 (3216079) LANGSTAFF RD EA\DRAWINGS\DRAINAGE\FINAL DRAWINGS\16M−01457−01_LANGSTAFF RD_PROPOSED_27.JULY2021_FINAL.DWG

INFILTRATION GALLERY (IG06)

INFILTRATION GALLERY (IG07)

INFILTRATION GALLERY (IG08)

INFILTRATION GALLERY (IG12)

MILLWAY AVE

JANE ST

LANGSTAFF ROAD

125
2.27 ha

135
1.43 ha

130
2.08 ha

130
2.08 ha

140
1.27 ha

Metric Scale
25m 0 50m
Horizontal

PROPOSED DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-13

wsp

DSP-1: STORAGE PIPE (SUPER PIPE)
SYSTEM FOR QUANTITY CONTROL
TWIN 3.0m x 1.2m BOX PIPE @0.10% SLOPE
PIPE LENGTH = 222 m
INVERT AT U/S = 208.20 m
INVERT AT D/S = 207.98 m
100-YR WSL = 209.18 m
100-YR STORAGE VOLUME = 1598 m³

DDP-1 DRY SWM POND FACILITY FOR
QUANTITY CONTROL
BOTTOM ELEV. = 205.60 m
100-YR WSL = 207.70 m
TOP OF POND ELEV.=208.00 m
100-YR STORAGE VOLUME = 1898 m³
QUALITY CONTROL BY OGS-2

RETAINING WALL
LENGTH=76m
ELEV.=211.50m

OUTLET
OF STORM
SEWER D

INFILTRATION GALLERY (IG09)
INFILTRATION GALLERY (IG10)
INFILTRATION GALLERY (IG11)
INFILTRATION GALLERY (IG13)
INFILTRATION GALLERY (IG14)
INFILTRATION GALLERY (IG15)
INFILTRATION GALLERY (IG16)

CREDITSTONE RD

STM SEWER C
STM SEWER D

135 / 1.43 ha
300 / 21.7 ha
350 / 0.90 ha
140 / 1.27 ha
145 / 3.05 ha

LC1

LEGEND:

⇐	DIRECTION OF FLOW		PIPE STORAGE		EXISTING STORM SEWERS
←	PROPOSED CULVERT	⊗	OIL GRIT SEPARATOR (OGS)		
LC1	PROPOSED CULVERT ID		CATCHMENT BOUNDARY		
	INFILTRATION GALLERY	105 / 4.4ha	CATCHMENT ID / CATCHMENT AREA		
	EXISTING CULVERT				
←	PROPOSED STORM SEWER LAYOUT	✕	CULVERT TO BE REMOVED		

Metric Scale
25m   0   50m
Horizontal

AREA

PROPOSED DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-14

wsp

CN MACMILLAN YARD

LANGSTAFF ROAD

150
3.81 ha

SWM POND C

LEGEND:

⇐ DIRECTION OF FLOW	PIPE STORAGE		EXISTING STORM SEWERS
⬅ PROPOSED CULVERT	⊗ OIL GRIT SEPARATOR (OGS)		
LC1 PROPOSED CULVERT ID	CATCHMENT BOUNDARY		
INFILTRATION GALLERY	105 CATCHMENT ID		
EXISTING CULVERT	4.4ha CATCHMENT AREA		
⬅ PROPOSED STORM SEWER LAYOUT	✗ CULVERT TO BE REMOVED		

Metric Scale
25m   0   50m
Horizontal

wsp

PROPOSED DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-15

LEGEND:

Symbol	Description	Symbol	Description	Symbol	Description
←	DIRECTION OF FLOW	⊐○	PIPE STORAGE	——	EXISTING STORM SEWERS
←	PROPOSED CULVERT	⊗	OIL GRIT SEPARATOR (OGS)		
LC1	PROPOSED CULVERT ID	▬▬	CATCHMENT BOUNDARY		
——	INFILTRATION GALLERY	105 / 4.4ha	CATCHMENT ID / CATCHMENT AREA		
——	EXISTING CULVERT				
←	PROPOSED STORM SEWER LAYOUT	✗	CULVERT TO BE REMOVED		

WEST DON RIVER

KEELE ST

EXFILTRATION TRENCH (ET17)

POND DWP-1

POND BOTTOM: 205.30m
PERMANENT POOL: 206.40m
FOREBAY BERM: 206.40m
TOP OF THE POND LEVEL: 207.50m
100-YR WATER LEVEL: 207.20m
PERMANENT POOL: 206.40m
POND BOTTOM: 205.30m

3.0m BERM ELEV. 208.00m

ha

160 / 0.46 ha

150 / 3.81 ha

50m

PROPOSED DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-16

wsp

LEGEND:

⬅	DIRECTION OF FLOW	▭○	PIPE STORAGE	── EXISTING STORM SEWERS
▬	PROPOSED CULVERT	⊗	OIL GRIT SEPARATOR (OGS)	
LC1	PROPOSED CULVERT ID	▬	CATCHMENT BOUNDARY	
▬	INFILTRATION GALLERY	105 / 4.4ha	CATCHMENT ID / CATCHMENT AREA	
▬	EXISTING CULVERT			
⬅	PROPOSED STORM SEWER LAYOUT	✖	CULVERT TO BE REMOVED	

WEST DON RIVER

PLANCHET RD.

GO-BARRIE LINE

GO-BARRIE LINE

WEST DON RIVER

165
0.60 ha

180
0.65 ha

190
0.86 ha

170
0.43 ha

185
0.47 ha

195
0.79 ha

REMOVED EXISTING CULVERT

INFILTRATION GALLERY (IG18)

INFILTRATION GALLERY (IG19)

DSP-2: STORAGE PIPE (SUPER PIPE)
SYSTEM FOR QUANTITY CONTROL
TWIN 3.0m x 1.2m BOX PIPE @0.20% SLOPE
PIPE LENGTH = 160 m
INVERT AT U/S = 197.90 m
INVERT AT D/S = 197.58 m
100-YR WSL = 198.78 m
100-YR STORAGE VOLUME = 1152 m³
QUALITY CONTROL BY OGS-4

Metric Scale
25m   0   50m
Horizontal

wsp

PROPOSED DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-17

LEGEND:

Symbol	Description	Symbol	Description	Symbol	Description
←	DIRECTION OF FLOW	▭—◯	PIPE STORAGE	——	EXISTING STORM SEWERS
←	PROPOSED CULVERT	⊗	OIL GRIT SEPARATOR (OGS)		
LC1	PROPOSED CULVERT ID	——	CATCHMENT BOUNDARY		
——	INFILTRATION GALLERY	105	CATCHMENT ID		
——	EXISTING CULVERT	4.4ha	CATCHMENT AREA		
←	PROPOSED STORM SEWER LAYOUT	✕	CULVERT TO BE REMOVED		

GO-BARRIE LINE

SPINNAKER WAY

LANGSTAFF ROAD

CONNIE CRÈS

GO-BARRIE LINE

190
0.86 ha

195
0.79 ha

205
1.10 ha

210
0.96 ha

REMOVED EXISTING CULVERT

REMOVED EXISTING CULVERT

19.1m
22.4m
11.0m

DSP-3A: STORAGE PIPE (SUPER PIPE) SYSTEM FOR QUANTITY CONTROL
2.4m x 1.2m BOX PIPE @0.20% SLOPE
PIPE LENGTH = 125 m
INVERT AT U/S = 202.00 m
INVERT AT D/S = 201.76 m
10-YR WSL = 202.95 m
10-YR STORAGE VOLUME = 346 m³
QUALITY CONTROL BY OGS-6

EXISTING SEWER PIPE
1050mm (42")

DSP-3B: STORAGE PIPE (SUPER PIPE) SYSTEM FOR QUANTITY CONTROL
2.4m x 1.2m BOX PIPE @0.20% SLOPE
PIPE LENGTH = 130 m
INVERT AT U/S = 202.76 m
INVERT AT D/S = 202.50 m
10-YR WSL = 203.67 m
10-YR STORAGE VOLUME = 361 m³
QUALITY CONTROL BY OGS-6

SEE EXHIBIT 10

Metric Scale
25m   0   50m
Horizontal

wsp

PROPOSED DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-18

LEGEND:

⬅	DIRECTION OF FLOW
▬	PROPOSED CULVERT
LC1	PROPOSED CULVERT ID
▬ (green)	INFILTRATION GALLERY
▬ (magenta)	EXISTING CULVERT
⬅	PROPOSED STORM SEWER LAYOUT
▭━○	PIPE STORAGE
⊗	OIL GRIT SEPARATOR (OGS)
▬ (red)	CATCHMENT BOUNDARY
105	CATCHMENT ID
4.4ha	CATCHMENT AREA
✗	CULVERT TO BE REMOVED

WESTMINSTER CREEK

STAFFERN DRIVE

N RIVERMEDE RD

LANGSTAFF ROAD

DUFFERIN ST

215
0.58 ha

205
1.10 ha

225
0.60 ha

210
0.96 ha

220
0.65 ha

230
0.70 ha

EXISTING DRAINAGE FLOW PATH WITH 1.75m WIDE FLAT BOTTOM CHANNEL IS MAINTAINED TO CONVEY THE FLOW FROM 750mm AND 1650mm STORM SEWERS FROM DUFFERIN STREET

INFILTRATION GALLERY (IG21)

UTILIZE EXISTING OUTLET

INFILTRATION GALLERY (IG22)

DSP-3B: STORAGE PIPE (SUPER PIPE) SYSTEM FOR QUANTITY CONTROL
2.4m x 1.2m BOX PIPE @0.20% SLOPE
PIPE LENGTH = 130 m
INVERT AT U/S = 202.76 m
INVERT AT D/S = 202.50 m
10-YR WSL = 203.67 m
10-YR STORAGE VOLUME = 361 m³
QUALITY CONTROL BY OGS-6

DSP-4: STORAGE PIPE (SUPER PIPE) SYSTEM FOR QUANTITY CONTROL
Twin 2.4m x 1.2m BOX PIPE @0.20% SLOPE
PIPE LENGTH = 110 m
INVERT AT U/S = 202.65 m
INVERT AT D/S = 202.43 m
100-YR WSL = 203.52 m
100-YR STORAGE VOLUME = 632 m³
QUALITY CONTROL BY OGS-7

DSP-5: STORAGE PIPE (SUPER PIPE) SYSTEM FOR QUANTITY CONTROL
TWIN 2.4m x 1.2m BOX PIPE @0.20% SLOPE
PIPE LENGTH = 100 m
INVERT AT U/S = 202.27 m
INVERT AT D/S = 202.05 m
100-YR WSL = 203.25 m
100-YR STORAGE VOLUME = 553 m³
QUALITY CONTROL BY OGS-8

Metric Scale
25m 0 50m
Horizontal

wsp

PROPOSED DRAINAGE CONDITIONS

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT, FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT

3-19

LEGEND:

⇦ DIRECTION OF FLOW

▬▬ PROPOSED CULVERT

(LC1) PROPOSED CULVERT ID

▬▬ INFILTRATION GALLERY

▬▬ EXISTING CULVERT

← PROPOSED STORM SEWER LAYOUT

▭─○─ PIPE STORAGE

⊗ OIL GRIT SEPARATOR (OGS)

▬▬ CATCHMENT BOUNDARY

105 — CATCHMENT ID
4.4ha — CATCHMENT AREA

✕ CULVERT TO BE REMOVED

▬▬ EXISTING STORM SEWERS

WEST DON RIVER

AREA A2

PART OF CATCHMENT A DRAINS TO SWM POND B

STM SEWER E

AREA A1

STM SEWER A

SWM POND B

OUTLET POINT WEST DON RIVER

STM SEWER A

STM SEWER B

SWM POND A

AREA D1

AREA D2

AREA B3

AREA B1

STM SEWER D

AREA C2

AREA B2

STM SEWER C

STM SEWER D

AREA D3

AREA C1

STM SEWER C

SWM POND C

ON MACMILLAN

Metric Scale
75m   0   150m
Horizontal

DRAINAGE MOSAIC FOR CULVERT LC1

LANGSTAFF ROAD IMPROVEMENTS ENVIRONMENTAL ASSESSMENT
FROM WESTON ROAD TO HIGHWAY 7

EXHIBIT
3-20

METRIC

LIST OF ABBREVIATIONS

WP — DENOTES WORKING POINT
T/P — DENOTES TOP OF PAVEMENT
NTS — DENOTES NOT TO SCALE
SHLD — DENOTES SHOULDER
MUP — DENOTES MULTI USE PATH

LIST OF DRAWINGS:

1. GENERAL ARRANGEMENT

APPLICABLE STANDARD DRAWINGS:

3941.2000 FIGURES IN CONCRETE – SITE NUMBER AND DATE LAYOUT
3370.100 DECK, WATERPROOFING, HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
3370.101 DECK, WATERPROOFING, HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS.
3419.100 BARRIERS AND RAILINGS, STEEL BEAM GUIDE RAIL AND CHANNEL ANCHORAGE

GENERAL NOTES:

DESIGN CODE AND LOADING
CHBDC CAN/CSA S6-19 CL-625-ONT

CLASS OF CONCRETE
GIRDER 50MPa
REMAINDER 35MPa

CLEAR COVER TO REINFORCING STEEL
FOOTING 100 ± 20mm
DECK
  TOP 70 ± 20mm
  BOTTOM 40 ± 10mm
REMAINDER UNLESS OTHERWISE SPECIFIED 70 ± 20mm

REINFORCING STEEL
1. REINFORCING STEEL SHALL BE WELDABLE GRADE 400W.
2. UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES FOR REINFORCING STEEL BARS SHALL BE CLASS B.
3. BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12-1 UNLESS INDICATED OTHERWISE.
4. STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.
5. BAR MARKS WITH THE PREFIX "S" DENOTES STAINLESS STEEL BARS.

CONSTRUCTION NOTES
6. ALL ELEVATIONS ARE TO GEODETIC DATUM.
7. THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGN DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.
8. BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
9. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS SHOWN ON DRAWINGS AGAINST SITE CONDITIONS AND REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR BEFORE PROCEEDING WITH WORK.
10. THE CONTRACTOR IS FULLY RESPONSIBLE FOR THE ADEQUATE PROTECTION OF ALL UTILITIES AS REQUIRED DURING CONSTRUCTION OPERATIONS.
11. THE CONTRACTOR SHALL ADVISE ALL UTILITY COMPANIES IN WRITING OF HIS PROPOSED WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR AT HIS EXPENSE OF ANY DAMAGE TO UTILITIES CAUSED BY THE CONTRACTOR.

PLAN
1:200

CONSTRUCTION NORTH

9000 RETAINING WALL
3250 WINGWALL
31500
8000 WINGWALL

₵ W ABUT BRGS
₵ E ABUT BRGS
HP

FLOW DON RIVER

TO KEELE ST.

13'2'57"
WP # 1 STA. 5+990.505 T/P EL. 202.178
R = 2000m
₵ NEW LANGSTAFF ROAD
PC 5+988.993

13'57'6"
WP # 2 STA. 6+022.005 T/P EL. 201.419

GUIDE RAIL (TYP)

1000 SHLD / 3500 LANE / 3300 LANE / 3300 LANE / 3500 LANE / 1000 SHLD

475 3000 MUP
460

SWALE
EXISTING BRIDGE TO BE REMOVED

6000mm APPROACH SLAB WITH 90mm ASPHALT (TYP)

TO DUFFERIN ST.

PT 6+047.64 B
PT 6+047.64 B

475 3000 MUP
460

PEDESTRIAN WALKWAY

FENCE (TYP)

SURVEYED EDGE OF RIVER (TYP)

8000 WINGWALL
8000 WINGWALL
2:1
2:1

HEDGE

MH

NEW LANGSTAFF ROAD PROFILE
N.T.S.

WEST
EVC 5+911.43 ELEV 204.968
BVC 5+931.15 ELEV 204.179
-4.000%

K = 47.24
VC = 231.31m

LOW PT STA = 6+120.09
LOW PT ELEV =200.400

EAST
EVC 6+162.46 ELEV 200.590
0.897%

STRUCTURE LIMITS

VPI 6+046.81 ELEV 199.555

PROPOSED TOP OF PAVEMENT

ELEVATION
1:200

WEST
₵ W ABUT BRGS
47500
₵ E ABUT BRGS
EAST

8000 WINGWALL
31500
8000 WINGWALL

30000 HORIZONTAL CLEARANCE

PEDESTRIAN RAILING

W.L. EL. 200.29 (REGIONAL STORM)
PEDESTRIAN WALKWAY
PROPOSED TOP OF PAVEMENT

EL. 195.780±

B1000 GIRDERS
W.L.
W.L. EL. 196.63 50 YEAR STORM

ORIGINAL GROUND

EXISTING ROAD GRADING
ROCK PROTECTION (TYP)
EL. 196.620±

NEW STEEL PILE HP 310x110 DRIVEN TO ELEVATION 182 (TYP)

150mm PERFORATED SUBDRAIN WRAPPED IN GEOTEXTILE (TYP)
150mm PERFORATED SUBDRAIN (TYP)

ELEV (m)
205 204 203 202 201 200 199 198 197 196 195 194 193 192 191 190

INTERIM
1:100

NORTH
₵ NEW LANGSTAFF ROAD
SOUTH

25170

460 / 3000 MUP / 475 / 1000 SHLD / 3500 LANE / 3300 LANE / 850 850 / 3300 LANE / 3500 LANE / 1000 SHLD / 475 / 3000 MUP / 460

PEDESTRIAN RAILING

150mm CONCRETE DECK
PROFILE CONTROL
MEDIAN BARRIER CURB
ASPHALT AND WATERPROOFING SYSTEM (90mm TOTAL)

2% 2% 2% 2% 2%

350 (TYP)

B1000 PRECAST GIRDER
19 @ 1220 = 23180
995 995

NOTE:
THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE DURING CONSTRUCTION.

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

No.	DATE	REVISIONS	BY

York Region Transportation Services

wsp

DESIGN / DESIGN
DRAWN / DRAWN
CHECKED / CHECKED

NEW LANGSTAFF ROAD
DON RIVER BRIDGE
PRELIMINARY
GENERAL ARRANGEMENT

DWG. NO. DWG_NUM
CONT. NO. CONT_NUM
EXHIBIT 4-1

CAD FILE LOCATION AND NAME: S:\2016\S16M-01457-01\301\S16M-01457-01-301-0020A.dwg
MODIFIED: 8/28/2020 12:55:43 PM BY: TULECK48
DATE PLOTTED: 8/28/2020 12:57:48 PM BY: TULECK48

S16M-01457-01-301-0020A.dwg

HEC-RAS SECTION LOCATIONS AND REGIONAL FLOOD LINES

LANGSTAFF ROAD EA

EXHIBIT

4-2

LEGEND

FUTURE REGIONAL FLOOD ELEVATION (m)	121.94
HEC-RAS SECTION ID	13.500
EXISTING REGIONAL FLOOD ELEVATION (m)	122.05
HEC-RAS SECTION	▬▬▬
FUTURE REGIONAL FLOOD LINE³	▬▬▬ (green)
EXISTING REGIONAL FLOOD LINE²	▬▬▬ (magenta)
REGIONAL FLOOD LINE (OLD)¹	▬ ▬ ▬ (purple dashed)
FLOW DIRECTION	→

NOTE:
1. REGIONAL FLOOD LINE (OLD)—BASED ON THE FLOOD PLAIN MAP (FPM) PROVIDED BY TRCA, WHICH REPRESENTS THE FLOOD LINE BEFORE GO RAILWAY BRIDGE CONSTRUCTION ON 2015/2016.
2. EXISTING REGIONAL FLOOD LINE – BASED ON THE UPDATED EXISTING CONDITIONS MODEL FOR LANGSTAFF ROAD WITH NEW GO RAILWAY BRIDGE.
3. FUTURE REGIONAL FLOOD LINE – BASED ON THE PROPOSED STRUCTURE WITH FUTURE ROAD PROFILE OF LANGSTAFF ROAD.

KEELE STREET

CNR YARD

GO RAILWAY LINE

LANGSTAFF ROAD

WEST DON RIVER

Metric Scale
100m   0   200m
Horizontal

MODIFIED: May. 07, 2020 5:09 PM

DRAWING NAME: I:\DRAWINGS\WATERRES\3216079 (16M-01457-01)\DRAINAGE\HEC-RAS\3216079 LANGSTAFF ROAD EA _FLOOD LINE MAP AND HEC-RAS SECTIONS V4.DWG

wsp

5.55

5.49 201.69 / 201.69

5.48 201.19 / 201.20

5.47 201.05 / 201.06

5.46 200.88 / 200.90

5.45 200.72 / 200.73

5.44 200.68 / 200.70

5.435 200.63 / 200.65

5.43 200.63 / 200.64

5.425 200.29 / 200.60

5.30 196.40 / 196.40

5.29

LEGEND

FUTURE REGIONAL FLOOD ELEVATION (m)

HEC-RAS SECTION ID — 13.500

EXISTING REGIONAL FLOOD ELEVATION (m)

121.94
122.05

HEC-RAS SECTION

FUTURE REGIONAL FLOOD LINE[3]

EXISTING REGIONAL FLOOD LINE[2]

REGIONAL FLOOD LINE (OLD)[1]

FLOW DIRECTION

NOTE:

1. REGIONAL FLOOD LINE (OLD)—BASED ON THE FLOOD PLAIN MAP (FPM) PROVIDED BY TRCA, WHICH REPRESENTS THE FLOOD LINE BEFORE GO RAILWAY BRIDGE CONSTRUCTION ON 2015/2016.

2. EXISTING REGIONAL FLOOD LINE – BASED ON THE UPDATED EXISTING CONDITIONS MODEL FOR LANGSTAFF ROAD WITH NEW GO RAILWAY BRIDGE.

3. FUTURE REGIONAL FLOOD LINE – BASED ON THE PROPOSED STRUCTURE WITH FUTURE ROAD PROFILE OF LANGSTAFF ROAD.

KEELE STREET

GO RAILWAY LINE

LANGSTAFF ROAD

WEST DON RIVER

GO RAILWAY LINE

5.44 — 200.68 / 200.70

5.435 — 200.63 / 200.65

5.43 — 200.63 / 200.64

5.425 — 200.29 / 200.60

5.40 — 199.89 / 199.89

5.38 — 199.93 / 199.93

5.37 — 199.85 / 199.85

5.36 — 199.86 / 199.86

5.35 — 199.82 / 199.82

5.34 — 199.76 / 199.76

5.32 — 197.78 / 197.78

5.30 — 196.40 / 196.40

5.29

5.28

5.27

5.26

5.25

5.22

5.21

Metric Scale

100m   0   200m

Horizontal

MODIFIED: May. 07, 2020 4:47 PM

DRAWING NAME: I:\DRAWINGS\WATERRES\3216079 (16M-01457-01)\DRAINAGE\HEC-RAS\3216079 LANGSTAFF ROAD EA _FLOOD LINE MAP AND HEC-RAS SECTIONS V4.DWG

wsp

HEC-RAS SECTION LOCATIONS AND REGIONAL FLOOD LINES

LANGSTAFF ROAD EA

EXHIBIT

4-3

LIST OF DRAWINGS:

S-001 GENERAL ARRANGEMENT
S-002 FOUNDATION LAYOUT
S-003 CAISSON DETAILS
S-004 SOUTH ABUTMENT
S-005 NORTH ABUTMENT
S-006 WINGWALLS
S-007 PIERS
S-008 GIRDERS LAYOUT
S-009 42' PRESTRESSED PRECAST BOX GIRDER-I
S-010 42' PRESTRESSED PRECAST BOX GIRDER-II
S-011 32' PRESTRESSED PRECAST BOX GIRDER-I
S-012 32' PRESTRESSED PRECAST BOX GIRDER-II
S-013 WALKWAY AND RAILING LAYOUT
S-014 WALKWAY ASSEMBLIES AND DETAILS
S-015 TRANSITION SLAB
S-016 RETAINING WALLS
S-017 MISCELLANEOUS DETAILS

LIST OF ABBREVIATIONS:

ABUT	ABUTMENT
BRG	BEARING
BVC	BEGINNING OF VERTICAL CURVE
CJ	CONSTRUCTION JOINT
CL	CENTER LINE
EL	ELEVATION
EVC	END OF VERTICAL CURVE
H.W.L.	HIGH WATER LEVEL
(N)	NORTH
NTS	NOT TO SCALE
PVI	POINT OF VERTICAL INTERSECTION
(S)	SOUTH
T/LR	TOP OF LOW RAIL
(TYP)	TYPICAL
W.L.	WATER LEVEL
WP	WORK POINT

GENERAL NOTES:

1. DESIGN AND CONSTRUCTION IN ACCORDANCE WITH AREMA (MANUAL FOR RAILWAY ENGINEERING), CN GUIDELINE FOR DESIGN OF RAILWAY STRUCTURES, GEOTECHNICAL INVESTIGATION REPORT BY THURBER (DATED FEBRUARY 19, 2015), AND MEMORANDUM FOR CAISSONS BY THURBER (DATED MARCH 23, 2015)

2. DESIGN LIVE LOAD: COOPER E80 PLUS IMPACT

3. BALLAST DEPTH, MEASURED TO TOP OF TIE, SHALL BE MINIMUM 405mm AND MAXIMUM OF 585mm.

4. APPLY WATERPROOFING TO PRECAST GIRDERS AT SHOP. WATERPROOFING SHALL COVER INTERIOR SIDE OF CURB, TOP OF GIRDER AND VERTICAL FACE BETWEEN GIRDERS. REFER TO SPECIFICATION FOR WATERPROOFING. ANY DAMAGED WATERPROOFING SHALL BE REPAIRED AT SITE.

5. DAMP-PROOFING SHALL BE APPLIED AT THE ENDS OF GIRDERS, AND AT SITE AT THE BACK OF ABUTMENTS, AS PER DWG S-017. REFER TO SPECIFICATION FOR DAMP-PROOFING.

6. BALLAST-MAT SHALL BE APPLIED AT THE INTERIOR FACE OF CURBS, TOP OF GIRDERS, AND TOP OF APPROACH SLABS, AS PER DWG S-017. ALL THE SEAMS SHALL BE SEALED PROPERLY AND WATER TIGHT.

7. ALL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION

8. USE TREMIE CONCRETE FOR CAISSONS.

9. APPLY CONCRETE SEALANT TO ALL EXPOSED SURFACES OF THE CAPS.

10. TRACK SHORING WALLS TO BE DESIGNED BY CONTRACTOR AND SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL.

11. ALL DIMENSIONS ARE IN MILLIMETER, ALL ELEVATIONS AND STATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

MATERIAL SPECIFICATIONS:

CONCRETE — ACI 318 OR CSA A23.1/A23.2-14 MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS SHALL BE:

PRECAST GIRDER	50 MPA
CAST-IN-PLACE	35 MPA

CONCRETE COVER — MINIMUM COVER TO REINFORCING STEEL:

CAISSON	75mm
REMAINDER	50mm

REINFORCING STEEL — ASTM A615 GRADE 60, OR CSA G30.18-09 (R2014) GRADE 400W

UNLESS NOTED OTHERWISE, TENSION LAP SPLICES FOR REINFORCING STEEL SHALL BE CLASS B.

BAR HOOKS — SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH ARTICLE 2.17 PART 2, AREMA MANUAL (2012), UNLESS INDICATED OTHERWISE.

BEARINGS — SHALL CONFORM TO AREMA CHAPTER 15, PART 10, ELASTOMERIC BEARING, DUROMETER 60

BALLAST MAT — SHALL BE GETZNER OR APPROVED EQUIVALENT

STEEL — STEEL SECTIONS AND PLATES SHALL BE AS PER ASTM A709 OR CSA G40.21-13, GRADE 350W

WELDING — SHALL BE AS PER CSA W59-13

BOLTS — SHALL BE AS PER ASTM A625 AND GALVANIZED

GALVANIZING — SHALL BE AS PER CAN/CSA-G164

TREMIE CONCRETE — SHALL BE AS PER OPSS 904

GRATING — SHALL BE "FISHER & LUDLOW" TYPE 18-102M WITH BEARING BARS SIZE 32mm x 3.2mm, OR APPROVED EQUIVALENT

CONCRETE SEALANT — SHALL BE AS PER SPECIFICATION

COUPLER — SHALL BE ABLE TO TRANSFER FULL REINFORCEMENT TENSILE CAPACITY

CONSTRUCTION SEQUENCE:

STAGE 1:
1.1 CONSTRUCT SHORING WALLS 'A', EXCAVATE AND PREPARE RIG PLATFORM.
1.2 AUGUR AND INSTALL CAISSONS FOR 'FUTURE TRACK' STRUCTURE.
1.3 COMPLETE 'FUTURE TRACK' STRUCTURE.

STAGE 2:
2.1 DIVERT EXISTING TRACK ON TO 'FUTURE TRACK' STRUCTURE.
2.2 INSTALL SHORING WALLS 'B'.
2.3 COMPLETE STRUCTURES FOR EAST AND WEST TRACKS.

FINAL STAGE:
3.1 REINSTATE EXISTING TRACK ON 'WEST TRACK' STRUCTURE.

WEST TRACK CURVE DATA (W12)

Dc	= 0° 48' 41"
R	= 2150.00m
Lc	= 276.089
Ls^IN	= 30.00m
Ls^OUT	= 50.00m
Ea	= 1.50"
Eu^P	= 1.70"
Eu^F	= 0.55"
V^P	= 75 MPH
V^F	= 60 MPH

EAST TRACK CURVE DATA (E11)

Dc	= 0° 52' 23"
R	= 2000.46m
Lc	= 496.623
Ls^IN	= 30.00m
Ls^OUT	= 58.00m
Ea	= 1.50"
Eu^P	= 1.94"
Eu^F	= 0.70"
V^P	= 75 MPH
V^F	= 60 MPH

DIVERSION TRACK CURVE DATA

Dc	= 0° 51' 21"
R	= 2040.57m
Lc	= 526.909
Ls^IN	= 200.00m
Ls^OUT	= 60.00m
Ea	= 2.0"
Eu^P	= 1.37"
Eu^F	= 0.16"
V^P	= 75 MPH
V^F	= 60 MPH

PROFILE OF WEST TRACK
NTS

WEST STRUCTURE STA 6+772.500
NEW WEST TRACK PROFILE CONTROL T/LR
BVC STA 6+724.509 EL 202.604
EVC STA 6+884.509 EL 203.299
K=183.22 LVC=160m
-0.002%   0.871%
PVI STA 6+804.509 EL 202.602

PROFILE OF EAST TRACK
NTS

EAST STRUCTURE STA 4+771.734
NEW EAST TRACK PROFILE CONTROL T/LR
BVC STA 4+724.497 EL 202.620
EVC STA 4+884.497 EL 203.200
K=221.55 LVC=160m
0.002%   0.724%
PVI STA 4+804.497 EL 202.621

PROFILE OF FUTURE TRACK
NTS

FUTURE STRUCTURE STA 24+770.583
NEW FUTURE TRACK PROFILE CONTROL T/LR
BVC STA 24+713.864 EL 202.619
EVC STA 24+883.864 EL 203.225
K=240.11 LVC=170m
0.002%   0.710%
PVI STA 24+798.864 EL 202.621

PLAN
1:150

EAST ELEVATION
1:150
NOTE: WALKWAY SHOWN PARTIALLY FOR CLARITY

SECTION 1
Scale = 1:75

GRADATION REQUIREMENT
D50=400mm

SIZE (mm)	% PASSING
600	80-100
500	60-80
400	40-60
200	35-40
100	30-35
26.5	25-30
GRAN 'A'	20

REFERENCE DRAWINGS	ISSUE	REVISIONS	DRAWN BY: ET	DESIGNED BY: MZ
			CHECKED BY: MZ	APPROVED BY: DD
DWG NO.	TITLE	NO. DATE	ISSUED FOR	REV. DATE

SCALE: FULL SIZE ONLY — AS SHOWN

M. ZANGANEH LICENSED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO June 09/15

MMM GROUP

GO — A Division of Metrolinx

BARRIE CORRIDOR
TRIPLE TRACK EXPANSION
DON RIVER BRIDGE
GENERAL ARRANGEMENT

CONTRACT NO.	DWG. NO.	REV.	SHEET
IT-2013-TS-012	S-001		

APPENDIX

A

Site Investigation Photographs

Photographic Inventory, May 2, 2018 (Photo 1 to 12)

Photo 1: Black Creek Culvert, Downstream View

Photo 2: Black Creek Culvert, Upstream View

Photo 3: West Don River Bridge (Bowes Bridge), Upstream view

Photo 4: West Don River Channel, Upstream view from Langstaff Road

Photo 5: West Don River Bridge (Bowes Bridge), Downstream view

Photo 6: Storm Outlet on West Don River, East side on downstream of Bridge

Photo 7: Existing Drainage culvert CSP 500 mm near St. 6+340, Upstream view

Photo 8: Existing Drainage culvert CSP 500 mm near St. 6+340, Downstream view

Photo 9: Existing Drainage Culvert Twin CSP 900 mm near St. 7+060, Downstream view

Photo 10: Existing Drainage Culvert Twin CSP 900 mm near St. 7+060, Upstream view

![wsp logo]

Photo 11: Westminster Creek Culvert, Upstream view

Photo 12: Westminster Creek Culvert, Upstream view

Photographic Inventory, June 16, 2021 (Photo 13 to 24)

Photo 13: Looking east from Langstaff Road toward CN Property Yard

Photo 14: Looking East toward CNR Property and Road

Photo 15: Looking North from Langstaff Road toward CNR Railway Line (West Side Ditch)

Photo 16: Looking North from Langstaff Road toward CNR Railway Line (East Side Ditch)

Photo 17: Outlet of 1650 mm diameter storm Sewer that crosses Langstaff Road and discharges to a ditch downstream of Langstaff Road in CN Property (Inlet Channel to Existing SWM Pond C)

Photo 18: Close view of 1650 mm diameter Storm Sewer Outlet

Langstaff Road EA

Photo 19: Downstream Channel of 1650 mm diameter Outlet, which drains to Existing SWM Pond C

Photo 20: Location of Drainage Features in the Vicinity of CNR Yard

Photo 21 Culvert C1 Upstream View

Photo 22: Culvert C2 Upstream View

![WSP logo]

Photo 23: Culvert C3 Downstream View

Photo 24: Culvert C4 Downstream view
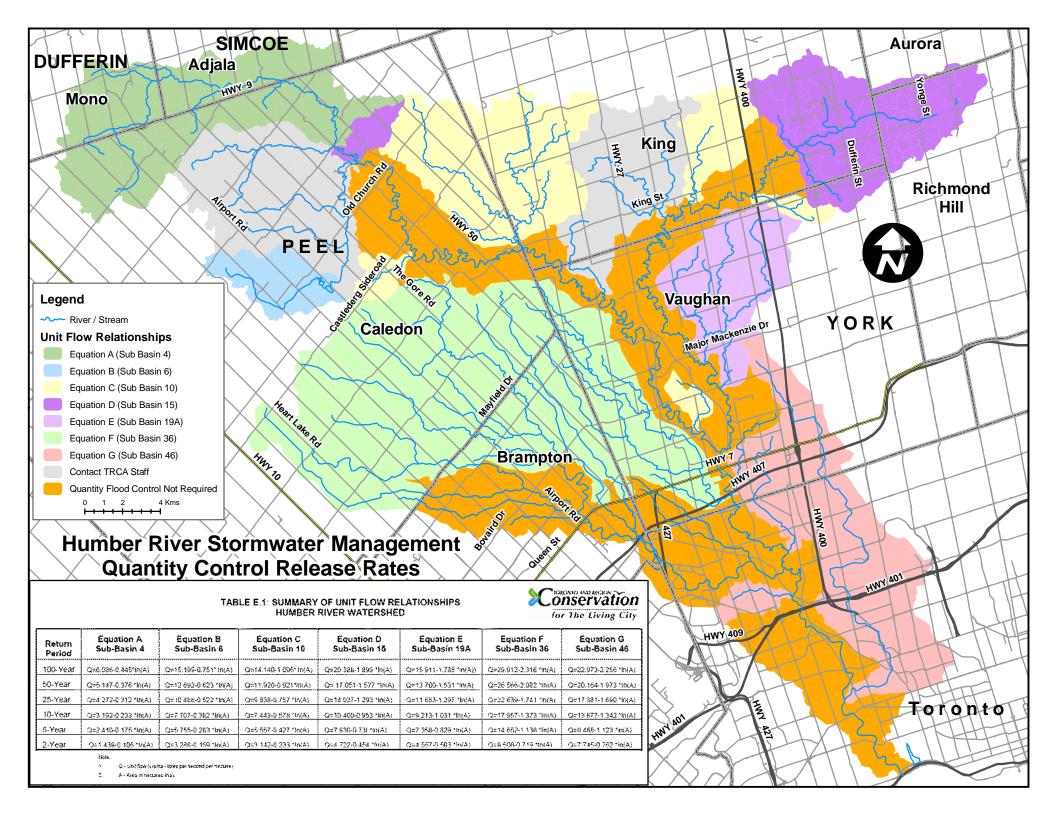
APPENDIX

B

Hydrologic Assessments
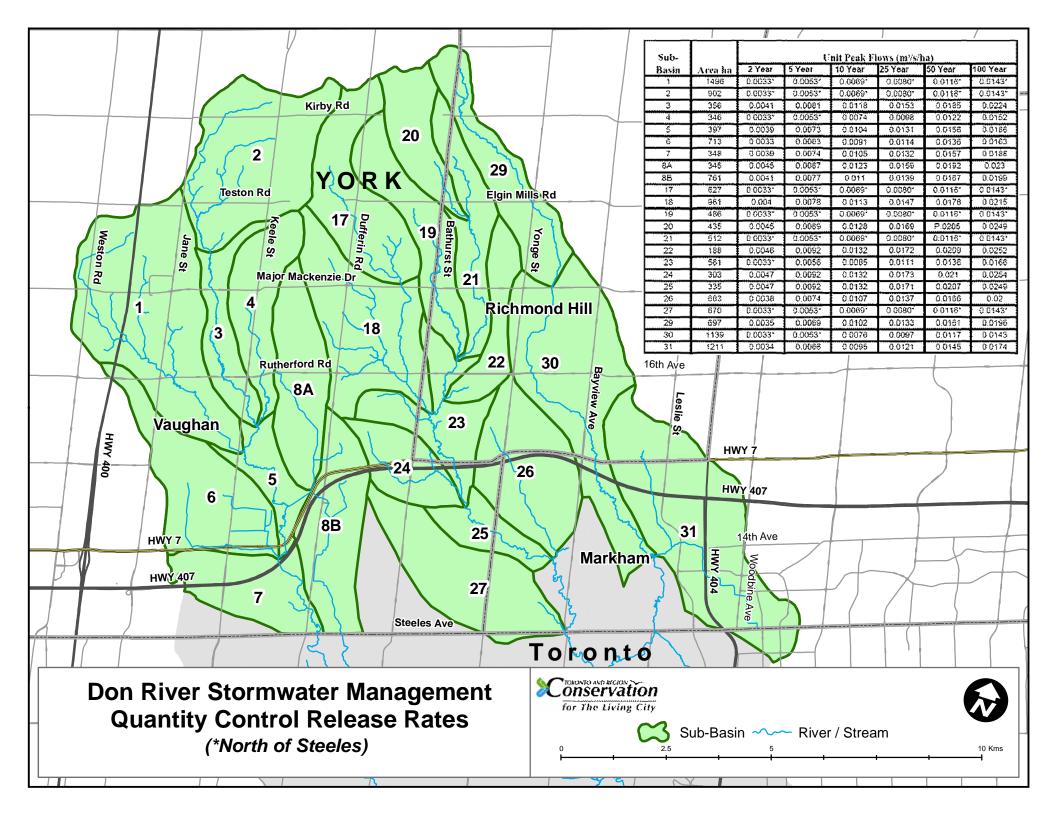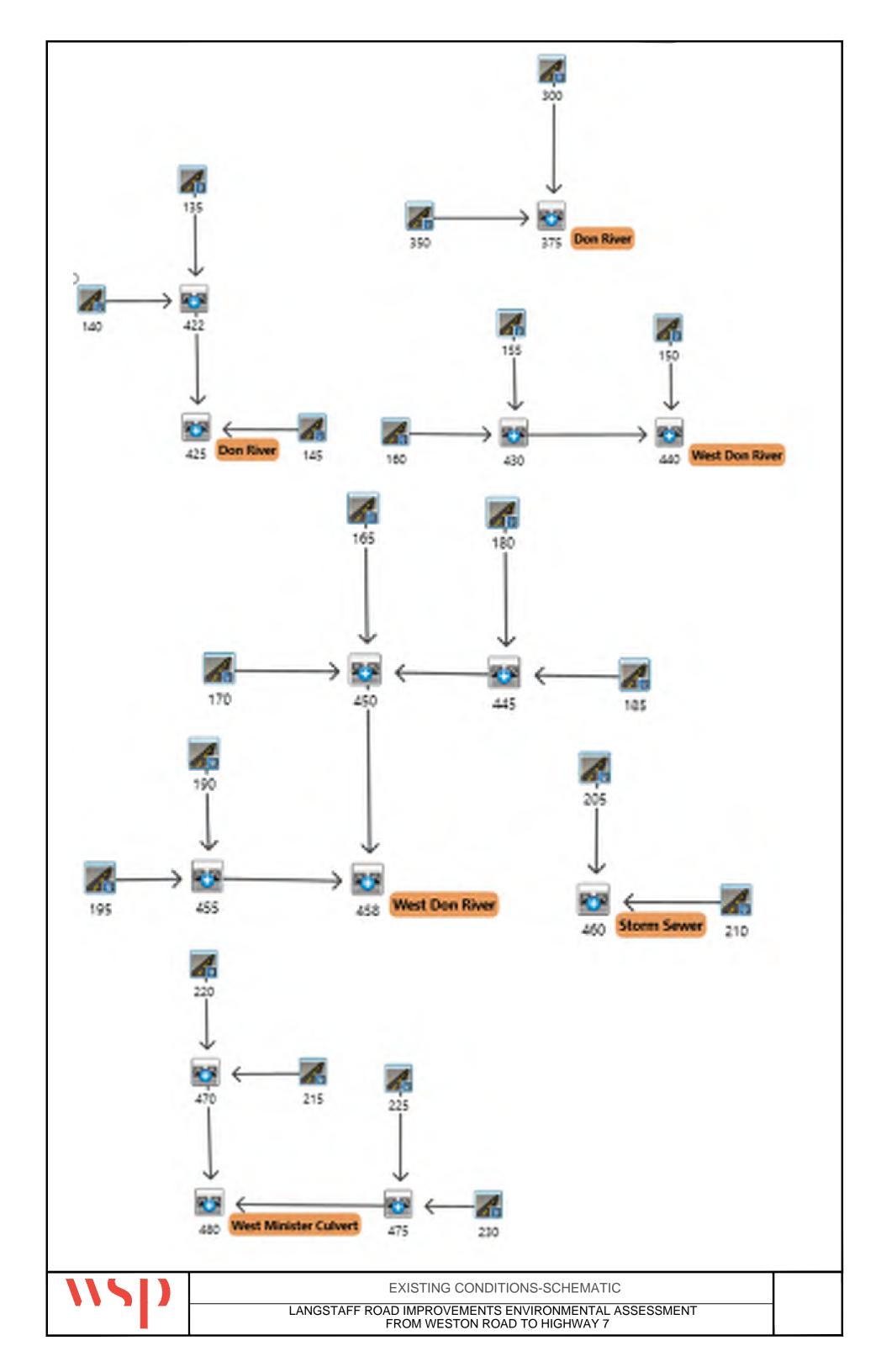
Unit Flow Rate of Humber River and Don River Watershed

Humber River Stormwater Management Quantity Control Release Rates

Legend

River / Stream

Unit Flow Relationships
- Equation A (Sub Basin 4)
- Equation B (Sub Basin 6)
- Equation C (Sub Basin 10)
- Equation D (Sub Basin 15)
- Equation E (Sub Basin 19A)
- Equation F (Sub Basin 36)
- Equation G (Sub Basin 46)
- Contact TRCA Staff
- Quantity Flood Control Not Required

0 1 2   4 Kms

TABLE E.1: SUMMARY OF UNIT FLOW RELATIONSHIPS HUMBER RIVER WATERSHED

Return Period	Equation A Sub-Basin 4	Equation B Sub-Basin 6	Equation C Sub-Basin 10	Equation D Sub-Basin 15	Equation E Sub-Basin 19A	Equation F Sub-Basin 36	Equation G Sub-Basin 46
100-Year	$Q=6.086-0.445\ln(A)$	$Q=15.199-0.751\ln(A)$	$Q=14.140-1.096\ln(A)$	$Q=20.386-1.896\ln(A)$	$Q=15.911-1.785\ln(A)$	$Q=29.912-2.316\ln(A)$	$Q=22.973-2.256\ln(A)$
50-Year	$Q=5.147-0.376\ln(A)$	$Q=12.692-0.623\ln(A)$	$Q=11.920-0.921\ln(A)$	$Q=17.051-1.577\ln(A)$	$Q=13.700-1.531\ln(A)$	$Q=26.586-2.082\ln(A)$	$Q=20.164-1.973\ln(A)$
25-Year	$Q=4.272-0.312\ln(A)$	$Q=10.488-0.522\ln(A)$	$Q=9.838-0.757\ln(A)$	$Q=14.037-1.293\ln(A)$	$Q=11.653-1.297\ln(A)$	$Q=22.639-1.741\ln(A)$	$Q=17.381-1.690\ln(A)$
10-Year	$Q=3.192-0.233\ln(A)$	$Q=7.707-0.382\ln(A)$	$Q=7.443-0.578\ln(A)$	$Q=10.400-0.953\ln(A)$	$Q=9.213-1.031\ln(A)$	$Q=17.957-1.373\ln(A)$	$Q=13.877-1.342\ln(A)$
5-Year	$Q=2.410-0.175\ln(A)$	$Q=6.755-0.263\ln(A)$	$Q=5.557-0.427\ln(A)$	$Q=7.930-0.731\ln(A)$	$Q=7.358-0.829\ln(A)$	$Q=14.652-1.136\ln(A)$	$Q=11.468-1.123\ln(A)$
2-Year	$Q=1.438-0.105\ln(A)$	$Q=3.228-0.159\ln(A)$	$Q=3.142-0.233\ln(A)$	$Q=4.722-0.454\ln(A)$	$Q=4.567-0.503\ln(A)$	$Q=9.506-0.719\ln(A)$	$Q=7.745-0.762\ln(A)$

Note:
1. Q - unit flow (L/s/ha - litres per second per hectare)
2. A - Area in hectares (ha)

Don River Stormwater Management Quantity Control Release Rates
(*North of Steeles)

Map labels: Kirby Rd, YORK, Teston Rd, Elgin Mills Rd, Weston Rd, Jane St, Keele St, Dufferin Rd, Bathurst St, Yonge St, Major Mackenzie Dr, Richmond Hill, Rutherford Rd, Bayview Ave, Leslie St, 16th Ave, Vaughan, HWY 400, HWY 7, HWY 407, Markham, HWY 404, Woodbine Ave, 14th Ave, Steeles Ave, Toronto

Sub-Basin	Area ha	Unit Peak Flows (m³/s/ha)					
		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
1	1496	0.0033*	0.0053*	0.0069*	0.0080*	0.0116*	0.0143*
2	902	0.0033*	0.0053*	0.0069*	0.0080*	0.0116*	0.0143*
3	356	0.0041	0.0081	0.0118	0.0153	0.0185	0.0224
4	346	0.0033*	0.0053*	0.0074	0.0098	0.0122	0.0152
5	397	0.0039	0.0073	0.0104	0.0131	0.0156	0.0186
6	713	0.0033	0.0063	0.0091	0.0114	0.0136	0.0163
7	348	0.0039	0.0074	0.0105	0.0132	0.0157	0.0188
8A	345	0.0045	0.0087	0.0123	0.0159	0.0192	0.023
8B	761	0.0041	0.0077	0.011	0.0139	0.0167	0.0199
17	627	0.0033*	0.0053*	0.0069*	0.0080*	0.0116*	0.0143*
18	961	0.004	0.0078	0.0113	0.0147	0.0176	0.0215
19	486	0.0033*	0.0053*	0.0069*	0.0080*	0.0116*	0.0143*
20	435	0.0045	0.0089	0.0128	0.0169	P.0205	0.0249
21	512	0.0033*	0.0053*	0.0069*	0.0080*	0.0116*	0.0143*
22	188	0.0046	0.0092	0.0132	0.0172	0.0209	0.0252
23	561	0.0033*	0.0056	0.0085	0.0111	0.0136	0.0166
24	303	0.0047	0.0092	0.0132	0.0173	0.021	0.0254
25	335	0.0047	0.0092	0.0132	0.0171	0.0207	0.0249
26	683	0.0038	0.0074	0.0107	0.0137	0.0166	0.02
27	670	0.0033*	0.0053*	0.0069*	0.0080*	0.0116*	0.0143*
29	697	0.0035	0.0069	0.0102	0.0133	0.0161	0.0196
30	1139	0.0033*	0.0053*	0.0076	0.0097	0.0117	0.0143
31	1211	0.0034	0.0066	0.0095	0.0121	0.0145	0.0174

Toronto and Region Conservation for The Living City

Sub-Basin   River / Stream

0   2.5   5   10 Kms

Existing Conditions Hydrologic Summary

Summary of Existing Conditions Hydrologic Modelling Parameters

16M-01457-01 Langstaff Rd EA

Sub-Catchment ID	IUH Class	Drainage Area (ha)	Imperviousness (%) Direct	+	Indirect	=	Total	SCS Curve Number	Initial Abstraction (mm) Pervious	Impervious	Manning's 'n' Pervious	Impervious	Time to Peak (hours)	Number of Linear Reservoirs	Flow Length (m) Pervious	Impervious	Slope (%) Pervious	Impervious	CN AMC III
105	Standard	1.63	61	+	0	=	61	86	5.0	2.0	0.25	0.013	n/a	n/a	25	650	2.0	1.0	
110	Standard	1.58	57	+	0	=	57	85	5.0	2.0	0.25	0.013	n/a	n/a	25	650	2.0	1.0	
115	Standard	1.00	46	+	0	=	46	83	5.0	2.0	0.25	0.013	n/a	n/a	17	475	2.0	1.0	
120	Standard	1.24	57	+	0	=	57	83	5.0	2.0	0.25	0.013	n/a	n/a	17	475	2.0	1.0	
125	Standard	2.27	53	+	0	=	53	83	5.0	2.0	0.25	0.013	n/a	n/a	20	800	2.0	1.0	
130	Standard	2.08	51	+	0	=	51	83	5.0	2.0	0.25	0.013	n/a	n/a	20	800	2.0	1.0	
135	Standard	1.43	39	+	0	=	39	84	5.0	2.0	0.25	0.013	n/a	n/a	30	503	2.0	1.0	
140	Standard	1.27	52	+	0	=	52	83	5.0	2.0	0.25	0.013	n/a	n/a	25	503	2.0	1.0	
145	Standard	3.05	62	+	0	=	62	86	5.0	2.0	0.25	0.013	n/a	n/a	40	531	2.0	1.0	
150	Standard	3.81	94	+	0	=	94	88	5.0	2.0	0.25	0.013	n/a	n/a	40	150	2.0	1.0	
155	Standard	0.56	45	+	0	=	45	87	5.0	2.0	0.29	0.013	n/a	n/a	25	260	2.0	1.0	
160	Standard	0.43	56	+	0	=	56	89	5.0	2.0	0.25	0.013	n/a	n/a	20	260	2.0	1.0	
165	Standard	0.60	40	+	0	=	40	83	5.0	2.0	0.25	0.013	n/a	n/a	20	250	2.0	1.0	
170	Standard	0.43	57	+	0	=	57	89	5.0	2.0	0.25	0.013	n/a	n/a	20	250	2.0	1.0	
180	Standard	0.65	33	+	0	=	33	83	5.0	2.0	0.25	0.013	n/a	n/a	40	66	2.0	1.0	
185	Standard	0.47	48	+	0	=	48	79	5.0	2.0	0.35	0.013	n/a	n/a	20	240	2.0	1.0	
190	Standard	0.86	42	+	0	=	42	83	5.0	2.0	0.25	0.013	n/a	n/a	50	340	2.0	1.0	
195	Standard	0.79	42	+	0	=	42	83	5.0	2.0	0.25	0.013	n/a	n/a	20	340	2.0	1.0	
205	Standard	1.11	38	+	0	=	38	83	5.0	2.0	0.25	0.013	n/a	n/a	20	470	2.0	1.0	
210	Standard	0.96	44	+	0	=	44	83	5.0	2.0	0.25	0.013	n/a	n/a	20	470	2.0	1.0	
215	Standard	0.58	57	+	0	=	57	83	5.0	2.0	0.25	0.013	n/a	n/a	30	260	2.0	1.0	
220	Standard	0.65	46	+	0	=	46	83	5.0	2.0	0.25	0.013	n/a	n/a	20	260	2.0	1.0	
225	Standard	0.90	53	+	0	=	53	83	5.0	2.0	0.25	0.013	n/a	n/a	25	320	2.0	1.0	
230	Standard	0.70	57	+	0	=	57	81	5.0	2.0	0.29	0.013	n/a	n/a	25	320	2.0	1.0	
235	Standard	0.66	67	+	0	=	67	83	5.0	2.0	0.25	0.013	n/a	n/a	20	320	2.0	1.0	
240	Standard	0.72	67	+	0	=	67	83	5.0	2.0	0.25	0.013	n/a	n/a	20	320	2.0	1.0	
350	Standard	0.90	70	+	0	=	70	79	5.0	2.0	0.25	0.013	n/a	n/a	40	258	2.0	1.0	
Total/Ave		41.33	63	+	0	=	63	83	5.00										

Humber River Watershed
Visual OTTHYMO Summary - Existing

LangstaffRd_EA_Existing_HumberWatershed
****
** SIMULATION:Run 02   **
****

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--------------------
|  READ STORM       |    Filename: C:\Users\ray.zhao\AppD
|                   |         ata\Local\Temp\
|                   |         fed60948-ccbe-4ce0-8b92-0edff20f5fb5\f5bec23e
| Ptotal= 42.00 mm  |    Comments: 2Y12
--------------------
```

| TIME | RAIN | TIME | RAIN | ' TIME | RAIN | TIME | RAIN |
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	7.14	6.75	2.94	10.00	0.42
0.50	0.42	3.75	7.14	7.00	2.94	10.25	0.42
0.75	0.42	4.00	7.14	7.25	2.94	10.50	0.42
1.00	0.42	4.25	7.14	7.50	1.68	10.75	0.42
1.25	0.42	4.50	19.32	7.75	1.68	11.00	0.42
1.50	0.42	4.75	19.32	8.00	1.68	11.25	0.42
1.75	0.42	5.00	19.32	8.25	1.68	11.50	0.42
2.00	0.42	5.25	19.32	8.50	0.84	11.75	0.42
2.25	0.42	5.50	5.46	8.75	0.84	12.00	0.42
2.50	2.52	5.75	5.46	9.00	0.84	12.25	0.42
2.75	2.52	6.00	5.46	9.25	0.84		
3.00	2.52	6.25	5.46	9.50	0.42		
3.25	2.52	6.50	2.94	9.75	0.42		

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--------------------
| CALIB             |
| STANDHYD ( 0110)  |    Area     (ha)=  1.58
|ID= 1 DT= 5.0 min  |    Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.90	0.68
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	650.00	25.00
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	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42

LangstaffRd_EA_Existing_HumberWatershed

0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)=	19.32	10.72
over (min)	15.00	30.00
Storage Coeff. (min)=	15.16 (ii)	28.16 (ii)
Unit Hyd. Tpeak (min)=	15.00	30.00
Unit Hyd. peak (cms)=	0.07	0.04

			TOTALS
PEAK FLOW (cms)=	0.05	0.01	0.060 (iii)
TIME TO PEAK (hrs)=	5.25	5.50	5.25
RUNOFF VOLUME (mm)=	40.00	16.73	29.98
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.95	0.40	0.71

```
   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 85.0   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.
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| CALIB             |
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LangstaffRd_EA_Existing_HumberWatershed

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--------------------
| STANDHYD ( 0105)  |    Area     (ha)=  1.63
|ID= 1 DT= 5.0 min  |    Total Imp(%)= 61.00   Dir. Conn.(%)= 61.00
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		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.99	0.64
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	650.00	25.00
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	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

LangstaffRd_EA_Existing_HumberWatershed

Max.Eff.Inten.(mm/hr)=	19.32	11.18
over (min)	15.00	30.00
Storage Coeff. (min)=	15.16 (ii)	27.95 (ii)
Unit Hyd. Tpeak (min)=	15.00	30.00
Unit Hyd. peak (cms)=	0.07	0.04

			TOTALS
PEAK FLOW (cms)=	0.05	0.01	0.065 (iii)
TIME TO PEAK (hrs)=	5.25	5.50	5.25
RUNOFF VOLUME (mm)=	40.00	17.47	31.20
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.95	0.42	0.74

```
   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 86.0   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.
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--------------------
| ADD HYD ( 0400)   |
|  1 + 2 = 3        |        AREA    QPEAK   TPEAK   R.V.
--------------------           (ha)   (cms)   (hrs)   (mm)
```

ID1= 1 (0105):	1.63	0.065	5.25	31.20
+ ID2= 2 (0110):	1.58	0.060	5.25	29.98
==				
ID = 3 (0400):	3.21	0.125	5.25	30.60

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| CALIB             |
| STANDHYD ( 0125)  |    Area     (ha)=  2.27
|ID= 1 DT= 5.0 min  |    Total Imp(%)= 53.00   Dir. Conn.(%)= 53.00
--------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.20	1.07
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	800.00	20.00
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	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42

```
                    LangstaffRd_EA_Existing_HumberWatershed
        0.250   0.00 | 3.333   7.14 | 6.417   2.94 |  9.50   0.42
        0.333   0.42 | 3.417   7.14 | 6.500   2.94 |  9.58   0.42
        0.417   0.42 | 3.500   7.14 | 6.583   2.94 |  9.67   0.42
        0.500   0.42 | 3.583   7.14 | 6.667   2.94 |  9.75   0.42
        0.583   0.42 | 3.667   7.14 | 6.750   2.94 |  9.83   0.42
        0.667   0.42 | 3.750   7.14 | 6.833   2.94 |  9.92   0.42
        0.750   0.42 | 3.833   7.14 | 6.917   2.94 | 10.00   0.42
        0.833   0.42 | 3.917   7.14 | 7.000   2.94 | 10.08   0.42
        0.917   0.42 | 4.000   7.14 | 7.083   2.94 | 10.17   0.42
        1.000   0.42 | 4.083   7.14 | 7.167   2.94 | 10.25   0.42
        1.083   0.42 | 4.167   7.14 | 7.250   2.94 | 10.33   0.42
        1.167   0.42 | 4.250   7.14 | 7.333   1.68 | 10.42   0.42
        1.250   0.42 | 4.333  19.32 | 7.417   1.68 | 10.50   0.42
        1.333   0.42 | 4.417  19.32 | 7.500   1.68 | 10.58   0.42
        1.417   0.42 | 4.500  19.32 | 7.583   1.68 | 10.67   0.42
        1.500   0.42 | 4.583  19.32 | 7.667   1.68 | 10.75   0.42
        1.583   0.42 | 4.667  19.32 | 7.750   1.68 | 10.83   0.42
        1.667   0.42 | 4.750  19.32 | 7.833   1.68 | 10.92   0.42
        1.750   0.42 | 4.833  19.32 | 7.917   1.68 | 11.00   0.42
        1.833   0.42 | 4.917  19.32 | 8.000   1.68 | 11.08   0.42
        1.917   0.42 | 5.000  19.32 | 8.083   1.68 | 11.17   0.42
        2.000   0.42 | 5.083  19.32 | 8.167   1.68 | 11.25   0.42
        2.083   0.42 | 5.167  19.32 | 8.250   1.68 | 11.33   0.42
        2.167   0.42 | 5.250  19.32 | 8.333   0.84 | 11.42   0.42
        2.250   0.42 | 5.333   5.46 | 8.417   0.84 | 11.50   0.42
        2.333   2.52 | 5.417   5.46 | 8.500   0.84 | 11.58   0.42
        2.417   2.52 | 5.500   5.46 | 8.583   0.84 | 11.67   0.42
        2.500   2.52 | 5.583   5.46 | 8.667   0.84 | 11.75   0.42
        2.583   2.52 | 5.667   5.46 | 8.750   0.84 | 11.83   0.42
        2.667   2.52 | 5.750   5.46 | 8.833   0.84 | 11.92   0.42
        2.750   2.52 | 5.833   5.46 | 8.917   0.84 | 12.00   0.42
        2.833   2.52 | 5.917   5.46 | 9.000   0.84 | 12.08   0.42
        2.917   2.52 | 6.000   5.46 | 9.083   0.84 | 12.17   0.42
        3.000   2.52 | 6.083   5.46 | 9.167   0.84 | 12.25   0.42
        3.083   2.52 | 6.167   5.46 | 9.250   0.84 |

    Max.Eff.Inten.(mm/hr)=     19.32          9.87
              over (min)       15.00         30.00
    Storage Coeff.  (min)=  17.17 (ii)    28.93 (ii)
    Unit Hyd. Tpeak (min)=     15.00         30.00
    Unit Hyd. peak  (cms)=      0.07          0.04
                                                        *TOTALS*
    PEAK FLOW       (cms)=      0.06          0.02      0.081 (iii)
    TIME TO PEAK    (hrs)=      5.25          5.50         5.25
    RUNOFF VOLUME    (mm)=     40.00         15.38        28.42
    TOTAL RAINFALL   (mm)=     42.00         42.00        42.00
    RUNOFF COEFFICIENT  =       0.95          0.37         0.68


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* =  83.0    Ia = Dep. Storage  (Above)
   (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
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Page 5

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                    LangstaffRd_EA_Existing_HumberWatershed
        (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  ------------------------------------------------------------------------------
  --------------------
  | CALIB              |
  | STANDHYD ( 0130)|    Area    (ha)=   2.08
  |ID= 1 DT= 5.0 min |  Total Imp(%)= 51.00   Dir. Conn.(%)= 51.00
  --------------------
                              IMPERVIOUS      PERVIOUS (i)
       Surface Area   (ha)=      1.06            1.02
       Dep. Storage   (mm)=      2.00            5.00
       Average Slope  (%)=       1.00            2.00
       Length         (m)=     800.00           20.00
       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 | 3.167   2.52 | 6.250   5.46 |  9.33   0.42
        0.167   0.00 | 3.250   2.52 | 6.333   2.94 |  9.42   0.42
        0.250   0.00 | 3.333   7.14 | 6.417   2.94 |  9.50   0.42
        0.333   0.42 | 3.417   7.14 | 6.500   2.94 |  9.58   0.42
        0.417   0.42 | 3.500   7.14 | 6.583   2.94 |  9.67   0.42
        0.500   0.42 | 3.583   7.14 | 6.667   2.94 |  9.75   0.42
        0.583   0.42 | 3.667   7.14 | 6.750   2.94 |  9.83   0.42
        0.667   0.42 | 3.750   7.14 | 6.833   2.94 |  9.92   0.42
        0.750   0.42 | 3.833   7.14 | 6.917   2.94 | 10.00   0.42
        0.833   0.42 | 3.917   7.14 | 7.000   2.94 | 10.08   0.42
        0.917   0.42 | 4.000   7.14 | 7.083   2.94 | 10.17   0.42
        1.000   0.42 | 4.083   7.14 | 7.167   2.94 | 10.25   0.42
        1.083   0.42 | 4.167   7.14 | 7.250   2.94 | 10.33   0.42
        1.167   0.42 | 4.250   7.14 | 7.333   1.68 | 10.42   0.42
        1.250   0.42 | 4.333  19.32 | 7.417   1.68 | 10.50   0.42
        1.333   0.42 | 4.417  19.32 | 7.500   1.68 | 10.58   0.42
        1.417   0.42 | 4.500  19.32 | 7.583   1.68 | 10.67   0.42
        1.500   0.42 | 4.583  19.32 | 7.667   1.68 | 10.75   0.42
        1.583   0.42 | 4.667  19.32 | 7.750   1.68 | 10.83   0.42
        1.667   0.42 | 4.750  19.32 | 7.833   1.68 | 10.92   0.42
        1.750   0.42 | 4.833  19.32 | 7.917   1.68 | 11.00   0.42
        1.833   0.42 | 4.917  19.32 | 8.000   1.68 | 11.08   0.42
        1.917   0.42 | 5.000  19.32 | 8.083   1.68 | 11.17   0.42
        2.000   0.42 | 5.083  19.32 | 8.167   1.68 | 11.25   0.42
        2.083   0.42 | 5.167  19.32 | 8.250   1.68 | 11.33   0.42
        2.167   0.42 | 5.250  19.32 | 8.333   0.84 | 11.42   0.42
        2.250   0.42 | 5.333   5.46 | 8.417   0.84 | 11.50   0.42
        2.333   2.52 | 5.417   5.46 | 8.500   0.84 | 11.58   0.42
        2.417   2.52 | 5.500   5.46 | 8.583   0.84 | 11.67   0.42
        2.500   2.52 | 5.583   5.46 | 8.667   0.84 | 11.75   0.42
        2.583   2.52 | 5.667   5.46 | 8.750   0.84 | 11.83   0.42
        2.667   2.52 | 5.750   5.46 | 8.833   0.84 | 11.92   0.42
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Page 6

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                    LangstaffRd_EA_Existing_HumberWatershed
        2.750   2.52 | 5.833   5.46 | 8.917   0.84 | 12.00   0.42
        2.833   2.52 | 5.917   5.46 | 9.000   0.84 | 12.08   0.42
        2.917   2.52 | 6.000   5.46 | 9.083   0.84 | 12.17   0.42
        3.000   2.52 | 6.083   5.46 | 9.167   0.84 | 12.25   0.42
        3.083   2.52 | 6.167   5.46 | 9.250   0.84 |

    Max.Eff.Inten.(mm/hr)=     19.32          9.87
              over (min)       15.00         30.00
    Storage Coeff.  (min)=  17.17 (ii)    28.93 (ii)
    Unit Hyd. Tpeak (min)=     15.00         30.00
    Unit Hyd. peak  (cms)=      0.07          0.04
                                                        *TOTALS*
    PEAK FLOW       (cms)=      0.06          0.02      0.072 (iii)
    TIME TO PEAK    (hrs)=      5.25          5.50         5.25
    RUNOFF VOLUME    (mm)=     40.00         15.38        27.93
    TOTAL RAINFALL   (mm)=     42.00         42.00        42.00
    RUNOFF COEFFICIENT  =       0.95          0.37         0.66


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* =  83.0    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  ( 0405)|
  |   1 + 2 = 3     |       AREA    QPEAK    TPEAK    R.V.
  --------------------      (ha)    (cms)    (hrs)    (mm)
       ID1= 1 ( 0125):      2.27    0.081     5.25    28.42
     + ID2= 2 ( 0130):      2.08    0.072     5.25    27.93
       =================================================
       ID = 3 ( 0405):      4.35    0.153     5.25    28.19

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  ------------------------------------------------------------------------------
  --------------------
  | CALIB              |
  | STANDHYD ( 0120)|    Area    (ha)=   1.24
  |ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
  --------------------
                              IMPERVIOUS      PERVIOUS (i)
       Surface Area   (ha)=      0.71            0.53
       Dep. Storage   (mm)=      2.00            5.00
       Average Slope  (%)=       1.00            2.00
       Length         (m)=     475.00           17.00
       Mannings n      =        0.013            0.250

       NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
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Page 7

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                    LangstaffRd_EA_Existing_HumberWatershed
                          ---- 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   2.52 | 6.250   5.46 |  9.33   0.42
        0.167   0.00 | 3.250   2.52 | 6.333   2.94 |  9.42   0.42
        0.250   0.00 | 3.333   7.14 | 6.417   2.94 |  9.50   0.42
        0.333   0.42 | 3.417   7.14 | 6.500   2.94 |  9.58   0.42
        0.417   0.42 | 3.500   7.14 | 6.583   2.94 |  9.67   0.42
        0.500   0.42 | 3.583   7.14 | 6.667   2.94 |  9.75   0.42
        0.583   0.42 | 3.667   7.14 | 6.750   2.94 |  9.83   0.42
        0.667   0.42 | 3.750   7.14 | 6.833   2.94 |  9.92   0.42
        0.750   0.42 | 3.833   7.14 | 6.917   2.94 | 10.00   0.42
        0.833   0.42 | 3.917   7.14 | 7.000   2.94 | 10.08   0.42
        0.917   0.42 | 4.000   7.14 | 7.083   2.94 | 10.17   0.42
        1.000   0.42 | 4.083   7.14 | 7.167   2.94 | 10.25   0.42
        1.083   0.42 | 4.167   7.14 | 7.250   2.94 | 10.33   0.42
        1.167   0.42 | 4.250   7.14 | 7.333   1.68 | 10.42   0.42
        1.250   0.42 | 4.333  19.32 | 7.417   1.68 | 10.50   0.42
        1.333   0.42 | 4.417  19.32 | 7.500   1.68 | 10.58   0.42
        1.417   0.42 | 4.500  19.32 | 7.583   1.68 | 10.67   0.42
        1.500   0.42 | 4.583  19.32 | 7.667   1.68 | 10.75   0.42
        1.583   0.42 | 4.667  19.32 | 7.750   1.68 | 10.83   0.42
        1.667   0.42 | 4.750  19.32 | 7.833   1.68 | 10.92   0.42
        1.750   0.42 | 4.833  19.32 | 7.917   1.68 | 11.00   0.42
        1.833   0.42 | 4.917  19.32 | 8.000   1.68 | 11.08   0.42
        1.917   0.42 | 5.000  19.32 | 8.083   1.68 | 11.17   0.42
        2.000   0.42 | 5.083  19.32 | 8.167   1.68 | 11.25   0.42
        2.083   0.42 | 5.167  19.32 | 8.250   1.68 | 11.33   0.42
        2.167   0.42 | 5.250  19.32 | 8.333   0.84 | 11.42   0.42
        2.250   0.42 | 5.333   5.46 | 8.417   0.84 | 11.50   0.42
        2.333   2.52 | 5.417   5.46 | 8.500   0.84 | 11.58   0.42
        2.417   2.52 | 5.500   5.46 | 8.583   0.84 | 11.67   0.42
        2.500   2.52 | 5.583   5.46 | 8.667   0.84 | 11.75   0.42
        2.583   2.52 | 5.667   5.46 | 8.750   0.84 | 11.83   0.42
        2.667   2.52 | 5.750   5.46 | 8.833   0.84 | 11.92   0.42
        2.750   2.52 | 5.833   5.46 | 8.917   0.84 | 12.00   0.42
        2.833   2.52 | 5.917   5.46 | 9.000   0.84 | 12.08   0.42
        2.917   2.52 | 6.000   5.46 | 9.083   0.84 | 12.17   0.42
        3.000   2.52 | 6.083   5.46 | 9.167   0.84 | 12.25   0.42
        3.083   2.52 | 6.167   5.46 | 9.250   0.84 |

    Max.Eff.Inten.(mm/hr)=     19.32          9.87
              over (min)       15.00         25.00
    Storage Coeff.  (min)=  12.56 (ii)    23.22 (ii)
    Unit Hyd. Tpeak (min)=     15.00         25.00
    Unit Hyd. peak  (cms)=      0.08          0.05
                                                        *TOTALS*
    PEAK FLOW       (cms)=      0.04          0.01      0.048 (iii)
    TIME TO PEAK    (hrs)=      5.25          5.42         5.25
    RUNOFF VOLUME    (mm)=     40.00         15.38        29.40
    TOTAL RAINFALL   (mm)=     42.00         42.00        42.00
    RUNOFF COEFFICIENT  =       0.95          0.37         0.70
```
Page 8

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
    CN* = 83.0   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 (0115)| Area   (ha)= 1.00
|ID= 1 DT= 5.0 min | Total Imp(%)= 46.00   Dir. Conn.(%)= 46.00

                              IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=   0.46   0.54
     Dep. Storage   (mm)=   2.00   5.00
     Average Slope   (%)=   1.00   2.00
     Length   (m)=   475.00   17.00
     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 | 3.167 2.52 | 6.250 5.46 | 9.33   0.42
       0.167 0.00 | 3.250 2.52 | 6.333 2.94 | 9.42   0.42
       0.250 0.00 | 3.333 7.14 | 6.417 2.94 | 9.50   0.42
       0.333 0.42 | 3.417 7.14 | 6.500 2.94 | 9.58   0.42
       0.417 0.42 | 3.500 7.14 | 6.583 2.94 | 9.67   0.42
       0.500 0.42 | 3.583 7.14 | 6.667 2.94 | 9.75   0.42
       0.583 0.42 | 3.667 7.14 | 6.750 2.94 | 9.83   0.42
       0.667 0.42 | 3.750 7.14 | 6.833 2.94 | 9.92   0.42
       0.750 0.42 | 3.833 7.14 | 6.917 2.94 | 10.00 0.42
       0.833 0.42 | 3.917 7.14 | 7.000 2.94 | 10.08 0.42
       0.917 0.42 | 4.000 7.14 | 7.083 2.94 | 10.17 0.42
       1.000 0.42 | 4.083 7.14 | 7.167 2.94 | 10.25 0.42
       1.083 0.42 | 4.167 7.14 | 7.250 2.94 | 10.33 0.42
       1.167 0.42 | 4.250 7.14 | 7.333 1.68 | 10.42 0.42
       1.250 0.42 | 4.333 19.32| 7.417 1.68 | 10.50 0.42
       1.333 0.42 | 4.417 19.32| 7.500 1.68 | 10.58 0.42
       1.417 0.42 | 4.500 19.32| 7.583 1.68 | 10.67 0.42
       1.500 0.42 | 4.583 19.32| 7.667 1.68 | 10.75 0.42
       1.583 0.42 | 4.667 19.32| 7.750 1.68 | 10.83 0.42
       1.667 0.42 | 4.750 19.32| 7.833 1.68 | 10.92 0.42
       1.750 0.42 | 4.833 19.32| 7.917 1.68 | 11.00 0.42
       1.833 0.42 | 4.917 19.32| 8.000 1.68 | 11.08 0.42
       1.917 0.42 | 5.000 19.32| 8.083 1.68 | 11.17 0.42
       2.000 0.42 | 5.083 19.32| 8.167 1.68 | 11.25 0.42
       2.083 0.42 | 5.167 19.32| 8.250 1.68 | 11.33 0.42
       2.167 0.42 | 5.250 19.32| 8.333 0.84 | 11.42 0.42
       2.250 0.42 | 5.333 5.46 | 8.417 0.84 | 11.50 0.42

       2.333 2.52 | 5.417 5.46 | 8.500 0.84 | 11.58 0.42
       2.417 2.52 | 5.500 5.46 | 8.583 0.84 | 11.67 0.42
       2.500 2.52 | 5.583 5.46 | 8.667 0.84 | 11.75 0.42
       2.583 2.52 | 5.667 5.46 | 8.750 0.84 | 11.83 0.42
       2.667 2.52 | 5.750 5.46 | 8.833 0.84 | 11.92 0.42
       2.750 2.52 | 5.833 5.46 | 8.917 0.84 | 12.00 0.42
       2.833 2.52 | 5.917 5.46 | 9.000 0.84 | 12.08 0.42
       2.917 2.52 | 6.000 5.46 | 9.083 0.84 | 12.17 0.42
       3.000 2.52 | 6.083 5.46 | 9.167 0.84 | 12.25 0.42
       3.083 2.52 | 6.167 5.46 | 9.250 0.84 |

Max.Eff.Inten.(mm/hr)=   19.32   9.87
        over (min)   15.00   25.00
Storage Coeff. (min)=   12.56 (ii)   23.22 (ii)
Unit Hyd. Tpeak (min)=   15.00   25.00
Unit Hyd. peak (cms)=   0.08   0.05
                                              TOTALS
PEAK FLOW   (cms)=   0.02   0.01   0.035 (iii)
TIME TO PEAK   (hrs)=   5.25   5.42   5.25
RUNOFF VOLUME (mm)=   40.00   15.38   26.69
TOTAL RAINFALL (mm)=   42.00   42.00   42.00
RUNOFF COEFFICIENT =   0.95   0.37   0.64

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 (0410)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
     ID1= 1 (0115):   1.00   0.035   5.25   26.69
    + ID2= 2 (0120):   1.24   0.048   5.25   29.40
     ===
     ID = 3 (0410):   2.24   0.083   5.25   28.19

     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0420)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
     ID1= 1 (0405):   4.35   0.153   5.25   28.19
    + ID2= 2 (0410):   2.24   0.083   5.25   28.19
     ===
     ID = 3 (0420):   6.59   0.236   5.25   28.19

     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:Run 04   **
****

| READ STORM | Filename: C:\Users\ray.zhao\AppD
| | ata\Local\Temp\
| | fed60948-ccbe-4ce0-8b92-0edff20f5fb5\4ca76be2
| Ptotal= 54.38 mm | Comments: 5Y12

       TIME   RAIN | TIME   RAIN |' TIME   RAIN | TIME   RAIN
       hrs   mm/hr| hrs   mm/hr|' hrs   mm/hr| hrs   mm/hr
       0.25   0.00 | 3.50   9.25 | 6.75   3.81 | 10.00 0.54
       0.50   0.54 | 3.75   9.25 | 7.00   3.81 | 10.25 0.54
       0.75   0.54 | 4.00   9.25 | 7.25   3.81 | 10.50 0.54
       1.00   0.54 | 4.25   9.25 | 7.50   2.18 | 10.75 0.54
       1.25   0.54 | 4.50   25.02| 7.75   2.18 | 11.00 0.54
       1.50   0.54 | 4.75   25.02| 8.00   2.18 | 11.25 0.54
       1.75   0.54 | 5.00   25.02| 8.25   2.18 | 11.50 0.54
       2.00   0.54 | 5.25   25.02| 8.50   1.09 | 11.75 0.54
       2.25   0.54 | 5.50   7.07 | 8.75   1.09 | 12.00 0.54
       2.50   3.26 | 5.75   7.07 | 9.00   1.09 | 12.25 0.54
       2.75   3.26 | 6.00   7.07 | 9.25   1.09 |
       3.00   3.26 | 6.25   7.07 | 9.50   0.54 |
       3.25   3.26 | 6.50   3.81 | 9.75   0.54 |

| CALIB |
| STANDHYD (0110)| Area   (ha)= 1.58
|ID= 1 DT= 5.0 min | Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00

                              IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=   0.90   0.68
     Dep. Storage   (mm)=   2.00   5.00
     Average Slope   (%)=   1.00   2.00
     Length   (m)=   650.00   25.00
     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 | 3.167 3.26 | 6.250 7.07 | 9.33   0.54
       0.167 0.00 | 3.250 3.26 | 6.333 3.81 | 9.42   0.54
       0.250 0.00 | 3.333 3.26 | 6.417 3.81 | 9.50   0.54
       0.333 0.54 | 3.417 9.25 | 6.500 3.81 | 9.58   0.54
       0.417 0.54 | 3.500 9.25 | 6.583 3.81 | 9.67   0.54

       0.500 0.54 | 3.583 9.25 | 6.667 3.81 | 9.75   0.54
       0.583 0.54 | 3.667 9.25 | 6.750 3.81 | 9.83   0.54
       0.667 0.54 | 3.750 9.25 | 6.833 3.81 | 9.92   0.54
       0.750 0.54 | 3.833 9.25 | 6.917 3.81 | 10.00 0.54
       0.833 0.54 | 3.917 9.25 | 7.000 3.81 | 10.08 0.54
       0.917 0.54 | 4.000 9.25 | 7.083 3.81 | 10.17 0.54
       1.000 0.54 | 4.083 9.25 | 7.167 3.81 | 10.25 0.54
       1.083 0.54 | 4.167 9.25 | 7.250 3.81 | 10.33 0.54
       1.167 0.54 | 4.250 9.25 | 7.333 2.18 | 10.42 0.54
       1.250 0.54 | 4.333 25.02| 7.417 2.18 | 10.50 0.54
       1.333 0.54 | 4.417 25.02| 7.500 2.18 | 10.58 0.54
       1.417 0.54 | 4.500 25.02| 7.583 2.18 | 10.67 0.54
       1.500 0.54 | 4.583 25.02| 7.667 2.18 | 10.75 0.54
       1.583 0.54 | 4.667 25.02| 7.750 2.18 | 10.83 0.54
       1.667 0.54 | 4.750 25.02| 7.833 2.18 | 10.92 0.54
       1.750 0.54 | 4.833 25.02| 7.917 2.18 | 11.00 0.54
       1.833 0.54 | 4.917 25.02| 8.000 2.18 | 11.08 0.54
       1.917 0.54 | 5.000 25.02| 8.083 2.18 | 11.17 0.54
       2.000 0.54 | 5.083 25.02| 8.167 2.18 | 11.25 0.54
       2.083 0.54 | 5.167 25.02| 8.250 2.18 | 11.33 0.54
       2.167 0.54 | 5.250 25.02| 8.333 1.09 | 11.42 0.54
       2.250 0.54 | 5.333 7.07 | 8.417 1.09 | 11.50 0.54
       2.333 3.26 | 5.417 7.07 | 8.500 1.09 | 11.58 0.54
       2.417 3.26 | 5.500 7.07 | 8.583 1.09 | 11.67 0.54
       2.500 3.26 | 5.583 7.07 | 8.667 1.09 | 11.75 0.54
       2.583 3.26 | 5.667 7.07 | 8.750 1.09 | 11.83 0.54
       2.667 3.26 | 5.750 7.07 | 8.833 1.09 | 11.92 0.54
       2.750 3.26 | 5.833 7.07 | 8.917 1.09 | 12.00 0.54
       2.833 3.26 | 5.917 7.07 | 9.000 1.09 | 12.08 0.54
       2.917 3.26 | 6.000 7.07 | 9.083 1.09 | 12.17 0.54
       3.000 3.26 | 6.083 7.07 | 9.167 1.09 | 12.25 0.54
       3.083 3.26 | 6.167 7.07 | 9.250 1.09 |

Max.Eff.Inten.(mm/hr)=   25.02   16.14
        over (min)   15.00   25.00
Storage Coeff. (min)=   13.67 (ii)   24.71 (ii)
Unit Hyd. Tpeak (min)=   15.00   25.00
Unit Hyd. peak (cms)=   0.08   0.05
                                              TOTALS
PEAK FLOW   (cms)=   0.06   0.02   0.084 (iii)
TIME TO PEAK   (hrs)=   5.25   5.42   5.25
RUNOFF VOLUME (mm)=   52.38   25.88   40.98
TOTAL RAINFALL (mm)=   54.38   54.38   54.38
RUNOFF COEFFICIENT =   0.96   0.48   0.75

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 85.0   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.

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--------------------
| CALIB            |
| STANDHYD ( 0105) |   Area     (ha)=  1.63
|ID= 1 DT= 5.0 min |   Total Imp(%)= 61.00   Dir. Conn.(%)= 61.00
--------------------
                               IMPERVIOUS   PERVIOUS (i)
      Surface Area    (ha)=       0.99         0.64
      Dep. Storage    (mm)=       2.00         5.00
      Average Slope   (%)=        1.00         2.00
      Length          (m)=      650.00        25.00
      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 | 3.167   3.26 | 6.250   7.07 | 9.33   0.54
         0.167   0.00 | 3.250   3.26 | 6.333   3.81 | 9.42   0.54
         0.250   0.00 | 3.333   9.25 | 6.417   3.81 | 9.50   0.54
         0.333   0.54 | 3.417   9.25 | 6.500   3.81 | 9.58   0.54
         0.417   0.54 | 3.500   9.25 | 6.583   3.81 | 9.67   0.54
         0.500   0.54 | 3.583   9.25 | 6.667   3.81 | 9.75   0.54
         0.583   0.54 | 3.667   9.25 | 6.750   3.81 | 9.83   0.54
         0.667   0.54 | 3.750   9.25 | 6.833   3.81 | 9.92   0.54
         0.750   0.54 | 3.833   9.25 | 6.917   3.81 | 10.00  0.54
         0.833   0.54 | 3.917   9.25 | 7.000   3.81 | 10.08  0.54
         0.917   0.54 | 4.000   9.25 | 7.083   3.81 | 10.17  0.54
         1.000   0.54 | 4.083   9.25 | 7.167   3.81 | 10.25  0.54
         1.083   0.54 | 4.167   9.25 | 7.250   3.81 | 10.33  0.54
         1.167   0.54 | 4.250   9.25 | 7.333   2.18 | 10.42  0.54
         1.250   0.54 | 4.333  25.02 | 7.417   2.18 | 10.50  0.54
         1.333   0.54 | 4.417  25.02 | 7.500   2.18 | 10.58  0.54
         1.417   0.54 | 4.500  25.02 | 7.583   2.18 | 10.67  0.54
         1.500   0.54 | 4.583  25.02 | 7.667   2.18 | 10.75  0.54
         1.583   0.54 | 4.667  25.02 | 7.750   2.18 | 10.83  0.54
         1.667   0.54 | 4.750  25.02 | 7.833   2.18 | 10.92  0.54
         1.750   0.54 | 4.833  25.02 | 7.917   2.18 | 11.00  0.54
         1.833   0.54 | 4.917  25.02 | 8.000   2.18 | 11.08  0.54
         1.917   0.54 | 5.000  25.02 | 8.083   2.18 | 11.17  0.54
         2.000   0.54 | 5.083  25.02 | 8.167   2.18 | 11.25  0.54
         2.083   0.54 | 5.167  25.02 | 8.250   2.18 | 11.33  0.54
         2.167   0.54 | 5.250  25.02 | 8.333   1.09 | 11.42  0.54
         2.250   0.54 | 5.333   7.07 | 8.417   1.09 | 11.50  0.54
         2.333   3.26 | 5.417   7.07 | 8.500   1.09 | 11.58  0.54
         2.417   3.26 | 5.500   7.07 | 8.583   1.09 | 11.67  0.54
         2.500   3.26 | 5.583   7.07 | 8.667   1.09 | 11.75  0.54
         2.583   3.26 | 5.667   7.07 | 8.750   1.09 | 11.83  0.54
         2.667   3.26 | 5.750   7.07 | 8.833   1.09 | 11.92  0.54
         2.750   3.26 | 5.833   7.07 | 8.917   1.09 | 12.00  0.54
         2.833   3.26 | 5.917   7.07 | 9.000   1.09 | 12.08  0.54
         2.917   3.26 | 6.000   7.07 | 9.083   1.09 | 12.17  0.54
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         3.000   3.26 | 6.083   7.07 | 9.167   1.09 | 12.25  0.54
         3.083   3.26 | 6.167   7.07 | 9.250   1.09 |

      Max.Eff.Inten.(mm/hr)=    25.02        16.71
              over (min)       15.00        25.00
      Storage Coeff. (min)=    13.67 (ii)   24.56 (ii)
      Unit Hyd. Tpeak (min)=   15.00        25.00
      Unit Hyd. peak (cms)=     0.08         0.05

                                                      *TOTALS*
      PEAK FLOW      (cms)=      0.07         0.02        0.090 (iii)
      TIME TO PEAK   (hrs)=      5.25         5.42        5.25
      RUNOFF VOLUME  (mm)=      52.38        26.88       42.43
      TOTAL RAINFALL (mm)=      54.38        54.38       54.38
      RUNOFF COEFFICIENT =       0.96         0.49        0.78


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 86.0   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  ( 0400) |
|  1 + 2 = 3       |       AREA    QPEAK   TPEAK    R.V.
--------------------              (ha)   (cms)   (hrs)    (mm)
     ID1= 1 ( 0105):   1.63   0.090    5.25    42.43
   + ID2= 2 ( 0110):   1.58   0.084    5.25    40.98
                       ======================================
     ID = 3 ( 0400):   3.21   0.174    5.25    41.71

      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
----------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0125) |   Area     (ha)=  2.27
|ID= 1 DT= 5.0 min |   Total Imp(%)= 53.00   Dir. Conn.(%)= 53.00
--------------------
                               IMPERVIOUS   PERVIOUS (i)
      Surface Area    (ha)=       1.20         1.07
      Dep. Storage    (mm)=       2.00         5.00
      Average Slope   (%)=        1.00         2.00
      Length          (m)=      800.00        20.00
      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 | 3.167   3.26 | 6.250   7.07 | 9.33   0.54
         0.167   0.00 | 3.250   3.26 | 6.333   3.81 | 9.42   0.54
         0.250   0.00 | 3.333   9.25 | 6.417   3.81 | 9.50   0.54
         0.333   0.54 | 3.417   9.25 | 6.500   3.81 | 9.58   0.54
         0.417   0.54 | 3.500   9.25 | 6.583   3.81 | 9.67   0.54
         0.500   0.54 | 3.583   9.25 | 6.667   3.81 | 9.75   0.54
         0.583   0.54 | 3.667   9.25 | 6.750   3.81 | 9.83   0.54
         0.667   0.54 | 3.750   9.25 | 6.833   3.81 | 9.92   0.54
         0.750   0.54 | 3.833   9.25 | 6.917   3.81 | 10.00  0.54
         0.833   0.54 | 3.917   9.25 | 7.000   3.81 | 10.08  0.54
         0.917   0.54 | 4.000   9.25 | 7.083   3.81 | 10.17  0.54
         1.000   0.54 | 4.083   9.25 | 7.167   3.81 | 10.25  0.54
         1.083   0.54 | 4.167   9.25 | 7.250   3.81 | 10.33  0.54
         1.167   0.54 | 4.250   9.25 | 7.333   2.18 | 10.42  0.54
         1.250   0.54 | 4.333  25.02 | 7.417   2.18 | 10.50  0.54
         1.333   0.54 | 4.417  25.02 | 7.500   2.18 | 10.58  0.54
         1.417   0.54 | 4.500  25.02 | 7.583   2.18 | 10.67  0.54
         1.500   0.54 | 4.583  25.02 | 7.667   2.18 | 10.75  0.54
         1.583   0.54 | 4.667  25.02 | 7.750   2.18 | 10.83  0.54
         1.667   0.54 | 4.750  25.02 | 7.833   2.18 | 10.92  0.54
         1.750   0.54 | 4.833  25.02 | 7.917   2.18 | 11.00  0.54
         1.833   0.54 | 4.917  25.02 | 8.000   2.18 | 11.08  0.54
         1.917   0.54 | 5.000  25.02 | 8.083   2.18 | 11.17  0.54
         2.000   0.54 | 5.083  25.02 | 8.167   2.18 | 11.25  0.54
         2.083   0.54 | 5.167  25.02 | 8.250   2.18 | 11.33  0.54
         2.167   0.54 | 5.250  25.02 | 8.333   1.09 | 11.42  0.54
         2.250   0.54 | 5.333   7.07 | 8.417   1.09 | 11.50  0.54
         2.333   3.26 | 5.417   7.07 | 8.500   1.09 | 11.58  0.54
         2.417   3.26 | 5.500   7.07 | 8.583   1.09 | 11.67  0.54
         2.500   3.26 | 5.583   7.07 | 8.667   1.09 | 11.75  0.54
         2.583   3.26 | 5.667   7.07 | 8.750   1.09 | 11.83  0.54
         2.667   3.26 | 5.750   7.07 | 8.833   1.09 | 11.92  0.54
         2.750   3.26 | 5.833   7.07 | 8.917   1.09 | 12.00  0.54
         2.833   3.26 | 5.917   7.07 | 9.000   1.09 | 12.08  0.54
         2.917   3.26 | 6.000   7.07 | 9.083   1.09 | 12.17  0.54
         3.000   3.26 | 6.083   7.07 | 9.167   1.09 | 12.25  0.54
         3.083   3.26 | 6.167   7.07 | 9.250   1.09 |

      Max.Eff.Inten.(mm/hr)=    25.02        15.31
              over (min)       15.00        30.00
      Storage Coeff. (min)=    15.48 (ii)   25.35 (ii)
      Unit Hyd. Tpeak (min)=   15.00        30.00
      Unit Hyd. peak (cms)=     0.07         0.04
                                                      *TOTALS*
      PEAK FLOW      (cms)=      0.08         0.03        0.112 (iii)
      TIME TO PEAK   (hrs)=      5.25         5.42        5.25
      RUNOFF VOLUME  (mm)=      52.38        24.05       39.06
      TOTAL RAINFALL (mm)=      54.38        54.38       54.38
      RUNOFF COEFFICIENT =       0.96         0.44        0.72


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 83.0   Ia = Dep. Storage (Above)
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      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD ( 0130) |   Area     (ha)=  2.08
|ID= 1 DT= 5.0 min |   Total Imp(%)= 51.00   Dir. Conn.(%)= 51.00
--------------------
                               IMPERVIOUS   PERVIOUS (i)
      Surface Area    (ha)=       1.06         1.02
      Dep. Storage    (mm)=       2.00         5.00
      Average Slope   (%)=        1.00         2.00
      Length          (m)=      800.00        20.00
      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 | 3.167   3.26 | 6.250   7.07 | 9.33   0.54
         0.167   0.00 | 3.250   3.26 | 6.333   3.81 | 9.42   0.54
         0.250   0.00 | 3.333   9.25 | 6.417   3.81 | 9.50   0.54
         0.333   0.54 | 3.417   9.25 | 6.500   3.81 | 9.58   0.54
         0.417   0.54 | 3.500   9.25 | 6.583   3.81 | 9.67   0.54
         0.500   0.54 | 3.583   9.25 | 6.667   3.81 | 9.75   0.54
         0.583   0.54 | 3.667   9.25 | 6.750   3.81 | 9.83   0.54
         0.667   0.54 | 3.750   9.25 | 6.833   3.81 | 9.92   0.54
         0.750   0.54 | 3.833   9.25 | 6.917   3.81 | 10.00  0.54
         0.833   0.54 | 3.917   9.25 | 7.000   3.81 | 10.08  0.54
         0.917   0.54 | 4.000   9.25 | 7.083   3.81 | 10.17  0.54
         1.000   0.54 | 4.083   9.25 | 7.167   3.81 | 10.25  0.54
         1.083   0.54 | 4.167   9.25 | 7.250   3.81 | 10.33  0.54
         1.167   0.54 | 4.250   9.25 | 7.333   2.18 | 10.42  0.54
         1.250   0.54 | 4.333  25.02 | 7.417   2.18 | 10.50  0.54
         1.333   0.54 | 4.417  25.02 | 7.500   2.18 | 10.58  0.54
         1.417   0.54 | 4.500  25.02 | 7.583   2.18 | 10.67  0.54
         1.500   0.54 | 4.583  25.02 | 7.667   2.18 | 10.75  0.54
         1.583   0.54 | 4.667  25.02 | 7.750   2.18 | 10.83  0.54
         1.667   0.54 | 4.750  25.02 | 7.833   2.18 | 10.92  0.54
         1.750   0.54 | 4.833  25.02 | 7.917   2.18 | 11.00  0.54
         1.833   0.54 | 4.917  25.02 | 8.000   2.18 | 11.08  0.54
         1.917   0.54 | 5.000  25.02 | 8.083   2.18 | 11.17  0.54
         2.000   0.54 | 5.083  25.02 | 8.167   2.18 | 11.25  0.54
         2.083   0.54 | 5.167  25.02 | 8.250   2.18 | 11.33  0.54
         2.167   0.54 | 5.250  25.02 | 8.333   1.09 | 11.42  0.54
         2.250   0.54 | 5.333   7.07 | 8.417   1.09 | 11.50  0.54
         2.333   3.26 | 5.417   7.07 | 8.500   1.09 | 11.58  0.54
         2.417   3.26 | 5.500   7.07 | 8.583   1.09 | 11.67  0.54
         2.500   3.26 | 5.583   7.07 | 8.667   1.09 | 11.75  0.54
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              2.583   3.26 | 5.667   7.07 | 8.750   1.09 | 11.83   0.54
              2.667   3.26 | 5.750   7.07 | 8.833   1.09 | 11.92   0.54
              2.750   3.26 | 5.833   7.07 | 8.917   1.09 | 12.00   0.54
              2.833   3.26 | 5.917   7.07 | 9.000   1.09 | 12.08   0.54
              2.917   3.26 | 6.000   7.07 | 9.083   1.09 | 12.17   0.54
              3.000   3.26 | 6.083   7.07 | 9.167   1.09 | 12.25   0.54
              3.083   3.26 | 6.167   7.07 | 9.250   1.09 |

     Max.Eff.Inten.(mm/hr)=      25.02        15.31
              over (min)         15.00        30.00
     Storage Coeff.  (min)=      15.48 (ii)   25.35 (ii)
     Unit Hyd. Tpeak (min)=      15.00        30.00
     Unit Hyd. peak  (cms)=       0.07         0.04
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.03        0.101 (iii)
     TIME TO PEAK    (hrs)=       5.25         5.42         5.25
     RUNOFF VOLUME    (mm)=      52.38        24.05        38.49
     TOTAL RAINFALL   (mm)=      54.38        54.38        54.38
     RUNOFF COEFFICIENT   =       0.96         0.44         0.71


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0    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  ( 0405)|
|  1 + 2 = 3      |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 0125):     2.27    0.112     5.25     39.06
     + ID2= 2 ( 0130):     2.08    0.101     5.25     38.49
                          =====================================
       ID = 3 ( 0405):     4.35    0.214     5.25     38.79

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0120)|  Area    (ha)=  1.24
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00  Dir. Conn.(%)= 57.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area    (ha)=        0.71          0.53
     Dep. Storage    (mm)=        2.00          5.00
     Average Slope   (%)=         1.00          2.00
     Length          (m)=       475.00         17.00
     Mannings n      =            0.013         0.250

     NOTE:  RAINFALL WAS TRANSFORMED TO  5.0 MIN. TIME STEP.
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```
               ---- 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   3.26 | 6.250   7.07 | 9.33   0.54
     0.167   0.00 | 3.250   3.26 | 6.333   3.81 | 9.42   0.54
     0.250   0.00 | 3.333   9.25 | 6.417   3.81 | 9.50   0.54
     0.333   0.54 | 3.417   9.25 | 6.500   3.81 | 9.58   0.54
     0.417   0.54 | 3.500   9.25 | 6.583   3.81 | 9.67   0.54
     0.500   0.54 | 3.583   9.25 | 6.667   3.81 | 9.75   0.54
     0.583   0.54 | 3.667   9.25 | 6.750   3.81 | 9.83   0.54
     0.667   0.54 | 3.750   9.25 | 6.833   3.81 | 9.92   0.54
     0.750   0.54 | 3.833   9.25 | 6.917   3.81 | 10.00   0.54
     0.833   0.54 | 3.917   9.25 | 7.000   3.81 | 10.08   0.54
     0.917   0.54 | 4.000   9.25 | 7.083   3.81 | 10.17   0.54
     1.000   0.54 | 4.083   9.25 | 7.167   3.81 | 10.25   0.54
     1.083   0.54 | 4.167   9.25 | 7.250   3.81 | 10.33   0.54
     1.167   0.54 | 4.250   9.25 | 7.333   2.18 | 10.42   0.54
     1.250   0.54 | 4.333  25.02 | 7.417   2.18 | 10.50   0.54
     1.333   0.54 | 4.417  25.02 | 7.500   2.18 | 10.58   0.54
     1.417   0.54 | 4.500  25.02 | 7.583   2.18 | 10.67   0.54
     1.500   0.54 | 4.583  25.02 | 7.667   2.18 | 10.75   0.54
     1.583   0.54 | 4.667  25.02 | 7.750   2.18 | 10.83   0.54
     1.667   0.54 | 4.750  25.02 | 7.833   2.18 | 10.92   0.54
     1.750   0.54 | 4.833  25.02 | 7.917   2.18 | 11.00   0.54
     1.833   0.54 | 4.917  25.02 | 8.000   2.18 | 11.08   0.54
     1.917   0.54 | 5.000  25.02 | 8.083   2.18 | 11.17   0.54
     2.000   0.54 | 5.083  25.02 | 8.167   2.18 | 11.25   0.54
     2.083   0.54 | 5.167  25.02 | 8.250   2.18 | 11.33   0.54
     2.167   0.54 | 5.250  25.02 | 8.333   1.09 | 11.42   0.54
     2.250   0.54 | 5.333   7.07 | 8.417   1.09 | 11.50   0.54
     2.333   3.26 | 5.417   7.07 | 8.500   1.09 | 11.58   0.54
     2.417   3.26 | 5.500   7.07 | 8.583   1.09 | 11.67   0.54
     2.500   3.26 | 5.583   7.07 | 8.667   1.09 | 11.75   0.54
     2.583   3.26 | 5.667   7.07 | 8.750   1.09 | 11.83   0.54
     2.667   3.26 | 5.750   7.07 | 8.833   1.09 | 11.92   0.54
     2.750   3.26 | 5.833   7.07 | 8.917   1.09 | 12.00   0.54
     2.833   3.26 | 5.917   7.07 | 9.000   1.09 | 12.08   0.54
     2.917   3.26 | 6.000   7.07 | 9.083   1.09 | 12.17   0.54
     3.000   3.26 | 6.083   7.07 | 9.167   1.09 | 12.25   0.54
     3.083   3.26 | 6.167   7.07 | 9.250   1.09 |

     Max.Eff.Inten.(mm/hr)=      25.02        15.31
              over (min)         10.00        25.00
     Storage Coeff.  (min)=      11.33 (ii)   20.27 (ii)
     Unit Hyd. Tpeak (min)=      10.00        25.00
     Unit Hyd. peak  (cms)=       0.10         0.05
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.02        0.066 (iii)
     TIME TO PEAK    (hrs)=       5.25         5.33         5.25
     RUNOFF VOLUME    (mm)=      52.38        24.05        40.19
     TOTAL RAINFALL   (mm)=      54.38        54.38        54.38
```

```
     RUNOFF COEFFICIENT   =       0.96         0.44         0.74


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0    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 ( 0115)|  Area    (ha)=  1.00
|ID= 1 DT= 5.0 min |  Total Imp(%)= 46.00  Dir. Conn.(%)= 46.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area    (ha)=        0.46          0.54
     Dep. Storage    (mm)=        2.00          5.00
     Average Slope   (%)=         1.00          2.00
     Length          (m)=       475.00         17.00
     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 | 3.167   3.26 | 6.250   7.07 | 9.33   0.54
     0.167   0.00 | 3.250   3.26 | 6.333   3.81 | 9.42   0.54
     0.250   0.00 | 3.333   9.25 | 6.417   3.81 | 9.50   0.54
     0.333   0.54 | 3.417   9.25 | 6.500   3.81 | 9.58   0.54
     0.417   0.54 | 3.500   9.25 | 6.583   3.81 | 9.67   0.54
     0.500   0.54 | 3.583   9.25 | 6.667   3.81 | 9.75   0.54
     0.583   0.54 | 3.667   9.25 | 6.750   3.81 | 9.83   0.54
     0.667   0.54 | 3.750   9.25 | 6.833   3.81 | 9.92   0.54
     0.750   0.54 | 3.833   9.25 | 6.917   3.81 | 10.00   0.54
     0.833   0.54 | 3.917   9.25 | 7.000   3.81 | 10.08   0.54
     0.917   0.54 | 4.000   9.25 | 7.083   3.81 | 10.17   0.54
     1.000   0.54 | 4.083   9.25 | 7.167   3.81 | 10.25   0.54
     1.083   0.54 | 4.167   9.25 | 7.250   3.81 | 10.33   0.54
     1.167   0.54 | 4.250   9.25 | 7.333   2.18 | 10.42   0.54
     1.250   0.54 | 4.333  25.02 | 7.417   2.18 | 10.50   0.54
     1.333   0.54 | 4.417  25.02 | 7.500   2.18 | 10.58   0.54
     1.417   0.54 | 4.500  25.02 | 7.583   2.18 | 10.67   0.54
     1.500   0.54 | 4.583  25.02 | 7.667   2.18 | 10.75   0.54
     1.583   0.54 | 4.667  25.02 | 7.750   2.18 | 10.83   0.54
     1.667   0.54 | 4.750  25.02 | 7.833   2.18 | 10.92   0.54
     1.750   0.54 | 4.833  25.02 | 7.917   2.18 | 11.00   0.54
     1.833   0.54 | 4.917  25.02 | 8.000   2.18 | 11.08   0.54
     1.917   0.54 | 5.000  25.02 | 8.083   2.18 | 11.17   0.54
     2.000   0.54 | 5.083  25.02 | 8.167   2.18 | 11.25   0.54
     2.083   0.54 | 5.167  25.02 | 8.250   2.18 | 11.33   0.54
```

```
     2.167   0.54 | 5.250  25.02 | 8.333   1.09 | 11.42   0.54
     2.250   0.54 | 5.333   7.07 | 8.417   1.09 | 11.50   0.54
     2.333   3.26 | 5.417   7.07 | 8.500   1.09 | 11.58   0.54
     2.417   3.26 | 5.500   7.07 | 8.583   1.09 | 11.67   0.54
     2.500   3.26 | 5.583   7.07 | 8.667   1.09 | 11.75   0.54
     2.583   3.26 | 5.667   7.07 | 8.750   1.09 | 11.83   0.54
     2.667   3.26 | 5.750   7.07 | 8.833   1.09 | 11.92   0.54
     2.750   3.26 | 5.833   7.07 | 8.917   1.09 | 12.00   0.54
     2.833   3.26 | 5.917   7.07 | 9.000   1.09 | 12.08   0.54
     2.917   3.26 | 6.000   7.07 | 9.083   1.09 | 12.17   0.54
     3.000   3.26 | 6.083   7.07 | 9.167   1.09 | 12.25   0.54
     3.083   3.26 | 6.167   7.07 | 9.250   1.09 |

     Max.Eff.Inten.(mm/hr)=      25.02        15.31
              over (min)         10.00        25.00
     Storage Coeff.  (min)=      11.33 (ii)   20.27 (ii)
     Unit Hyd. Tpeak (min)=      10.00        25.00
     Unit Hyd. peak  (cms)=       0.10         0.05
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.02        0.049 (iii)
     TIME TO PEAK    (hrs)=       5.25         5.33         5.25
     RUNOFF VOLUME    (mm)=      52.38        24.05        37.07
     TOTAL RAINFALL   (mm)=      54.38        54.38        54.38
     RUNOFF COEFFICIENT   =       0.96         0.44         0.68


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0    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  ( 0410)|
|  1 + 2 = 3      |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 0115):     1.00    0.049     5.25     37.07
     + ID2= 2 ( 0120):     1.24    0.066     5.25     40.19
                          =====================================
       ID = 3 ( 0410):     2.24    0.115     5.25     38.80

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------
--------------------
| ADD HYD  ( 0420)|
|  1 + 2 = 3      |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 0405):     4.35    0.214     5.25     38.79
     + ID2= 2 ( 0410):     2.24    0.115     5.25     38.80
                          =====================================
```

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                    LangstaffRd_EA_Existing_HumberWatershed
          ID = 3 ( 0420):    6.59   0.329    5.25    38.79

     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
*********************************
** SIMULATION:Run 06        **
*********************************

---------------------
| READ STORM     |   Filename: C:\Users\ray.zhao\AppD
|                |            ata\Local\Temp\
|                |            fed60948-ccbe-4ce0-8b92-0edff20f5fb5\1f25e1d6
| Ptotal= 62.71 mm |  Comments: 10Y12
---------------------
            TIME    RAIN |   TIME    RAIN |'  TIME    RAIN |   TIME    RAIN
             hrs   mm/hr |    hrs   mm/hr |'   hrs   mm/hr |    hrs   mm/hr
            0.25    0.00 |   3.50   10.66 |  6.75    4.39 |  10.00    0.63
            0.50    0.63 |   3.75   10.66 |  7.00    4.39 |  10.25    0.63
            0.75    0.63 |   4.00   10.66 |  7.25    4.39 |  10.50    0.63
            1.00    0.63 |   4.25   10.66 |  7.50    2.51 |  10.75    0.63
            1.25    0.63 |   4.50   28.84 |  7.75    2.51 |  11.00    0.63
            1.50    0.63 |   4.75   28.84 |  8.00    2.51 |  11.25    0.63
            1.75    0.63 |   5.00   28.84 |  8.25    2.51 |  11.50    0.63
            2.00    0.63 |   5.25   28.84 |  8.50    1.25 |  11.75    0.63
            2.25    0.63 |   5.50    8.15 |  8.75    1.25 |  12.00    0.63
            2.50    3.76 |   5.75    8.15 |  9.00    1.25 |  12.25    0.63
            2.75    3.76 |   6.00    8.15 |  9.25    1.25 |
            3.00    3.76 |   6.25    8.15 |  9.50    0.63 |
            3.25    3.76 |   6.50    4.39 |  9.75    0.63 |

------------------------------------------------------------------------------

---------------------
| CALIB          |
| STANDHYD ( 0110)|  Area    (ha)=  1.58
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00  Dir. Conn.(%)= 57.00
---------------------
                            IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=    0.90         0.68
       Dep. Storage   (mm)=    2.00         5.00
       Average Slope  (%)=    1.00         2.00
       Length         (m)=  650.00        25.00
       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 |  3.167   3.76 |  6.250   8.15 |  9.33    0.63
            0.167   0.00 |  3.250   3.76 |  6.333   4.39 |  9.42    0.63
            0.250   0.00 |  3.333  10.66 |  6.417   4.39 |  9.50    0.63
                              Page 21
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                    LangstaffRd_EA_Existing_HumberWatershed
            0.333   0.63 |  3.417  10.66 |  6.500   4.39 |  9.58    0.63
            0.417   0.63 |  3.500  10.66 |  6.583   4.39 |  9.67    0.63
            0.500   0.63 |  3.583  10.66 |  6.667   4.39 |  9.75    0.63
            0.583   0.63 |  3.667  10.66 |  6.750   4.39 |  9.83    0.63
            0.667   0.63 |  3.750  10.66 |  6.833   4.39 |  9.92    0.63
            0.750   0.63 |  3.833  10.66 |  6.917   4.39 | 10.00    0.63
            0.833   0.63 |  3.917  10.66 |  7.000   4.39 | 10.08    0.63
            0.917   0.63 |  4.000  10.66 |  7.083   4.39 | 10.17    0.63
            1.000   0.63 |  4.083  10.66 |  7.167   4.39 | 10.25    0.63
            1.083   0.63 |  4.167  10.66 |  7.250   4.39 | 10.33    0.63
            1.167   0.63 |  4.250  10.66 |  7.333   2.51 | 10.42    0.63
            1.250   0.63 |  4.333  28.84 |  7.417   2.51 | 10.50    0.63
            1.333   0.63 |  4.417  28.84 |  7.500   2.51 | 10.58    0.63
            1.417   0.63 |  4.500  28.84 |  7.583   2.51 | 10.67    0.63
            1.500   0.63 |  4.583  28.84 |  7.667   2.51 | 10.75    0.63
            1.583   0.63 |  4.667  28.84 |  7.750   2.51 | 10.83    0.63
            1.667   0.63 |  4.750  28.84 |  7.833   2.51 | 10.92    0.63
            1.750   0.63 |  4.833  28.84 |  7.917   2.51 | 11.00    0.63
            1.833   0.63 |  4.917  28.84 |  8.000   2.51 | 11.08    0.63
            1.917   0.63 |  5.000  28.84 |  8.083   2.51 | 11.17    0.63
            2.000   0.63 |  5.083  28.84 |  8.167   2.51 | 11.25    0.63
            2.083   0.63 |  5.167  28.84 |  8.250   2.51 | 11.33    0.63
            2.167   0.63 |  5.250  28.84 |  8.333   1.25 | 11.42    0.63
            2.250   0.63 |  5.333   8.15 |  8.417   1.25 | 11.50    0.63
            2.333   3.76 |  5.417   8.15 |  8.500   1.25 | 11.58    0.63
            2.417   3.76 |  5.500   8.15 |  8.583   1.25 | 11.67    0.63
            2.500   3.76 |  5.583   8.15 |  8.667   1.25 | 11.75    0.63
            2.583   3.76 |  5.667   8.15 |  8.750   1.25 | 11.83    0.63
            2.667   3.76 |  5.750   8.15 |  8.833   1.25 | 11.92    0.63
            2.750   3.76 |  5.833   8.15 |  8.917   1.25 | 12.00    0.63
            2.833   3.76 |  5.917   8.15 |  9.000   1.25 | 12.08    0.63
            2.917   3.76 |  6.000   8.15 |  9.083   1.25 | 12.17    0.63
            3.000   3.76 |  6.083   8.15 |  9.167   1.25 | 12.25    0.63
            3.083   3.76 |  6.167   8.15 |  9.250   1.25 |

      Max.Eff.Inten.(mm/hr)=   28.84       19.93
                  over (min)=   15.00       25.00
      Storage Coeff. (min)=    12.91 (ii)  23.06 (ii)
      Unit Hyd. Tpeak (min)=   15.00       25.00
      Unit Hyd. peak  (cms)=    0.08        0.05
                                                       *TOTALS*
      PEAK FLOW      (cms)=     0.07        0.03      0.100 (iii)
      TIME TO PEAK   (hrs)=     5.25        5.33      5.25
      RUNOFF VOLUME   (mm)=    60.71       32.48     48.56
      TOTAL RAINFALL  (mm)=    62.71       62.71     62.71
      RUNOFF COEFFICIENT  =     0.97        0.52      0.77


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 85.0   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.

                              Page 22
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                    LangstaffRd_EA_Existing_HumberWatershed

------------------------------------------------------------------------------
---------------------
| CALIB          |
| STANDHYD ( 0105)|  Area    (ha)=  1.63
|ID= 1 DT= 5.0 min |  Total Imp(%)= 61.00  Dir. Conn.(%)= 61.00
---------------------
                            IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=    0.99         0.64
       Dep. Storage   (mm)=    2.00         5.00
       Average Slope  (%)=    1.00         2.00
       Length         (m)=  650.00        25.00
       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 |  3.167   3.76 |  6.250   8.15 |  9.33    0.63
            0.167   0.00 |  3.250   3.76 |  6.333   4.39 |  9.42    0.63
            0.250   0.00 |  3.333  10.66 |  6.417   4.39 |  9.50    0.63
            0.333   0.63 |  3.417  10.66 |  6.500   4.39 |  9.58    0.63
            0.417   0.63 |  3.500  10.66 |  6.583   4.39 |  9.67    0.63
            0.500   0.63 |  3.583  10.66 |  6.667   4.39 |  9.75    0.63
            0.583   0.63 |  3.667  10.66 |  6.750   4.39 |  9.83    0.63
            0.667   0.63 |  3.750  10.66 |  6.833   4.39 |  9.92    0.63
            0.750   0.63 |  3.833  10.66 |  6.917   4.39 | 10.00    0.63
            0.833   0.63 |  3.917  10.66 |  7.000   4.39 | 10.08    0.63
            0.917   0.63 |  4.000  10.66 |  7.083   4.39 | 10.17    0.63
            1.000   0.63 |  4.083  10.66 |  7.167   4.39 | 10.25    0.63
            1.083   0.63 |  4.167  10.66 |  7.250   4.39 | 10.33    0.63
            1.167   0.63 |  4.250  10.66 |  7.333   2.51 | 10.42    0.63
            1.250   0.63 |  4.333  28.84 |  7.417   2.51 | 10.50    0.63
            1.333   0.63 |  4.417  28.84 |  7.500   2.51 | 10.58    0.63
            1.417   0.63 |  4.500  28.84 |  7.583   2.51 | 10.67    0.63
            1.500   0.63 |  4.583  28.84 |  7.667   2.51 | 10.75    0.63
            1.583   0.63 |  4.667  28.84 |  7.750   2.51 | 10.83    0.63
            1.667   0.63 |  4.750  28.84 |  7.833   2.51 | 10.92    0.63
            1.750   0.63 |  4.833  28.84 |  7.917   2.51 | 11.00    0.63
            1.833   0.63 |  4.917  28.84 |  8.000   2.51 | 11.08    0.63
            1.917   0.63 |  5.000  28.84 |  8.083   2.51 | 11.17    0.63
            2.000   0.63 |  5.083  28.84 |  8.167   2.51 | 11.25    0.63
            2.083   0.63 |  5.167  28.84 |  8.250   2.51 | 11.33    0.63
            2.167   0.63 |  5.250  28.84 |  8.333   1.25 | 11.42    0.63
            2.250   0.63 |  5.333   8.15 |  8.417   1.25 | 11.50    0.63
            2.333   3.76 |  5.417   8.15 |  8.500   1.25 | 11.58    0.63
            2.417   3.76 |  5.500   8.15 |  8.583   1.25 | 11.67    0.63
            2.500   3.76 |  5.583   8.15 |  8.667   1.25 | 11.75    0.63
            2.583   3.76 |  5.667   8.15 |  8.750   1.25 | 11.83    0.63
            2.667   3.76 |  5.750   8.15 |  8.833   1.25 | 11.92    0.63
            2.750   3.76 |  5.833   8.15 |  8.917   1.25 | 12.00    0.63
                              Page 23
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                    LangstaffRd_EA_Existing_HumberWatershed
            2.833   3.76 |  5.917   8.15 |  9.000   1.25 | 12.08    0.63
            2.917   3.76 |  6.000   8.15 |  9.083   1.25 | 12.17    0.63
            3.000   3.76 |  6.083   8.15 |  9.167   1.25 | 12.25    0.63
            3.083   3.76 |  6.167   8.15 |  9.250   1.25 |

      Max.Eff.Inten.(mm/hr)=   28.84       20.82
                  over (min)=   15.00       25.00
      Storage Coeff. (min)=    12.91 (ii)  22.89 (ii)
      Unit Hyd. Tpeak (min)=   15.00       25.00
      Unit Hyd. peak  (cms)=    0.08        0.05
                                                       *TOTALS*
      PEAK FLOW      (cms)=     0.08        0.03      0.107 (iii)
      TIME TO PEAK   (hrs)=     5.25        5.33      5.25
      RUNOFF VOLUME   (mm)=    60.71       33.62     50.14
      TOTAL RAINFALL  (mm)=    62.71       62.71     62.71
      RUNOFF COEFFICIENT  =     0.97        0.54      0.80


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 86.0   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.

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---------------------
| ADD HYD ( 0400)|
|  1 + 2 = 3     |       AREA    QPEAK   TPEAK    R.V.
---------------------       (ha)    (cms)   (hrs)    (mm)
        ID1= 1 ( 0105):     1.63    0.107    5.25    50.14
      + ID2= 2 ( 0110):     1.58    0.100    5.25    48.56
        ====================================================
        ID = 3 ( 0400):     3.21    0.207    5.25    49.36

     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
---------------------
| CALIB          |
| STANDHYD ( 0125)|  Area    (ha)=  2.27
|ID= 1 DT= 5.0 min |  Total Imp(%)= 53.00  Dir. Conn.(%)= 53.00
---------------------
                            IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=    1.20         1.07
       Dep. Storage   (mm)=    2.00         5.00
       Average Slope  (%)=    1.00         2.00
       Length         (m)=  800.00        20.00
       Mannings n      =    0.013         0.250

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


                    ---- TRANSFORMED HYETOGRAPH ----
                              Page 24
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	' TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.583	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

```
Max.Eff.Inten.(mm/hr)=      28.84          19.01
         over (min)         15.00          25.00
Storage Coeff.  (min)=      14.63 (ii)     23.67 (ii)
Unit Hyd. Tpeak (min)=      15.00          25.00
Unit Hyd. peak  (cms)=       0.08           0.05
                                                        *TOTALS*
PEAK FLOW       (cms)=       0.09           0.04       0.136 (iii)
TIME TO PEAK    (hrs)=       5.25           5.42        5.25
RUNOFF VOLUME    (mm)=      60.71          30.35       46.43
TOTAL RAINFALL   (mm)=      62.71          62.71       62.71
RUNOFF COEFFICIENT  =        0.97           0.48        0.74
```

```
  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 (0130)| Area   (ha)= 2.08
|ID= 1 DT= 5.0 min | Total Imp(%)= 51.00   Dir. Conn.(%)= 51.00

```
                         IMPERVIOUS     PERVIOUS (i)
Surface Area    (ha)=       1.06           1.02
Dep. Storage    (mm)=       2.00           5.00
Average Slope    (%)=       1.00           2.00
Length           (m)=     800.00          20.00
Mannings n        =         0.013          0.250
```

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	' TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	' TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

```
Max.Eff.Inten.(mm/hr)=      28.84          19.01
         over (min)         15.00          25.00
Storage Coeff.  (min)=      14.63 (ii)     23.67 (ii)
Unit Hyd. Tpeak (min)=      15.00          25.00
Unit Hyd. peak  (cms)=       0.08           0.05
                                                        *TOTALS*
PEAK FLOW       (cms)=       0.08           0.04       0.123 (iii)
TIME TO PEAK    (hrs)=       5.25           5.42        5.25
RUNOFF VOLUME    (mm)=      60.71          30.35       45.83
TOTAL RAINFALL   (mm)=      62.71          62.71       62.71
RUNOFF COEFFICIENT  =        0.97           0.48        0.73
```

```
  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 (0405)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
-------------------   (ha)   (cms)   (hrs)   (mm)
```
      ID1= 1 ( 0125):    2.27    0.136     5.25     46.43
    + ID2= 2 ( 0130):    2.08    0.123     5.25     45.83
      ===============================================
      ID = 3 ( 0405):    4.35    0.259     5.25     46.14
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0120)| Area   (ha)= 1.24
|ID= 1 DT= 5.0 min | Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00

```
                         IMPERVIOUS     PERVIOUS (i)
Surface Area    (ha)=       0.71           0.53
Dep. Storage    (mm)=       2.00           5.00
Average Slope    (%)=       1.00           2.00
Length           (m)=     475.00          17.00
Mannings n        =         0.013          0.250
```

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	' TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

```
Max.Eff.Inten.(mm/hr)=      28.84          19.01
         over (min)         10.00          20.00
Storage Coeff.  (min)=      10.70 (ii)     18.90 (ii)
Unit Hyd. Tpeak (min)=      10.00          20.00
Unit Hyd. peak  (cms)=       0.11           0.06
                                                        *TOTALS*
PEAK FLOW       (cms)=       0.06           0.02       0.079 (iii)
TIME TO PEAK    (hrs)=       5.25           5.33        5.25
```

```
                    LangstaffRd_EA_Existing_HumberWatershed
      RUNOFF VOLUME    (mm)=      60.71         30.35        47.65
      TOTAL RAINFALL   (mm)=      62.71         62.71        62.71
      RUNOFF COEFFICIENT  =       0.97          0.48         0.76


         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  83.0   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 ( 0115)|   Area    (ha)=  1.00
   |ID= 1 DT= 5.0 min |   Total Imp(%)= 46.00   Dir. Conn.(%)= 46.00
   ---------------------
                                  IMPERVIOUS    PERVIOUS (i)
      Surface Area     (ha)=        0.46          0.54
      Dep. Storage     (mm)=        2.00          5.00
      Average Slope    (%)=         1.00          2.00
      Length           (m)=       475.00         17.00
      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  | 3.167  3.76 | 6.250  8.15 | 9.33   0.63
             0.167  0.00  | 3.250  3.76 | 6.333  4.39 | 9.42   0.63
             0.250  0.00  | 3.333 10.66 | 6.417  4.39 | 9.50   0.63
             0.333  0.63  | 3.417 10.66 | 6.500  4.39 | 9.58   0.63
             0.417  0.63  | 3.500 10.66 | 6.583  4.39 | 9.67   0.63
             0.500  0.63  | 3.583 10.66 | 6.667  4.39 | 9.75   0.63
             0.583  0.63  | 3.667 10.66 | 6.750  4.39 | 9.83   0.63
             0.667  0.63  | 3.750 10.66 | 6.833  4.39 | 9.92   0.63
             0.750  0.63  | 3.833 10.66 | 6.917  4.39 |10.00   0.63
             0.833  0.63  | 3.917 10.66 | 7.000  4.39 |10.08   0.63
             0.917  0.63  | 4.000 10.66 | 7.083  4.39 |10.17   0.63
             1.000  0.63  | 4.083 10.66 | 7.167  4.39 |10.25   0.63
             1.083  0.63  | 4.167 10.66 | 7.250  4.39 |10.33   0.63
             1.167  0.63  | 4.250 10.66 | 7.333  2.51 |10.42   0.63
             1.250  0.63  | 4.333 28.84 | 7.417  2.51 |10.50   0.63
             1.333  0.63  | 4.417 28.84 | 7.500  2.51 |10.58   0.63
             1.417  0.63  | 4.500 28.84 | 7.583  2.51 |10.67   0.63
             1.500  0.63  | 4.583 28.84 | 7.667  2.51 |10.75   0.63
             1.583  0.63  | 4.667 28.84 | 7.750  2.51 |10.83   0.63
             1.667  0.63  | 4.750 28.84 | 7.833  2.51 |10.92   0.63
             1.750  0.63  | 4.833 28.84 | 7.917  2.51 |11.00   0.63
             1.833  0.63  | 4.917 28.84 | 8.000  2.51 |11.08   0.63
             1.917  0.63  | 5.000 28.84 | 8.083  2.51 |11.17   0.63
```

```
                    LangstaffRd_EA_Existing_HumberWatershed
             2.000  0.63  | 5.083 28.84 | 8.167  2.51 |11.25   0.63
             2.083  0.63  | 5.167 28.84 | 8.250  2.51 |11.33   0.63
             2.167  0.63  | 5.250 28.84 | 8.333  1.25 |11.42   0.63
             2.250  0.63  | 5.333  8.15 | 8.417  1.25 |11.50   0.63
             2.333  3.76  | 5.417  8.15 | 8.500  1.25 |11.58   0.63
             2.417  3.76  | 5.500  8.15 | 8.583  1.25 |11.67   0.63
             2.500  3.76  | 5.583  8.15 | 8.667  1.25 |11.75   0.63
             2.583  3.76  | 5.667  8.15 | 8.750  1.25 |11.83   0.63
             2.667  3.76  | 5.750  8.15 | 8.833  1.25 |11.92   0.63
             2.750  3.76  | 5.833  8.15 | 8.917  1.25 |12.00   0.63
             2.833  3.76  | 5.917  8.15 | 9.000  1.25 |12.08   0.63
             2.917  3.76  | 6.000  8.15 | 9.083  1.25 |12.17   0.63
             3.000  3.76  | 6.083  8.15 | 9.167  1.25 |12.25   0.63
             3.083  3.76  | 6.167  8.15 | 9.250  1.25 |

      Max.Eff.Inten.(mm/hr)=      28.84         19.01
            over (min)            10.00         20.00
      Storage Coeff. (min)=       10.70 (ii)    18.90 (ii)
      Unit Hyd. Tpeak (min)=      10.00         20.00
      Unit Hyd. peak (cms)=        0.11          0.06
                                                          *TOTALS*
      PEAK FLOW        (cms)=      0.04          0.02       0.060 (iii)
      TIME TO PEAK     (hrs)=      5.25          5.33       5.25
      RUNOFF VOLUME    (mm)=      60.71         30.35      44.30
      TOTAL RAINFALL   (mm)=      62.71         62.71      62.71
      RUNOFF COEFFICIENT  =        0.97          0.48       0.71


         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  83.0   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 ( 0410)|
   |  1 + 2 = 3      |          AREA    QPEAK    TPEAK    R.V.
   ---------------------          (ha)    (cms)    (hrs)    (mm)
         ID1= 1 ( 0115):   1.00   0.060    5.25   44.30
       + ID2= 2 ( 0120):   1.24   0.079    5.25   47.65
         ==========================================
         ID = 3 ( 0410):   2.24   0.139    5.25   46.15

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

   ---------------------
   | ADD HYD ( 0420)|
   |  1 + 2 = 3      |          AREA    QPEAK    TPEAK    R.V.
   ---------------------          (ha)    (cms)    (hrs)    (mm)
         ID1= 1 ( 0405):   4.35   0.259    5.25   46.14
```

```
                    LangstaffRd_EA_Existing_HumberWatershed
       + ID2= 2 ( 0410):   2.24   0.139    5.25   46.15
         ==========================================
         ID = 3 ( 0420):   6.59   0.399    5.25   46.15

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
   ---------------------------------------------------------------------
   *******************************
   ** SIMULATION:Run 08         **
   *******************************

   ---------------------
   | READ STORM    |    Filename: C:\Users\ray.zhao\AppD
   |               |             ata\Local\Temp\
   |               |             fed60948-ccbe-4ce0-8b92-0edff20f5fb5\4f82851c
   | Ptotal= 73.10 mm |  Comments: 25Y12
   ---------------------
                    TIME   RAIN | TIME   RAIN |' TIME   RAIN | TIME   RAIN
                    hrs   mm/hr | hrs   mm/hr |  hrs   mm/hr | hrs   mm/hr
                   0.25   0.00  | 3.50  12.43 | 6.75   5.12 |10.00   0.73
                   0.50   0.73  | 3.75  12.43 | 7.00   5.12 |10.25   0.73
                   0.75   0.73  | 4.00  12.43 | 7.25   5.12 |10.50   0.73
                   1.00   0.73  | 4.25  12.43 | 7.50   2.92 |10.75   0.73
                   1.25   0.73  | 4.50  33.63 | 7.75   2.92 |11.00   0.73
                   1.50   0.73  | 4.75  33.63 | 8.00   2.92 |11.25   0.73
                   1.75   0.73  | 5.00  33.63 | 8.25   2.92 |11.50   0.73
                   2.00   0.73  | 5.25  33.63 | 8.50   1.46 |11.75   0.73
                   2.25   0.73  | 5.50   9.50 | 8.75   1.46 |12.00   0.73
                   2.50   4.39  | 5.75   9.50 | 9.00   1.46 |12.25   0.73
                   2.75   4.39  | 6.00   9.50 | 9.25   1.46 |
                   3.00   4.39  | 6.25   9.50 | 9.50   0.73 |
                   3.25   4.39  | 6.50   5.12 | 9.75   0.73 |

   ---------------------------------------------------------------------
   ---------------------
   | CALIB               |
   | STANDHYD ( 0110)|   Area    (ha)=  1.58
   |ID= 1 DT= 5.0 min |   Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
   ---------------------
                                  IMPERVIOUS    PERVIOUS (i)
      Surface Area     (ha)=        0.90          0.68
      Dep. Storage     (mm)=        2.00          5.00
      Average Slope    (%)=         1.00          2.00
      Length           (m)=       650.00         25.00
      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  | 3.167  4.39 | 6.250  9.50 | 9.33   0.73
```

```
                    LangstaffRd_EA_Existing_HumberWatershed
             0.167  0.00  | 3.250  4.39 | 6.333  5.12 | 9.42   0.73
             0.250  0.00  | 3.333 12.43 | 6.417  5.12 | 9.50   0.73
             0.333  0.73  | 3.417 12.43 | 6.500  5.12 | 9.58   0.73
             0.417  0.73  | 3.500 12.43 | 6.583  5.12 | 9.67   0.73
             0.500  0.73  | 3.583 12.43 | 6.667  5.12 | 9.75   0.73
             0.583  0.73  | 3.667 12.43 | 6.750  5.12 | 9.83   0.73
             0.667  0.73  | 3.750 12.43 | 6.833  5.12 | 9.92   0.73
             0.750  0.73  | 3.833 12.43 | 6.917  5.12 |10.00   0.73
             0.833  0.73  | 3.917 12.43 | 7.000  5.12 |10.08   0.73
             0.917  0.73  | 4.000 12.43 | 7.083  5.12 |10.17   0.73
             1.000  0.73  | 4.083 12.43 | 7.167  5.12 |10.25   0.73
             1.083  0.73  | 4.167 12.43 | 7.250  5.12 |10.33   0.73
             1.167  0.73  | 4.250 12.43 | 7.333  2.92 |10.42   0.73
             1.250  0.73  | 4.333 33.63 | 7.417  2.92 |10.50   0.73
             1.333  0.73  | 4.417 33.63 | 7.500  2.92 |10.58   0.73
             1.417  0.73  | 4.500 33.63 | 7.583  2.92 |10.67   0.73
             1.500  0.73  | 4.583 33.63 | 7.667  2.92 |10.75   0.73
             1.583  0.73  | 4.667 33.63 | 7.750  2.92 |10.83   0.73
             1.667  0.73  | 4.750 33.63 | 7.833  2.92 |10.92   0.73
             1.750  0.73  | 4.833 33.63 | 7.917  2.92 |11.00   0.73
             1.833  0.73  | 4.917 33.63 | 8.000  2.92 |11.08   0.73
             1.917  0.73  | 5.000 33.63 | 8.083  2.92 |11.17   0.73
             2.000  0.73  | 5.083 33.63 | 8.167  2.92 |11.25   0.73
             2.083  0.73  | 5.167 33.63 | 8.250  2.92 |11.33   0.73
             2.167  0.73  | 5.250 33.63 | 8.333  1.46 |11.42   0.73
             2.250  0.73  | 5.333  9.50 | 8.417  1.46 |11.50   0.73
             2.333  4.39  | 5.417  9.50 | 8.500  1.46 |11.58   0.73
             2.417  4.39  | 5.500  9.50 | 8.583  1.46 |11.67   0.73
             2.500  4.39  | 5.583  9.50 | 8.667  1.46 |11.75   0.73
             2.583  4.39  | 5.667  9.50 | 8.750  1.46 |11.83   0.73
             2.667  4.39  | 5.750  9.50 | 8.833  1.46 |11.92   0.73
             2.750  4.39  | 5.833  9.50 | 8.917  1.46 |12.00   0.73
             2.833  4.39  | 5.917  9.50 | 9.000  1.46 |12.08   0.73
             2.917  4.39  | 6.000  9.50 | 9.083  1.46 |12.17   0.73
             3.000  4.39  | 6.083  9.50 | 9.167  1.46 |12.25   0.73
             3.083  4.39  | 6.167  9.50 | 9.250  1.46 |

      Max.Eff.Inten.(mm/hr)=      33.63         25.08
            over (min)            10.00         25.00
      Storage Coeff. (min)=       12.14 (ii)    21.40 (ii)
      Unit Hyd. Tpeak (min)=      10.00         25.00
      Unit Hyd. peak (cms)=        0.10          0.05
                                                          *TOTALS*
      PEAK FLOW        (cms)=      0.08          0.04       0.121 (iii)
      TIME TO PEAK     (hrs)=      5.25          5.33       5.25
      RUNOFF VOLUME    (mm)=      71.10         41.07      58.18
      TOTAL RAINFALL   (mm)=      73.10         73.10      73.10
      RUNOFF COEFFICIENT  =        0.97          0.56       0.80


         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  85.0   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.

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--------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0105)|   Area    (ha)=  1.63
|ID= 1 DT= 5.0 min |   Total Imp(%)= 61.00   Dir. Conn.(%)= 61.00
--------------------
                                    IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=          0.99           0.64
        Dep. Storage   (mm)=          2.00           5.00
        Average Slope  (%)=           1.00           2.00
        Length         (m)=         650.00          25.00
        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 | 3.167   4.39 | 6.250   9.50 | 9.33    0.73
        0.167   0.00 | 3.250   4.39 | 6.333   5.12 | 9.42    0.73
        0.250   0.00 | 3.333  12.43 | 6.417   5.12 | 9.50    0.73
        0.333   0.73 | 3.417  12.43 | 6.500   5.12 | 9.58    0.73
        0.417   0.73 | 3.500  12.43 | 6.583   5.12 | 9.67    0.73
        0.500   0.73 | 3.583  12.43 | 6.667   5.12 | 9.75    0.73
        0.583   0.73 | 3.667  12.43 | 6.750   5.12 | 9.83    0.73
        0.667   0.73 | 3.750  12.43 | 6.833   5.12 | 9.92    0.73
        0.750   0.73 | 3.833  12.43 | 6.917   5.12 | 10.00   0.73
        0.833   0.73 | 3.917  12.43 | 7.000   5.12 | 10.08   0.73
        0.917   0.73 | 4.000  12.43 | 7.083   5.12 | 10.17   0.73
        1.000   0.73 | 4.083  12.43 | 7.167   5.12 | 10.25   0.73
        1.083   0.73 | 4.167  12.43 | 7.250   5.12 | 10.33   0.73
        1.167   0.73 | 4.250  12.43 | 7.333   2.92 | 10.42   0.73
        1.250   0.73 | 4.333  33.63 | 7.417   2.92 | 10.50   0.73
        1.333   0.73 | 4.417  33.63 | 7.500   2.92 | 10.58   0.73
        1.417   0.73 | 4.500  33.63 | 7.583   2.92 | 10.67   0.73
        1.500   0.73 | 4.583  33.63 | 7.667   2.92 | 10.75   0.73
        1.583   0.73 | 4.667  33.63 | 7.750   2.92 | 10.83   0.73
        1.667   0.73 | 4.750  33.63 | 7.833   2.92 | 10.92   0.73
        1.750   0.73 | 4.833  33.63 | 7.917   2.92 | 11.00   0.73
        1.833   0.73 | 4.917  33.63 | 8.000   2.92 | 11.08   0.73
        1.917   0.73 | 5.000  33.63 | 8.083   2.92 | 11.17   0.73
        2.000   0.73 | 5.083  33.63 | 8.167   2.92 | 11.25   0.73
        2.083   0.73 | 5.167  33.63 | 8.250   2.92 | 11.33   0.73
        2.167   0.73 | 5.250  33.63 | 8.333   1.46 | 11.42   0.73
        2.250   0.73 | 5.333   9.50 | 8.417   1.46 | 11.50   0.73
        2.333   4.39 | 5.417   9.50 | 8.500   1.46 | 11.58   0.73
        2.417   4.39 | 5.500   9.50 | 8.583   1.46 | 11.67   0.73
        2.500   4.39 | 5.583   9.50 | 8.667   1.46 | 11.75   0.73
        2.583   4.39 | 5.667   9.50 | 8.750   1.46 | 11.83   0.73
```

```
        2.667   4.39 | 5.750   9.50 | 8.833   1.46 | 11.92   0.73
        2.750   4.39 | 5.833   9.50 | 8.917   1.46 | 12.00   0.73
        2.833   4.39 | 5.917   9.50 | 9.000   1.46 | 12.08   0.73
        2.917   4.39 | 6.000   9.50 | 9.083   1.46 | 12.17   0.73
        3.000   4.39 | 6.083   9.50 | 9.167   1.46 | 12.25   0.73
        3.083   4.39 | 6.167   9.50 | 9.250   1.46 |

Max.Eff.Inten.(mm/hr)=     33.63        25.75
        over (min)         10.00        25.00
Storage Coeff.  (min)=     12.14 (ii)   21.31 (ii)
Unit Hyd. Tpeak (min)=     10.00        25.00
Unit Hyd. peak  (cms)=      0.10         0.05
                                                    *TOTALS*
PEAK FLOW      (cms)=        0.09         0.04        0.129 (iii)
TIME TO PEAK   (hrs)=        5.25         5.33        5.25
RUNOFF VOLUME   (mm)        71.10        42.37       59.89
TOTAL RAINFALL  (mm)        73.10        73.10       73.10
RUNOFF COEFFICIENT  =        0.97         0.58        0.82
```

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 86.0   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.

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--------------------------------------------------------------------------
--------------------
| ADD HYD ( 0400)|
|  1 + 2 = 3     |          AREA    QPEAK    TPEAK    R.V.
--------------------          (ha)    (cms)    (hrs)    (mm)
        ID1= 1 ( 0105):       1.63    0.129    5.25     59.89
      + ID2= 2 ( 0110):       1.58    0.121    5.25     58.18
        ==========================================================
        ID = 3 ( 0400):       3.21    0.249    5.25     59.05

        NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0125)|   Area    (ha)=  2.27
|ID= 1 DT= 5.0 min |   Total Imp(%)= 53.00   Dir. Conn.(%)= 53.00
--------------------
                                    IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=          1.20           1.07
        Dep. Storage   (mm)=          2.00           5.00
        Average Slope  (%)=           1.00           2.00
        Length         (m)=         800.00          20.00
        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 | 3.167   4.39 | 6.250   9.50 | 9.33    0.73
        0.167   0.00 | 3.250   4.39 | 6.333   5.12 | 9.42    0.73
        0.250   0.00 | 3.333  12.43 | 6.417   5.12 | 9.50    0.73
        0.333   0.73 | 3.417  12.43 | 6.500   5.12 | 9.58    0.73
        0.417   0.73 | 3.500  12.43 | 6.583   5.12 | 9.67    0.73
        0.500   0.73 | 3.583  12.43 | 6.667   5.12 | 9.75    0.73
        0.583   0.73 | 3.667  12.43 | 6.750   5.12 | 9.83    0.73
        0.667   0.73 | 3.750  12.43 | 6.833   5.12 | 9.92    0.73
        0.750   0.73 | 3.833  12.43 | 6.917   5.12 | 10.00   0.73
        0.833   0.73 | 3.917  12.43 | 7.000   5.12 | 10.08   0.73
        0.917   0.73 | 4.000  12.43 | 7.083   5.12 | 10.17   0.73
        1.000   0.73 | 4.083  12.43 | 7.167   5.12 | 10.25   0.73
        1.083   0.73 | 4.167  12.43 | 7.250   5.12 | 10.33   0.73
        1.167   0.73 | 4.250  12.43 | 7.333   2.92 | 10.42   0.73
        1.250   0.73 | 4.333  33.63 | 7.417   2.92 | 10.50   0.73
        1.333   0.73 | 4.417  33.63 | 7.500   2.92 | 10.58   0.73
        1.417   0.73 | 4.500  33.63 | 7.583   2.92 | 10.67   0.73
        1.500   0.73 | 4.583  33.63 | 7.667   2.92 | 10.75   0.73
        1.583   0.73 | 4.667  33.63 | 7.750   2.92 | 10.83   0.73
        1.667   0.73 | 4.750  33.63 | 7.833   2.92 | 10.92   0.73
        1.750   0.73 | 4.833  33.63 | 7.917   2.92 | 11.00   0.73
        1.833   0.73 | 4.917  33.63 | 8.000   2.92 | 11.08   0.73
        1.917   0.73 | 5.000  33.63 | 8.083   2.92 | 11.17   0.73
        2.000   0.73 | 5.083  33.63 | 8.167   2.92 | 11.25   0.73
        2.083   0.73 | 5.167  33.63 | 8.250   2.92 | 11.33   0.73
        2.167   0.73 | 5.250  33.63 | 8.333   1.46 | 11.42   0.73
        2.250   0.73 | 5.333   9.50 | 8.417   1.46 | 11.50   0.73
        2.333   4.39 | 5.417   9.50 | 8.500   1.46 | 11.58   0.73
        2.417   4.39 | 5.500   9.50 | 8.583   1.46 | 11.67   0.73
        2.500   4.39 | 5.583   9.50 | 8.667   1.46 | 11.75   0.73
        2.583   4.39 | 5.667   9.50 | 8.750   1.46 | 11.83   0.73
        2.667   4.39 | 5.750   9.50 | 8.833   1.46 | 11.92   0.73
        2.750   4.39 | 5.833   9.50 | 8.917   1.46 | 12.00   0.73
        2.833   4.39 | 5.917   9.50 | 9.000   1.46 | 12.08   0.73
        2.917   4.39 | 6.000   9.50 | 9.083   1.46 | 12.17   0.73
        3.000   4.39 | 6.083   9.50 | 9.167   1.46 | 12.25   0.73
        3.083   4.39 | 6.167   9.50 | 9.250   1.46 |

Max.Eff.Inten.(mm/hr)=     33.63        23.77
        over (min)         15.00        25.00
Storage Coeff.  (min)=     13.76 (ii)   22.03 (ii)
Unit Hyd. Tpeak (min)=     15.00        25.00
Unit Hyd. peak  (cms)=      0.08         0.05
                                                    *TOTALS*
PEAK FLOW      (cms)=        0.11         0.06        0.165 (iii)
TIME TO PEAK   (hrs)=        5.25         5.33        5.25
RUNOFF VOLUME   (mm)        71.10        38.61       55.82
TOTAL RAINFALL  (mm)        73.10        73.10       73.10
RUNOFF COEFFICIENT  =        0.97         0.53        0.76
```

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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 ( 0130)|   Area    (ha)=  2.08
|ID= 1 DT= 5.0 min |   Total Imp(%)= 51.00   Dir. Conn.(%)= 51.00
--------------------
                                    IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=          1.06           1.02
        Dep. Storage   (mm)=          2.00           5.00
        Average Slope  (%)=           1.00           2.00
        Length         (m)=         800.00          20.00
        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 | 3.167   4.39 | 6.250   9.50 | 9.33    0.73
        0.167   0.00 | 3.250   4.39 | 6.333   5.12 | 9.42    0.73
        0.250   0.00 | 3.333  12.43 | 6.417   5.12 | 9.50    0.73
        0.333   0.73 | 3.417  12.43 | 6.500   5.12 | 9.58    0.73
        0.417   0.73 | 3.500  12.43 | 6.583   5.12 | 9.67    0.73
        0.500   0.73 | 3.583  12.43 | 6.667   5.12 | 9.75    0.73
        0.583   0.73 | 3.667  12.43 | 6.750   5.12 | 9.83    0.73
        0.667   0.73 | 3.750  12.43 | 6.833   5.12 | 9.92    0.73
        0.750   0.73 | 3.833  12.43 | 6.917   5.12 | 10.00   0.73
        0.833   0.73 | 3.917  12.43 | 7.000   5.12 | 10.08   0.73
        0.917   0.73 | 4.000  12.43 | 7.083   5.12 | 10.17   0.73
        1.000   0.73 | 4.083  12.43 | 7.167   5.12 | 10.25   0.73
        1.083   0.73 | 4.167  12.43 | 7.250   5.12 | 10.33   0.73
        1.167   0.73 | 4.250  12.43 | 7.333   2.92 | 10.42   0.73
        1.250   0.73 | 4.333  33.63 | 7.417   2.92 | 10.50   0.73
        1.333   0.73 | 4.417  33.63 | 7.500   2.92 | 10.58   0.73
        1.417   0.73 | 4.500  33.63 | 7.583   2.92 | 10.67   0.73
        1.500   0.73 | 4.583  33.63 | 7.667   2.92 | 10.75   0.73
        1.583   0.73 | 4.667  33.63 | 7.750   2.92 | 10.83   0.73
        1.667   0.73 | 4.750  33.63 | 7.833   2.92 | 10.92   0.73
        1.750   0.73 | 4.833  33.63 | 7.917   2.92 | 11.00   0.73
        1.833   0.73 | 4.917  33.63 | 8.000   2.92 | 11.08   0.73
        1.917   0.73 | 5.000  33.63 | 8.083   2.92 | 11.17   0.73
        2.000   0.73 | 5.083  33.63 | 8.167   2.92 | 11.25   0.73
        2.083   0.73 | 5.167  33.63 | 8.250   2.92 | 11.33   0.73
        2.167   0.73 | 5.250  33.63 | 8.333   1.46 | 11.42   0.73
```

```
                  2.250   0.73 | 5.333   9.50 | 8.417   1.46 | 11.50   0.73
                  2.333   4.39 | 5.417   9.50 | 8.500   1.46 | 11.58   0.73
                  2.417   4.39 | 5.500   9.50 | 8.583   1.46 | 11.67   0.73
                  2.500   4.39 | 5.583   9.50 | 8.667   1.46 | 11.75   0.73
                  2.583   4.39 | 5.667   9.50 | 8.750   1.46 | 11.83   0.73
                  2.667   4.39 | 5.750   9.50 | 8.833   1.46 | 11.92   0.73
                  2.750   4.39 | 5.833   9.50 | 8.917   1.46 | 12.00   0.73
                  2.833   4.39 | 5.917   9.50 | 9.000   1.46 | 12.08   0.73
                  2.917   4.39 | 6.000   9.50 | 9.083   1.46 | 12.17   0.73
                  3.000   4.39 | 6.083   9.50 | 9.167   1.46 | 12.25   0.73
                  3.083   4.39 | 6.167   9.50 | 9.250   1.46 |
```

```
        Max.Eff.Inten.(mm/hr)=      33.63        23.77
                 over (min)         15.00        25.00
        Storage Coeff.  (min)=      13.76 (ii)   22.03 (ii)
        Unit Hyd. Tpeak (min)=      15.00        25.00
        Unit Hyd. peak  (cms)=       0.08         0.05
                                                            *TOTALS*
        PEAK FLOW       (cms)=       0.10         0.05        0.150 (iii)
        TIME TO PEAK    (hrs)=       5.25         5.33        5.25
        RUNOFF VOLUME    (mm)=      71.10        38.61       55.17
        TOTAL RAINFALL   (mm)=      73.10        73.10       73.10
        RUNOFF COEFFICIENT  =       0.97         0.53        0.75


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 ( 0405)|
|   1 + 2 = 3   |        AREA    QPEAK    TPEAK     R.V.
--------------------      (ha)    (cms)    (hrs)     (mm)
        ID1= 1 ( 0125):   2.27    0.165    5.25     55.82
      + ID2= 2 ( 0130):   2.08    0.150    5.25     55.17
                        =================================
        ID = 3 ( 0405):   4.35    0.315    5.25     55.51

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

--------------------
| CALIB          |
| STANDHYD ( 0120)|   Area    (ha)=  1.24
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                              IMPERVIOUS      PERVIOUS (i)
        Surface Area    (ha)=    0.71            0.53
        Dep. Storage    (mm)=    2.00            5.00
        Average Slope   (%)=     1.00            2.00
```

```
        Length          (m)=   475.00           17.00
        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 | 3.167   4.39 | 6.250   9.50 | 9.33   0.73
             0.167   0.00 | 3.250   4.39 | 6.333   5.12 | 9.42   0.73
             0.250   0.00 | 3.333  12.43 | 6.417   5.12 | 9.50   0.73
             0.333   0.73 | 3.417  12.43 | 6.500   5.12 | 9.58   0.73
             0.417   0.73 | 3.500  12.43 | 6.583   5.12 | 9.67   0.73
             0.500   0.73 | 3.583  12.43 | 6.667   5.12 | 9.75   0.73
             0.583   0.73 | 3.667  12.43 | 6.750   5.12 | 9.83   0.73
             0.667   0.73 | 3.750  12.43 | 6.833   5.12 | 9.92   0.73
             0.750   0.73 | 3.833  12.43 | 6.917   5.12 | 10.00  0.73
             0.833   0.73 | 3.917  12.43 | 7.000   5.12 | 10.08  0.73
             0.917   0.73 | 4.000  12.43 | 7.083   5.12 | 10.17  0.73
             1.000   0.73 | 4.083  12.43 | 7.167   5.12 | 10.25  0.73
             1.083   0.73 | 4.167  12.43 | 7.250   5.12 | 10.33  0.73
             1.167   0.73 | 4.250  12.43 | 7.333   2.92 | 10.42  0.73
             1.250   0.73 | 4.333  33.63 | 7.417   2.92 | 10.50  0.73
             1.333   0.73 | 4.417  33.63 | 7.500   2.92 | 10.58  0.73
             1.417   0.73 | 4.500  33.63 | 7.583   2.92 | 10.67  0.73
             1.500   0.73 | 4.583  33.63 | 7.667   2.92 | 10.75  0.73
             1.583   0.73 | 4.667  33.63 | 7.750   2.92 | 10.83  0.73
             1.667   0.73 | 4.750  33.63 | 7.833   2.92 | 10.92  0.73
             1.750   0.73 | 4.833  33.63 | 7.917   2.92 | 11.00  0.73
             1.833   0.73 | 4.917  33.63 | 8.000   2.92 | 11.08  0.73
             1.917   0.73 | 5.000  33.63 | 8.083   2.92 | 11.17  0.73
             2.000   0.73 | 5.083  33.63 | 8.167   2.92 | 11.25  0.73
             2.083   0.73 | 5.167  33.63 | 8.250   2.92 | 11.33  0.73
             2.167   0.73 | 5.250  33.63 | 8.333   1.46 | 11.42  0.73
             2.250   0.73 | 5.333   9.50 | 8.417   1.46 | 11.50  0.73
             2.333   4.39 | 5.417   9.50 | 8.500   1.46 | 11.58  0.73
             2.417   4.39 | 5.500   9.50 | 8.583   1.46 | 11.67  0.73
             2.500   4.39 | 5.583   9.50 | 8.667   1.46 | 11.75  0.73
             2.583   4.39 | 5.667   9.50 | 8.750   1.46 | 11.83  0.73
             2.667   4.39 | 5.750   9.50 | 8.833   1.46 | 11.92  0.73
             2.750   4.39 | 5.833   9.50 | 8.917   1.46 | 12.00  0.73
             2.833   4.39 | 5.917   9.50 | 9.000   1.46 | 12.08  0.73
             2.917   4.39 | 6.000   9.50 | 9.083   1.46 | 12.17  0.73
             3.000   4.39 | 6.083   9.50 | 9.167   1.46 | 12.25  0.73
             3.083   4.39 | 6.167   9.50 | 9.250   1.46 |

        Max.Eff.Inten.(mm/hr)=      33.63        23.77
                 over (min)         10.00        20.00
        Storage Coeff.  (min)=      10.06 (ii)   17.57 (ii)
        Unit Hyd. Tpeak (min)=      10.00        20.00
        Unit Hyd. peak  (cms)=       0.11         0.06
                                                    *TOTALS*
```

```
        PEAK FLOW       (cms)=       0.07         0.03        0.096 (iii)
        TIME TO PEAK    (hrs)=       5.25         5.33        5.25
        RUNOFF VOLUME    (mm)=      71.10        38.61       57.12
        TOTAL RAINFALL   (mm)=      73.10        73.10       73.10
        RUNOFF COEFFICIENT  =       0.97         0.53        0.78


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 ( 0115)|   Area    (ha)=  1.00
|ID= 1 DT= 5.0 min |  Total Imp(%)= 46.00   Dir. Conn.(%)= 46.00
--------------------
                              IMPERVIOUS      PERVIOUS (i)
        Surface Area    (ha)=    0.46            0.54
        Dep. Storage    (mm)=    2.00            5.00
        Average Slope   (%)=     1.00            2.00
        Length          (m)=   475.00           17.00
        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 | 3.167   4.39 | 6.250   9.50 | 9.33   0.73
             0.167   0.00 | 3.250   4.39 | 6.333   5.12 | 9.42   0.73
             0.250   0.00 | 3.333  12.43 | 6.417   5.12 | 9.50   0.73
             0.333   0.73 | 3.417  12.43 | 6.500   5.12 | 9.58   0.73
             0.417   0.73 | 3.500  12.43 | 6.583   5.12 | 9.67   0.73
             0.500   0.73 | 3.583  12.43 | 6.667   5.12 | 9.75   0.73
             0.583   0.73 | 3.667  12.43 | 6.750   5.12 | 9.83   0.73
             0.667   0.73 | 3.750  12.43 | 6.833   5.12 | 9.92   0.73
             0.750   0.73 | 3.833  12.43 | 6.917   5.12 | 10.00  0.73
             0.833   0.73 | 3.917  12.43 | 7.000   5.12 | 10.08  0.73
             0.917   0.73 | 4.000  12.43 | 7.083   5.12 | 10.17  0.73
             1.000   0.73 | 4.083  12.43 | 7.167   5.12 | 10.25  0.73
             1.083   0.73 | 4.167  12.43 | 7.250   5.12 | 10.33  0.73
             1.167   0.73 | 4.250  12.43 | 7.333   2.92 | 10.42  0.73
             1.250   0.73 | 4.333  33.63 | 7.417   2.92 | 10.50  0.73
             1.333   0.73 | 4.417  33.63 | 7.500   2.92 | 10.58  0.73
             1.417   0.73 | 4.500  33.63 | 7.583   2.92 | 10.67  0.73
             1.500   0.73 | 4.583  33.63 | 7.667   2.92 | 10.75  0.73
             1.583   0.73 | 4.667  33.63 | 7.750   2.92 | 10.83  0.73
             1.667   0.73 | 4.750  33.63 | 7.833   2.92 | 10.92  0.73
             1.750   0.73 | 4.833  33.63 | 7.917   2.92 | 11.00  0.73
```

```
                  1.833   0.73 | 4.917  33.63 | 8.000   2.92 | 11.08   0.73
                  1.917   0.73 | 5.000  33.63 | 8.083   2.92 | 11.17   0.73
                  2.000   0.73 | 5.083  33.63 | 8.167   2.92 | 11.25   0.73
                  2.083   0.73 | 5.167  33.63 | 8.250   2.92 | 11.33   0.73
                  2.167   0.73 | 5.250  33.63 | 8.333   1.46 | 11.42   0.73
                  2.250   0.73 | 5.333   9.50 | 8.417   1.46 | 11.50   0.73
                  2.333   4.39 | 5.417   9.50 | 8.500   1.46 | 11.58   0.73
                  2.417   4.39 | 5.500   9.50 | 8.583   1.46 | 11.67   0.73
                  2.500   4.39 | 5.583   9.50 | 8.667   1.46 | 11.75   0.73
                  2.583   4.39 | 5.667   9.50 | 8.750   1.46 | 11.83   0.73
                  2.667   4.39 | 5.750   9.50 | 8.833   1.46 | 11.92   0.73
                  2.750   4.39 | 5.833   9.50 | 8.917   1.46 | 12.00   0.73
                  2.833   4.39 | 5.917   9.50 | 9.000   1.46 | 12.08   0.73
                  2.917   4.39 | 6.000   9.50 | 9.083   1.46 | 12.17   0.73
                  3.000   4.39 | 6.083   9.50 | 9.167   1.46 | 12.25   0.73
                  3.083   4.39 | 6.167   9.50 | 9.250   1.46 |

        Max.Eff.Inten.(mm/hr)=      33.63        23.77
                 over (min)         10.00        20.00
        Storage Coeff.  (min)=      10.06 (ii)   17.57 (ii)
        Unit Hyd. Tpeak (min)=      10.00        20.00
        Unit Hyd. peak  (cms)=       0.11         0.06
                                                    *TOTALS*
        PEAK FLOW       (cms)=       0.04         0.03        0.073 (iii)
        TIME TO PEAK    (hrs)=       5.25         5.33        5.25
        RUNOFF VOLUME    (mm)=      71.10        38.61       53.54
        TOTAL RAINFALL   (mm)=      73.10        73.10       73.10
        RUNOFF COEFFICIENT  =       0.97         0.53        0.73


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 ( 0410)|
|   1 + 2 = 3   |        AREA    QPEAK    TPEAK     R.V.
--------------------      (ha)    (cms)    (hrs)     (mm)
        ID1= 1 ( 0115):   1.00    0.073    5.25     53.54
      + ID2= 2 ( 0120):   1.24    0.096    5.25     57.12
                        =================================
        ID = 3 ( 0410):   2.24    0.168    5.25     55.52

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

--------------------
| ADD HYD ( 0420)|
|   1 + 2 = 3   |        AREA    QPEAK    TPEAK     R.V.
```

```
                     LangstaffRd_EA_Existing_HumberWatershed
----------------------    (ha)   (cms)   (hrs)    (mm)
   ID1= 1 (  0405):    4.35   0.315   5.25   55.51
 + ID2= 2 (  0410):    2.24   0.168   5.25   55.52
   =========================================================
   ID = 3 (  0420):    6.59   0.483   5.25   55.52

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*******************************
** SIMULATION:Run 10        **
*******************************

--------------------
| READ STORM      |   Filename: C:\Users\ray.zhao\AppD
|                 |           ata\Local\Temp\
|                 |           fed60948-ccbe-4ce0-8b92-0edff20f5fb5\5040be70
| Ptotal= 80.82 mm |   Comments: 50Y12
--------------------
              TIME   RAIN | TIME   RAIN |' TIME   RAIN | TIME   RAIN
              hrs    mm/hr | hrs    mm/hr |' hrs    mm/hr | hrs    mm/hr
              0.25   0.00 | 3.50   13.74 | 6.75   5.66 | 10.00  0.81
              0.50   0.81 | 3.75   13.74 | 7.00   5.66 | 10.25  0.81
              0.75   0.81 | 4.00   13.74 | 7.25   5.66 | 10.50  0.81
              1.00   0.81 | 4.25   13.74 | 7.50   3.23 | 10.75  0.81
              1.25   0.81 | 4.50   37.17 | 7.75   3.23 | 11.00  0.81
              1.50   0.81 | 4.75   37.17 | 8.00   3.23 | 11.25  0.81
              1.75   0.81 | 5.00   37.17 | 8.25   3.23 | 11.50  0.81
              2.00   0.81 | 5.25   37.17 | 8.50   1.62 | 11.75  0.81
              2.25   0.81 | 5.50   10.50 | 8.75   1.62 | 12.00  0.81
              2.50   4.85 | 5.75   10.50 | 9.00   1.62 | 12.25  0.81
              2.75   4.85 | 6.00   10.50 | 9.25   1.62 |
              3.00   4.85 | 6.25   10.50 | 9.50   0.81 |
              3.25   4.85 | 6.50   5.66  | 9.75   0.81 |

-------------------------------------------------------------------------------

--------------------
| CALIB           |
| STANDHYD ( 0110)|   Area    (ha)=  1.58
|ID= 1 DT= 5.0 min |   Total Imp(%)=  57.00   Dir. Conn.(%)=  57.00
--------------------
                        IMPERVIOUS    PERVIOUS (i)
   Surface Area   (ha)=   0.90         0.68
   Dep. Storage   (mm)=   2.00         5.00
   Average Slope  (%)=    1.00         2.00
   Length         (m)=  650.00        25.00
   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 | 3.167  4.85 | 6.250  10.50 | 9.33  0.81
              0.167  0.00 | 3.250  4.85 | 6.333  5.66 | 9.42  0.81
              0.250  0.00 | 3.333  13.74 | 6.417  5.66 | 9.50  0.81
              0.333  0.81 | 3.417  13.74 | 6.500  5.66 | 9.58  0.81
              0.417  0.81 | 3.500  13.74 | 6.583  5.66 | 9.67  0.81
              0.500  0.81 | 3.583  13.74 | 6.667  5.66 | 9.75  0.81
              0.583  0.81 | 3.667  13.74 | 6.750  5.66 | 9.83  0.81
              0.667  0.81 | 3.750  13.74 | 6.833  5.66 | 9.92  0.81
              0.750  0.81 | 3.833  13.74 | 6.917  5.66 | 10.00  0.81
              0.833  0.81 | 3.917  13.74 | 7.000  5.66 | 10.08  0.81
              0.917  0.81 | 4.000  13.74 | 7.083  5.66 | 10.17  0.81
              1.000  0.81 | 4.083  13.74 | 7.167  5.66 | 10.25  0.81
              1.083  0.81 | 4.167  13.74 | 7.250  5.66 | 10.33  0.81
              1.167  0.81 | 4.250  13.74 | 7.333  3.23 | 10.42  0.81
              1.250  0.81 | 4.333  37.17 | 7.417  3.23 | 10.50  0.81
              1.333  0.81 | 4.417  37.17 | 7.500  3.23 | 10.58  0.81
              1.417  0.81 | 4.500  37.17 | 7.583  3.23 | 10.67  0.81
              1.500  0.81 | 4.583  37.17 | 7.667  3.23 | 10.75  0.81
              1.583  0.81 | 4.667  37.17 | 7.750  3.23 | 10.83  0.81
              1.667  0.81 | 4.750  37.17 | 7.833  3.23 | 10.92  0.81
              1.750  0.81 | 4.833  37.17 | 7.917  3.23 | 11.00  0.81
              1.833  0.81 | 4.917  37.17 | 8.000  3.23 | 11.08  0.81
              1.917  0.81 | 5.000  37.17 | 8.083  3.23 | 11.17  0.81
              2.000  0.81 | 5.083  37.17 | 8.167  3.23 | 11.25  0.81
              2.083  0.81 | 5.167  37.17 | 8.250  3.23 | 11.33  0.81
              2.167  0.81 | 5.250  37.17 | 8.333  1.62 | 11.42  0.81
              2.250  0.81 | 5.333  10.50 | 8.417  1.62 | 11.50  0.81
              2.333  4.85 | 5.417  10.50 | 8.500  1.62 | 11.58  0.81
              2.417  4.85 | 5.500  10.50 | 8.583  1.62 | 11.67  0.81
              2.500  4.85 | 5.583  10.50 | 8.667  1.62 | 11.75  0.81
              2.583  4.85 | 5.667  10.50 | 8.750  1.62 | 11.83  0.81
              2.667  4.85 | 5.750  10.50 | 8.833  1.62 | 11.92  0.81
              2.750  4.85 | 5.833  10.50 | 8.917  1.62 | 12.00  0.81
              2.833  4.85 | 5.917  10.50 | 9.000  1.62 | 12.08  0.81
              2.917  4.85 | 6.000  10.50 | 9.083  1.62 | 12.17  0.81
              3.000  4.85 | 6.083  10.50 | 9.167  1.62 | 12.25  0.81
              3.083  4.85 | 6.167  10.50 | 9.250  1.62 |

   Max.Eff.Inten.(mm/hr)=    37.17        28.73
           over (min)       10.00        25.00
   Storage Coeff. (min)=    11.67 (ii)   20.44 (ii)
   Unit Hyd. Tpeak (min)=   10.00        25.00
   Unit Hyd. peak (cms)=     0.10         0.05
                                                    *TOTALS*
   PEAK FLOW      (cms)=     0.09         0.04        0.136 (iii)
   TIME TO PEAK   (hrs)=     5.25         5.33        5.25
   RUNOFF VOLUME  (mm)=     78.82        47.65       65.41
   TOTAL RAINFALL (mm)=     80.82        80.82       80.82
   RUNOFF COEFFICIENT  =     0.98         0.59        0.81

   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
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```
       CN* =  85.0    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.

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--------------------
| CALIB           |
| STANDHYD ( 0105)|   Area    (ha)=  1.63
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------
                        IMPERVIOUS    PERVIOUS (i)
   Surface Area   (ha)=   0.99         0.64
   Dep. Storage   (mm)=   2.00         5.00
   Average Slope  (%)=    1.00         2.00
   Length         (m)=  650.00        25.00
   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 | 3.167  4.85 | 6.250  10.50 | 9.33  0.81
              0.167  0.00 | 3.250  4.85 | 6.333  5.66 | 9.42  0.81
              0.250  0.00 | 3.333  13.74 | 6.417  5.66 | 9.50  0.81
              0.333  0.81 | 3.417  13.74 | 6.500  5.66 | 9.58  0.81
              0.417  0.81 | 3.500  13.74 | 6.583  5.66 | 9.67  0.81
              0.500  0.81 | 3.583  13.74 | 6.667  5.66 | 9.75  0.81
              0.583  0.81 | 3.667  13.74 | 6.750  5.66 | 9.83  0.81
              0.667  0.81 | 3.750  13.74 | 6.833  5.66 | 9.92  0.81
              0.750  0.81 | 3.833  13.74 | 6.917  5.66 | 10.00  0.81
              0.833  0.81 | 3.917  13.74 | 7.000  5.66 | 10.08  0.81
              0.917  0.81 | 4.000  13.74 | 7.083  5.66 | 10.17  0.81
              1.000  0.81 | 4.083  13.74 | 7.167  5.66 | 10.25  0.81
              1.083  0.81 | 4.167  13.74 | 7.250  5.66 | 10.33  0.81
              1.167  0.81 | 4.250  13.74 | 7.333  3.23 | 10.42  0.81
              1.250  0.81 | 4.333  37.17 | 7.417  3.23 | 10.50  0.81
              1.333  0.81 | 4.417  37.17 | 7.500  3.23 | 10.58  0.81
              1.417  0.81 | 4.500  37.17 | 7.583  3.23 | 10.67  0.81
              1.500  0.81 | 4.583  37.17 | 7.667  3.23 | 10.75  0.81
              1.583  0.81 | 4.667  37.17 | 7.750  3.23 | 10.83  0.81
              1.667  0.81 | 4.750  37.17 | 7.833  3.23 | 10.92  0.81
              1.750  0.81 | 4.833  37.17 | 7.917  3.23 | 11.00  0.81
              1.833  0.81 | 4.917  37.17 | 8.000  3.23 | 11.08  0.81
              1.917  0.81 | 5.000  37.17 | 8.083  3.23 | 11.17  0.81
              2.000  0.81 | 5.083  37.17 | 8.167  3.23 | 11.25  0.81
              2.083  0.81 | 5.167  37.17 | 8.250  3.23 | 11.33  0.81
              2.167  0.81 | 5.250  37.17 | 8.333  1.62 | 11.42  0.81
              2.250  0.81 | 5.333  10.50 | 8.417  1.62 | 11.50  0.81
              2.333  4.85 | 5.417  10.50 | 8.500  1.62 | 11.58  0.81
              2.417  4.85 | 5.500  10.50 | 8.583  1.62 | 11.67  0.81
```

```
              2.500  4.85 | 5.583  10.50 | 8.667  1.62 | 11.75  0.81
              2.583  4.85 | 5.667  10.50 | 8.750  1.62 | 11.83  0.81
              2.667  4.85 | 5.750  10.50 | 8.833  1.62 | 11.92  0.81
              2.750  4.85 | 5.833  10.50 | 8.917  1.62 | 12.00  0.81
              2.833  4.85 | 5.917  10.50 | 9.000  1.62 | 12.08  0.81
              2.917  4.85 | 6.000  10.50 | 9.083  1.62 | 12.17  0.81
              3.000  4.85 | 6.083  10.50 | 9.167  1.62 | 12.25  0.81
              3.083  4.85 | 6.167  10.50 | 9.250  1.62 |

   Max.Eff.Inten.(mm/hr)=    37.17        29.42
           over (min)       10.00        25.00
   Storage Coeff. (min)=    11.67 (ii)   20.35 (ii)
   Unit Hyd. Tpeak (min)=   10.00        25.00
   Unit Hyd. peak (cms)=     0.10         0.05
                                                    *TOTALS*
   PEAK FLOW      (cms)=     0.10         0.04        0.145 (iii)
   TIME TO PEAK   (hrs)=     5.25         5.33        5.25
   RUNOFF VOLUME  (mm)=     78.82        49.06       67.21
   TOTAL RAINFALL (mm)=     80.82        80.82       80.82
   RUNOFF COEFFICIENT  =     0.98         0.61        0.83

   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* =  86.0    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.

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--------------------
| ADD HYD  ( 0400)|
|  1 + 2 = 3      |          AREA   QPEAK   TPEAK   R.V.
--------------------           (ha)   (cms)   (hrs)   (mm)
   ID1= 1 (  0105):    1.63   0.145   5.25   67.21
 + ID2= 2 (  0110):    1.58   0.136   5.25   65.41
   =========================================================
   ID = 3 (  0400):    3.21   0.281   5.25   66.32

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| CALIB           |
| STANDHYD ( 0125)|   Area    (ha)=  2.27
|ID= 1 DT= 5.0 min |   Total Imp(%)=  53.00   Dir. Conn.(%)=  53.00
--------------------
                        IMPERVIOUS    PERVIOUS (i)
   Surface Area   (ha)=   1.20         1.07
   Dep. Storage   (mm)=   2.00         5.00
   Average Slope  (%)=    1.00         2.00
   Length         (m)=  800.00        20.00
   Mannings n      =     0.013         0.250
```

LangstaffRd_EA_Existing_HumberWatershed
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   4.85 | 6.250  10.50 | 9.33   0.81
           0.167   0.00 | 3.250   4.85 | 6.333   5.66 | 9.42   0.81
           0.250   0.00 | 3.333  13.74 | 6.417   5.66 | 9.50   0.81
           0.333   0.81 | 3.417  13.74 | 6.500   5.66 | 9.58   0.81
           0.417   0.81 | 3.500  13.74 | 6.583   5.66 | 9.67   0.81
           0.500   0.81 | 3.583  13.74 | 6.667   5.66 | 9.75   0.81
           0.583   0.81 | 3.667  13.74 | 6.750   5.66 | 9.83   0.81
           0.667   0.81 | 3.750  13.74 | 6.833   5.66 | 9.92   0.81
           0.750   0.81 | 3.833  13.74 | 6.917   5.66 | 10.00  0.81
           0.833   0.81 | 3.917  13.74 | 7.000   5.66 | 10.08  0.81
           0.917   0.81 | 4.000  13.74 | 7.083   5.66 | 10.17  0.81
           1.000   0.81 | 4.083  13.74 | 7.167   5.66 | 10.25  0.81
           1.083   0.81 | 4.167  13.74 | 7.250   5.66 | 10.33  0.81
           1.167   0.81 | 4.250  13.74 | 7.333   3.23 | 10.42  0.81
           1.250   0.81 | 4.333  37.17 | 7.417   3.23 | 10.50  0.81
           1.333   0.81 | 4.417  37.17 | 7.500   3.23 | 10.58  0.81
           1.417   0.81 | 4.500  37.17 | 7.583   3.23 | 10.67  0.81
           1.500   0.81 | 4.583  37.17 | 7.667   3.23 | 10.75  0.81
           1.583   0.81 | 4.667  37.17 | 7.750   3.23 | 10.83  0.81
           1.667   0.81 | 4.750  37.17 | 7.833   3.23 | 10.92  0.81
           1.750   0.81 | 4.833  37.17 | 7.917   3.23 | 11.00  0.81
           1.833   0.81 | 4.917  37.17 | 8.000   3.23 | 11.08  0.81
           1.917   0.81 | 5.000  37.17 | 8.083   3.23 | 11.17  0.81
           2.000   0.81 | 5.083  37.17 | 8.167   3.23 | 11.25  0.81
           2.083   0.81 | 5.167  37.17 | 8.250   3.23 | 11.33  0.81
           2.167   0.81 | 5.250  37.17 | 8.333   3.23 | 11.42  0.81
           2.250   0.81 | 5.333  10.50 | 8.417   1.62 | 11.50  0.81
           2.333   4.85 | 5.417  10.50 | 8.500   1.62 | 11.58  0.81
           2.417   4.85 | 5.500  10.50 | 8.583   1.62 | 11.67  0.81
           2.500   4.85 | 5.583  10.50 | 8.667   1.62 | 11.75  0.81
           2.583   4.85 | 5.667  10.50 | 8.750   1.62 | 11.83  0.81
           2.667   4.85 | 5.750  10.50 | 8.833   1.62 | 11.92  0.81
           2.750   4.85 | 5.833  10.50 | 8.917   1.62 | 12.00  0.81
           2.833   4.85 | 5.917  10.50 | 9.000   1.62 | 12.08  0.81
           2.917   4.85 | 6.000  10.50 | 9.083   1.62 | 12.17  0.81
           3.000   4.85 | 6.083  10.50 | 9.167   1.62 | 12.25  0.81
           3.083   4.85 | 6.167  10.50 | 9.250   1.62 |

        Max.Eff.Inten.(mm/hr)=       37.17         27.36
                  over (min)         15.00         25.00
        Storage Coeff.  (min)=       13.22 (ii)    21.04 (ii)
        Unit Hyd. Tpeak (min)=       15.00         25.00
        Unit Hyd. peak  (cms)=        0.08          0.05
                                                              *TOTALS*
        PEAK FLOW       (cms)=        0.12          0.07        0.187 (iii)
        TIME TO PEAK    (hrs)=        5.25          5.33        5.25
        RUNOFF VOLUME   (mm)=        78.82         44.97       62.90
```
Page 45

Page 45

LangstaffRd_EA_Existing_HumberWatershed
```
TOTAL RAINFALL   (mm)=       80.82         80.82         80.82
RUNOFF COEFFICIENT   =        0.98          0.56          0.78


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* =  83.0    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 ( 0130)  |   Area    (ha)=  2.08
|ID= 1 DT= 5.0 min  |   Total Imp(%)= 51.00   Dir. Conn.(%)= 51.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=    1.06          1.02
        Dep. Storage   (mm)=    2.00          5.00
        Average Slope  (%)=     1.00          2.00
        Length         (m)=   800.00         20.00
        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 | 3.167   4.85 | 6.250  10.50 | 9.33   0.81
           0.167   0.00 | 3.250   4.85 | 6.333   5.66 | 9.42   0.81
           0.250   0.00 | 3.333  13.74 | 6.417   5.66 | 9.50   0.81
           0.333   0.81 | 3.417  13.74 | 6.500   5.66 | 9.58   0.81
           0.417   0.81 | 3.500  13.74 | 6.583   5.66 | 9.67   0.81
           0.500   0.81 | 3.583  13.74 | 6.667   5.66 | 9.75   0.81
           0.583   0.81 | 3.667  13.74 | 6.750   5.66 | 9.83   0.81
           0.667   0.81 | 3.750  13.74 | 6.833   5.66 | 9.92   0.81
           0.750   0.81 | 3.833  13.74 | 6.917   5.66 | 10.00  0.81
           0.833   0.81 | 3.917  13.74 | 7.000   5.66 | 10.08  0.81
           0.917   0.81 | 4.000  13.74 | 7.083   5.66 | 10.17  0.81
           1.000   0.81 | 4.083  13.74 | 7.167   5.66 | 10.25  0.81
           1.083   0.81 | 4.167  13.74 | 7.250   5.66 | 10.33  0.81
           1.167   0.81 | 4.250  13.74 | 7.333   3.23 | 10.42  0.81
           1.250   0.81 | 4.333  37.17 | 7.417   3.23 | 10.50  0.81
           1.333   0.81 | 4.417  37.17 | 7.500   3.23 | 10.58  0.81
           1.417   0.81 | 4.500  37.17 | 7.583   3.23 | 10.67  0.81
           1.500   0.81 | 4.583  37.17 | 7.667   3.23 | 10.75  0.81
           1.583   0.81 | 4.667  37.17 | 7.750   3.23 | 10.83  0.81
           1.667   0.81 | 4.750  37.17 | 7.833   3.23 | 10.92  0.81
           1.750   0.81 | 4.833  37.17 | 7.917   3.23 | 11.00  0.81
           1.833   0.81 | 4.917  37.17 | 8.000   3.23 | 11.08  0.81
           1.917   0.81 | 5.000  37.17 | 8.083   3.23 | 11.17  0.81
           2.000   0.81 | 5.083  37.17 | 8.167   3.23 | 11.25  0.81
```

Page 46

LangstaffRd_EA_Existing_HumberWatershed
```
           2.083   0.81 | 5.167  37.17 | 8.250   3.23 | 11.33  0.81
           2.167   0.81 | 5.250  37.17 | 8.333   1.62 | 11.42  0.81
           2.250   0.81 | 5.333  10.50 | 8.417   1.62 | 11.50  0.81
           2.333   4.85 | 5.417  10.50 | 8.500   1.62 | 11.58  0.81
           2.417   4.85 | 5.500  10.50 | 8.583   1.62 | 11.67  0.81
           2.500   4.85 | 5.583  10.50 | 8.667   1.62 | 11.75  0.81
           2.583   4.85 | 5.667  10.50 | 8.750   1.62 | 11.83  0.81
           2.667   4.85 | 5.750  10.50 | 8.833   1.62 | 11.92  0.81
           2.750   4.85 | 5.833  10.50 | 8.917   1.62 | 12.00  0.81
           2.833   4.85 | 5.917  10.50 | 9.000   1.62 | 12.08  0.81
           2.917   4.85 | 6.000  10.50 | 9.083   1.62 | 12.17  0.81
           3.000   4.85 | 6.083  10.50 | 9.167   1.62 | 12.25  0.81
           3.083   4.85 | 6.167  10.50 | 9.250   1.62 |

        Max.Eff.Inten.(mm/hr)=       37.17         27.36
                  over (min)         15.00         25.00
        Storage Coeff.  (min)=       13.22 (ii)    21.04 (ii)
        Unit Hyd. Tpeak (min)=       15.00         25.00
        Unit Hyd. peak  (cms)=        0.08          0.05
                                                              *TOTALS*
        PEAK FLOW       (cms)=        0.11          0.06        0.170 (iii)
        TIME TO PEAK    (hrs)=        5.25          5.33        5.25
        RUNOFF VOLUME   (mm)=        78.82         44.97       62.23
        TOTAL RAINFALL  (mm)=        80.82         80.82       80.82
        RUNOFF COEFFICIENT   =        0.98          0.56        0.77


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* =  83.0    Ia = Dep. Storage  (Above)
   (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
  (iii) PEAK FLOWS DO NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------

--------------------
| ADD HYD ( 0405)   |
|  1 + 2 = 3        |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)   (cms)    (hrs)     (mm)
        ID1= 1 ( 0125):       2.27    0.187    5.25     62.90
      + ID2= 2 ( 0130):       2.08    0.170    5.25     62.23
                           =======================================
        ID = 3 ( 0405):       4.35    0.357    5.25     62.58

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD ( 0120)  |   Area    (ha)=  1.24
|ID= 1 DT= 5.0 min  |   Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=    0.71          0.53
```

Page 47

LangstaffRd_EA_Existing_HumberWatershed
```
        Dep. Storage   (mm)=    2.00          5.00
        Average Slope  (%)=     1.00          2.00
        Length         (m)=   475.00         17.00
        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 | 3.167   4.85 | 6.250  10.50 | 9.33   0.81
           0.167   0.00 | 3.250   4.85 | 6.333   5.66 | 9.42   0.81
           0.250   0.00 | 3.333  13.74 | 6.417   5.66 | 9.50   0.81
           0.333   0.81 | 3.417  13.74 | 6.500   5.66 | 9.58   0.81
           0.417   0.81 | 3.500  13.74 | 6.583   5.66 | 9.67   0.81
           0.500   0.81 | 3.583  13.74 | 6.667   5.66 | 9.75   0.81
           0.583   0.81 | 3.667  13.74 | 6.750   5.66 | 9.83   0.81
           0.667   0.81 | 3.750  13.74 | 6.833   5.66 | 9.92   0.81
           0.750   0.81 | 3.833  13.74 | 6.917   5.66 | 10.00  0.81
           0.833   0.81 | 3.917  13.74 | 7.000   5.66 | 10.08  0.81
           0.917   0.81 | 4.000  13.74 | 7.083   5.66 | 10.17  0.81
           1.000   0.81 | 4.083  13.74 | 7.167   5.66 | 10.25  0.81
           1.083   0.81 | 4.167  13.74 | 7.250   5.66 | 10.33  0.81
           1.167   0.81 | 4.250  13.74 | 7.333   3.23 | 10.42  0.81
           1.250   0.81 | 4.333  37.17 | 7.417   3.23 | 10.50  0.81
           1.333   0.81 | 4.417  37.17 | 7.500   3.23 | 10.58  0.81
           1.417   0.81 | 4.500  37.17 | 7.583   3.23 | 10.67  0.81
           1.500   0.81 | 4.583  37.17 | 7.667   3.23 | 10.75  0.81
           1.583   0.81 | 4.667  37.17 | 7.750   3.23 | 10.83  0.81
           1.667   0.81 | 4.750  37.17 | 7.833   3.23 | 10.92  0.81
           1.750   0.81 | 4.833  37.17 | 7.917   3.23 | 11.00  0.81
           1.833   0.81 | 4.917  37.17 | 8.000   3.23 | 11.08  0.81
           1.917   0.81 | 5.000  37.17 | 8.083   3.23 | 11.17  0.81
           2.000   0.81 | 5.083  37.17 | 8.167   3.23 | 11.25  0.81
           2.083   0.81 | 5.167  37.17 | 8.250   3.23 | 11.33  0.81
           2.167   0.81 | 5.250  37.17 | 8.333   3.23 | 11.42  0.81
           2.250   0.81 | 5.333  10.50 | 8.417   1.62 | 11.50  0.81
           2.333   4.85 | 5.417  10.50 | 8.500   1.62 | 11.58  0.81
           2.417   4.85 | 5.500  10.50 | 8.583   1.62 | 11.67  0.81
           2.500   4.85 | 5.583  10.50 | 8.667   1.62 | 11.75  0.81
           2.583   4.85 | 5.667  10.50 | 8.750   1.62 | 11.83  0.81
           2.667   4.85 | 5.750  10.50 | 8.833   1.62 | 11.92  0.81
           2.750   4.85 | 5.833  10.50 | 8.917   1.62 | 12.00  0.81
           2.833   4.85 | 5.917  10.50 | 9.000   1.62 | 12.08  0.81
           2.917   4.85 | 6.000  10.50 | 9.083   1.62 | 12.17  0.81
           3.000   4.85 | 6.083  10.50 | 9.167   1.62 | 12.25  0.81
           3.083   4.85 | 6.167  10.50 | 9.250   1.62 |

        Max.Eff.Inten.(mm/hr)=       37.17         27.36
                  over (min)         10.00         20.00
        Storage Coeff.  (min)=        9.67 (ii)    16.76 (ii)
        Unit Hyd. Tpeak (min)=       10.00         20.00
```

Page 48

```
                    LangstaffRd_EA_Existing_HumberWatershed
      Unit Hyd. peak (cms)=      0.11          0.06

                                                        *TOTALS*
      PEAK FLOW        (cms)=    0.07          0.03      0.108 (iii)
      TIME TO PEAK     (hrs)=    5.25          5.33      5.25
      RUNOFF VOLUME    (mm)=     78.82         44.97     64.26
      TOTAL RAINFALL   (mm)=     80.82         80.82     80.82
      RUNOFF COEFFICIENT =       0.98          0.56      0.80


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0    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 ( 0115)|   Area     (ha)=   1.00
|ID= 1 DT= 5.0 min |  Total Imp(%)= 46.00   Dir. Conn.(%)= 46.00
--------------------
                        IMPERVIOUS     PERVIOUS (i)
      Surface Area   (ha)=    0.46         0.54
      Dep. Storage   (mm)=    2.00         5.00
      Average Slope   (%)=    1.00         2.00
      Length          (m)=  475.00        17.00
      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 | 3.167  4.85 | 6.250  10.50 | 9.33   0.81
          0.167  0.00 | 3.250  4.85 | 6.333   5.66 | 9.42   0.81
          0.250  0.00 | 3.333 13.74 | 6.417   5.66 | 9.50   0.81
          0.333  0.81 | 3.417 13.74 | 6.500   5.66 | 9.58   0.81
          0.417  0.81 | 3.500 13.74 | 6.583   5.66 | 9.67   0.81
          0.500  0.81 | 3.583 13.74 | 6.667   5.66 | 9.75   0.81
          0.583  0.81 | 3.667 13.74 | 6.750   5.66 | 9.83   0.81
          0.667  0.81 | 3.750 13.74 | 6.833   5.66 | 9.92   0.81
          0.750  0.81 | 3.833 13.74 | 6.917   5.66 | 10.00  0.81
          0.833  0.81 | 3.917 13.74 | 7.000   5.66 | 10.08  0.81
          0.917  0.81 | 4.000 13.74 | 7.083   5.66 | 10.17  0.81
          1.000  0.81 | 4.083 13.74 | 7.167   5.66 | 10.25  0.81
          1.083  0.81 | 4.167 13.74 | 7.250   5.66 | 10.33  0.81
          1.167  0.81 | 4.250 13.74 | 7.333   3.23 | 10.42  0.81
          1.250  0.81 | 4.333 37.17 | 7.417   3.23 | 10.50  0.81
          1.333  0.81 | 4.417 37.17 | 7.500   3.23 | 10.58  0.81
          1.417  0.81 | 4.500 37.17 | 7.583   3.23 | 10.67  0.81
          1.500  0.81 | 4.583 37.17 | 7.667   3.23 | 10.75  0.81
          1.583  0.81 | 4.667 37.17 | 7.750   3.23 | 10.83  0.81
```

```
                    LangstaffRd_EA_Existing_HumberWatershed
          1.667  0.81 | 4.750 37.17 | 7.833   3.23 | 10.92  0.81
          1.750  0.81 | 4.833 37.17 | 7.917   3.23 | 11.00  0.81
          1.833  0.81 | 4.917 37.17 | 8.000   3.23 | 11.08  0.81
          1.917  0.81 | 5.000 37.17 | 8.083   3.23 | 11.17  0.81
          2.000  0.81 | 5.083 37.17 | 8.167   3.23 | 11.25  0.81
          2.083  0.81 | 5.167 37.17 | 8.250   3.23 | 11.33  0.81
          2.167  0.81 | 5.250 37.17 | 8.333   1.62 | 11.42  0.81
          2.250  0.81 | 5.333 10.50 | 8.417   1.62 | 11.50  0.81
          2.333  4.85 | 5.417 10.50 | 8.500   1.62 | 11.58  0.81
          2.417  4.85 | 5.500 10.50 | 8.583   1.62 | 11.67  0.81
          2.500  4.85 | 5.583 10.50 | 8.667   1.62 | 11.75  0.81
          2.583  4.85 | 5.667 10.50 | 8.750   1.62 | 11.83  0.81
          2.667  4.85 | 5.750 10.50 | 8.833   1.62 | 11.92  0.81
          2.750  4.85 | 5.833 10.50 | 8.917   1.62 | 12.00  0.81
          2.833  4.85 | 5.917 10.50 | 9.000   1.62 | 12.08  0.81
          2.917  4.85 | 6.000 10.50 | 9.083   1.62 | 12.17  0.81
          3.000  4.85 | 6.083 10.50 | 9.167   1.62 | 12.25  0.81
          3.083  4.85 | 6.167 10.50 | 9.250   1.62 |

      Max.Eff.Inten.(mm/hr)=    37.17         27.36
              over (min)        10.00         20.00
      Storage Coeff. (min)=      9.67 (ii)    16.76 (ii)
      Unit Hyd. Tpeak (min)=    10.00         20.00
      Unit Hyd. peak  (cms)=     0.11          0.06
                                                        *TOTALS*
      PEAK FLOW        (cms)=    0.05          0.04      0.083 (iii)
      TIME TO PEAK     (hrs)=    5.25          5.33      5.25
      RUNOFF VOLUME    (mm)=     78.82         44.97     60.53
      TOTAL RAINFALL   (mm)=     80.82         80.82     80.82
      RUNOFF COEFFICIENT =       0.98          0.56      0.75


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0    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  ( 0410)|
|  1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------       (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 0115):     1.00   0.083     5.25     60.53
     + ID2= 2 ( 0120):     1.24   0.108     5.25     64.26
       ===================================================
       ID = 3 ( 0410):     2.24   0.190     5.25     62.59

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
```

```
                    LangstaffRd_EA_Existing_HumberWatershed
| ADD HYD  ( 0420)|
|  1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------       (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 0405):     4.35   0.357     5.25     62.58
     + ID2= 2 ( 0410):     2.24   0.190     5.25     62.59
       ===================================================
       ID = 3 ( 0420):     6.59   0.547     5.25     62.58

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*********************************
** SIMULATION:Run 12        **
*********************************

--------------------
| READ STORM      |   Filename: C:\Users\ray.zhao\AppD
|                 |             ata\Local\Temp\
|                 |             fed60948-ccbe-4ce0-8b92-0edff20f5fb5\69ca7235
| Ptotal= 88.54 mm |  Comments: 100Y12
--------------------
             TIME   RAIN | TIME   RAIN |' TIME  RAIN | TIME   RAIN
             hrs    mm/hr| hrs    mm/hr|  hrs   mm/hr| hrs    mm/hr
             0.25   0.00 | 3.50  15.05 | 6.75   6.20 | 10.00  0.89
             0.50   0.89 | 3.75  15.05 | 7.00   6.20 | 10.25  0.89
             0.75   0.89 | 4.00  15.05 | 7.25   6.20 | 10.50  0.89
             1.00   0.89 | 4.25  15.05 | 7.50   3.54 | 10.75  0.89
             1.25   0.89 | 4.50  40.71 | 7.75   3.54 | 11.00  0.89
             1.50   0.89 | 4.75  40.71 | 8.00   3.54 | 11.25  0.89
             1.75   0.89 | 5.00  40.71 | 8.25   3.54 | 11.50  0.89
             2.00   0.89 | 5.25  40.71 | 8.50   1.77 | 11.75  0.89
             2.25   0.89 | 5.50  11.51 | 8.75   1.77 | 12.00  0.89
             2.50   5.31 | 5.75  11.51 | 9.00   1.77 | 12.25  0.89
             2.75   5.31 | 6.00  11.51 | 9.25   1.77 |
             3.00   5.31 | 6.25  11.51 | 9.50   0.89 |
             3.25   5.31 | 6.50   6.20 | 9.75   0.89 |


-------------------------------------------------------------------------------
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| CALIB              |
| STANDHYD ( 0110)|   Area     (ha)=   1.58
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                        IMPERVIOUS     PERVIOUS (i)
      Surface Area   (ha)=    0.90         0.68
      Dep. Storage   (mm)=    2.00         5.00
      Average Slope   (%)=    1.00         2.00
      Length          (m)=  650.00        25.00
      Mannings n       =      0.013        0.250

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

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                    LangstaffRd_EA_Existing_HumberWatershed
                     ---- 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  5.31 | 6.250  11.51 | 9.33   0.89
          0.167  0.00 | 3.250  5.31 | 6.333   6.20 | 9.42   0.89
          0.250  0.00 | 3.333 15.05 | 6.417   6.20 | 9.50   0.89
          0.333  0.89 | 3.417 15.05 | 6.500   6.20 | 9.58   0.89
          0.417  0.89 | 3.500 15.05 | 6.583   6.20 | 9.67   0.89
          0.500  0.89 | 3.583 15.05 | 6.667   6.20 | 9.75   0.89
          0.583  0.89 | 3.667 15.05 | 6.750   6.20 | 9.83   0.89
          0.667  0.89 | 3.750 15.05 | 6.833   6.20 | 9.92   0.89
          0.750  0.89 | 3.833 15.05 | 6.917   6.20 | 10.00  0.89
          0.833  0.89 | 3.917 15.05 | 7.000   6.20 | 10.08  0.89
          0.917  0.89 | 4.000 15.05 | 7.083   6.20 | 10.17  0.89
          1.000  0.89 | 4.083 15.05 | 7.167   6.20 | 10.25  0.89
          1.083  0.89 | 4.167 15.05 | 7.250   6.20 | 10.33  0.89
          1.167  0.89 | 4.250 15.05 | 7.333   3.54 | 10.42  0.89
          1.250  0.89 | 4.333 40.71 | 7.417   3.54 | 10.50  0.89
          1.333  0.89 | 4.417 40.71 | 7.500   3.54 | 10.58  0.89
          1.417  0.89 | 4.500 40.71 | 7.583   3.54 | 10.67  0.89
          1.500  0.89 | 4.583 40.71 | 7.667   3.54 | 10.75  0.89
          1.583  0.89 | 4.667 40.71 | 7.750   3.54 | 10.83  0.89
          1.667  0.89 | 4.750 40.71 | 7.833   3.54 | 10.92  0.89
          1.750  0.89 | 4.833 40.71 | 7.917   3.54 | 11.00  0.89
          1.833  0.89 | 4.917 40.71 | 8.000   3.54 | 11.08  0.89
          1.917  0.89 | 5.000 40.71 | 8.083   3.54 | 11.17  0.89
          2.000  0.89 | 5.083 40.71 | 8.167   3.54 | 11.25  0.89
          2.083  0.89 | 5.167 40.71 | 8.250   3.54 | 11.33  0.89
          2.167  0.89 | 5.250 40.71 | 8.333   1.77 | 11.42  0.89
          2.250  0.89 | 5.333 11.51 | 8.417   1.77 | 11.50  0.89
          2.333  5.31 | 5.417 11.51 | 8.500   1.77 | 11.58  0.89
          2.417  5.31 | 5.500 11.51 | 8.583   1.77 | 11.67  0.89
          2.500  5.31 | 5.583 11.51 | 8.667   1.77 | 11.75  0.89
          2.583  5.31 | 5.667 11.51 | 8.750   1.77 | 11.83  0.89
          2.667  5.31 | 5.750 11.51 | 8.833   1.77 | 11.92  0.89
          2.750  5.31 | 5.833 11.51 | 8.917   1.77 | 12.00  0.89
          2.833  5.31 | 5.917 11.51 | 9.000   1.77 | 12.08  0.89
          2.917  5.31 | 6.000 11.51 | 9.083   1.77 | 12.17  0.89
          3.000  5.31 | 6.083 11.51 | 9.167   1.77 | 12.25  0.89
          3.083  5.31 | 6.167 11.51 | 9.250   1.77 |

      Max.Eff.Inten.(mm/hr)=    40.71         32.40
              over (min)        10.00         20.00
      Storage Coeff. (min)=     11.25 (ii)    19.61 (ii)
      Unit Hyd. Tpeak (min)=    10.00         20.00
      Unit Hyd. peak  (cms)=     0.10          0.06
                                                        *TOTALS*
      PEAK FLOW        (cms)=    0.10          0.05      0.153 (iii)
      TIME TO PEAK     (hrs)=    5.25          5.33      5.25
      RUNOFF VOLUME    (mm)=     86.54         54.37     72.70
      TOTAL RAINFALL   (mm)=     88.54         88.54     88.54
      RUNOFF COEFFICIENT =       0.98          0.61      0.82
```

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN* = 85.0   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 (0105)| Area   (ha)= 1.63
|ID= 1 DT= 5.0 min | Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

                              IMPERVIOUS   PERVIOUS (i)
      Surface Area   (ha)=   0.99   0.64
      Dep. Storage   (mm)=   2.00   5.00
      Average Slope   (%)=   1.00   2.00
      Length   (m)=   650.00   25.00
      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	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89

2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

      Max.Eff.Inten.(mm/hr)=   40.71   33.12
             over (min)   10.00   20.00
      Storage Coeff. (min)=   11.25 (ii)   19.53 (ii)
      Unit Hyd. Tpeak (min)=   10.00   20.00
      Unit Hyd. peak (cms)=   0.10   0.06
                                                      TOTALS
      PEAK FLOW   (cms)=   0.11   0.05   0.162 (iii)
      TIME TO PEAK   (hrs)=   5.25   5.33   5.25
      RUNOFF VOLUME   (mm)=   86.54   55.88   74.58
      TOTAL RAINFALL (mm)=   88.54   88.54   88.54
      RUNOFF COEFFICIENT =   0.98   0.63   0.84

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 86.0   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 (0400)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
      ID1= 1 (0105):   1.63   0.162   5.25   74.58
    + ID2= 2 (0110):   1.58   0.153   5.25   72.70
      ===
      ID = 3 (0400):   3.21   0.315   5.25   73.65

      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0125)| Area   (ha)= 2.27
|ID= 1 DT= 5.0 min | Total Imp(%)= 53.00 Dir. Conn.(%)= 53.00

                              IMPERVIOUS   PERVIOUS (i)
      Surface Area   (ha)=   1.20   1.07
      Dep. Storage   (mm)=   2.00   5.00
      Average Slope   (%)=   1.00   2.00
      Length   (m)=   800.00   20.00

      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	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

      Max.Eff.Inten.(mm/hr)=   40.71   30.98
             over (min)   15.00   25.00
      Storage Coeff. (min)=   12.74 (ii)   20.18 (ii)
      Unit Hyd. Tpeak (min)=   15.00   25.00
      Unit Hyd. peak (cms)=   0.08   0.05
                                                      TOTALS
      PEAK FLOW   (cms)=   0.13   0.08   0.209 (iii)

      TIME TO PEAK   (hrs)=   5.25   5.33   5.25
      RUNOFF VOLUME   (mm)=   86.54   51.48   70.06
      TOTAL RAINFALL (mm)=   88.54   88.54   88.54
      RUNOFF COEFFICIENT =   0.98   0.58   0.79

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0   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 (0130)| Area   (ha)= 2.08
|ID= 1 DT= 5.0 min | Total Imp(%)= 51.00 Dir. Conn.(%)= 51.00

                              IMPERVIOUS   PERVIOUS (i)
      Surface Area   (ha)=   1.06   1.02
      Dep. Storage   (mm)=   2.00   5.00
      Average Slope   (%)=   1.00   2.00
      Length   (m)=   800.00   20.00
      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	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89

LangstaffRd_EA_Existing_HumberWatershed

1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

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Max.Eff.Inten.(mm/hr)=      40.71      30.98
          over (min)        15.00      25.00
Storage Coeff.   (min)=    12.74 (ii)  20.18 (ii)
Unit Hyd. Tpeak (min)=      15.00      25.00
Unit Hyd. peak  (cms)=       0.08       0.05
                                                *TOTALS*
PEAK FLOW       (cms)=        0.12       0.07       0.190 (iii)
TIME TO PEAK    (hrs)=        5.25       5.33       5.25
RUNOFF VOLUME    (mm)=       86.54      51.48      69.36
TOTAL RAINFALL   (mm)=       88.54      88.54      88.54
RUNOFF COEFFICIENT  =         0.98       0.58       0.78


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* =  83.0   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.
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--------------------
| ADD HYD ( 0405)|
|  1 + 2 = 3     |        AREA     QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
      ID1= 1 ( 0125):      2.27    0.209     5.25    70.06
    + ID2= 2 ( 0130):      2.08    0.190     5.25    69.36
      =================================================
      ID = 3 ( 0405):      4.35    0.399     5.25    69.72

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| CALIB            |
| STANDHYD ( 0120)|  Area    (ha)=  1.24
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
```

LangstaffRd_EA_Existing_HumberWatershed

```
                           IMPERVIOUS   PERVIOUS (i)
Surface Area   (ha)=         0.71       0.53
Dep. Storage   (mm)=         2.00       5.00
Average Slope  (%)=          1.00       2.00
Length         (m)=        475.00      17.00
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	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

```
Max.Eff.Inten.(mm/hr)=      40.71      30.98
          over (min)        10.00      20.00
```

LangstaffRd_EA_Existing_HumberWatershed

```
Storage Coeff.   (min)=       9.32 (ii)   16.07 (ii)
Unit Hyd. Tpeak (min)=       10.00      20.00
Unit Hyd. peak  (cms)=        0.12       0.06
                                                *TOTALS*
PEAK FLOW       (cms)=         0.08       0.04       0.120 (iii)
TIME TO PEAK    (hrs)=         5.25       5.25       5.25
RUNOFF VOLUME    (mm)=        86.54      51.48      71.46
TOTAL RAINFALL   (mm)=        88.54      88.54      88.54
RUNOFF COEFFICIENT  =          0.98       0.58       0.81


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* =  83.0   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 ( 0115)|  Area    (ha)=  1.00
|ID= 1 DT= 5.0 min |  Total Imp(%)= 46.00   Dir. Conn.(%)= 46.00
--------------------
                           IMPERVIOUS   PERVIOUS (i)
Surface Area   (ha)=         0.46       0.54
Dep. Storage   (mm)=         2.00       5.00
Average Slope  (%)=          1.00       2.00
Length         (m)=        475.00      17.00
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	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89

LangstaffRd_EA_Existing_HumberWatershed

1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	3.54	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

```
Max.Eff.Inten.(mm/hr)=      40.71      30.98
          over (min)        10.00      20.00
Storage Coeff.   (min)=       9.32 (ii)   16.07 (ii)
Unit Hyd. Tpeak (min)=       10.00      20.00
Unit Hyd. peak  (cms)=        0.12       0.06
                                                *TOTALS*
PEAK FLOW       (cms)=         0.05       0.04       0.093 (iii)
TIME TO PEAK    (hrs)=         5.25       5.25       5.25
RUNOFF VOLUME    (mm)=        86.54      51.48      67.60
TOTAL RAINFALL   (mm)=        88.54      88.54      88.54
RUNOFF COEFFICIENT  =          0.98       0.58       0.76


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* =  83.0   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 ( 0410)|
|  1 + 2 = 3     |        AREA     QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
      ID1= 1 ( 0115):      1.00    0.093     5.25    67.60
    + ID2= 2 ( 0120):      1.24    0.120     5.25    71.46
      =================================================
      ID = 3 ( 0410):      2.24    0.212     5.25    69.73

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

```
                    LangstaffRd_EA_Existing_HumberWatershed

--------------------
| ADD HYD (  0420)|
|  1 +  2 =  3    |        AREA    QPEAK    TPEAK    R.V.
--------------------        (ha)    (cms)    (hrs)    (mm)
        ID1= 1 (  0405):    4.35    0.399    5.25    69.72
      + ID2= 2 (  0410):    2.24    0.212    5.25    69.73
        ========================================================
        ID = 3 (  0420):    6.59    0.611    5.25    69.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

Page 61

Don River Watershed
Visual OTTHYMO Summary - Existing

LangstaffRd_EA_Existing_WestDonWatershd
```
********************************
** SIMULATION:Run 02        **
********************************

--------------------
|  READ STORM      |   Filename: C:\Users\ray.zhao\AppD
|                  |         ata\Local\Temp\
|                  |         278a4b54-8409-4519-9819-1b44900a1c25\e8708d30
| Ptotal= 42.93 mm |   Comments: 2yr-12hrSCS
--------------------
            TIME   RAIN |  TIME   RAIN |'  TIME   RAIN |  TIME   RAIN
            hrs    mm/hr |  hrs    mm/hr |   hrs    mm/hr |  hrs    mm/hr
            0.25   0.00  |  3.50   1.02  |  6.75   8.13  | 10.00   1.02
            0.50   1.02  |  3.75   2.03  |  7.00   3.05  | 10.25   1.02
            0.75   1.02  |  4.00   2.03  |  7.25   3.05  | 10.50   1.02
            1.00   1.02  |  4.25   1.02  |  7.50   3.05  | 10.75   1.02
            1.25   0.00  |  4.50   3.05  |  7.75   2.03  | 11.00   1.02
            1.50   1.02  |  4.75   3.05  |  8.00   3.05  | 11.25   1.02
            1.75   1.02  |  5.00   3.05  |  8.25   2.03  | 11.50   0.00
            2.00   1.02  |  5.25   3.05  |  8.50   2.03  | 11.75   1.02
            2.25   1.02  |  5.50   5.08  |  8.75   2.03  | 12.00   1.02
            2.50   1.02  |  5.75   5.08  |  9.00   1.02  | 12.25   1.02
            2.75   2.03  |  6.00  38.61  |  9.25   2.03  |
            3.00   2.03  |  6.25  38.61  |  9.50   1.02  |
            3.25   2.03  |  6.50   8.13  |  9.75   2.03  |
```

```
--------------------
|  CALIB           |
| STANDHYD ( 0145) |   Area      (ha)=  3.05
|ID= 1 DT= 5.0 min |   Total Imp(%)= 62.00   Dir. Conn.(%)= 62.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
    Surface Area   (ha)=     1.89         1.16
    Dep. Storage   (mm)=     2.00         5.00
    Average Slope  (%)=      1.00         2.00
    Length         (m)=    531.00        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  |  3.167  2.03  |  6.250 38.61  |  9.33   1.02
            0.167  0.00  |  3.250  2.03  |  6.333  8.13  |  9.42   1.02
            0.250  0.00  |  3.333  1.02  |  6.417  8.13  |  9.50   1.02
            0.333  1.02  |  3.417  1.02  |  6.500  8.13  |  9.58   2.03
            0.417  1.02  |  3.500  1.02  |  6.583  8.13  |  9.67   2.03
            0.500  1.02  |  3.583  2.03  |  6.667  8.13  |  9.75   2.03
            0.583  1.02  |  3.667  2.03  |  6.750  8.13  |  9.83   1.02
```
Page 1

LangstaffRd_EA_Existing_WestDonWatershd
```
            0.667  1.02  |  3.750  2.03  |  6.833  3.05  |  9.92   1.02
            0.750  1.02  |  3.833  2.03  |  6.917  3.05  | 10.00   1.02
            0.833  1.02  |  3.917  2.03  |  7.000  3.05  | 10.08   1.02
            0.917  1.02  |  4.000  2.03  |  7.083  3.05  | 10.17   1.02
            1.000  1.02  |  4.083  1.02  |  7.167  3.05  | 10.25   1.02
            1.083  0.00  |  4.167  1.02  |  7.250  3.05  | 10.33   1.02
            1.167  0.00  |  4.250  1.02  |  7.333  3.05  | 10.42   1.02
            1.250  0.00  |  4.333  3.05  |  7.417  3.05  | 10.50   1.02
            1.333  1.02  |  4.417  3.05  |  7.500  3.05  | 10.58   1.02
            1.417  1.02  |  4.500  3.05  |  7.583  2.03  | 10.67   1.02
            1.500  1.02  |  4.583  3.05  |  7.667  2.03  | 10.75   1.02
            1.583  1.02  |  4.667  3.05  |  7.750  2.03  | 10.83   1.02
            1.667  1.02  |  4.750  3.05  |  7.833  3.05  | 10.92   1.02
            1.750  1.02  |  4.833  3.05  |  7.917  3.05  | 11.00   1.02
            1.833  1.02  |  4.917  3.05  |  8.000  3.05  | 11.08   1.02
            1.917  1.02  |  5.000  3.05  |  8.083  2.03  | 11.17   1.02
            2.000  1.02  |  5.083  3.05  |  8.167  2.03  | 11.25   1.02
            2.083  1.02  |  5.167  3.05  |  8.250  2.03  | 11.33   0.00
            2.167  1.02  |  5.250  3.05  |  8.333  2.03  | 11.42   0.00
            2.250  1.02  |  5.333  5.08  |  8.417  2.03  | 11.50   0.00
            2.333  1.02  |  5.417  5.08  |  8.500  2.03  | 11.58   1.02
            2.417  1.02  |  5.500  5.08  |  8.583  2.03  | 11.67   1.02
            2.500  1.02  |  5.583  5.08  |  8.667  2.03  | 11.75   1.02
            2.583  2.03  |  5.667  5.08  |  8.750  1.02  | 11.83   1.02
            2.667  2.03  |  5.750  5.08  |  8.833  1.02  | 11.92   1.02
            2.750  2.03  |  5.833 38.61  |  8.917  1.02  | 12.00   1.02
            2.833  2.03  |  5.917 38.61  |  9.000  1.02  | 12.08   1.02
            2.917  2.03  |  6.000 38.61  |  9.083  2.03  | 12.17   1.02
            3.000  2.03  |  6.083 38.61  |  9.167  2.03  | 12.25   1.02
            3.083  2.03  |  6.167 38.61  |  9.250  2.03  |

    Max.Eff.Inten.(mm/hr)=     38.61         21.04
              over (min)       10.00         25.00
    Storage Coeff.  (min)=     10.18 (ii)    23.34 (ii)
    Unit Hyd. Tpeak (min)=     10.00         25.00
    Unit Hyd. peak  (cms)=      0.11          0.05

                                                     *TOTALS*
    PEAK FLOW       (cms)=      0.19          0.04        0.218 (iii)
    TIME TO PEAK    (hrs)=      6.25          6.50        6.25
    RUNOFF VOLUME   (mm)=      40.93         18.14       32.26
    TOTAL RAINFALL  (mm)=      42.93         42.93       42.93
    RUNOFF COEFFICIENT  =       0.95          0.42        0.75


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 86.0   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           |
```
Page 2

LangstaffRd_EA_Existing_WestDonWatershd
```
--------------------
| STANDHYD ( 0140) |   Area      (ha)=  1.27
|ID= 1 DT= 5.0 min |   Total Imp(%)= 52.00   Dir. Conn.(%)= 52.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
    Surface Area   (ha)=     0.66         0.61
    Dep. Storage   (mm)=     2.00         5.00
    Average Slope  (%)=      1.00         2.00
    Length         (m)=    503.00        25.00
    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  |  3.167  2.03  |  6.250 38.61  |  9.33   1.02
            0.167  0.00  |  3.250  2.03  |  6.333  8.13  |  9.42   1.02
            0.250  0.00  |  3.333  1.02  |  6.417  8.13  |  9.50   1.02
            0.333  1.02  |  3.417  1.02  |  6.500  8.13  |  9.58   2.03
            0.417  1.02  |  3.500  1.02  |  6.583  8.13  |  9.67   2.03
            0.500  1.02  |  3.583  2.03  |  6.667  8.13  |  9.75   2.03
            0.583  1.02  |  3.667  2.03  |  6.750  8.13  |  9.83   1.02
            0.667  1.02  |  3.750  2.03  |  6.833  3.05  |  9.92   1.02
            0.750  1.02  |  3.833  2.03  |  6.917  3.05  | 10.00   1.02
            0.833  1.02  |  3.917  2.03  |  7.000  3.05  | 10.08   1.02
            0.917  1.02  |  4.000  2.03  |  7.083  3.05  | 10.17   1.02
            1.000  1.02  |  4.083  1.02  |  7.167  3.05  | 10.25   1.02
            1.083  0.00  |  4.167  1.02  |  7.250  3.05  | 10.33   1.02
            1.167  0.00  |  4.250  1.02  |  7.333  3.05  | 10.42   1.02
            1.250  0.00  |  4.333  3.05  |  7.417  3.05  | 10.50   1.02
            1.333  1.02  |  4.417  3.05  |  7.500  3.05  | 10.58   1.02
            1.417  1.02  |  4.500  3.05  |  7.583  2.03  | 10.67   1.02
            1.500  1.02  |  4.583  3.05  |  7.667  2.03  | 10.75   1.02
            1.583  1.02  |  4.667  3.05  |  7.750  2.03  | 10.83   1.02
            1.667  1.02  |  4.750  3.05  |  7.833  3.05  | 10.92   1.02
            1.750  1.02  |  4.833  3.05  |  7.917  3.05  | 11.00   1.02
            1.833  1.02  |  4.917  3.05  |  8.000  3.05  | 11.08   1.02
            1.917  1.02  |  5.000  3.05  |  8.083  2.03  | 11.17   1.02
            2.000  1.02  |  5.083  3.05  |  8.167  2.03  | 11.25   1.02
            2.083  1.02  |  5.167  3.05  |  8.250  2.03  | 11.33   0.00
            2.167  1.02  |  5.250  3.05  |  8.333  2.03  | 11.42   0.00
            2.250  1.02  |  5.333  5.08  |  8.417  2.03  | 11.50   0.00
            2.333  1.02  |  5.417  5.08  |  8.500  2.03  | 11.58   1.02
            2.417  1.02  |  5.500  5.08  |  8.583  2.03  | 11.67   1.02
            2.500  1.02  |  5.583  5.08  |  8.667  2.03  | 11.75   1.02
            2.583  2.03  |  5.667  5.08  |  8.750  2.03  | 11.83   1.02
            2.667  2.03  |  5.750  5.08  |  8.833  1.02  | 11.92   1.02
            2.750  2.03  |  5.833 38.61  |  8.917  1.02  | 12.00   1.02
            2.833  2.03  |  5.917 38.61  |  9.000  1.02  | 12.08   1.02
            2.917  2.03  |  6.000 38.61  |  9.083  2.03  | 12.17   1.02
            3.000  2.03  |  6.083 38.61  |  9.167  2.03  | 12.25   1.02
            3.083  2.03  |  6.167 38.61  |  9.250  2.03  |
```
Page 3

LangstaffRd_EA_Existing_WestDonWatershd
```
    Max.Eff.Inten.(mm/hr)=     38.61         18.46
              over (min)       10.00         25.00
    Storage Coeff.  (min)=      9.85 (ii)    20.32 (ii)
    Unit Hyd. Tpeak (min)=     10.00         25.00
    Unit Hyd. peak  (cms)=      0.11          0.05

                                                     *TOTALS*
    PEAK FLOW       (cms)=      0.07          0.02        0.081 (iii)
    TIME TO PEAK    (hrs)=      6.25          6.50        6.25
    RUNOFF VOLUME   (mm)=      40.93         15.99       28.95
    TOTAL RAINFALL  (mm)=      42.93         42.93       42.93
    RUNOFF COEFFICIENT  =       0.95          0.37        0.67


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0   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 ( 0135) |   Area      (ha)=  1.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 40.00   Dir. Conn.(%)= 40.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
    Surface Area   (ha)=     0.57         0.86
    Dep. Storage   (mm)=     2.00         5.00
    Average Slope  (%)=      1.00         2.00
    Length         (m)=    503.00        30.00
    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  |  3.167  2.03  |  6.250 38.61  |  9.33   1.02
            0.167  0.00  |  3.250  2.03  |  6.333  8.13  |  9.42   1.02
            0.250  0.00  |  3.333  1.02  |  6.417  8.13  |  9.50   1.02
            0.333  1.02  |  3.417  1.02  |  6.500  8.13  |  9.58   2.03
            0.417  1.02  |  3.500  1.02  |  6.583  8.13  |  9.67   2.03
            0.500  1.02  |  3.583  2.03  |  6.667  8.13  |  9.75   2.03
            0.583  1.02  |  3.667  2.03  |  6.750  8.13  |  9.83   1.02
            0.667  1.02  |  3.750  2.03  |  6.833  3.05  |  9.92   1.02
            0.750  1.02  |  3.833  2.03  |  6.917  3.05  | 10.00   1.02
            0.833  1.02  |  3.917  2.03  |  7.000  3.05  | 10.08   1.02
            0.917  1.02  |  4.000  2.03  |  7.083  3.05  | 10.17   1.02
            1.000  1.02  |  4.083  1.02  |  7.167  3.05  | 10.25   1.02
            1.083  0.00  |  4.167  1.02  |  7.250  3.05  | 10.33   1.02
            1.167  0.00  |  4.250  1.02  |  7.333  3.05  | 10.42   1.02
```
Page 4

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                     1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50   1.02
                     1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58   1.02
                     1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67   1.02
                     1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75   1.02
                     1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83   1.02
                     1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92   1.02
                     1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00   1.02
                     1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08   1.02
                     1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17   1.02
                     2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25   1.02
                     2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33   0.00
                     2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   0.00
                     2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50   0.00
                     2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58   1.02
                     2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67   1.02
                     2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75   1.02
                     2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83   1.02
                     2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92   1.02
                     2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00   1.02
                     2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08   1.02
                     2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17   1.02
                     3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25   1.02
                     3.083   2.03 | 6.167  38.61 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=     38.61            19.27
            over (min)         10.00            25.00
    Storage Coeff.  (min)=      9.85 (ii)       21.33 (ii)
    Unit Hyd. Tpeak (min)=     10.00            25.00
    Unit Hyd. peak  (cms)=      0.11             0.05
                                                            *TOTALS*
    PEAK FLOW       (cms)=      0.06             0.03        0.078 (iii)
    TIME TO PEAK    (hrs)=      6.25             6.50        6.25
    RUNOFF VOLUME   (mm)=      40.93            16.67       26.36
    TOTAL RAINFALL  (mm)=      42.93            42.93       42.93
    RUNOFF COEFFICIENT  =       0.95             0.39        0.61


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  84.0   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 ( 0420)|
|  1 + 2 = 3     |           AREA    QPEAK    TPEAK     R.V.
--------------------           (ha)   (cms)    (hrs)     (mm)
         ID1= 1 ( 0135):       1.43   0.078     6.25    26.36
       + ID2= 2 ( 0140):       1.27   0.081     6.25    28.95
         ===================================================
         ID = 3 ( 0420):       2.70   0.158     6.25    27.58
```

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     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------------
--------------------
| ADD HYD ( 0425)|
|  1 + 2 = 3     |           AREA    QPEAK    TPEAK     R.V.
--------------------           (ha)   (cms)    (hrs)     (mm)
         ID1= 1 ( 0145):       3.05   0.218     6.25    32.26
       + ID2= 2 ( 0420):       2.70   0.158     6.25    27.58
         ===================================================
         ID = 3 ( 0425):       5.75   0.377     6.25    30.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0210)|   Area     (ha)=  0.96
|ID= 1 DT= 5.0 min |   Total Imp(%)= 44.00   Dir. Conn.(%)= 44.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
    Surface Area    (ha)=          0.42          0.54
    Dep. Storage    (mm)=          2.00          5.00
    Average Slope   (%)=           1.00          2.00
    Length          (m)=         470.00         20.00
    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 | 3.167   2.03 | 6.250  38.61 | 9.33   1.02
           0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42   1.02
           0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50   1.02
           0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58   2.03
           0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67   2.03
           0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75   2.03
           0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83   1.02
           0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92   1.02
           0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00  1.02
           0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08  1.02
           0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17  1.02
           1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25  1.02
           1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33  1.02
           1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42  1.02
           1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50  1.02
           1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58  1.02
           1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67  1.02
           1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75  1.02
           1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83  1.02
           1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92  1.02
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                     1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00   1.02
                     1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08   1.02
                     1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17   1.02
                     2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25   1.02
                     2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33   0.00
                     2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   0.00
                     2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50   0.00
                     2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58   1.02
                     2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67   1.02
                     2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75   1.02
                     2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83   1.02
                     2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92   1.02
                     2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00   1.02
                     2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08   1.02
                     2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17   1.02
                     3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25   1.02
                     3.083   2.03 | 6.167  38.61 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=     38.61            19.37
            over (min)         10.00            20.00
    Storage Coeff.  (min)=      9.46 (ii)       18.44 (ii)
    Unit Hyd. Tpeak (min)=     10.00            20.00
    Unit Hyd. peak  (cms)=      0.12             0.06
                                                            *TOTALS*
    PEAK FLOW       (cms)=      0.04             0.02        0.058 (iii)
    TIME TO PEAK    (hrs)=      6.25             6.42        6.25
    RUNOFF VOLUME   (mm)=      40.93            15.99       26.95
    TOTAL RAINFALL  (mm)=      42.93            42.93       42.93
    RUNOFF COEFFICIENT  =       0.95             0.37        0.63


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  83.0   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 ( 0205)|   Area     (ha)=  1.11
|ID= 1 DT= 5.0 min |   Total Imp(%)= 38.00   Dir. Conn.(%)= 38.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
    Surface Area    (ha)=          0.42          0.69
    Dep. Storage    (mm)=          2.00          5.00
    Average Slope   (%)=           1.00          2.00
    Length          (m)=         470.00         20.00
    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 | 3.167   2.03 | 6.250  38.61 | 9.33   1.02
           0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42   1.02
           0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50   1.02
           0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58   2.03
           0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67   2.03
           0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75   2.03
           0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83   1.02
           0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92   1.02
           0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00  1.02
           0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08  1.02
           0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17  1.02
           1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25  1.02
           1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33  1.02
           1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42  1.02
           1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50  1.02
           1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58  1.02
           1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67  1.02
           1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75  1.02
           1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83  1.02
           1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92  1.02
           1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00  1.02
           1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08  1.02
           1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17  1.02
           2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25  1.02
           2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33  0.00
           2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  0.00
           2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50  0.00
           2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58  1.02
           2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67  1.02
           2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75  1.02
           2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83  1.02
           2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92  1.02
           2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00  1.02
           2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08  1.02
           2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17  1.02
           3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25  1.02
           3.083   2.03 | 6.167  38.61 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=     38.61            19.37
            over (min)         10.00            20.00
    Storage Coeff.  (min)=      9.46 (ii)       18.44 (ii)
    Unit Hyd. Tpeak (min)=     10.00            20.00
    Unit Hyd. peak  (cms)=      0.12             0.06
                                                            *TOTALS*
    PEAK FLOW       (cms)=      0.04             0.02        0.062 (iii)
    TIME TO PEAK    (hrs)=      6.25             6.42        6.25
    RUNOFF VOLUME   (mm)=      40.93            15.99       25.46
    TOTAL RAINFALL  (mm)=      42.93            42.93       42.93
    RUNOFF COEFFICIENT  =       0.95             0.37        0.59
```

Page 9

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                    LangstaffRd_EA_Existing_WestDonWatershd
        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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  ( 0460)|
|  1 + 2 =  3     |      AREA    QPEAK   TPEAK    R.V.
--------------------      (ha)    (cms)   (hrs)    (mm)
        ID1= 1 ( 0205):   1.11   0.062    6.25    25.46
       + ID2= 2 ( 0210):  0.96   0.058    6.25    26.95
       =================================================
         ID = 3 ( 0460):  2.07   0.120    6.25    26.15

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0230)|  Area    (ha)=  0.70
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
   Surface Area  (ha)=      0.40          0.30
   Dep. Storage  (mm)=      2.00          5.00
   Average Slope  (%)=      1.00          2.00
   Length        (m)=    320.00         25.00
   Mannings n      =       0.013         0.290

   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  2.03 | 6.250 38.61 | 9.33  1.02
  0.167  0.00 | 3.250  2.03 | 6.333  8.13 | 9.42  1.02
  0.250  0.00 | 3.333  1.02 | 6.417  8.13 | 9.50  1.02
  0.333  1.02 | 3.417  1.02 | 6.500  8.13 | 9.58  2.03
  0.417  1.02 | 3.500  1.02 | 6.583  8.13 | 9.67  2.03
  0.500  1.02 | 3.583  2.03 | 6.667  8.13 | 9.75  2.03
  0.583  1.02 | 3.667  2.03 | 6.750  8.13 | 9.83  1.02
  0.667  1.02 | 3.750  2.03 | 6.833  3.05 | 9.92  1.02
  0.750  1.02 | 3.833  2.03 | 6.917  3.05 | 10.00 1.02
  0.833  1.02 | 3.917  2.03 | 7.000  3.05 | 10.08 1.02
  0.917  1.02 | 4.000  2.03 | 7.083  3.05 | 10.17 1.02
  1.000  1.02 | 4.083  1.02 | 7.167  3.05 | 10.25 1.02
  1.083  0.00 | 4.167  1.02 | 7.250  3.05 | 10.33 1.02
  1.167  0.00 | 4.250  1.02 | 7.333  3.05 | 10.42 1.02
  1.250  0.00 | 4.333  3.05 | 7.417  3.05 | 10.50 1.02
```

Page 10

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                    LangstaffRd_EA_Existing_WestDonWatershd
  1.333  1.02 | 4.417  3.05 | 7.500  3.05 | 10.58 1.02
  1.417  1.02 | 4.500  3.05 | 7.583  2.03 | 10.67 1.02
  1.500  1.02 | 4.583  3.05 | 7.667  2.03 | 10.75 1.02
  1.583  1.02 | 4.667  3.05 | 7.750  2.03 | 10.83 1.02
  1.667  1.02 | 4.750  3.05 | 7.833  3.05 | 10.92 1.02
  1.750  1.02 | 4.833  3.05 | 7.917  3.05 | 11.00 1.02
  1.833  1.02 | 4.917  3.05 | 8.000  3.05 | 11.08 1.02
  1.917  1.02 | 5.000  3.05 | 8.083  2.03 | 11.17 1.02
  2.000  1.02 | 5.083  3.05 | 8.167  2.03 | 11.25 1.02
  2.083  1.02 | 5.167  3.05 | 8.250  2.03 | 11.33 0.00
  2.167  1.02 | 5.250  3.05 | 8.333  2.03 | 11.42 0.00
  2.250  1.02 | 5.333  5.08 | 8.417  2.03 | 11.50 0.00
  2.333  1.02 | 5.417  5.08 | 8.500  2.03 | 11.58 1.02
  2.417  1.02 | 5.500  5.08 | 8.583  2.03 | 11.67 1.02
  2.500  1.02 | 5.583  5.08 | 8.667  2.03 | 11.75 1.02
  2.583  2.03 | 5.667  5.08 | 8.750  2.03 | 11.83 1.02
  2.667  2.03 | 5.750  5.08 | 8.833  1.02 | 11.92 1.02
  2.750  2.03 | 5.833 38.61 | 8.917  1.02 | 12.00 1.02
  2.833  2.03 | 5.917 38.61 | 9.000  1.02 | 12.08 1.02
  2.917  2.03 | 6.000 38.61 | 9.083  2.03 | 12.17 1.02
  3.000  2.03 | 6.083 38.61 | 9.167  2.03 | 12.25 1.02
  3.083  2.03 | 6.167 38.61 | 9.250  2.03 |

Max.Eff.Inten.(mm/hr)=      38.61         16.97
        over (min)          10.00         20.00
Storage Coeff.  (min)=       7.51 (ii)    19.34 (ii)
Unit Hyd. Tpeak (min)=      10.00         20.00
Unit Hyd. peak  (cms)=       0.13          0.06
                                                       *TOTALS*
PEAK FLOW       (cms)=       0.04          0.01       0.049 (iii)
TIME TO PEAK    (hrs)=       6.25          6.42        6.25
RUNOFF VOLUME    (mm)=      40.93         14.75       29.66
TOTAL RAINFALL   (mm)=      42.93         42.93       42.93
RUNOFF COEFFICIENT  =        0.95          0.34        0.69


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 81.0   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 ( 0225)|  Area    (ha)=  0.90
|ID= 1 DT= 5.0 min |  Total Imp(%)= 53.00   Dir. Conn.(%)= 53.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
   Surface Area  (ha)=      0.48          0.42
   Dep. Storage  (mm)=      2.00          5.00
   Average Slope  (%)=      1.00          2.00
   Length        (m)=    320.00         25.00
```

Page 11

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                    LangstaffRd_EA_Existing_WestDonWatershd
   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  2.03 | 6.250 38.61 | 9.33  1.02
  0.167  0.00 | 3.250  2.03 | 6.333  8.13 | 9.42  1.02
  0.250  0.00 | 3.333  1.02 | 6.417  8.13 | 9.50  1.02
  0.333  1.02 | 3.417  1.02 | 6.500  8.13 | 9.58  2.03
  0.417  1.02 | 3.500  1.02 | 6.583  8.13 | 9.67  2.03
  0.500  1.02 | 3.583  2.03 | 6.667  8.13 | 9.75  2.03
  0.583  1.02 | 3.667  2.03 | 6.750  8.13 | 9.83  1.02
  0.667  1.02 | 3.750  2.03 | 6.833  3.05 | 9.92  1.02
  0.750  1.02 | 3.833  2.03 | 6.917  3.05 | 10.00 1.02
  0.833  1.02 | 3.917  2.03 | 7.000  3.05 | 10.08 1.02
  0.917  1.02 | 4.000  2.03 | 7.083  3.05 | 10.17 1.02
  1.000  1.02 | 4.083  1.02 | 7.167  3.05 | 10.25 1.02
  1.083  0.00 | 4.167  1.02 | 7.250  3.05 | 10.33 1.02
  1.167  0.00 | 4.250  1.02 | 7.333  3.05 | 10.42 1.02
  1.250  0.00 | 4.333  3.05 | 7.417  3.05 | 10.50 1.02
  1.333  1.02 | 4.417  3.05 | 7.500  3.05 | 10.58 1.02
  1.417  1.02 | 4.500  3.05 | 7.583  2.03 | 10.67 1.02
  1.500  1.02 | 4.583  3.05 | 7.667  2.03 | 10.75 1.02
  1.583  1.02 | 4.667  3.05 | 7.750  2.03 | 10.83 1.02
  1.667  1.02 | 4.750  3.05 | 7.833  3.05 | 10.92 1.02
  1.750  1.02 | 4.833  3.05 | 7.917  3.05 | 11.00 1.02
  1.833  1.02 | 4.917  3.05 | 8.000  3.05 | 11.08 1.02
  1.917  1.02 | 5.000  3.05 | 8.083  2.03 | 11.17 1.02
  2.000  1.02 | 5.083  3.05 | 8.167  2.03 | 11.25 1.02
  2.083  1.02 | 5.167  3.05 | 8.250  2.03 | 11.33 0.00
  2.167  1.02 | 5.250  3.05 | 8.333  2.03 | 11.42 0.00
  2.250  1.02 | 5.333  5.08 | 8.417  2.03 | 11.50 0.00
  2.333  1.02 | 5.417  5.08 | 8.500  2.03 | 11.58 1.02
  2.417  1.02 | 5.500  5.08 | 8.583  2.03 | 11.67 1.02
  2.500  1.02 | 5.583  5.08 | 8.667  2.03 | 11.75 1.02
  2.583  2.03 | 5.667  5.08 | 8.750  2.03 | 11.83 1.02
  2.667  2.03 | 5.750  5.08 | 8.833  1.02 | 11.92 1.02
  2.750  2.03 | 5.833 38.61 | 8.917  1.02 | 12.00 1.02
  2.833  2.03 | 5.917 38.61 | 9.000  1.02 | 12.08 1.02
  2.917  2.03 | 6.000 38.61 | 9.083  2.03 | 12.17 1.02
  3.000  2.03 | 6.083 38.61 | 9.167  2.03 | 12.25 1.02
  3.083  2.03 | 6.167 38.61 | 9.250  2.03 |

Max.Eff.Inten.(mm/hr)=      38.61         18.46
        over (min)          10.00         20.00
Storage Coeff.  (min)=       7.51 (ii)    17.98 (ii)
Unit Hyd. Tpeak (min)=      10.00         20.00
Unit Hyd. peak  (cms)=       0.13          0.06
                                                       *TOTALS*
PEAK FLOW       (cms)=       0.05          0.01       0.062 (iii)
```

Page 12

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                    LangstaffRd_EA_Existing_WestDonWatershd
TIME TO PEAK    (hrs)=       6.25          6.42        6.25
RUNOFF VOLUME    (mm)=      40.93         15.99       29.20
TOTAL RAINFALL   (mm)=      42.93         42.93       42.93
RUNOFF COEFFICIENT  =        0.95          0.37        0.68

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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  ( 0475)|
|  1 + 2 =  3     |      AREA    QPEAK   TPEAK    R.V.
--------------------      (ha)    (cms)   (hrs)    (mm)
        ID1= 1 ( 0225):   0.90   0.062    6.25    29.20
       + ID2= 2 ( 0230):  0.70   0.049    6.25    29.66
       =================================================
         ID = 3 ( 0475):  1.60   0.111    6.25    29.40

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0220)|  Area    (ha)=  0.65
|ID= 1 DT= 5.0 min |  Total Imp(%)= 46.00   Dir. Conn.(%)= 46.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
   Surface Area  (ha)=      0.30          0.35
   Dep. Storage  (mm)=      2.00          5.00
   Average Slope  (%)=      1.00          2.00
   Length        (m)=    260.00         20.00
   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 | 3.167  2.03 | 6.250 38.61 | 9.33  1.02
  0.167  0.00 | 3.250  2.03 | 6.333  8.13 | 9.42  1.02
  0.250  0.00 | 3.333  1.02 | 6.417  8.13 | 9.50  1.02
  0.333  1.02 | 3.417  1.02 | 6.500  8.13 | 9.58  2.03
  0.417  1.02 | 3.500  1.02 | 6.583  8.13 | 9.67  2.03
  0.500  1.02 | 3.583  2.03 | 6.667  8.13 | 9.75  2.03
  0.583  1.02 | 3.667  2.03 | 6.750  8.13 | 9.83  1.02
  0.667  1.02 | 3.750  2.03 | 6.833  3.05 | 9.92  1.02
  0.750  1.02 | 3.833  2.03 | 6.917  3.05 | 10.00 1.02
  0.833  1.02 | 3.917  2.03 | 7.000  3.05 | 10.08 1.02
```

LangstaffRd_EA_Existing_WestDonWatershd

```
            0.917  1.02 | 4.000   2.03 | 7.083   3.05 | 10.17   1.02
            1.000  1.02 | 4.083   1.02 | 7.167   3.05 | 10.25   1.02
            1.083  0.00 | 4.167   1.02 | 7.250   3.05 | 10.33   1.02
            1.167  0.00 | 4.250   1.02 | 7.333   3.05 | 10.42   1.02
            1.250  0.00 | 4.333   3.05 | 7.417   3.05 | 10.50   1.02
            1.333  1.02 | 4.417   3.05 | 7.500   3.05 | 10.58   1.02
            1.417  1.02 | 4.500   3.05 | 7.583   2.03 | 10.67   1.02
            1.500  1.02 | 4.583   3.05 | 7.667   2.03 | 10.75   1.02
            1.583  1.02 | 4.667   3.05 | 7.750   2.03 | 10.83   1.02
            1.667  1.02 | 4.750   3.05 | 7.833   3.05 | 10.92   1.02
            1.750  1.02 | 4.833   3.05 | 7.917   3.05 | 11.00   1.02
            1.833  1.02 | 4.917   3.05 | 8.000   3.05 | 11.08   1.02
            1.917  1.02 | 5.000   3.05 | 8.083   2.03 | 11.17   1.02
            2.000  1.02 | 5.083   3.05 | 8.167   2.03 | 11.25   1.02
            2.083  1.02 | 5.167   3.05 | 8.250   2.03 | 11.33   0.00
            2.167  1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   0.00
            2.250  1.02 | 5.333   5.08 | 8.417   2.03 | 11.50   0.00
            2.333  1.02 | 5.417   5.08 | 8.500   2.03 | 11.58   1.02
            2.417  1.02 | 5.500   5.08 | 8.583   2.03 | 11.67   1.02
            2.500  1.02 | 5.583   5.08 | 8.667   2.03 | 11.75   1.02
            2.583  2.03 | 5.667   5.08 | 8.750   2.03 | 11.83   1.02
            2.667  2.03 | 5.750   5.08 | 8.833   1.02 | 11.92   1.02
            2.750  2.03 | 5.833  38.61 | 8.917   1.02 | 12.00   1.02
            2.833  2.03 | 5.917  38.61 | 9.000   1.02 | 12.08   1.02
            2.917  2.03 | 6.000  38.61 | 9.083   2.03 | 12.17   1.02
            3.000  2.03 | 6.083  38.61 | 9.167   2.03 | 12.25   1.02
            3.083  2.03 | 6.167  38.61 | 9.250   2.03 |
```

```
    Max.Eff.Inten.(mm/hr)=      38.61        19.37
              over (min)          5.00        20.00
    Storage Coeff.  (min)=      6.63 (ii)   15.61 (ii)
    Unit Hyd. Tpeak (min)=      5.00        20.00
    Unit Hyd. peak  (cms)=      0.18         0.07
                                                        *TOTALS*
    PEAK FLOW       (cms)=      0.03         0.01       0.042 (iii)
    TIME TO PEAK    (hrs)=      6.25         6.42       6.25
    RUNOFF VOLUME   (mm)=      40.93        15.99      27.45
    TOTAL RAINFALL  (mm)=      42.93        42.93      42.93
    RUNOFF COEFFICIENT  =       0.95         0.37       0.64
```

```
    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  83.0   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 ( 0215)   | Area     (ha)=  0.58
|ID= 1 DT= 5.0 min  | Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
```

LangstaffRd_EA_Existing_WestDonWatershd

```
                      IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=     0.33        0.25
Dep. Storage    (mm)=     2.00        5.00
Average Slope   (%)=      1.00        2.00
Length          (m)=    260.00       30.00
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 | 3.167   2.03 | 6.250  38.61 | 9.33    1.02
      0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42    1.02
      0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50    1.02
      0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58    2.03
      0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67    2.03
      0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75    2.03
      0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83    1.02
      0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92    1.02
      0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00   1.02
      0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08   1.02
      0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17   1.02
      1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25   1.02
      1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33   1.02
      1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42   1.02
      1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50   1.02
      1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58   1.02
      1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67   1.02
      1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75   1.02
      1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83   1.02
      1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92   1.02
      1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00   1.02
      1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08   1.02
      1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17   1.02
      2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25   1.02
      2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33   0.00
      2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   0.00
      2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50   0.00
      2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58   1.02
      2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67   1.02
      2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75   1.02
      2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83   1.02
      2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92   1.02
      2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00   1.02
      2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08   1.02
      2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17   1.02
      3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25   1.02
      3.083   2.03 | 6.167  38.61 | 9.250   2.03 |
```

```
Max.Eff.Inten.(mm/hr)=      38.61        18.46
          over (min)          5.00        20.00
```

LangstaffRd_EA_Existing_WestDonWatershd

```
    Storage Coeff.  (min)=      6.63 (ii)   18.31 (ii)
    Unit Hyd. Tpeak (min)=      5.00        20.00
    Unit Hyd. peak  (cms)=      0.18         0.06
                                                        *TOTALS*
    PEAK FLOW       (cms)=      0.04         0.01       0.042 (iii)
    TIME TO PEAK    (hrs)=      6.25         6.42       6.25
    RUNOFF VOLUME   (mm)=      40.93        15.99      30.19
    TOTAL RAINFALL  (mm)=      42.93        42.93      42.93
    RUNOFF COEFFICIENT  =       0.95         0.37       0.70
```

```
    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  83.0   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  ( 0470)   |
|  1 + 2 = 3         |      AREA    QPEAK    TPEAK    R.V.
--------------------      (ha)    (cms)    (hrs)    (mm)
      ID1= 1 ( 0215):     0.58    0.042    6.25    30.19
    + ID2= 2 ( 0220):     0.65    0.042    6.25    27.45
                        ===========================================
      ID = 3 ( 0470):     1.23    0.084    6.25    28.74

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------
--------------------
| ADD HYD  ( 0480)   |
|  1 + 2 = 3         |      AREA    QPEAK    TPEAK    R.V.
--------------------      (ha)    (cms)    (hrs)    (mm)
      ID1= 1 ( 0470):     1.23    0.084    6.25    28.74
    + ID2= 2 ( 0475):     1.60    0.111    6.25    29.40
                        ===========================================
      ID = 3 ( 0480):     2.83    0.195    6.25    29.11

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0160)   | Area     (ha)=  0.43
|ID= 1 DT= 5.0 min  | Total Imp(%)= 56.00   Dir. Conn.(%)= 56.00
--------------------
                      IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=     0.24        0.19
Dep. Storage    (mm)=     2.00        5.00
Average Slope   (%)=      1.00        2.00
Length          (m)=    260.00       20.00
Mannings n      =         0.013       0.250
```

LangstaffRd_EA_Existing_WestDonWatershd

   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   2.03 | 6.250  38.61 | 9.33    1.02
      0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42    1.02
      0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50    1.02
      0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58    2.03
      0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67    2.03
      0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75    2.03
      0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83    1.02
      0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92    1.02
      0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00   1.02
      0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08   1.02
      0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17   1.02
      1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25   1.02
      1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33   1.02
      1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42   1.02
      1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50   1.02
      1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58   1.02
      1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67   1.02
      1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75   1.02
      1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83   1.02
      1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92   1.02
      1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00   1.02
      1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08   1.02
      1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17   1.02
      2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25   1.02
      2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33   0.00
      2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   0.00
      2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50   0.00
      2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58   1.02
      2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67   1.02
      2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75   1.02
      2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83   1.02
      2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92   1.02
      2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00   1.02
      2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08   1.02
      2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17   1.02
      3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25   1.02
      3.083   2.03 | 6.167  38.61 | 9.250   2.03 |
```

```
Max.Eff.Inten.(mm/hr)=      38.61        25.09
          over (min)          5.00        15.00
Storage Coeff.  (min)=       6.63 (ii)   14.73 (ii)
Unit Hyd. Tpeak (min)=       5.00        15.00
Unit Hyd. peak  (cms)=       0.18         0.08
                                                    *TOTALS*
PEAK FLOW       (cms)=       0.03         0.01       0.034 (iii)
TIME TO PEAK    (hrs)=       6.25         6.33       6.25
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                  LangstaffRd_EA_Existing_WestDonWatershd
RUNOFF VOLUME    (mm)=    40.93        20.75         32.03
TOTAL RAINFALL   (mm)=    42.93        42.93         42.93
RUNOFF COEFFICIENT  =      0.95         0.48          0.75


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  89.0    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 ( 0155)|   Area   (ha)=   0.56
|ID= 1 DT= 5.0 min |   Total Imp(%)= 45.00  Dir. Conn.(%)= 45.00
--------------------
                            IMPERVIOUS     PERVIOUS (i)
   Surface Area    (ha)=      0.25           0.31
   Dep. Storage    (mm)=      2.00           5.00
   Average Slope   (%)=       1.00           2.00
   Length          (m)=     260.00          25.00
   Mannings n       =        0.013          0.290

     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  2.03 | 6.250  38.61 | 9.33   1.02
       0.167  0.00 | 3.250  2.03 | 6.333   8.13 | 9.42   1.02
       0.250  0.00 | 3.333  1.02 | 6.417   8.13 | 9.50   1.02
       0.333  1.02 | 3.417  1.02 | 6.500   8.13 | 9.58   2.03
       0.417  1.02 | 3.500  1.02 | 6.583   8.13 | 9.67   2.03
       0.500  1.02 | 3.583  2.03 | 6.667   8.13 | 9.75   2.03
       0.583  1.02 | 3.667  2.03 | 6.750   8.13 | 9.83   1.02
       0.667  1.02 | 3.750  2.03 | 6.833   3.05 | 9.92   1.02
       0.750  1.02 | 3.833  2.03 | 6.917   3.05 | 10.00  1.02
       0.833  1.02 | 3.917  2.03 | 7.000   3.05 | 10.08  1.02
       0.917  1.02 | 4.000  2.03 | 7.083   3.05 | 10.17  1.02
       1.000  1.02 | 4.083  1.02 | 7.167   3.05 | 10.25  1.02
       1.083  0.00 | 4.167  1.02 | 7.250   3.05 | 10.33  1.02
       1.167  0.00 | 4.250  1.02 | 7.333   3.05 | 10.42  1.02
       1.250  0.00 | 4.333  3.05 | 7.417   3.05 | 10.50  1.02
       1.333  1.02 | 4.417  3.05 | 7.500   3.05 | 10.58  1.02
       1.417  1.02 | 4.500  3.05 | 7.583   2.03 | 10.67  1.02
       1.500  1.02 | 4.583  3.05 | 7.667   2.03 | 10.75  1.02
       1.583  1.02 | 4.667  3.05 | 7.750   2.03 | 10.83  1.02
       1.667  1.02 | 4.750  3.05 | 7.833   3.05 | 10.92  1.02
       1.750  1.02 | 4.833  3.05 | 7.917   3.05 | 11.00  1.02
       1.833  1.02 | 4.917  3.05 | 8.000   3.05 | 11.08  1.02
       1.917  1.02 | 5.000  3.05 | 8.083   2.03 | 11.17  1.02

                              Page 17
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                  LangstaffRd_EA_Existing_WestDonWatershd
       2.000  1.02 | 5.083  3.05 | 8.167   2.03 | 11.25  1.02
       2.083  1.02 | 5.167  3.05 | 8.250   2.03 | 11.33  0.00
       2.167  1.02 | 5.250  3.05 | 8.333   2.03 | 11.42  0.00
       2.250  1.02 | 5.333  5.08 | 8.417   2.03 | 11.50  0.00
       2.333  1.02 | 5.417  5.08 | 8.500   2.03 | 11.58  1.02
       2.417  1.02 | 5.500  5.08 | 8.583   2.03 | 11.67  1.02
       2.500  1.02 | 5.583  5.08 | 8.667   2.03 | 11.75  1.02
       2.583  2.03 | 5.667  5.08 | 8.750   2.03 | 11.83  1.02
       2.667  2.03 | 5.750  5.08 | 8.833   1.02 | 11.92  1.02
       2.750  2.03 | 5.833 38.61 | 8.917   1.02 | 12.00  1.02
       2.833  2.03 | 5.917 38.61 | 9.000   1.02 | 12.08  1.02
       2.917  2.03 | 6.000 38.61 | 9.083   2.03 | 12.17  1.02
       3.000  2.03 | 6.083 38.61 | 9.167   2.03 | 12.25  1.02
       3.083  2.03 | 6.167 38.61 | 9.250   2.03 |

   Max.Eff.Inten.(mm/hr)=      38.61          22.02
             over (min)        5.00           20.00
   Storage Coeff.  (min)=      6.63 (ii)     17.29 (ii)
   Unit Hyd. Tpeak (min)=      5.00           20.00
   Unit Hyd. peak  (cms)=      0.18           0.06

                                                *TOTALS*
   PEAK FLOW       (cms)=      0.03           0.01         0.038 (iii)
   TIME TO PEAK    (hrs)=      6.25           6.42          6.25
   RUNOFF VOLUME   (mm)=      40.93          18.96         28.83
   TOTAL RAINFALL  (mm)=      42.93          42.93         42.93
   RUNOFF COEFFICIENT  =       0.95           0.44          0.67


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* =  87.0    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 ( 0430)|
|  1 + 2 = 3      |       AREA    QPEAK   TPEAK    R.V.
--------------------       (ha)    (cms)   (hrs)    (mm)
       ID1= 1 ( 0155):    0.56    0.038   6.25    28.83
     + ID2= 2 ( 0160):    0.43    0.034   6.25    32.03
                         =====================================
       ID = 3 ( 0430):    0.99    0.072   6.25    30.22

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD ( 0150)|   Area   (ha)=   3.81
|ID= 1 DT= 5.0 min |   Total Imp(%)= 94.00  Dir. Conn.(%)= 94.00
--------------------
                            IMPERVIOUS     PERVIOUS (i)

                              Page 18
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                  LangstaffRd_EA_Existing_WestDonWatershd
   Surface Area    (ha)=      3.58           0.23
   Dep. Storage    (mm)=      2.00           5.00
   Average Slope   (%)=       1.00           2.00
   Length          (m)=     150.00          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 | 3.167  2.03 | 6.250  38.61 | 9.33   1.02
       0.167  0.00 | 3.250  2.03 | 6.333   8.13 | 9.42   1.02
       0.250  0.00 | 3.333  1.02 | 6.417   8.13 | 9.50   1.02
       0.333  1.02 | 3.417  1.02 | 6.500   8.13 | 9.58   2.03
       0.417  1.02 | 3.500  1.02 | 6.583   8.13 | 9.67   2.03
       0.500  1.02 | 3.583  2.03 | 6.667   8.13 | 9.75   2.03
       0.583  1.02 | 3.667  2.03 | 6.750   8.13 | 9.83   1.02
       0.667  1.02 | 3.750  2.03 | 6.833   3.05 | 9.92   1.02
       0.750  1.02 | 3.833  2.03 | 6.917   3.05 | 10.00  1.02
       0.833  1.02 | 3.917  2.03 | 7.000   3.05 | 10.08  1.02
       0.917  1.02 | 4.000  2.03 | 7.083   3.05 | 10.17  1.02
       1.000  1.02 | 4.083  1.02 | 7.167   3.05 | 10.25  1.02
       1.083  0.00 | 4.167  1.02 | 7.250   3.05 | 10.33  1.02
       1.167  0.00 | 4.250  1.02 | 7.333   3.05 | 10.42  1.02
       1.250  0.00 | 4.333  3.05 | 7.417   3.05 | 10.50  1.02
       1.333  1.02 | 4.417  3.05 | 7.500   3.05 | 10.58  1.02
       1.417  1.02 | 4.500  3.05 | 7.583   2.03 | 10.67  1.02
       1.500  1.02 | 4.583  3.05 | 7.667   2.03 | 10.75  1.02
       1.583  1.02 | 4.667  3.05 | 7.750   2.03 | 10.83  1.02
       1.667  1.02 | 4.750  3.05 | 7.833   3.05 | 10.92  1.02
       1.750  1.02 | 4.833  3.05 | 7.917   3.05 | 11.00  1.02
       1.833  1.02 | 4.917  3.05 | 8.000   3.05 | 11.08  1.02
       1.917  1.02 | 5.000  3.05 | 8.083   2.03 | 11.17  1.02
       2.000  1.02 | 5.083  3.05 | 8.167   2.03 | 11.25  1.02
       2.083  1.02 | 5.167  3.05 | 8.250   2.03 | 11.33  0.00
       2.167  1.02 | 5.250  3.05 | 8.333   2.03 | 11.42  0.00
       2.250  1.02 | 5.333  5.08 | 8.417   2.03 | 11.50  0.00
       2.333  1.02 | 5.417  5.08 | 8.500   2.03 | 11.58  1.02
       2.417  1.02 | 5.500  5.08 | 8.583   2.03 | 11.67  1.02
       2.500  1.02 | 5.583  5.08 | 8.667   2.03 | 11.75  1.02
       2.583  2.03 | 5.667  5.08 | 8.750   2.03 | 11.83  1.02
       2.667  2.03 | 5.750  5.08 | 8.833   1.02 | 11.92  1.02
       2.750  2.03 | 5.833 38.61 | 8.917   1.02 | 12.00  1.02
       2.833  2.03 | 5.917 38.61 | 9.000   1.02 | 12.08  1.02
       2.917  2.03 | 6.000 38.61 | 9.083   2.03 | 12.17  1.02
       3.000  2.03 | 6.083 38.61 | 9.167   2.03 | 12.25  1.02
       3.083  2.03 | 6.167 38.61 | 9.250   2.03 |

   Max.Eff.Inten.(mm/hr)=      38.61          23.99
             over (min)        5.00           10.00
   Storage Coeff.  (min)=      4.77 (ii)      8.20 (ii)

                              Page 19
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```
                  LangstaffRd_EA_Existing_WestDonWatershd
   Unit Hyd. Tpeak (min)=      5.00           10.00
   Unit Hyd. peak  (cms)=      0.22           0.13
                                                *TOTALS*
   PEAK FLOW       (cms)=      0.38           0.01         0.397 (iii)
   TIME TO PEAK    (hrs)=      6.25           6.25          6.25
   RUNOFF VOLUME   (mm)=      40.93          19.82         39.66
   TOTAL RAINFALL  (mm)=      42.93          42.93         42.93
   RUNOFF COEFFICIENT  =       0.95           0.46          0.92

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* =  88.0    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 ( 0440)|
|  1 + 2 = 3      |       AREA    QPEAK   TPEAK    R.V.
--------------------       (ha)    (cms)   (hrs)    (mm)
       ID1= 1 ( 0150):    3.81    0.397   6.25    39.66
     + ID2= 2 ( 0430):    0.99    0.072   6.25    30.22
                         =====================================
       ID = 3 ( 0440):    4.80    0.469   6.25    37.71

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD ( 0185)|   Area   (ha)=   0.47
|ID= 1 DT= 5.0 min |   Total Imp(%)= 48.00  Dir. Conn.(%)= 48.00
--------------------
                            IMPERVIOUS     PERVIOUS (i)
   Surface Area    (ha)=      0.23           0.24
   Dep. Storage    (mm)=      2.00           5.00
   Average Slope   (%)=       1.00           2.00
   Length          (m)=     240.00          20.00
   Mannings n       =        0.013          0.350

     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  2.03 | 6.250  38.61 | 9.33   1.02
       0.167  0.00 | 3.250  2.03 | 6.333   8.13 | 9.42   1.02
       0.250  0.00 | 3.333  1.02 | 6.417   8.13 | 9.50   1.02
       0.333  1.02 | 3.417  1.02 | 6.500   8.13 | 9.58   2.03
       0.417  1.02 | 3.500  1.02 | 6.583   8.13 | 9.67   2.03

                              Page 20
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0.500	1.02	3.583	2.03	6.667	8.13	9.75	2.03
0.583	1.02	3.667	2.03	6.750	8.13	9.83	1.02
0.667	1.02	3.750	2.03	6.833	3.05	9.92	1.02
0.750	1.02	3.833	2.03	6.917	3.05	10.00	1.02
0.833	1.02	3.917	2.03	7.000	3.05	10.08	1.02
0.917	1.02	4.000	2.03	7.083	3.05	10.17	1.02
1.000	1.02	4.083	1.02	7.167	3.05	10.25	1.02
1.083	0.00	4.167	1.02	7.250	3.05	10.33	1.02
1.167	0.00	4.250	1.02	7.333	3.05	10.42	1.02
1.250	0.00	4.333	3.05	7.417	3.05	10.50	1.02
1.333	1.02	4.417	3.05	7.500	3.05	10.58	1.02
1.417	1.02	4.500	3.05	7.583	2.03	10.67	1.02
1.500	1.02	4.583	3.05	7.667	2.03	10.75	1.02
1.583	1.02	4.667	3.05	7.750	2.03	10.83	1.02
1.667	1.02	4.750	3.05	7.833	3.05	10.92	1.02
1.750	1.02	4.833	3.05	7.917	3.05	11.00	1.02
1.833	1.02	4.917	3.05	8.000	3.05	11.08	1.02
1.917	1.02	5.000	3.05	8.083	2.03	11.17	1.02
2.000	1.02	5.083	3.05	8.167	2.03	11.25	1.02
2.083	1.02	5.167	3.05	8.250	2.03	11.33	0.00
2.167	1.02	5.250	3.05	8.333	2.03	11.42	0.00
2.250	1.02	5.333	5.08	8.417	2.03	11.50	0.00
2.333	1.02	5.417	5.08	8.500	2.03	11.58	1.02
2.417	1.02	5.500	5.08	8.583	2.03	11.67	1.02
2.500	1.02	5.583	5.08	8.667	2.03	11.75	1.02
2.583	2.03	5.667	5.08	8.750	2.03	11.83	1.02
2.667	2.03	5.750	5.08	8.833	1.02	11.92	1.02
2.750	2.03	5.833	38.61	8.917	1.02	12.00	1.02
2.833	2.03	5.917	38.61	9.000	1.02	12.08	1.02
2.917	2.03	6.000	38.61	9.083	2.03	12.17	1.02
3.000	2.03	6.083	38.61	9.167	2.03	12.25	1.02
3.083	2.03	6.167	38.61	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=    38.61          15.64
          over (min)      5.00           20.00
Storage Coeff.  (min)=    6.32 (ii)     18.29 (ii)
Unit Hyd. Tpeak (min)=    5.00           20.00
Unit Hyd. peak  (cms)=    0.19           0.06
                                                   *TOTALS*
PEAK FLOW       (cms)=    0.02           0.01      0.030 (iii)
TIME TO PEAK    (hrs)=    6.25           6.42      6.25
RUNOFF VOLUME    (mm)=   40.93          13.64     26.71
TOTAL RAINFALL   (mm)=   42.93          42.93     42.93
RUNOFF COEFFICIENT  =     0.95           0.32      0.62


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 79.0   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 ( 0180)| Area    (ha)=  0.65
|ID= 1 DT= 5.0 min | Total Imp(%)= 33.00   Dir. Conn.(%)= 33.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
Surface Area     (ha)=       0.21        0.44
Dep. Storage     (mm)=       2.00        5.00
Average Slope    (%)=        1.00        2.00
Length           (m)=       65.83       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	3.167	2.03		6.250	38.61	9.33	1.02
0.167	0.00	3.250	2.03		6.333	8.13	9.42	1.02
0.250	0.00	3.333	1.02		6.417	8.13	9.50	1.02
0.333	1.02	3.417	1.02		6.500	8.13	9.58	2.03
0.417	1.02	3.500	1.02		6.583	8.13	9.67	2.03
0.500	1.02	3.583	2.03		6.667	8.13	9.75	2.03
0.583	1.02	3.667	2.03		6.750	8.13	9.83	1.02
0.667	1.02	3.750	2.03		6.833	3.05	9.92	1.02
0.750	1.02	3.833	2.03		6.917	3.05	10.00	1.02
0.833	1.02	3.917	2.03		7.000	3.05	10.08	1.02
0.917	1.02	4.000	2.03		7.083	3.05	10.17	1.02
1.000	1.02	4.083	1.02		7.167	3.05	10.25	1.02
1.083	0.00	4.167	1.02		7.250	3.05	10.33	1.02
1.167	0.00	4.250	1.02		7.333	3.05	10.42	1.02
1.250	0.00	4.333	3.05		7.417	3.05	10.50	1.02
1.333	1.02	4.417	3.05		7.500	3.05	10.58	1.02
1.417	1.02	4.500	3.05		7.583	2.03	10.67	1.02
1.500	1.02	4.583	3.05		7.667	2.03	10.75	1.02
1.583	1.02	4.667	3.05		7.750	2.03	10.83	1.02
1.667	1.02	4.750	3.05		7.833	3.05	10.92	1.02
1.750	1.02	4.833	3.05		7.917	3.05	11.00	1.02
1.833	1.02	4.917	3.05		8.000	3.05	11.08	1.02
1.917	1.02	5.000	3.05		8.083	2.03	11.17	1.02
2.000	1.02	5.083	3.05		8.167	2.03	11.25	1.02
2.083	1.02	5.167	3.05		8.250	2.03	11.33	0.00
2.167	1.02	5.250	3.05		8.333	2.03	11.42	0.00
2.250	1.02	5.333	5.08		8.417	2.03	11.50	0.00
2.333	1.02	5.417	5.08		8.500	2.03	11.58	1.02
2.417	1.02	5.500	5.08		8.583	2.03	11.67	1.02
2.500	1.02	5.583	5.08		8.667	2.03	11.75	1.02
2.583	2.03	5.667	5.08		8.750	2.03	11.83	1.02
2.667	2.03	5.750	5.08		8.833	1.02	11.92	1.02
2.750	2.03	5.833	38.61		8.917	1.02	12.00	1.02
2.833	2.03	5.917	38.61		9.000	1.02	12.08	1.02
2.917	2.03	6.000	38.61		9.083	2.03	12.17	1.02

3.000	2.03	6.083	38.61	9.167	2.03	12.25	1.02
3.083	2.03	6.167	38.61	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=    38.61          18.46
          over (min)      5.00           20.00
Storage Coeff.  (min)=    2.91 (ii)     16.78 (ii)
Unit Hyd. Tpeak (min)=    5.00           20.00
Unit Hyd. peak  (cms)=    0.28           0.06
                                                   *TOTALS*
PEAK FLOW       (cms)=    0.02           0.01      0.036 (iii)
TIME TO PEAK    (hrs)=    6.25           6.42      6.25
RUNOFF VOLUME    (mm)=   40.93          15.99     24.20
TOTAL RAINFALL   (mm)=   42.93          42.93     42.93
RUNOFF COEFFICIENT  =     0.95           0.37      0.56

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

  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 83.0   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 ( 0445)|
|  1 + 2 = 3      |         AREA    QPEAK    TPEAK    R.V.
--------------------          (ha)    (cms)    (hrs)    (mm)
    ID1= 1 ( 0180):    0.65    0.036    6.25    24.20
  + ID2= 2 ( 0185):    0.47    0.030    6.25    26.71
                     ======================================
    ID = 3 ( 0445):    1.12    0.065    6.25    25.26

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

```
--------------------
| CALIB             |
| STANDHYD ( 0165)| Area    (ha)=  0.60
|ID= 1 DT= 5.0 min | Total Imp(%)= 40.00   Dir. Conn.(%)= 40.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
Surface Area     (ha)=       0.24        0.36
Dep. Storage     (mm)=       2.00        5.00
Average Slope    (%)=        1.00        2.00
Length           (m)=      250.00       20.00
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	3.167	2.03		6.250	38.61	9.33	1.02
0.167	0.00	3.250	2.03		6.333	8.13	9.42	1.02
0.250	0.00	3.333	1.02		6.417	8.13	9.50	1.02
0.333	1.02	3.417	1.02		6.500	8.13	9.58	2.03
0.417	1.02	3.500	1.02		6.583	8.13	9.67	2.03
0.500	1.02	3.583	2.03		6.667	8.13	9.75	2.03
0.583	1.02	3.667	2.03		6.750	8.13	9.83	1.02
0.667	1.02	3.750	2.03		6.833	3.05	9.92	1.02
0.750	1.02	3.833	2.03		6.917	3.05	10.00	1.02
0.833	1.02	3.917	2.03		7.000	3.05	10.08	1.02
0.917	1.02	4.000	2.03		7.083	3.05	10.17	1.02
1.000	1.02	4.083	1.02		7.167	3.05	10.25	1.02
1.083	0.00	4.167	1.02		7.250	3.05	10.33	1.02
1.167	0.00	4.250	1.02		7.333	3.05	10.42	1.02
1.250	0.00	4.333	3.05		7.417	3.05	10.50	1.02
1.333	1.02	4.417	3.05		7.500	3.05	10.58	1.02
1.417	1.02	4.500	3.05		7.583	2.03	10.67	1.02
1.500	1.02	4.583	3.05		7.667	2.03	10.75	1.02
1.583	1.02	4.667	3.05		7.750	2.03	10.83	1.02
1.667	1.02	4.750	3.05		7.833	3.05	10.92	1.02
1.750	1.02	4.833	3.05		7.917	3.05	11.00	1.02
1.833	1.02	4.917	3.05		8.000	3.05	11.08	1.02
1.917	1.02	5.000	3.05		8.083	2.03	11.17	1.02
2.000	1.02	5.083	3.05		8.167	2.03	11.25	1.02
2.083	1.02	5.167	3.05		8.250	2.03	11.33	0.00
2.167	1.02	5.250	3.05		8.333	2.03	11.42	0.00
2.250	1.02	5.333	5.08		8.417	2.03	11.50	0.00
2.333	1.02	5.417	5.08		8.500	2.03	11.58	1.02
2.417	1.02	5.500	5.08		8.583	2.03	11.67	1.02
2.500	1.02	5.583	5.08		8.667	2.03	11.75	1.02
2.583	2.03	5.667	5.08		8.750	2.03	11.83	1.02
2.667	2.03	5.750	5.08		8.833	1.02	11.92	1.02
2.750	2.03	5.833	38.61		8.917	1.02	12.00	1.02
2.833	2.03	5.917	38.61		9.000	1.02	12.08	1.02
2.917	2.03	6.000	38.61		9.083	2.03	12.17	1.02
3.000	2.03	6.083	38.61		9.167	2.03	12.25	1.02
3.083	2.03	6.167	38.61		9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=    38.61          19.37
          over (min)      5.00           20.00
Storage Coeff.  (min)=    6.48 (ii)     15.46 (ii)
Unit Hyd. Tpeak (min)=    5.00           20.00
Unit Hyd. peak  (cms)=    0.18           0.07
                                                   *TOTALS*
PEAK FLOW       (cms)=    0.03           0.01      0.036 (iii)
TIME TO PEAK    (hrs)=    6.25           6.42      6.25
RUNOFF VOLUME    (mm)=   40.93          15.99     25.95
TOTAL RAINFALL   (mm)=   42.93          42.93     42.93
RUNOFF COEFFICIENT  =     0.95           0.37      0.60


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
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Page 25 (top-left)

```
                    LangstaffRd_EA_Existing_WestDonWatershd
              CN* =  83.0   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 ( 0170)|   Area    (ha)=  0.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 57.00  Dir. Conn.(%)= 57.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area    (ha)=    0.25          0.18
     Dep. Storage    (mm)=    2.00          5.00
     Average Slope   (%)=     1.00          2.00
     Length          (m)=   250.00         20.00
     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 | 3.167   2.03 | 6.250  38.61 | 9.33   1.02
        0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42   1.02
        0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50   1.02
        0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58   2.03
        0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67   2.03
        0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75   2.03
        0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83   1.02
        0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92   1.02
        0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00  1.02
        0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08  1.02
        0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17  1.02
        1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25  1.02
        1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33  1.02
        1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42  1.02
        1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50  1.02
        1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58  1.02
        1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67  1.02
        1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75  1.02
        1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83  1.02
        1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92  1.02
        1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00  1.02
        1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08  1.02
        1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17  1.02
        2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25  1.02
        2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33  0.00
        2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  0.00
        2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50  0.00
        2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58  1.02
        2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67  1.02
```

Page 26 (top-right)

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                    LangstaffRd_EA_Existing_WestDonWatershd
        2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75  1.02
        2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83  1.02
        2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92  1.02
        2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00  1.02
        2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08  1.02
        2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17  1.02
        3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25  1.02
        3.083   2.03 | 6.167  38.61 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=    38.61         25.09
             over (min)=       5.00         15.00
    Storage Coeff.  (min)=     6.48 (ii)   14.57 (ii)
    Unit Hyd. Tpeak (min)=     5.00         15.00
    Unit Hyd. peak  (cms)=     0.18          0.08
                                                    *TOTALS*
    PEAK FLOW      (cms)=      0.03          0.01       0.035 (iii)
    TIME TO PEAK   (hrs)=      6.25          6.33       6.25
    RUNOFF VOLUME  (mm)=      40.93         20.75      32.23
    TOTAL RAINFALL (mm)=      42.93         42.93      42.93
    RUNOFF COEFFICIENT  =      0.95          0.48       0.75

         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* =  89.0   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 ( 0450)|
|  1 + 2 = 3     |           AREA   QPEAK   TPEAK    R.V.
--------------------            (ha)   (cms)   (hrs)    (mm)
           ID1= 1 ( 0165):    0.60   0.036    6.25    25.95
         + ID2= 2 ( 0170):    0.43   0.035    6.25    32.23
                             ======================================
           ID = 3 ( 0450):    1.03   0.071    6.25    28.57

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

--------------------
| ADD HYD ( 0450)|
|  3 + 2 = 1     |           AREA   QPEAK   TPEAK    R.V.
--------------------            (ha)   (cms)   (hrs)    (mm)
           ID1= 3 ( 0450):    1.03   0.071    6.25    28.57
         + ID2= 2 ( 0445):    1.12   0.065    6.25    25.26
                             ======================================
           ID = 1 ( 0450):    2.15   0.136    6.25    26.84

      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------
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Page 27 (bottom-left)

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                    LangstaffRd_EA_Existing_WestDonWatershd
--------------------
| CALIB              |
| STANDHYD ( 0190)|   Area    (ha)=  0.86
|ID= 1 DT= 5.0 min |   Total Imp(%)= 42.00  Dir. Conn.(%)= 42.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area    (ha)=    0.36          0.50
     Dep. Storage    (mm)=    2.00          5.00
     Average Slope   (%)=     1.00          2.00
     Length          (m)=   340.00         50.00
     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 | 3.167   2.03 | 6.250  38.61 | 9.33   1.02
        0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42   1.02
        0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50   1.02
        0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58   2.03
        0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67   2.03
        0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75   2.03
        0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83   1.02
        0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92   1.02
        0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00  1.02
        0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08  1.02
        0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17  1.02
        1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25  1.02
        1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33  1.02
        1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42  1.02
        1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50  1.02
        1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58  1.02
        1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67  1.02
        1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75  1.02
        1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83  1.02
        1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92  1.02
        1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00  1.02
        1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08  1.02
        1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17  1.02
        2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25  1.02
        2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33  0.00
        2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  0.00
        2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50  0.00
        2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58  1.02
        2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67  1.02
        2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75  1.02
        2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83  1.02
        2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92  1.02
        2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00  1.02
        2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08  1.02
        2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17  1.02
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Page 28 (bottom-right)

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                    LangstaffRd_EA_Existing_WestDonWatershd
        3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25  1.02
        3.083   2.03 | 6.167  38.61 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=    38.61         17.44
             over (min)=      10.00         25.00
    Storage Coeff.  (min)=     7.79 (ii)   24.01 (ii)
    Unit Hyd. Tpeak (min)=    10.00         25.00
    Unit Hyd. peak  (cms)=     0.13          0.05
                                                    *TOTALS*
    PEAK FLOW      (cms)=      0.04          0.01       0.048 (iii)
    TIME TO PEAK   (hrs)=      6.25          6.50       6.25
    RUNOFF VOLUME  (mm)=      40.93         15.99      26.45
    TOTAL RAINFALL (mm)=      42.93         42.93      42.93
    RUNOFF COEFFICIENT  =      0.95          0.37       0.62

         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* =  83.0   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 ( 0195)|   Area    (ha)=  0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)= 42.00  Dir. Conn.(%)= 42.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area    (ha)=    0.33          0.46
     Dep. Storage    (mm)=    2.00          5.00
     Average Slope   (%)=     1.00          2.00
     Length          (m)=   340.00         20.00
     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 | 3.167   2.03 | 6.250  38.61 | 9.33   1.02
        0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42   1.02
        0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50   1.02
        0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58   2.03
        0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67   2.03
        0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75   2.03
        0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83   1.02
        0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92   1.02
        0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00  1.02
        0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08  1.02
        0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17  1.02
        1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25  1.02
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             1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33   1.02
             1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42   1.02
             1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50   1.02
             1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58   1.02
             1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67   1.02
             1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75   1.02
             1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83   1.02
             1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92   1.02
             1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00   1.02
             1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08   1.02
             1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17   1.02
             2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25   1.02
             2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33   0.00
             2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   0.00
             2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50   0.00
             2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58   1.02
             2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67   1.02
             2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75   1.02
             2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83   1.02
             2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92   1.02
             2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00   1.02
             2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08   1.02
             2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17   1.02
             3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25   1.02
             3.083   2.03 | 6.167  38.61 | 9.250   2.03 |
```

```
    Max.Eff.Inten.(mm/hr)=     38.61            19.37
          over (min)           10.00            20.00
    Storage Coeff.  (min)=      7.79 (ii)       16.77 (ii)
    Unit Hyd. Tpeak (min)=     10.00            20.00
    Unit Hyd. peak  (cms)=      0.13             0.06
                                                          *TOTALS*
    PEAK FLOW       (cms)=      0.03             0.02       0.048 (iii)
    TIME TO PEAK    (hrs)=      6.25             6.42       6.25
    RUNOFF VOLUME   (mm)=      40.93            15.99      26.45
    TOTAL RAINFALL  (mm)=      42.93            42.93      42.93
    RUNOFF COEFFICIENT  =       0.95             0.37       0.62


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0    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 (  0455)|
|  1 + 2 = 3      |            AREA     QPEAK    TPEAK    R.V.
--------------------            (ha)    (cms)    (hrs)    (mm)
      ID1= 1 (  0190):          0.86    0.048    6.25    26.45
    + ID2= 2 (  0195):          0.79    0.048    6.25    26.45
```

```
    ========================================================
     ID = 3 (  0455):    1.65   0.096    6.25    26.45

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

```
--------------------
| ADD HYD (  0458)|
|  1 + 2 = 3      |            AREA     QPEAK    TPEAK    R.V.
--------------------            (ha)    (cms)    (hrs)    (mm)
      ID1= 1 (  0450):          2.15    0.136    6.25    26.84
    + ID2= 2 (  0455):          1.65    0.096    6.25    26.45
    ========================================================
     ID = 3 (  0458):    3.80   0.232    6.25    26.67

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

```
--------------------
| CALIB           |
| STANDHYD (  0300)|   Area    (ha)= 10.00
|ID= 1 DT= 5.0 min |   Total Imp(%)= 80.00   Dir. Conn.(%)= 80.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
    Surface Area    (ha)=      8.00         2.00
    Dep. Storage    (mm)=      1.00         5.00
    Average Slope   (%)=       1.00         2.00
    Length          (m)=     258.20        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 | 3.167   2.03 | 6.250  38.61 | 9.33    1.02
    0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42    1.02
    0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50    1.02
    0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58    2.03
    0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67    2.03
    0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75    2.03
    0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83    1.02
    0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92    1.02
    0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00   1.02
    0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08   1.02
    0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17   1.02
    1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25   1.02
    1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33   1.02
    1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42   1.02
    1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50   1.02
    1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58   1.02
    1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67   1.02
    1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75   1.02
```

```
             1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83   1.02
             1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92   1.02
             1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00   1.02
             1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08   1.02
             1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17   1.02
             2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25   1.02
             2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33   0.00
             2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   0.00
             2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50   0.00
             2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58   1.02
             2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67   1.02
             2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75   1.02
             2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83   1.02
             2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92   1.02
             2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00   1.02
             2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08   1.02
             2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17   1.02
             3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25   1.02
             3.083   2.03 | 6.167  38.61 | 9.250   2.03 |
```

```
    Max.Eff.Inten.(mm/hr)=     38.61            15.64
          over (min)            5.00            25.00
    Storage Coeff.  (min)=      6.60 (ii)       21.43 (ii)
    Unit Hyd. Tpeak (min)=      5.00            25.00
    Unit Hyd. peak  (cms)=      0.18             0.05
                                                          *TOTALS*
    PEAK FLOW       (cms)=      0.85             0.05       0.886 (iii)
    TIME TO PEAK    (hrs)=      6.25             6.50       6.25
    RUNOFF VOLUME   (mm)=      41.93            13.64      36.27
    TOTAL RAINFALL  (mm)=      42.93            42.93      42.93
    RUNOFF COEFFICIENT  =       0.98             0.32       0.84


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 79.0    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 (  0350)|   Area    (ha)=  0.90
|ID= 1 DT= 5.0 min |   Total Imp(%)= 70.00   Dir. Conn.(%)= 70.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
    Surface Area    (ha)=      0.63         0.27
    Dep. Storage    (mm)=      1.00         5.00
    Average Slope   (%)=       1.00         2.00
    Length          (m)=      77.46        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 | 3.167   2.03 | 6.250  38.61 | 9.33    1.02
    0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42    1.02
    0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50    1.02
    0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58    2.03
    0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67    2.03
    0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75    2.03
    0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83    1.02
    0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92    1.02
    0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00   1.02
    0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08   1.02
    0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17   1.02
    1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25   1.02
    1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33   1.02
    1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42   1.02
    1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50   1.02
    1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58   1.02
    1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67   1.02
    1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75   1.02
    1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83   1.02
    1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92   1.02
    1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00   1.02
    1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08   1.02
    1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17   1.02
    2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25   1.02
    2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33   0.00
    2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   0.00
    2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50   0.00
    2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58   1.02
    2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67   1.02
    2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75   1.02
    2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83   1.02
    2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92   1.02
    2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00   1.02
    2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08   1.02
    2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17   1.02
    3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25   1.02
    3.083   2.03 | 6.167  38.61 | 9.250   2.03 |
```

```
    Max.Eff.Inten.(mm/hr)=     38.61            15.64
          over (min)            5.00            20.00
    Storage Coeff.  (min)=      3.21 (ii)       18.03 (ii)
    Unit Hyd. Tpeak (min)=      5.00            20.00
    Unit Hyd. peak  (cms)=      0.27             0.06
                                                          *TOTALS*
    PEAK FLOW       (cms)=      0.07             0.01       0.074 (iii)
    TIME TO PEAK    (hrs)=      6.25             6.42       6.25
    RUNOFF VOLUME   (mm)=      41.93            13.64      33.43
    TOTAL RAINFALL  (mm)=      42.93            42.93      42.93
```

                    RUNOFF COEFFICIENT   =   0.98   0.32   0.78

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

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 79.0   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 (0375)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
      ID1= 1 (0300):   10.00   0.886   6.25   36.27
    + ID2= 2 (0350):   0.90   0.074   6.25   33.43
                       ===
      ID = 3 (0375):   10.90   0.960   6.25   36.03

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:Run 03   **
****

| READ STORM | Filename: C:\Users\ray.zhao\AppD
| | ata\Local\Temp\
| | 278a4b54-8409-4519-9819-1b44900a1c25\526be1c0
| Ptotal= 55.37 mm | Comments: 5yr-12hrSCS

                 TIME   RAIN | TIME   RAIN |' TIME   RAIN | TIME   RAIN
                 hrs   mm/hr | hrs   mm/hr |' hrs   mm/hr | hrs   mm/hr
                 0.25   0.00 | 3.50   3.05 | 6.75 10.16 | 10.00 2.03
                 0.50   1.02 | 3.75   2.03 | 7.00   5.08 | 10.25 1.02
                 0.75   1.02 | 4.00   2.03 | 7.25   4.06 | 10.50 1.02
                 1.00   1.02 | 4.25   2.03 | 7.50   3.05 | 10.75 1.02
                 1.25   1.02 | 4.50   4.06 | 7.75   3.05 | 11.00 2.03
                 1.50   1.02 | 4.75   4.06 | 8.00   4.06 | 11.25 1.02
                 1.75   2.03 | 5.00   4.06 | 8.25   3.05 | 11.50 1.02
                 2.00   1.02 | 5.25   3.05 | 8.50   2.03 | 11.75 1.02
                 2.25   1.02 | 5.50   7.11 | 8.75   2.03 | 12.00 1.02
                 2.50   2.03 | 5.75   7.11 | 9.00   3.05 | 12.25 1.02
                 2.75   2.03 | 6.00 49.78 | 9.25   2.03 |
                 3.00   2.03 | 6.25 49.78 | 9.50   1.02 |
                 3.25   2.03 | 6.50   9.14 | 9.75   2.03 |

| CALIB |

| STANDHYD (0145)| Area   (ha)= 3.05
|ID= 1 DT= 5.0 min | Total Imp(%)= 62.00   Dir. Conn.(%)= 62.00

                        IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=   1.89   1.16
   Dep. Storage   (mm)=   2.00   5.00
   Average Slope (%)=   1.00   2.00
   Length   (m)=   531.00   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 | 3.167 2.03 | 6.250 49.78 | 9.33 1.02
           0.167 0.00 | 3.250 2.03 | 6.333 9.14 | 9.42 1.02
           0.250 0.00 | 3.333 3.05 | 6.417 9.14 | 9.50 1.02
           0.333 1.02 | 3.417 3.05 | 6.500 9.14 | 9.58 2.03
           0.417 1.02 | 3.500 3.05 | 6.583 10.16 | 9.67 2.03
           0.500 1.02 | 3.583 2.03 | 6.667 10.16 | 9.75 2.03
           0.583 1.02 | 3.667 2.03 | 6.750 10.16 | 9.83 2.03
           0.667 1.02 | 3.750 2.03 | 6.833 5.08 | 9.92 2.03
           0.750 1.02 | 3.833 2.03 | 6.917 5.08 | 10.00 2.03
           0.833 1.02 | 3.917 2.03 | 7.000 5.08 | 10.08 1.02
           0.917 1.02 | 4.000 2.03 | 7.083 4.06 | 10.17 1.02
           1.000 1.02 | 4.083 2.03 | 7.167 4.06 | 10.25 1.02
           1.083 1.02 | 4.167 2.03 | 7.250 4.06 | 10.33 1.02
           1.167 1.02 | 4.250 2.03 | 7.333 3.05 | 10.42 1.02
           1.250 1.02 | 4.333 4.06 | 7.417 3.05 | 10.50 1.02
           1.333 1.02 | 4.417 4.06 | 7.500 3.05 | 10.58 1.02
           1.417 1.02 | 4.500 4.06 | 7.583 3.05 | 10.67 1.02
           1.500 1.02 | 4.583 4.06 | 7.667 3.05 | 10.75 1.02
           1.583 2.03 | 4.667 4.06 | 7.750 3.05 | 10.83 2.03
           1.667 2.03 | 4.750 4.06 | 7.833 4.06 | 10.92 2.03
           1.750 2.03 | 4.833 4.06 | 7.917 4.06 | 11.00 2.03
           1.833 1.02 | 4.917 4.06 | 8.000 4.06 | 11.08 1.02
           1.917 1.02 | 5.000 4.06 | 8.083 3.05 | 11.17 1.02
           2.000 1.02 | 5.083 3.05 | 8.167 3.05 | 11.25 1.02
           2.083 1.02 | 5.167 3.05 | 8.250 3.05 | 11.33 1.02
           2.167 1.02 | 5.250 3.05 | 8.333 2.03 | 11.42 1.02
           2.250 1.02 | 5.333 7.11 | 8.417 2.03 | 11.50 1.02
           2.333 2.03 | 5.417 7.11 | 8.500 2.03 | 11.58 1.02
           2.417 2.03 | 5.500 7.11 | 8.583 2.03 | 11.67 1.02
           2.500 2.03 | 5.583 7.11 | 8.667 2.03 | 11.75 1.02
           2.583 2.03 | 5.667 7.11 | 8.750 2.03 | 11.83 1.02
           2.667 2.03 | 5.750 7.11 | 8.833 3.05 | 11.92 1.02
           2.750 2.03 | 5.833 49.78 | 8.917 3.05 | 12.00 1.02
           2.833 2.03 | 5.917 49.78 | 9.000 3.05 | 12.08 1.02
           2.917 2.03 | 6.000 49.78 | 9.083 2.03 | 12.17 1.02
           3.000 2.03 | 6.083 49.78 | 9.167 2.03 | 12.25 1.02
           3.083 2.03 | 6.167 49.78 | 9.250 2.03 |

                  LangstaffRd_EA_Existing_WestDonWatershd

   Max.Eff.Inten.(mm/hr)=   49.78   31.75
           over (min)   10.00   25.00
   Storage Coeff. (min)=   9.20 (ii)   20.36 (ii)
   Unit Hyd. Tpeak (min)= 10.00   25.00
   Unit Hyd. peak (cms)=   0.12   0.05
                                                    TOTALS
   PEAK FLOW   (cms)=   0.25   0.06   0.299 (iii)
   TIME TO PEAK   (hrs)=   6.25   6.50   6.25
   RUNOFF VOLUME (mm)=   53.37   27.66   43.60
   TOTAL RAINFALL (mm)=   55.37   55.37   55.37
   RUNOFF COEFFICIENT =   0.96   0.50   0.79

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 86.0   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 (0140)| Area   (ha)= 1.27
|ID= 1 DT= 5.0 min | Total Imp(%)= 52.00   Dir. Conn.(%)= 52.00

                        IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=   0.66   0.61
   Dep. Storage   (mm)=   2.00   5.00
   Average Slope (%)=   1.00   2.00
   Length   (m)=   503.00   25.00
   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 | 3.167 2.03 | 6.250 49.78 | 9.33 1.02
           0.167 0.00 | 3.250 2.03 | 6.333 9.14 | 9.42 1.02
           0.250 0.00 | 3.333 3.05 | 6.417 9.14 | 9.50 1.02
           0.333 1.02 | 3.417 3.05 | 6.500 9.14 | 9.58 2.03
           0.417 1.02 | 3.500 3.05 | 6.583 10.16 | 9.67 2.03
           0.500 1.02 | 3.583 2.03 | 6.667 10.16 | 9.75 2.03
           0.583 1.02 | 3.667 2.03 | 6.750 10.16 | 9.83 2.03
           0.667 1.02 | 3.750 2.03 | 6.833 5.08 | 9.92 2.03
           0.750 1.02 | 3.833 2.03 | 6.917 5.08 | 10.00 2.03
           0.833 1.02 | 3.917 2.03 | 7.000 5.08 | 10.08 1.02
           0.917 1.02 | 4.000 2.03 | 7.083 4.06 | 10.17 1.02
           1.000 1.02 | 4.083 2.03 | 7.167 4.06 | 10.25 1.02
           1.083 1.02 | 4.167 2.03 | 7.250 4.06 | 10.33 1.02
           1.167 1.02 | 4.250 2.03 | 7.333 3.05 | 10.42 1.02

                    LangstaffRd_EA_Existing_WestDonWatershd
           1.250 1.02 | 4.333 4.06 | 7.417 3.05 | 10.50 1.02
           1.333 1.02 | 4.417 4.06 | 7.500 3.05 | 10.58 1.02
           1.417 1.02 | 4.500 4.06 | 7.583 3.05 | 10.67 1.02
           1.500 1.02 | 4.583 4.06 | 7.667 3.05 | 10.75 1.02
           1.583 2.03 | 4.667 4.06 | 7.750 3.05 | 10.83 2.03
           1.667 2.03 | 4.750 4.06 | 7.833 4.06 | 10.92 2.03
           1.750 2.03 | 4.833 4.06 | 7.917 4.06 | 11.00 2.03
           1.833 1.02 | 4.917 4.06 | 8.000 4.06 | 11.08 1.02
           1.917 1.02 | 5.000 4.06 | 8.083 3.05 | 11.17 1.02
           2.000 1.02 | 5.083 3.05 | 8.167 3.05 | 11.25 1.02
           2.083 1.02 | 5.167 3.05 | 8.250 3.05 | 11.33 1.02
           2.167 1.02 | 5.250 3.05 | 8.333 2.03 | 11.42 1.02
           2.250 1.02 | 5.333 7.11 | 8.417 2.03 | 11.50 1.02
           2.333 2.03 | 5.417 7.11 | 8.500 2.03 | 11.58 1.02
           2.417 2.03 | 5.500 7.11 | 8.583 2.03 | 11.67 1.02
           2.500 2.03 | 5.583 7.11 | 8.667 2.03 | 11.75 1.02
           2.583 2.03 | 5.667 7.11 | 8.750 2.03 | 11.83 1.02
           2.667 2.03 | 5.750 7.11 | 8.833 3.05 | 11.92 1.02
           2.750 2.03 | 5.833 49.78 | 8.917 3.05 | 12.00 1.02
           2.833 2.03 | 5.917 49.78 | 9.000 3.05 | 12.08 1.02
           2.917 2.03 | 6.000 49.78 | 9.083 2.03 | 12.17 1.02
           3.000 2.03 | 6.083 49.78 | 9.167 2.03 | 12.25 1.02
           3.083 2.03 | 6.167 49.78 | 9.250 2.03 |

   Max.Eff.Inten.(mm/hr)=   49.78   29.56
           over (min)   10.00   20.00
   Storage Coeff. (min)=   8.90 (ii)   17.57 (ii)
   Unit Hyd. Tpeak (min)= 10.00   20.00
   Unit Hyd. peak (cms)=   0.12   0.06
                                                    TOTALS
   PEAK FLOW   (cms)=   0.09   0.03   0.115 (iii)
   TIME TO PEAK   (hrs)=   6.25   6.42   6.25
   RUNOFF VOLUME (mm)=   53.37   24.78   39.64
   TOTAL RAINFALL (mm)=   55.37   55.37   55.37
   RUNOFF COEFFICIENT =   0.96   0.45   0.72

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 (0135)| Area   (ha)= 1.43
|ID= 1 DT= 5.0 min | Total Imp(%)= 40.00   Dir. Conn.(%)= 40.00

                        IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=   0.57   0.86
   Dep. Storage   (mm)=   2.00   5.00
   Average Slope (%)=   1.00   2.00

Page 37 (top-left)

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                    LangstaffRd_EA_Existing_WestDonWatershd
Length          (m)=    503.00        30.00
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 | 3.167  2.03 | 6.250  49.78 | 9.33   1.02
       0.167  0.00 | 3.250  2.03 | 6.333   9.14 | 9.42   1.02
       0.250  0.00 | 3.333  3.05 | 6.417   9.14 | 9.50   1.02
       0.333  1.02 | 3.417  3.05 | 6.500   9.14 | 9.58   2.03
       0.417  1.02 | 3.500  3.05 | 6.583  10.16 | 9.67   2.03
       0.500  1.02 | 3.583  2.03 | 6.667  10.16 | 9.75   2.03
       0.583  1.02 | 3.667  2.03 | 6.750  10.16 | 9.83   2.03
       0.667  1.02 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
       0.750  1.02 | 3.833  2.03 | 6.917   5.08 | 10.00  2.03
       0.833  1.02 | 3.917  2.03 | 7.000   5.08 | 10.08  1.02
       0.917  1.02 | 4.000  2.03 | 7.083   4.06 | 10.17  1.02
       1.000  1.02 | 4.083  2.03 | 7.167   4.06 | 10.25  1.02
       1.083  1.02 | 4.167  2.03 | 7.250   4.06 | 10.33  1.02
       1.167  1.02 | 4.250  2.03 | 7.333   3.05 | 10.42  1.02
       1.250  1.02 | 4.333  4.06 | 7.417   3.05 | 10.50  1.02
       1.333  1.02 | 4.417  4.06 | 7.500   3.05 | 10.58  1.02
       1.417  1.02 | 4.500  4.06 | 7.583   3.05 | 10.67  1.02
       1.500  1.02 | 4.583  4.06 | 7.667   3.05 | 10.75  1.02
       1.583  2.03 | 4.667  4.06 | 7.750   3.05 | 10.83  2.03
       1.667  2.03 | 4.750  4.06 | 7.833   4.06 | 10.92  2.03
       1.750  2.03 | 4.833  4.06 | 7.917   4.06 | 11.00  2.03
       1.833  1.02 | 4.917  4.06 | 8.000   4.06 | 11.08  1.02
       1.917  1.02 | 5.000  4.06 | 8.083   3.05 | 11.17  1.02
       2.000  1.02 | 5.083  3.05 | 8.167   3.05 | 11.25  1.02
       2.083  1.02 | 5.167  3.05 | 8.250   3.05 | 11.33  1.02
       2.167  1.02 | 5.250  3.05 | 8.333   2.03 | 11.42  1.02
       2.250  1.02 | 5.333  7.11 | 8.417   2.03 | 11.50  1.02
       2.333  2.03 | 5.417  7.11 | 8.500   2.03 | 11.58  1.02
       2.417  2.03 | 5.500  7.11 | 8.583   2.03 | 11.67  1.02
       2.500  2.03 | 5.583  7.11 | 8.667   2.03 | 11.75  1.02
       2.583  2.03 | 5.667  7.11 | 8.750   2.03 | 11.83  1.02
       2.667  2.03 | 5.750  7.11 | 8.833   3.05 | 11.92  1.02
       2.750  2.03 | 5.833  49.78| 8.917   3.05 | 12.00  1.02
       2.833  2.03 | 5.917  49.78| 9.000   3.05 | 12.08  1.02
       2.917  2.03 | 6.000  49.78| 9.083   2.03 | 12.17  1.02
       3.000  2.03 | 6.083  49.78| 9.167   2.03 | 12.25  1.02
       3.083  2.03 | 6.167  49.78| 9.250   2.03 |

Max.Eff.Inten.(mm/hr)=   49.78        30.62
        over (min)      10.00        20.00
Storage Coeff.  (min)=   8.90 (ii)   18.44 (ii)
Unit Hyd. Tpeak (min)=  10.00        20.00
Unit Hyd. peak  (cms)=   0.12         0.06
                                          *TOTALS*
```

Page 38 (top-right)

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                    LangstaffRd_EA_Existing_WestDonWatershd
PEAK FLOW      (cms)=     0.08        0.05        0.116 (iii)
TIME TO PEAK   (hrs)=     6.25        6.42        6.25
RUNOFF VOLUME  (mm)=     53.37       25.69       36.76
TOTAL RAINFALL (mm)=     55.37       55.37       55.37
RUNOFF COEFFICIENT =      0.96        0.46        0.66


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 84.0   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 ( 0420)|
|  1 + 2 = 3   |           AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
      ID1= 1 ( 0135):        1.43    0.116     6.25     36.76
    + ID2= 2 ( 0140):        1.27    0.115     6.25     39.64
                     ======================================
        ID = 3 ( 0420):      2.70    0.231     6.25     38.11

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

--------------------
| ADD HYD ( 0425)|
|  1 + 2 = 3   |           AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
      ID1= 1 ( 0145):        3.05    0.299     6.25     43.60
    + ID2= 2 ( 0420):        2.70    0.231     6.25     38.11
                     ======================================
        ID = 3 ( 0425):      5.75    0.530     6.25     41.02

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0210)|  Area    (ha)=  0.96
|ID= 1 DT= 5.0 min |  Total Imp(%)= 44.00   Dir. Conn.(%)= 44.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
       Surface Area  (ha)=    0.42        0.54
       Dep. Storage  (mm)=    2.00        5.00
       Average Slope (%)=     1.00        2.00
       Length        (m)=   470.00       20.00
       Mannings n     =       0.013        0.250

   NOTE: RAINFALL WAS TRANSFORMED TO  5.0 MIN. TIME STEP.
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Page 39 (bottom-left)

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                    LangstaffRd_EA_Existing_WestDonWatershd
                        ---- 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  2.03 | 6.250  49.78 | 9.33   1.02
       0.167  0.00 | 3.250  2.03 | 6.333   9.14 | 9.42   1.02
       0.250  0.00 | 3.333  3.05 | 6.417   9.14 | 9.50   1.02
       0.333  1.02 | 3.417  3.05 | 6.500   9.14 | 9.58   2.03
       0.417  1.02 | 3.500  3.05 | 6.583  10.16 | 9.67   2.03
       0.500  1.02 | 3.583  2.03 | 6.667  10.16 | 9.75   2.03
       0.583  1.02 | 3.667  2.03 | 6.750  10.16 | 9.83   2.03
       0.667  1.02 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
       0.750  1.02 | 3.833  2.03 | 6.917   5.08 | 10.00  2.03
       0.833  1.02 | 3.917  2.03 | 7.000   5.08 | 10.08  1.02
       0.917  1.02 | 4.000  2.03 | 7.083   4.06 | 10.17  1.02
       1.000  1.02 | 4.083  2.03 | 7.167   4.06 | 10.25  1.02
       1.083  1.02 | 4.167  2.03 | 7.250   4.06 | 10.33  1.02
       1.167  1.02 | 4.250  2.03 | 7.333   3.05 | 10.42  1.02
       1.250  1.02 | 4.333  4.06 | 7.417   3.05 | 10.50  1.02
       1.333  1.02 | 4.417  4.06 | 7.500   3.05 | 10.58  1.02
       1.417  1.02 | 4.500  4.06 | 7.583   3.05 | 10.67  1.02
       1.500  1.02 | 4.583  4.06 | 7.667   3.05 | 10.75  1.02
       1.583  2.03 | 4.667  4.06 | 7.750   3.05 | 10.83  2.03
       1.667  2.03 | 4.750  4.06 | 7.833   4.06 | 10.92  2.03
       1.750  2.03 | 4.833  4.06 | 7.917   4.06 | 11.00  2.03
       1.833  1.02 | 4.917  4.06 | 8.000   4.06 | 11.08  1.02
       1.917  1.02 | 5.000  4.06 | 8.083   3.05 | 11.17  1.02
       2.000  1.02 | 5.083  3.05 | 8.167   3.05 | 11.25  1.02
       2.083  1.02 | 5.167  3.05 | 8.250   3.05 | 11.33  1.02
       2.167  1.02 | 5.250  3.05 | 8.333   2.03 | 11.42  1.02
       2.250  1.02 | 5.333  7.11 | 8.417   2.03 | 11.50  1.02
       2.333  2.03 | 5.417  7.11 | 8.500   2.03 | 11.58  1.02
       2.417  2.03 | 5.500  7.11 | 8.583   2.03 | 11.67  1.02
       2.500  2.03 | 5.583  7.11 | 8.667   2.03 | 11.75  1.02
       2.583  2.03 | 5.667  7.11 | 8.750   2.03 | 11.83  1.02
       2.667  2.03 | 5.750  7.11 | 8.833   3.05 | 11.92  1.02
       2.750  2.03 | 5.833  49.78| 8.917   3.05 | 12.00  1.02
       2.833  2.03 | 5.917  49.78| 9.000   3.05 | 12.08  1.02
       2.917  2.03 | 6.000  49.78| 9.083   2.03 | 12.17  1.02
       3.000  2.03 | 6.083  49.78| 9.167   2.03 | 12.25  1.02
       3.083  2.03 | 6.167  49.78| 9.250   2.03 |

Max.Eff.Inten.(mm/hr)=   49.78        29.56
        over (min)      10.00        20.00
Storage Coeff.  (min)=   8.55 (ii)   16.13 (ii)
Unit Hyd. Tpeak (min)=  10.00        20.00
Unit Hyd. peak  (cms)=   0.12         0.06
                                          *TOTALS*
PEAK FLOW      (cms)=     0.06        0.03        0.082 (iii)
TIME TO PEAK   (hrs)=     6.25        6.42        6.25
RUNOFF VOLUME  (mm)=     53.37       24.78       37.35
TOTAL RAINFALL (mm)=     55.37       55.37       55.37
RUNOFF COEFFICIENT =      0.96        0.45        0.67
```

Page 40 (bottom-right)

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                    LangstaffRd_EA_Existing_WestDonWatershd
   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 ( 0205)|  Area    (ha)=  1.11
|ID= 1 DT= 5.0 min |  Total Imp(%)= 38.00   Dir. Conn.(%)= 38.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
       Surface Area  (ha)=    0.42        0.69
       Dep. Storage  (mm)=    2.00        5.00
       Average Slope (%)=     1.00        2.00
       Length        (m)=   470.00       20.00
       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 | 3.167  2.03 | 6.250  49.78 | 9.33   1.02
       0.167  0.00 | 3.250  2.03 | 6.333   9.14 | 9.42   1.02
       0.250  0.00 | 3.333  3.05 | 6.417   9.14 | 9.50   1.02
       0.333  1.02 | 3.417  3.05 | 6.500   9.14 | 9.58   2.03
       0.417  1.02 | 3.500  3.05 | 6.583  10.16 | 9.67   2.03
       0.500  1.02 | 3.583  2.03 | 6.667  10.16 | 9.75   2.03
       0.583  1.02 | 3.667  2.03 | 6.750  10.16 | 9.83   2.03
       0.667  1.02 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
       0.750  1.02 | 3.833  2.03 | 6.917   5.08 | 10.00  2.03
       0.833  1.02 | 3.917  2.03 | 7.000   5.08 | 10.08  1.02
       0.917  1.02 | 4.000  2.03 | 7.083   4.06 | 10.17  1.02
       1.000  1.02 | 4.083  2.03 | 7.167   4.06 | 10.25  1.02
       1.083  1.02 | 4.167  2.03 | 7.250   4.06 | 10.33  1.02
       1.167  1.02 | 4.250  2.03 | 7.333   3.05 | 10.42  1.02
       1.250  1.02 | 4.333  4.06 | 7.417   3.05 | 10.50  1.02
       1.333  1.02 | 4.417  4.06 | 7.500   3.05 | 10.58  1.02
       1.417  1.02 | 4.500  4.06 | 7.583   3.05 | 10.67  1.02
       1.500  1.02 | 4.583  4.06 | 7.667   3.05 | 10.75  1.02
       1.583  2.03 | 4.667  4.06 | 7.750   3.05 | 10.83  2.03
       1.667  2.03 | 4.750  4.06 | 7.833   4.06 | 10.92  2.03
       1.750  2.03 | 4.833  4.06 | 7.917   4.06 | 11.00  2.03
       1.833  1.02 | 4.917  4.06 | 8.000   4.06 | 11.08  1.02
       1.917  1.02 | 5.000  4.06 | 8.083   3.05 | 11.17  1.02
       2.000  1.02 | 5.083  3.05 | 8.167   3.05 | 11.25  1.02
       2.083  1.02 | 5.167  3.05 | 8.250   3.05 | 11.33  1.02
       2.167  1.02 | 5.250  3.05 | 8.333   2.03 | 11.42  1.02
       2.250  1.02 | 5.333  7.11 | 8.417   2.03 | 11.50  1.02
```

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                LangstaffRd_EA_Existing_WestDonWatershd
      2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58   1.02
      2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
      2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75   1.02
      2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83   1.02
      2.667   2.03 | 5.750  49.78 | 8.833   3.05 | 11.92   1.02
      2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00   1.02
      2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08   1.02
      2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17   1.02
      3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25   1.02
      3.083   2.03 | 6.167  49.78 | 9.250   2.03 |

  Max.Eff.Inten.(mm/hr)=    49.78        29.56
          over (min)       10.00        20.00
  Storage Coeff.  (min)=    8.55 (ii)   16.13 (ii)
  Unit Hyd. Tpeak (min)=   10.00        20.00
  Unit Hyd. peak  (cms)=    0.12         0.06
                                                   *TOTALS*
  PEAK FLOW      (cms)=     0.06         0.04       0.089 (iii)
  TIME TO PEAK   (hrs)=     6.25         6.42       6.25
  RUNOFF VOLUME  (mm)=     53.37        24.78      35.64
  TOTAL RAINFALL (mm)=     55.37        55.37      55.37
  RUNOFF COEFFICIENT  =     0.96         0.45       0.64


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 ( 0460)|
|  1 + 2  =  3   |          AREA    QPEAK   TPEAK    R.V.
--------------------          (ha)   (cms)   (hrs)    (mm)
       ID1= 1 ( 0205):    1.11    0.089    6.25    35.64
     + ID2= 2 ( 0210):    0.96    0.082    6.25    37.35
       ========================================================
       ID = 3 ( 0460):    2.07    0.171    6.25    36.43

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0230)|  Area    (ha)=  0.70
|ID= 1 DT= 5.0 min | Total Imp(%)= 57.00  Dir. Conn.(%)= 57.00
--------------------
                         IMPERVIOUS   PERVIOUS (i)
  Surface Area    (ha)=      0.40        0.30
  Dep. Storage    (mm)=      2.00        5.00
  Average Slope   (%)=       1.00        2.00
  Length          (m)=     320.00       25.00
```

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                LangstaffRd_EA_Existing_WestDonWatershd
  Mannings n         =       0.013        0.290

    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   2.03 | 6.250  49.78 | 9.33    1.02
      0.167   0.00 | 3.250   2.03 | 6.333   9.14 | 9.42    1.02
      0.250   0.00 | 3.333   3.05 | 6.417   9.14 | 9.50    1.02
      0.333   1.02 | 3.417   3.05 | 6.500   9.14 | 9.58    2.03
      0.417   1.02 | 3.500   3.05 | 6.583  10.16 | 9.67    2.03
      0.500   1.02 | 3.583   2.03 | 6.667  10.16 | 9.75    2.03
      0.583   1.02 | 3.667   2.03 | 6.750  10.16 | 9.83    2.03
      0.667   1.02 | 3.750   2.03 | 6.833   5.08 | 9.92    2.03
      0.750   1.02 | 3.833   2.03 | 6.917   5.08 | 10.00   2.03
      0.833   1.02 | 3.917   2.03 | 7.000   5.08 | 10.08   1.02
      0.917   1.02 | 4.000   2.03 | 7.083   4.06 | 10.17   1.02
      1.000   1.02 | 4.083   2.03 | 7.167   4.06 | 10.25   1.02
      1.083   1.02 | 4.167   2.03 | 7.250   4.06 | 10.33   1.02
      1.167   1.02 | 4.250   2.03 | 7.333   3.05 | 10.42   1.02
      1.250   1.02 | 4.333   4.06 | 7.417   3.05 | 10.50   1.02
      1.333   1.02 | 4.417   4.06 | 7.500   3.05 | 10.58   1.02
      1.417   1.02 | 4.500   4.06 | 7.583   3.05 | 10.67   1.02
      1.500   1.02 | 4.583   4.06 | 7.667   3.05 | 10.75   1.02
      1.583   2.03 | 4.667   4.06 | 7.750   3.05 | 10.83   2.03
      1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
      1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
      1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
      1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
      2.000   1.02 | 5.083   3.05 | 8.167   3.05 | 11.25   1.02
      2.083   1.02 | 5.167   3.05 | 8.250   3.05 | 11.33   1.02
      2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   1.02
      2.250   1.02 | 5.333   7.11 | 8.417   2.03 | 11.50   1.02
      2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58   1.02
      2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
      2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75   1.02
      2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83   1.02
      2.667   2.03 | 5.750   7.11 | 8.833   3.05 | 11.92   1.02
      2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00   1.02
      2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08   1.02
      2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17   1.02
      3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25   1.02
      3.083   2.03 | 6.167  49.78 | 9.250   2.03 |

  Max.Eff.Inten.(mm/hr)=    49.78        27.57
          over (min)        5.00        20.00
  Storage Coeff.  (min)=    6.79 (ii)   16.53 (ii)
  Unit Hyd. Tpeak (min)=    5.00        20.00
  Unit Hyd. peak  (cms)=    0.18         0.06
                                                   *TOTALS*
  PEAK FLOW      (cms)=     0.05         0.01       0.068 (iii)
```

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                LangstaffRd_EA_Existing_WestDonWatershd
  TIME TO PEAK   (hrs)=     6.25         6.42       6.25
  RUNOFF VOLUME  (mm)=     53.37        23.08      40.33
  TOTAL RAINFALL (mm)=     55.37        55.37      55.37
  RUNOFF COEFFICIENT  =     0.96         0.42       0.73


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 81.0   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 ( 0225)|  Area    (ha)=  0.90
|ID= 1 DT= 5.0 min | Total Imp(%)= 53.00  Dir. Conn.(%)= 53.00
--------------------
                         IMPERVIOUS   PERVIOUS (i)
  Surface Area    (ha)=      0.48        0.42
  Dep. Storage    (mm)=      2.00        5.00
  Average Slope   (%)=       1.00        2.00
  Length          (m)=     320.00       25.00
  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 | 3.167   2.03 | 6.250  49.78 | 9.33    1.02
      0.167   0.00 | 3.250   2.03 | 6.333   9.14 | 9.42    1.02
      0.250   0.00 | 3.333   3.05 | 6.417   9.14 | 9.50    1.02
      0.333   1.02 | 3.417   3.05 | 6.500   9.14 | 9.58    2.03
      0.417   1.02 | 3.500   3.05 | 6.583  10.16 | 9.67    2.03
      0.500   1.02 | 3.583   2.03 | 6.667  10.16 | 9.75    2.03
      0.583   1.02 | 3.667   2.03 | 6.750  10.16 | 9.83    2.03
      0.667   1.02 | 3.750   2.03 | 6.833   5.08 | 9.92    2.03
      0.750   1.02 | 3.833   2.03 | 6.917   5.08 | 10.00   2.03
      0.833   1.02 | 3.917   2.03 | 7.000   5.08 | 10.08   1.02
      0.917   1.02 | 4.000   2.03 | 7.083   4.06 | 10.17   1.02
      1.000   1.02 | 4.083   2.03 | 7.167   4.06 | 10.25   1.02
      1.083   1.02 | 4.167   2.03 | 7.250   4.06 | 10.33   1.02
      1.167   1.02 | 4.250   2.03 | 7.333   3.05 | 10.42   1.02
      1.250   1.02 | 4.333   4.06 | 7.417   3.05 | 10.50   1.02
      1.333   1.02 | 4.417   4.06 | 7.500   3.05 | 10.58   1.02
      1.417   1.02 | 4.500   4.06 | 7.583   3.05 | 10.67   1.02
      1.500   1.02 | 4.583   4.06 | 7.667   3.05 | 10.75   1.02
      1.583   2.03 | 4.667   4.06 | 7.750   3.05 | 10.83   2.03
      1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
      1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
      1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
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                LangstaffRd_EA_Existing_WestDonWatershd
      1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
      2.000   1.02 | 5.083   3.05 | 8.167   3.05 | 11.25   1.02
      2.083   1.02 | 5.167   3.05 | 8.250   3.05 | 11.33   1.02
      2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   1.02
      2.250   1.02 | 5.333   7.11 | 8.417   2.03 | 11.50   1.02
      2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58   1.02
      2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
      2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75   1.02
      2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83   1.02
      2.667   2.03 | 5.750   7.11 | 8.833   3.05 | 11.92   1.02
      2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00   1.02
      2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08   1.02
      2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17   1.02
      3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25   1.02
      3.083   2.03 | 6.167  49.78 | 9.250   2.03 |

  Max.Eff.Inten.(mm/hr)=    49.78        29.56
          over (min)        5.00        20.00
  Storage Coeff.  (min)=    6.79 (ii)   15.45 (ii)
  Unit Hyd. Tpeak (min)=    5.00        20.00
  Unit Hyd. peak  (cms)=    0.18         0.07
                                                   *TOTALS*
  PEAK FLOW      (cms)=     0.07         0.02       0.086 (iii)
  TIME TO PEAK   (hrs)=     6.25         6.42       6.25
  RUNOFF VOLUME  (mm)=     53.37        24.78      39.92
  TOTAL RAINFALL (mm)=     55.37        55.37      55.37
  RUNOFF COEFFICIENT  =     0.96         0.45       0.72


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 ( 0475)|
|  1 + 2  =  3   |          AREA    QPEAK   TPEAK    R.V.
--------------------          (ha)   (cms)   (hrs)    (mm)
       ID1= 1 ( 0225):    0.90    0.086    6.25    39.92
     + ID2= 2 ( 0230):    0.70    0.068    6.25    40.33
       ========================================================
       ID = 3 ( 0475):    1.60    0.154    6.25    40.10

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0220)|  Area    (ha)=  0.65
|ID= 1 DT= 5.0 min | Total Imp(%)= 46.00  Dir. Conn.(%)= 46.00
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Page 45 (top-left)

LangstaffRd_EA_Existing_WestDonWatershd

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.30	0.35
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	260.00	20.00
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	3.167	2.03	6.250	49.78	9.33	1.02
0.167	0.00	3.250	2.03	6.333	9.14	9.42	1.02
0.250	0.00	3.333	3.05	6.417	9.14	9.50	1.02
0.333	1.02	3.417	3.05	6.500	9.14	9.58	2.03
0.417	1.02	3.500	3.05	6.583	10.16	9.67	2.03
0.500	1.02	3.583	3.05	6.667	10.16	9.75	2.03
0.583	1.02	3.667	2.03	6.750	10.16	9.83	2.03
0.667	1.02	3.750	2.03	6.833	5.08	9.92	2.03
0.750	1.02	3.833	2.03	6.917	5.08	10.00	2.03
0.833	1.02	3.917	2.03	7.000	5.08	10.08	1.02
0.917	1.02	4.000	2.03	7.083	4.06	10.17	1.02
1.000	1.02	4.083	2.03	7.167	4.06	10.25	1.02
1.083	1.02	4.167	2.03	7.250	4.06	10.33	1.02
1.167	1.02	4.250	2.03	7.333	3.05	10.42	1.02
1.250	1.02	4.333	4.06	7.417	3.05	10.50	1.02
1.333	1.02	4.417	4.06	7.500	3.05	10.58	1.02
1.417	1.02	4.500	4.06	7.583	3.05	10.67	1.02
1.500	1.02	4.583	4.06	7.667	3.05	10.75	1.02
1.583	2.03	4.667	4.06	7.750	3.05	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	3.05	8.167	3.05	11.25	1.02
2.083	1.02	5.167	3.05	8.250	3.05	11.33	1.02
2.167	1.02	5.250	3.05	8.333	2.03	11.42	1.02
2.250	1.02	5.333	7.11	8.417	2.03	11.50	1.02
2.333	2.03	5.417	7.11	8.500	2.03	11.58	1.02
2.417	2.03	5.500	7.11	8.583	2.03	11.67	1.02
2.500	2.03	5.583	7.11	8.667	2.03	11.75	1.02
2.583	2.03	5.667	7.11	8.750	2.03	11.83	1.02
2.667	2.03	5.750	7.11	8.833	3.05	11.92	1.02
2.750	2.03	5.833	49.78	8.917	3.05	12.00	1.02
2.833	2.03	5.917	49.78	9.000	3.05	12.08	1.02
2.917	2.03	6.000	49.78	9.083	2.03	12.17	1.02
3.000	2.03	6.083	49.78	9.167	2.03	12.25	1.02
3.083	2.03	6.167	49.78	9.250	2.03		

Max.Eff.Inten.(mm/hr)=	49.78	29.56
over (min)	5.00	15.00

Page 45

Page 46 (top-right)

LangstaffRd_EA_Existing_WestDonWatershd

Storage Coeff.	(min)=	5.99 (ii)	13.57 (ii)
Unit Hyd. Tpeak	(min)=	5.00	15.00
Unit Hyd. peak	(cms)=	0.19	0.08

				TOTALS
PEAK FLOW	(cms)=	0.04	0.02	0.061 (iii)
TIME TO PEAK	(hrs)=	6.25	6.33	6.25
RUNOFF VOLUME	(mm)=	53.37	24.78	37.92
TOTAL RAINFALL	(mm)=	55.37	55.37	55.37
RUNOFF COEFFICIENT	=	0.96	0.45	0.68

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
    CN* = 83.0   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 ( 0215)|   Area    (ha)= 0.58
|ID= 1 DT= 5.0 min |   Total Imp(%)= 57.00  Dir. Conn.(%)= 57.00
--------------------
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		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.33	0.25
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	260.00	30.00
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	3.167	2.03	6.250	49.78	9.33	1.02
0.167	0.00	3.250	2.03	6.333	9.14	9.42	1.02
0.250	0.00	3.333	3.05	6.417	9.14	9.50	1.02
0.333	1.02	3.417	3.05	6.500	9.14	9.58	2.03
0.417	1.02	3.500	3.05	6.583	10.16	9.67	2.03
0.500	1.02	3.583	2.03	6.667	10.16	9.75	2.03
0.583	1.02	3.667	2.03	6.750	10.16	9.83	2.03
0.667	1.02	3.750	2.03	6.833	5.08	9.92	2.03
0.750	1.02	3.833	2.03	6.917	5.08	10.00	2.03
0.833	1.02	3.917	2.03	7.000	5.08	10.08	1.02
0.917	1.02	4.000	2.03	7.083	4.06	10.17	1.02
1.000	1.02	4.083	2.03	7.167	4.06	10.25	1.02
1.083	1.02	4.167	2.03	7.250	4.06	10.33	1.02
1.167	1.02	4.250	2.03	7.333	3.05	10.42	1.02
1.250	1.02	4.333	4.06	7.417	3.05	10.50	1.02
1.333	1.02	4.417	4.06	7.500	3.05	10.58	1.02
1.417	1.02	4.500	4.06	7.583	3.05	10.67	1.02

Page 46

Page 47 (bottom-left)

LangstaffRd_EA_Existing_WestDonWatershd

1.500	1.02	4.583	4.06	7.667	3.05	10.75	1.02
1.583	2.03	4.667	4.06	7.750	3.05	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	3.05	8.167	3.05	11.25	1.02
2.083	1.02	5.167	3.05	8.250	3.05	11.33	1.02
2.167	1.02	5.250	3.05	8.333	2.03	11.42	1.02
2.250	1.02	5.333	7.11	8.417	2.03	11.50	1.02
2.333	2.03	5.417	7.11	8.500	2.03	11.58	1.02
2.417	2.03	5.500	7.11	8.583	2.03	11.67	1.02
2.500	2.03	5.583	7.11	8.667	2.03	11.75	1.02
2.583	2.03	5.667	7.11	8.750	2.03	11.83	1.02
2.667	2.03	5.750	7.11	8.833	3.05	11.92	1.02
2.750	2.03	5.833	49.78	8.917	3.05	12.00	1.02
2.833	2.03	5.917	49.78	9.000	3.05	12.08	1.02
2.917	2.03	6.000	49.78	9.083	2.03	12.17	1.02
3.000	2.03	6.083	49.78	9.167	2.03	12.25	1.02
3.083	2.03	6.167	49.78	9.250	2.03		

Max.Eff.Inten.(mm/hr)=	49.78	29.56
over (min)	5.00	20.00
Storage Coeff. (min)=	5.99 (ii)	15.66 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.07

				TOTALS
PEAK FLOW	(cms)=	0.05	0.01	0.058 (iii)
TIME TO PEAK	(hrs)=	6.25	6.42	6.25
RUNOFF VOLUME	(mm)=	53.37	24.78	41.06
TOTAL RAINFALL	(mm)=	55.37	55.37	55.37
RUNOFF COEFFICIENT	=	0.96	0.45	0.74

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
    CN* = 83.0   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 ( 0470)|
|   1 + 2 = 3      |        AREA     QPEAK    TPEAK     R.V.
--------------------        (ha)     (cms)    (hrs)     (mm)
      ID1= 1 ( 0215):       0.58     0.058    6.25      41.06
    + ID2= 2 ( 0220):       0.65     0.061    6.25      37.92
      ======================================================
      ID = 3 ( 0470):       1.23     0.119    6.25      39.40
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Page 47

Page 48

LangstaffRd_EA_Existing_WestDonWatershd

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--------------------
| ADD HYD ( 0480)|
|   1 + 2 = 3      |        AREA     QPEAK    TPEAK     R.V.
--------------------        (ha)     (cms)    (hrs)     (mm)
      ID1= 1 ( 0470):       1.23     0.119    6.25      39.40
    + ID2= 2 ( 0475):       1.60     0.154    6.25      40.10
      ======================================================
      ID = 3 ( 0480):       2.83     0.272    6.25      39.80
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB              |
| STANDHYD ( 0160)|   Area    (ha)= 0.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 56.00  Dir. Conn.(%)= 56.00
--------------------
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		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.19
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	260.00	20.00
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	3.167	2.03	6.250	49.78	9.33	1.02
0.167	0.00	3.250	2.03	6.333	9.14	9.42	1.02
0.250	0.00	3.333	3.05	6.417	9.14	9.50	1.02
0.333	1.02	3.417	3.05	6.500	9.14	9.58	2.03
0.417	1.02	3.500	3.05	6.583	10.16	9.67	2.03
0.500	1.02	3.583	2.03	6.667	10.16	9.75	2.03
0.583	1.02	3.667	2.03	6.750	10.16	9.83	2.03
0.667	1.02	3.750	2.03	6.833	5.08	9.92	2.03
0.750	1.02	3.833	2.03	6.917	5.08	10.00	2.03
0.833	1.02	3.917	2.03	7.000	5.08	10.08	1.02
0.917	1.02	4.000	2.03	7.083	4.06	10.17	1.02
1.000	1.02	4.083	2.03	7.167	4.06	10.25	1.02
1.083	1.02	4.167	2.03	7.250	4.06	10.33	1.02
1.167	1.02	4.250	2.03	7.333	3.05	10.42	1.02
1.250	1.02	4.333	4.06	7.417	3.05	10.50	1.02
1.333	1.02	4.417	4.06	7.500	3.05	10.58	1.02
1.417	1.02	4.500	4.06	7.583	3.05	10.67	1.02
1.500	1.02	4.583	4.06	7.667	3.05	10.75	1.02
1.583	2.03	4.667	4.06	7.750	3.05	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02

Page 48

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                2.000  1.02 | 5.083   3.05 | 8.167   3.05 | 11.25   1.02
                2.083  1.02 | 5.167   3.05 | 8.250   3.05 | 11.33   1.02
                2.167  1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   1.02
                2.250  1.02 | 5.333   7.11 | 8.417   2.03 | 11.50   1.02
                2.333  2.03 | 5.417   7.11 | 8.500   2.03 | 11.58   1.02
                2.417  2.03 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
                2.500  2.03 | 5.583   7.11 | 8.667   2.03 | 11.75   1.02
                2.583  2.03 | 5.667   7.11 | 8.750   2.03 | 11.83   1.02
                2.667  2.03 | 5.750   7.11 | 8.833   3.05 | 11.92   1.02
                2.750  2.03 | 5.833  49.78 | 8.917   3.05 | 12.00   1.02
                2.833  2.03 | 5.917  49.78 | 9.000   3.05 | 12.08   1.02
                2.917  2.03 | 6.000  49.78 | 9.083   2.03 | 12.17   1.02
                3.000  2.03 | 6.083  49.78 | 9.167   2.03 | 12.25   1.02
                3.083  2.03 | 6.167  49.78 | 9.250   2.03 |
```

```
       Max.Eff.Inten.(mm/hr)=     49.78           36.58
                  over (min)      5.00           15.00
       Storage Coeff.  (min)=     5.99 (ii)      12.95 (ii)
       Unit Hyd. Tpeak (min)=     5.00           15.00
       Unit Hyd. peak  (cms)=     0.19            0.08
                                                         *TOTALS*
       PEAK FLOW       (cms)=     0.03            0.01        0.047 (iii)
       TIME TO PEAK    (hrs)=     6.25            6.33        6.25
       RUNOFF VOLUME   (mm)=     53.37           31.03       43.53
       TOTAL RAINFALL  (mm)=     55.37           55.37       55.37
       RUNOFF COEFFICIENT  =      0.96            0.56        0.79
```

```
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 89.0   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 ( 0155)|   Area    (ha)=  0.56
|ID= 1 DT= 5.0 min |   Total Imp(%)= 45.00   Dir. Conn.(%)= 45.00
--------------------
                                IMPERVIOUS      PERVIOUS (i)
       Surface Area    (ha)=       0.25            0.31
       Dep. Storage    (mm)=       2.00            5.00
       Average Slope   (%)=        1.00            2.00
       Length          (m)=      260.00           25.00
       Mannings n       =         0.013           0.290

       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   2.03 | 6.250  49.78 | 9.33   1.02
                0.167  0.00 | 3.250   2.03 | 6.333   9.14 | 9.42   1.02
                0.250  0.00 | 3.333   3.05 | 6.417   9.14 | 9.50   1.02
                0.333  1.02 | 3.417   3.05 | 6.500   9.14 | 9.58   2.03
                0.417  1.02 | 3.500   3.05 | 6.583  10.16 | 9.67   2.03
                0.500  1.02 | 3.583   2.03 | 6.667  10.16 | 9.75   2.03
                0.583  1.02 | 3.667   2.03 | 6.750  10.16 | 9.83   2.03
                0.667  1.02 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
                0.750  1.02 | 3.833   2.03 | 6.917   5.08 | 10.00  2.03
                0.833  1.02 | 3.917   2.03 | 7.000   5.08 | 10.08  1.02
                0.917  1.02 | 4.000   2.03 | 7.083   4.06 | 10.17  1.02
                1.000  1.02 | 4.083   2.03 | 7.167   4.06 | 10.25  1.02
                1.083  1.02 | 4.167   2.03 | 7.250   4.06 | 10.33  1.02
                1.167  1.02 | 4.250   2.03 | 7.333   3.05 | 10.42  1.02
                1.250  1.02 | 4.333   4.06 | 7.417   3.05 | 10.50  1.02
                1.333  1.02 | 4.417   4.06 | 7.500   3.05 | 10.58  1.02
                1.417  1.02 | 4.500   4.06 | 7.583   3.05 | 10.67  1.02
                1.500  1.02 | 4.583   4.06 | 7.667   3.05 | 10.75  1.02
                1.583  2.03 | 4.667   4.06 | 7.750   3.05 | 10.83  2.03
                1.667  2.03 | 4.750   4.06 | 7.833   4.06 | 10.92  2.03
                1.750  2.03 | 4.833   4.06 | 7.917   4.06 | 11.00  2.03
                1.833  1.02 | 4.917   4.06 | 8.000   4.06 | 11.08  1.02
                1.917  1.02 | 5.000   4.06 | 8.083   3.05 | 11.17  1.02
                2.000  1.02 | 5.083   3.05 | 8.167   3.05 | 11.25  1.02
                2.083  1.02 | 5.167   3.05 | 8.250   3.05 | 11.33  1.02
                2.167  1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  1.02
                2.250  1.02 | 5.333   7.11 | 8.417   2.03 | 11.50  1.02
                2.333  2.03 | 5.417   7.11 | 8.500   2.03 | 11.58  1.02
                2.417  2.03 | 5.500   7.11 | 8.583   2.03 | 11.67  1.02
                2.500  2.03 | 5.583   7.11 | 8.667   2.03 | 11.75  1.02
                2.583  2.03 | 5.667   7.11 | 8.750   2.03 | 11.83  1.02
                2.667  2.03 | 5.750   7.11 | 8.833   3.05 | 11.92  1.02
                2.750  2.03 | 5.833  49.78 | 8.917   3.05 | 12.00  1.02
                2.833  2.03 | 5.917  49.78 | 9.000   3.05 | 12.08  1.02
                2.917  2.03 | 6.000  49.78 | 9.083   2.03 | 12.17  1.02
                3.000  2.03 | 6.083  49.78 | 9.167   2.03 | 12.25  1.02
                3.083  2.03 | 6.167  49.78 | 9.250   2.03 |
```

```
       Max.Eff.Inten.(mm/hr)=     49.78           34.06
                  over (min)      5.00           15.00
       Storage Coeff.  (min)=     5.99 (ii)      14.94 (ii)
       Unit Hyd. Tpeak (min)=     5.00           15.00
       Unit Hyd. peak  (cms)=     0.19            0.08
                                                         *TOTALS*
       PEAK FLOW       (cms)=     0.03            0.02        0.055 (iii)
       TIME TO PEAK    (hrs)=     6.25            6.33        6.25
       RUNOFF VOLUME   (mm)=     53.37           28.73       39.80
       TOTAL RAINFALL  (mm)=     55.37           55.37       55.37
       RUNOFF COEFFICIENT  =      0.96            0.52        0.72
```

```
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 87.0   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  ( 0430)|
|  1 + 2 = 3      |      AREA    QPEAK   TPEAK    R.V.
--------------------      (ha)   (cms)   (hrs)    (mm)
        ID1= 1 ( 0155):   0.56   0.055    6.25    39.80
      + ID2= 2 ( 0160):   0.43   0.047    6.25    43.53
        ===================================================
        ID = 3 ( 0430):   0.99   0.102    6.25    41.42

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0150)|   Area    (ha)=  3.81
|ID= 1 DT= 5.0 min |   Total Imp(%)= 94.00   Dir. Conn.(%)= 94.00
--------------------
                                IMPERVIOUS      PERVIOUS (i)
       Surface Area    (ha)=       3.58            0.23
       Dep. Storage    (mm)=       2.00            5.00
       Average Slope   (%)=        1.00            2.00
       Length          (m)=      150.00           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 | 3.167   2.03 | 6.250  49.78 | 9.33   1.02
          0.167  0.00 | 3.250   2.03 | 6.333   9.14 | 9.42   1.02
          0.250  0.00 | 3.333   3.05 | 6.417   9.14 | 9.50   1.02
          0.333  1.02 | 3.417   3.05 | 6.500   9.14 | 9.58   2.03
          0.417  1.02 | 3.500   3.05 | 6.583  10.16 | 9.67   2.03
          0.500  1.02 | 3.583   2.03 | 6.667  10.16 | 9.75   2.03
          0.583  1.02 | 3.667   2.03 | 6.750  10.16 | 9.83   2.03
          0.667  1.02 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
          0.750  1.02 | 3.833   2.03 | 6.917   5.08 | 10.00  2.03
          0.833  1.02 | 3.917   2.03 | 7.000   5.08 | 10.08  1.02
          0.917  1.02 | 4.000   2.03 | 7.083   4.06 | 10.17  1.02
          1.000  1.02 | 4.083   2.03 | 7.167   4.06 | 10.25  1.02
          1.083  1.02 | 4.167   2.03 | 7.250   4.06 | 10.33  1.02
          1.167  1.02 | 4.250   2.03 | 7.333   3.05 | 10.42  1.02
          1.250  1.02 | 4.333   4.06 | 7.417   3.05 | 10.50  1.02
          1.333  1.02 | 4.417   4.06 | 7.500   3.05 | 10.58  1.02
          1.417  1.02 | 4.500   4.06 | 7.583   3.05 | 10.67  1.02
          1.500  1.02 | 4.583   4.06 | 7.667   3.05 | 10.75  1.02
```

```
                1.583  2.03 | 4.667   4.06 | 7.750   3.05 | 10.83  2.03
                1.667  2.03 | 4.750   4.06 | 7.833   4.06 | 10.92  2.03
                1.750  2.03 | 4.833   4.06 | 7.917   4.06 | 11.00  2.03
                1.833  1.02 | 4.917   4.06 | 8.000   4.06 | 11.08  1.02
                1.917  1.02 | 5.000   4.06 | 8.083   3.05 | 11.17  1.02
                2.000  1.02 | 5.083   3.05 | 8.167   3.05 | 11.25  1.02
                2.083  1.02 | 5.167   3.05 | 8.250   3.05 | 11.33  1.02
                2.167  1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  1.02
                2.250  1.02 | 5.333   7.11 | 8.417   2.03 | 11.50  1.02
                2.333  2.03 | 5.417   7.11 | 8.500   2.03 | 11.58  1.02
                2.417  2.03 | 5.500   7.11 | 8.583   2.03 | 11.67  1.02
                2.500  2.03 | 5.583   7.11 | 8.667   2.03 | 11.75  1.02
                2.583  2.03 | 5.667   7.11 | 8.750   2.03 | 11.83  1.02
                2.667  2.03 | 5.750   7.11 | 8.833   3.05 | 11.92  1.02
                2.750  2.03 | 5.833  49.78 | 8.917   3.05 | 12.00  1.02
                2.833  2.03 | 5.917  49.78 | 9.000   3.05 | 12.08  1.02
                2.917  2.03 | 6.000  49.78 | 9.083   2.03 | 12.17  1.02
                3.000  2.03 | 6.083  49.78 | 9.167   2.03 | 12.25  1.02
                3.083  2.03 | 6.167  49.78 | 9.250   2.03 |
```

```
       Max.Eff.Inten.(mm/hr)=     49.78           35.30
                  over (min)      5.00           10.00
       Storage Coeff.  (min)=     4.31 (ii)       7.41 (ii)
       Unit Hyd. Tpeak (min)=     5.00           10.00
       Unit Hyd. peak  (cms)=     0.23            0.13
                                                         *TOTALS*
       PEAK FLOW       (cms)=     0.49            0.02        0.515 (iii)
       TIME TO PEAK    (hrs)=     6.25            6.25        6.25
       RUNOFF VOLUME   (mm)=     53.37           29.85       51.96
       TOTAL RAINFALL  (mm)=     55.37           55.37       55.37
       RUNOFF COEFFICIENT  =      0.96            0.54        0.94
```

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

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 88.0   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  ( 0440)|
|  1 + 2 = 3      |      AREA    QPEAK   TPEAK    R.V.
--------------------      (ha)   (cms)   (hrs)    (mm)
        ID1= 1 ( 0150):   3.81   0.515    6.25    51.96
      + ID2= 2 ( 0430):   0.99   0.102    6.25    41.42
        ===================================================
        ID = 3 ( 0440):   4.80   0.617    6.25    49.79

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

LangstaffRd_EA_Existing_WestDonWatershd
```
--------------------
| CALIB           |
| STANDHYD ( 0185)|   Area      (ha)=   0.47
|ID= 1 DT= 5.0 min |   Total Imp(%)= 48.00   Dir. Conn.(%)= 48.00
--------------------
                              IMPERVIOUS   PERVIOUS (i)
     Surface Area    (ha)=      0.23         0.24
     Dep. Storage    (mm)=      2.00         5.00
     Average Slope   (%)=       1.00         2.00
     Length          (m)=     240.00        20.00
     Mannings n       =        0.013         0.350

        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  2.03 | 6.250  49.78 | 9.33   1.02
         0.167   0.00 | 3.250  2.03 | 6.333  9.14  | 9.42   1.02
         0.250   0.00 | 3.333  3.05 | 6.417  9.14  | 9.50   1.02
         0.333   1.02 | 3.417  3.05 | 6.500  9.14  | 9.58   2.03
         0.417   1.02 | 3.500  3.05 | 6.583  10.16 | 9.67   2.03
         0.500   1.02 | 3.583  2.03 | 6.667  10.16 | 9.75   2.03
         0.583   1.02 | 3.667  2.03 | 6.750  10.16 | 9.83   2.03
         0.667   1.02 | 3.750  2.03 | 6.833  5.08  | 9.92   2.03
         0.750   1.02 | 3.833  2.03 | 6.917  5.08  | 10.00  2.03
         0.833   1.02 | 3.917  2.03 | 7.000  5.08  | 10.08  1.02
         0.917   1.02 | 4.000  2.03 | 7.083  4.06  | 10.17  1.02
         1.000   1.02 | 4.083  2.03 | 7.167  4.06  | 10.25  1.02
         1.083   1.02 | 4.167  2.03 | 7.250  4.06  | 10.33  1.02
         1.167   1.02 | 4.250  2.03 | 7.333  3.05  | 10.42  1.02
         1.250   1.02 | 4.333  4.06 | 7.417  3.05  | 10.50  1.02
         1.333   1.02 | 4.417  4.06 | 7.500  3.05  | 10.58  1.02
         1.417   1.02 | 4.500  4.06 | 7.583  3.05  | 10.67  1.02
         1.500   1.02 | 4.583  4.06 | 7.667  3.05  | 10.75  1.02
         1.583   2.03 | 4.667  4.06 | 7.750  3.05  | 10.83  2.03
         1.667   2.03 | 4.750  4.06 | 7.833  4.06  | 10.92  2.03
         1.750   2.03 | 4.833  4.06 | 7.917  4.06  | 11.00  2.03
         1.833   1.02 | 4.917  4.06 | 8.000  4.06  | 11.08  1.02
         1.917   1.02 | 5.000  4.06 | 8.083  3.05  | 11.17  1.02
         2.000   1.02 | 5.083  3.05 | 8.167  3.05  | 11.25  1.02
         2.083   1.02 | 5.167  3.05 | 8.250  3.05  | 11.33  1.02
         2.167   1.02 | 5.250  3.05 | 8.333  2.03  | 11.42  1.02
         2.250   1.02 | 5.333  7.11 | 8.417  2.03  | 11.50  1.02
         2.333   2.03 | 5.417  7.11 | 8.500  2.03  | 11.58  1.02
         2.417   2.03 | 5.500  7.11 | 8.583  2.03  | 11.67  1.02
         2.500   2.03 | 5.583  7.11 | 8.667  2.03  | 11.75  1.02
         2.583   2.03 | 5.667  7.11 | 8.750  2.03  | 11.83  1.02
         2.667   2.03 | 5.750  7.11 | 8.833  3.05  | 11.92  1.02
         2.750   2.03 | 5.833  49.78| 8.917  3.05  | 12.00  1.02
         2.833   2.03 | 5.917  49.78| 9.000  3.05  | 12.08  1.02
         2.917   2.03 | 6.000  49.78| 9.083  2.03  | 12.17  1.02
```

LangstaffRd_EA_Existing_WestDonWatershd
```
         3.000  2.03 | 6.083  49.78 | 9.167   2.03 | 12.25  1.02
         3.083  2.03 | 6.167  49.78 | 9.250   2.03 |

     Max.Eff.Inten.(mm/hr)=    49.78        25.73
                over (min)     5.00        20.00
     Storage Coeff.  (min)=    5.71 (ii)   15.52 (ii)
     Unit Hyd. Tpeak (min)=    5.00        20.00
     Unit Hyd. peak  (cms)=    0.20         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=    0.03         0.01        0.041 (iii)
     TIME TO PEAK    (hrs)=    6.25         6.42        6.25
     RUNOFF VOLUME   (mm)=    53.37        21.52       36.79
     TOTAL RAINFALL  (mm)=    55.37        55.37       55.37
     RUNOFF COEFFICIENT  =     0.96         0.39        0.66

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0   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 ( 0180)|   Area     (ha)=   0.65
|ID= 1 DT= 5.0 min |   Total Imp(%)= 33.00   Dir. Conn.(%)= 33.00
--------------------
                              IMPERVIOUS   PERVIOUS (i)
     Surface Area    (ha)=      0.21         0.44
     Dep. Storage    (mm)=      2.00         5.00
     Average Slope   (%)=       1.00         2.00
     Length          (m)=      65.83        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 | 3.167  2.03 | 6.250  49.78 | 9.33   1.02
         0.167   0.00 | 3.250  2.03 | 6.333  9.14  | 9.42   1.02
         0.250   0.00 | 3.333  3.05 | 6.417  9.14  | 9.50   1.02
         0.333   1.02 | 3.417  3.05 | 6.500  9.14  | 9.58   2.03
         0.417   1.02 | 3.500  3.05 | 6.583  10.16 | 9.67   2.03
         0.500   1.02 | 3.583  2.03 | 6.667  10.16 | 9.75   2.03
         0.583   1.02 | 3.667  2.03 | 6.750  10.16 | 9.83   2.03
         0.667   1.02 | 3.750  2.03 | 6.833  5.08  | 9.92   2.03
         0.750   1.02 | 3.833  2.03 | 6.917  5.08  | 10.00  2.03
         0.833   1.02 | 3.917  2.03 | 7.000  5.08  | 10.08  1.02
         0.917   1.02 | 4.000  2.03 | 7.083  4.06  | 10.17  1.02
         1.000   1.02 | 4.083  2.03 | 7.167  4.06  | 10.25  1.02
```

LangstaffRd_EA_Existing_WestDonWatershd
```
         1.083  1.02 | 4.167  2.03 | 7.250  4.06 | 10.33  1.02
         1.167  1.02 | 4.250  2.03 | 7.333  3.05 | 10.42  1.02
         1.250  1.02 | 4.333  4.06 | 7.417  3.05 | 10.50  1.02
         1.333  1.02 | 4.417  4.06 | 7.500  3.05 | 10.58  1.02
         1.417  1.02 | 4.500  4.06 | 7.583  3.05 | 10.67  1.02
         1.500  1.02 | 4.583  4.06 | 7.667  3.05 | 10.75  1.02
         1.583  2.03 | 4.667  4.06 | 7.750  3.05 | 10.83  2.03
         1.667  2.03 | 4.750  4.06 | 7.833  4.06 | 10.92  2.03
         1.750  2.03 | 4.833  4.06 | 7.917  4.06 | 11.00  2.03
         1.833  1.02 | 4.917  4.06 | 8.000  4.06 | 11.08  1.02
         1.917  1.02 | 5.000  4.06 | 8.083  3.05 | 11.17  1.02
         2.000  1.02 | 5.083  3.05 | 8.167  3.05 | 11.25  1.02
         2.083  1.02 | 5.167  3.05 | 8.250  3.05 | 11.33  1.02
         2.167  1.02 | 5.250  3.05 | 8.333  2.03 | 11.42  1.02
         2.250  1.02 | 5.333  7.11 | 8.417  2.03 | 11.50  1.02
         2.333  2.03 | 5.417  7.11 | 8.500  2.03 | 11.58  1.02
         2.417  2.03 | 5.500  7.11 | 8.583  2.03 | 11.67  1.02
         2.500  2.03 | 5.583  7.11 | 8.667  2.03 | 11.75  1.02
         2.583  2.03 | 5.667  7.11 | 8.750  2.03 | 11.83  1.02
         2.667  2.03 | 5.750  7.11 | 8.833  3.05 | 11.92  1.02
         2.750  2.03 | 5.833  49.78| 8.917  3.05 | 12.00  1.02
         2.833  2.03 | 5.917  49.78| 9.000  3.05 | 12.08  1.02
         2.917  2.03 | 6.000  49.78| 9.083  2.03 | 12.17  1.02
         3.000  2.03 | 6.083  49.78| 9.167  2.03 | 12.25  1.02
         3.083  2.03 | 6.167  49.78| 9.250  2.03 |

     Max.Eff.Inten.(mm/hr)=    49.78        28.42
                over (min)     5.00        15.00
     Storage Coeff.  (min)=    2.63 (ii)   14.30 (ii)
     Unit Hyd. Tpeak (min)=    5.00        15.00
     Unit Hyd. peak  (cms)=    0.29         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=    0.03         0.03        0.054 (iii)
     TIME TO PEAK    (hrs)=    6.25         6.33        6.25
     RUNOFF VOLUME   (mm)=    53.37        24.78       34.20
     TOTAL RAINFALL  (mm)=    55.37        55.37       55.37
     RUNOFF COEFFICIENT  =     0.96         0.45        0.62

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

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  83.0   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 ( 0445)|
|  1 + 2 = 3      |          AREA    QPEAK    TPEAK    R.V.
--------------------          (ha)    (cms)    (hrs)    (mm)
      ID1= 1 ( 0180):    0.65    0.054    6.25    34.20
```

LangstaffRd_EA_Existing_WestDonWatershd
```
   + ID2= 2 ( 0185):    0.47    0.041    6.25    36.79
     ========================================================
     ID = 3 ( 0445):    1.12    0.095    6.25    35.29

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

----------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0165)|   Area     (ha)=   0.60
|ID= 1 DT= 5.0 min |   Total Imp(%)= 40.00   Dir. Conn.(%)= 40.00
--------------------
                              IMPERVIOUS   PERVIOUS (i)
     Surface Area    (ha)=      0.24         0.36
     Dep. Storage    (mm)=      2.00         5.00
     Average Slope   (%)=       1.00         2.00
     Length          (m)=     250.00        20.00
     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 | 3.167  2.03 | 6.250  49.78 | 9.33   1.02
         0.167   0.00 | 3.250  2.03 | 6.333  9.14  | 9.42   1.02
         0.250   0.00 | 3.333  3.05 | 6.417  9.14  | 9.50   1.02
         0.333   1.02 | 3.417  3.05 | 6.500  9.14  | 9.58   2.03
         0.417   1.02 | 3.500  3.05 | 6.583  10.16 | 9.67   2.03
         0.500   1.02 | 3.583  2.03 | 6.667  10.16 | 9.75   2.03
         0.583   1.02 | 3.667  2.03 | 6.750  10.16 | 9.83   2.03
         0.667   1.02 | 3.750  2.03 | 6.833  5.08  | 9.92   2.03
         0.750   1.02 | 3.833  2.03 | 6.917  5.08  | 10.00  2.03
         0.833   1.02 | 3.917  2.03 | 7.000  5.08  | 10.08  1.02
         0.917   1.02 | 4.000  2.03 | 7.083  4.06  | 10.17  1.02
         1.000   1.02 | 4.083  2.03 | 7.167  4.06  | 10.25  1.02
         1.083   1.02 | 4.167  2.03 | 7.250  4.06  | 10.33  1.02
         1.167   1.02 | 4.250  2.03 | 7.333  3.05  | 10.42  1.02
         1.250   1.02 | 4.333  4.06 | 7.417  3.05  | 10.50  1.02
         1.333   1.02 | 4.417  4.06 | 7.500  3.05  | 10.58  1.02
         1.417   1.02 | 4.500  4.06 | 7.583  3.05  | 10.67  1.02
         1.500   1.02 | 4.583  4.06 | 7.667  3.05  | 10.75  1.02
         1.583   2.03 | 4.667  4.06 | 7.750  3.05  | 10.83  2.03
         1.667   2.03 | 4.750  4.06 | 7.833  4.06  | 10.92  2.03
         1.750   2.03 | 4.833  4.06 | 7.917  4.06  | 11.00  2.03
         1.833   1.02 | 4.917  4.06 | 8.000  4.06  | 11.08  1.02
         1.917   1.02 | 5.000  4.06 | 8.083  3.05  | 11.17  1.02
         2.000   1.02 | 5.083  3.05 | 8.167  3.05  | 11.25  1.02
         2.083   1.02 | 5.167  3.05 | 8.250  3.05  | 11.33  1.02
         2.167   1.02 | 5.250  3.05 | 8.333  2.03  | 11.42  1.02
         2.250   1.02 | 5.333  7.11 | 8.417  2.03  | 11.50  1.02
         2.333   2.03 | 5.417  7.11 | 8.500  2.03  | 11.58  1.02
         2.417   2.03 | 5.500  7.11 | 8.583  2.03  | 11.67  1.02
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                  LangstaffRd_EA_Existing_WestDonWatershd
        2.500  2.03 | 5.583   7.11 | 8.667   2.03 | 11.75  1.02
        2.583  2.03 | 5.667   7.11 | 8.750   2.03 | 11.83  1.02
        2.667  2.03 | 5.750   7.11 | 8.833   3.05 | 11.92  1.02
        2.750  2.03 | 5.833  49.78 | 8.917   3.05 | 12.00  1.02
        2.833  2.03 | 5.917  49.78 | 9.000   3.05 | 12.08  1.02
        2.917  2.03 | 6.000  49.78 | 9.083   2.03 | 12.17  1.02
        3.000  2.03 | 6.083  49.78 | 9.167   2.03 | 12.25  1.02
        3.083  2.03 | 6.167  49.78 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=    49.78        29.56
             over (min)        5.00        15.00
    Storage Coeff.  (min)=     5.85 (ii)   13.43 (ii)
    Unit Hyd. Tpeak (min)=     5.00        15.00
    Unit Hyd. peak  (cms)=     0.20         0.08
                                                *TOTALS*
    PEAK FLOW       (cms)=     0.03         0.02        0.054 (iii)
    TIME TO PEAK    (hrs)=     6.25         6.33        6.25
    RUNOFF VOLUME    (mm)=    53.37        24.78       36.20
    TOTAL RAINFALL   (mm)=    55.37        55.37       55.37
    RUNOFF COEFFICIENT  =      0.96         0.45        0.65

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0   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 ( 0170)|   Area   (ha)=  0.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 57.00  Dir. Conn.(%)= 57.00
--------------------
                        IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=   0.25         0.18
    Dep. Storage     (mm)=   2.00         5.00
    Average Slope    (%)=    1.00         2.00
    Length           (m)=  250.00        20.00
    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 | 3.167  2.03 | 6.250  49.78 | 9.33  1.02
          0.167  0.00 | 3.250  2.03 | 6.333   9.14 | 9.42  1.02
          0.250  0.00 | 3.333  3.05 | 6.417   9.14 | 9.50  1.02
          0.333  1.02 | 3.417  3.05 | 6.500   9.14 | 9.58  2.03
          0.417  1.02 | 3.500  3.05 | 6.583  10.16 | 9.67  2.03
          0.500  1.02 | 3.583  2.03 | 6.667  10.16 | 9.75  2.03
                              Page 57
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                  LangstaffRd_EA_Existing_WestDonWatershd
        0.583  1.02 | 3.667   2.03 | 6.750  10.16 | 9.83  2.03
        0.667  1.02 | 3.750   2.03 | 6.833   5.08 | 9.92  2.03
        0.750  1.02 | 3.833   2.03 | 6.917   5.08 | 10.00 2.03
        0.833  1.02 | 3.917   2.03 | 7.000   5.08 | 10.08 1.02
        0.917  1.02 | 4.083   2.03 | 7.083   4.06 | 10.17 1.02
        1.000  1.02 | 4.083   2.03 | 7.167   4.06 | 10.25 1.02
        1.083  1.02 | 4.250   2.03 | 7.250   4.06 | 10.33 1.02
        1.167  1.02 | 4.250   2.03 | 7.333   3.05 | 10.42 1.02
        1.250  1.02 | 4.333   4.06 | 7.417   3.05 | 10.50 1.02
        1.333  1.02 | 4.417   4.06 | 7.500   3.05 | 10.58 1.02
        1.417  1.02 | 4.500   4.06 | 7.583   3.05 | 10.67 1.02
        1.500  1.02 | 4.583   4.06 | 7.667   3.05 | 10.75 1.02
        1.583  2.03 | 4.667   4.06 | 7.750   3.05 | 10.83 2.03
        1.667  2.03 | 4.750   4.06 | 7.833   4.06 | 10.92 2.03
        1.750  2.03 | 4.833   4.06 | 7.917   4.06 | 11.00 2.03
        1.833  1.02 | 4.917   4.06 | 8.000   4.06 | 11.08 1.02
        1.917  1.02 | 5.000   4.06 | 8.083   3.05 | 11.17 1.02
        2.000  1.02 | 5.083   3.05 | 8.167   3.05 | 11.25 1.02
        2.083  1.02 | 5.167   3.05 | 8.250   3.05 | 11.33 1.02
        2.167  1.02 | 5.250   3.05 | 8.333   2.03 | 11.42 1.02
        2.250  1.02 | 5.333   7.11 | 8.417   2.03 | 11.50 1.02
        2.333  2.03 | 5.417   7.11 | 8.500   2.03 | 11.58 1.02
        2.417  2.03 | 5.500   7.11 | 8.583   2.03 | 11.67 1.02
        2.500  2.03 | 5.583   7.11 | 8.667   2.03 | 11.75 1.02
        2.583  2.03 | 5.667   7.11 | 8.750   2.03 | 11.83 1.02
        2.667  2.03 | 5.750   7.11 | 8.833   3.05 | 11.92 1.02
        2.750  2.03 | 5.833  49.78 | 8.917   3.05 | 12.00 1.02
        2.833  2.03 | 5.917  49.78 | 9.000   3.05 | 12.08 1.02
        2.917  2.03 | 6.000  49.78 | 9.083   2.03 | 12.17 1.02
        3.000  2.03 | 6.083  49.78 | 9.167   2.03 | 12.25 1.02
        3.083  2.03 | 6.167  49.78 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=    49.78        36.58
             over (min)        5.00        15.00
    Storage Coeff.  (min)=     5.85 (ii)   12.81 (ii)
    Unit Hyd. Tpeak (min)=     5.00        15.00
    Unit Hyd. peak  (cms)=     0.20         0.08
                                                *TOTALS*
    PEAK FLOW       (cms)=     0.03         0.01        0.048 (iii)
    TIME TO PEAK    (hrs)=     6.25         6.33        6.25
    RUNOFF VOLUME    (mm)=    53.37        31.03       43.75
    TOTAL RAINFALL   (mm)=    55.37        55.37       55.37
    RUNOFF COEFFICIENT  =      0.96         0.56        0.79

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 89.0   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.

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                              Page 58
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                  LangstaffRd_EA_Existing_WestDonWatershd
--------------------
| ADD HYD ( 0450)|
|  1 + 2 = 3    |      AREA   QPEAK   TPEAK    R.V.
--------------------   (ha)   (cms)   (hrs)    (mm)
      ID1= 1 ( 0165):   0.60   0.054   6.25    36.20
    + ID2= 2 ( 0170):   0.43   0.048   6.25    43.75
      ===============================================
      ID = 3 ( 0450):   1.03   0.101   6.25    39.35

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------
--------------------
| ADD HYD ( 0450)|
|  3 + 2 = 1    |      AREA   QPEAK   TPEAK    R.V.
--------------------   (ha)   (cms)   (hrs)    (mm)
      ID1= 3 ( 0450):   1.03   0.101   6.25    39.35
    + ID2= 2 ( 0445):   1.12   0.095   6.25    35.29
      ===============================================
      ID = 1 ( 0450):   2.15   0.197   6.25    37.24

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD ( 0190)|   Area   (ha)=  0.86
|ID= 1 DT= 5.0 min |   Total Imp(%)= 42.00  Dir. Conn.(%)= 42.00
--------------------
                        IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=   0.36         0.50
    Dep. Storage     (mm)=   2.00         5.00
    Average Slope    (%)=    1.00         2.00
    Length           (m)=  340.00        50.00
    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 | 3.167  2.03 | 6.250  49.78 | 9.33  1.02
          0.167  0.00 | 3.250  2.03 | 6.333   9.14 | 9.42  1.02
          0.250  0.00 | 3.333  3.05 | 6.417   9.14 | 9.50  1.02
          0.333  1.02 | 3.417  3.05 | 6.500   9.14 | 9.58  2.03
          0.417  1.02 | 3.500  3.05 | 6.583  10.16 | 9.67  2.03
          0.500  1.02 | 3.583  2.03 | 6.667  10.16 | 9.75  2.03
          0.583  1.02 | 3.667  2.03 | 6.750  10.16 | 9.83  2.03
          0.667  1.02 | 3.750  2.03 | 6.833   5.08 | 9.92  2.03
          0.750  1.02 | 3.833  2.03 | 6.917   5.08 | 10.00 2.03
          0.833  1.02 | 3.917  2.03 | 7.000   5.08 | 10.08 1.02
          0.917  1.02 | 4.000  2.03 | 7.083   4.06 | 10.17 1.02
          1.000  1.02 | 4.083  2.03 | 7.167   4.06 | 10.25 1.02
                              Page 59
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                  LangstaffRd_EA_Existing_WestDonWatershd
        1.083  1.02 | 4.167   2.03 | 7.250   4.06 | 10.33 1.02
        1.167  1.02 | 4.250   2.03 | 7.333   3.05 | 10.42 1.02
        1.250  1.02 | 4.333   4.06 | 7.417   3.05 | 10.50 1.02
        1.333  1.02 | 4.417   4.06 | 7.500   3.05 | 10.58 1.02
        1.417  1.02 | 4.500   4.06 | 7.583   3.05 | 10.67 1.02
        1.500  1.02 | 4.583   4.06 | 7.667   3.05 | 10.75 1.02
        1.583  2.03 | 4.667   4.06 | 7.750   3.05 | 10.83 2.03
        1.667  2.03 | 4.750   4.06 | 7.833   4.06 | 10.92 2.03
        1.750  2.03 | 4.833   4.06 | 7.917   4.06 | 11.00 2.03
        1.833  1.02 | 4.917   4.06 | 8.000   4.06 | 11.08 1.02
        1.917  1.02 | 5.000   4.06 | 8.083   3.05 | 11.17 1.02
        2.000  1.02 | 5.083   3.05 | 8.167   3.05 | 11.25 1.02
        2.083  1.02 | 5.167   3.05 | 8.250   3.05 | 11.33 1.02
        2.167  1.02 | 5.250   3.05 | 8.333   2.03 | 11.42 1.02
        2.250  1.02 | 5.333   7.11 | 8.417   2.03 | 11.50 1.02
        2.333  2.03 | 5.417   7.11 | 8.500   2.03 | 11.58 1.02
        2.417  2.03 | 5.500   7.11 | 8.583   2.03 | 11.67 1.02
        2.500  2.03 | 5.583   7.11 | 8.667   2.03 | 11.75 1.02
        2.583  2.03 | 5.667   7.11 | 8.750   2.03 | 11.83 1.02
        2.667  2.03 | 5.750   7.11 | 8.833   3.05 | 11.92 1.02
        2.750  2.03 | 5.833  49.78 | 8.917   3.05 | 12.00 1.02
        2.833  2.03 | 5.917  49.78 | 9.000   3.05 | 12.08 1.02
        2.917  2.03 | 6.000  49.78 | 9.083   2.03 | 12.17 1.02
        3.000  2.03 | 6.083  49.78 | 9.167   2.03 | 12.25 1.02
        3.083  2.03 | 6.167  49.78 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=    49.78        28.42
             over (min)        5.00        25.00
    Storage Coeff.  (min)=     7.04 (ii)   20.38 (ii)
    Unit Hyd. Tpeak (min)=     5.00        25.00
    Unit Hyd. peak  (cms)=     0.17         0.05
                                                *TOTALS*
    PEAK FLOW       (cms)=     0.05         0.02        0.068 (iii)
    TIME TO PEAK    (hrs)=     6.25         6.50        6.25
    RUNOFF VOLUME    (mm)=    53.37        24.78       36.78
    TOTAL RAINFALL   (mm)=    55.37        55.37       55.37
    RUNOFF COEFFICIENT  =      0.96         0.45        0.66

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0   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 ( 0195)|   Area   (ha)=  0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)= 42.00  Dir. Conn.(%)= 42.00
--------------------
                        IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=   0.33         0.46
                              Page 60
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Page 61 (top-left)

LangstaffRd_EA_Existing_WestDonWatershd

Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	340.00	20.00
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	3.167	2.03	6.250	49.78	9.33	1.02
0.167	0.00	3.250	2.03	6.333	9.14	9.42	1.02
0.250	0.00	3.333	3.05	6.417	9.14	9.50	1.02
0.333	1.02	3.417	3.05	6.500	9.14	9.58	1.02
0.417	1.02	3.500	3.05	6.583	10.16	9.67	2.03
0.500	1.02	3.583	2.03	6.667	10.16	9.75	2.03
0.583	1.02	3.667	2.03	6.750	10.16	9.83	2.03
0.667	1.02	3.750	2.03	6.833	5.08	9.92	2.03
0.750	1.02	3.833	2.03	6.917	5.08	10.00	2.03
0.833	1.02	3.917	2.03	7.000	5.08	10.08	1.02
0.917	1.02	4.000	2.03	7.083	4.06	10.17	1.02
1.000	1.02	4.083	2.03	7.167	4.06	10.25	1.02
1.083	1.02	4.167	2.03	7.250	4.06	10.33	1.02
1.167	1.02	4.250	2.03	7.333	3.05	10.42	1.02
1.250	1.02	4.333	4.06	7.417	3.05	10.50	1.02
1.333	1.02	4.417	4.06	7.500	3.05	10.58	1.02
1.417	1.02	4.500	4.06	7.583	3.05	10.67	1.02
1.500	1.02	4.583	4.06	7.667	3.05	10.75	1.02
1.583	2.03	4.667	4.06	7.750	3.05	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	3.05	8.167	3.05	11.25	1.02
2.083	1.02	5.167	3.05	8.250	3.05	11.33	1.02
2.167	1.02	5.250	3.05	8.333	2.03	11.42	1.02
2.250	1.02	5.333	7.11	8.417	2.03	11.50	1.02
2.333	2.03	5.417	7.11	8.500	2.03	11.58	1.02
2.417	2.03	5.500	7.11	8.583	2.03	11.67	1.02
2.500	2.03	5.583	7.11	8.667	2.03	11.75	1.02
2.583	2.03	5.667	7.11	8.750	2.03	11.83	1.02
2.667	2.03	5.750	7.11	8.833	3.05	11.92	1.02
2.750	2.03	5.833	49.78	8.917	3.05	12.00	1.02
2.833	2.03	5.917	49.78	9.000	3.05	12.08	1.02
2.917	2.03	6.000	49.78	9.083	2.03	12.17	1.02
3.000	2.03	6.083	49.78	9.167	2.03	12.25	1.02
3.083	2.03	6.167	49.78	9.250	2.03		

Max.Eff.Inten.(mm/hr)=	49.78	29.56
over (min)	5.00	15.00
Storage Coeff. (min)=	7.04 (ii)	14.62 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00

Page 61

Page 62 (top-right)

LangstaffRd_EA_Existing_WestDonWatershd

				TOTALS
Unit Hyd. peak	(cms)=	0.17	0.08	
PEAK FLOW	(cms)=	0.05	0.03	0.071 (iii)
TIME TO PEAK	(hrs)=	6.25	6.33	6.25
RUNOFF VOLUME	(mm)=	53.37	24.78	36.78
TOTAL RAINFALL	(mm)=	55.37	55.37	55.37
RUNOFF COEFFICIENT	=	0.96	0.45	0.66

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
    CN* = 83.0   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 (0455)|
| 1 + 2 = 3 |

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0190):	0.86	0.068	6.25	36.78
+ ID2= 2 (0195):	0.79	0.071	6.25	36.78
ID = 3 (0455):	1.65	0.139	6.25	36.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0458)|
| 1 + 2 = 3 |

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0450):	2.15	0.197	6.25	37.24
+ ID2= 2 (0455):	1.65	0.139	6.25	36.78
ID = 3 (0458):	3.80	0.335	6.25	37.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0300)| Area (ha)= 10.00
|ID= 1 DT= 5.0 min | Total Imp(%)= 80.00   Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	8.00	2.00
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	258.20	40.00
Mannings n	=	0.013	0.250

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

Page 62

Page 63 (bottom-left)

LangstaffRd_EA_Existing_WestDonWatershd

---- 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	2.03	6.250	49.78	9.33	1.02
0.167	0.00	3.250	2.03	6.333	9.14	9.42	1.02
0.250	0.00	3.333	3.05	6.417	9.14	9.50	1.02
0.333	1.02	3.417	3.05	6.500	9.14	9.58	2.03
0.417	1.02	3.500	3.05	6.583	10.16	9.67	2.03
0.500	1.02	3.583	2.03	6.667	10.16	9.75	2.03
0.583	1.02	3.667	2.03	6.750	10.16	9.83	2.03
0.667	1.02	3.750	2.03	6.833	5.08	9.92	2.03
0.750	1.02	3.833	2.03	6.917	5.08	10.00	2.03
0.833	1.02	3.917	2.03	7.000	5.08	10.08	1.02
0.917	1.02	4.000	2.03	7.083	4.06	10.17	1.02
1.000	1.02	4.083	2.03	7.167	4.06	10.25	1.02
1.083	1.02	4.167	2.03	7.250	4.06	10.33	1.02
1.167	1.02	4.250	2.03	7.333	3.05	10.42	1.02
1.250	1.02	4.333	4.06	7.417	3.05	10.50	1.02
1.333	1.02	4.417	4.06	7.500	3.05	10.58	1.02
1.417	1.02	4.500	4.06	7.583	3.05	10.67	1.02
1.500	1.02	4.583	4.06	7.667	3.05	10.75	1.02
1.583	2.03	4.667	4.06	7.750	3.05	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	3.05	8.167	3.05	11.25	1.02
2.083	1.02	5.167	3.05	8.250	3.05	11.33	1.02
2.167	1.02	5.250	3.05	8.333	2.03	11.42	1.02
2.250	1.02	5.333	7.11	8.417	2.03	11.50	1.02
2.333	2.03	5.417	7.11	8.500	2.03	11.58	1.02
2.417	2.03	5.500	7.11	8.583	2.03	11.67	1.02
2.500	2.03	5.583	7.11	8.667	2.03	11.75	1.02
2.583	2.03	5.667	7.11	8.750	2.03	11.83	1.02
2.667	2.03	5.750	7.11	8.833	3.05	11.92	1.02
2.750	2.03	5.833	49.78	8.917	3.05	12.00	1.02
2.833	2.03	5.917	49.78	9.000	3.05	12.08	1.02
2.917	2.03	6.000	49.78	9.083	2.03	12.17	1.02
3.000	2.03	6.083	49.78	9.167	2.03	12.25	1.02
3.083	2.03	6.167	49.78	9.250	2.03		

Max.Eff.Inten.(mm/hr)=	49.78	24.61
over (min)	5.00	20.00
Storage Coeff. (min)=	5.97 (ii)	18.33 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06

				TOTALS
PEAK FLOW	(cms)=	1.10	0.09	1.176 (iii)
TIME TO PEAK	(hrs)=	6.25	6.42	6.25
RUNOFF VOLUME	(mm)=	54.37	21.52	47.80
TOTAL RAINFALL	(mm)=	55.37	55.37	55.37

Page 63

Page 64 (bottom-right)

LangstaffRd_EA_Existing_WestDonWatershd

RUNOFF COEFFICIENT	=	0.98	0.39	0.86

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
    CN* = 79.0   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 (0350)| Area (ha)= 0.90
|ID= 1 DT= 5.0 min | Total Imp(%)= 70.00   Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.63	0.27
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	77.46	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	3.167	2.03	6.250	49.78	9.33	1.02
0.167	0.00	3.250	2.03	6.333	9.14	9.42	1.02
0.250	0.00	3.333	3.05	6.417	9.14	9.50	1.02
0.333	1.02	3.417	3.05	6.500	9.14	9.58	2.03
0.417	1.02	3.500	3.05	6.583	10.16	9.67	2.03
0.500	1.02	3.583	2.03	6.667	10.16	9.75	2.03
0.583	1.02	3.667	2.03	6.750	10.16	9.83	2.03
0.667	1.02	3.750	2.03	6.833	5.08	9.92	2.03
0.750	1.02	3.833	2.03	6.917	5.08	10.00	2.03
0.833	1.02	3.917	2.03	7.000	5.08	10.08	1.02
0.917	1.02	4.000	2.03	7.083	4.06	10.17	1.02
1.000	1.02	4.083	2.03	7.167	4.06	10.25	1.02
1.083	1.02	4.167	2.03	7.250	4.06	10.33	1.02
1.167	1.02	4.250	2.03	7.333	3.05	10.42	1.02
1.250	1.02	4.333	4.06	7.417	3.05	10.50	1.02
1.333	1.02	4.417	4.06	7.500	3.05	10.58	1.02
1.417	1.02	4.500	4.06	7.583	3.05	10.67	1.02
1.500	1.02	4.583	4.06	7.667	3.05	10.75	1.02
1.583	2.03	4.667	4.06	7.750	3.05	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	3.05	8.167	3.05	11.25	1.02
2.083	1.02	5.167	3.05	8.250	3.05	11.33	1.02

Page 64

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                  LangstaffRd_EA_Existing_WestDonWatershd
          2.167   1.02 |  5.250   3.05 |  8.333   2.03 | 11.42   1.02
          2.250   1.02 |  5.333   7.11 |  8.417   2.03 | 11.50   1.02
          2.333   2.03 |  5.417   7.11 |  8.500   2.03 | 11.58   1.02
          2.417   2.03 |  5.500   7.11 |  8.583   2.03 | 11.67   1.02
          2.500   2.03 |  5.583   7.11 |  8.667   2.03 | 11.75   1.02
          2.583   2.03 |  5.667   7.11 |  8.750   2.03 | 11.83   1.02
          2.667   2.03 |  5.750   7.11 |  8.833   3.05 | 11.92   1.02
          2.750   2.03 |  5.833  49.78 |  8.917   3.05 | 12.00   1.02
          2.833   2.03 |  5.917  49.78 |  9.000   3.05 | 12.08   1.02
          2.917   2.03 |  6.000  49.78 |  9.083   2.03 | 12.17   1.02
          3.000   2.03 |  6.083  49.78 |  9.167   2.03 | 12.25   1.02
          3.083   2.03 |  6.167  49.78 |  9.250   2.03 |

   Max.Eff.Inten.(mm/hr)=   49.78       24.61
             over (min)      5.00       20.00
   Storage Coeff.  (min)=    2.90 (ii)  15.26 (ii)
   Unit Hyd. Tpeak (min)=    5.00       20.00
   Unit Hyd. peak  (cms)=    0.28        0.07
                                                    *TOTALS*
   PEAK FLOW      (cms)=     0.09        0.01        0.098 (iii)
   TIME TO PEAK   (hrs)=     6.25        6.42        6.25
   RUNOFF VOLUME   (mm)=    54.37       21.52       44.51
   TOTAL RAINFALL  (mm)=    55.37       55.37       55.37
   RUNOFF COEFFICIENT =     0.98        0.39        0.80

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 79.0   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 ( 0375)|
|  1 + 2 = 3   |         AREA    QPEAK    TPEAK    R.V.
--------------------     (ha)    (cms)    (hrs)    (mm)
      ID1= 1 ( 0300):   10.00   1.176    6.25    47.80
    + ID2= 2 ( 0350):    0.90   0.098    6.25    44.51
      ============================================
      ID = 3 ( 0375):   10.90   1.274    6.25    47.53

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
*********************************
** SIMULATION:Run 04        **
*********************************

--------------------
|  READ STORM  |  Filename: C:\Users\ray.zhao\AppD
|            |              ata\Local\Temp\
```

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                  LangstaffRd_EA_Existing_WestDonWatershd
|            |         278a4b54-8409-4519-9819-1b44900a1c25\c585f216
| Ptotal= 63.75 mm |  Comments: 10yr-12hrSCS
--------------------

          TIME   RAIN | TIME   RAIN |' TIME   RAIN | TIME   RAIN
          hrs   mm/hr | hrs   mm/hr |  hrs   mm/hr | hrs   mm/hr
          0.25   0.00 | 3.50   3.05 | 6.75  11.18 | 10.00   2.03
          0.50   1.02 | 3.75   2.03 | 7.00   5.08 | 10.25   2.03
          0.75   2.03 | 4.00   3.05 | 7.25   5.08 | 10.50   1.02
          1.00   1.02 | 4.25   2.03 | 7.50   4.06 | 10.75   1.02
          1.25   1.02 | 4.50   5.08 | 7.75   4.06 | 11.00   2.03
          1.50   1.02 | 4.75   4.06 | 8.00   4.06 | 11.25   1.02
          1.75   2.03 | 5.00   4.06 | 8.25   3.05 | 11.50   1.02
          2.00   1.02 | 5.25   5.08 | 8.50   3.05 | 11.75   1.02
          2.25   1.02 | 5.50   7.11 | 8.75   2.03 | 12.00   2.03
          2.50   3.05 | 5.75   8.13 | 9.00   3.05 | 12.25   1.02
          2.75   2.03 | 6.00  56.90 | 9.25   2.03 |
          3.00   3.05 | 6.25  57.91 | 9.50   2.03 |
          3.25   2.03 | 6.50  11.18 | 9.75   2.03 |

--------------------------------------------------------------------------------

--------------------
| CALIB        |
| STANDHYD ( 0145)|  Area   (ha)=  3.05
|ID= 1 DT= 5.0 min |  Total Imp(%)= 62.00   Dir. Conn.(%)= 62.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
   Surface Area  (ha)=       1.89         1.16
   Dep. Storage  (mm)=       2.00         5.00
   Average Slope (%)=        1.00         2.00
   Length    (m)=          531.00        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 | 3.167  2.03 | 6.250  57.91 | 9.33   2.03
          0.167  0.00 | 3.250  2.03 | 6.333  11.18 | 9.42   2.03
          0.250  0.00 | 3.333  3.05 | 6.417  11.18 | 9.50   2.03
          0.333  1.02 | 3.417  3.05 | 6.500  11.18 | 9.58   2.03
          0.417  1.02 | 3.500  3.05 | 6.583  11.18 | 9.67   2.03
          0.500  1.02 | 3.583  2.03 | 6.667  11.18 | 9.75   2.03
          0.583  2.03 | 3.667  2.03 | 6.750  11.18 | 9.83   2.03
          0.667  2.03 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
          0.750  2.03 | 3.833  3.05 | 6.917   5.08 | 10.00  2.03
          0.833  1.02 | 3.917  3.05 | 7.000   5.08 | 10.08  2.03
          0.917  1.02 | 4.000  3.05 | 7.083   5.08 | 10.17  2.03
          1.000  1.02 | 4.083  2.03 | 7.167   5.08 | 10.25  2.03
          1.083  1.02 | 4.167  2.03 | 7.250   5.08 | 10.33  1.02
          1.167  1.02 | 4.250  2.03 | 7.333   4.06 | 10.42  1.02
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                  LangstaffRd_EA_Existing_WestDonWatershd
          1.250   1.02 |  4.333   5.08 |  7.417   4.06 | 10.50   1.02
          1.333   1.02 |  4.417   5.08 |  7.500   4.06 | 10.58   1.02
          1.417   1.02 |  4.500   5.08 |  7.583   4.06 | 10.67   1.02
          1.500   1.02 |  4.583   4.06 |  7.667   4.06 | 10.75   1.02
          1.583   2.03 |  4.667   4.06 |  7.750   4.06 | 10.83   2.03
          1.667   2.03 |  4.750   4.06 |  7.833   4.06 | 10.92   2.03
          1.750   2.03 |  4.833   4.06 |  7.917   4.06 | 11.00   2.03
          1.833   1.02 |  4.917   4.06 |  8.000   4.06 | 11.08   1.02
          1.917   1.02 |  5.000   4.06 |  8.083   3.05 | 11.17   1.02
          2.000   1.02 |  5.083   5.08 |  8.167   3.05 | 11.25   1.02
          2.083   1.02 |  5.167   5.08 |  8.250   3.05 | 11.33   1.02
          2.167   1.02 |  5.250   5.08 |  8.333   3.05 | 11.42   1.02
          2.250   1.02 |  5.333   7.11 |  8.417   3.05 | 11.50   1.02
          2.333   3.05 |  5.417   7.11 |  8.500   3.05 | 11.58   1.02
          2.417   3.05 |  5.500   7.11 |  8.583   2.03 | 11.67   1.02
          2.500   3.05 |  5.583   8.13 |  8.667   2.03 | 11.75   1.02
          2.583   2.03 |  5.667   8.13 |  8.750   2.03 | 11.83   2.03
          2.667   2.03 |  5.750   8.13 |  8.833   3.05 | 11.92   2.03
          2.750   2.03 |  5.833  56.90 |  8.917   3.05 | 12.00   2.03
          2.833   3.05 |  5.917  56.90 |  9.000   3.05 | 12.08   1.02
          2.917   3.05 |  6.000  56.90 |  9.083   2.03 | 12.17   1.02
          3.000   3.05 |  6.083  57.91 |  9.167   2.03 | 12.25   1.02
          3.083   2.03 |  6.167  57.91 |  9.250   2.03 |

   Max.Eff.Inten.(mm/hr)=   57.91       39.56
             over (min)     10.00       20.00
   Storage Coeff.  (min)=    8.66 (ii)  18.88 (ii)
   Unit Hyd. Tpeak (min)=   10.00       20.00
   Unit Hyd. peak  (cms)=    0.12        0.06
                                                    *TOTALS*
   PEAK FLOW      (cms)=     0.29        0.08        0.365 (iii)
   TIME TO PEAK   (hrs)=     6.25        6.42        6.25
   RUNOFF VOLUME   (mm)=    61.75       34.48       51.39
   TOTAL RAINFALL  (mm)=    63.75       63.75       63.75
   RUNOFF COEFFICIENT =     0.97        0.54        0.81


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 86.0   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 ( 0140)|  Area   (ha)=  1.27
|ID= 1 DT= 5.0 min |  Total Imp(%)= 52.00   Dir. Conn.(%)= 52.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
   Surface Area  (ha)=       0.66         0.61
   Dep. Storage  (mm)=       2.00         5.00
   Average Slope (%)=        1.00         2.00
```

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                  LangstaffRd_EA_Existing_WestDonWatershd
   Length    (m)=          503.00        25.00
   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 | 3.167  2.03 | 6.250  57.91 | 9.33   2.03
          0.167  0.00 | 3.250  2.03 | 6.333  11.18 | 9.42   2.03
          0.250  0.00 | 3.333  3.05 | 6.417  11.18 | 9.50   2.03
          0.333  1.02 | 3.417  3.05 | 6.500  11.18 | 9.58   2.03
          0.417  1.02 | 3.500  3.05 | 6.583  11.18 | 9.67   2.03
          0.500  1.02 | 3.583  2.03 | 6.667  11.18 | 9.75   2.03
          0.583  2.03 | 3.667  2.03 | 6.750  11.18 | 9.83   2.03
          0.667  2.03 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
          0.750  2.03 | 3.833  3.05 | 6.917   5.08 | 10.00  2.03
          0.833  1.02 | 3.917  3.05 | 7.000   5.08 | 10.08  2.03
          0.917  1.02 | 4.000  3.05 | 7.083   5.08 | 10.17  2.03
          1.000  1.02 | 4.083  2.03 | 7.167   5.08 | 10.25  2.03
          1.083  1.02 | 4.167  2.03 | 7.250   5.08 | 10.33  1.02
          1.167  1.02 | 4.250  2.03 | 7.333   4.06 | 10.42  1.02
          1.250  1.02 | 4.333  5.08 | 7.417   4.06 | 10.50  1.02
          1.333  1.02 | 4.417  5.08 | 7.500   4.06 | 10.58  1.02
          1.417  1.02 | 4.500  5.08 | 7.583   4.06 | 10.67  1.02
          1.500  1.02 | 4.583  4.06 | 7.667   4.06 | 10.75  1.02
          1.583  2.03 | 4.667  4.06 | 7.750   4.06 | 10.83  2.03
          1.667  2.03 | 4.750  4.06 | 7.833   4.06 | 10.92  2.03
          1.750  2.03 | 4.833  4.06 | 7.917   4.06 | 11.00  2.03
          1.833  1.02 | 4.917  4.06 | 8.000   4.06 | 11.08  1.02
          1.917  1.02 | 5.000  4.06 | 8.083   3.05 | 11.17  1.02
          2.000  1.02 | 5.083  5.08 | 8.167   3.05 | 11.25  1.02
          2.083  1.02 | 5.167  5.08 | 8.250   3.05 | 11.33  1.02
          2.167  1.02 | 5.250  5.08 | 8.333   3.05 | 11.42  1.02
          2.250  1.02 | 5.333  7.11 | 8.417   3.05 | 11.50  1.02
          2.333  3.05 | 5.417  7.11 | 8.500   3.05 | 11.58  1.02
          2.417  3.05 | 5.500  7.11 | 8.583   2.03 | 11.67  1.02
          2.500  3.05 | 5.583  8.13 | 8.667   2.03 | 11.75  1.02
          2.583  2.03 | 5.667  8.13 | 8.750   2.03 | 11.83  2.03
          2.667  2.03 | 5.750  8.13 | 8.833   3.05 | 11.92  2.03
          2.750  2.03 | 5.833 56.90 | 8.917   3.05 | 12.00  2.03
          2.833  3.05 | 5.917 56.90 | 9.000   3.05 | 12.08  1.02
          2.917  3.05 | 6.000 56.90 | 9.083   2.03 | 12.17  1.02
          3.000  3.05 | 6.083 57.91 | 9.167   2.03 | 12.25  1.02
          3.083  2.03 | 6.167 57.91 | 9.250   2.03 |

   Max.Eff.Inten.(mm/hr)=   57.91       37.09
             over (min)     10.00       20.00
   Storage Coeff.  (min)=    8.38 (ii)  16.29 (ii)
   Unit Hyd. Tpeak (min)=   10.00       20.00
   Unit Hyd. peak  (cms)=    0.12        0.06
                                                    *TOTALS*
```

Top-left panel (Page 69)

```
                  LangstaffRd_EA_Existing_WestDonWatershd
PEAK FLOW      (cms)=      0.10        0.04       0.139 (iii)
TIME TO PEAK   (hrs)=      6.25        6.42        6.25
RUNOFF VOLUME  (mm)=      61.75       31.16       47.06
TOTAL RAINFALL (mm)=      63.75       63.75       63.75
RUNOFF COEFFICIENT =       0.97        0.49        0.74


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 83.0   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 ( 0135)|   Area    (ha)=  1.43
|ID= 1 DT= 5.0 min |  Total Imp(%)= 40.00  Dir. Conn.(%)= 40.00
--------------------
                             IMPERVIOUS   PERVIOUS (i)
   Surface Area    (ha)=        0.57         0.86
   Dep. Storage    (mm)=        2.00         5.00
   Average Slope   (%)=         1.00         2.00
   Length          (m)=      503.00        30.00
   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 | 3.167  2.03 | 6.250 57.91 | 9.33  2.03
       0.167  0.00 | 3.250  2.03 | 6.333 11.18 | 9.42  2.03
       0.250  0.00 | 3.333  3.05 | 6.417 11.18 | 9.50  2.03
       0.333  1.02 | 3.417  3.05 | 6.500 11.18 | 9.58  2.03
       0.417  1.02 | 3.500  3.05 | 6.583 11.18 | 9.67  2.03
       0.500  1.02 | 3.583  2.03 | 6.667 11.18 | 9.75  2.03
       0.583  2.03 | 3.667  2.03 | 6.750 11.18 | 9.83  2.03
       0.667  2.03 | 3.750  2.03 | 6.833  5.08 | 9.92  2.03
       0.750  2.03 | 3.833  3.05 | 6.917  5.08 | 10.00 2.03
       0.833  1.02 | 3.917  3.05 | 7.000  5.08 | 10.08 2.03
       0.917  1.02 | 4.000  3.05 | 7.083  5.08 | 10.17 2.03
       1.000  1.02 | 4.083  2.03 | 7.167  5.08 | 10.25 2.03
       1.083  1.02 | 4.167  2.03 | 7.250  5.08 | 10.33 1.02
       1.167  1.02 | 4.250  2.03 | 7.333  4.06 | 10.42 1.02
       1.250  1.02 | 4.333  5.08 | 7.417  4.06 | 10.50 1.02
       1.333  1.02 | 4.417  5.08 | 7.500  4.06 | 10.58 1.02
       1.417  1.02 | 4.500  5.08 | 7.583  4.06 | 10.67 1.02
       1.500  1.02 | 4.583  4.06 | 7.667  4.06 | 10.75 1.02
       1.583  2.03 | 4.667  4.06 | 7.750  4.06 | 10.83 2.03
       1.667  2.03 | 4.750  4.06 | 7.833  4.06 | 10.92 2.03
       1.750  2.03 | 4.833  4.06 | 7.917  4.06 | 11.00 2.03
```

Top-right panel (Page 70)

```
                  LangstaffRd_EA_Existing_WestDonWatershd
       1.833  1.02 | 4.917  4.06 | 8.000  4.06 | 11.08 1.02
       1.917  1.02 | 5.000  4.06 | 8.083  3.05 | 11.17 1.02
       2.000  1.02 | 5.083  5.08 | 8.167  3.05 | 11.25 1.02
       2.083  1.02 | 5.167  5.08 | 8.250  3.05 | 11.33 1.02
       2.167  1.02 | 5.250  5.08 | 8.333  3.05 | 11.42 1.02
       2.250  1.02 | 5.333  7.11 | 8.417  3.05 | 11.50 1.02
       2.333  3.05 | 5.417  7.11 | 8.500  3.05 | 11.58 1.02
       2.417  3.05 | 5.500  7.11 | 8.583  2.03 | 11.67 1.02
       2.500  3.05 | 5.583  8.13 | 8.667  2.03 | 11.75 1.02
       2.583  2.03 | 5.667  8.13 | 8.750  2.03 | 11.83 2.03
       2.667  2.03 | 5.750  8.13 | 8.833  3.05 | 11.92 2.03
       2.750  2.03 | 5.833 56.90 | 8.917  3.05 | 12.00 2.03
       2.833  3.05 | 5.917 56.90 | 9.000  3.05 | 12.08 1.02
       2.917  3.05 | 6.000 56.90 | 9.083  2.03 | 12.17 1.02
       3.000  3.05 | 6.083 57.91 | 9.167  2.03 | 12.25 1.02
       3.083  2.03 | 6.167 57.91 | 9.250  2.03 |

   Max.Eff.Inten.(mm/hr)=    57.91        38.29
           over (min)        10.00        20.00
   Storage Coeff.  (min)=     8.38 (ii)  17.10 (ii)
   Unit Hyd. Tpeak (min)=    10.00        20.00
   Unit Hyd. peak  (cms)=     0.12         0.06
                                                    *TOTALS*
   PEAK FLOW      (cms)=      0.09         0.06       0.141 (iii)
   TIME TO PEAK   (hrs)=      6.25         6.42        6.25
   RUNOFF VOLUME  (mm)=      61.75        32.22       44.03
   TOTAL RAINFALL (mm)=      63.75        63.75       63.75
   RUNOFF COEFFICIENT =       0.97         0.51        0.69


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 84.0   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 ( 0420)|
|  1 + 2 = 3     |         AREA   QPEAK   TPEAK    R.V.
--------------------        (ha)   (cms)   (hrs)    (mm)
     ID1= 1 ( 0135):       1.43   0.141    6.25    44.03
   + ID2= 2 ( 0140):       1.27   0.139    6.25    47.06
     =============================================
     ID = 3 ( 0420):       2.70   0.280    6.25    45.45

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| ADD HYD ( 0425)|
|  1 + 2 = 3     |         AREA   QPEAK   TPEAK    R.V.
```

Bottom-left panel (Page 71)

```
                  LangstaffRd_EA_Existing_WestDonWatershd
                           (ha)   (cms)   (hrs)    (mm)
     ID1= 1 ( 0145):       3.05   0.365    6.25    51.39
   + ID2= 2 ( 0420):       2.70   0.280    6.25    45.45
     =============================================
     ID = 3 ( 0425):       5.75   0.645    6.25    48.60

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0210)|   Area    (ha)=  0.96
|ID= 1 DT= 5.0 min |  Total Imp(%)= 44.00  Dir. Conn.(%)= 44.00
--------------------
                             IMPERVIOUS   PERVIOUS (i)
   Surface Area    (ha)=        0.42         0.54
   Dep. Storage    (mm)=        2.00         5.00
   Average Slope   (%)=         1.00         2.00
   Length          (m)=      470.00        20.00
   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 | 3.167  2.03 | 6.250 57.91 | 9.33  2.03
       0.167  0.00 | 3.250  2.03 | 6.333 11.18 | 9.42  2.03
       0.250  0.00 | 3.333  3.05 | 6.417 11.18 | 9.50  2.03
       0.333  1.02 | 3.417  3.05 | 6.500 11.18 | 9.58  2.03
       0.417  1.02 | 3.500  3.05 | 6.583 11.18 | 9.67  2.03
       0.500  1.02 | 3.583  2.03 | 6.667 11.18 | 9.75  2.03
       0.583  2.03 | 3.667  2.03 | 6.750 11.18 | 9.83  2.03
       0.667  2.03 | 3.750  2.03 | 6.833  5.08 | 9.92  2.03
       0.750  2.03 | 3.833  3.05 | 6.917  5.08 | 10.00 2.03
       0.833  1.02 | 3.917  3.05 | 7.000  5.08 | 10.08 2.03
       0.917  1.02 | 4.000  3.05 | 7.083  5.08 | 10.17 2.03
       1.000  1.02 | 4.083  2.03 | 7.167  5.08 | 10.25 2.03
       1.083  1.02 | 4.167  2.03 | 7.250  5.08 | 10.33 1.02
       1.167  1.02 | 4.250  2.03 | 7.333  4.06 | 10.42 1.02
       1.250  1.02 | 4.333  5.08 | 7.417  4.06 | 10.50 1.02
       1.333  1.02 | 4.417  5.08 | 7.500  4.06 | 10.58 1.02
       1.417  1.02 | 4.500  5.08 | 7.583  4.06 | 10.67 1.02
       1.500  1.02 | 4.583  4.06 | 7.667  4.06 | 10.75 1.02
       1.583  2.03 | 4.667  4.06 | 7.750  4.06 | 10.83 2.03
       1.667  2.03 | 4.750  4.06 | 7.833  4.06 | 10.92 2.03
       1.750  2.03 | 4.833  4.06 | 7.917  4.06 | 11.00 2.03
       1.833  1.02 | 4.917  4.06 | 8.000  4.06 | 11.08 1.02
       1.917  1.02 | 5.000  4.06 | 8.083  3.05 | 11.17 1.02
       2.000  1.02 | 5.083  5.08 | 8.167  3.05 | 11.25 1.02
       2.083  1.02 | 5.167  5.08 | 8.250  3.05 | 11.33 1.02
       2.167  1.02 | 5.250  5.08 | 8.333  3.05 | 11.42 1.02
       2.250  1.02 | 5.333  7.11 | 8.417  3.05 | 11.50 1.02
```

Bottom-right panel (Page 72)

```
                  LangstaffRd_EA_Existing_WestDonWatershd
       2.333  3.05 | 5.417  7.11 | 8.500  3.05 | 11.58 1.02
       2.417  3.05 | 5.500  7.11 | 8.583  2.03 | 11.67 1.02
       2.500  3.05 | 5.583  8.13 | 8.667  2.03 | 11.75 1.02
       2.583  2.03 | 5.667  8.13 | 8.750  2.03 | 11.83 2.03
       2.667  2.03 | 5.750  8.13 | 8.833  3.05 | 11.92 2.03
       2.750  2.03 | 5.833 56.90 | 8.917  3.05 | 12.00 2.03
       2.833  3.05 | 5.917 56.90 | 9.000  3.05 | 12.08 1.02
       2.917  3.05 | 6.000 56.90 | 9.083  2.03 | 12.17 1.02
       3.000  3.05 | 6.083 57.91 | 9.167  2.03 | 12.25 1.02
       3.083  2.03 | 6.167 57.91 | 9.250  2.03 |

   Max.Eff.Inten.(mm/hr)=    57.91        37.09
           over (min)        10.00        15.00
   Storage Coeff.  (min)=     8.04 (ii)  14.97 (ii)
   Unit Hyd. Tpeak (min)=    10.00        15.00
   Unit Hyd. peak  (cms)=     0.13         0.08
                                                    *TOTALS*
   PEAK FLOW      (cms)=      0.07         0.04       0.103 (iii)
   TIME TO PEAK   (hrs)=      6.25         6.33        6.25
   RUNOFF VOLUME  (mm)=      61.75        31.16       44.61
   TOTAL RAINFALL (mm)=      63.75        63.75       63.75
   RUNOFF COEFFICIENT =       0.97         0.49        0.70


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 83.0   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 ( 0205)|   Area    (ha)=  1.11
|ID= 1 DT= 5.0 min |  Total Imp(%)= 38.00  Dir. Conn.(%)= 38.00
--------------------
                             IMPERVIOUS   PERVIOUS (i)
   Surface Area    (ha)=        0.42         0.69
   Dep. Storage    (mm)=        2.00         5.00
   Average Slope   (%)=         1.00         2.00
   Length          (m)=      470.00        20.00
   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 | 3.167  2.03 | 6.250 57.91 | 9.33  2.03
       0.167  0.00 | 3.250  2.03 | 6.333 11.18 | 9.42  2.03
       0.250  0.00 | 3.333  3.05 | 6.417 11.18 | 9.50  2.03
       0.333  1.02 | 3.417  3.05 | 6.500 11.18 | 9.58  2.03
```

0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=   57.91          37.09
         over (min)      10.00          15.00
Storage Coeff.  (min)=    8.04 (ii)     14.97 (ii)
Unit Hyd. Tpeak (min)=   10.00          15.00
Unit Hyd. peak  (cms)=    0.13           0.08
                                                   *TOTALS*
PEAK FLOW       (cms)=    0.07           0.05      0.114 (iii)
TIME TO PEAK    (hrs)=    6.25           6.33       6.25
RUNOFF VOLUME   (mm)=    61.75          31.16      42.78
TOTAL RAINFALL  (mm)=    63.75          63.75      63.75
RUNOFF COEFFICIENT  =     0.97           0.49       0.67


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN* =  83.0    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 ( 0460)|
|  1 + 2 = 3     |            AREA     QPEAK    TPEAK     R.V.
--------------------            (ha)    (cms)    (hrs)    (mm)
      ID1= 1 ( 0205):           1.11    0.114     6.25    42.78
    + ID2= 2 ( 0210):           0.96    0.103     6.25    44.61
                      ==================================================
       ID = 3 ( 0460):          2.07    0.217     6.25    43.63

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0230)|    Area   (ha)=  0.70
|ID= 1 DT= 5.0 min |   Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area    (ha)=    0.40          0.30
    Dep. Storage    (mm)=    2.00          5.00
    Average Slope   (%)=     1.00          2.00
    Length          (m)=   320.00         25.00
    Mannings n       =       0.013         0.290

    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	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02

1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=   57.91          34.81
         over (min)       5.00          20.00
Storage Coeff.  (min)=    6.39 (ii)     15.26 (ii)
Unit Hyd. Tpeak (min)=    5.00          20.00
Unit Hyd. peak  (cms)=    0.18           0.07
                                                   *TOTALS*
PEAK FLOW       (cms)=    0.06           0.02      0.081 (iii)
TIME TO PEAK    (hrs)=    6.25           6.42       6.25
RUNOFF VOLUME   (mm)=    61.75          29.17      47.73
TOTAL RAINFALL  (mm)=    63.75          63.75      63.75
RUNOFF COEFFICIENT  =     0.97           0.46       0.75


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN* =  81.0    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 ( 0225)|    Area   (ha)=  0.90
|ID= 1 DT= 5.0 min |   Total Imp(%)= 53.00   Dir. Conn.(%)= 53.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area    (ha)=    0.48          0.42
    Dep. Storage    (mm)=    2.00          5.00
    Average Slope   (%)=     1.00          2.00
    Length          (m)=   320.00         25.00
    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	3.167	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=   57.91          37.09
         over (min)       5.00          15.00
Storage Coeff.  (min)=    6.39 (ii)     14.30 (ii)
Unit Hyd. Tpeak (min)=    5.00          15.00
Unit Hyd. peak  (cms)=    0.18           0.08
                                                   *TOTALS*
PEAK FLOW       (cms)=    0.08           0.03      0.106 (iii)
TIME TO PEAK    (hrs)=    6.25           6.33       6.25
RUNOFF VOLUME   (mm)=    61.75          31.16      47.37
TOTAL RAINFALL  (mm)=    63.75          63.75      63.75
RUNOFF COEFFICIENT  =     0.97           0.49       0.74


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

LangstaffRd_EA_Existing_WestDonWatershd
CN* = 83.0   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 (0475)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
    ID1= 1 (0225):   0.90   0.106   6.25   47.37
  + ID2= 2 (0230):   0.70   0.081   6.25   47.73
                   ==
    ID = 3 (0475):   1.60   0.187   6.25   47.53

  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0220)| Area   (ha)= 0.65
|ID= 1 DT= 5.0 min | Total Imp(%)= 46.00   Dir. Conn.(%)= 46.00

                          IMPERVIOUS   PERVIOUS (i)
  Surface Area   (ha)=   0.30   0.35
  Dep. Storage   (mm)=   2.00   5.00
  Average Slope   (%)=   1.00   2.00
  Length   (m)=   260.00   20.00
  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 | 3.167   2.03 | 6.250 57.91 | 9.33   2.03
       0.167   0.00 | 3.250   2.03 | 6.333 11.18 | 9.42   2.03
       0.250   0.00 | 3.333   3.05 | 6.417 11.18 | 9.50   2.03
       0.333   1.02 | 3.417   3.05 | 6.500 11.18 | 9.58   2.03
       0.417   1.02 | 3.500   3.05 | 6.583 11.18 | 9.67   2.03
       0.500   1.02 | 3.583   2.03 | 6.667 11.18 | 9.75   2.03
       0.583   2.03 | 3.667   2.03 | 6.750 11.18 | 9.83   2.03
       0.667   2.03 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
       0.750   2.03 | 3.833   3.05 | 6.917   5.08 | 10.00   2.03
       0.833   1.02 | 3.917   3.05 | 7.000   5.08 | 10.08   2.03
       0.917   1.02 | 4.000   3.05 | 7.083   5.08 | 10.17   2.03
       1.000   1.02 | 4.083   2.03 | 7.167   5.08 | 10.25   2.03
       1.083   1.02 | 4.167   2.03 | 7.250   5.08 | 10.33   1.02
       1.167   1.02 | 4.250   2.03 | 7.333   4.06 | 10.42   1.02
       1.250   1.02 | 4.333   5.08 | 7.417   4.06 | 10.50   1.02
       1.333   1.02 | 4.417   5.08 | 7.500   4.06 | 10.58   1.02
       1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67   1.02

LangstaffRd_EA_Existing_WestDonWatershd
       1.500   1.02 | 4.583   4.06 | 7.667   4.06 | 10.75   1.02
       1.583   2.03 | 4.667   4.06 | 7.750   4.06 | 10.83   2.03
       1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
       1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
       1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
       1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
       2.000   1.02 | 5.083   5.08 | 8.167   3.05 | 11.25   1.02
       2.083   1.02 | 5.167   5.08 | 8.250   3.05 | 11.33   1.02
       2.167   1.02 | 5.250   5.08 | 8.333   3.05 | 11.42   1.02
       2.250   1.02 | 5.333   7.11 | 8.417   3.05 | 11.50   1.02
       2.333   3.05 | 5.417   7.11 | 8.500   3.05 | 11.58   1.02
       2.417   3.05 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
       2.500   3.05 | 5.583   8.13 | 8.667   2.03 | 11.75   1.02
       2.583   2.03 | 5.667   8.13 | 8.750   2.03 | 11.83   2.03
       2.667   2.03 | 5.750   8.13 | 8.833   3.05 | 11.92   2.03
       2.750   2.03 | 5.833 56.90 | 8.917   3.05 | 12.00   2.03
       2.833   3.05 | 5.917 56.90 | 9.000   3.05 | 12.08   1.02
       2.917   3.05 | 6.000 56.90 | 9.083   2.03 | 12.17   1.02
       3.000   3.05 | 6.083 57.91 | 9.167   2.03 | 12.25   1.02
       3.083   2.03 | 6.167 57.91 | 9.250   2.03 |

  Max.Eff.Inten.(mm/hr)=   57.91   37.09
          over (min)   5.00   15.00
  Storage Coeff. (min)=   5.64 (ii)   12.56 (ii)
  Unit Hyd. Tpeak (min)=   5.00   15.00
  Unit Hyd. peak (cms)=   0.20   0.08
                                                    TOTALS
  PEAK FLOW   (cms)=   0.05   0.03   0.074 (iii)
  TIME TO PEAK   (hrs)=   6.25   6.33   6.25
  RUNOFF VOLUME (mm)=   61.75   31.16   45.22
  TOTAL RAINFALL (mm)=   63.75   63.75   63.75
  RUNOFF COEFFICIENT =   0.97   0.49   0.71

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 (0215)| Area   (ha)= 0.58
|ID= 1 DT= 5.0 min | Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00

                          IMPERVIOUS   PERVIOUS (i)
  Surface Area   (ha)=   0.33   0.25
  Dep. Storage   (mm)=   2.00   5.00
  Average Slope   (%)=   1.00   2.00
  Length   (m)=   260.00   30.00
  Mannings n   =   0.013   0.250

LangstaffRd_EA_Existing_WestDonWatershd
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   2.03 | 6.250 57.91 | 9.33   2.03
       0.167   0.00 | 3.250   2.03 | 6.333 11.18 | 9.42   2.03
       0.250   0.00 | 3.333   3.05 | 6.417 11.18 | 9.50   2.03
       0.333   1.02 | 3.417   3.05 | 6.500 11.18 | 9.58   2.03
       0.417   1.02 | 3.500   3.05 | 6.583 11.18 | 9.67   2.03
       0.500   1.02 | 3.583   2.03 | 6.667 11.18 | 9.75   2.03
       0.583   2.03 | 3.667   2.03 | 6.750 11.18 | 9.83   2.03
       0.667   2.03 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
       0.750   2.03 | 3.833   3.05 | 6.917   5.08 | 10.00   2.03
       0.833   1.02 | 3.917   3.05 | 7.000   5.08 | 10.08   2.03
       0.917   1.02 | 4.000   3.05 | 7.083   5.08 | 10.17   2.03
       1.000   1.02 | 4.083   2.03 | 7.167   5.08 | 10.25   2.03
       1.083   1.02 | 4.167   2.03 | 7.250   5.08 | 10.33   1.02
       1.167   1.02 | 4.250   2.03 | 7.333   4.06 | 10.42   1.02
       1.250   1.02 | 4.333   5.08 | 7.417   4.06 | 10.50   1.02
       1.333   1.02 | 4.417   5.08 | 7.500   4.06 | 10.58   1.02
       1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67   1.02
       1.500   1.02 | 4.583   4.06 | 7.667   4.06 | 10.75   1.02
       1.583   2.03 | 4.667   4.06 | 7.750   4.06 | 10.83   2.03
       1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
       1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
       1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
       1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
       2.000   1.02 | 5.083   5.08 | 8.167   3.05 | 11.25   1.02
       2.083   1.02 | 5.167   5.08 | 8.250   3.05 | 11.33   1.02
       2.167   1.02 | 5.250   5.08 | 8.333   3.05 | 11.42   1.02
       2.250   1.02 | 5.333   7.11 | 8.417   3.05 | 11.50   1.02
       2.333   3.05 | 5.417   7.11 | 8.500   3.05 | 11.58   1.02
       2.417   3.05 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
       2.500   3.05 | 5.583   8.13 | 8.667   2.03 | 11.75   1.02
       2.583   2.03 | 5.667   8.13 | 8.750   2.03 | 11.83   2.03
       2.667   2.03 | 5.750   8.13 | 8.833   3.05 | 11.92   2.03
       2.750   2.03 | 5.833 56.90 | 8.917   3.05 | 12.00   2.03
       2.833   3.05 | 5.917 56.90 | 9.000   3.05 | 12.08   1.02
       2.917   3.05 | 6.000 56.90 | 9.083   2.03 | 12.17   1.02
       3.000   3.05 | 6.083 57.91 | 9.167   2.03 | 12.25   1.02
       3.083   2.03 | 6.167 57.91 | 9.250   2.03 |

  Max.Eff.Inten.(mm/hr)=   57.91   37.09
          over (min)   5.00   15.00
  Storage Coeff. (min)=   5.64 (ii)   14.47 (ii)
  Unit Hyd. Tpeak (min)=   5.00   15.00
  Unit Hyd. peak (cms)=   0.20   0.08
                                                    TOTALS
  PEAK FLOW   (cms)=   0.05   0.02   0.071 (iii)
  TIME TO PEAK   (hrs)=   6.25   6.33   6.25
  RUNOFF VOLUME (mm)=   61.75   31.16   48.58

LangstaffRd_EA_Existing_WestDonWatershd
  TOTAL RAINFALL (mm)=   63.75   63.75   63.75
  RUNOFF COEFFICIENT =   0.97   0.49   0.76

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 (0470)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
    ID1= 1 (0215):   0.58   0.071   6.25   48.58
  + ID2= 2 (0220):   0.65   0.074   6.25   45.22
                   ==
    ID = 3 (0470):   1.23   0.145   6.25   46.81

  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0480)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
    ID1= 1 (0470):   1.23   0.145   6.25   46.81
  + ID2= 2 (0475):   1.60   0.187   6.25   47.53
                   ==
    ID = 3 (0480):   2.83   0.332   6.25   47.21

  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0160)| Area   (ha)= 0.43
|ID= 1 DT= 5.0 min | Total Imp(%)= 56.00   Dir. Conn.(%)= 56.00

                          IMPERVIOUS   PERVIOUS (i)
  Surface Area   (ha)=   0.24   0.19
  Dep. Storage   (mm)=   2.00   5.00
  Average Slope   (%)=   1.00   2.00
  Length   (m)=   260.00   20.00
  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

LangstaffRd_EA_Existing_WestDonWatershd

0.083	0.00	3.167	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	3.05	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      57.91        44.85
          over (min)        5.00         15.00
Storage Coeff.  (min)=      5.64 (ii)    12.06 (ii)
Unit Hyd. Tpeak (min)=      5.00         15.00
Unit Hyd. peak  (cms)=      0.20         0.09
                                                    *TOTALS*
PEAK FLOW       (cms)=      0.04         0.02      0.057 (iii)
TIME TO PEAK    (hrs)=      6.25         6.33      6.25
RUNOFF VOLUME    (mm)=     61.75        38.29     51.41
TOTAL RAINFALL   (mm)=     63.75        63.75     63.75
RUNOFF COEFFICIENT  =       0.97         0.60      0.81


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 89.0    Ia = Dep. Storage  (Above)
```

LangstaffRd_EA_Existing_WestDonWatershd

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--------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0155)|   Area     (ha)=  0.56
|ID= 1 DT= 5.0 min |   Total Imp(%)= 45.00   Dir. Conn.(%)= 45.00
--------------------
                       IMPERVIOUS      PERVIOUS (i)
   Surface Area   (ha)=     0.25          0.31
   Dep. Storage   (mm)=     2.00          5.00
   Average Slope  (%)=      1.00          2.00
   Length         (m)=    260.00         25.00
   Mannings n      =       0.013          0.290

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	' TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02

LangstaffRd_EA_Existing_WestDonWatershd

2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      57.91        42.12
          over (min)        5.00         15.00
Storage Coeff.  (min)=      5.64 (ii)    13.86 (ii)
Unit Hyd. Tpeak (min)=      5.00         15.00
Unit Hyd. peak  (cms)=      0.20         0.08
                                                    *TOTALS*
PEAK FLOW       (cms)=      0.04         0.03      0.066 (iii)
TIME TO PEAK    (hrs)=      6.25         6.33      6.25
RUNOFF VOLUME    (mm)=     61.75        35.70     47.41
TOTAL RAINFALL   (mm)=     63.75        63.75     63.75
RUNOFF COEFFICIENT  =       0.97         0.56      0.74


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 87.0    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 ( 0430)|
|  1 + 2 = 3     |        AREA    QPEAK    TPEAK    R.V.
--------------------        (ha)    (cms)    (hrs)    (mm)
    ID1= 1 ( 0155):        0.56     0.066     6.25    47.41
  + ID2= 2 ( 0160):        0.43     0.057     6.25    51.41
    ==================================================
    ID = 3 ( 0430):        0.99     0.123     6.25    49.15

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

--------------------
| CALIB              |
| STANDHYD ( 0150)|   Area     (ha)=  3.81
|ID= 1 DT= 5.0 min |   Total Imp(%)= 94.00   Dir. Conn.(%)= 94.00
--------------------
                       IMPERVIOUS      PERVIOUS (i)
   Surface Area   (ha)=     3.58          0.23
   Dep. Storage   (mm)=     2.00          5.00
   Average Slope  (%)=      1.00          2.00
   Length         (m)=    150.00         40.00
   Mannings n      =       0.013          0.250

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

LangstaffRd_EA_Existing_WestDonWatershd

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	' TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      57.91        43.46
          over (min)        5.00         10.00
Storage Coeff.  (min)=      4.05 (ii)    6.98 (ii)
Unit Hyd. Tpeak (min)=      5.00         10.00
Unit Hyd. peak  (cms)=      0.24         0.14
                                                    *TOTALS*
PEAK FLOW       (cms)=      0.58         0.03      0.601 (iii)
TIME TO PEAK    (hrs)=      6.25         6.25      6.25
RUNOFF VOLUME    (mm)=     61.75        36.96     60.27
TOTAL RAINFALL   (mm)=     63.75        63.75     63.75
```

RUNOFF COEFFICIENT   =   0.97   0.58   0.95

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

    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 88.0   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 (0440)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
   ID1= 1 (0150):   3.81   0.601   6.25   60.27
 + ID2= 2 (0430):   0.99   0.123   6.25   49.15
   ==
   ID = 3 (0440):   4.80   0.724   6.25   57.97

  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0185)| Area   (ha)=   0.47
|ID= 1 DT= 5.0 min | Total Imp(%)= 48.00 Dir. Conn.(%)= 48.00

              IMPERVIOUS   PERVIOUS (i)
  Surface Area   (ha)=   0.23   0.24
  Dep. Storage   (mm)=   2.00   5.00
  Average Slope   (%)=   1.00   2.00
  Length   (m)=   240.00   20.00
  Mannings n   =   0.013   0.350

   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	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03

1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

  Max.Eff.Inten.(mm/hr)=   57.91   32.68
       over (min)   5.00   15.00
  Storage Coeff. (min)=   5.37 (ii)   14.29 (ii)
  Unit Hyd. Tpeak (min)=   5.00   15.00
  Unit Hyd. peak (cms)=   0.21   0.08

                             TOTALS
  PEAK FLOW   (cms)=   0.04   0.02   0.051 (iii)
  TIME TO PEAK   (hrs)=   6.25   6.33   6.25
  RUNOFF VOLUME (mm)=   61.75   27.34   43.84
  TOTAL RAINFALL (mm)=   63.75   63.75   63.75
  RUNOFF COEFFICIENT =   0.97   0.43   0.69

    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 79.0   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 (0180)| Area   (ha)=   0.65
|ID= 1 DT= 5.0 min | Total Imp(%)= 33.00 Dir. Conn.(%)= 33.00

              IMPERVIOUS   PERVIOUS (i)
  Surface Area   (ha)=   0.21   0.44

  Dep. Storage   (mm)=   2.00   5.00
  Average Slope   (%)=   1.00   2.00
  Length   (m)=   65.83   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	3.167	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

  Max.Eff.Inten.(mm/hr)=   57.91   35.79
        over (min)   5.00   15.00
  Storage Coeff. (min)=   2.47 (ii)   13.12 (ii)
  Unit Hyd. Tpeak (min)=   5.00   15.00

  Unit Hyd. peak (cms)=   0.29   0.08

                             TOTALS
  PEAK FLOW   (cms)=   0.03   0.03   0.067 (iii)
  TIME TO PEAK   (hrs)=   6.25   6.33   6.25
  RUNOFF VOLUME (mm)=   61.75   31.16   41.24
  TOTAL RAINFALL (mm)=   63.75   63.75   63.75
  RUNOFF COEFFICIENT =   0.97   0.49   0.65

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

    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 83.0   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 (0445)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
   ID1= 1 (0180):   0.65   0.067   6.25   41.24
 + ID2= 2 (0185):   0.47   0.051   6.25   43.84
   ==
   ID = 3 (0445):   1.12   0.118   6.25   42.33

  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0165)| Area   (ha)=   0.60
|ID= 1 DT= 5.0 min | Total Imp(%)= 40.00 Dir. Conn.(%)= 40.00

              IMPERVIOUS   PERVIOUS (i)
  Surface Area   (ha)=   0.24   0.36
  Dep. Storage   (mm)=   2.00   5.00
  Average Slope   (%)=   1.00   2.00
  Length   (m)=   250.00   20.00
  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	3.167	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03

LangstaffRd_EA_Existing_WestDonWatershd

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=    57.91          37.09
        over (min)        5.00           15.00
Storage Coeff.  (min)=    5.51 (ii)      12.43 (ii)
Unit Hyd. Tpeak (min)=    5.00           15.00
Unit Hyd. peak  (cms)=    0.20           0.08
                                                    *TOTALS*
PEAK FLOW      (cms)=     0.04           0.03        0.065 (iii)
TIME TO PEAK   (hrs)=     6.25           6.33        6.25
RUNOFF VOLUME   (mm)=     61.75          31.16       43.38
TOTAL RAINFALL  (mm)=     63.75          63.75       63.75
RUNOFF COEFFICIENT  =     0.97           0.49        0.68


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 83.0   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.
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Page 89

LangstaffRd_EA_Existing_WestDonWatershd

```
| CALIB             |
| STANDHYD ( 0170)|   Area   (ha)=  0.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                            IMPERVIOUS     PERVIOUS (i)
     Surface Area   (ha)=      0.25           0.18
     Dep. Storage   (mm)=      2.00           5.00
     Average Slope  (%)=       1.00           2.00
     Length         (m)=     250.00          20.00
     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	3.167	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02

Page 90

LangstaffRd_EA_Existing_WestDonWatershd

```
        3.083    2.03 | 6.167  57.91 | 9.250   2.03 |

Max.Eff.Inten.(mm/hr)=    57.91          44.85
        over (min)        5.00           15.00
Storage Coeff.  (min)=    5.51 (ii)      11.93 (ii)
Unit Hyd. Tpeak (min)=    5.00           15.00
Unit Hyd. peak  (cms)=    0.20           0.09
                                                    *TOTALS*
PEAK FLOW      (cms)=     0.04           0.02        0.057 (iii)
TIME TO PEAK   (hrs)=     6.25           6.33        6.25
RUNOFF VOLUME   (mm)=     61.75          38.29       51.65
TOTAL RAINFALL  (mm)=     63.75          63.75       63.75
RUNOFF COEFFICIENT  =     0.97           0.60        0.81


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 89.0   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.
```

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--------------------
| ADD HYD ( 0450)|
|  1 + 2 = 3     |      AREA    QPEAK   TPEAK    R.V.
--------------------      (ha)   (cms)   (hrs)    (mm)
      ID1= 1 ( 0165):    0.60    0.065   6.25    43.38
    + ID2= 2 ( 0170):    0.43    0.057   6.25    51.65
      ============================================
      ID = 3 ( 0450):    1.03    0.122   6.25    46.83

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

```
--------------------
| ADD HYD ( 0450)|
|  3 + 2 = 1     |      AREA    QPEAK   TPEAK    R.V.
--------------------      (ha)   (cms)   (hrs)    (mm)
      ID1= 3 ( 0450):    1.03    0.122   6.25    46.83
    + ID2= 2 ( 0445):    1.12    0.118   6.25    42.33
      ============================================
      ID = 1 ( 0450):    2.15    0.240   6.25    44.49

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

```
--------------------
| CALIB             |
| STANDHYD ( 0190)|   Area   (ha)=  0.86
|ID= 1 DT= 5.0 min |   Total Imp(%)= 42.00   Dir. Conn.(%)= 42.00
--------------------
                            IMPERVIOUS     PERVIOUS (i)
     Surface Area   (ha)=      0.36           0.50
```

Page 91

LangstaffRd_EA_Existing_WestDonWatershd

```
Dep. Storage    (mm)=     2.00           5.00
Average Slope   (%)=      1.00           2.00
Length          (m)=    340.00          50.00
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	3.167	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=    57.91          35.79
        over (min)        5.00           20.00
Storage Coeff.  (min)=    6.62 (ii)      18.79 (ii)
Unit Hyd. Tpeak (min)=    5.00           20.00
```

Page 92

```
              Unit Hyd. peak (cms)=      0.18           0.06
                                                                     *TOTALS*
              PEAK FLOW      (cms)=      0.06           0.03        0.086 (iii)
              TIME TO PEAK   (hrs)=      6.25           6.42        6.25
              RUNOFF VOLUME   (mm)=     61.75          31.16       44.00
              TOTAL RAINFALL  (mm)=     63.75          63.75       63.75
              RUNOFF COEFFICIENT =      0.97           0.49        0.69


              (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                  CN* = 83.0   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 ( 0195)|  Area    (ha)=  0.79
|ID= 1 DT= 5.0 min |  Total Imp(%)= 42.00  Dir. Conn.(%)= 42.00
--------------------
                             IMPERVIOUS     PERVIOUS (i)
              Surface Area    (ha)=    0.33          0.46
              Dep. Storage    (mm)=    2.00          5.00
              Average Slope   (%)=     1.00          2.00
              Length          (m)=  340.00         20.00
              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 | 3.167   2.03 | 6.250  57.91 | 9.33    2.03
              0.167   0.00 | 3.250   2.03 | 6.333  11.18 | 9.42    2.03
              0.250   0.00 | 3.333   3.05 | 6.417  11.18 | 9.50    2.03
              0.333   1.02 | 3.417   3.05 | 6.500  11.18 | 9.58    2.03
              0.417   1.02 | 3.500   3.05 | 6.583  11.18 | 9.67    2.03
              0.500   1.02 | 3.583   2.03 | 6.667  11.18 | 9.75    2.03
              0.583   2.03 | 3.667   2.03 | 6.750  11.18 | 9.83    2.03
              0.667   2.03 | 3.750   2.03 | 6.833   5.08 | 9.92    2.03
              0.750   2.03 | 3.833   3.05 | 6.917   5.08 | 10.00   2.03
              0.833   1.02 | 3.917   3.05 | 7.000   5.08 | 10.08   2.03
              0.917   1.02 | 4.000   3.05 | 7.083   5.08 | 10.17   2.03
              1.000   1.02 | 4.083   2.03 | 7.167   5.08 | 10.25   2.03
              1.083   1.02 | 4.167   2.03 | 7.250   5.08 | 10.33   1.02
              1.167   1.02 | 4.250   2.03 | 7.333   4.06 | 10.42   1.02
              1.250   1.02 | 4.333   5.08 | 7.417   4.06 | 10.50   1.02
              1.333   1.02 | 4.417   5.08 | 7.500   4.06 | 10.58   1.02
              1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67   1.02
              1.500   1.02 | 4.583   5.08 | 7.667   4.06 | 10.75   1.02
              1.583   2.03 | 4.667   5.08 | 7.750   4.06 | 10.83   2.03
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              1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
              1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
              1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
              1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
              2.000   1.02 | 5.083   5.08 | 8.167   3.05 | 11.25   1.02
              2.083   1.02 | 5.167   5.08 | 8.250   3.05 | 11.33   1.02
              2.167   1.02 | 5.250   5.08 | 8.333   3.05 | 11.42   1.02
              2.250   1.02 | 5.333   7.11 | 8.417   3.05 | 11.50   1.02
              2.333   3.05 | 5.417   7.11 | 8.500   3.05 | 11.58   1.02
              2.417   3.05 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
              2.500   3.05 | 5.583   8.13 | 8.667   2.03 | 11.75   1.02
              2.583   2.03 | 5.667   8.13 | 8.750   2.03 | 11.83   2.03
              2.667   2.03 | 5.750   8.13 | 8.833   3.05 | 11.92   2.03
              2.750   2.03 | 5.833  56.90 | 8.917   3.05 | 12.00   2.03
              2.833   3.05 | 5.917  56.90 | 9.000   3.05 | 12.08   1.02
              2.917   3.05 | 6.000  56.90 | 9.083   2.03 | 12.17   1.02
              3.000   3.05 | 6.083  57.91 | 9.167   2.03 | 12.25   1.02
              3.083   2.03 | 6.167  57.91 | 9.250   2.03 |

         Max.Eff.Inten.(mm/hr)=      57.91          37.09
                  over (min)=         5.00          15.00
         Storage Coeff.  (min)=      6.62 (ii)     13.55 (ii)
         Unit Hyd. Tpeak (min)=      5.00          15.00
         Unit Hyd. peak  (cms)=      0.18           0.08
                                                                     *TOTALS*
              PEAK FLOW      (cms)=      0.05           0.03        0.086 (iii)
              TIME TO PEAK   (hrs)=      6.25           6.33        6.25
              RUNOFF VOLUME   (mm)=     61.75          31.16       44.00
              TOTAL RAINFALL  (mm)=     63.75          63.75       63.75
              RUNOFF COEFFICIENT =      0.97           0.49        0.69


              (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                  CN* = 83.0   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 ( 0455)|
|  1 + 2 = 3       |          AREA    QPEAK    TPEAK    R.V.
--------------------          (ha)    (cms)    (hrs)    (mm)
              ID1= 1 ( 0190):  0.86   0.086    6.25    44.00
            + ID2= 2 ( 0195):  0.79   0.086    6.25    44.00
              =================================================
              ID = 3 ( 0455):  1.65   0.172    6.25    44.00

            NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
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--------------------
| ADD HYD ( 0458)|
|  1 + 2 = 3       |          AREA    QPEAK    TPEAK    R.V.
--------------------          (ha)    (cms)    (hrs)    (mm)
              ID1= 1 ( 0450):  2.15   0.240    6.25    44.49
            + ID2= 2 ( 0455):  1.65   0.172    6.25    44.00
              =================================================
              ID = 3 ( 0458):  3.80   0.412    6.25    44.28

            NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD ( 0300)|  Area    (ha)= 10.00
|ID= 1 DT= 5.0 min |  Total Imp(%)= 80.00  Dir. Conn.(%)= 80.00
--------------------
                             IMPERVIOUS     PERVIOUS (i)
              Surface Area    (ha)=    8.00          2.00
              Dep. Storage    (mm)=    1.00          5.00
              Average Slope   (%)=     1.00          2.00
              Length          (m)=  258.20         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 | 3.167   2.03 | 6.250  57.91 | 9.33    2.03
              0.167   0.00 | 3.250   2.03 | 6.333  11.18 | 9.42    2.03
              0.250   0.00 | 3.333   3.05 | 6.417  11.18 | 9.50    2.03
              0.333   1.02 | 3.417   3.05 | 6.500  11.18 | 9.58    2.03
              0.417   1.02 | 3.500   3.05 | 6.583  11.18 | 9.67    2.03
              0.500   1.02 | 3.583   2.03 | 6.667  11.18 | 9.75    2.03
              0.583   2.03 | 3.667   2.03 | 6.750  11.18 | 9.83    2.03
              0.667   2.03 | 3.750   2.03 | 6.833   5.08 | 9.92    2.03
              0.750   2.03 | 3.833   3.05 | 6.917   5.08 | 10.00   2.03
              0.833   1.02 | 3.917   3.05 | 7.000   5.08 | 10.08   2.03
              0.917   1.02 | 4.000   3.05 | 7.083   5.08 | 10.17   2.03
              1.000   1.02 | 4.083   2.03 | 7.167   5.08 | 10.25   2.03
              1.083   1.02 | 4.167   2.03 | 7.250   5.08 | 10.33   1.02
              1.167   1.02 | 4.250   2.03 | 7.333   4.06 | 10.42   1.02
              1.250   1.02 | 4.333   5.08 | 7.417   4.06 | 10.50   1.02
              1.333   1.02 | 4.417   5.08 | 7.500   4.06 | 10.58   1.02
              1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67   1.02
              1.500   1.02 | 4.583   5.08 | 7.667   4.06 | 10.75   1.02
              1.583   2.03 | 4.667   5.08 | 7.750   4.06 | 10.83   2.03
              1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
              1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
              1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
              1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
              2.000   1.02 | 5.083   5.08 | 8.167   3.05 | 11.25   1.02
              2.083   1.02 | 5.167   5.08 | 8.250   3.05 | 11.33   1.02
```

```
              2.167   1.02 | 5.250   5.08 | 8.333   3.05 | 11.42   1.02
              2.250   1.02 | 5.333   7.11 | 8.417   3.05 | 11.50   1.02
              2.333   3.05 | 5.417   7.11 | 8.500   3.05 | 11.58   1.02
              2.417   3.05 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
              2.500   3.05 | 5.583   8.13 | 8.667   2.03 | 11.75   1.02
              2.583   2.03 | 5.667   8.13 | 8.750   2.03 | 11.83   2.03
              2.667   2.03 | 5.750   8.13 | 8.833   3.05 | 11.92   2.03
              2.750   2.03 | 5.833  56.90 | 8.917   3.05 | 12.00   2.03
              2.833   3.05 | 5.917  56.90 | 9.000   3.05 | 12.08   1.02
              2.917   3.05 | 6.000  56.90 | 9.083   2.03 | 12.17   1.02
              3.000   3.05 | 6.083  57.91 | 9.167   2.03 | 12.25   1.02
              3.083   2.03 | 6.167  57.91 | 9.250   2.03 |

         Max.Eff.Inten.(mm/hr)=      57.91          31.36
                  over (min)=         5.00          20.00
         Storage Coeff.  (min)=      5.62 (ii)     16.84 (ii)
         Unit Hyd. Tpeak (min)=      5.00          20.00
         Unit Hyd. peak  (cms)=      0.20           0.06
                                                                     *TOTALS*
              PEAK FLOW      (cms)=      1.28           0.12        1.382 (iii)
              TIME TO PEAK   (hrs)=      6.25           6.42        6.25
              RUNOFF VOLUME   (mm)=     62.75          27.34       55.67
              TOTAL RAINFALL  (mm)=     63.75          63.75       63.75
              RUNOFF COEFFICIENT =      0.98           0.43        0.87


              (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                  CN* = 79.0   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 ( 0350)|  Area    (ha)=  0.90
|ID= 1 DT= 5.0 min |  Total Imp(%)= 70.00  Dir. Conn.(%)= 70.00
--------------------
                             IMPERVIOUS     PERVIOUS (i)
              Surface Area    (ha)=    0.63          0.27
              Dep. Storage    (mm)=    1.00          5.00
              Average Slope   (%)=     1.00          2.00
              Length          (m)=   77.46         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 | 3.167   2.03 | 6.250  57.91 | 9.33    2.03
              0.167   0.00 | 3.250   2.03 | 6.333  11.18 | 9.42    2.03
```

LangstaffRd_EA_Existing_WestDonWatershd

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	3.05	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      57.91        31.36
          over (min)         5.00        15.00
Storage Coeff.  (min)=       2.73 (ii)   13.95 (ii)
Unit Hyd. Tpeak (min)=       5.00        15.00
Unit Hyd. peak  (cms)=       0.29         0.08
                                                      *TOTALS*
PEAK FLOW       (cms)=       0.10         0.02      0.118 (iii)
TIME TO PEAK    (hrs)=       6.25         6.33        6.25
RUNOFF VOLUME    (mm)=      62.75        27.34       52.12
TOTAL RAINFALL   (mm)=      63.75        63.75       63.75
RUNOFF COEFFICIENT   =       0.98         0.43        0.82

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

    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 79.0   Ia = Dep. Storage  (Above)
   (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
```

LangstaffRd_EA_Existing_WestDonWatershd
```
        THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------
| ADD HYD  ( 0375)|
|  1 + 2 = 3      |            AREA     QPEAK    TPEAK     R.V.
--------------------            (ha)     (cms)    (hrs)     (mm)
       ID1= 1 ( 0300):        10.00     1.382     6.25     55.67
     + ID2= 2 ( 0350):         0.90     0.118     6.25     52.12
       ============================================
       ID = 3 ( 0375):        10.90     1.500     6.25     55.38

    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

*******************************
** SIMULATION:Run 05          **
*******************************

--------------------
| READ STORM      |    Filename: C:\Users\ray.zhao\AppD
|                 |              ata\Local\Temp\
|                 |              278a4b54-8409-4519-9819-1b44900a1c25\d55f05e6
| Ptotal= 74.42 mm|    Comments: 25yr-12hrSCS
--------------------
```

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	3.05		6.75	13.21	10.00	2.03
0.50	1.02	3.75	3.05		7.00	6.10	10.25	2.03
0.75	2.03	4.00	3.05		7.25	6.10	10.50	2.03
1.00	1.02	4.25	3.05		7.50	5.08	10.75	1.02
1.25	2.03	4.50	5.08		7.75	4.06	11.00	2.03
1.50	1.02	4.75	5.08		8.00	4.06	11.25	1.02
1.75	2.03	5.00	6.10		8.25	5.08	11.50	2.03
2.00	1.02	5.25	5.08		8.50	3.05	11.75	1.02
2.25	2.03	5.50	8.13		8.75	3.05	12.00	2.03
2.50	3.05	5.75	9.14		9.00	3.05	12.25	1.02
2.75	3.05	6.00	67.06		9.25	2.03		
3.00	3.05	6.25	67.06		9.50	3.05		
3.25	2.03	6.50	13.21		9.75	2.03		

```
--------------------
| CALIB           |
| STANDHYD ( 0145)|   Area    (ha)=  3.05
|ID= 1 DT= 5.0 min|   Total Imp(%)= 62.00   Dir. Conn.(%)= 62.00
--------------------
                            IMPERVIOUS   PERVIOUS (i)
    Surface Area  (ha)=        1.89         1.16
    Dep. Storage  (mm)=        2.00         5.00
    Average Slope (%)=         1.00         2.00
```

LangstaffRd_EA_Existing_WestDonWatershd
```
Length        (m)=   531.00       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	3.167	2.03		6.250	67.05	9.33	3.05
0.167	0.00	3.250	2.03		6.333	13.21	9.42	3.05
0.250	0.00	3.333	3.05		6.417	13.21	9.50	3.05
0.333	1.02	3.417	3.05		6.500	13.21	9.58	2.03
0.417	1.02	3.500	3.05		6.583	13.21	9.67	2.03
0.500	1.02	3.583	3.05		6.667	13.21	9.75	2.03
0.583	2.03	3.667	3.05		6.750	13.21	9.83	2.03
0.667	2.03	3.750	3.05		6.833	6.10	9.92	2.03
0.750	2.03	3.833	3.05		6.917	6.10	10.00	2.03
0.833	1.02	3.917	3.05		7.000	6.10	10.08	2.03
0.917	1.02	4.000	3.05		7.083	6.10	10.17	2.03
1.000	1.02	4.083	3.05		7.167	6.10	10.25	2.03
1.083	2.03	4.167	3.05		7.250	6.10	10.33	2.03
1.167	2.03	4.250	3.05		7.333	5.08	10.42	2.03
1.250	2.03	4.333	5.08		7.417	5.08	10.50	2.03
1.333	1.02	4.417	5.08		7.500	5.08	10.58	1.02
1.417	1.02	4.500	5.08		7.583	4.06	10.67	1.02
1.500	1.02	4.583	5.08		7.667	4.06	10.75	1.02
1.583	2.03	4.667	5.08		7.750	4.06	10.83	2.03
1.667	2.03	4.750	5.08		7.833	4.06	10.92	2.03
1.750	2.03	4.833	6.10		7.917	4.06	11.00	2.03
1.833	1.02	4.917	6.10		8.000	4.06	11.08	1.02
1.917	1.02	5.000	6.10		8.083	5.08	11.17	1.02
2.000	1.02	5.083	5.08		8.167	5.08	11.25	1.02
2.083	2.03	5.167	5.08		8.250	5.08	11.33	2.03
2.167	2.03	5.250	5.08		8.333	3.05	11.42	2.03
2.250	2.03	5.333	8.13		8.417	3.05	11.50	2.03
2.333	3.05	5.417	8.13		8.500	3.05	11.58	1.02
2.417	3.05	5.500	8.13		8.583	3.05	11.67	1.02
2.500	3.05	5.583	9.14		8.667	3.05	11.75	1.02
2.583	3.05	5.667	9.14		8.750	3.05	11.83	2.03
2.667	3.05	5.750	9.15		8.833	3.05	11.92	2.03
2.750	3.05	5.833	67.06		8.917	3.05	12.00	2.03
2.833	3.05	5.917	67.06		9.000	3.05	12.08	1.02
2.917	3.05	6.000	67.06		9.083	2.03	12.17	1.02
3.000	3.05	6.083	67.06		9.167	2.03	12.25	1.02
3.083	2.03	6.167	67.06		9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      67.06        50.27
          over (min)        10.00        20.00
Storage Coeff.  (min)=       8.16 (ii)   17.46 (ii)
Unit Hyd. Tpeak (min)=      10.00        20.00
Unit Hyd. peak  (cms)=       0.13         0.06
                                                      *TOTALS*
```

LangstaffRd_EA_Existing_WestDonWatershd
```
PEAK FLOW       (cms)=       0.34         0.11      0.438 (iii)
TIME TO PEAK    (hrs)=       6.25         6.42        6.25
RUNOFF VOLUME    (mm)=      72.42        43.51       61.43
TOTAL RAINFALL   (mm)=      74.42        74.42       74.42
RUNOFF COEFFICIENT   =       0.97         0.58        0.83

    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 86.0   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 ( 0140)|   Area    (ha)=  1.27
|ID= 1 DT= 5.0 min|   Total Imp(%)= 52.00   Dir. Conn.(%)= 52.00
--------------------
                            IMPERVIOUS   PERVIOUS (i)
    Surface Area  (ha)=        0.66         0.61
    Dep. Storage  (mm)=        2.00         5.00
    Average Slope (%)=         1.00         2.00
    Length        (m)=       503.00        25.00
    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	3.167	2.03		6.250	67.05	9.33	3.05
0.167	0.00	3.250	2.03		6.333	13.21	9.42	3.05
0.250	0.00	3.333	3.05		6.417	13.21	9.50	3.05
0.333	1.02	3.417	3.05		6.500	13.21	9.58	2.03
0.417	1.02	3.500	3.05		6.583	13.21	9.67	2.03
0.500	1.02	3.583	3.05		6.667	13.21	9.75	2.03
0.583	2.03	3.667	3.05		6.750	13.21	9.83	2.03
0.667	2.03	3.750	3.05		6.833	6.10	9.92	2.03
0.750	2.03	3.833	3.05		6.917	6.10	10.00	2.03
0.833	1.02	3.917	3.05		7.000	6.10	10.08	2.03
0.917	1.02	4.000	3.05		7.083	6.10	10.17	2.03
1.000	1.02	4.083	3.05		7.167	6.10	10.25	2.03
1.083	2.03	4.167	3.05		7.250	6.10	10.33	2.03
1.167	2.03	4.250	3.05		7.333	5.08	10.42	2.03
1.250	2.03	4.333	5.08		7.417	5.08	10.50	2.03
1.333	1.02	4.417	5.08		7.500	5.08	10.58	1.02
1.417	1.02	4.500	5.08		7.583	4.06	10.67	1.02
1.500	1.02	4.583	5.08		7.667	4.06	10.75	1.02
1.583	2.03	4.667	5.08		7.750	4.06	10.83	2.03
1.667	2.03	4.750	5.08		7.833	4.06	10.92	2.03
1.750	2.03	4.833	6.10		7.917	4.06	11.00	2.03

```
                    LangstaffRd_EA_Existing_WestDonWatershd
          1.833    1.02 | 4.917   6.10 | 8.000   4.06 | 11.08   1.02
          1.917    1.02 | 5.000   6.10 | 8.083   5.08 | 11.17   1.02
          2.000    1.02 | 5.083   5.08 | 8.167   5.08 | 11.25   1.02
          2.083    2.03 | 5.167   5.08 | 8.250   5.08 | 11.33   2.03
          2.167    2.03 | 5.250   5.08 | 8.333   3.05 | 11.42   2.03
          2.250    2.03 | 5.333   8.13 | 8.417   3.05 | 11.50   2.03
          2.333    3.05 | 5.417   8.13 | 8.500   3.05 | 11.58   1.02
          2.417    3.05 | 5.500   8.13 | 8.583   3.05 | 11.67   1.02
          2.500    3.05 | 5.583   9.14 | 8.667   3.05 | 11.75   1.02
          2.583    3.05 | 5.667   9.14 | 8.750   3.05 | 11.83   2.03
          2.667    3.05 | 5.750   9.15 | 8.833   3.05 | 11.92   2.03
          2.750    3.05 | 5.833  67.06 | 8.917   3.05 | 12.00   2.03
          2.833    3.05 | 5.917  67.06 | 9.000   2.03 | 12.08   1.02
          2.917    3.05 | 6.000  67.06 | 9.083   2.03 | 12.17   1.02
          3.000    3.05 | 6.083  67.06 | 9.167   2.03 | 12.25   1.02
          3.083    2.03 | 6.167  67.06 | 9.250   2.03 |

     Max.Eff.Inten.(mm/hr)=     67.06        46.22
           over (min)            10.00        20.00
     Storage Coeff.  (min)=       7.90 (ii)  15.15 (ii)
     Unit Hyd.Tpeak (min)=       10.00        20.00
     Unit Hyd. peak  (cms)=       0.13         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.05      0.168 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.33      6.25
     RUNOFF VOLUME   (mm)=       72.42        39.68     56.70
     TOTAL RAINFALL  (mm)=       74.42        74.42     74.42
     RUNOFF COEFFICIENT  =        0.97         0.53      0.76


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  = 83.0   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 ( 0135)|    Area    (ha)=  1.43
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00  Dir. Conn.(%)=  40.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area    (ha)=       0.57         0.86
     Dep. Storage    (mm)=       2.00         5.00
     Average Slope   (%)=        1.00         2.00
     Length          (m)=      503.00        30.00
     Mannings n      =           0.013        0.250

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


                    ---- TRANSFORMED HYETOGRAPH ----

                                Page 101
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                    LangstaffRd_EA_Existing_WestDonWatershd
           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  2.03 | 6.250  67.05 | 9.33    3.05
          0.167    0.00 | 3.250  2.03 | 6.333  13.21 | 9.42    3.05
          0.250    0.00 | 3.333  3.05 | 6.417  13.21 | 9.50    3.05
          0.333    1.02 | 3.417  3.05 | 6.500  13.21 | 9.58    2.03
          0.417    1.02 | 3.500  3.05 | 6.583  13.21 | 9.67    2.03
          0.500    1.02 | 3.583  3.05 | 6.667  13.21 | 9.75    2.03
          0.583    2.03 | 3.667  3.05 | 6.750  13.21 | 9.83    2.03
          0.667    2.03 | 3.750  3.05 | 6.833   6.10 | 9.92    2.03
          0.750    2.03 | 3.833  3.05 | 6.917   6.10 | 10.00   2.03
          0.833    1.02 | 3.917  3.05 | 7.000   6.10 | 10.08   2.03
          0.917    1.02 | 4.000  3.05 | 7.083   6.10 | 10.17   2.03
          1.000    1.02 | 4.083  3.05 | 7.167   6.10 | 10.25   2.03
          1.083    2.03 | 4.167  3.05 | 7.250   6.10 | 10.33   2.03
          1.167    2.03 | 4.250  3.05 | 7.333   5.08 | 10.42   2.03
          1.250    2.03 | 4.333  5.08 | 7.417   5.08 | 10.50   2.03
          1.333    1.02 | 4.417  5.08 | 7.500   5.08 | 10.58   1.02
          1.417    1.02 | 4.500  5.08 | 7.583   4.06 | 10.67   1.02
          1.500    1.02 | 4.583  5.08 | 7.667   4.06 | 10.75   1.02
          1.583    2.03 | 4.667  5.08 | 7.750   4.06 | 10.83   2.03
          1.667    2.03 | 4.750  5.08 | 7.833   4.06 | 10.92   2.03
          1.750    2.03 | 4.833  6.10 | 7.917   4.06 | 11.00   2.03
          1.833    1.02 | 4.917  6.10 | 8.000   4.06 | 11.08   1.02
          1.917    1.02 | 5.000  6.10 | 8.083   5.08 | 11.17   1.02
          2.000    1.02 | 5.083  5.08 | 8.167   5.08 | 11.25   1.02
          2.083    2.03 | 5.167  5.08 | 8.250   5.08 | 11.33   2.03
          2.167    2.03 | 5.250  5.08 | 8.333   3.05 | 11.42   2.03
          2.250    2.03 | 5.333  8.13 | 8.417   3.05 | 11.50   2.03
          2.333    3.05 | 5.417  8.13 | 8.500   3.05 | 11.58   1.02
          2.417    3.05 | 5.500  8.13 | 8.583   3.05 | 11.67   1.02
          2.500    3.05 | 5.583  9.14 | 8.667   3.05 | 11.75   1.02
          2.583    3.05 | 5.667  9.14 | 8.750   3.05 | 11.83   2.03
          2.667    3.05 | 5.750  9.15 | 8.833   3.05 | 11.92   2.03
          2.750    3.05 | 5.833 67.06 | 8.917   3.05 | 12.00   2.03
          2.833    3.05 | 5.917 67.06 | 9.000   3.05 | 12.08   1.02
          2.917    3.05 | 6.000 67.06 | 9.083   2.03 | 12.17   1.02
          3.000    3.05 | 6.083 67.06 | 9.167   2.03 | 12.25   1.02
          3.083    2.03 | 6.167 67.06 | 9.250   2.03 |

     Max.Eff.Inten.(mm/hr)=     67.06        47.54
           over (min)            10.00        20.00
     Storage Coeff.  (min)=       7.90 (ii)  15.90 (ii)
     Unit Hyd.Tpeak (min)=       10.00        20.00
     Unit Hyd. peak  (cms)=       0.13         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.08      0.174 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.42      6.25
     RUNOFF VOLUME   (mm)=       72.42        40.91     53.51
     TOTAL RAINFALL  (mm)=       74.42        74.42     74.42
     RUNOFF COEFFICIENT  =        0.97         0.55      0.72

                                Page 102
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                    LangstaffRd_EA_Existing_WestDonWatershd
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  = 84.0   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.

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--------------------
| ADD HYD  ( 0420)|
|  1 + 2 = 3      |        AREA    QPEAK    TPEAK    R.V.
--------------------        (ha)   (cms)    (hrs)    (mm)
         ID1= 1 ( 0135):   1.43    0.174    6.25     53.51
       + ID2= 2 ( 0140):   1.27    0.168    6.25     56.70
                          =========================================
         ID = 3 ( 0420):   2.70    0.342    6.25     55.01

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

--------------------
| ADD HYD  ( 0425)|
|  1 + 2 = 3      |        AREA    QPEAK    TPEAK    R.V.
--------------------        (ha)   (cms)    (hrs)    (mm)
         ID1= 1 ( 0145):   3.05    0.438    6.25     61.43
       + ID2= 2 ( 0420):   2.70    0.342    6.25     55.01
                          =========================================
         ID = 3 ( 0425):   5.75    0.780    6.25     58.42

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0210)|    Area    (ha)=  0.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  44.00  Dir. Conn.(%)=  44.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area    (ha)=       0.42         0.54
     Dep. Storage    (mm)=       2.00         5.00
     Average Slope   (%)=        1.00         2.00
     Length          (m)=      470.00        20.00
     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 | 3.167  2.03 | 6.250  67.05 | 9.33    3.05
          0.167    0.00 | 3.250  2.03 | 6.333  13.21 | 9.42    3.05
          0.250    0.00 | 3.333  3.05 | 6.417  13.21 | 9.50    3.05
          0.333    1.02 | 3.417  3.05 | 6.500  13.21 | 9.58    2.03

                                Page 103
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                    LangstaffRd_EA_Existing_WestDonWatershd
          0.417    1.02 | 3.500  3.05 | 6.583  13.21 | 9.67    2.03
          0.500    1.02 | 3.583  3.05 | 6.667  13.21 | 9.75    2.03
          0.583    2.03 | 3.667  3.05 | 6.750  13.21 | 9.83    2.03
          0.667    2.03 | 3.750  3.05 | 6.833   6.10 | 9.92    2.03
          0.750    2.03 | 3.833  3.05 | 6.917   6.10 | 10.00   2.03
          0.833    1.02 | 3.917  3.05 | 7.000   6.10 | 10.08   2.03
          0.917    1.02 | 4.000  3.05 | 7.083   6.10 | 10.17   2.03
          1.000    1.02 | 4.083  3.05 | 7.167   6.10 | 10.25   2.03
          1.083    2.03 | 4.167  3.05 | 7.250   6.10 | 10.33   2.03
          1.167    2.03 | 4.250  3.05 | 7.333   5.08 | 10.42   2.03
          1.250    2.03 | 4.333  5.08 | 7.417   5.08 | 10.50   2.03
          1.333    1.02 | 4.417  5.08 | 7.500   5.08 | 10.58   1.02
          1.417    1.02 | 4.500  5.08 | 7.583   4.06 | 10.67   1.02
          1.500    1.02 | 4.583  5.08 | 7.667   4.06 | 10.75   1.02
          1.583    2.03 | 4.667  5.08 | 7.750   4.06 | 10.83   2.03
          1.667    2.03 | 4.750  5.08 | 7.833   4.06 | 10.92   2.03
          1.750    2.03 | 4.833  6.10 | 7.917   4.06 | 11.00   2.03
          1.833    1.02 | 4.917  6.10 | 8.000   4.06 | 11.08   1.02
          1.917    1.02 | 5.000  6.10 | 8.083   5.08 | 11.17   1.02
          2.000    1.02 | 5.083  5.08 | 8.167   5.08 | 11.25   1.02
          2.083    2.03 | 5.167  5.08 | 8.250   5.08 | 11.33   2.03
          2.167    2.03 | 5.250  5.08 | 8.333   3.05 | 11.42   2.03
          2.250    2.03 | 5.333  8.13 | 8.417   3.05 | 11.50   2.03
          2.333    3.05 | 5.417  8.13 | 8.500   3.05 | 11.58   1.02
          2.417    3.05 | 5.500  8.13 | 8.583   3.05 | 11.67   1.02
          2.500    3.05 | 5.583  9.14 | 8.667   3.05 | 11.75   1.02
          2.583    3.05 | 5.667  9.14 | 8.750   3.05 | 11.83   2.03
          2.667    3.05 | 5.750  9.15 | 8.833   3.05 | 11.92   2.03
          2.750    3.05 | 5.833 67.06 | 8.917   3.05 | 12.00   2.03
          2.833    3.05 | 5.917 67.06 | 9.000   3.05 | 12.08   1.02
          2.917    3.05 | 6.000 67.06 | 9.083   2.03 | 12.17   1.02
          3.000    3.05 | 6.083 67.06 | 9.167   2.03 | 12.25   1.02
          3.083    2.03 | 6.167 67.06 | 9.250   2.03 |

     Max.Eff.Inten.(mm/hr)=     67.06        46.22
           over (min)            10.00        15.00
     Storage Coeff.  (min)=       7.59 (ii)  13.93 (ii)
     Unit Hyd.Tpeak (min)=       10.00        15.00
     Unit Hyd. peak  (cms)=       0.13         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.08         0.05      0.126 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.33      6.25
     RUNOFF VOLUME   (mm)=       72.42        39.68     54.08
     TOTAL RAINFALL  (mm)=       74.42        74.42     74.42
     RUNOFF COEFFICIENT  =        0.97         0.53      0.73


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  = 83.0   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.

                                Page 104
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| CALIB |
| STANDHYD (0205) | Area   (ha)= 1.11
|ID= 1 DT= 5.0 min | Total Imp(%)= 38.00   Dir. Conn.(%)= 38.00

                                 IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=   0.42   0.69
       Dep. Storage   (mm)=   2.00   5.00
       Average Slope   (%)=   1.00   2.00
       Length   (m)=   470.00   20.00
       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	3.167	2.03	6.250	67.05	9.33	3.05
0.167	0.00	3.250	2.03	6.333	13.21	9.42	3.05
0.250	0.00	3.333	3.05	6.417	13.21	9.50	3.05
0.333	1.02	3.417	3.05	6.500	13.21	9.58	2.03
0.417	1.02	3.500	3.05	6.583	13.21	9.67	2.03
0.500	1.02	3.583	3.05	6.667	13.21	9.75	2.03
0.583	2.03	3.667	3.05	6.750	13.21	9.83	2.03
0.667	2.03	3.750	3.05	6.833	6.10	9.92	2.03
0.750	2.03	3.833	3.05	6.917	6.10	10.00	2.03
0.833	1.02	3.917	3.05	7.000	6.10	10.08	2.03
0.917	1.02	4.000	3.05	7.083	6.10	10.17	2.03
1.000	1.02	4.083	3.05	7.167	6.10	10.25	2.03
1.083	2.03	4.167	3.05	7.250	6.10	10.33	2.03
1.167	2.03	4.250	3.05	7.333	5.08	10.42	2.03
1.250	2.03	4.333	5.08	7.417	5.08	10.50	2.03
1.333	1.02	4.417	5.08	7.500	5.08	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	5.08	7.667	4.06	10.75	1.02
1.583	2.03	4.667	5.08	7.750	4.06	10.83	2.03
1.667	2.03	4.750	5.08	7.833	4.06	10.92	2.03
1.750	2.03	4.833	6.10	7.917	4.06	11.00	2.03
1.833	1.02	4.917	6.10	8.000	4.06	11.08	1.02
1.917	1.02	5.000	6.10	8.083	5.08	11.17	1.02
2.000	1.02	5.083	5.08	8.167	5.08	11.25	1.02
2.083	2.03	5.167	5.08	8.250	5.08	11.33	2.03
2.167	2.03	5.250	5.08	8.333	3.05	11.42	2.03
2.250	2.03	5.333	8.13	8.417	3.05	11.50	2.03
2.333	3.05	5.417	8.13	8.500	3.05	11.58	1.02
2.417	3.05	5.500	8.13	8.583	3.05	11.67	1.02
2.500	3.05	5.583	9.14	8.667	3.05	11.75	1.02
2.583	3.05	5.667	9.14	8.750	3.05	11.83	2.03
2.667	3.05	5.750	9.15	8.833	3.05	11.92	2.03
2.750	3.05	5.833	67.06	8.917	3.05	12.00	2.03
2.833	3.05	5.917	67.06	9.000	3.05	12.08	1.02

2.917	3.05	6.000	67.06	9.083	2.03	12.17	1.02
3.000	3.05	6.083	67.06	9.167	2.03	12.25	1.02
3.083	2.03	6.167	67.06	9.250	2.03		

```
        Max.Eff.Inten.(mm/hr)=       67.06          46.22
              over (min)             10.00          15.00
        Storage Coeff.  (min)=        7.59 (ii)     13.93 (ii)
        Unit Hyd. Tpeak (min)=       10.00          15.00
        Unit Hyd. peak  (cms)=        0.13           0.08
                                                              *TOTALS*
        PEAK FLOW       (cms)=        0.08           0.07      0.140 (iii)
        TIME TO PEAK    (hrs)=        6.25           6.33      6.25
        RUNOFF VOLUME   (mm)=        72.42          39.68     52.12
        TOTAL RAINFALL  (mm)=        74.42          74.42     74.42
        RUNOFF COEFFICIENT  =         0.97           0.53      0.70


          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* =  83.0   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.
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| ADD HYD (0460)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
          ID1= 1 (0205):   1.11   0.140   6.25   52.12
        + ID2= 2 (0210):   0.96   0.126   6.25   54.08
        ===
          ID = 3 (0460):   2.07   0.266   6.25   53.03

        NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0230) | Area   (ha)= 0.70
|ID= 1 DT= 5.0 min | Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00

                                 IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=   0.40   0.30
       Dep. Storage   (mm)=   2.00   5.00
       Average Slope   (%)=   1.00   2.00
       Length   (m)=   320.00   25.00
       Mannings n   =   0.013   0.290

        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	2.03	6.250	67.05	9.33	3.05
0.167	0.00	3.250	2.03	6.333	13.21	9.42	3.05
0.250	0.00	3.333	3.05	6.417	13.21	9.50	3.05
0.333	1.02	3.417	3.05	6.500	13.21	9.58	2.03
0.417	1.02	3.500	3.05	6.583	13.21	9.67	2.03
0.500	1.02	3.583	3.05	6.667	13.21	9.75	2.03
0.583	2.03	3.667	3.05	6.750	13.21	9.83	2.03
0.667	2.03	3.750	3.05	6.833	6.10	9.92	2.03
0.750	2.03	3.833	3.05	6.917	6.10	10.00	2.03
0.833	1.02	3.917	3.05	7.000	6.10	10.08	2.03
0.917	1.02	4.000	3.05	7.083	6.10	10.17	2.03
1.000	1.02	4.083	3.05	7.167	6.10	10.25	2.03
1.083	2.03	4.167	3.05	7.250	6.10	10.33	2.03
1.167	2.03	4.250	3.05	7.333	5.08	10.42	2.03
1.250	2.03	4.333	5.08	7.417	5.08	10.50	2.03
1.333	1.02	4.417	5.08	7.500	5.08	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	5.08	7.667	4.06	10.75	1.02
1.583	2.03	4.667	5.08	7.750	4.06	10.83	2.03
1.667	2.03	4.750	5.08	7.833	4.06	10.92	2.03
1.750	2.03	4.833	6.10	7.917	4.06	11.00	2.03
1.833	1.02	4.917	6.10	8.000	4.06	11.08	1.02
1.917	1.02	5.000	6.10	8.083	5.08	11.17	1.02
2.000	1.02	5.083	5.08	8.167	5.08	11.25	1.02
2.083	2.03	5.167	5.08	8.250	5.08	11.33	2.03
2.167	2.03	5.250	5.08	8.333	3.05	11.42	2.03
2.250	2.03	5.333	8.13	8.417	3.05	11.50	2.03
2.333	3.05	5.417	8.13	8.500	3.05	11.58	1.02
2.417	3.05	5.500	8.13	8.583	3.05	11.67	1.02
2.500	3.05	5.583	9.14	8.667	3.05	11.75	1.02
2.583	3.05	5.667	9.14	8.750	3.05	11.83	2.03
2.667	3.05	5.750	9.15	8.833	3.05	11.92	2.03
2.750	3.05	5.833	67.06	8.917	3.05	12.00	2.03
2.833	3.05	5.917	67.06	9.000	3.05	12.08	1.02
2.917	3.05	6.000	67.06	9.083	2.03	12.17	1.02
3.000	3.05	6.083	67.06	9.167	2.03	12.25	1.02
3.083	2.03	6.167	67.06	9.250	2.03		

```
        Max.Eff.Inten.(mm/hr)=       67.06          43.68
              over (min)              5.00          15.00
        Storage Coeff.  (min)=        6.02 (ii)     14.13 (ii)
        Unit Hyd. Tpeak (min)=        5.00          15.00
        Unit Hyd. peak  (cms)=        0.19           0.08
                                                              *TOTALS*
        PEAK FLOW       (cms)=        0.07           0.03      0.100 (iii)
        TIME TO PEAK    (hrs)=        6.25           6.33      6.25
        RUNOFF VOLUME   (mm)=        72.42          37.36     57.33
        TOTAL RAINFALL  (mm)=        74.42          74.42     74.42
        RUNOFF COEFFICIENT  =         0.97           0.50      0.77


          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

```
              CN* =  81.0   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 (0225) | Area   (ha)= 0.90
|ID= 1 DT= 5.0 min | Total Imp(%)= 53.00   Dir. Conn.(%)= 53.00

                                 IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=   0.48   0.42
       Dep. Storage   (mm)=   2.00   5.00
       Average Slope   (%)=   1.00   2.00
       Length   (m)=   320.00   25.00
       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	3.167	2.03	6.250	67.05	9.33	3.05
0.167	0.00	3.250	2.03	6.333	13.21	9.42	3.05
0.250	0.00	3.333	3.05	6.417	13.21	9.50	3.05
0.333	1.02	3.417	3.05	6.500	13.21	9.58	2.03
0.417	1.02	3.500	3.05	6.583	13.21	9.67	2.03
0.500	1.02	3.583	3.05	6.667	13.21	9.75	2.03
0.583	2.03	3.667	3.05	6.750	13.21	9.83	2.03
0.667	2.03	3.750	3.05	6.833	6.10	9.92	2.03
0.750	2.03	3.833	3.05	6.917	6.10	10.00	2.03
0.833	1.02	3.917	3.05	7.000	6.10	10.08	2.03
0.917	1.02	4.000	3.05	7.083	6.10	10.17	2.03
1.000	1.02	4.083	3.05	7.167	6.10	10.25	2.03
1.083	2.03	4.167	3.05	7.250	6.10	10.33	2.03
1.167	2.03	4.250	3.05	7.333	5.08	10.42	2.03
1.250	2.03	4.333	5.08	7.417	5.08	10.50	2.03
1.333	1.02	4.417	5.08	7.500	5.08	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	5.08	7.667	4.06	10.75	1.02
1.583	2.03	4.667	5.08	7.750	4.06	10.83	2.03
1.667	2.03	4.750	5.08	7.833	4.06	10.92	2.03
1.750	2.03	4.833	6.10	7.917	4.06	11.00	2.03
1.833	1.02	4.917	6.10	8.000	4.06	11.08	1.02
1.917	1.02	5.000	6.10	8.083	5.08	11.17	1.02
2.000	1.02	5.083	5.08	8.167	5.08	11.25	1.02
2.083	2.03	5.167	5.08	8.250	5.08	11.33	2.03
2.167	2.03	5.250	5.08	8.333	3.05	11.42	2.03
2.250	2.03	5.333	8.13	8.417	3.05	11.50	2.03
2.333	3.05	5.417	8.13	8.500	3.05	11.58	1.02
2.417	3.05	5.500	8.13	8.583	3.05	11.67	1.02

```
         2.500   3.05 | 5.583    9.14 | 8.667    3.05 | 11.75   1.02
         2.583   3.05 | 5.667    9.14 | 8.750    3.05 | 11.83   2.03
         2.667   3.05 | 5.750    9.15 | 8.833    3.05 | 11.92   2.03
         2.750   3.05 | 5.833   67.06 | 8.917    3.05 | 12.00   2.03
         2.833   3.05 | 5.917   67.06 | 9.000    3.05 | 12.08   1.02
         2.917   3.05 | 6.000   67.06 | 9.083    2.03 | 12.17   1.02
         3.000   3.05 | 6.083   67.06 | 9.167    2.03 | 12.25   1.02
         3.083   2.03 | 6.167   67.06 | 9.250    2.03 |
```

```
    Max.Eff.Inten.(mm/hr)=      67.06           46.22
              over (min)         5.00           15.00
    Storage Coeff.  (min)=       6.02 (ii)      13.27 (ii)
    Unit Hyd. Tpeak (min)=       5.00           15.00
    Unit Hyd. peak  (cms)=       0.19            0.08
                                                            *TOTALS*
    PEAK FLOW       (cms)=       0.09            0.04        0.128 (iii)
    TIME TO PEAK    (hrs)=       6.25            6.33        6.25
    RUNOFF VOLUME     (mm)=      72.42          39.68       57.02
    TOTAL RAINFALL   (mm)=       74.42          74.42       74.42
    RUNOFF COEFFICIENT  =        0.97            0.53        0.77


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN*  = 83.0    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 ( 0475)|
|  1 + 2 = 3     |          AREA   QPEAK   TPEAK    R.V.
--------------------          (ha)  (cms)   (hrs)    (mm)
      ID1= 1 ( 0225):     0.90   0.128    6.25    57.02
    + ID2= 2 ( 0230):     0.70   0.100    6.25    57.33
      =================================================
        ID = 3 ( 0475):     1.60   0.228    6.25    57.16

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

--------------------
| CALIB           |
| STANDHYD ( 0220)|  Area   (ha)=  0.65
|ID= 1 DT= 5.0 min |  Total Imp(%)= 46.00   Dir. Conn.(%)= 46.00
--------------------
                              IMPERVIOUS     PERVIOUS (i)
      Surface Area    (ha)=      0.30           0.35
      Dep. Storage    (mm)=      2.00           5.00
      Average Slope   (%)=       1.00           2.00
      Length          (m)=     260.00          20.00
      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 | 3.167   2.03 | 6.250  67.05 | 9.33   3.05
             0.167   0.00 | 3.250   2.03 | 6.333  13.21 | 9.42   3.05
             0.250   0.00 | 3.333   3.05 | 6.417  13.21 | 9.50   3.05
             0.333   1.02 | 3.417   3.05 | 6.500  13.21 | 9.58   2.03
             0.417   1.02 | 3.500   3.05 | 6.583  13.21 | 9.67   2.03
             0.500   1.02 | 3.583   3.05 | 6.667  13.21 | 9.75   2.03
             0.583   2.03 | 3.667   3.05 | 6.750  13.21 | 9.83   2.03
             0.667   2.03 | 3.750   3.05 | 6.833   6.10 | 9.92   2.03
             0.750   2.03 | 3.833   3.05 | 6.917   6.10 | 10.00  2.03
             0.833   1.02 | 3.917   3.05 | 7.000   6.10 | 10.08  2.03
             0.917   1.02 | 4.000   3.05 | 7.083   6.10 | 10.17  2.03
             1.000   1.02 | 4.083   3.05 | 7.167   6.10 | 10.25  2.03
             1.083   2.03 | 4.167   3.05 | 7.250   6.10 | 10.33  2.03
             1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
             1.250   2.03 | 4.333   5.08 | 7.417   5.08 | 10.50  2.03
             1.333   1.02 | 4.417   5.08 | 7.500   5.08 | 10.58  1.02
             1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67  1.02
             1.500   1.02 | 4.583   5.08 | 7.667   4.06 | 10.75  1.02
             1.583   2.03 | 4.667   5.08 | 7.750   4.06 | 10.83  2.03
             1.667   2.03 | 4.750   5.08 | 7.833   4.06 | 10.92  2.03
             1.750   2.03 | 4.833   6.10 | 7.917   4.06 | 11.00  2.03
             1.833   1.02 | 4.917   6.10 | 8.000   4.06 | 11.08  1.02
             1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  1.02
             2.000   1.02 | 5.083   5.08 | 8.167   5.08 | 11.25  1.02
             2.083   2.03 | 5.167   5.08 | 8.250   5.08 | 11.33  2.03
             2.167   2.03 | 5.250   5.08 | 8.333   3.05 | 11.42  2.03
             2.250   2.03 | 5.333   8.13 | 8.417   3.05 | 11.50  2.03
             2.333   3.05 | 5.417   8.13 | 8.500   3.05 | 11.58  1.02
             2.417   3.05 | 5.500   8.13 | 8.583   3.05 | 11.67  1.02
             2.500   3.05 | 5.583   9.14 | 8.667   3.05 | 11.75  1.02
             2.583   3.05 | 5.667   9.14 | 8.750   3.05 | 11.83  2.03
             2.667   3.05 | 5.750   9.15 | 8.833   3.05 | 11.92  2.03
             2.750   3.05 | 5.833  67.06 | 8.917   3.05 | 12.00  2.03
             2.833   3.05 | 5.917  67.06 | 9.000   3.05 | 12.08  1.02
             2.917   3.05 | 6.000  67.06 | 9.083   2.03 | 12.17  1.02
             3.000   3.05 | 6.083  67.06 | 9.167   2.03 | 12.25  1.02
             3.083   2.03 | 6.167  67.06 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=      67.06           46.22
              over (min)         5.00           15.00
    Storage Coeff.  (min)=       5.32 (ii)      11.66 (ii)
    Unit Hyd. Tpeak (min)=       5.00           15.00
    Unit Hyd. peak  (cms)=       0.21            0.09
                                                            *TOTALS*
    PEAK FLOW       (cms)=       0.06            0.03        0.090 (iii)
    TIME TO PEAK    (hrs)=       6.25            6.33        6.25
    RUNOFF VOLUME     (mm)=      72.42          39.68       54.73
```

```
    TOTAL RAINFALL   (mm)=       74.42          74.42       74.42
    RUNOFF COEFFICIENT  =        0.97            0.53        0.74


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN*  = 83.0    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 ( 0215)|  Area   (ha)=  0.58
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                              IMPERVIOUS     PERVIOUS (i)
      Surface Area    (ha)=      0.33           0.25
      Dep. Storage    (mm)=      2.00           5.00
      Average Slope   (%)=       1.00           2.00
      Length          (m)=     260.00          30.00
      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 | 3.167   2.03 | 6.250  67.05 | 9.33   3.05
             0.167   0.00 | 3.250   2.03 | 6.333  13.21 | 9.42   3.05
             0.250   0.00 | 3.333   3.05 | 6.417  13.21 | 9.50   3.05
             0.333   1.02 | 3.417   3.05 | 6.500  13.21 | 9.58   2.03
             0.417   1.02 | 3.500   3.05 | 6.583  13.21 | 9.67   2.03
             0.500   1.02 | 3.583   3.05 | 6.667  13.21 | 9.75   2.03
             0.583   2.03 | 3.667   3.05 | 6.750  13.21 | 9.83   2.03
             0.667   2.03 | 3.750   3.05 | 6.833   6.10 | 9.92   2.03
             0.750   2.03 | 3.833   3.05 | 6.917   6.10 | 10.00  2.03
             0.833   1.02 | 3.917   3.05 | 7.000   6.10 | 10.08  2.03
             0.917   1.02 | 4.000   3.05 | 7.083   6.10 | 10.17  2.03
             1.000   1.02 | 4.083   3.05 | 7.167   6.10 | 10.25  2.03
             1.083   2.03 | 4.167   3.05 | 7.250   6.10 | 10.33  2.03
             1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
             1.250   2.03 | 4.333   5.08 | 7.417   5.08 | 10.50  2.03
             1.333   1.02 | 4.417   5.08 | 7.500   5.08 | 10.58  1.02
             1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67  1.02
             1.500   1.02 | 4.583   5.08 | 7.667   4.06 | 10.75  1.02
             1.583   2.03 | 4.667   5.08 | 7.750   4.06 | 10.83  2.03
             1.667   2.03 | 4.750   5.08 | 7.833   4.06 | 10.92  2.03
             1.750   2.03 | 4.833   6.10 | 7.917   4.06 | 11.00  2.03
             1.833   1.02 | 4.917   6.10 | 8.000   4.06 | 11.08  1.02
             1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  1.02
             2.000   1.02 | 5.083   5.08 | 8.167   5.08 | 11.25  1.02
```

```
         2.083   2.03 | 5.167    5.08 | 8.250    5.08 | 11.33   2.03
         2.167   2.03 | 5.250    5.08 | 8.333    3.05 | 11.42   2.03
         2.250   2.03 | 5.333    8.13 | 8.417    3.05 | 11.50   2.03
         2.333   3.05 | 5.417    8.13 | 8.500    3.05 | 11.58   1.02
         2.417   3.05 | 5.500    8.13 | 8.583    3.05 | 11.67   1.02
         2.500   3.05 | 5.583    9.14 | 8.667    3.05 | 11.75   1.02
         2.583   3.05 | 5.667    9.14 | 8.750    3.05 | 11.83   2.03
         2.667   3.05 | 5.750    9.15 | 8.833    3.05 | 11.92   2.03
         2.750   3.05 | 5.833   67.06 | 8.917    3.05 | 12.00   2.03
         2.833   3.05 | 5.917   67.06 | 9.000    3.05 | 12.08   1.02
         2.917   3.05 | 6.000   67.06 | 9.083    2.03 | 12.17   1.02
         3.000   3.05 | 6.083   67.06 | 9.167    2.03 | 12.25   1.02
         3.083   2.03 | 6.167   67.06 | 9.250    2.03 |

    Max.Eff.Inten.(mm/hr)=      67.06           46.22
              over (min)         5.00           15.00
    Storage Coeff.  (min)=       5.32 (ii)      13.40 (ii)
    Unit Hyd. Tpeak (min)=       5.00           15.00
    Unit Hyd. peak  (cms)=       0.21            0.08
                                                            *TOTALS*
    PEAK FLOW       (cms)=       0.06            0.02        0.085 (iii)
    TIME TO PEAK    (hrs)=       6.25            6.33        6.25
    RUNOFF VOLUME     (mm)=      72.42          39.68       58.33
    TOTAL RAINFALL   (mm)=       74.42          74.42       74.42
    RUNOFF COEFFICIENT  =        0.97            0.53        0.78


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN*  = 83.0    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 ( 0470)|
|  1 + 2 = 3     |          AREA   QPEAK   TPEAK    R.V.
--------------------          (ha)  (cms)   (hrs)    (mm)
      ID1= 1 ( 0215):     0.58   0.085    6.25    58.33
    + ID2= 2 ( 0220):     0.65   0.090    6.25    54.73
      =================================================
        ID = 3 ( 0470):     1.23   0.175    6.25    56.43

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

--------------------
| ADD HYD ( 0480)|
|  1 + 2 = 3     |          AREA   QPEAK   TPEAK    R.V.
--------------------          (ha)  (cms)   (hrs)    (mm)
      ID1= 1 ( 0470):     1.23   0.175    6.25    56.43
    + ID2= 2 ( 0475):     1.60   0.228    6.25    57.16
```

LangstaffRd_EA_Existing_WestDonWatershd
==
ID = 3 (0480):   2.83   0.402   6.25   56.84

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0160)| Area   (ha)= 0.43
|ID= 1 DT= 5.0 min | Total Imp(%)= 56.00   Dir. Conn.(%)= 56.00

                              IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=   0.24   0.19
   Dep. Storage   (mm)=   2.00   5.00
   Average Slope   (%)=   1.00   2.00
   Length   (m)=   260.00   20.00
   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| 3.167   2.03| 6.250 67.05| 9.33   3.05
         0.167   0.00| 3.250   2.03| 6.333 13.21| 9.42   3.05
         0.250   0.00| 3.333   3.05| 6.417 13.21| 9.50   3.05
         0.333   1.02| 3.417   3.05| 6.500 13.21| 9.58   2.03
         0.417   1.02| 3.500   3.05| 6.583 13.21| 9.67   2.03
         0.500   1.02| 3.583   3.05| 6.667 13.21| 9.75   2.03
         0.583   2.03| 3.667   3.05| 6.750 13.21| 9.83   2.03
         0.667   2.03| 3.750   3.05| 6.833   6.10| 9.92   2.03
         0.750   2.03| 3.833   3.05| 6.917   6.10|10.00   2.03
         0.833   1.02| 3.917   3.05| 7.000   6.10|10.08   2.03
         0.917   1.02| 4.000   3.05| 7.083   6.10|10.17   2.03
         1.000   1.02| 4.083   3.05| 7.167   6.10|10.25   2.03
         1.083   2.03| 4.167   3.05| 7.250   6.10|10.33   2.03
         1.167   2.03| 4.250   3.05| 7.333   5.08|10.42   2.03
         1.250   2.03| 4.333   5.08| 7.417   5.08|10.50   2.03
         1.333   1.02| 4.417   5.08| 7.500   5.08|10.58   1.02
         1.417   1.02| 4.500   5.08| 7.583   4.06|10.67   1.02
         1.500   1.02| 4.583   5.08| 7.667   4.06|10.75   1.02
         1.583   2.03| 4.667   5.08| 7.750   4.06|10.83   2.03
         1.667   2.03| 4.750   5.08| 7.833   4.06|10.92   2.03
         1.750   2.03| 4.833   6.10| 7.917   4.06|11.00   2.03
         1.833   1.02| 4.917   6.10| 8.000   4.06|11.08   1.02
         1.917   1.02| 5.000   6.10| 8.083   5.08|11.17   1.02
         2.000   1.02| 5.083   5.08| 8.167   5.08|11.25   1.02
         2.083   2.03| 5.167   5.08| 8.250   5.08|11.33   2.03
         2.167   2.03| 5.250   5.08| 8.333   3.05|11.42   2.03
         2.250   2.03| 5.333   8.13| 8.417   3.05|11.50   2.03
         2.333   3.05| 5.417   8.13| 8.500   3.05|11.58   1.02
         2.417   3.05| 5.500   8.13| 8.583   3.05|11.67   1.02
         2.500   3.05| 5.583   9.14| 8.667   3.05|11.75   1.02

LangstaffRd_EA_Existing_WestDonWatershd
         2.583   3.05| 5.667   9.14| 8.750   3.05|11.83   2.03
         2.667   3.05| 5.750   9.15| 8.833   3.05|11.92   2.03
         2.750   3.05| 5.833 67.06| 8.917   3.05|12.00   2.03
         2.833   3.05| 5.917 67.06| 9.000   3.05|12.08   1.02
         2.917   3.05| 6.000 67.06| 9.083   2.03|12.17   1.02
         3.000   3.05| 6.083 67.06| 9.167   2.03|12.25   1.02
         3.083   2.03| 6.167 67.06| 9.250   2.03|

   Max.Eff.Inten.(mm/hr)=   67.06   54.54
           over (min)=   5.00   15.00
   Storage Coeff. (min)=   5.32 (ii)   10.28 (ii)
   Unit Hyd. Tpeak (min)=   5.00   15.00
   Unit Hyd. peak (cms)=   0.21   0.09
                                                        TOTALS
   PEAK FLOW   (cms)=   0.04   0.02   0.068 (iii)
   TIME TO PEAK   (hrs)=   6.25   6.25   6.25
   RUNOFF VOLUME   (mm)=   72.42   47.80   61.58
   TOTAL RAINFALL (mm)=   74.42   74.42   74.42
   RUNOFF COEFFICIENT =   0.97   0.64   0.83

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 89.0   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 (0155)| Area   (ha)= 0.56
|ID= 1 DT= 5.0 min | Total Imp(%)= 45.00   Dir. Conn.(%)= 45.00

                              IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=   0.25   0.31
   Dep. Storage   (mm)=   2.00   5.00
   Average Slope   (%)=   1.00   2.00
   Length   (m)=   260.00   25.00
   Mannings n   =   0.013   0.290

     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   2.03| 6.250 67.05| 9.33   3.05
         0.167   0.00| 3.250   2.03| 6.333 13.21| 9.42   3.05
         0.250   0.00| 3.333   3.05| 6.417 13.21| 9.50   3.05
         0.333   1.02| 3.417   3.05| 6.500 13.21| 9.58   2.03
         0.417   1.02| 3.500   3.05| 6.583 13.21| 9.67   2.03
         0.500   1.02| 3.583   3.05| 6.667 13.21| 9.75   2.03
         0.583   2.03| 3.667   3.05| 6.750 13.21| 9.83   2.03

LangstaffRd_EA_Existing_WestDonWatershd
         0.667   2.03| 3.750   3.05| 6.833   6.10| 9.92   2.03
         0.750   2.03| 3.833   3.05| 6.917   6.10|10.00   2.03
         0.833   1.02| 3.917   3.05| 7.000   6.10|10.08   2.03
         0.917   1.02| 4.000   3.05| 7.083   6.10|10.17   2.03
         1.000   1.02| 4.083   3.05| 7.167   6.10|10.25   2.03
         1.083   2.03| 4.167   3.05| 7.250   6.10|10.33   2.03
         1.167   2.03| 4.250   3.05| 7.333   5.08|10.42   2.03
         1.250   2.03| 4.333   5.08| 7.417   5.08|10.50   2.03
         1.333   1.02| 4.417   5.08| 7.500   5.08|10.58   1.02
         1.417   1.02| 4.500   5.08| 7.583   4.06|10.67   1.02
         1.500   1.02| 4.583   5.08| 7.667   4.06|10.75   1.02
         1.583   2.03| 4.667   5.08| 7.750   4.06|10.83   2.03
         1.667   2.03| 4.750   5.08| 7.833   4.06|10.92   2.03
         1.750   2.03| 4.833   6.10| 7.917   4.06|11.00   2.03
         1.833   1.02| 4.917   6.10| 8.000   4.06|11.08   1.02
         1.917   1.02| 5.000   6.10| 8.083   5.08|11.17   1.02
         2.000   1.02| 5.083   5.08| 8.167   5.08|11.25   1.02
         2.083   2.03| 5.167   5.08| 8.250   5.08|11.33   2.03
         2.167   2.03| 5.250   5.08| 8.333   3.05|11.42   2.03
         2.250   2.03| 5.333   8.13| 8.417   3.05|11.50   2.03
         2.333   3.05| 5.417   8.13| 8.500   3.05|11.58   1.02
         2.417   3.05| 5.500   8.13| 8.583   3.05|11.67   1.02
         2.500   3.05| 5.583   9.14| 8.667   3.05|11.75   1.02
         2.583   3.05| 5.667   9.14| 8.750   3.05|11.83   2.03
         2.667   3.05| 5.750   9.15| 8.833   3.05|11.92   2.03
         2.750   3.05| 5.833 67.06| 8.917   3.05|12.00   2.03
         2.833   3.05| 5.917 67.06| 9.000   3.05|12.08   1.02
         2.917   3.05| 6.000 67.06| 9.083   2.03|12.17   1.02
         3.000   3.05| 6.083 67.06| 9.167   2.03|12.25   1.02
         3.083   2.03| 6.167 67.06| 9.250   2.03|

   Max.Eff.Inten.(mm/hr)=   67.06   51.67
           over (min)=   5.00   15.00
   Storage Coeff. (min)=   5.32 (ii)   12.90 (ii)
   Unit Hyd. Tpeak (min)=   5.00   15.00
   Unit Hyd. peak (cms)=   0.21   0.08
                                                        TOTALS
   PEAK FLOW   (cms)=   0.05   0.03   0.080 (iii)
   TIME TO PEAK   (hrs)=   6.25   6.33   6.25
   RUNOFF VOLUME   (mm)=   72.42   44.88   57.26
   TOTAL RAINFALL (mm)=   74.42   74.42   74.42
   RUNOFF COEFFICIENT =   0.97   0.60   0.77

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 87.0   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.

LangstaffRd_EA_Existing_WestDonWatershd
| ADD HYD (0430)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
    ID1= 1 (0155):   0.56   0.080   6.25   57.26
  + ID2= 2 (0160):   0.43   0.068   6.25   61.58
                     ==
    ID = 3 (0430):   0.99   0.149   6.25   59.14

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0150)| Area   (ha)= 3.81
|ID= 1 DT= 5.0 min | Total Imp(%)= 94.00   Dir. Conn.(%)= 94.00

                              IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=   3.58   0.23
   Dep. Storage   (mm)=   2.00   5.00
   Average Slope   (%)=   1.00   2.00
   Length   (m)=   150.00   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| 3.167   2.03| 6.250 67.05| 9.33   3.05
         0.167   0.00| 3.250   2.03| 6.333 13.21| 9.42   3.05
         0.250   0.00| 3.333   3.05| 6.417 13.21| 9.50   3.05
         0.333   1.02| 3.417   3.05| 6.500 13.21| 9.58   2.03
         0.417   1.02| 3.500   3.05| 6.583 13.21| 9.67   2.03
         0.500   1.02| 3.583   3.05| 6.667 13.21| 9.75   2.03
         0.583   2.03| 3.667   3.05| 6.750 13.21| 9.83   2.03
         0.667   2.03| 3.750   3.05| 6.833   6.10| 9.92   2.03
         0.750   2.03| 3.833   3.05| 6.917   6.10|10.00   2.03
         0.833   1.02| 3.917   3.05| 7.000   6.10|10.08   2.03
         0.917   1.02| 4.000   3.05| 7.083   6.10|10.17   2.03
         1.000   1.02| 4.083   3.05| 7.167   6.10|10.25   2.03
         1.083   2.03| 4.167   3.05| 7.250   6.10|10.33   2.03
         1.167   2.03| 4.250   3.05| 7.333   5.08|10.42   2.03
         1.250   2.03| 4.333   5.08| 7.417   5.08|10.50   2.03
         1.333   1.02| 4.417   5.08| 7.500   5.08|10.58   1.02
         1.417   1.02| 4.500   5.08| 7.583   4.06|10.67   1.02
         1.500   1.02| 4.583   5.08| 7.667   4.06|10.75   1.02
         1.583   2.03| 4.667   5.08| 7.750   4.06|10.83   2.03
         1.667   2.03| 4.750   5.08| 7.833   4.06|10.92   2.03
         1.750   2.03| 4.833   6.10| 7.917   4.06|11.00   2.03
         1.833   1.02| 4.917   6.10| 8.000   4.06|11.08   1.02
         1.917   1.02| 5.000   6.10| 8.083   5.08|11.17   1.02
         2.000   1.02| 5.083   5.08| 8.167   5.08|11.25   1.02
         2.083   2.03| 5.167   5.08| 8.250   5.08|11.33   2.03

```
              2.167   2.03 | 5.250   5.08 | 8.333   3.05 | 11.42   2.03
              2.250   2.03 | 5.333   8.13 | 8.417   3.05 | 11.50   2.03
              2.333   3.05 | 5.417   8.13 | 8.500   3.05 | 11.58   1.02
              2.417   3.05 | 5.500   8.13 | 8.583   3.05 | 11.67   1.02
              2.500   3.05 | 5.583   9.14 | 8.667   3.05 | 11.75   1.02
              2.583   3.05 | 5.667   9.14 | 8.750   3.05 | 11.83   2.03
              2.667   3.05 | 5.750   9.15 | 8.833   3.05 | 11.92   2.03
              2.750   3.05 | 5.833  67.06 | 8.917   3.05 | 12.00   2.03
              2.833   3.05 | 5.917  67.06 | 9.000   3.05 | 12.08   1.02
              2.917   3.05 | 6.000  67.06 | 9.083   2.03 | 12.17   1.02
              3.000   3.05 | 6.083  67.06 | 9.167   2.03 | 12.25   1.02
              3.083   2.03 | 6.167  67.06 | 9.250   2.03 |
```

```
      Max.Eff.Inten.(mm/hr)=     67.06          53.10
                over (min)        5.00          10.00
      Storage Coeff.  (min)=      3.82 (ii)      6.58 (ii)
      Unit Hyd. Tpeak (min)=      5.00          10.00
      Unit Hyd. peak  (cms)=      0.25           0.14
                                                          *TOTALS*
      PEAK FLOW       (cms)=      0.67           0.03       0.699 (iii)
      TIME TO PEAK    (hrs)=      6.25           6.25       6.25
      RUNOFF VOLUME   (mm)=      72.42          46.31      70.86
      TOTAL RAINFALL  (mm)=      74.42          74.42      74.42
      RUNOFF COEFFICIENT  =       0.97           0.62       0.95

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

         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 88.0   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 ( 0440)|
|  1 + 2 = 3    |            AREA    QPEAK    TPEAK    R.V.
--------------------           (ha)    (cms)    (hrs)    (mm)
       ID1= 1 ( 0150):         3.81    0.699    6.25    70.86
     + ID2= 2 ( 0430):         0.99    0.149    6.25    59.14
                             ==========================================
       ID = 3 ( 0440):         4.80    0.847    6.25    68.44

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

```
--------------------
| CALIB          |
| STANDHYD ( 0185)|  Area    (ha)=  0.47
|ID= 1 DT= 5.0 min |  Total Imp(%)= 48.00  Dir. Conn.(%)= 48.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
      Surface Area   (ha)=    0.23         0.24
```

```
      Dep. Storage    (mm)=      2.00           5.00
      Average Slope   (%)=       1.00           2.00
      Length          (m)=     240.00          20.00
      Mannings n       =        0.013          0.350

      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   2.03 | 6.250  67.05 | 9.33   3.05
             0.167   0.00 | 3.250   2.03 | 6.333  13.21 | 9.42   3.05
             0.250   0.00 | 3.333   3.05 | 6.417  13.21 | 9.50   3.05
             0.333   1.02 | 3.417   3.05 | 6.500  13.21 | 9.58   2.03
             0.417   1.02 | 3.500   3.05 | 6.583  13.21 | 9.67   2.03
             0.500   1.02 | 3.583   3.05 | 6.667  13.21 | 9.75   2.03
             0.583   2.03 | 3.667   3.05 | 6.750  13.21 | 9.83   2.03
             0.667   2.03 | 3.750   3.05 | 6.833   6.10 | 9.92   2.03
             0.750   2.03 | 3.833   3.05 | 6.917   6.10 | 10.00  2.03
             0.833   1.02 | 3.917   3.05 | 7.000   6.10 | 10.08  2.03
             0.917   1.02 | 4.000   3.05 | 7.083   6.10 | 10.17  2.03
             1.000   1.02 | 4.083   3.05 | 7.167   6.10 | 10.25  2.03
             1.083   2.03 | 4.167   3.05 | 7.250   6.10 | 10.33  2.03
             1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
             1.250   2.03 | 4.333   5.08 | 7.417   5.08 | 10.50  2.03
             1.333   1.02 | 4.417   5.08 | 7.500   5.08 | 10.58  1.02
             1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67  1.02
             1.500   1.02 | 4.583   5.08 | 7.667   4.06 | 10.75  1.02
             1.583   2.03 | 4.667   5.08 | 7.750   4.06 | 10.83  2.03
             1.667   2.03 | 4.750   5.08 | 7.833   4.06 | 10.92  2.03
             1.750   2.03 | 4.833   6.10 | 7.917   4.06 | 11.00  2.03
             1.833   1.02 | 4.917   6.10 | 8.000   4.06 | 11.08  1.02
             1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  1.02
             2.000   1.02 | 5.083   5.08 | 8.167   5.08 | 11.25  1.02
             2.083   2.03 | 5.167   5.08 | 8.250   5.08 | 11.33  2.03
             2.167   2.03 | 5.250   5.08 | 8.333   3.05 | 11.42  2.03
             2.250   2.03 | 5.333   8.13 | 8.417   3.05 | 11.50  2.03
             2.333   3.05 | 5.417   8.13 | 8.500   3.05 | 11.58  1.02
             2.417   3.05 | 5.500   8.13 | 8.583   3.05 | 11.67  1.02
             2.500   3.05 | 5.583   9.14 | 8.667   3.05 | 11.75  1.02
             2.583   3.05 | 5.667   9.14 | 8.750   3.05 | 11.83  2.03
             2.667   3.05 | 5.750   9.15 | 8.833   3.05 | 11.92  2.03
             2.750   3.05 | 5.833  67.06 | 8.917   3.05 | 12.00  2.03
             2.833   3.05 | 5.917  67.06 | 9.000   3.05 | 12.08  1.02
             2.917   3.05 | 6.000  67.06 | 9.083   2.03 | 12.17  1.02
             3.000   3.05 | 6.083  67.06 | 9.167   2.03 | 12.25  1.02
             3.083   2.03 | 6.167  67.06 | 9.250   2.03 |
```

```
      Max.Eff.Inten.(mm/hr)=     67.06          41.26
                over (min)        5.00          15.00
      Storage Coeff.  (min)=      5.07 (ii)     13.19 (ii)
      Unit Hyd. Tpeak (min)=      5.00          15.00
```

```
      Unit Hyd. peak  (cms)=      0.21           0.08
                                                          *TOTALS*
      PEAK FLOW       (cms)=      0.04           0.02       0.062 (iii)
      TIME TO PEAK    (hrs)=      6.25           6.33       6.25
      RUNOFF VOLUME   (mm)=      72.42          35.19      53.05
      TOTAL RAINFALL  (mm)=      74.42          74.42      74.42
      RUNOFF COEFFICIENT  =       0.97           0.47       0.71


         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 79.0   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 ( 0180)|  Area    (ha)=  0.65
|ID= 1 DT= 5.0 min |  Total Imp(%)= 33.00  Dir. Conn.(%)= 33.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
      Surface Area   (ha)=    0.21         0.44
      Dep. Storage   (mm)=    2.00         5.00
      Average Slope  (%)=     1.00         2.00
      Length         (m)=    65.83        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 | 3.167   2.03 | 6.250  67.05 | 9.33   3.05
             0.167   0.00 | 3.250   2.03 | 6.333  13.21 | 9.42   3.05
             0.250   0.00 | 3.333   3.05 | 6.417  13.21 | 9.50   3.05
             0.333   1.02 | 3.417   3.05 | 6.500  13.21 | 9.58   2.03
             0.417   1.02 | 3.500   3.05 | 6.583  13.21 | 9.67   2.03
             0.500   1.02 | 3.583   3.05 | 6.667  13.21 | 9.75   2.03
             0.583   2.03 | 3.667   3.05 | 6.750  13.21 | 9.83   2.03
             0.667   2.03 | 3.750   3.05 | 6.833   6.10 | 9.92   2.03
             0.750   2.03 | 3.833   3.05 | 6.917   6.10 | 10.00  2.03
             0.833   1.02 | 3.917   3.05 | 7.000   6.10 | 10.08  2.03
             0.917   1.02 | 4.000   3.05 | 7.083   6.10 | 10.17  2.03
             1.000   1.02 | 4.083   3.05 | 7.167   6.10 | 10.25  2.03
             1.083   2.03 | 4.167   3.05 | 7.250   6.10 | 10.33  2.03
             1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
             1.250   2.03 | 4.333   5.08 | 7.417   5.08 | 10.50  2.03
             1.333   1.02 | 4.417   5.08 | 7.500   5.08 | 10.58  1.02
             1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67  1.02
             1.500   1.02 | 4.583   5.08 | 7.667   4.06 | 10.75  1.02
             1.583   2.03 | 4.667   5.08 | 7.750   4.06 | 10.83  2.03
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             1.667   2.03 | 4.750   5.08 | 7.833   4.06 | 10.92  2.03
             1.750   2.03 | 4.833   6.10 | 7.917   4.06 | 11.00  2.03
             1.833   1.02 | 4.917   6.10 | 8.000   4.06 | 11.08  1.02
             1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  1.02
             2.000   1.02 | 5.083   5.08 | 8.167   5.08 | 11.25  1.02
             2.083   2.03 | 5.167   5.08 | 8.250   5.08 | 11.33  2.03
             2.167   2.03 | 5.250   5.08 | 8.333   3.05 | 11.42  2.03
             2.250   2.03 | 5.333   8.13 | 8.417   3.05 | 11.50  2.03
             2.333   3.05 | 5.417   8.13 | 8.500   3.05 | 11.58  1.02
             2.417   3.05 | 5.500   8.13 | 8.583   3.05 | 11.67  1.02
             2.500   3.05 | 5.583   9.14 | 8.667   3.05 | 11.75  1.02
             2.583   3.05 | 5.667   9.14 | 8.750   3.05 | 11.83  2.03
             2.667   3.05 | 5.750   9.15 | 8.833   3.05 | 11.92  2.03
             2.750   3.05 | 5.833  67.06 | 8.917   3.05 | 12.00  2.03
             2.833   3.05 | 5.917  67.06 | 9.000   3.05 | 12.08  1.02
             2.917   3.05 | 6.000  67.06 | 9.083   2.03 | 12.17  1.02
             3.000   3.05 | 6.083  67.06 | 9.167   2.03 | 12.25  1.02
             3.083   2.03 | 6.167  67.06 | 9.250   2.03 |
```

```
      Max.Eff.Inten.(mm/hr)=     67.06          46.22
                over (min)        5.00          15.00
      Storage Coeff.  (min)=      2.33 (ii)     11.94 (ii)
      Unit Hyd. Tpeak (min)=      5.00          15.00
      Unit Hyd. peak  (cms)=      0.30           0.09
                                                          *TOTALS*
      PEAK FLOW       (cms)=      0.04           0.04       0.082 (iii)
      TIME TO PEAK    (hrs)=      6.17           6.33       6.25
      RUNOFF VOLUME   (mm)=      72.42          39.68      50.48
      TOTAL RAINFALL  (mm)=      74.42          74.42      74.42
      RUNOFF COEFFICIENT  =       0.97           0.53       0.68

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

         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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.
```

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--------------------
| ADD HYD ( 0445)|
|  1 + 2 = 3    |            AREA    QPEAK    TPEAK    R.V.
--------------------           (ha)    (cms)    (hrs)    (mm)
       ID1= 1 ( 0180):         0.65    0.082    6.25    50.48
     + ID2= 2 ( 0185):         0.47    0.062    6.25    53.05
                             ==========================================
       ID = 3 ( 0445):         1.12    0.144    6.25    51.56

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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Page 121

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                    LangstaffRd_EA_Existing_WestDonWatershd
| CALIB            |
| STANDHYD ( 0165)|  Area    (ha)=  0.60
|ID= 1 DT= 5.0 min |  Total Imp(%)= 40.00   Dir. Conn.(%)= 40.00
-------------------
                              IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=       0.24          0.36
     Dep. Storage    (mm)=       2.00          5.00
     Average Slope   (%)=        1.00          2.00
     Length          (m)=      250.00         20.00
     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 | 3.167    2.03 | 6.250   67.05 | 9.33    3.05
         0.167    0.00 | 3.250    2.03 | 6.333   13.21 | 9.42    3.05
         0.250    0.00 | 3.333    3.05 | 6.417   13.21 | 9.50    3.05
         0.333    1.02 | 3.417    3.05 | 6.500   13.21 | 9.58    2.03
         0.417    1.02 | 3.500    3.05 | 6.583   13.21 | 9.67    2.03
         0.500    1.02 | 3.583    3.05 | 6.667   13.21 | 9.75    2.03
         0.583    2.03 | 3.667    3.05 | 6.750   13.21 | 9.83    2.03
         0.667    2.03 | 3.750    3.05 | 6.833    6.10 | 9.92    2.03
         0.750    2.03 | 3.833    3.05 | 6.917    6.10 | 10.00   2.03
         0.833    1.02 | 3.917    3.05 | 7.000    6.10 | 10.08   2.03
         0.917    1.02 | 4.000    3.05 | 7.083    6.10 | 10.17   2.03
         1.000    1.02 | 4.083    3.05 | 7.167    6.10 | 10.25   2.03
         1.083    2.03 | 4.167    3.05 | 7.250    6.10 | 10.33   2.03
         1.167    2.03 | 4.250    3.05 | 7.333    5.08 | 10.42   2.03
         1.250    2.03 | 4.333    5.08 | 7.417    5.08 | 10.50   2.03
         1.333    1.02 | 4.417    5.08 | 7.500    5.08 | 10.58   1.02
         1.417    1.02 | 4.500    5.08 | 7.583    4.06 | 10.67   1.02
         1.500    1.02 | 4.583    5.08 | 7.667    4.06 | 10.75   1.02
         1.583    2.03 | 4.667    5.08 | 7.750    4.06 | 10.83   2.03
         1.667    2.03 | 4.750    5.08 | 7.833    4.06 | 10.92   2.03
         1.750    2.03 | 4.833    6.10 | 7.917    4.06 | 11.00   2.03
         1.833    1.02 | 4.917    6.10 | 8.000    4.06 | 11.08   1.02
         1.917    1.02 | 5.000    6.10 | 8.083    5.08 | 11.17   1.02
         2.000    1.02 | 5.083    5.08 | 8.167    5.08 | 11.25   1.02
         2.083    2.03 | 5.167    5.08 | 8.250    5.08 | 11.33   2.03
         2.167    2.03 | 5.250    5.08 | 8.333    3.05 | 11.42   2.03
         2.250    2.03 | 5.333    8.13 | 8.417    3.05 | 11.50   2.03
         2.333    3.05 | 5.417    8.13 | 8.500    3.05 | 11.58   1.02
         2.417    3.05 | 5.500    8.13 | 8.583    3.05 | 11.67   1.02
         2.500    3.05 | 5.583    9.14 | 8.667    3.05 | 11.75   1.02
         2.583    3.05 | 5.667    9.14 | 8.750    3.05 | 11.83   2.03
         2.667    3.05 | 5.750    9.15 | 8.833    3.05 | 11.92   2.03
         2.750    3.05 | 5.833   67.06 | 8.917    3.05 | 12.00   2.03
         2.833    3.05 | 5.917   67.06 | 9.000    3.05 | 12.08   1.02
         2.917    3.05 | 6.000   67.06 | 9.083    2.03 | 12.17   1.02
         3.000    3.05 | 6.083   67.06 | 9.167    2.03 | 12.25   1.02
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Page 122

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                    LangstaffRd_EA_Existing_WestDonWatershd
          3.083    2.03 | 6.167   67.06 | 9.250    2.03 |

     Max.Eff.Inten.(mm/hr)=    67.06          46.22
           over (min)         5.00          15.00
     Storage Coeff.  (min)=   5.19 (ii)    11.53 (ii)
     Unit Hyd. Tpeak (min)=   5.00          15.00
     Unit Hyd. peak  (cms)=   0.21           0.09

                                                      *TOTALS*
     PEAK FLOW       (cms)=    0.04           0.04      0.080 (iii)
     TIME TO PEAK    (hrs)=    6.25           6.33      6.25
     RUNOFF VOLUME   (mm)=    72.42          39.68     52.77
     TOTAL RAINFALL  (mm)=    74.42          74.42     74.42
     RUNOFF COEFFICIENT =     0.97           0.53      0.71


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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 ( 0170)|  Area    (ha)=  0.43
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
-------------------
                              IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=       0.25          0.18
     Dep. Storage    (mm)=       2.00          5.00
     Average Slope   (%)=        1.00          2.00
     Length          (m)=      250.00         20.00
     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 | 3.167    2.03 | 6.250   67.05 | 9.33    3.05
         0.167    0.00 | 3.250    2.03 | 6.333   13.21 | 9.42    3.05
         0.250    0.00 | 3.333    3.05 | 6.417   13.21 | 9.50    3.05
         0.333    1.02 | 3.417    3.05 | 6.500   13.21 | 9.58    2.03
         0.417    1.02 | 3.500    3.05 | 6.583   13.21 | 9.67    2.03
         0.500    1.02 | 3.583    3.05 | 6.667   13.21 | 9.75    2.03
         0.583    2.03 | 3.667    3.05 | 6.750   13.21 | 9.83    2.03
         0.667    2.03 | 3.750    3.05 | 6.833    6.10 | 9.92    2.03
         0.750    2.03 | 3.833    3.05 | 6.917    6.10 | 10.00   2.03
         0.833    1.02 | 3.917    3.05 | 7.000    6.10 | 10.08   2.03
         0.917    1.02 | 4.000    3.05 | 7.083    6.10 | 10.17   2.03
         1.000    1.02 | 4.083    3.05 | 7.167    6.10 | 10.25   2.03
         1.083    2.03 | 4.167    3.05 | 7.250    6.10 | 10.33   2.03
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Page 123

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                    LangstaffRd_EA_Existing_WestDonWatershd
         1.167    2.03 | 4.250    3.05 | 7.333    5.08 | 10.42   2.03
         1.250    2.03 | 4.333    5.08 | 7.417    5.08 | 10.50   2.03
         1.333    1.02 | 4.417    5.08 | 7.500    5.08 | 10.58   1.02
         1.417    1.02 | 4.500    5.08 | 7.583    4.06 | 10.67   1.02
         1.500    1.02 | 4.583    5.08 | 7.667    4.06 | 10.75   1.02
         1.583    2.03 | 4.667    5.08 | 7.750    4.06 | 10.83   2.03
         1.667    2.03 | 4.750    5.08 | 7.833    4.06 | 10.92   2.03
         1.750    2.03 | 4.833    6.10 | 7.917    4.06 | 11.00   2.03
         1.833    1.02 | 4.917    6.10 | 8.000    4.06 | 11.08   1.02
         1.917    1.02 | 5.000    6.10 | 8.083    5.08 | 11.17   1.02
         2.000    1.02 | 5.083    5.08 | 8.167    5.08 | 11.25   1.02
         2.083    2.03 | 5.167    5.08 | 8.250    5.08 | 11.33   2.03
         2.167    2.03 | 5.250    5.08 | 8.333    3.05 | 11.42   2.03
         2.250    2.03 | 5.333    8.13 | 8.417    3.05 | 11.50   2.03
         2.333    3.05 | 5.417    8.13 | 8.500    3.05 | 11.58   1.02
         2.417    3.05 | 5.500    8.13 | 8.583    3.05 | 11.67   1.02
         2.500    3.05 | 5.583    9.14 | 8.667    3.05 | 11.75   1.02
         2.583    3.05 | 5.667    9.14 | 8.750    3.05 | 11.83   2.03
         2.667    3.05 | 5.750    9.15 | 8.833    3.05 | 11.92   2.03
         2.750    3.05 | 5.833   67.06 | 8.917    3.05 | 12.00   2.03
         2.833    3.05 | 5.917   67.06 | 9.000    3.05 | 12.08   1.02
         2.917    3.05 | 6.000   67.06 | 9.083    2.03 | 12.17   1.02
         3.000    3.05 | 6.083   67.06 | 9.167    2.03 | 12.25   1.02
         3.083    2.03 | 6.167   67.06 | 9.250    2.03 |

     Max.Eff.Inten.(mm/hr)=    67.06          54.54
           over (min)         5.00          15.00
     Storage Coeff.  (min)=   5.19 (ii)    10.08 (ii)
     Unit Hyd. Tpeak (min)=   5.00          15.00
     Unit Hyd. peak  (cms)=   0.21           0.10

                                                      *TOTALS*
     PEAK FLOW       (cms)=    0.05           0.02      0.069 (iii)
     TIME TO PEAK    (hrs)=    6.25           6.25      6.25
     RUNOFF VOLUME   (mm)=    72.42          47.80     61.82
     TOTAL RAINFALL  (mm)=    74.42          74.42     74.42
     RUNOFF COEFFICIENT =     0.97           0.64      0.83


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 89.0   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  ( 0450)|
|   1 + 2 = 3     |        AREA     QPEAK    TPEAK     R.V.
--------------------        (ha)     (cms)    (hrs)     (mm)
         ID1= 1 ( 0165):    0.60     0.080     6.25    52.77
       + ID2= 2 ( 0170):    0.43     0.069     6.25    61.82
         ========================================================
```

Page 124

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                    LangstaffRd_EA_Existing_WestDonWatershd
       ID = 3 ( 0450):    1.03    0.149     6.25    56.55

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

--------------------
| ADD HYD  ( 0450)|
|   3 + 2 = 1     |        AREA     QPEAK    TPEAK     R.V.
--------------------        (ha)     (cms)    (hrs)     (mm)
         ID1= 3 ( 0450):    1.03    0.149     6.25    56.55
       + ID2= 2 ( 0445):    1.12    0.144     6.25    51.56
         ========================================================
       ID = 1 ( 0450):    2.15    0.293     6.25    53.95

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0190)|  Area    (ha)=  0.86
|ID= 1 DT= 5.0 min |  Total Imp(%)= 42.00   Dir. Conn.(%)= 42.00
-------------------
                              IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=       0.36          0.50
     Dep. Storage    (mm)=       2.00          5.00
     Average Slope   (%)=        1.00          2.00
     Length          (m)=      340.00         50.00
     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 | 3.167    2.03 | 6.250   67.05 | 9.33    3.05
         0.167    0.00 | 3.250    2.03 | 6.333   13.21 | 9.42    3.05
         0.250    0.00 | 3.333    3.05 | 6.417   13.21 | 9.50    3.05
         0.333    1.02 | 3.417    3.05 | 6.500   13.21 | 9.58    2.03
         0.417    1.02 | 3.500    3.05 | 6.583   13.21 | 9.67    2.03
         0.500    1.02 | 3.583    3.05 | 6.667   13.21 | 9.75    2.03
         0.583    2.03 | 3.667    3.05 | 6.750   13.21 | 9.83    2.03
         0.667    2.03 | 3.750    3.05 | 6.833    6.10 | 9.92    2.03
         0.750    2.03 | 3.833    3.05 | 6.917    6.10 | 10.00   2.03
         0.833    1.02 | 3.917    3.05 | 7.000    6.10 | 10.08   2.03
         0.917    1.02 | 4.000    3.05 | 7.083    6.10 | 10.17   2.03
         1.000    1.02 | 4.083    3.05 | 7.167    6.10 | 10.25   2.03
         1.083    2.03 | 4.167    3.05 | 7.250    6.10 | 10.33   2.03
         1.167    2.03 | 4.250    3.05 | 7.333    5.08 | 10.42   2.03
         1.250    2.03 | 4.333    5.08 | 7.417    5.08 | 10.50   2.03
         1.333    1.02 | 4.417    5.08 | 7.500    5.08 | 10.58   1.02
         1.417    1.02 | 4.500    5.08 | 7.583    4.06 | 10.67   1.02
         1.500    1.02 | 4.583    5.08 | 7.667    4.06 | 10.75   1.02
         1.583    2.03 | 4.667    5.08 | 7.750    4.06 | 10.83   2.03
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         1.667  2.03 | 4.750   5.08 | 7.833   4.06 | 10.92   2.03
         1.750  2.03 | 4.833   6.10 | 7.917   4.06 | 11.00   2.03
         1.833  1.02 | 4.917   6.10 | 8.000   4.06 | 11.08   1.02
         1.917  1.02 | 5.000   6.10 | 8.083   5.08 | 11.17   1.02
         2.000  1.02 | 5.083   5.08 | 8.167   5.08 | 11.25   1.02
         2.083  2.03 | 5.167   5.08 | 8.250   5.08 | 11.33   2.03
         2.167  2.03 | 5.250   5.08 | 8.333   3.05 | 11.42   2.03
         2.250  2.03 | 5.333   8.13 | 8.417   3.05 | 11.50   2.03
         2.333  3.05 | 5.417   8.13 | 8.500   3.05 | 11.58   1.02
         2.417  3.05 | 5.500   8.13 | 8.583   3.05 | 11.67   1.02
         2.500  3.05 | 5.583   9.14 | 8.667   3.05 | 11.75   1.02
         2.583  3.05 | 5.667   9.14 | 8.750   3.05 | 11.83   2.03
         2.667  3.05 | 5.750   9.15 | 8.833   3.05 | 11.92   2.03
         2.750  3.05 | 5.833  67.06 | 8.917   3.05 | 12.00   2.03
         2.833  3.05 | 5.917  67.06 | 9.000   3.05 | 12.08   1.02
         2.917  3.05 | 6.000  67.06 | 9.083   2.03 | 12.17   1.02
         3.000  3.05 | 6.083  67.06 | 9.167   2.03 | 12.25   1.02
         3.083  2.03 | 6.167  67.06 | 9.250   2.03 |

   Max.Eff.Inten.(mm/hr)=    67.06         44.81
             over (min)      5.00         20.00
   Storage Coeff.  (min)=    6.25 (ii)    17.37 (ii)
   Unit Hyd. Tpeak (min)=    5.00         20.00
   Unit Hyd. peak  (cms)=    0.19          0.06
                                                    *TOTALS*
   PEAK FLOW       (cms)=    0.07          0.04         0.105 (iii)
   TIME TO PEAK    (hrs)=    6.25          6.42         6.25
   RUNOFF VOLUME   (mm)=    72.42         39.68        53.42
   TOTAL RAINFALL  (mm)=    74.42         74.42        74.42
   RUNOFF COEFFICIENT  =     0.97          0.53         0.72


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 ( 0195)|  Area     (ha)=  0.79
|ID= 1 DT= 5.0 min |  Total Imp(%)= 42.00  Dir. Conn.(%)= 42.00
--------------------
                             IMPERVIOUS   PERVIOUS (i)
   Surface Area      (ha)=      0.33        0.46
   Dep. Storage      (mm)=      2.00        5.00
   Average Slope     (%)=       1.00        2.00
   Length            (m)=     340.00       20.00
   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 | 3.167   2.03 | 6.250  67.05 | 9.33   3.05
     0.167   0.00 | 3.250   2.03 | 6.333  13.21 | 9.42   3.05
     0.250   0.00 | 3.333   3.05 | 6.417  13.21 | 9.50   3.05
     0.333   1.02 | 3.417   3.05 | 6.500  13.21 | 9.58   2.03
     0.417   1.02 | 3.500   3.05 | 6.583  13.21 | 9.67   2.03
     0.500   1.02 | 3.583   3.05 | 6.667  13.21 | 9.75   2.03
     0.583   2.03 | 3.667   3.05 | 6.750  13.21 | 9.83   2.03
     0.667   2.03 | 3.750   3.05 | 6.833   6.10 | 9.92   2.03
     0.750   2.03 | 3.833   3.05 | 6.917   6.10 | 10.00  2.03
     0.833   1.02 | 3.917   3.05 | 7.000   6.10 | 10.08  2.03
     0.917   1.02 | 4.000   3.05 | 7.083   6.10 | 10.17  2.03
     1.000   1.02 | 4.083   3.05 | 7.167   6.10 | 10.25  2.03
     1.083   2.03 | 4.167   3.05 | 7.250   6.10 | 10.33  2.03
     1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
     1.250   2.03 | 4.333   3.05 | 7.417   5.08 | 10.50  2.03
     1.333   1.02 | 4.417   5.08 | 7.500   5.08 | 10.58  1.02
     1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67  1.02
     1.500   1.02 | 4.583   5.08 | 7.667   4.06 | 10.75  1.02
     1.583   2.03 | 4.667   5.08 | 7.750   4.06 | 10.83  2.03
     1.667   2.03 | 4.750   5.08 | 7.833   4.06 | 10.92  2.03
     1.750   2.03 | 4.833   6.10 | 7.917   4.06 | 11.00  2.03
     1.833   1.02 | 4.917   6.10 | 8.000   4.06 | 11.08  1.02
     1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  1.02
     2.000   1.02 | 5.083   5.08 | 8.167   5.08 | 11.25  1.02
     2.083   2.03 | 5.167   5.08 | 8.250   5.08 | 11.33  2.03
     2.167   2.03 | 5.250   5.08 | 8.333   3.05 | 11.42  2.03
     2.250   2.03 | 5.333   8.13 | 8.417   3.05 | 11.50  2.03
     2.333   3.05 | 5.417   8.13 | 8.500   3.05 | 11.58  1.02
     2.417   3.05 | 5.500   8.13 | 8.583   3.05 | 11.67  1.02
     2.500   3.05 | 5.583   9.14 | 8.667   3.05 | 11.75  1.02
     2.583   3.05 | 5.667   9.14 | 8.750   3.05 | 11.83  2.03
     2.667   3.05 | 5.750   9.15 | 8.833   3.05 | 11.92  2.03
     2.750   3.05 | 5.833  67.06 | 8.917   3.05 | 12.00  2.03
     2.833   3.05 | 5.917  67.06 | 9.000   3.05 | 12.08  1.02
     2.917   3.05 | 6.000  67.06 | 9.083   2.03 | 12.17  1.02
     3.000   3.05 | 6.083  67.06 | 9.167   2.03 | 12.25  1.02
     3.083   2.03 | 6.167  67.06 | 9.250   2.03 |

   Max.Eff.Inten.(mm/hr)=    67.06         46.22
             over (min)      5.00         15.00
   Storage Coeff.  (min)=    6.25 (ii)    12.59 (ii)
   Unit Hyd. Tpeak (min)=    5.00         15.00
   Unit Hyd. peak  (cms)=    0.19          0.08
                                                    *TOTALS*
   PEAK FLOW       (cms)=    0.06          0.04         0.105 (iii)
   TIME TO PEAK    (hrs)=    6.25          6.33         6.25
   RUNOFF VOLUME   (mm)=    72.42         39.68        53.42
   TOTAL RAINFALL  (mm)=    74.42         74.42        74.42
   RUNOFF COEFFICIENT  =     0.97          0.53         0.72
```

```
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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  ( 0455)|
|  1 + 2  = 3     |      AREA     QPEAK    TPEAK     R.V.
--------------------      (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 0190):    0.86    0.105     6.25    53.42
     + ID2= 2 ( 0195):    0.79    0.105     6.25    53.42
                        ==============================================
       ID = 3 ( 0455):    1.65    0.210     6.25    53.42

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

--------------------
| ADD HYD  ( 0458)|
|  1 + 2  = 3     |      AREA     QPEAK    TPEAK     R.V.
--------------------      (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 0450):    2.15    0.293     6.25    53.95
     + ID2= 2 ( 0455):    1.65    0.210     6.25    53.42
                        ==============================================
       ID = 3 ( 0458):    3.80    0.503     6.25    53.72

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0300)|  Area     (ha)= 10.00
|ID= 1 DT= 5.0 min |  Total Imp(%)= 80.00  Dir. Conn.(%)= 80.00
--------------------
                             IMPERVIOUS   PERVIOUS (i)
   Surface Area      (ha)=      8.00        2.00
   Dep. Storage      (mm)=      1.00        5.00
   Average Slope     (%)=       1.00        2.00
   Length            (m)=     258.20       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 | 3.167   2.03 | 6.250  67.05 | 9.33   3.05
     0.167   0.00 | 3.250   2.03 | 6.333  13.21 | 9.42   3.05
```

```
     0.250   0.00 | 3.333   3.05 | 6.417  13.21 | 9.50   3.05
     0.333   1.02 | 3.417   3.05 | 6.500  13.21 | 9.58   2.03
     0.417   1.02 | 3.500   3.05 | 6.583  13.21 | 9.67   2.03
     0.500   1.02 | 3.583   3.05 | 6.667  13.21 | 9.75   2.03
     0.583   2.03 | 3.667   3.05 | 6.750  13.21 | 9.83   2.03
     0.667   2.03 | 3.750   3.05 | 6.833   6.10 | 9.92   2.03
     0.750   2.03 | 3.833   3.05 | 6.917   6.10 | 10.00  2.03
     0.833   1.02 | 3.917   3.05 | 7.000   6.10 | 10.08  2.03
     0.917   1.02 | 4.000   3.05 | 7.083   6.10 | 10.17  2.03
     1.000   1.02 | 4.083   3.05 | 7.167   6.10 | 10.25  2.03
     1.083   2.03 | 4.167   3.05 | 7.250   6.10 | 10.33  2.03
     1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
     1.250   2.03 | 4.333   5.08 | 7.417   5.08 | 10.50  2.03
     1.333   1.02 | 4.417   5.08 | 7.500   5.08 | 10.58  1.02
     1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67  1.02
     1.500   1.02 | 4.583   5.08 | 7.667   4.06 | 10.75  1.02
     1.583   2.03 | 4.667   5.08 | 7.750   4.06 | 10.83  2.03
     1.667   2.03 | 4.750   5.08 | 7.833   4.06 | 10.92  2.03
     1.750   2.03 | 4.833   6.10 | 7.917   4.06 | 11.00  2.03
     1.833   1.02 | 4.917   6.10 | 8.000   4.06 | 11.08  1.02
     1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  1.02
     2.000   1.02 | 5.083   5.08 | 8.167   5.08 | 11.25  1.02
     2.083   2.03 | 5.167   5.08 | 8.250   5.08 | 11.33  2.03
     2.167   2.03 | 5.250   5.08 | 8.333   3.05 | 11.42  2.03
     2.250   2.03 | 5.333   8.13 | 8.417   3.05 | 11.50  2.03
     2.333   3.05 | 5.417   8.13 | 8.500   3.05 | 11.58  1.02
     2.417   3.05 | 5.500   8.13 | 8.583   3.05 | 11.67  1.02
     2.500   3.05 | 5.583   9.14 | 8.667   3.05 | 11.75  1.02
     2.583   3.05 | 5.667   9.14 | 8.750   3.05 | 11.83  2.03
     2.667   3.05 | 5.750   9.15 | 8.833   3.05 | 11.92  2.03
     2.750   3.05 | 5.833  67.06 | 8.917   3.05 | 12.00  2.03
     2.833   3.05 | 5.917  67.06 | 9.000   3.05 | 12.08  1.02
     2.917   3.05 | 6.000  67.06 | 9.083   2.03 | 12.17  1.02
     3.000   3.05 | 6.083  67.06 | 9.167   2.03 | 12.25  1.02
     3.083   2.03 | 6.167  67.06 | 9.250   2.03 |

   Max.Eff.Inten.(mm/hr)=    67.06         41.26
             over (min)      5.00         15.00
   Storage Coeff.  (min)=    5.30 (ii)    10.05 (ii)
   Unit Hyd. Tpeak (min)=    5.00         15.00
   Unit Hyd. peak  (cms)=    0.21          0.10
                                                    *TOTALS*
   PEAK FLOW       (cms)=    1.49          0.18         1.665 (iii)
   TIME TO PEAK    (hrs)=    6.25          6.33         6.25
   RUNOFF VOLUME   (mm)=    73.42         35.19        65.78
   TOTAL RAINFALL  (mm)=    74.42         74.42        74.42
   RUNOFF COEFFICIENT  =     0.99          0.47         0.88


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 79.0   Ia = Dep. Storage  (Above)
    (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
```

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0350)|   Area    (ha)=  0.90
|ID= 1 DT= 5.0 min |   Total Imp(%)= 70.00   Dir. Conn.(%)= 70.00
--------------------
                          IMPERVIOUS      PERVIOUS (i)
   Surface Area    (ha)=      0.63          0.27
   Dep. Storage    (mm)=      1.00          5.00
   Average Slope   (%)=       1.00          2.00
   Length          (m)=      77.46         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 | 3.167  2.03 | 6.250 67.05 | 9.33   3.05
        0.167   0.00 | 3.250  2.03 | 6.333 13.21 | 9.42   3.05
        0.250   0.00 | 3.333  3.05 | 6.417 13.21 | 9.50   3.05
        0.333   1.02 | 3.417  3.05 | 6.500 13.21 | 9.58   2.03
        0.417   1.02 | 3.500  3.05 | 6.583 13.21 | 9.67   2.03
        0.500   1.02 | 3.583  3.05 | 6.667 13.21 | 9.75   2.03
        0.583   2.03 | 3.667  3.05 | 6.750 13.21 | 9.83   2.03
        0.667   2.03 | 3.750  3.05 | 6.833  6.10 | 9.92   2.03
        0.750   2.03 | 3.833  3.05 | 6.917  6.10 | 10.00  2.03
        0.833   1.02 | 3.917  3.05 | 7.000  6.10 | 10.08  2.03
        0.917   1.02 | 4.000  3.05 | 7.083  6.10 | 10.17  2.03
        1.000   1.02 | 4.083  3.05 | 7.167  6.10 | 10.25  2.03
        1.083   2.03 | 4.167  3.05 | 7.250  6.10 | 10.33  2.03
        1.167   2.03 | 4.250  3.05 | 7.333  5.08 | 10.42  2.03
        1.250   2.03 | 4.333  5.08 | 7.417  5.08 | 10.50  2.03
        1.333   1.02 | 4.417  5.08 | 7.500  5.08 | 10.58  1.02
        1.417   1.02 | 4.500  5.08 | 7.583  4.06 | 10.67  1.02
        1.500   1.02 | 4.583  5.08 | 7.667  4.06 | 10.75  1.02
        1.583   2.03 | 4.667  5.08 | 7.750  4.06 | 10.83  2.03
        1.667   2.03 | 4.750  5.08 | 7.833  4.06 | 10.92  2.03
        1.750   2.03 | 4.833  6.10 | 7.917  4.06 | 11.00  2.03
        1.833   1.02 | 4.917  6.10 | 8.000  4.06 | 11.08  1.02
        1.917   1.02 | 5.000  6.10 | 8.083  5.08 | 11.17  1.02
        2.000   1.02 | 5.083  5.08 | 8.167  5.08 | 11.25  1.02
        2.083   2.03 | 5.167  5.08 | 8.250  5.08 | 11.33  2.03
        2.167   2.03 | 5.250  5.08 | 8.333  4.06 | 11.42  2.03
        2.250   2.03 | 5.333  8.13 | 8.417  3.05 | 11.50  2.03
        2.333   3.05 | 5.417  8.13 | 8.500  3.05 | 11.58  1.02
        2.417   3.05 | 5.500  8.13 | 8.583  3.05 | 11.67  1.02
        2.500   3.05 | 5.583  9.14 | 8.667  3.05 | 11.75  1.02
        2.583   3.05 | 5.667  9.14 | 8.750  3.05 | 11.83  2.03
        2.667   3.05 | 5.750  9.15 | 8.833  3.05 | 11.92  2.03
```

LangstaffRd_EA_Existing_WestDonWatershd

```
        2.750   3.05 | 5.833 67.06 | 8.917  3.05 | 12.00  2.03
        2.833   3.05 | 5.917 67.06 | 9.000  3.05 | 12.08  1.02
        2.917   3.05 | 6.000 67.06 | 9.083  2.03 | 12.17  1.02
        3.000   3.05 | 6.083 67.06 | 9.167  2.03 | 12.25  1.02
        3.083   2.03 | 6.167 67.06 | 9.250  2.03 |
```

```
   Max.Eff.Inten.(mm/hr)=    67.06          39.79
            over (min)       5.00           15.00
   Storage Coeff. (min)=     2.57 (ii)     12.78 (ii)
   Unit Hyd. Tpeak (min)=    5.00           15.00
   Unit Hyd. peak  (cms)=    0.29           0.08
                                                        *TOTALS*
   PEAK FLOW      (cms)=     0.12           0.02        0.140 (iii)
   TIME TO PEAK   (hrs)=     6.25           6.33        6.25
   RUNOFF VOLUME   (mm)=    73.42          35.19       61.95
   TOTAL RAINFALL  (mm)=    74.42          74.42       74.42
   RUNOFF COEFFICIENT  =     0.99           0.47        0.83

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

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 79.0   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  ( 0375)|
|  1 + 2 = 3      |          AREA     QPEAK     TPEAK     R.V.
--------------------          (ha)     (cms)     (hrs)     (mm)
      ID1= 1 ( 0300):       10.00     1.665     6.25     65.78
    + ID2= 2 ( 0350):        0.90     0.140     6.25     61.95
      ======================================================
      ID = 3 ( 0375):       10.90     1.805     6.25     65.46

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
********************************
** SIMULATION:Run 06        **
********************************

--------------------
| READ STORM      |    Filename: C:\Users\ray.zhao\AppD
|                 |            ata\Local\Temp\
|                 |            278a4b54-8409-4519-9819-1b44900a1c25\d7466973
| Ptotal= 82.04 mm |    Comments: 50yr-12hrSCS
--------------------
         TIME   RAIN | TIME   RAIN |' TIME   RAIN | TIME   RAIN
         hrs   mm/hr | hrs   mm/hr |  hrs   mm/hr | hrs   mm/hr
        0.25   0.00 | 3.50   3.05 | 6.75  14.22 | 10.00  3.05
        0.50   2.03 | 3.75   3.05 | 7.00   7.11 | 10.25  2.03
```

LangstaffRd_EA_Existing_WestDonWatershd

```
        0.75   1.02 | 4.00   4.06 | 7.25   6.10 | 10.50  2.03
        1.00   2.03 | 4.25   3.05 | 7.50   5.08 | 10.75  1.02
        1.25   2.03 | 4.50   5.08 | 7.75   5.08 | 11.00  2.03
        1.50   2.03 | 4.75   6.10 | 8.00   5.08 | 11.25  2.03
        1.75   2.03 | 5.00   6.10 | 8.25   4.06 | 11.50  1.02
        2.00   1.02 | 5.25   5.08 | 8.50   4.06 | 11.75  2.03
        2.25   2.03 | 5.50   5.08 | 8.75   3.05 | 12.00  1.02
        2.50   3.05 | 5.75  10.16 | 9.00   3.05 | 12.25  2.03
        2.75   3.05 | 6.00  73.15 | 9.25   3.05 |
        3.00   4.06 | 6.25  74.17 | 9.50   3.05 |
        3.25   3.05 | 6.50  15.24 | 9.75   2.03 |
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0145)|   Area    (ha)=  3.05
|ID= 1 DT= 5.0 min |   Total Imp(%)= 62.00   Dir. Conn.(%)= 62.00
--------------------
                          IMPERVIOUS      PERVIOUS (i)
   Surface Area    (ha)=      1.89          1.16
   Dep. Storage    (mm)=      2.00          5.00
   Average Slope   (%)=       1.00          2.00
   Length          (m)=     531.00         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 | 3.167  3.05 | 6.250 74.17 | 9.33   3.05
        0.167   0.00 | 3.250  3.05 | 6.333 15.24 | 9.42   3.05
        0.250   0.00 | 3.333  3.05 | 6.417 15.24 | 9.50   3.05
        0.333   2.03 | 3.417  3.05 | 6.500 15.24 | 9.58   2.03
        0.417   2.03 | 3.500  3.05 | 6.583 14.22 | 9.67   2.03
        0.500   1.02 | 3.583  3.05 | 6.667 14.22 | 9.75   2.03
        0.583   1.02 | 3.667  3.05 | 6.750 14.22 | 9.83   3.05
        0.667   1.02 | 3.750  3.05 | 6.833  7.11 | 9.92   3.05
        0.750   1.02 | 3.833  4.06 | 6.917  7.11 | 10.00  3.05
        0.833   2.03 | 3.917  4.06 | 7.000  7.11 | 10.08  2.03
        0.917   2.03 | 4.000  4.06 | 7.083  6.10 | 10.17  2.03
        1.000   2.03 | 4.083  3.05 | 7.167  6.10 | 10.25  2.03
        1.083   1.02 | 4.167  3.05 | 7.250  6.10 | 10.33  2.03
        1.167   1.02 | 4.250  3.05 | 7.333  5.08 | 10.42  2.03
        1.250   1.02 | 4.333  5.08 | 7.417  5.08 | 10.50  2.03
        1.333   2.03 | 4.417  5.08 | 7.500  5.08 | 10.58  1.02
        1.417   2.03 | 4.500  6.10 | 7.583  5.08 | 10.67  1.02
        1.500   2.03 | 4.583  6.10 | 7.667  5.08 | 10.75  1.02
        1.583   2.03 | 4.667  6.10 | 7.750  5.08 | 10.83  2.03
        1.667   2.03 | 4.750  6.10 | 7.833  5.08 | 10.92  2.03
        1.750   2.03 | 4.833  6.10 | 7.917  5.08 | 11.00  2.03
```

LangstaffRd_EA_Existing_WestDonWatershd

```
        1.833   1.02 | 4.917  6.10 | 8.000  5.08 | 11.08  2.03
        1.917   1.02 | 5.000  6.10 | 8.083  4.06 | 11.17  2.03
        2.000   1.02 | 5.083  5.08 | 8.167  4.06 | 11.25  2.03
        2.083   2.03 | 5.167  5.08 | 8.250  4.06 | 11.33  1.02
        2.167   2.03 | 5.250  5.08 | 8.333  4.06 | 11.42  1.02
        2.250   2.03 | 5.333 10.16 | 8.417  4.06 | 11.50  1.02
        2.333   3.05 | 5.417 10.16 | 8.500  4.06 | 11.58  2.03
        2.417   3.05 | 5.500 10.16 | 8.583  3.05 | 11.67  2.03
        2.500   3.05 | 5.583 10.16 | 8.667  3.05 | 11.75  2.03
        2.583   3.05 | 5.667 10.16 | 8.750  3.05 | 11.83  1.02
        2.667   3.05 | 5.750 10.16 | 8.833  3.05 | 11.92  1.02
        2.750   3.05 | 5.833 73.15 | 8.917  3.05 | 12.00  1.02
        2.833   4.06 | 5.917 73.15 | 9.000  3.05 | 12.08  2.03
        2.917   4.06 | 6.000 73.15 | 9.083  3.05 | 12.17  2.03
        3.000   4.06 | 6.083 74.17 | 9.167  3.05 | 12.25  2.03
        3.083   3.05 | 6.167 74.17 | 9.250  3.05 |
```

```
   Max.Eff.Inten.(mm/hr)=    74.17          57.55
            over (min)      10.00           20.00
   Storage Coeff. (min)=     7.84 (ii)     16.64 (ii)
   Unit Hyd. Tpeak (min)=   10.00           20.00
   Unit Hyd. peak  (cms)=    0.13           0.06
                                                        *TOTALS*
   PEAK FLOW      (cms)=     0.38           0.13        0.493 (iii)
   TIME TO PEAK   (hrs)=     6.25           6.42        6.25
   RUNOFF VOLUME   (mm)=    80.04          50.13       68.67
   TOTAL RAINFALL  (mm)=    82.04          82.04       82.04
   RUNOFF COEFFICIENT  =     0.98           0.61        0.84

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 86.0   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 ( 0140)|   Area    (ha)=  1.27
|ID= 1 DT= 5.0 min |   Total Imp(%)= 52.00   Dir. Conn.(%)= 52.00
--------------------
                          IMPERVIOUS      PERVIOUS (i)
   Surface Area    (ha)=      0.66          0.61
   Dep. Storage    (mm)=      2.00          5.00
   Average Slope   (%)=       1.00          2.00
   Length          (m)=     503.00         25.00
   Mannings n      =         0.013         0.250

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


                    ---- TRANSFORMED HYETOGRAPH ----
```

Page 133 (top-left)

```
                 LangstaffRd_EA_Existing_WestDonWatershd
          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   3.05 | 6.250  74.17 |  9.33   3.05
         0.167   0.00 | 3.250   3.05 | 6.333  15.24 |  9.42   3.05
         0.250   0.00 | 3.333   3.05 | 6.417  15.24 |  9.50   3.05
         0.333   2.03 | 3.417   3.05 | 6.500  15.24 |  9.58   2.03
         0.417   2.03 | 3.500   3.05 | 6.583  14.22 |  9.67   2.03
         0.500   2.03 | 3.583   3.05 | 6.667  14.22 |  9.75   2.03
         0.583   1.02 | 3.667   3.05 | 6.750  14.22 |  9.83   3.05
         0.667   1.02 | 3.750   3.05 | 6.833   7.11 |  9.92   3.05
         0.750   1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
         0.833   2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
         0.917   2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
         1.000   2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
         1.083   1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
         1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
         1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
         1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
         1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
         1.500   2.03 | 4.583   5.08 | 7.667   5.08 | 10.75   1.02
         1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
         1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
         1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
         1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
         1.917   1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
         2.000   1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
         2.083   2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
         2.167   2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
         2.250   2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
         2.333   3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
         2.417   3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
         2.500   3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
         2.583   3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
         2.667   3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
         2.750   3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
         2.833   4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
         2.917   4.06 | 6.000  73.15 | 9.083   3.05 | 12.17   2.03
         3.000   4.06 | 6.083  74.17 | 9.167   3.05 | 12.25   2.03
         3.083   3.05 | 6.167  74.17 | 9.250   3.05 |
```

```
Max.Eff.Inten.(mm/hr)=      74.17         53.29
           over (min)       10.00         15.00
Storage Coeff.  (min)=       7.59 (ii)   14.44 (ii)
Unit Hyd. Tpeak (min)=      10.00         15.00
Unit Hyd. peak  (cms)=       0.13          0.08
                                                         *TOTALS*
PEAK FLOW       (cms)=       0.13          0.07        0.196 (iii)
TIME TO PEAK    (hrs)=       6.25          6.33          6.25
RUNOFF VOLUME    (mm)=      80.04         45.99         63.69
TOTAL RAINFALL   (mm)=      82.04         82.04         82.04
RUNOFF COEFFICIENT  =        0.98          0.56          0.78
```

Page 133

Page 134 (top-right)

```
                 LangstaffRd_EA_Existing_WestDonWatershd
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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 ( 0135)|   Area    (ha)=  1.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 40.00   Dir. Conn.(%)= 40.00
--------------------
                         IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=     0.57         0.86
     Dep. Storage   (mm)=     2.00         5.00
     Average Slope  (%)=      1.00         2.00
     Length         (m)=    503.00        30.00
     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 | 3.167   3.05 | 6.250  74.17 |  9.33   3.05
         0.167   0.00 | 3.250   3.05 | 6.333  15.24 |  9.42   3.05
         0.250   0.00 | 3.333   3.05 | 6.417  15.24 |  9.50   3.05
         0.333   2.03 | 3.417   3.05 | 6.500  15.24 |  9.58   2.03
         0.417   2.03 | 3.500   3.05 | 6.583  14.22 |  9.67   2.03
         0.500   2.03 | 3.583   3.05 | 6.667  14.22 |  9.75   2.03
         0.583   1.02 | 3.667   3.05 | 6.750  14.22 |  9.83   3.05
         0.667   1.02 | 3.750   3.05 | 6.833   7.11 |  9.92   3.05
         0.750   1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
         0.833   2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
         0.917   2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
         1.000   2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
         1.083   1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
         1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
         1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
         1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
         1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
         1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
         1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
         1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
         1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
         1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
         1.917   1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
         2.000   1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
         2.083   2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
         2.167   2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
         2.250   2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
         2.333   3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
```

Page 134

Page 135 (bottom-left)

```
                 LangstaffRd_EA_Existing_WestDonWatershd
         2.417   3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
         2.500   3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
         2.583   3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
         2.667   3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
         2.750   3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
         2.833   4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
         2.917   4.06 | 6.000  73.15 | 9.083   3.05 | 12.17   2.03
         3.000   4.06 | 6.083  74.17 | 9.167   3.05 | 12.25   2.03
         3.083   3.05 | 6.167  74.17 | 9.250   3.05 |
```

```
Max.Eff.Inten.(mm/hr)=      74.17         54.69
           over (min)       10.00         20.00
Storage Coeff.  (min)=       7.59 (ii)   15.15 (ii)
Unit Hyd. Tpeak (min)=      10.00         20.00
Unit Hyd. peak  (cms)=       0.13          0.07
                                                         *TOTALS*
PEAK FLOW       (cms)=       0.11          0.09        0.198 (iii)
TIME TO PEAK    (hrs)=       6.25          6.33          6.25
RUNOFF VOLUME    (mm)=      80.04         47.32         60.40
TOTAL RAINFALL   (mm)=      82.04         82.04         82.04
RUNOFF COEFFICIENT  =        0.98          0.58          0.74
```

```
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 84.0   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 ( 0420)|
|  1 + 2 = 3     |      AREA    QPEAK   TPEAK    R.V.
--------------------      (ha)    (cms)   (hrs)    (mm)
       ID1= 1 ( 0135):   1.43    0.198    6.25    60.40
     + ID2= 2 ( 0140):   1.27    0.196    6.25    63.69
       ===================================================
       ID = 3 ( 0420):   2.70    0.394    6.25    61.95

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

--------------------
| ADD HYD ( 0425)|
|  1 + 2 = 3     |      AREA    QPEAK   TPEAK    R.V.
--------------------      (ha)    (cms)   (hrs)    (mm)
       ID1= 1 ( 0145):   3.05    0.493    6.25    68.67
     + ID2= 2 ( 0420):   2.70    0.394    6.25    61.95
       ===================================================
       ID = 3 ( 0425):   5.75    0.887    6.25    65.52

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

Page 135

Page 136

```
                 LangstaffRd_EA_Existing_WestDonWatershd
--------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0210)|   Area    (ha)=  0.96
|ID= 1 DT= 5.0 min |   Total Imp(%)= 44.00   Dir. Conn.(%)= 44.00
--------------------
                         IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=     0.42         0.54
     Dep. Storage   (mm)=     2.00         5.00
     Average Slope  (%)=      1.00         2.00
     Length         (m)=    470.00        20.00
     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 | 3.167   3.05 | 6.250  74.17 |  9.33   3.05
         0.167   0.00 | 3.250   3.05 | 6.333  15.24 |  9.42   3.05
         0.250   0.00 | 3.333   3.05 | 6.417  15.24 |  9.50   3.05
         0.333   2.03 | 3.417   3.05 | 6.500  15.24 |  9.58   2.03
         0.417   2.03 | 3.500   3.05 | 6.583  14.22 |  9.67   2.03
         0.500   2.03 | 3.583   3.05 | 6.667  14.22 |  9.75   2.03
         0.583   1.02 | 3.667   3.05 | 6.750  14.22 |  9.83   3.05
         0.667   1.02 | 3.750   3.05 | 6.833   7.11 |  9.92   3.05
         0.750   1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
         0.833   2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
         0.917   2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
         1.000   2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
         1.083   1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
         1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
         1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
         1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
         1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
         1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
         1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
         1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
         1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
         1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
         1.917   1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
         2.000   1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
         2.083   2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
         2.167   2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
         2.250   2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
         2.333   3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
         2.417   3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
         2.500   3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
         2.583   3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
         2.667   3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
         2.750   3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
         2.833   4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
```

Page 136

Top-left panel

```
                    LangstaffRd_EA_Existing_WestDonWatershd
            2.917    4.06 | 6.000   73.15 | 9.083    3.05 | 12.17    2.03
            3.000    4.06 | 6.083   74.17 | 9.167    3.05 | 12.25    2.03
            3.083    3.05 | 6.167   74.17 | 9.250    3.05 |

        Max.Eff.Inten.(mm/hr)=      74.17          53.29
              over (min)             5.00          15.00
        Storage Coeff.  (min)=       7.29 (ii)     13.28 (ii)
        Unit Hyd. Tpeak (min)=       5.00          15.00
        Unit Hyd. peak  (cms)=       0.17           0.08
                                                              *TOTALS*
        PEAK FLOW       (cms)=       0.09           0.06        0.144 (iii)
        TIME TO PEAK    (hrs)=       6.25           6.33        6.25
        RUNOFF VOLUME   (mm)=       80.04          45.99       60.96
        TOTAL RAINFALL  (mm)=       82.04          82.04       82.04
        RUNOFF COEFFICIENT  =        0.98           0.56        0.74


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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 ( 0205)|
|ID= 1 DT= 5.0 min |   Total Imp(%)= 38.00   Dir. Conn.(%)= 38.00
--------------------
                                   IMPERVIOUS    PERVIOUS (i)
        Surface Area     (ha)=        0.42          0.69
        Dep. Storage     (mm)=        2.00          5.00
        Average Slope    (%)=         1.00          2.00
        Length           (m)=       470.00         20.00
        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 | 3.167   3.05 | 6.250   74.17 | 9.33    3.05
        0.167   0.00 | 3.250   3.05 | 6.333   15.24 | 9.42    3.05
        0.250   0.00 | 3.333   3.05 | 6.417   15.24 | 9.50    3.05
        0.333   2.03 | 3.417   3.05 | 6.500   15.24 | 9.58    2.03
        0.417   2.03 | 3.500   3.05 | 6.583   14.22 | 9.67    2.03
        0.500   2.03 | 3.583   3.05 | 6.667   14.22 | 9.75    2.03
        0.583   1.02 | 3.667   3.05 | 6.750   14.22 | 9.83    3.05
        0.667   1.02 | 3.750   3.05 | 6.833    7.11 | 9.92    3.05
        0.750   1.02 | 3.833   4.06 | 6.917    7.11 | 10.00   3.05
        0.833   2.03 | 3.917   4.06 | 7.000    7.11 | 10.08   2.03
        0.917   2.03 | 4.000   4.06 | 7.083    6.10 | 10.17   2.03
```

Top-right panel

```
                    LangstaffRd_EA_Existing_WestDonWatershd
            1.000    2.03 | 4.083    3.05 | 7.167    6.10 | 10.25    2.03
            1.083    1.02 | 4.167    3.05 | 7.250    6.10 | 10.33    2.03
            1.167    1.02 | 4.250    3.05 | 7.333    5.08 | 10.42    2.03
            1.250    1.02 | 4.333    5.08 | 7.417    5.08 | 10.50    2.03
            1.333    1.02 | 4.417    5.08 | 7.500    5.08 | 10.58    1.02
            1.417    2.03 | 4.500    5.08 | 7.583    5.08 | 10.67    1.02
            1.500    2.03 | 4.583    6.10 | 7.667    5.08 | 10.75    1.02
            1.583    2.03 | 4.667    6.10 | 7.750    5.08 | 10.83    2.03
            1.667    2.03 | 4.750    6.10 | 7.833    5.08 | 10.92    2.03
            1.750    2.03 | 4.833    6.10 | 7.917    5.08 | 11.00    2.03
            1.833    1.02 | 4.917    6.10 | 8.000    5.08 | 11.08    2.03
            1.917    1.02 | 5.000    6.10 | 8.083    4.06 | 11.17    2.03
            2.000    1.02 | 5.083    5.08 | 8.167    4.06 | 11.25    2.03
            2.083    2.03 | 5.167    5.08 | 8.250    4.06 | 11.33    1.02
            2.167    2.03 | 5.250    5.08 | 8.333    4.06 | 11.42    1.02
            2.250    2.03 | 5.333   10.16 | 8.417    4.06 | 11.50    1.02
            2.333    3.05 | 5.417   10.16 | 8.500    4.06 | 11.58    2.03
            2.417    3.05 | 5.500   10.16 | 8.583    3.05 | 11.67    2.03
            2.500    3.05 | 5.583   10.16 | 8.667    3.05 | 11.75    2.03
            2.583    3.05 | 5.667   10.16 | 8.750    3.05 | 11.83    1.02
            2.667    3.05 | 5.750   10.16 | 8.833    3.05 | 11.92    1.02
            2.750    3.05 | 5.833   73.15 | 8.917    3.05 | 12.00    1.02
            2.833    4.06 | 5.917   73.15 | 9.000    3.05 | 12.08    2.03
            2.917    4.06 | 6.000   73.15 | 9.083    3.05 | 12.17    2.03
            3.000    4.06 | 6.083   74.17 | 9.167    3.05 | 12.25    2.03
            3.083    3.05 | 6.167   74.17 | 9.250    3.05 |

        Max.Eff.Inten.(mm/hr)=      74.17          53.29
              over (min)             5.00          15.00
        Storage Coeff.  (min)=       7.29 (ii)     13.28 (ii)
        Unit Hyd. Tpeak (min)=       5.00          15.00
        Unit Hyd. peak  (cms)=       0.17           0.08
                                                              *TOTALS*
        PEAK FLOW       (cms)=       0.09           0.08        0.160 (iii)
        TIME TO PEAK    (hrs)=       6.25           6.33        6.25
        RUNOFF VOLUME   (mm)=       80.04          45.99       58.92
        TOTAL RAINFALL  (mm)=       82.04          82.04       82.04
        RUNOFF COEFFICIENT  =        0.98           0.56        0.72


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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 ( 0460)|
|  1 + 2 = 3     |        AREA    QPEAK    TPEAK    R.V.
--------------------        (ha)    (cms)    (hrs)    (mm)
        ID1= 1 ( 0205):    1.11    0.160    6.25    58.92
```

Bottom-left panel

```
                    LangstaffRd_EA_Existing_WestDonWatershd
      + ID2= 2 ( 0210):    0.96    0.144    6.25    60.96
      =================================================
        ID = 3 ( 0460):    2.07    0.305    6.25    59.87

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0230)|
|ID= 1 DT= 5.0 min |   Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                                   IMPERVIOUS    PERVIOUS (i)
        Surface Area     (ha)=        0.40          0.30
        Dep. Storage     (mm)=        2.00          5.00
        Average Slope    (%)=         1.00          2.00
        Length           (m)=       320.00         25.00
        Mannings n        =           0.013         0.290

        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   3.05 | 6.250   74.17 | 9.33    3.05
        0.167   0.00 | 3.250   3.05 | 6.333   15.24 | 9.42    3.05
        0.250   0.00 | 3.333   3.05 | 6.417   15.24 | 9.50    3.05
        0.333   2.03 | 3.417   3.05 | 6.500   15.24 | 9.58    2.03
        0.417   2.03 | 3.500   3.05 | 6.583   14.22 | 9.67    2.03
        0.500   2.03 | 3.583   3.05 | 6.667   14.22 | 9.75    2.03
        0.583   1.02 | 3.667   3.05 | 6.750   14.22 | 9.83    3.05
        0.667   1.02 | 3.750   3.05 | 6.833    7.11 | 9.92    3.05
        0.750   1.02 | 3.833   4.06 | 6.917    7.11 | 10.00   3.05
        0.833   2.03 | 3.917   4.06 | 7.000    7.11 | 10.08   2.03
        0.917   2.03 | 4.000   4.06 | 7.083    6.10 | 10.17   2.03
        1.000   2.03 | 4.083   3.05 | 7.167    6.10 | 10.25   2.03
        1.083   1.02 | 4.167   3.05 | 7.250    6.10 | 10.33   2.03
        1.167   1.02 | 4.250   3.05 | 7.333    5.08 | 10.42   2.03
        1.250   1.02 | 4.333   5.08 | 7.417    5.08 | 10.50   2.03
        1.333   2.03 | 4.417   5.08 | 7.500    5.08 | 10.58   1.02
        1.417   2.03 | 4.500   5.08 | 7.583    5.08 | 10.67   1.02
        1.500   2.03 | 4.583   6.10 | 7.667    5.08 | 10.75   1.02
        1.583   2.03 | 4.667   6.10 | 7.750    5.08 | 10.83   2.03
        1.667   2.03 | 4.750   6.10 | 7.833    5.08 | 10.92   2.03
        1.750   2.03 | 4.833   6.10 | 7.917    5.08 | 11.00   2.03
        1.833   1.02 | 4.917   6.10 | 8.000    5.08 | 11.08   2.03
        1.917   1.02 | 5.000   6.10 | 8.083    4.06 | 11.17   2.03
        2.000   1.02 | 5.083   5.08 | 8.167    4.06 | 11.25   2.03
        2.083   2.03 | 5.167   5.08 | 8.250    4.06 | 11.33   1.02
        2.167   2.03 | 5.250   5.08 | 8.333    4.06 | 11.42   1.02
        2.250   2.03 | 5.333  10.16 | 8.417    4.06 | 11.50   1.02
        2.333   3.05 | 5.417  10.16 | 8.500    4.06 | 11.58   2.03
        2.417   3.05 | 5.500  10.16 | 8.583    3.05 | 11.67   2.03
```

Bottom-right panel

```
                    LangstaffRd_EA_Existing_WestDonWatershd
            2.500    3.05 | 5.583   10.16 | 8.667    3.05 | 11.75    2.03
            2.583    3.05 | 5.667   10.16 | 8.750    3.05 | 11.83    1.02
            2.667    3.05 | 5.750   10.16 | 8.833    3.05 | 11.92    1.02
            2.750    3.05 | 5.833   73.15 | 8.917    3.05 | 12.00    1.02
            2.833    4.06 | 5.917   73.15 | 9.000    3.05 | 12.08    2.03
            2.917    4.06 | 6.000   73.15 | 9.083    3.05 | 12.17    2.03
            3.000    4.06 | 6.083   74.17 | 9.167    3.05 | 12.25    2.03
            3.083    3.05 | 6.167   74.17 | 9.250    3.05 |

        Max.Eff.Inten.(mm/hr)=      74.17          50.57
              over (min)             5.00          15.00
        Storage Coeff.  (min)=       5.79 (ii)     13.43 (ii)
        Unit Hyd. Tpeak (min)=       5.00          15.00
        Unit Hyd. peak  (cms)=       0.20           0.08
                                                              *TOTALS*
        PEAK FLOW       (cms)=       0.08           0.03        0.112 (iii)
        TIME TO PEAK    (hrs)=       6.25           6.33        6.25
        RUNOFF VOLUME   (mm)=       80.04          43.44       64.30
        TOTAL RAINFALL  (mm)=       82.04          82.04       82.04
        RUNOFF COEFFICIENT  =        0.98           0.53        0.78


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 81.0   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 ( 0225)|
|ID= 1 DT= 5.0 min |   Total Imp(%)= 53.00   Dir. Conn.(%)= 53.00
--------------------
                                   IMPERVIOUS    PERVIOUS (i)
        Surface Area     (ha)=        0.48          0.42
        Dep. Storage     (mm)=        2.00          5.00
        Average Slope    (%)=         1.00          2.00
        Length           (m)=       320.00         25.00
        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 | 3.167   3.05 | 6.250   74.17 | 9.33    3.05
        0.167   0.00 | 3.250   3.05 | 6.333   15.24 | 9.42    3.05
        0.250   0.00 | 3.333   3.05 | 6.417   15.24 | 9.50    3.05
        0.333   2.03 | 3.417   3.05 | 6.500   15.24 | 9.58    2.03
        0.417   2.03 | 3.500   3.05 | 6.583   14.22 | 9.67    2.03
        0.500   2.03 | 3.583   3.05 | 6.667   14.22 | 9.75    2.03
```

LangstaffRd_EA_Existing_WestDonWatershd
```
          0.583  1.02 | 3.667   3.05 | 6.750  14.22 |  9.83   3.05
          0.667  1.02 | 3.750   3.05 | 6.833   7.11 |  9.92   3.05
          0.750  1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
          0.833  2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
          0.917  2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
          1.000  2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
          1.083  1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
          1.167  1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
          1.250  1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
          1.333  2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
          1.417  2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
          1.500  2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
          1.583  2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
          1.667  2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
          1.750  2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
          1.833  1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
          1.917  1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
          2.000  1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
          2.083  2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
          2.167  2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
          2.250  2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
          2.333  3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
          2.417  3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
          2.500  3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
          2.583  3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
          2.667  3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
          2.750  3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
          2.833  4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
          2.917  4.06 | 6.000  73.15 | 9.083   3.05 | 12.17   2.03
          3.000  4.06 | 6.083  74.17 | 9.167   3.05 | 12.25   2.03
          3.083  3.05 | 6.167  74.17 | 9.250   3.05 |
```

```
      Max.Eff.Inten.(mm/hr)=     74.17          53.29
             over (min)          5.00           15.00
      Storage Coeff.  (min)=     5.79 (ii)      12.63 (ii)
      Unit Hyd. Tpeak (min)=     5.00           15.00
      Unit Hyd. peak  (cms)=     0.20           0.08
                                                           *TOTALS*
      PEAK FLOW       (cms)=     0.10           0.05       0.145 (iii)
      TIME TO PEAK    (hrs)=     6.25           6.33       6.25
      RUNOFF VOLUME   (mm)=      80.04          45.99      64.03
      TOTAL RAINFALL  (mm)=      82.04          82.04      82.04
      RUNOFF COEFFICIENT  =      0.98           0.56       0.78


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0    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.
```

LangstaffRd_EA_Existing_WestDonWatershd
```
--------------------
| ADD HYD ( 0475)|
|  1 + 2 = 3    |             AREA    QPEAK    TPEAK    R.V.
--------------------             (ha)    (cms)    (hrs)    (mm)
         ID1= 1 ( 0225):        0.90    0.145    6.25    64.03
       + ID2= 2 ( 0230):        0.70    0.112    6.25    64.30
         ============================================================
         ID = 3 ( 0475):        1.60    0.257    6.25    64.14

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

```
--------------------
| CALIB          |
| STANDHYD ( 0220)|  Area    (ha)=  0.65
|ID= 1 DT= 5.0 min |  Total Imp(%)= 46.00  Dir. Conn.(%)= 46.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
      Surface Area   (ha)=    0.30         0.35
      Dep. Storage   (mm)=    2.00         5.00
      Average Slope  (%)=     1.00         2.00
      Length         (m)=   260.00        20.00
      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 | 3.167   3.05 | 6.250  74.17 |  9.33   3.05
           0.167   0.00 | 3.250   3.05 | 6.333  15.24 |  9.42   3.05
           0.250   0.00 | 3.333   3.05 | 6.417  15.24 |  9.50   3.05
           0.333   2.03 | 3.417   3.05 | 6.500  15.24 |  9.58   2.03
           0.417   2.03 | 3.500   3.05 | 6.583  14.22 |  9.67   2.03
           0.500   2.03 | 3.583   3.05 | 6.667  14.22 |  9.75   2.03
           0.583   1.02 | 3.667   3.05 | 6.750  14.22 |  9.83   3.05
           0.667   1.02 | 3.750   3.05 | 6.833   7.11 |  9.92   3.05
           0.750   1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
           0.833   2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
           0.917   2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
           1.000   2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
           1.083   1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
           1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
           1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
           1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
           1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
           1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
           1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
           1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
           1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
           1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
           1.917   1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
           2.000   1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
```

LangstaffRd_EA_Existing_WestDonWatershd
```
          2.083  2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
          2.167  2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
          2.250  2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
          2.333  3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
          2.417  3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
          2.500  3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
          2.583  3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
          2.667  3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
          2.750  3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
          2.833  4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
          2.917  4.06 | 6.000  73.15 | 9.083   3.05 | 12.17   2.03
          3.000  4.06 | 6.083  74.17 | 9.167   3.05 | 12.25   2.03
          3.083  3.05 | 6.167  74.17 | 9.250   3.05 |
```

```
      Max.Eff.Inten.(mm/hr)=     74.17          53.29
             over (min)          5.00           15.00
      Storage Coeff.  (min)=     5.11 (ii)      11.10 (ii)
      Unit Hyd. Tpeak (min)=     5.00           15.00
      Unit Hyd. peak  (cms)=     0.21           0.09
                                                           *TOTALS*
      PEAK FLOW       (cms)=     0.06           0.04       0.102 (iii)
      TIME TO PEAK    (hrs)=     6.25           6.33       6.25
      RUNOFF VOLUME   (mm)=      80.04          45.99      61.64
      TOTAL RAINFALL  (mm)=      82.04          82.04      82.04
      RUNOFF COEFFICIENT  =      0.98           0.56       0.75


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0    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 ( 0215)|  Area    (ha)=  0.58
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00  Dir. Conn.(%)= 57.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
      Surface Area   (ha)=    0.33         0.25
      Dep. Storage   (mm)=    2.00         5.00
      Average Slope  (%)=     1.00         2.00
      Length         (m)=   260.00        30.00
      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 | 3.167   3.05 | 6.250  74.17 |  9.33   3.05
```

LangstaffRd_EA_Existing_WestDonWatershd
```
          0.167   0.00 | 3.333   3.05 | 6.333  15.24 |  9.42   3.05
          0.250   0.00 | 3.333   3.05 | 6.417  15.24 |  9.50   3.05
          0.333   2.03 | 3.417   3.05 | 6.500  15.24 |  9.58   2.03
          0.417   2.03 | 3.500   3.05 | 6.583  14.22 |  9.67   2.03
          0.500   2.03 | 3.583   3.05 | 6.667  14.22 |  9.75   2.03
          0.583   1.02 | 3.667   3.05 | 6.750  14.22 |  9.83   3.05
          0.667   1.02 | 3.750   3.05 | 6.833   7.11 |  9.92   3.05
          0.750   1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
          0.833   2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
          0.917   2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
          1.000   2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
          1.083   1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
          1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
          1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
          1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
          1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
          1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
          1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
          1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
          1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
          1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
          1.917   1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
          2.000   1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
          2.083   2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
          2.167   2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
          2.250   2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
          2.333   3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
          2.417   3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
          2.500   3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
          2.583   3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
          2.667   3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
          2.750   3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
          2.833   4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
          2.917   4.06 | 6.000  73.15 | 9.083   3.05 | 12.17   2.03
          3.000   4.06 | 6.083  74.17 | 9.167   3.05 | 12.25   2.03
          3.083   3.05 | 6.167  74.17 | 9.250   3.05 |
```

```
      Max.Eff.Inten.(mm/hr)=     74.17          53.29
             over (min)          5.00           15.00
      Storage Coeff.  (min)=     5.11 (ii)      12.75 (ii)
      Unit Hyd. Tpeak (min)=     5.00           15.00
      Unit Hyd. peak  (cms)=     0.21           0.08
                                                           *TOTALS*
      PEAK FLOW       (cms)=     0.07           0.03       0.095 (iii)
      TIME TO PEAK    (hrs)=     6.25           6.33       6.25
      RUNOFF VOLUME   (mm)=      80.04          45.99      65.39
      TOTAL RAINFALL  (mm)=      82.04          82.04      82.04
      RUNOFF COEFFICIENT  =      0.98           0.56       0.80


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0    Ia = Dep. Storage (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
```

LangstaffRd_EA_Existing_WestDonWatershd
```
                  THAN THE STORAGE COEFFICIENT.
          (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------

--------------------
| ADD HYD  ( 0470)|
|   1 + 2 = 3     |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)    (mm)
       ID1= 1 ( 0215):     0.58    0.095    6.25    65.39
      + ID2= 2 ( 0220):     0.65    0.102    6.25    61.64
                          =====================================
       ID = 3 ( 0470):     1.23    0.197    6.25    63.41

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

--------------------
| ADD HYD  ( 0480)|
|   1 + 2 = 3     |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)    (mm)
       ID1= 1 ( 0470):     1.23    0.197    6.25    63.41
      + ID2= 2 ( 0475):     1.60    0.257    6.25    64.14
                          =====================================
       ID = 3 ( 0480):     2.83    0.454    6.25    63.82

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0160)|  Area    (ha)=   0.43
|ID= 1 DT= 5.0 min |  Total Imp(%)= 56.00   Dir. Conn.(%)= 56.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area    (ha)=     0.24          0.19
     Dep. Storage    (mm)=     2.00          5.00
     Average Slope   (%)=      1.00          2.00
     Length          (m)=    260.00         20.00
     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 | 3.167   3.05 | 6.250  74.17 | 9.33   3.05
       0.167    0.00 | 3.250   3.05 | 6.333  15.24 | 9.42   3.05
       0.250    0.00 | 3.333   3.05 | 6.417  15.24 | 9.50   3.05
       0.333    2.03 | 3.417   3.05 | 6.500  15.24 | 9.58   2.03
       0.417    2.03 | 3.500   3.05 | 6.583  14.22 | 9.67   2.03
       0.500    2.03 | 3.583   3.05 | 6.667  14.22 | 9.75   2.03
       0.583    1.02 | 3.667   3.05 | 6.750  14.22 | 9.83   3.05
```

LangstaffRd_EA_Existing_WestDonWatershd
```
       0.667    1.02 | 3.750   3.05 | 6.833   7.11 |  9.92   3.05
       0.750    1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
       0.833    2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
       0.917    2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
       1.000    2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
       1.083    1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
       1.167    1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
       1.250    1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
       1.333    2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
       1.417    2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
       1.500    2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
       1.583    2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
       1.667    2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
       1.750    2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
       1.833    1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
       1.917    1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
       2.000    1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
       2.083    2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
       2.167    2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
       2.250    2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
       2.333    3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
       2.417    3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
       2.500    3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
       2.583    3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
       2.667    3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
       2.750    3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
       2.833    4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
       2.917    4.06 | 6.000  73.15 | 9.083   3.05 | 12.17   2.03
       3.000    4.06 | 6.083  74.17 | 9.167   3.05 | 12.25   2.03
       3.083    3.05 | 6.167  74.17 | 9.250   3.05 |

     Max.Eff.Inten.(mm/hr)=     74.17        61.96
              over (min)          5.00        10.00
     Storage Coeff.  (min)=       5.11 (ii)    9.87 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.21         0.11
                                                        *TOTALS*
     PEAK FLOW     (cms)=         0.05         0.03       0.078 (iii)
     TIME TO PEAK  (hrs)=         6.25         6.25       6.25
     RUNOFF VOLUME  (mm)=        80.04        54.74      68.90
     TOTAL RAINFALL (mm)=        82.04        82.04      82.04
     RUNOFF COEFFICIENT  =        0.98         0.67       0.84


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 89.0   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.

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--------------------
| CALIB           |
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LangstaffRd_EA_Existing_WestDonWatershd
```
| STANDHYD ( 0155)|  Area    (ha)=   0.56
|ID= 1 DT= 5.0 min |  Total Imp(%)= 45.00   Dir. Conn.(%)= 45.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area    (ha)=     0.25          0.31
     Dep. Storage    (mm)=     2.00          5.00
     Average Slope   (%)=      1.00          2.00
     Length          (m)=    260.00         25.00
     Mannings n       =       0.013         0.290

     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   3.05 | 6.250  74.17 |  9.33   3.05
       0.167    0.00 | 3.250   3.05 | 6.333  15.24 |  9.42   3.05
       0.250    0.00 | 3.333   3.05 | 6.417  15.24 |  9.50   3.05
       0.333    2.03 | 3.417   3.05 | 6.500  15.24 |  9.58   2.03
       0.417    2.03 | 3.500   3.05 | 6.583  14.22 |  9.67   2.03
       0.500    2.03 | 3.583   3.05 | 6.667  14.22 |  9.75   2.03
       0.583    1.02 | 3.667   3.05 | 6.750  14.22 |  9.83   3.05
       0.667    1.02 | 3.750   3.05 | 6.833   7.11 |  9.92   3.05
       0.750    1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
       0.833    2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
       0.917    2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
       1.000    2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
       1.083    1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
       1.167    1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
       1.250    1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
       1.333    2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
       1.417    2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
       1.500    2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
       1.583    2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
       1.667    2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
       1.750    2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
       1.833    1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
       1.917    1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
       2.000    1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
       2.083    2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
       2.167    2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
       2.250    2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
       2.333    3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
       2.417    3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
       2.500    3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
       2.583    3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
       2.667    3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
       2.750    3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
       2.833    4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
       2.917    4.06 | 6.000  73.15 | 9.083   3.05 | 12.17   2.03
       3.000    4.06 | 6.083  74.17 | 9.167   3.05 | 12.25   2.03
       3.083    3.05 | 6.167  74.17 | 9.250   3.05 |
```

LangstaffRd_EA_Existing_WestDonWatershd
```
     Max.Eff.Inten.(mm/hr)=     74.17        59.01
              over (min)          5.00        15.00
     Storage Coeff.  (min)=       5.11 (ii)   12.29 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.21         0.09
                                                        *TOTALS*
     PEAK FLOW     (cms)=         0.05         0.04       0.091 (iii)
     TIME TO PEAK  (hrs)=         6.25         6.33       6.25
     RUNOFF VOLUME  (mm)=        80.04        51.61      64.39
     TOTAL RAINFALL (mm)=        82.04        82.04      82.04
     RUNOFF COEFFICIENT  =        0.98         0.63       0.78


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 87.0   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.

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--------------------
| ADD HYD  ( 0430)|
|   1 + 2 = 3     |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)    (mm)
       ID1= 1 ( 0155):     0.56    0.091    6.25    64.39
      + ID2= 2 ( 0160):     0.43    0.078    6.25    68.90
                          =====================================
       ID = 3 ( 0430):     0.99    0.169    6.25    66.35

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0150)|  Area    (ha)=   3.81
|ID= 1 DT= 5.0 min |  Total Imp(%)= 94.00   Dir. Conn.(%)= 94.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area    (ha)=     3.58          0.23
     Dep. Storage    (mm)=     2.00          5.00
     Average Slope   (%)=      1.00          2.00
     Length          (m)=    150.00         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 | 3.167   3.05 | 6.250  74.17 |  9.33   3.05
       0.167    0.00 | 3.250   3.05 | 6.333  15.24 |  9.42   3.05
```

0.250	0.00	3.333	3.05	6.417	15.24	9.50	3.05
0.333	2.03	3.417	3.05	6.500	15.24	9.58	2.03
0.417	2.03	3.500	3.05	6.583	14.22	9.67	2.03
0.500	2.03	3.583	3.05	6.667	14.22	9.75	2.03
0.583	1.02	3.667	3.05	6.750	14.22	9.83	3.05
0.667	1.02	3.750	3.05	6.833	7.11	9.92	3.05
0.750	1.02	3.833	4.06	6.917	7.11	10.00	3.05
0.833	2.03	3.917	4.06	7.000	7.11	10.08	2.03
0.917	2.03	4.000	4.06	7.083	6.10	10.17	2.03
1.000	2.03	4.083	3.05	7.167	6.10	10.25	2.03
1.083	1.02	4.167	3.05	7.250	6.10	10.33	2.03
1.167	1.02	4.250	3.05	7.333	5.08	10.42	2.03
1.250	1.02	4.333	5.08	7.417	5.08	10.50	2.03
1.333	2.03	4.417	5.08	7.500	5.08	10.58	1.02
1.417	2.03	4.500	5.08	7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10	7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10	7.833	5.08	10.92	2.03
1.750	2.03	4.833	6.10	7.917	5.08	11.00	2.03
1.833	1.02	4.917	6.10	8.000	5.08	11.08	2.03
1.917	1.02	5.000	6.10	8.083	4.06	11.17	2.03
2.000	1.02	5.083	5.08	8.167	4.06	11.25	2.03
2.083	2.03	5.167	5.08	8.250	4.06	11.33	1.02
2.167	2.03	5.250	5.08	8.333	4.06	11.42	1.02
2.250	2.03	5.333	10.16	8.417	4.06	11.50	1.02
2.333	3.05	5.417	10.16	8.500	4.06	11.58	2.03
2.417	3.05	5.500	10.16	8.583	3.05	11.67	2.03
2.500	3.05	5.583	10.16	8.667	3.05	11.75	2.03
2.583	3.05	5.667	10.16	8.750	3.05	11.83	1.02
2.667	3.05	5.750	10.16	8.833	3.05	11.92	1.02
2.750	3.05	5.833	73.15	8.917	3.05	12.00	1.02
2.833	4.06	5.917	73.15	9.000	3.05	12.08	2.03
2.917	4.06	6.000	73.15	9.083	3.05	12.17	2.03
3.000	4.06	6.083	74.17	9.167	3.05	12.25	2.03
3.083	3.05	6.167	74.17	9.250	3.05		

```
      Max.Eff.Inten.(mm/hr)=       74.17         60.48
               over (min)           5.00         10.00
      Storage Coeff.  (min)=        3.67 (ii)     6.32 (ii)
      Unit Hyd. Tpeak (min)=        5.00         10.00
      Unit Hyd. peak  (cms)=        0.25          0.15
                                                                *TOTALS*
      PEAK FLOW       (cms)=        0.74          0.04        0.774 (iii)
      TIME TO PEAK    (hrs)=        6.25          6.25          6.25
      RUNOFF VOLUME   (mm)=        80.04         53.15         78.43
      TOTAL RAINFALL  (mm)=        82.04         82.04         82.04
      RUNOFF COEFFICIENT  =         0.98          0.65          0.96

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  88.0    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  ( 0440)|
|   1 + 2 = 3     |              AREA      QPEAK     TPEAK      R.V.
--------------------              (ha)     (cms)     (hrs)      (mm)
      ID1= 1 ( 0150):             3.81     0.774      6.25     78.43
    + ID2= 2 ( 0430):             0.99     0.169      6.25     66.35
                        ==========================================
      ID = 3 ( 0440):             4.80     0.943      6.25     75.94

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0185)|   Area     (ha)=  0.47
|ID= 1 DT= 5.0 min |   Total Imp(%)= 48.00   Dir. Conn.(%)= 48.00
--------------------
                            IMPERVIOUS     PERVIOUS (i)
      Surface Area    (ha)=     0.23          0.24
      Dep. Storage    (mm)=     2.00          5.00
      Average Slope   (%)=      1.00          2.00
      Length          (m)=    240.00         20.00
      Mannings n       =        0.013         0.350

      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
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.05	6.250	74.17	9.33	3.05
0.167	0.00	3.250	3.05	6.333	15.24	9.42	3.05
0.250	0.00	3.333	3.05	6.417	15.24	9.50	3.05
0.333	2.03	3.417	3.05	6.500	15.24	9.58	2.03
0.417	2.03	3.500	3.05	6.583	14.22	9.67	2.03
0.500	2.03	3.583	3.05	6.667	14.22	9.75	2.03
0.583	1.02	3.667	3.05	6.750	14.22	9.83	3.05
0.667	1.02	3.750	3.05	6.833	7.11	9.92	3.05
0.750	1.02	3.833	4.06	6.917	7.11	10.00	3.05
0.833	2.03	3.917	4.06	7.000	7.11	10.08	2.03
0.917	2.03	4.000	4.06	7.083	6.10	10.17	2.03
1.000	2.03	4.083	3.05	7.167	6.10	10.25	2.03
1.083	1.02	4.167	3.05	7.250	6.10	10.33	2.03
1.167	1.02	4.250	3.05	7.333	5.08	10.42	2.03
1.250	1.02	4.333	5.08	7.417	5.08	10.50	2.03
1.333	2.03	4.417	5.08	7.500	5.08	10.58	1.02
1.417	2.03	4.500	5.08	7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10	7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03

1.667	2.03	4.750	6.10	7.833	5.08	10.92	2.03
1.750	2.03	4.833	6.10	7.917	5.08	11.00	2.03
1.833	1.02	4.917	6.10	8.000	5.08	11.08	2.03
1.917	1.02	5.000	6.10	8.083	4.06	11.17	2.03
2.000	1.02	5.083	5.08	8.167	4.06	11.25	2.03
2.083	2.03	5.167	5.08	8.250	4.06	11.33	1.02
2.167	2.03	5.250	5.08	8.333	4.06	11.42	1.02
2.250	2.03	5.333	10.16	8.417	4.06	11.50	1.02
2.333	3.05	5.417	10.16	8.500	4.06	11.58	2.03
2.417	3.05	5.500	10.16	8.583	3.05	11.67	2.03
2.500	3.05	5.583	10.16	8.667	3.05	11.75	2.03
2.583	3.05	5.667	10.16	8.750	3.05	11.83	1.02
2.667	3.05	5.750	10.16	8.833	3.05	11.92	1.02
2.750	3.05	5.833	73.15	8.917	3.05	12.00	1.02
2.833	4.06	5.917	73.15	9.000	3.05	12.08	2.03
2.917	4.06	6.000	73.15	9.083	3.05	12.17	2.03
3.000	4.06	6.083	74.17	9.167	3.05	12.25	2.03
3.083	3.05	6.167	74.17	9.250	3.05		

```
      Max.Eff.Inten.(mm/hr)=       74.17         47.96
               over (min)           5.00         15.00
      Storage Coeff.  (min)=        4.87 (ii)    12.51 (ii)
      Unit Hyd. Tpeak (min)=        5.00         15.00
      Unit Hyd. peak  (cms)=        0.22          0.08
                                                                *TOTALS*
      PEAK FLOW       (cms)=        0.05          0.02        0.070 (iii)
      TIME TO PEAK    (hrs)=        6.25          6.33          6.25
      RUNOFF VOLUME   (mm)=        80.04         41.06         59.75
      TOTAL RAINFALL  (mm)=        82.04         82.04         82.04
      RUNOFF COEFFICIENT  =         0.98          0.50          0.73

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    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 ( 0180)|   Area     (ha)=  0.65
|ID= 1 DT= 5.0 min |   Total Imp(%)= 33.00   Dir. Conn.(%)= 33.00
--------------------
                            IMPERVIOUS     PERVIOUS (i)
      Surface Area    (ha)=     0.21          0.44
      Dep. Storage    (mm)=     2.00          5.00
      Average Slope   (%)=      1.00          2.00
      Length          (m)=     65.83         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
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.05	6.250	74.17	9.33	3.05
0.167	0.00	3.250	3.05	6.333	15.24	9.42	3.05
0.250	0.00	3.333	3.05	6.417	15.24	9.50	3.05
0.333	2.03	3.417	3.05	6.500	15.24	9.58	2.03
0.417	2.03	3.500	3.05	6.583	14.22	9.67	2.03
0.500	2.03	3.583	3.05	6.667	14.22	9.75	2.03
0.583	1.02	3.667	3.05	6.750	14.22	9.83	3.05
0.667	1.02	3.750	3.05	6.833	7.11	9.92	3.05
0.750	1.02	3.833	4.06	6.917	7.11	10.00	3.05
0.833	2.03	3.917	4.06	7.000	7.11	10.08	2.03
0.917	2.03	4.000	4.06	7.083	6.10	10.17	2.03
1.000	2.03	4.083	3.05	7.167	6.10	10.25	2.03
1.083	1.02	4.167	3.05	7.250	6.10	10.33	2.03
1.167	1.02	4.250	3.05	7.333	5.08	10.42	2.03
1.250	1.02	4.333	5.08	7.417	5.08	10.50	2.03
1.333	2.03	4.417	5.08	7.500	5.08	10.58	1.02
1.417	2.03	4.500	5.08	7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10	7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10	7.833	5.08	10.92	2.03
1.750	2.03	4.833	6.10	7.917	5.08	11.00	2.03
1.833	1.02	4.917	6.10	8.000	5.08	11.08	2.03
1.917	1.02	5.000	6.10	8.083	4.06	11.17	2.03
2.000	1.02	5.083	5.08	8.167	4.06	11.25	2.03
2.083	2.03	5.167	5.08	8.250	4.06	11.33	1.02
2.167	2.03	5.250	5.08	8.333	4.06	11.42	1.02
2.250	2.03	5.333	10.16	8.417	4.06	11.50	1.02
2.333	3.05	5.417	10.16	8.500	4.06	11.58	2.03
2.417	3.05	5.500	10.16	8.583	3.05	11.67	2.03
2.500	3.05	5.583	10.16	8.667	3.05	11.75	2.03
2.583	3.05	5.667	10.16	8.750	3.05	11.83	1.02
2.667	3.05	5.750	10.16	8.833	3.05	11.92	1.02
2.750	3.05	5.833	73.15	8.917	3.05	12.00	1.02
2.833	4.06	5.917	73.15	9.000	3.05	12.08	2.03
2.917	4.06	6.000	73.15	9.083	3.05	12.17	2.03
3.000	4.06	6.083	74.17	9.167	3.05	12.25	2.03
3.083	3.05	6.167	74.17	9.250	3.05		

```
      Max.Eff.Inten.(mm/hr)=       74.17         53.29
               over (min)           5.00         15.00
      Storage Coeff.  (min)=        2.24 (ii)    11.32 (ii)
      Unit Hyd. Tpeak (min)=        5.00         15.00
      Unit Hyd. peak  (cms)=        0.30          0.09
                                                                *TOTALS*
      PEAK FLOW       (cms)=        0.04          0.05        0.094 (iii)
      TIME TO PEAK    (hrs)=        6.25          6.33          6.25
      RUNOFF VOLUME   (mm)=        80.04         45.99         57.21
      TOTAL RAINFALL  (mm)=        82.04         82.04         82.04
```

LangstaffRd_EA_Existing_WestDonWatershd
```
        RUNOFF COEFFICIENT   =       0.98         0.56          0.70

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

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 ( 0445)|
|  1 + 2 = 3     |          AREA    QPEAK    TPEAK    R.V.
--------------------         (ha)   (cms)    (hrs)    (mm)
     ID1= 1 ( 0180):        0.65    0.094    6.25    57.21
   + ID2= 2 ( 0185):        0.47    0.070    6.25    59.75
                           ====================================
     ID = 3 ( 0445):        1.12    0.164    6.25    58.28

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

--------------------
| CALIB          |
| STANDHYD ( 0165)|  Area   (ha)=   0.60
|ID= 1 DT= 5.0 min |  Total Imp(%)= 40.00   Dir. Conn.(%)= 40.00
--------------------
                              IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=       0.24          0.36
     Dep. Storage    (mm)=       2.00          5.00
     Average Slope   (%)=        1.00          2.00
     Length          (m)=      250.00         20.00
     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 | 3.167  3.05 | 6.250  74.17 | 9.33   3.05
       0.167   0.00 | 3.250  3.05 | 6.333  15.24 | 9.42   3.05
       0.250   0.00 | 3.333  3.05 | 6.417  15.24 | 9.50   3.05
       0.333   2.03 | 3.417  3.05 | 6.500  15.24 | 9.58   2.03
       0.417   2.03 | 3.500  3.05 | 6.583  14.22 | 9.67   2.03
       0.500   2.03 | 3.583  3.05 | 6.667  14.22 | 9.75   2.03
       0.583   1.02 | 3.667  3.05 | 6.750  14.22 | 9.83   3.05
       0.667   1.02 | 3.750  3.05 | 6.833   7.11 | 9.92   3.05
       0.750   1.02 | 3.833  4.06 | 6.917   7.11 | 10.00  3.05
       0.833   2.03 | 3.917  4.06 | 7.000   7.11 | 10.08  2.03
       0.917   2.03 | 4.000  4.06 | 7.083   6.10 | 10.17  2.03
       1.000   2.03 | 4.083  3.05 | 7.167   6.10 | 10.25  2.03
```

LangstaffRd_EA_Existing_WestDonWatershd
```
       1.083   1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
       1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
       1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
       1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
       1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
       1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
       1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
       1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
       1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
       1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
       1.917   1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
       2.000   1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
       2.083   2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
       2.167   2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
       2.250   2.03 | 5.333   5.08 | 8.417   4.06 | 11.50   1.02
       2.333   3.05 | 5.417   10.16 | 8.500   4.06 | 11.58   2.03
       2.417   3.05 | 5.500   10.16 | 8.583   3.05 | 11.67   2.03
       2.500   3.05 | 5.583   10.16 | 8.667   3.05 | 11.75   2.03
       2.583   3.05 | 5.667   10.16 | 8.750   3.05 | 11.83   1.02
       2.667   3.05 | 5.750   10.16 | 8.833   3.05 | 11.92   1.02
       2.750   3.05 | 5.833   73.15 | 8.917   3.05 | 12.00   1.02
       2.833   4.06 | 5.917   73.15 | 9.000   3.05 | 12.08   2.03
       2.917   4.06 | 6.000   73.15 | 9.083   3.05 | 12.17   2.03
       3.000   4.06 | 6.083   74.17 | 9.167   3.05 | 12.25   2.03
       3.083   3.05 | 6.167   74.17 | 9.250   3.05 |

     Max.Eff.Inten.(mm/hr)=      74.17          53.29
                  over (min)      5.00          15.00
     Storage Coeff.  (min)=       4.99 (ii)     10.98 (ii)
     Unit Hyd. Tpeak (min)=       5.00          15.00
     Unit Hyd. peak  (cms)=       0.22           0.09

                                                    *TOTALS*
     PEAK FLOW      (cms)=        0.05           0.04       0.091 (iii)
     TIME TO PEAK   (hrs)=        6.25           6.33       6.25
     RUNOFF VOLUME  (mm)=        80.04          45.99      59.60
     TOTAL RAINFALL (mm)=        82.04          82.04      82.04
     RUNOFF COEFFICIENT =         0.98           0.56       0.73

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

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 ( 0170)|  Area   (ha)=   0.43
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                              IMPERVIOUS     PERVIOUS (i)
```

LangstaffRd_EA_Existing_WestDonWatershd
```
     Surface Area    (ha)=       0.25          0.18
     Dep. Storage    (mm)=       2.00          5.00
     Average Slope   (%)=        1.00          2.00
     Length          (m)=      250.00         20.00
     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 | 3.167  3.05 | 6.250  74.17 | 9.33   3.05
       0.167   0.00 | 3.250  3.05 | 6.333  15.24 | 9.42   3.05
       0.250   0.00 | 3.333  3.05 | 6.417  15.24 | 9.50   3.05
       0.333   2.03 | 3.417  3.05 | 6.500  15.24 | 9.58   2.03
       0.417   2.03 | 3.500  3.05 | 6.583  14.22 | 9.67   2.03
       0.500   2.03 | 3.583  3.05 | 6.667  14.22 | 9.75   2.03
       0.583   1.02 | 3.667  3.05 | 6.750  14.22 | 9.83   3.05
       0.667   1.02 | 3.750  3.05 | 6.833   7.11 | 9.92   3.05
       0.750   1.02 | 3.833  4.06 | 6.917   7.11 | 10.00  3.05
       0.833   2.03 | 3.917  4.06 | 7.000   7.11 | 10.08  2.03
       0.917   2.03 | 4.000  4.06 | 7.083   6.10 | 10.17  2.03
       1.000   2.03 | 4.083  3.05 | 7.167   6.10 | 10.25  2.03
       1.083   1.02 | 4.167  3.05 | 7.250   6.10 | 10.33  2.03
       1.167   1.02 | 4.250  3.05 | 7.333   5.08 | 10.42  2.03
       1.250   1.02 | 4.333  5.08 | 7.417   5.08 | 10.50  2.03
       1.333   2.03 | 4.417  5.08 | 7.500   5.08 | 10.58  1.02
       1.417   2.03 | 4.500  5.08 | 7.583   5.08 | 10.67  1.02
       1.500   2.03 | 4.583  6.10 | 7.667   5.08 | 10.75  1.02
       1.583   2.03 | 4.667  6.10 | 7.750   5.08 | 10.83  2.03
       1.667   2.03 | 4.750  6.10 | 7.833   5.08 | 10.92  2.03
       1.750   2.03 | 4.833  6.10 | 7.917   5.08 | 11.00  2.03
       1.833   1.02 | 4.917  6.10 | 8.000   5.08 | 11.08  2.03
       1.917   1.02 | 5.000  6.10 | 8.083   4.06 | 11.17  2.03
       2.000   1.02 | 5.083  5.08 | 8.167   4.06 | 11.25  2.03
       2.083   2.03 | 5.167  5.08 | 8.250   4.06 | 11.33  1.02
       2.167   2.03 | 5.250  5.08 | 8.333   4.06 | 11.42  1.02
       2.250   2.03 | 5.333  5.08 | 8.417   4.06 | 11.50  1.02
       2.333   3.05 | 5.417  10.16 | 8.500   4.06 | 11.58  2.03
       2.417   3.05 | 5.500  10.16 | 8.583   3.05 | 11.67  2.03
       2.500   3.05 | 5.583  10.16 | 8.667   3.05 | 11.75  2.03
       2.583   3.05 | 5.667  10.16 | 8.750   3.05 | 11.83  1.02
       2.667   3.05 | 5.750  10.16 | 8.833   3.05 | 11.92  1.02
       2.750   3.05 | 5.833  73.15 | 8.917   3.05 | 12.00  1.02
       2.833   4.06 | 5.917  73.15 | 9.000   3.05 | 12.08  2.03
       2.917   4.06 | 6.000  73.15 | 9.083   3.05 | 12.17  2.03
       3.000   4.06 | 6.083  74.17 | 9.167   3.05 | 12.25  2.03
       3.083   3.05 | 6.167  74.17 | 9.250   3.05 |

     Max.Eff.Inten.(mm/hr)=      74.17          61.96
                  over (min)      5.00          10.00
     Storage Coeff.  (min)=       4.99 (ii)      9.68 (ii)
```

LangstaffRd_EA_Existing_WestDonWatershd
```
     Unit Hyd. Tpeak (min)=       5.00          10.00
     Unit Hyd. peak  (cms)=       0.22           0.11

                                                    *TOTALS*
     PEAK FLOW      (cms)=        0.05           0.03       0.079 (iii)
     TIME TO PEAK   (hrs)=        6.25           6.25       6.25
     RUNOFF VOLUME  (mm)=        80.04          54.74      69.15
     TOTAL RAINFALL (mm)=        82.04          82.04      82.04
     RUNOFF COEFFICIENT =         0.98           0.67       0.84

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

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 89.0   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 ( 0450)|
|  1 + 2 = 3     |          AREA    QPEAK    TPEAK    R.V.
--------------------         (ha)   (cms)    (hrs)    (mm)
     ID1= 1 ( 0165):        0.60    0.091    6.25    59.60
   + ID2= 2 ( 0170):        0.43    0.079    6.25    69.15
                           ====================================
     ID = 3 ( 0450):        1.03    0.170    6.25    63.59

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

--------------------
| ADD HYD ( 0450)|
|  3 + 2 = 1     |          AREA    QPEAK    TPEAK    R.V.
--------------------         (ha)   (cms)    (hrs)    (mm)
     ID1= 3 ( 0450):        1.03    0.170    6.25    63.59
   + ID2= 2 ( 0445):        1.12    0.164    6.25    58.28
                           ====================================
     ID = 1 ( 0450):        2.15    0.334    6.25    60.82

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

--------------------
| CALIB          |
| STANDHYD ( 0190)|  Area   (ha)=   0.86
|ID= 1 DT= 5.0 min |  Total Imp(%)= 42.00   Dir. Conn.(%)= 42.00
--------------------
                              IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=       0.36          0.50
     Dep. Storage    (mm)=       2.00          5.00
     Average Slope   (%)=        1.00          2.00
     Length          (m)=      340.00         50.00
     Mannings n      =          0.013          0.250
```

Page 157 (top-left)

```
                    LangstaffRd_EA_Existing_WestDonWatershd

        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   3.05 | 6.250   74.17 | 9.33    3.05
           0.167    0.00 | 3.250   3.05 | 6.333   15.24 | 9.42    3.05
           0.250    0.00 | 3.333   3.05 | 6.417   15.24 | 9.50    3.05
           0.333    2.03 | 3.417   3.05 | 6.500   15.24 | 9.58    2.03
           0.417    2.03 | 3.500   3.05 | 6.583   14.22 | 9.67    2.03
           0.500    2.03 | 3.583   3.05 | 6.667   14.22 | 9.75    2.03
           0.583    1.02 | 3.667   3.05 | 6.750   14.22 | 9.83    3.05
           0.667    1.02 | 3.750   3.05 | 6.833    7.11 | 9.92    3.05
           0.750    1.02 | 3.833   4.06 | 6.917    7.11 | 10.00   3.05
           0.833    2.03 | 3.917   4.06 | 7.000    7.11 | 10.08   2.03
           0.917    2.03 | 4.000   4.06 | 7.083    6.10 | 10.17   2.03
           1.000    2.03 | 4.083   3.05 | 7.167    6.10 | 10.25   2.03
           1.083    1.02 | 4.167   3.05 | 7.250    6.10 | 10.33   2.03
           1.167    1.02 | 4.250   3.05 | 7.333    5.08 | 10.42   2.03
           1.250    1.02 | 4.333   5.08 | 7.417    5.08 | 10.50   2.03
           1.333    2.03 | 4.417   5.08 | 7.500    5.08 | 10.58   1.02
           1.417    2.03 | 4.500   5.08 | 7.583    5.08 | 10.67   1.02
           1.500    2.03 | 4.583   6.10 | 7.667    5.08 | 10.75   1.02
           1.583    2.03 | 4.667   6.10 | 7.750    5.08 | 10.83   2.03
           1.667    2.03 | 4.750   6.10 | 7.833    5.08 | 10.92   2.03
           1.750    2.03 | 4.833   6.10 | 7.917    5.08 | 11.00   2.03
           1.833    1.02 | 4.917   6.10 | 8.000    5.08 | 11.08   2.03
           1.917    1.02 | 5.000   6.10 | 8.083    4.06 | 11.17   2.03
           2.000    1.02 | 5.083   5.08 | 8.167    4.06 | 11.25   2.03
           2.083    2.03 | 5.167   5.08 | 8.250    4.06 | 11.33   1.02
           2.167    2.03 | 5.250   5.08 | 8.333    4.06 | 11.42   1.02
           2.250    2.03 | 5.333  10.16 | 8.417    4.06 | 11.50   1.02
           2.333    3.05 | 5.417  10.16 | 8.500    4.06 | 11.58   2.03
           2.417    3.05 | 5.500  10.16 | 8.583    3.05 | 11.67   2.03
           2.500    3.05 | 5.583  10.16 | 8.667    3.05 | 11.75   2.03
           2.583    3.05 | 5.667  10.16 | 8.750    3.05 | 11.83   1.02
           2.667    3.05 | 5.750  10.16 | 8.833    3.05 | 11.92   1.02
           2.750    3.05 | 5.833  73.15 | 8.917    3.05 | 12.00   1.02
           2.833    4.06 | 5.917  73.15 | 9.000    3.05 | 12.08   2.03
           2.917    4.06 | 6.000  73.15 | 9.083    3.05 | 12.17   2.03
           3.000    4.06 | 6.083  74.17 | 9.167    3.05 | 12.25   2.03
           3.083    3.05 | 6.167  74.17 | 9.250    3.05 |
```

```
        Max.Eff.Inten.(mm/hr)=    74.17        51.79
               over (min)         5.00         20.00
        Storage Coeff.  (min)=    6.00 (ii)    16.50 (ii)
        Unit Hyd. Tpeak (min)=    5.00         20.00
        Unit Hyd. peak  (cms)=    0.19          0.06
                                                         *TOTALS*
        PEAK FLOW      (cms)=     0.07          0.05       0.119 (iii)
        TIME TO PEAK   (hrs)=     6.25          6.42       6.25
```

Page 157

Page 158 (top-right)

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                    LangstaffRd_EA_Existing_WestDonWatershd
        RUNOFF VOLUME    (mm)=    80.04        45.99        60.28
        TOTAL RAINFALL   (mm)=    82.04        82.04        82.04
        RUNOFF COEFFICIENT  =     0.98         0.56         0.73


           (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                 CN* = 83.0   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 ( 0195)|  Area   (ha)=  0.79
    |ID= 1 DT= 5.0 min |  Total Imp(%)= 42.00   Dir. Conn.(%)= 42.00
    --------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=    0.33          0.46
        Dep. Storage    (mm)=    1.00          5.00
        Average Slope   (%)=     1.00          2.00
        Length          (m)=   340.00         20.00
        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 | 3.167   3.05 | 6.250   74.17 | 9.33    3.05
           0.167    0.00 | 3.250   3.05 | 6.333   15.24 | 9.42    3.05
           0.250    0.00 | 3.333   3.05 | 6.417   15.24 | 9.50    3.05
           0.333    2.03 | 3.417   3.05 | 6.500   15.24 | 9.58    2.03
           0.417    2.03 | 3.500   3.05 | 6.583   14.22 | 9.67    2.03
           0.500    2.03 | 3.583   3.05 | 6.667   14.22 | 9.75    2.03
           0.583    1.02 | 3.667   3.05 | 6.750   14.22 | 9.83    3.05
           0.667    1.02 | 3.750   3.05 | 6.833    7.11 | 9.92    3.05
           0.750    1.02 | 3.833   4.06 | 6.917    7.11 | 10.00   3.05
           0.833    2.03 | 3.917   4.06 | 7.000    7.11 | 10.08   2.03
           0.917    2.03 | 4.000   4.06 | 7.083    6.10 | 10.17   2.03
           1.000    2.03 | 4.083   3.05 | 7.167    6.10 | 10.25   2.03
           1.083    1.02 | 4.167   3.05 | 7.250    6.10 | 10.33   2.03
           1.167    1.02 | 4.250   3.05 | 7.333    5.08 | 10.42   2.03
           1.250    1.02 | 4.333   5.08 | 7.417    5.08 | 10.50   2.03
           1.333    2.03 | 4.417   5.08 | 7.500    5.08 | 10.58   1.02
           1.417    2.03 | 4.500   5.08 | 7.583    5.08 | 10.67   1.02
           1.500    2.03 | 4.583   6.10 | 7.667    5.08 | 10.75   1.02
           1.583    2.03 | 4.667   6.10 | 7.750    5.08 | 10.83   2.03
           1.667    2.03 | 4.750   6.10 | 7.833    5.08 | 10.92   2.03
           1.750    2.03 | 4.833   6.10 | 7.917    5.08 | 11.00   2.03
           1.833    1.02 | 4.917   6.10 | 8.000    5.08 | 11.08   2.03
           1.917    1.02 | 5.000   6.10 | 8.083    4.06 | 11.17   2.03
```

Page 158

Page 159 (bottom-left)

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                    LangstaffRd_EA_Existing_WestDonWatershd
           2.000    1.02 | 5.083   5.08 | 8.167    4.06 | 11.25   2.03
           2.083    2.03 | 5.167   5.08 | 8.250    4.06 | 11.33   1.02
           2.167    2.03 | 5.250   5.08 | 8.333    4.06 | 11.42   1.02
           2.250    2.03 | 5.333  10.16 | 8.417    4.06 | 11.50   1.02
           2.333    3.05 | 5.417  10.16 | 8.500    4.06 | 11.58   2.03
           2.417    3.05 | 5.500  10.16 | 8.583    3.05 | 11.67   2.03
           2.500    3.05 | 5.583  10.16 | 8.667    3.05 | 11.75   2.03
           2.583    3.05 | 5.667  10.16 | 8.750    3.05 | 11.83   1.02
           2.667    3.05 | 5.750  10.16 | 8.833    3.05 | 11.92   1.02
           2.750    3.05 | 5.833  73.15 | 8.917    3.05 | 12.00   1.02
           2.833    4.06 | 5.917  73.15 | 9.000    3.05 | 12.08   2.03
           2.917    4.06 | 6.000  73.15 | 9.083    3.05 | 12.17   2.03
           3.000    4.06 | 6.083  74.17 | 9.167    3.05 | 12.25   2.03
           3.083    3.05 | 6.167  74.17 | 9.250    3.05 |
```

```
        Max.Eff.Inten.(mm/hr)=    74.17        53.29
               over (min)         5.00         15.00
        Storage Coeff.  (min)=    6.00 (ii)    11.99 (ii)
        Unit Hyd. Tpeak (min)=    5.00         15.00
        Unit Hyd. peak  (cms)=    0.19          0.09
                                                         *TOTALS*
        PEAK FLOW      (cms)=     0.07          0.05       0.120 (iii)
        TIME TO PEAK   (hrs)=     6.25          6.33       6.25
        RUNOFF VOLUME    (mm)=    80.04        45.99        60.28
        TOTAL RAINFALL   (mm)=    82.04        82.04        82.04
        RUNOFF COEFFICIENT  =     0.98         0.56         0.73


           (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                 CN* = 83.0   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 ( 0455)|
    | 1 + 2 = 3       |        AREA    QPEAK    TPEAK    R.V.
    --------------------        (ha)   (cms)    (hrs)    (mm)
           ID1= 1 ( 0190):     0.86    0.119    6.25    60.28
         + ID2= 2 ( 0195):     0.79    0.120    6.25    60.28
           ===================================================
           ID = 3 ( 0455):     1.65    0.238    6.25    60.28

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

    --------------------
    | ADD HYD ( 0458)|
    | 1 + 2 = 3       |        AREA    QPEAK    TPEAK    R.V.
    --------------------        (ha)   (cms)    (hrs)    (mm)
           ID1= 1 ( 0450):     2.15    0.334    6.25    60.82
```

Page 159

Page 160 (bottom-right)

```
                    LangstaffRd_EA_Existing_WestDonWatershd
         + ID2= 2 ( 0455):     1.65    0.238    6.25    60.28
           ===================================================
           ID = 3 ( 0458):     3.80    0.573    6.25    60.59

       NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
    --------------------------------------------------------------------
    --------------------
    | CALIB              |
    | STANDHYD ( 0300)|  Area   (ha)= 10.00
    |ID= 1 DT= 5.0 min |  Total Imp(%)= 80.00   Dir. Conn.(%)= 80.00
    --------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=    8.00          2.00
        Dep. Storage    (mm)=    1.00          5.00
        Average Slope   (%)=     1.00          2.00
        Length          (m)=   258.20         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 | 3.167   3.05 | 6.250   74.17 | 9.33    3.05
           0.167    0.00 | 3.250   3.05 | 6.333   15.24 | 9.42    3.05
           0.250    0.00 | 3.333   3.05 | 6.417   15.24 | 9.50    3.05
           0.333    2.03 | 3.417   3.05 | 6.500   15.24 | 9.58    2.03
           0.417    2.03 | 3.500   3.05 | 6.583   14.22 | 9.67    2.03
           0.500    2.03 | 3.583   3.05 | 6.667   14.22 | 9.75    2.03
           0.583    1.02 | 3.667   3.05 | 6.750   14.22 | 9.83    3.05
           0.667    1.02 | 3.750   3.05 | 6.833    7.11 | 9.92    3.05
           0.750    1.02 | 3.833   4.06 | 6.917    7.11 | 10.00   3.05
           0.833    2.03 | 3.917   4.06 | 7.000    7.11 | 10.08   2.03
           0.917    2.03 | 4.000   4.06 | 7.083    6.10 | 10.17   2.03
           1.000    2.03 | 4.083   3.05 | 7.167    6.10 | 10.25   2.03
           1.083    1.02 | 4.167   3.05 | 7.250    6.10 | 10.33   2.03
           1.167    1.02 | 4.250   3.05 | 7.333    5.08 | 10.42   2.03
           1.250    1.02 | 4.333   5.08 | 7.417    5.08 | 10.50   2.03
           1.333    2.03 | 4.417   5.08 | 7.500    5.08 | 10.58   1.02
           1.417    2.03 | 4.500   5.08 | 7.583    5.08 | 10.67   1.02
           1.500    2.03 | 4.583   6.10 | 7.667    5.08 | 10.75   1.02
           1.583    2.03 | 4.667   6.10 | 7.750    5.08 | 10.83   2.03
           1.667    2.03 | 4.750   6.10 | 7.833    5.08 | 10.92   2.03
           1.750    2.03 | 4.833   6.10 | 7.917    5.08 | 11.00   2.03
           1.833    1.02 | 4.917   6.10 | 8.000    5.08 | 11.08   2.03
           1.917    1.02 | 5.000   6.10 | 8.083    4.06 | 11.17   2.03
           2.000    1.02 | 5.083   5.08 | 8.167    4.06 | 11.25   2.03
           2.083    2.03 | 5.167   5.08 | 8.250    4.06 | 11.33   1.02
           2.167    2.03 | 5.250   5.08 | 8.333    4.06 | 11.42   1.02
           2.250    2.03 | 5.333  10.16 | 8.417    4.06 | 11.50   1.02
           2.333    3.05 | 5.417  10.16 | 8.500    4.06 | 11.58   2.03
           2.417    3.05 | 5.500  10.16 | 8.583    3.05 | 11.67   2.03
```

Page 160

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                 2.500   3.05 | 5.583  10.16 | 8.667   3.05 | 11.75  2.03
                 2.583   3.05 | 5.667  10.16 | 8.750   3.05 | 11.83  1.02
                 2.667   3.05 | 5.750  10.16 | 8.833   3.05 | 11.92  1.02
                 2.750   3.05 | 5.833  73.15 | 8.917   3.05 | 12.00  1.02
                 2.833   4.06 | 5.917  73.15 | 9.000   3.05 | 12.08  2.03
                 2.917   4.06 | 6.000  73.15 | 9.083   3.05 | 12.17  2.03
                 3.000   4.06 | 6.083  74.17 | 9.167   3.05 | 12.25  2.03
                 3.083   3.05 | 6.167  74.17 | 9.250   3.05 |

      Max.Eff.Inten.(mm/hr)=   74.17         47.96
                 over (min)     5.00         10.00
      Storage Coeff.  (min)=    5.09 (ii)     9.65 (ii)
      Unit Hyd. Tpeak (min)=    5.00         10.00
      Unit Hyd. peak  (cms)=    0.21          0.11
                                                           *TOTALS*
      PEAK FLOW       (cms)=    1.64          0.23        1.871 (iii)
      TIME TO PEAK    (hrs)=    6.25          6.25         6.25
      RUNOFF VOLUME    (mm)=   81.04         41.06        73.04
      TOTAL RAINFALL   (mm)=   82.04         82.04        82.04
      RUNOFF COEFFICIENT  =     0.99          0.50         0.89


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 79.0   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 ( 0350)|   Area    (ha)=  0.90
|ID= 1 DT= 5.0 min  |  Total Imp(%)= 70.00  Dir. Conn.(%)= 70.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area   (ha)=    0.63         0.27
     Dep. Storage   (mm)=    1.00         5.00
     Average Slope  (%)=     1.00         2.00
     Length         (m)=    77.46        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 | 3.167  3.05 | 6.250 74.17 | 9.33  3.05
           0.167  0.00 | 3.250  3.05 | 6.333 15.24 | 9.42  3.05
           0.250  0.00 | 3.333  3.05 | 6.417 15.24 | 9.50  3.05
           0.333  2.03 | 3.417  3.05 | 6.500 15.24 | 9.58  2.03
           0.417  2.03 | 3.500  3.05 | 6.583 14.22 | 9.67  2.03
           0.500  2.03 | 3.583  3.05 | 6.667 14.22 | 9.75  2.03
```

```
               0.583   1.02 | 3.667   3.05 | 6.750  14.22 | 9.83   3.05
               0.667   1.02 | 3.750   3.05 | 6.833   7.11 | 9.92   3.05
               0.750   1.02 | 3.833   4.06 | 6.917   7.11 | 10.00  3.05
               0.833   2.03 | 3.917   4.06 | 7.000   7.11 | 10.08  2.03
               0.917   2.03 | 4.000   4.06 | 7.083   6.10 | 10.17  2.03
               1.000   2.03 | 4.083   3.05 | 7.167   6.10 | 10.25  2.03
               1.083   1.02 | 4.167   3.05 | 7.250   6.10 | 10.33  2.03
               1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
               1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50  2.03
               1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58  1.02
               1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67  1.02
               1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75  1.02
               1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83  2.03
               1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92  2.03
               1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00  2.03
               1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08  2.03
               1.917   1.02 | 5.000   6.10 | 8.083   4.06 | 11.17  2.03
               2.000   1.02 | 5.083   5.08 | 8.167   4.06 | 11.25  2.03
               2.083   2.03 | 5.167   5.08 | 8.250   4.06 | 11.33  1.02
               2.167   2.03 | 5.250   5.08 | 8.333   4.06 | 11.42  1.02
               2.250   2.03 | 5.333  10.16 | 8.417   4.06 | 11.50  1.02
               2.333   3.05 | 5.417  10.16 | 8.500   4.06 | 11.58  2.03
               2.417   3.05 | 5.500  10.16 | 8.583   3.05 | 11.67  2.03
               2.500   3.05 | 5.583  10.16 | 8.667   3.05 | 11.75  2.03
               2.583   3.05 | 5.667  10.16 | 8.750   3.05 | 11.83  1.02
               2.667   3.05 | 5.750  10.16 | 8.833   3.05 | 11.92  1.02
               2.750   3.05 | 5.833  73.15 | 8.917   3.05 | 12.00  1.02
               2.833   4.06 | 5.917  73.15 | 9.000   3.05 | 12.08  2.03
               2.917   4.06 | 6.000  73.15 | 9.083   3.05 | 12.17  2.03
               3.000   4.06 | 6.083  74.17 | 9.167   3.05 | 12.25  2.03
               3.083   3.05 | 6.167  74.17 | 9.250   3.05 |

      Max.Eff.Inten.(mm/hr)=   74.17         47.96
                 over (min)     5.00         15.00
      Storage Coeff.  (min)=    2.47 (ii)    11.94 (ii)
      Unit Hyd. Tpeak (min)=    5.00         15.00
      Unit Hyd. peak  (cms)=    0.29          0.09
                                                           *TOTALS*
      PEAK FLOW       (cms)=    0.13          0.03        0.157 (iii)
      TIME TO PEAK    (hrs)=    6.25          6.33         6.25
      RUNOFF VOLUME    (mm)=   81.04         41.06        69.04
      TOTAL RAINFALL   (mm)=   82.04         82.04        82.04
      RUNOFF COEFFICIENT  =     0.99          0.50         0.84

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 79.0   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  ( 0375)|
|  1 + 2 = 3       |       AREA     QPEAK    TPEAK    R.V.
--------------------        (ha)    (cms)    (hrs)    (mm)
     ID1= 1 ( 0300):      10.00    1.871     6.25    73.04
   + ID2= 2 ( 0350):       0.90    0.157     6.25    69.04
                      ======================================
     ID = 3 ( 0375):      10.90    2.028     6.25    72.71

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------------
********************************
** SIMULATION:Run 07        **
********************************

--------------------
| READ STORM        |   Filename: C:\Users\ray.zhao\AppD
|                   |       ata\Local\Temp\
|                   |       278a4b54-8409-4519-9819-1b44900a1c25\571caf6d
| Ptotal= 89.92 mm  |   Comments: 100yr-12hrSCS
--------------------
           TIME   RAIN | TIME   RAIN |' TIME   RAIN | TIME   RAIN
           hrs   mm/hr | hrs   mm/hr | hrs   mm/hr | hrs   mm/hr
           0.25   0.00 | 3.50   4.06 | 6.75  16.26 | 10.00  2.03
           0.50   2.03 | 3.75   3.05 | 7.00   7.11 | 10.25  3.05
           0.75   2.03 | 4.00   4.06 | 7.25   7.11 | 10.50  2.03
           1.00   1.02 | 4.25   3.05 | 7.50   5.08 | 10.75  1.02
           1.25   2.03 | 4.50   7.11 | 7.75   5.08 | 11.00  2.03
           1.50   2.03 | 4.75   6.10 | 8.00   6.10 | 11.25  2.03
           1.75   2.03 | 5.00   6.10 | 8.25   5.08 | 11.50  2.03
           2.00   1.02 | 5.25   6.10 | 8.50   4.06 | 11.75  1.02
           2.25   2.03 | 5.50  11.18 | 8.75   3.05 | 12.00  2.03
           2.50   4.06 | 5.75  11.18 | 9.00   4.06 | 12.25  2.03
           2.75   3.05 | 6.00  80.26 | 9.25   3.05 |
           3.00   4.06 | 6.25  81.28 | 9.50   3.05 |
           3.25   3.05 | 6.50  16.26 | 9.75   3.05 |

-----------------------------------------------------------------------------

--------------------
| CALIB              |
| STANDHYD ( 0145)|   Area    (ha)=  3.05
|ID= 1 DT= 5.0 min  |  Total Imp(%)= 62.00  Dir. Conn.(%)= 62.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area   (ha)=    1.89         1.16
     Dep. Storage   (mm)=    2.00         5.00
     Average Slope  (%)=     1.00         2.00
     Length         (m)=   531.00        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 | 3.167  3.05 | 6.250 81.28 | 9.33  3.05
           0.167  0.00 | 3.250  3.05 | 6.333 16.26 | 9.42  3.05
           0.250  0.00 | 3.333  4.06 | 6.417 16.26 | 9.50  3.05
           0.333  2.03 | 3.417  4.06 | 6.500 16.26 | 9.58  3.05
           0.417  2.03 | 3.500  4.06 | 6.583 16.26 | 9.67  3.05
           0.500  2.03 | 3.583  3.05 | 6.667 16.26 | 9.75  3.05
           0.583  2.03 | 3.667  3.05 | 6.750 16.26 | 9.83  2.03
           0.667  2.03 | 3.750  3.05 | 6.833  7.11 | 9.92  2.03
           0.750  2.03 | 3.833  4.06 | 6.917  7.11 | 10.00 2.03
           0.833  1.02 | 3.917  4.06 | 7.000  7.11 | 10.08 3.05
           0.917  1.02 | 4.000  4.06 | 7.083  7.11 | 10.17 3.05
           1.000  1.02 | 4.083  3.05 | 7.167  7.11 | 10.25 3.05
           1.083  2.03 | 4.167  3.05 | 7.250  7.11 | 10.33 2.03
           1.167  2.03 | 4.250  3.05 | 7.333  5.08 | 10.42 2.03
           1.250  2.03 | 4.333  7.11 | 7.417  5.08 | 10.50 2.03
           1.333  2.03 | 4.417  7.11 | 7.500  5.08 | 10.58 1.02
           1.417  2.03 | 4.500  7.11 | 7.583  5.08 | 10.67 1.02
           1.500  2.03 | 4.583  6.10 | 7.667  5.08 | 10.75 1.02
           1.583  2.03 | 4.667  6.10 | 7.750  5.08 | 10.83 2.03
           1.667  2.03 | 4.750  6.10 | 7.833  6.10 | 10.92 2.03
           1.750  2.03 | 4.833  6.10 | 7.917  6.10 | 11.00 2.03
           1.833  1.02 | 4.917  6.10 | 8.000  6.10 | 11.08 2.03
           1.917  1.02 | 5.000  6.10 | 8.083  6.10 | 11.17 2.03
           2.000  1.02 | 5.083  6.10 | 8.167  5.08 | 11.25 2.03
           2.083  2.03 | 5.167  6.10 | 8.250  5.08 | 11.33 2.03
           2.167  2.03 | 5.250  6.10 | 8.333  4.06 | 11.42 2.03
           2.250  2.03 | 5.333 11.18 | 8.417  4.06 | 11.50 2.03
           2.333  4.06 | 5.417 11.18 | 8.500  4.06 | 11.58 1.02
           2.417  4.06 | 5.500 11.18 | 8.583  3.05 | 11.67 1.02
           2.500  4.06 | 5.583 11.18 | 8.667  3.05 | 11.75 1.02
           2.583  3.05 | 5.667 11.18 | 8.750  3.05 | 11.83 2.03
           2.667  3.05 | 5.750 11.18 | 8.833  4.06 | 11.92 2.03
           2.750  3.05 | 5.833 80.26 | 8.917  4.06 | 12.00 2.03
           2.833  4.06 | 5.917 80.26 | 9.000  4.06 | 12.08 2.03
           2.917  4.06 | 6.000 80.26 | 9.083  3.05 | 12.17 2.03
           3.000  4.06 | 6.083 81.28 | 9.167  3.05 | 12.25 2.03
           3.083  3.05 | 6.167 81.28 | 9.250  3.05 |

      Max.Eff.Inten.(mm/hr)=   81.28         64.97
                 over (min)    10.00         20.00
      Storage Coeff.  (min)=    7.56 (ii)    15.94 (ii)
      Unit Hyd. Tpeak (min)=   10.00         20.00
      Unit Hyd. peak  (cms)=    0.13          0.07
                                                           *TOTALS*
      PEAK FLOW       (cms)=    0.42          0.15        0.550 (iii)
      TIME TO PEAK    (hrs)=    6.25          6.33         6.25
      RUNOFF VOLUME    (mm)=   87.92         57.11        76.21
      TOTAL RAINFALL   (mm)=   89.92         89.92        89.92
```

```
RUNOFF COEFFICIENT   =      0.98        0.64        0.85


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 86.0   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 ( 0140)|   Area    (ha)=  1.27
|ID= 1 DT= 5.0 min |   Total Imp(%)= 52.00  Dir. Conn.(%)= 52.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
    Surface Area      (ha)=     0.66          0.61
    Dep. Storage      (mm)=     2.00          5.00
    Average Slope     (%)=      1.00          2.00
    Length            (m)=    503.00         25.00
    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  | 3.167  3.05  | 6.250  81.28 | 9.33   3.05
       0.167   0.00  | 3.250  4.06  | 6.333  16.26 | 9.42   3.05
       0.250   0.00  | 3.333  4.06  | 6.417  16.26 | 9.50   3.05
       0.333   2.03  | 3.417  4.06  | 6.500  16.26 | 9.58   3.05
       0.417   2.03  | 3.500  4.06  | 6.583  16.26 | 9.67   3.05
       0.500   2.03  | 3.583  3.05  | 6.667  16.26 | 9.75   3.05
       0.583   2.03  | 3.667  3.05  | 6.750  16.26 | 9.83   2.03
       0.667   2.03  | 3.750  3.05  | 6.833   7.11 | 9.92   2.03
       0.750   2.03  | 3.833  4.06  | 6.917   7.11 | 10.00  2.03
       0.833   1.02  | 3.917  4.06  | 7.000   7.11 | 10.08  3.05
       0.917   1.02  | 4.000  4.06  | 7.083   7.11 | 10.17  3.05
       1.000   1.02  | 4.083  3.05  | 7.167   7.11 | 10.25  3.05
       1.083   2.03  | 4.167  3.05  | 7.250   7.11 | 10.33  2.03
       1.167   2.03  | 4.250  3.05  | 7.333   5.08 | 10.42  2.03
       1.250   2.03  | 4.333  7.11  | 7.417   5.08 | 10.50  2.03
       1.333   2.03  | 4.417  7.11  | 7.500   5.08 | 10.58  1.02
       1.417   2.03  | 4.500  7.11  | 7.583   5.08 | 10.67  1.02
       1.500   2.03  | 4.583  6.10  | 7.667   5.08 | 10.75  1.02
       1.583   2.03  | 4.667  6.10  | 7.750   5.08 | 10.83  2.03
       1.667   2.03  | 4.750  6.10  | 7.833   6.10 | 10.92  2.03
       1.750   2.03  | 4.833  6.10  | 7.917   6.10 | 11.00  2.03
       1.833   1.02  | 4.917  6.10  | 8.000   6.10 | 11.08  2.03
       1.917   1.02  | 5.000  6.10  | 8.083   5.08 | 11.17  2.03
       2.000   1.02  | 5.083  6.10  | 8.167   5.08 | 11.25  2.03
       2.083   2.03  | 5.167  6.10  | 8.250   5.08 | 11.33  2.03
```

```
       2.167   2.03  | 5.250   6.10  | 8.333   4.06 | 11.42  2.03
       2.250   2.03  | 5.333  11.18  | 8.417   4.06 | 11.50  2.03
       2.333   4.06  | 5.417  11.18  | 8.500   4.06 | 11.58  1.02
       2.417   4.06  | 5.500  11.18  | 8.583   3.05 | 11.67  1.02
       2.500   4.06  | 5.583  11.18  | 8.667   3.05 | 11.75  1.02
       2.583   3.05  | 5.667  11.18  | 8.750   3.05 | 11.83  2.03
       2.667   3.05  | 5.750  11.18  | 8.833   4.06 | 11.92  2.03
       2.750   3.05  | 5.833  80.26  | 8.917   4.06 | 12.00  2.03
       2.833   4.06  | 5.917  80.26  | 9.000   4.06 | 12.08  2.03
       2.917   4.06  | 6.000  80.26  | 9.083   3.05 | 12.17  2.03
       3.000   4.06  | 6.083  81.28  | 9.167   3.05 | 12.25  2.03
       3.083   3.05  | 6.167  81.28  | 9.250   3.05 |

    Max.Eff.Inten.(mm/hr)=    81.28         60.55
             over (min)        5.00         15.00
    Storage Coeff.  (min)=     7.32 (ii)   13.82 (ii)
    Unit Hyd. Tpeak (min)=     5.00         15.00
    Unit Hyd. peak  (cms)=     0.17          0.08

                                                   *TOTALS*
    PEAK FLOW       (cms)=     0.15          0.08       0.222 (iii)
    TIME TO PEAK    (hrs)=     6.25          6.33       6.25
    RUNOFF VOLUME   (mm)=     87.92         52.66      70.98
    TOTAL RAINFALL  (mm)=     89.92         89.92      89.92
    RUNOFF COEFFICIENT  =      0.98          0.59       0.79


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 83.0   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 ( 0135)|   Area    (ha)=  1.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 40.00  Dir. Conn.(%)= 40.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
    Surface Area      (ha)=     0.57          0.86
    Dep. Storage      (mm)=     2.00          5.00
    Average Slope     (%)=      1.00          2.00
    Length            (m)=    503.00         30.00
    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  | 3.167  3.05  | 6.250  81.28 | 9.33   3.05
       0.167   0.00  | 3.250  3.05  | 6.333  16.26 | 9.42   3.05
```
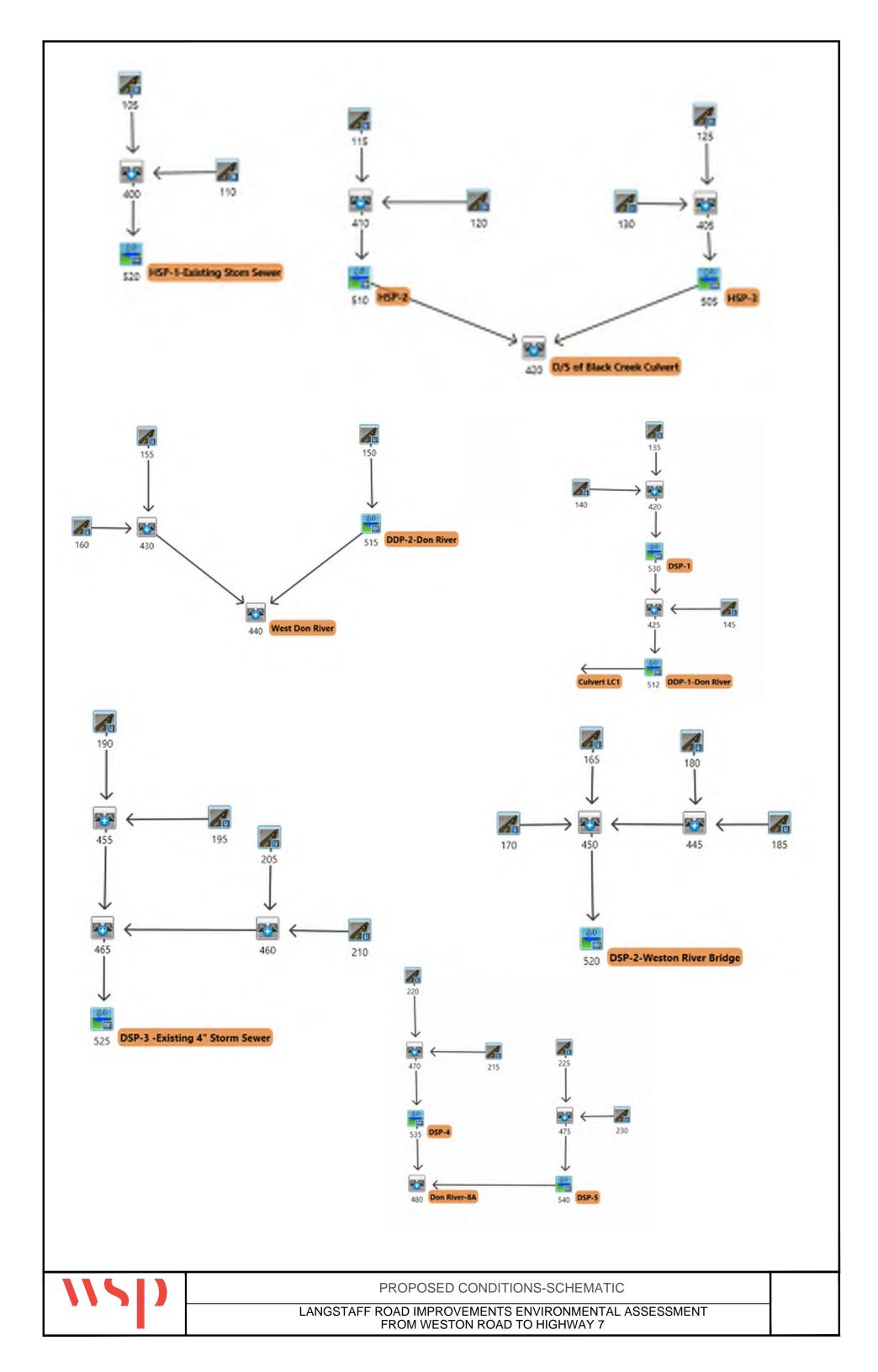
```
       0.250   0.00  | 3.333   4.06  | 6.417  16.26 | 9.50   3.05
       0.333   2.03  | 3.417   4.06  | 6.500  16.26 | 9.58   3.05
       0.417   2.03  | 3.500   4.06  | 6.583  16.26 | 9.67   3.05
       0.500   2.03  | 3.583   3.05  | 6.667  16.26 | 9.75   3.05
       0.583   2.03  | 3.667   3.05  | 6.750  16.26 | 9.83   2.03
       0.667   2.03  | 3.750   3.05  | 6.833   7.11 | 9.92   2.03
       0.750   2.03  | 3.833   4.06  | 6.917   7.11 | 10.00  2.03
       0.833   1.02  | 3.917   4.06  | 7.000   7.11 | 10.08  3.05
       0.917   1.02  | 4.000   4.06  | 7.083   7.11 | 10.17  3.05
       1.000   1.02  | 4.083   3.05  | 7.167   7.11 | 10.25  3.05
       1.083   2.03  | 4.167   3.05  | 7.250   7.11 | 10.33  2.03
       1.167   2.03  | 4.250   3.05  | 7.333   5.08 | 10.42  2.03
       1.250   2.03  | 4.333   7.11  | 7.417   5.08 | 10.50  2.03
       1.333   2.03  | 4.417   7.11  | 7.500   5.08 | 10.58  1.02
       1.417   2.03  | 4.500   7.11  | 7.583   5.08 | 10.67  1.02
       1.500   2.03  | 4.583   6.10  | 7.667   5.08 | 10.75  1.02
       1.583   2.03  | 4.667   6.10  | 7.750   5.08 | 10.83  2.03
       1.667   2.03  | 4.750   6.10  | 7.833   6.10 | 10.92  2.03
       1.750   2.03  | 4.833   6.10  | 7.917   6.10 | 11.00  2.03
       1.833   1.02  | 4.917   6.10  | 8.000   6.10 | 11.08  2.03
       1.917   1.02  | 5.000   6.10  | 8.083   5.08 | 11.17  2.03
       2.000   1.02  | 5.083   6.10  | 8.167   5.08 | 11.25  2.03
       2.083   2.03  | 5.167   6.10  | 8.250   5.08 | 11.33  2.03
       2.167   2.03  | 5.250   6.10  | 8.333   4.06 | 11.42  2.03
       2.250   2.03  | 5.333  11.18  | 8.417   4.06 | 11.50  2.03
       2.333   4.06  | 5.417  11.18  | 8.500   4.06 | 11.58  1.02
       2.417   4.06  | 5.500  11.18  | 8.583   3.05 | 11.67  1.02
       2.500   4.06  | 5.583  11.18  | 8.667   3.05 | 11.75  1.02
       2.583   3.05  | 5.667  11.18  | 8.750   3.05 | 11.83  2.03
       2.667   3.05  | 5.750  11.18  | 8.833   4.06 | 11.92  2.03
       2.750   3.05  | 5.833  80.26  | 8.917   4.06 | 12.00  2.03
       2.833   4.06  | 5.917  80.26  | 9.000   4.06 | 12.08  2.03
       2.917   4.06  | 6.000  80.26  | 9.083   3.05 | 12.17  2.03
       3.000   4.06  | 6.083  81.28  | 9.167   3.05 | 12.25  2.03
       3.083   3.05  | 6.167  81.28  | 9.250   3.05 |

    Max.Eff.Inten.(mm/hr)=    81.28         62.01
             over (min)        5.00         15.00
    Storage Coeff.  (min)=     7.32 (ii)   14.51 (ii)
    Unit Hyd. Tpeak (min)=     5.00         15.00
    Unit Hyd. peak  (cms)=     0.17          0.08
                                                   *TOTALS*
    PEAK FLOW       (cms)=     0.13          0.11       0.234 (iii)
    TIME TO PEAK    (hrs)=     6.25          6.33       6.25
    RUNOFF VOLUME   (mm)=     87.92         54.09      67.62
    TOTAL RAINFALL  (mm)=     89.92         89.92      89.92
    RUNOFF COEFFICIENT  =      0.98          0.60       0.75


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 84.0   Ia = Dep. Storage  (Above)
  (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
       THAN THE STORAGE COEFFICIENT.
```

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

----------------------------------------------------------------------

--------------------
| ADD HYD  ( 0420)|
|   1 + 2 = 3      |      AREA    QPEAK    TPEAK     R.V.
--------------------      (ha)    (cms)    (hrs)     (mm)
    ID1= 1 ( 0135):       1.43    0.234    6.25     67.62
  + ID2= 2 ( 0140):       1.27    0.222    6.25     70.98
    ==================================================
    ID = 3 ( 0420):       2.70    0.456    6.25     69.20

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

--------------------
| ADD HYD  ( 0425)|
|   1 + 2 = 3      |      AREA    QPEAK    TPEAK     R.V.
--------------------      (ha)    (cms)    (hrs)     (mm)
    ID1= 1 ( 0145):       3.05    0.550    6.25     76.21
  + ID2= 2 ( 0420):       2.70    0.456    6.25     69.20
    ==================================================
    ID = 3 ( 0425):       5.75    1.006    6.25     72.92

    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
----------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0210)|   Area    (ha)=  0.96
|ID= 1 DT= 5.0 min |   Total Imp(%)= 44.00  Dir. Conn.(%)= 44.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
    Surface Area      (ha)=     0.42          0.54
    Dep. Storage      (mm)=     2.00          5.00
    Average Slope     (%)=      1.00          2.00
    Length            (m)=    470.00         20.00
    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  | 3.167  3.05  | 6.250  81.28 | 9.33   3.05
       0.167   0.00  | 3.250  3.05  | 6.333  16.26 | 9.42   3.05
       0.250   0.00  | 3.333  4.06  | 6.417  16.26 | 9.50   3.05
       0.333   2.03  | 3.417  4.06  | 6.500  16.26 | 9.58   3.05
       0.417   2.03  | 3.500  4.06  | 6.583  16.26 | 9.67   3.05
       0.500   2.03  | 3.583  3.05  | 6.667  16.26 | 9.75   3.05
       0.583   2.03  | 3.667  3.05  | 6.750  16.26 | 9.83   2.03
       0.667   2.03  | 3.750  3.05  | 6.833   7.11 | 9.92   2.03
```

0.750	2.03	3.833	4.06	6.917	7.11	10.00	2.03
0.833	1.02	3.917	4.06	7.000	7.11	10.08	3.05
0.917	1.02	4.000	4.06	7.083	7.11	10.17	3.05
1.000	1.02	4.083	3.05	7.167	7.11	10.25	3.05
1.083	2.03	4.167	3.05	7.250	7.11	10.33	2.03
1.167	2.03	4.250	3.05	7.333	5.08	10.42	2.03
1.250	2.03	4.333	7.11	7.417	5.08	10.50	2.03
1.333	2.03	4.417	7.11	7.500	5.08	10.58	1.02
1.417	2.03	4.500	7.11	7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10	7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10	7.833	6.10	10.92	2.03
1.750	2.03	4.833	6.10	7.917	6.10	11.00	2.03
1.833	1.02	4.917	6.10	8.000	6.10	11.08	2.03
1.917	1.02	5.000	6.10	8.083	5.08	11.17	2.03
2.000	1.02	5.083	6.10	8.167	5.08	11.25	2.03
2.083	2.03	5.167	6.10	8.250	5.08	11.33	2.03
2.167	2.03	5.250	6.10	8.333	4.06	11.42	2.03
2.250	2.03	5.333	11.18	8.417	4.06	11.50	2.03
2.333	4.06	5.417	11.18	8.500	4.06	11.58	1.02
2.417	4.06	5.500	11.18	8.583	3.05	11.67	1.02
2.500	4.06	5.583	11.18	8.667	3.05	11.75	1.02
2.583	3.05	5.667	11.18	8.750	3.05	11.83	2.03
2.667	3.05	5.750	11.18	8.833	4.06	11.92	2.03
2.750	3.05	5.833	80.26	8.917	4.06	12.00	2.03
2.833	4.06	5.917	80.26	9.000	4.06	12.08	2.03
2.917	4.06	6.000	80.26	9.083	3.05	12.17	2.03
3.000	4.06	6.083	81.28	9.167	3.05	12.25	2.03
3.083	3.05	6.167	81.28	9.250	3.05		

```
Max.Eff.Inten.(mm/hr)=     81.28           60.55
           over (min)       5.00           15.00
Storage Coeff.  (min)=      7.02 (ii)      12.72 (ii)
Unit Hyd. Tpeak (min)=      5.00           15.00
Unit Hyd. peak  (cms)=      0.17            0.08
                                                     *TOTALS*
PEAK FLOW       (cms)=      0.09            0.07      0.162 (iii)
TIME TO PEAK    (hrs)=      6.25            6.33      6.25
RUNOFF VOLUME   (mm)=      87.92           52.66     68.16
TOTAL RAINFALL  (mm)=      89.92           89.92     89.92
RUNOFF COEFFICIENT  =       0.98            0.59      0.76


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0    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 ( 0205)|   Area    (ha)=  1.11
```

```
|ID= 1 DT= 5.0 min |   Total Imp(%)= 38.00   Dir. Conn.(%)= 38.00
--------------------
                        IMPERVIOUS     PERVIOUS (i)
   Surface Area   (ha)=    0.42          0.69
   Dep. Storage   (mm)=    2.00          5.00
   Average Slope   (%)=    1.00          2.00
   Length          (m)=  470.00         20.00
   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	3.167	3.05	6.250	81.28	9.33	3.05
0.167	0.00	3.250	3.05	6.333	16.26	9.42	3.05
0.250	0.00	3.333	4.06	6.417	16.26	9.50	3.05
0.333	2.03	3.417	4.06	6.500	16.26	9.58	3.05
0.417	2.03	3.500	4.06	6.583	16.26	9.67	3.05
0.500	2.03	3.583	3.05	6.667	16.26	9.75	3.05
0.583	2.03	3.667	3.05	6.750	16.26	9.83	2.03
0.667	2.03	3.750	3.05	6.833	7.11	9.92	2.03
0.750	1.02	3.833	4.06	6.917	7.11	10.00	2.03
0.833	1.02	3.917	4.06	7.000	7.11	10.08	3.05
0.917	1.02	4.000	4.06	7.083	7.11	10.17	3.05
1.000	1.02	4.083	3.05	7.167	7.11	10.25	3.05
1.083	2.03	4.167	3.05	7.250	7.11	10.33	2.03
1.167	2.03	4.250	3.05	7.333	5.08	10.42	2.03
1.250	2.03	4.333	7.11	7.417	5.08	10.50	2.03
1.333	2.03	4.417	7.11	7.500	5.08	10.58	1.02
1.417	2.03	4.500	7.11	7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10	7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10	7.833	6.10	10.92	2.03
1.750	2.03	4.833	6.10	7.917	6.10	11.00	2.03
1.833	1.02	4.917	6.10	8.000	6.10	11.08	2.03
1.917	1.02	5.000	6.10	8.083	5.08	11.17	2.03
2.000	1.02	5.083	6.10	8.167	5.08	11.25	2.03
2.083	2.03	5.167	6.10	8.250	5.08	11.33	2.03
2.167	2.03	5.250	6.10	8.333	4.06	11.42	2.03
2.250	2.03	5.333	11.18	8.417	4.06	11.50	2.03
2.333	4.06	5.417	11.18	8.500	4.06	11.58	1.02
2.417	4.06	5.500	11.18	8.583	3.05	11.67	1.02
2.500	4.06	5.583	11.18	8.667	3.05	11.75	1.02
2.583	3.05	5.667	11.18	8.750	3.05	11.83	2.03
2.667	3.05	5.750	11.18	8.833	4.06	11.92	2.03
2.750	3.05	5.833	80.26	8.917	4.06	12.00	2.03
2.833	4.06	5.917	80.26	9.000	4.06	12.08	2.03
2.917	4.06	6.000	80.26	9.083	3.05	12.17	2.03
3.000	4.06	6.083	81.28	9.167	3.05	12.25	2.03
3.083	3.05	6.167	81.28	9.250	3.05		

```
Max.Eff.Inten.(mm/hr)=     81.28           60.55
           over (min)       5.00           15.00
Storage Coeff.  (min)=      7.02 (ii)      12.72 (ii)
Unit Hyd. Tpeak (min)=      5.00           15.00
Unit Hyd. peak  (cms)=      0.17            0.08
                                                     *TOTALS*
PEAK FLOW       (cms)=      0.09            0.09      0.181 (iii)
TIME TO PEAK    (hrs)=      6.25            6.33      6.25
RUNOFF VOLUME   (mm)=      87.92           52.66     66.05
TOTAL RAINFALL  (mm)=      89.92           89.92     89.92
RUNOFF COEFFICIENT  =       0.98            0.59      0.73


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0    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.

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--------------------
| ADD HYD ( 0460)|
|  1 + 2 = 3       |        AREA    QPEAK    TPEAK     R.V.
--------------------               (ha)    (cms)    (hrs)     (mm)
     ID1= 1 ( 0205):     1.11    0.181    6.25     66.05
   + ID2= 2 ( 0210):     0.96    0.162    6.25     68.16
                        =======================================
     ID = 3 ( 0460):     2.07    0.344    6.25     67.03

NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0230)|   Area    (ha)=  0.70
|ID= 1 DT= 5.0 min |   Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                        IMPERVIOUS     PERVIOUS (i)
   Surface Area   (ha)=    0.40          0.30
   Dep. Storage   (mm)=    2.00          5.00
   Average Slope   (%)=    1.00          2.00
   Length          (m)=  320.00         25.00
   Mannings n        =     0.013         0.290

   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	3.05	6.250	81.28	9.33	3.05
0.167	0.00	3.250	3.05	6.333	16.26	9.42	3.05
0.250	0.00	3.333	4.06	6.417	16.26	9.50	3.05

0.333	2.03	3.417	4.06	6.500	16.26	9.58	3.05
0.417	2.03	3.500	4.06	6.583	16.26	9.67	3.05
0.500	2.03	3.583	3.05	6.667	16.26	9.75	3.05
0.583	2.03	3.667	3.05	6.750	16.26	9.83	2.03
0.667	2.03	3.750	3.05	6.833	7.11	9.92	2.03
0.750	2.03	3.833	4.06	6.917	7.11	10.00	2.03
0.833	1.02	3.917	4.06	7.000	7.11	10.08	3.05
0.917	1.02	4.000	4.06	7.083	7.11	10.17	3.05
1.000	1.02	4.083	3.05	7.167	7.11	10.25	3.05
1.083	2.03	4.167	3.05	7.250	7.11	10.33	2.03
1.167	2.03	4.250	3.05	7.333	5.08	10.42	2.03
1.250	2.03	4.333	7.11	7.417	5.08	10.50	2.03
1.333	2.03	4.417	7.11	7.500	5.08	10.58	1.02
1.417	2.03	4.500	7.11	7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10	7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10	7.833	6.10	10.92	2.03
1.750	2.03	4.833	6.10	7.917	6.10	11.00	2.03
1.833	1.02	4.917	6.10	8.000	6.10	11.08	2.03
1.917	1.02	5.000	6.10	8.083	5.08	11.17	2.03
2.000	1.02	5.083	6.10	8.167	5.08	11.25	2.03
2.083	2.03	5.167	6.10	8.250	5.08	11.33	2.03
2.167	2.03	5.250	6.10	8.333	4.06	11.42	2.03
2.250	2.03	5.333	11.18	8.417	4.06	11.50	2.03
2.333	4.06	5.417	11.18	8.500	4.06	11.58	1.02
2.417	4.06	5.500	11.18	8.583	3.05	11.67	1.02
2.500	4.06	5.583	11.18	8.667	3.05	11.75	1.02
2.583	3.05	5.667	11.18	8.750	3.05	11.83	2.03
2.667	3.05	5.750	11.18	8.833	4.06	11.92	2.03
2.750	3.05	5.833	80.26	8.917	4.06	12.00	2.03
2.833	4.06	5.917	80.26	9.000	4.06	12.08	2.03
2.917	4.06	6.000	80.26	9.083	3.05	12.17	2.03
3.000	4.06	6.083	81.28	9.167	3.05	12.25	2.03
3.083	3.05	6.167	81.28	9.250	3.05		

```
Max.Eff.Inten.(mm/hr)=     81.28           57.69
           over (min)       5.00           15.00
Storage Coeff.  (min)=      5.58 (ii)      12.83 (ii)
Unit Hyd. Tpeak (min)=      5.00           15.00
Unit Hyd. peak  (cms)=      0.20            0.08
                                                     *TOTALS*
PEAK FLOW       (cms)=      0.09            0.04      0.126 (iii)
TIME TO PEAK    (hrs)=      6.25            6.33      6.25
RUNOFF VOLUME   (mm)=      87.92           49.90     71.56
TOTAL RAINFALL  (mm)=      89.92           89.92     89.92
RUNOFF COEFFICIENT  =       0.98            0.55      0.80


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 81.0    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 (0225)| Area   (ha)= 0.90
|ID= 1 DT= 5.0 min | Total Imp(%)= 53.00   Dir. Conn.(%)= 53.00

                              IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=   0.48   0.42
     Dep. Storage   (mm)=   2.00   5.00
     Average Slope   (%)=   1.00   2.00
     Length   (m)=   320.00   25.00
     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 | 3.167 3.05 | 6.250 81.28 | 9.33   3.05
    0.167   0.00 | 3.250 3.05 | 6.333 16.26 | 9.42   3.05
    0.250   0.00 | 3.333 4.06 | 6.417 16.26 | 9.50   3.05
    0.333   2.03 | 3.417 4.06 | 6.500 16.26 | 9.58   3.05
    0.417   2.03 | 3.500 4.06 | 6.583 16.26 | 9.67   3.05
    0.500   2.03 | 3.583 3.05 | 6.667 16.26 | 9.75   3.05
    0.583   2.03 | 3.667 3.05 | 6.750 16.26 | 9.83   2.03
    0.667   2.03 | 3.750 3.05 | 6.833   7.11 | 9.92   2.03
    0.750   2.03 | 3.833 4.06 | 6.917   7.11 | 10.00 2.03
    0.833   1.02 | 3.917 4.06 | 7.000   7.11 | 10.08 3.05
    0.917   1.02 | 4.000 4.06 | 7.083   7.11 | 10.17 3.05
    1.000   1.02 | 4.083 3.05 | 7.167   7.11 | 10.25 3.05
    1.083   2.03 | 4.167 3.05 | 7.250   7.11 | 10.33 2.03
    1.167   2.03 | 4.250 3.05 | 7.333   5.08 | 10.42 2.03
    1.250   2.03 | 4.333 7.11 | 7.417   5.08 | 10.50 2.03
    1.333   2.03 | 4.417 7.11 | 7.500   5.08 | 10.58 1.02
    1.417   2.03 | 4.500 7.11 | 7.583   5.08 | 10.67 1.02
    1.500   2.03 | 4.583 6.10 | 7.667   5.08 | 10.75 1.02
    1.583   2.03 | 4.667 6.10 | 7.750   5.08 | 10.83 2.03
    1.667   2.03 | 4.750 6.10 | 7.833   6.10 | 10.92 2.03
    1.750   2.03 | 4.833 6.10 | 7.917   6.10 | 11.00 2.03
    1.833   1.02 | 4.917 6.10 | 8.000   6.10 | 11.08 2.03
    1.917   1.02 | 5.000 6.10 | 8.083   5.08 | 11.17 2.03
    2.000   1.02 | 5.083 6.10 | 8.167   5.08 | 11.25 2.03
    2.083   2.03 | 5.167 6.10 | 8.250   5.08 | 11.33 2.03
    2.167   2.03 | 5.250 6.10 | 8.333   4.06 | 11.42 2.03
    2.250   2.03 | 5.333 11.18 | 8.417   4.06 | 11.50 2.03
    2.333   4.06 | 5.417 11.18 | 8.500   4.06 | 11.58 1.02
    2.417   4.06 | 5.500 11.18 | 8.583   3.05 | 11.67 1.02
    2.500   4.06 | 5.583 11.18 | 8.667   3.05 | 11.75 1.02
    2.583   3.05 | 5.667 11.18 | 8.750   3.05 | 11.83 2.03
    2.667   3.05 | 5.750 11.18 | 8.833   4.06 | 11.92 2.03
    2.750   3.05 | 5.833 80.26 | 8.917   4.06 | 12.00 2.03

                 2.833   4.06 | 5.917 80.26 | 9.000   4.06 | 12.08 2.03
                 2.917   4.06 | 6.000 80.26 | 9.083   3.05 | 12.17 2.03
                 3.000   4.06 | 6.083 81.28 | 9.167   3.05 | 12.25 2.03
                 3.083   3.05 | 6.167 81.28 | 9.250   3.05 |

    Max.Eff.Inten.(mm/hr)=   81.28   60.55
                 over (min)   5.00   15.00
    Storage Coeff. (min)=   5.58 (ii)   12.08 (ii)
    Unit Hyd. Tpeak (min)=   5.00   15.00
    Unit Hyd. peak (cms)=   0.20   0.09

                                                           TOTALS
    PEAK FLOW   (cms)=   0.11   0.06   0.162 (iii)
    TIME TO PEAK   (hrs)=   6.25   6.33   6.25
    RUNOFF VOLUME   (mm)=   87.92   52.66   71.34
    TOTAL RAINFALL (mm)=   89.92   89.92   89.92
    RUNOFF COEFFICIENT =   0.98   0.59   0.79

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 (0475)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
     ID1= 1 (0225):   0.90   0.162   6.25   71.34
   + ID2= 2 (0230):   0.70   0.126   6.25   71.56
     ==
     ID = 3 (0475):   1.60   0.287   6.25   71.43

    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0220)| Area   (ha)= 0.65
|ID= 1 DT= 5.0 min | Total Imp(%)= 46.00   Dir. Conn.(%)= 46.00

                              IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=   0.30   0.35
     Dep. Storage   (mm)=   2.00   5.00
     Average Slope   (%)=   1.00   2.00
     Length   (m)=   260.00   20.00
     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 | 3.167 3.05 | 6.250 81.28 | 9.33   3.05
    0.167   0.00 | 3.250 3.05 | 6.333 16.26 | 9.42   3.05
    0.250   0.00 | 3.333 4.06 | 6.417 16.26 | 9.50   3.05
    0.333   2.03 | 3.417 4.06 | 6.500 16.26 | 9.58   3.05
    0.417   2.03 | 3.500 4.06 | 6.583 16.26 | 9.67   3.05
    0.500   2.03 | 3.583 3.05 | 6.667 16.26 | 9.75   3.05
    0.583   2.03 | 3.667 3.05 | 6.750 16.26 | 9.83   2.03
    0.667   2.03 | 3.750 3.05 | 6.833   7.11 | 9.92   2.03
    0.750   2.03 | 3.833 4.06 | 6.917   7.11 | 10.00 2.03
    0.833   1.02 | 3.917 4.06 | 7.000   7.11 | 10.08 3.05
    0.917   1.02 | 4.000 4.06 | 7.083   7.11 | 10.17 3.05
    1.000   1.02 | 4.083 3.05 | 7.167   7.11 | 10.25 3.05
    1.083   2.03 | 4.167 3.05 | 7.250   7.11 | 10.33 2.03
    1.167   2.03 | 4.250 3.05 | 7.333   5.08 | 10.42 2.03
    1.250   2.03 | 4.333 7.11 | 7.417   5.08 | 10.50 2.03
    1.333   2.03 | 4.417 7.11 | 7.500   5.08 | 10.58 1.02
    1.417   2.03 | 4.500 7.11 | 7.583   5.08 | 10.67 1.02
    1.500   2.03 | 4.583 6.10 | 7.667   5.08 | 10.75 1.02
    1.583   2.03 | 4.667 6.10 | 7.750   5.08 | 10.83 2.03
    1.667   2.03 | 4.750 6.10 | 7.833   6.10 | 10.92 2.03
    1.750   2.03 | 4.833 6.10 | 7.917   6.10 | 11.00 2.03
    1.833   1.02 | 4.917 6.10 | 8.000   6.10 | 11.08 2.03
    1.917   1.02 | 5.000 6.10 | 8.083   5.08 | 11.17 2.03
    2.000   1.02 | 5.083 6.10 | 8.167   5.08 | 11.25 2.03
    2.083   2.03 | 5.167 6.10 | 8.250   5.08 | 11.33 2.03
    2.167   2.03 | 5.250 6.10 | 8.333   4.06 | 11.42 2.03
    2.250   2.03 | 5.333 11.18 | 8.417   4.06 | 11.50 2.03
    2.333   4.06 | 5.417 11.18 | 8.500   4.06 | 11.58 1.02
    2.417   4.06 | 5.500 11.18 | 8.583   3.05 | 11.67 1.02
    2.500   4.06 | 5.583 11.18 | 8.667   3.05 | 11.75 1.02
    2.583   3.05 | 5.667 11.18 | 8.750   3.05 | 11.83 2.03
    2.667   3.05 | 5.750 11.18 | 8.833   4.06 | 11.92 2.03
    2.750   3.05 | 5.833 80.26 | 8.917   4.06 | 12.00 2.03
    2.833   4.06 | 5.917 80.26 | 9.000   4.06 | 12.08 2.03
    2.917   4.06 | 6.000 80.26 | 9.083   3.05 | 12.17 2.03
    3.000   4.06 | 6.083 81.28 | 9.167   3.05 | 12.25 2.03
    3.083   3.05 | 6.167 81.28 | 9.250   3.05 |

    Max.Eff.Inten.(mm/hr)=   81.28   60.55
                 over (min)   5.00   15.00
    Storage Coeff. (min)=   4.92 (ii)   10.62 (ii)
    Unit Hyd. Tpeak (min)=   5.00   15.00
    Unit Hyd. peak (cms)=   0.22   0.09
                                                           TOTALS
    PEAK FLOW   (cms)=   0.07   0.05   0.115 (iii)
    TIME TO PEAK   (hrs)=   6.25   6.33   6.25
    RUNOFF VOLUME   (mm)=   87.92   52.66   68.87
    TOTAL RAINFALL (mm)=   89.92   89.92   89.92
    RUNOFF COEFFICIENT =   0.98   0.59   0.77

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

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 (0215)| Area   (ha)= 0.58
|ID= 1 DT= 5.0 min | Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00

                              IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=   0.33   0.25
     Dep. Storage   (mm)=   2.00   5.00
     Average Slope   (%)=   1.00   2.00
     Length   (m)=   260.00   30.00
     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 | 3.167 3.05 | 6.250 81.28 | 9.33   3.05
    0.167   0.00 | 3.250 3.05 | 6.333 16.26 | 9.42   3.05
    0.250   0.00 | 3.333 4.06 | 6.417 16.26 | 9.50   3.05
    0.333   2.03 | 3.417 4.06 | 6.500 16.26 | 9.58   3.05
    0.417   2.03 | 3.500 4.06 | 6.583 16.26 | 9.67   3.05
    0.500   2.03 | 3.583 3.05 | 6.667 16.26 | 9.75   3.05
    0.583   2.03 | 3.667 3.05 | 6.750 16.26 | 9.83   2.03
    0.667   2.03 | 3.750 3.05 | 6.833   7.11 | 9.92   2.03
    0.750   2.03 | 3.833 4.06 | 6.917   7.11 | 10.00 2.03
    0.833   1.02 | 3.917 4.06 | 7.000   7.11 | 10.08 3.05
    0.917   1.02 | 4.000 4.06 | 7.083   7.11 | 10.17 3.05
    1.000   1.02 | 4.083 3.05 | 7.167   7.11 | 10.25 3.05
    1.083   2.03 | 4.167 3.05 | 7.250   7.11 | 10.33 2.03
    1.167   2.03 | 4.250 3.05 | 7.333   5.08 | 10.42 2.03
    1.250   2.03 | 4.333 7.11 | 7.417   5.08 | 10.50 2.03
    1.333   2.03 | 4.417 7.11 | 7.500   5.08 | 10.58 1.02
    1.417   2.03 | 4.500 7.11 | 7.583   5.08 | 10.67 1.02
    1.500   2.03 | 4.583 6.10 | 7.667   5.08 | 10.75 1.02
    1.583   2.03 | 4.667 6.10 | 7.750   5.08 | 10.83 2.03
    1.667   2.03 | 4.750 6.10 | 7.833   6.10 | 10.92 2.03
    1.750   2.03 | 4.833 6.10 | 7.917   6.10 | 11.00 2.03
    1.833   1.02 | 4.917 6.10 | 8.000   6.10 | 11.08 2.03
    1.917   1.02 | 5.000 6.10 | 8.083   5.08 | 11.17 2.03
    2.000   1.02 | 5.083 6.10 | 8.167   5.08 | 11.25 2.03
    2.083   2.03 | 5.167 6.10 | 8.250   5.08 | 11.33 2.03
    2.167   2.03 | 5.250 6.10 | 8.333   4.06 | 11.42 2.03
    2.250   2.03 | 5.333 11.18 | 8.417   4.06 | 11.50 2.03

```
                 2.333    4.06 |  5.417   11.18 |  8.500    4.06 | 11.58    1.02
                 2.417    4.06 |  5.500   11.18 |  8.583    3.05 | 11.67    1.02
                 2.500    4.06 |  5.583   11.18 |  8.667    3.05 | 11.75    1.02
                 2.583    3.05 |  5.667   11.18 |  8.750    3.05 | 11.83    2.03
                 2.667    3.05 |  5.750   11.18 |  8.833    4.06 | 11.92    2.03
                 2.750    3.05 |  5.833   80.26 |  8.917    4.06 | 12.00    2.03
                 2.833    4.06 |  5.917   80.26 |  9.000    4.06 | 12.08    2.03
                 2.917    4.06 |  6.000   80.26 |  9.083    3.05 | 12.17    2.03
                 3.000    4.06 |  6.083   81.28 |  9.167    3.05 | 12.25    2.03
                 3.083    3.05 |  6.167   81.28 |  9.250    3.05 |

       Max.Eff.Inten.(mm/hr)=    81.28          60.55
              over (min)          5.00          15.00
       Storage Coeff.  (min)=     4.92 (ii)     12.18 (ii)
       Unit Hyd. Tpeak (min)=     5.00          15.00
       Unit Hyd. peak  (cms)=     0.22           0.09
                                                          *TOTALS*
       PEAK FLOW       (cms)=     0.07           0.03       0.107 (iii)
       TIME TO PEAK    (hrs)=     6.25           6.33       6.25
       RUNOFF VOLUME    (mm)=    87.92          52.66      72.74
       TOTAL RAINFALL   (mm)=    89.92          89.92      89.92
       RUNOFF COEFFICIENT  =     0.98           0.59       0.81

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  83.0    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  ( 0470)|
|  1 + 2 =  3     |         AREA     QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 0215):      0.58     0.107     6.25    72.74
     + ID2= 2 ( 0220):      0.65     0.115     6.25    68.87
                         =========================================
       ID = 3 ( 0470):      1.23     0.221     6.25    70.69

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
----------------------------------------------------------------------
--------------------
| ADD HYD  ( 0480)|
|  1 + 2 =  3     |         AREA     QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 0470):      1.23     0.221     6.25    70.69
     + ID2= 2 ( 0475):      1.60     0.287     6.25    71.43
                         =========================================
       ID = 3 ( 0480):      2.83     0.508     6.25    71.11
```

```
   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
----------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0160)|  Area     (ha)=  0.43
|ID= 1 DT= 5.0 min |  Total Imp(%)= 56.00   Dir. Conn.(%)= 56.00
--------------------
                          IMPERVIOUS      PERVIOUS (i)
       Surface Area   (ha)=    0.24           0.19
       Dep. Storage   (mm)=    2.00           5.00
       Average Slope  (%)=     1.00           2.00
       Length         (m)=   260.00          20.00
       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 |  3.167   3.05 |  6.250  81.28 |  9.33   3.05
           0.167   0.00 |  3.250   3.05 |  6.333  16.26 |  9.42   3.05
           0.250   0.00 |  3.333   4.06 |  6.417  16.26 |  9.50   3.05
           0.333   2.03 |  3.417   4.06 |  6.500  16.26 |  9.58   3.05
           0.417   2.03 |  3.500   4.06 |  6.583  16.26 |  9.67   3.05
           0.500   2.03 |  3.583   3.05 |  6.667  16.26 |  9.75   3.05
           0.583   2.03 |  3.667   3.05 |  6.750  16.26 |  9.83   2.03
           0.667   2.03 |  3.750   3.05 |  6.833   7.11 |  9.92   2.03
           0.750   2.03 |  3.833   4.06 |  6.917   7.11 | 10.00   2.03
           0.833   1.02 |  3.917   4.06 |  7.000   7.11 | 10.08   3.05
           0.917   1.02 |  4.000   4.06 |  7.083   7.11 | 10.17   3.05
           1.000   1.02 |  4.083   3.05 |  7.167   7.11 | 10.25   3.05
           1.083   2.03 |  4.167   3.05 |  7.250   7.11 | 10.33   2.03
           1.167   2.03 |  4.250   3.05 |  7.333   5.08 | 10.42   2.03
           1.250   2.03 |  4.333   7.11 |  7.417   5.08 | 10.50   2.03
           1.333   2.03 |  4.417   7.11 |  7.500   5.08 | 10.58   1.02
           1.417   2.03 |  4.500   7.11 |  7.583   5.08 | 10.67   1.02
           1.500   2.03 |  4.583   6.10 |  7.667   5.08 | 10.75   1.02
           1.583   2.03 |  4.667   6.10 |  7.750   5.08 | 10.83   2.03
           1.667   2.03 |  4.750   6.10 |  7.833   6.10 | 10.92   2.03
           1.750   2.03 |  4.833   6.10 |  7.917   6.10 | 11.00   2.03
           1.833   1.02 |  4.917   6.10 |  8.000   6.10 | 11.08   2.03
           1.917   1.02 |  5.000   6.10 |  8.083   5.08 | 11.17   2.03
           2.000   1.02 |  5.083   6.10 |  8.167   5.08 | 11.25   2.03
           2.083   2.03 |  5.167   6.10 |  8.250   5.08 | 11.33   2.03
           2.167   2.03 |  5.250   6.10 |  8.333   4.06 | 11.42   2.03
           2.250   2.03 |  5.333   3.05 |  8.417   4.06 | 11.50   2.03
           2.333   4.06 |  5.417  11.18 |  8.500   4.06 | 11.58   1.02
           2.417   4.06 |  5.500  11.18 |  8.583   3.05 | 11.67   1.02
           2.500   4.06 |  5.583  11.18 |  8.667   3.05 | 11.75   1.02
           2.583   3.05 |  5.667  11.18 |  8.750   3.05 | 11.83   2.03
           2.667   3.05 |  5.750  11.18 |  8.833   4.06 | 11.92   2.03
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                 2.750    3.05 |  5.833   80.26 |  8.917    4.06 | 12.00    2.03
                 2.833    4.06 |  5.917   80.26 |  9.000    4.06 | 12.08    2.03
                 2.917    4.06 |  6.000   80.26 |  9.083    3.05 | 12.17    2.03
                 3.000    4.06 |  6.083   81.28 |  9.167    3.05 | 12.25    2.03
                 3.083    3.05 |  6.167   81.28 |  9.250    3.05 |

       Max.Eff.Inten.(mm/hr)=    81.28          69.46
              over (min)          5.00          10.00
       Storage Coeff.  (min)=     4.92 (ii)      9.52 (ii)
       Unit Hyd. Tpeak (min)=     5.00          10.00
       Unit Hyd. peak  (cms)=     0.22           0.12
                                                          *TOTALS*
       PEAK FLOW       (cms)=     0.05           0.03       0.087 (iii)
       TIME TO PEAK    (hrs)=     6.25           6.25       6.25
       RUNOFF VOLUME    (mm)=    87.92          62.00      76.50
       TOTAL RAINFALL   (mm)=    89.92          89.92      89.92
       RUNOFF COEFFICIENT  =     0.98           0.69       0.85

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  89.0    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 ( 0155)|  Area     (ha)=  0.56
|ID= 1 DT= 5.0 min |  Total Imp(%)= 45.00   Dir. Conn.(%)= 45.00
--------------------
                          IMPERVIOUS      PERVIOUS (i)
       Surface Area   (ha)=    0.25           0.31
       Dep. Storage   (mm)=    2.00           5.00
       Average Slope  (%)=     1.00           2.00
       Length         (m)=   260.00          25.00
       Mannings n      =      0.013           0.290

    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   3.05 |  6.250  81.28 |  9.33   3.05
           0.167   0.00 |  3.250   3.05 |  6.333  16.26 |  9.42   3.05
           0.250   0.00 |  3.333   4.06 |  6.417  16.26 |  9.50   3.05
           0.333   2.03 |  3.417   4.06 |  6.500  16.26 |  9.58   3.05
           0.417   2.03 |  3.500   4.06 |  6.583  16.26 |  9.67   3.05
           0.500   2.03 |  3.583   3.05 |  6.667  16.26 |  9.75   3.05
           0.583   2.03 |  3.667   3.05 |  6.750  16.26 |  9.83   2.03
           0.667   2.03 |  3.750   3.05 |  6.833   7.11 |  9.92   2.03
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                 0.750    2.03 |  3.833    4.06 |  6.917    7.11 | 10.00    2.03
                 0.833    1.02 |  3.917    4.06 |  7.000    7.11 | 10.08    3.05
                 0.917    1.02 |  4.000    4.06 |  7.083    7.11 | 10.17    3.05
                 1.000    1.02 |  4.083    3.05 |  7.167    7.11 | 10.25    3.05
                 1.083    2.03 |  4.167    3.05 |  7.250    7.11 | 10.33    2.03
                 1.167    2.03 |  4.250    3.05 |  7.333    5.08 | 10.42    2.03
                 1.250    2.03 |  4.333    7.11 |  7.417    5.08 | 10.50    2.03
                 1.333    2.03 |  4.417    7.11 |  7.500    5.08 | 10.58    1.02
                 1.417    2.03 |  4.500    7.11 |  7.583    5.08 | 10.67    1.02
                 1.500    2.03 |  4.583    6.10 |  7.667    5.08 | 10.75    1.02
                 1.583    2.03 |  4.667    6.10 |  7.750    5.08 | 10.83    2.03
                 1.667    2.03 |  4.750    6.10 |  7.833    6.10 | 10.92    2.03
                 1.750    2.03 |  4.833    6.10 |  7.917    6.10 | 11.00    2.03
                 1.833    1.02 |  4.917    6.10 |  8.000    6.10 | 11.08    2.03
                 1.917    1.02 |  5.000    6.10 |  8.083    5.08 | 11.17    2.03
                 2.000    1.02 |  5.083    6.10 |  8.167    5.08 | 11.25    2.03
                 2.083    2.03 |  5.167    6.10 |  8.250    5.08 | 11.33    2.03
                 2.167    2.03 |  5.250    6.10 |  8.333    4.06 | 11.42    2.03
                 2.250    2.03 |  5.333    3.05 |  8.417    4.06 | 11.50    2.03
                 2.333    4.06 |  5.417   11.18 |  8.500    4.06 | 11.58    1.02
                 2.417    4.06 |  5.500   11.18 |  8.583    3.05 | 11.67    1.02
                 2.500    4.06 |  5.583   11.18 |  8.667    3.05 | 11.75    1.02
                 2.583    3.05 |  5.667   11.18 |  8.750    3.05 | 11.83    2.03
                 2.667    3.05 |  5.750   11.18 |  8.833    4.06 | 11.92    2.03
                 2.750    3.05 |  5.833   80.26 |  8.917    4.06 | 12.00    2.03
                 2.833    4.06 |  5.917   80.26 |  9.000    4.06 | 12.08    2.03
                 2.917    4.06 |  6.000   80.26 |  9.083    3.05 | 12.17    2.03
                 3.000    4.06 |  6.083   81.28 |  9.167    3.05 | 12.25    2.03
                 3.083    3.05 |  6.167   81.28 |  9.250    3.05 |

       Max.Eff.Inten.(mm/hr)=    81.28          66.47
              over (min)          5.00          15.00
       Storage Coeff.  (min)=     4.92 (ii)     11.78 (ii)
       Unit Hyd. Tpeak (min)=     5.00          15.00
       Unit Hyd. peak  (cms)=     0.22           0.09
                                                          *TOTALS*
       PEAK FLOW       (cms)=     0.06           0.05       0.102 (iii)
       TIME TO PEAK    (hrs)=     6.25           6.33       6.25
       RUNOFF VOLUME    (mm)=    87.92          58.69      71.83
       TOTAL RAINFALL   (mm)=    89.92          89.92      89.92
       RUNOFF COEFFICIENT  =     0.98           0.65       0.80

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  87.0    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.

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LangstaffRd_EA_Existing_WestDonWatershd

```
| ADD HYD ( 0430)|
|  1 + 2 = 3   |        AREA    QPEAK   TPEAK     R.V.
--------------------      (ha)    (cms)   (hrs)    (mm)
     ID1= 1 ( 0155):     0.56    0.102    6.25    71.83
   + ID2= 2 ( 0160):     0.43    0.087    6.25    76.50
                        =======================================
     ID = 3 ( 0430):     0.99    0.189    6.25    73.86

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0150)|   Area    (ha)=  3.81
|ID= 1 DT= 5.0 min |   Total Imp(%)= 94.00   Dir. Conn.(%)= 94.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
   Surface Area   (ha)=      3.58          0.23
   Dep. Storage   (mm)=      2.00          5.00
   Average Slope  (%)=       1.00          2.00
   Length         (m)=     150.00         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  | 3.167  3.05  | 6.250  81.28  | 9.33   3.05
  0.167  0.00  | 3.250  3.05  | 6.333  16.26  | 9.42   3.05
  0.250  0.00  | 3.333  4.06  | 6.417  16.26  | 9.50   3.05
  0.333  2.03  | 3.417  4.06  | 6.500  16.26  | 9.58   3.05
  0.417  2.03  | 3.500  4.06  | 6.583  16.26  | 9.67   3.05
  0.500  2.03  | 3.583  3.05  | 6.667  16.26  | 9.75   3.05
  0.583  2.03  | 3.667  3.05  | 6.750  16.26  | 9.83   2.03
  0.667  2.03  | 3.750  3.05  | 6.833   7.11  | 9.92   2.03
  0.750  2.03  | 3.833  4.06  | 6.917   7.11  | 10.00  2.03
  0.833  1.02  | 3.917  4.06  | 7.000   7.11  | 10.08  3.05
  0.917  1.02  | 4.000  4.06  | 7.083   7.11  | 10.17  3.05
  1.000  1.02  | 4.083  3.05  | 7.167   7.11  | 10.25  3.05
  1.083  2.03  | 4.167  3.05  | 7.250   7.11  | 10.33  2.03
  1.167  2.03  | 4.250  3.05  | 7.333   5.08  | 10.42  2.03
  1.250  2.03  | 4.333  7.11  | 7.417   5.08  | 10.50  2.03
  1.333  2.03  | 4.417  7.11  | 7.500   5.08  | 10.58  1.02
  1.417  2.03  | 4.500  7.11  | 7.583   5.08  | 10.67  1.02
  1.500  2.03  | 4.583  6.10  | 7.667   5.08  | 10.75  1.02
  1.583  2.03  | 4.667  6.10  | 7.750   5.08  | 10.83  2.03
  1.667  2.03  | 4.750  6.10  | 7.833   6.10  | 10.92  2.03
  1.750  2.03  | 4.833  6.10  | 7.917   6.10  | 11.00  2.03
  1.833  1.02  | 4.917  6.10  | 8.000   6.10  | 11.08  2.03
  1.917  1.02  | 5.000  6.10  | 8.083   5.08  | 11.17  2.03
  2.000  1.02  | 5.083  6.10  | 8.167   5.08  | 11.25  2.03
  2.083  2.03  | 5.167  6.10  | 8.250   5.08  | 11.33  2.03
```

LangstaffRd_EA_Existing_WestDonWatershd

```
  2.167   2.03  | 5.250   6.10  | 8.333   4.06  | 11.42  2.03
  2.250   2.03  | 5.333  11.18  | 8.417   4.06  | 11.50  2.03
  2.333   4.06  | 5.417  11.18  | 8.500   4.06  | 11.58  1.02
  2.417   4.06  | 5.500  11.18  | 8.583   3.05  | 11.67  1.02
  2.500   4.06  | 5.583  11.18  | 8.667   3.05  | 11.75  1.02
  2.583   3.05  | 5.667  11.18  | 8.750   3.05  | 11.83  2.03
  2.667   3.05  | 5.750  11.18  | 8.833   4.06  | 11.92  2.03
  2.750   3.05  | 5.833  80.26  | 8.917   4.06  | 12.00  2.03
  2.833   4.06  | 5.917  80.26  | 9.000   4.06  | 12.08  2.03
  2.917   4.06  | 6.000  80.26  | 9.083   3.05  | 12.17  2.03
  3.000   4.06  | 6.083  81.28  | 9.167   3.05  | 12.25  2.03
  3.083   3.05  | 6.167  81.28  | 9.250   3.05  |
```

```
   Max.Eff.Inten.(mm/hr)=     81.28          67.97
            over (min)         5.00          10.00
   Storage Coeff.  (min)=      3.54 (ii)      6.09 (ii)
   Unit Hyd. Tpeak (min)=      5.00          10.00
   Unit Hyd. peak  (cms)=      0.26           0.15

                                                   *TOTALS*
   PEAK FLOW      (cms)=       0.81           0.04    0.849 (iii)
   TIME TO PEAK   (hrs)=       6.25           6.25    6.25
   RUNOFF VOLUME  (mm)=       87.92          60.31   86.26
   TOTAL RAINFALL (mm)=       89.92          89.92   89.92
   RUNOFF COEFFICIENT =        0.98           0.67    0.96

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

          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                CN* = 88.0    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 ( 0440)|
|  1 + 2 = 3   |        AREA    QPEAK   TPEAK     R.V.
--------------------      (ha)    (cms)   (hrs)    (mm)
     ID1= 1 ( 0150):     3.81    0.849    6.25    86.26
   + ID2= 2 ( 0430):     0.99    0.189    6.25    73.86
                        =======================================
     ID = 3 ( 0440):     4.80    1.038    6.25    83.70

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0185)|   Area    (ha)=  0.47
|ID= 1 DT= 5.0 min |   Total Imp(%)= 48.00   Dir. Conn.(%)= 48.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
   Surface Area   (ha)=      0.23          0.24
```

LangstaffRd_EA_Existing_WestDonWatershd

```
   Dep. Storage   (mm)=      2.00          5.00
   Average Slope  (%)=       1.00          2.00
   Length         (m)=     240.00         20.00
   Mannings n      =        0.013         0.350

   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  3.05  | 6.250  81.28  | 9.33   3.05
  0.167  0.00  | 3.250  3.05  | 6.333  16.26  | 9.42   3.05
  0.250  0.00  | 3.333  4.06  | 6.417  16.26  | 9.50   3.05
  0.333  2.03  | 3.417  4.06  | 6.500  16.26  | 9.58   3.05
  0.417  2.03  | 3.500  4.06  | 6.583  16.26  | 9.67   3.05
  0.500  2.03  | 3.583  3.05  | 6.667  16.26  | 9.75   3.05
  0.583  2.03  | 3.667  3.05  | 6.750  16.26  | 9.83   2.03
  0.667  2.03  | 3.750  3.05  | 6.833   7.11  | 9.92   2.03
  0.750  2.03  | 3.833  4.06  | 6.917   7.11  | 10.00  2.03
  0.833  1.02  | 3.917  4.06  | 7.000   7.11  | 10.08  3.05
  0.917  1.02  | 4.000  4.06  | 7.083   7.11  | 10.17  3.05
  1.000  1.02  | 4.083  3.05  | 7.167   7.11  | 10.25  3.05
  1.083  2.03  | 4.167  3.05  | 7.250   7.11  | 10.33  2.03
  1.167  2.03  | 4.250  3.05  | 7.333   5.08  | 10.42  2.03
  1.250  2.03  | 4.333  7.11  | 7.417   5.08  | 10.50  2.03
  1.333  2.03  | 4.417  7.11  | 7.500   5.08  | 10.58  1.02
  1.417  2.03  | 4.500  7.11  | 7.583   5.08  | 10.67  1.02
  1.500  2.03  | 4.583  6.10  | 7.667   5.08  | 10.75  1.02
  1.583  2.03  | 4.667  6.10  | 7.750   5.08  | 10.83  2.03
  1.667  2.03  | 4.750  6.10  | 7.833   6.10  | 10.92  2.03
  1.750  2.03  | 4.833  6.10  | 7.917   6.10  | 11.00  2.03
  1.833  1.02  | 4.917  6.10  | 8.000   6.10  | 11.08  2.03
  1.917  1.02  | 5.000  6.10  | 8.083   5.08  | 11.17  2.03
  2.000  1.02  | 5.083  6.10  | 8.167   5.08  | 11.25  2.03
  2.083  2.03  | 5.167  6.10  | 8.250   5.08  | 11.33  2.03
  2.167  2.03  | 5.250  6.10  | 8.333   4.06  | 11.42  2.03
  2.250  2.03  | 5.333 11.18  | 8.417   4.06  | 11.50  2.03
  2.333  4.06  | 5.417 11.18  | 8.500   4.06  | 11.58  1.02
  2.417  4.06  | 5.500 11.18  | 8.583   3.05  | 11.67  1.02
  2.500  4.06  | 5.583 11.18  | 8.667   3.05  | 11.75  1.02
  2.583  3.05  | 5.667 11.18  | 8.750   3.05  | 11.83  2.03
  2.667  3.05  | 5.750 11.18  | 8.833   4.06  | 11.92  2.03
  2.750  3.05  | 5.833 80.26  | 8.917   4.06  | 12.00  2.03
  2.833  4.06  | 5.917 80.26  | 9.000   4.06  | 12.08  2.03
  2.917  4.06  | 6.000 80.26  | 9.083   3.05  | 12.17  2.03
  3.000  4.06  | 6.083 81.28  | 9.167   3.05  | 12.25  2.03
  3.083  3.05  | 6.167 81.28  | 9.250   3.05  |

   Max.Eff.Inten.(mm/hr)=     81.28          54.91
            over (min)         5.00          15.00
   Storage Coeff.  (min)=      4.69 (ii)     11.94 (ii)
   Unit Hyd. Tpeak (min)=      5.00          15.00
```

LangstaffRd_EA_Existing_WestDonWatershd

```
   Unit Hyd. peak  (cms)=      0.22           0.09

                                                   *TOTALS*
   PEAK FLOW      (cms)=       0.05           0.03    0.079 (iii)
   TIME TO PEAK   (hrs)=       6.25           6.33    6.25
   RUNOFF VOLUME  (mm)=       87.92          47.30   66.78
   TOTAL RAINFALL (mm)=       89.92          89.92   89.92
   RUNOFF COEFFICIENT =        0.98           0.53    0.74

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

          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                CN* = 79.0    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 ( 0180)|   Area    (ha)=  0.65
|ID= 1 DT= 5.0 min |   Total Imp(%)= 33.00   Dir. Conn.(%)= 33.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
   Surface Area   (ha)=      0.21          0.44
   Dep. Storage   (mm)=      2.00          5.00
   Average Slope  (%)=       1.00          2.00
   Length         (m)=      65.83         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  | 3.167  3.05  | 6.250  81.28  | 9.33   3.05
  0.167  0.00  | 3.250  3.05  | 6.333  16.26  | 9.42   3.05
  0.250  0.00  | 3.333  4.06  | 6.417  16.26  | 9.50   3.05
  0.333  2.03  | 3.417  4.06  | 6.500  16.26  | 9.58   3.05
  0.417  2.03  | 3.500  4.06  | 6.583  16.26  | 9.67   3.05
  0.500  2.03  | 3.583  3.05  | 6.667  16.26  | 9.75   3.05
  0.583  2.03  | 3.667  3.05  | 6.750  16.26  | 9.83   2.03
  0.667  2.03  | 3.750  3.05  | 6.833   7.11  | 9.92   2.03
  0.750  2.03  | 3.833  4.06  | 6.917   7.11  | 10.00  2.03
  0.833  1.02  | 3.917  4.06  | 7.000   7.11  | 10.08  3.05
  0.917  1.02  | 4.000  4.06  | 7.083   7.11  | 10.17  3.05
  1.000  1.02  | 4.083  3.05  | 7.167   7.11  | 10.25  3.05
  1.083  2.03  | 4.167  3.05  | 7.250   7.11  | 10.33  2.03
  1.167  2.03  | 4.250  3.05  | 7.333   5.08  | 10.42  2.03
  1.250  2.03  | 4.333  7.11  | 7.417   5.08  | 10.50  2.03
  1.333  2.03  | 4.417  7.11  | 7.500   5.08  | 10.58  1.02
  1.417  2.03  | 4.500  7.11  | 7.583   5.08  | 10.67  1.02
  1.500  2.03  | 4.583  6.10  | 7.667   5.08  | 10.75  1.02
```

LangstaffRd_EA_Existing_WestDonWatershd

1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10	7.833	6.10	10.92	2.03
1.750	2.03	4.833	6.10	7.917	6.10	11.00	2.03
1.833	1.02	4.917	6.10	8.000	6.10	11.08	2.03
1.917	1.02	5.000	6.10	8.083	5.08	11.17	2.03
2.000	1.02	5.083	6.10	8.167	5.08	11.25	2.03
2.083	2.03	5.167	6.10	8.250	5.08	11.33	2.03
2.167	2.03	5.250	6.10	8.333	4.06	11.42	2.03
2.250	2.03	5.333	11.18	8.417	4.06	11.50	2.03
2.333	4.06	5.417	11.18	8.500	4.06	11.58	1.02
2.417	4.06	5.500	11.18	8.583	3.05	11.67	1.02
2.500	4.06	5.583	11.18	8.667	3.05	11.75	1.02
2.583	3.05	5.667	11.18	8.750	3.05	11.83	2.03
2.667	3.05	5.750	11.18	8.833	4.06	11.92	2.03
2.750	3.05	5.833	80.26	8.917	4.06	12.00	2.03
2.833	4.06	5.917	80.26	9.000	4.06	12.08	2.03
2.917	4.06	6.000	80.26	9.083	3.05	12.17	2.03
3.000	4.06	6.083	81.28	9.167	3.05	12.25	2.03
3.083	3.05	6.167	81.28	9.250	3.05		

```
Max.Eff.Inten.(mm/hr)=   81.28        60.55
            over (min)    5.00        15.00
Storage Coeff. (min)=     2.16 (ii)   10.79 (ii)
Unit Hyd. Tpeak (min)=    5.00        15.00
Unit Hyd. peak (cms)=     0.31         0.09
                                                  *TOTALS*
PEAK FLOW      (cms)=     0.05         0.06      0.107 (iii)
TIME TO PEAK   (hrs)=     6.25         6.33       6.25
RUNOFF VOLUME   (mm)=    87.92        52.66      64.28
TOTAL RAINFALL  (mm)=    89.92        89.92      89.92
RUNOFF COEFFICIENT =      0.98         0.59       0.71

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

   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 ( 0445)|
|  1 + 2 = 3     |        AREA   QPEAK   TPEAK    R.V.
--------------------        (ha)  (cms)   (hrs)    (mm)
     ID1= 1 ( 0180):      0.65   0.107    6.25    64.28
   + ID2= 2 ( 0185):      0.47   0.079    6.25    66.78
                        =======================================
     ID = 3 ( 0445):     1.12   0.186    6.25    65.33

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

LangstaffRd_EA_Existing_WestDonWatershd

```
--------------------
| CALIB            |
| STANDHYD ( 0165)|   Area   (ha)=  0.60
|ID= 1 DT= 5.0 min |   Total Imp(%)= 40.00  Dir. Conn.(%)= 40.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=       0.24          0.36
Dep. Storage    (mm)=       2.00          5.00
Average Slope   (%)=        1.00          2.00
Length          (m)=      250.00         20.00
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	3.167	3.05		6.250	81.28	9.33	3.05
0.167	0.00	3.250	3.05		6.333	16.26	9.42	3.05
0.250	0.00	3.333	4.06		6.417	16.26	9.50	3.05
0.333	2.03	3.417	4.06		6.500	16.26	9.58	3.05
0.417	2.03	3.500	4.06		6.583	16.26	9.67	3.05
0.500	2.03	3.583	3.05		6.667	16.26	9.75	3.05
0.583	2.03	3.667	3.05		6.750	16.26	9.83	2.03
0.667	2.03	3.750	3.05		6.833	7.11	9.92	2.03
0.750	2.03	3.833	4.06		6.917	7.11	10.00	2.03
0.833	1.02	3.917	4.06		7.000	7.11	10.08	3.05
0.917	1.02	4.000	4.06		7.083	7.11	10.17	3.05
1.000	1.02	4.083	3.05		7.167	7.11	10.25	3.05
1.083	2.03	4.167	3.05		7.250	7.11	10.33	2.03
1.167	2.03	4.250	3.05		7.333	5.08	10.42	2.03
1.250	2.03	4.333	7.11		7.417	5.08	10.50	2.03
1.333	2.03	4.417	7.11		7.500	5.08	10.58	1.02
1.417	2.03	4.500	7.11		7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10		7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10		7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10		7.833	6.10	10.92	2.03
1.750	2.03	4.833	6.10		7.917	6.10	11.00	2.03
1.833	1.02	4.917	6.10		8.000	6.10	11.08	2.03
1.917	1.02	5.000	6.10		8.083	5.08	11.17	2.03
2.000	1.02	5.083	6.10		8.167	5.08	11.25	2.03
2.083	2.03	5.167	6.10		8.250	6.10	11.33	2.03
2.167	2.03	5.250	6.10		8.333	4.06	11.42	2.03
2.250	2.03	5.333	11.18		8.417	4.06	11.50	2.03
2.333	4.06	5.417	11.18		8.500	4.06	11.58	1.02
2.417	4.06	5.500	11.18		8.583	3.05	11.67	1.02
2.500	4.06	5.583	11.18		8.667	3.05	11.75	1.02
2.583	3.05	5.667	11.18		8.750	3.05	11.83	2.03
2.667	3.05	5.750	11.18		8.833	4.06	11.92	2.03
2.750	3.05	5.833	80.26		8.917	4.06	12.00	2.03
2.833	4.06	5.917	80.26		9.000	4.06	12.08	2.03
2.917	4.06	6.000	80.26		9.083	3.05	12.17	2.03

LangstaffRd_EA_Existing_WestDonWatershd

| 3.000 | 4.06 | 6.083 | 81.28 | 9.167 | 3.05 | 12.25 | 2.03 |
| 3.083 | 3.05 | 6.167 | 81.28 | 9.250 | 3.05 | | |

```
Max.Eff.Inten.(mm/hr)=   81.28        60.55
            over (min)    5.00        15.00
Storage Coeff. (min)=     4.81 (ii)   10.50 (ii)
Unit Hyd. Tpeak (min)=    5.00        15.00
Unit Hyd. peak (cms)=     0.22         0.09
                                                  *TOTALS*
PEAK FLOW      (cms)=     0.05         0.05      0.103 (iii)
TIME TO PEAK   (hrs)=     6.25         6.33       6.25
RUNOFF VOLUME   (mm)=    87.92        52.66      66.75
TOTAL RAINFALL  (mm)=    89.92        89.92      89.92
RUNOFF COEFFICIENT =      0.98         0.59       0.74

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

   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 ( 0170)|   Area   (ha)=  0.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 57.00  Dir. Conn.(%)= 57.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=       0.25          0.18
Dep. Storage    (mm)=       2.00          5.00
Average Slope   (%)=        1.00          2.00
Length          (m)=      250.00         20.00
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	3.167	3.05		6.250	81.28	9.33	3.05
0.167	0.00	3.250	3.05		6.333	16.26	9.42	3.05
0.250	0.00	3.333	4.06		6.417	16.26	9.50	3.05
0.333	2.03	3.417	4.06		6.500	16.26	9.58	3.05
0.417	2.03	3.500	4.06		6.583	16.26	9.67	3.05
0.500	2.03	3.583	3.05		6.667	16.26	9.75	3.05
0.583	2.03	3.667	3.05		6.750	16.26	9.83	2.03
0.667	2.03	3.750	3.05		6.833	7.11	9.92	2.03
0.750	2.03	3.833	4.06		6.917	7.11	10.00	2.03
0.833	1.02	3.917	4.06		7.000	7.11	10.08	3.05
0.917	1.02	4.000	4.06		7.083	7.11	10.17	3.05

LangstaffRd_EA_Existing_WestDonWatershd

1.000	1.02	4.083	3.05	7.167	7.11	10.25	3.05
1.083	2.03	4.167	3.05	7.250	7.11	10.33	2.03
1.167	2.03	4.250	3.05	7.333	5.08	10.42	2.03
1.250	2.03	4.333	7.11	7.417	5.08	10.50	2.03
1.333	2.03	4.417	7.11	7.500	5.08	10.58	1.02
1.417	2.03	4.500	7.11	7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10	7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10	7.833	6.10	10.92	2.03
1.750	2.03	4.833	6.10	7.917	6.10	11.00	2.03
1.833	1.02	4.917	6.10	8.000	6.10	11.08	2.03
1.917	1.02	5.000	6.10	8.083	5.08	11.17	2.03
2.000	1.02	5.083	6.10	8.167	5.08	11.25	2.03
2.083	2.03	5.167	6.10	8.250	6.10	11.33	2.03
2.167	2.03	5.250	6.10	8.333	4.06	11.42	2.03
2.250	2.03	5.333	11.18	8.417	4.06	11.50	2.03
2.333	4.06	5.417	11.18	8.500	4.06	11.58	1.02
2.417	4.06	5.500	11.18	8.583	3.05	11.67	1.02
2.500	4.06	5.583	11.18	8.667	3.05	11.75	1.02
2.583	3.05	5.667	11.18	8.750	3.05	11.83	2.03
2.667	3.05	5.750	11.18	8.833	4.06	11.92	2.03
2.750	3.05	5.833	80.26	8.917	4.06	12.00	2.03
2.833	4.06	5.917	80.26	9.000	4.06	12.08	2.03
2.917	4.06	6.000	80.26	9.083	3.05	12.17	2.03
3.000	4.06	6.083	81.28	9.167	3.05	12.25	2.03
3.083	3.05	6.167	81.28	9.250	3.05		

```
Max.Eff.Inten.(mm/hr)=   81.28        69.46
            over (min)    5.00        10.00
Storage Coeff. (min)=     4.81 (ii)    9.33 (ii)
Unit Hyd. Tpeak (min)=    5.00        10.00
Unit Hyd. peak (cms)=     0.22         0.12
                                                  *TOTALS*
PEAK FLOW      (cms)=     0.06         0.03      0.087 (iii)
TIME TO PEAK   (hrs)=     6.25         6.25       6.25
RUNOFF VOLUME   (mm)=    87.92        62.00      76.76
TOTAL RAINFALL  (mm)=    89.92        89.92      89.92
RUNOFF COEFFICIENT =      0.98         0.69       0.85

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

   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 89.0   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 ( 0450)|
|  1 + 2 = 3     |        AREA   QPEAK   TPEAK    R.V.
--------------------        (ha)  (cms)   (hrs)    (mm)
```

```
         ID1= 1 ( 0165):    0.60  0.103    6.25   66.75
       + ID2= 2 ( 0170):    0.43  0.087    6.25   76.76
         ===============================================
         ID = 3 ( 0450):    1.03  0.190    6.25   70.93

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------------
--------------------
| ADD HYD  ( 0450)|
|  3 + 2 = 1      |        AREA   QPEAK   TPEAK    R.V.
--------------------        (ha)   (cms)   (hrs)   (mm)
         ID1= 3 ( 0450):    1.03  0.190    6.25   70.93
       + ID2= 2 ( 0445):    1.12  0.186    6.25   65.33
         ===============================================
         ID = 1 ( 0450):    2.15  0.376    6.25   68.01

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0190) |  Area   (ha)=   0.86
|ID= 1 DT= 5.0 min |  Total Imp(%)= 42.00   Dir. Conn.(%)= 42.00
--------------------
                             IMPERVIOUS   PERVIOUS (i)
     Surface Area     (ha)=     0.36        0.50
     Dep. Storage     (mm)=     2.00        5.00
     Average Slope     (%)=     1.00        2.00
     Length            (m)=   340.00       50.00
     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  | 3.167  3.05 | 6.250 81.28  | 9.33   3.05
       0.167  0.00  | 3.250  3.05 | 6.333 16.26  | 9.42   3.05
       0.250  0.00  | 3.333  4.06 | 6.417 16.26  | 9.50   3.05
       0.333  2.03  | 3.417  4.06 | 6.500 16.26  | 9.58   3.05
       0.417  2.03  | 3.500  4.06 | 6.583 16.26  | 9.67   3.05
       0.500  2.03  | 3.583  3.05 | 6.667 16.26  | 9.75   3.05
       0.583  2.03  | 3.667  3.05 | 6.750 16.26  | 9.83   2.03
       0.667  2.03  | 3.750  3.05 | 6.833  7.11  | 9.92   2.03
       0.750  2.03  | 3.833  4.06 | 6.917  7.11  |10.00   2.03
       0.833  1.02  | 3.917  4.06 | 7.000  7.11  |10.08   3.05
       0.917  1.02  | 4.000  4.06 | 7.083  7.11  |10.17   3.05
       1.000  1.02  | 4.083  3.05 | 7.167  7.11  |10.25   3.05
       1.083  2.03  | 4.167  3.05 | 7.250  7.11  |10.33   2.03
       1.167  2.03  | 4.250  3.05 | 7.333  5.08  |10.42   2.03
       1.250  2.03  | 4.333  7.11 | 7.417  5.08  |10.50   2.03
       1.333  2.03  | 4.417  7.11 | 7.500  5.08  |10.58   1.02
```

```
       1.417  2.03  | 4.500  7.11 | 7.583  5.08  |10.67   1.02
       1.500  2.03  | 4.583  6.10 | 7.667  5.08  |10.75   1.02
       1.583  2.03  | 4.667  6.10 | 7.750  5.08  |10.83   2.03
       1.667  2.03  | 4.750  6.10 | 7.833  6.10  |10.92   2.03
       1.750  2.03  | 4.833  6.10 | 7.917  6.10  |11.00   2.03
       1.833  1.02  | 4.917  6.10 | 8.000  6.10  |11.08   2.03
       1.917  1.02  | 5.000  6.10 | 8.083  5.08  |11.17   2.03
       2.000  1.02  | 5.083  6.10 | 8.167  5.08  |11.25   2.03
       2.083  2.03  | 5.167  6.10 | 8.250  5.08  |11.33   2.03
       2.167  2.03  | 5.250  6.10 | 8.333  4.06  |11.42   2.03
       2.250  2.03  | 5.333 11.18 | 8.417  4.06  |11.50   2.03
       2.333  4.06  | 5.417 11.18 | 8.500  4.06  |11.58   1.02
       2.417  4.06  | 5.500 11.18 | 8.583  3.05  |11.67   1.02
       2.500  4.06  | 5.583 11.18 | 8.667  3.05  |11.75   1.02
       2.583  3.05  | 5.667 11.18 | 8.750  3.05  |11.83   2.03
       2.667  3.05  | 5.750 11.18 | 8.833  4.06  |11.92   2.03
       2.750  3.05  | 5.833 80.26 | 8.917  4.06  |12.00   2.03
       2.833  4.06  | 5.917 80.26 | 9.000  4.06  |12.08   2.03
       2.917  4.06  | 6.000 80.26 | 9.083  3.05  |12.17   2.03
       3.000  4.06  | 6.083 81.28 | 9.167  3.05  |12.25   2.03
       3.083  3.05  | 6.167 81.28 | 9.250  3.05  |

   Max.Eff.Inten.(mm/hr)=     81.28         60.55
              over (min)       5.00         20.00
   Storage Coeff.  (min)=      5.78 (ii)    15.65 (ii)
   Unit Hyd. Tpeak (min)=      5.00         20.00
   Unit Hyd. peak  (cms)=      0.20          0.07
                                                         *TOTALS*
   PEAK FLOW      (cms)=       0.08          0.06         0.134 (iii)
   TIME TO PEAK   (hrs)=       6.25          6.33         6.25
   RUNOFF VOLUME   (mm)=      87.92         52.66        67.45
   TOTAL RAINFALL  (mm)=      89.92         89.92        89.92
   RUNOFF COEFFICIENT  =       0.98          0.59         0.75

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* = 83.0   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 ( 0195) |  Area   (ha)=   0.79
|ID= 1 DT= 5.0 min |  Total Imp(%)= 42.00   Dir. Conn.(%)= 42.00
--------------------
                             IMPERVIOUS   PERVIOUS (i)
     Surface Area     (ha)=     0.33        0.46
     Dep. Storage     (mm)=     2.00        5.00
     Average Slope     (%)=     1.00        2.00
     Length            (m)=   340.00       20.00
     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  | 3.167  3.05 | 6.250 81.28  | 9.33   3.05
       0.167  0.00  | 3.250  3.05 | 6.333 16.26  | 9.42   3.05
       0.250  0.00  | 3.333  4.06 | 6.417 16.26  | 9.50   3.05
       0.333  2.03  | 3.417  4.06 | 6.500 16.26  | 9.58   3.05
       0.417  2.03  | 3.500  4.06 | 6.583 16.26  | 9.67   3.05
       0.500  2.03  | 3.583  3.05 | 6.667 16.26  | 9.75   3.05
       0.583  2.03  | 3.667  3.05 | 6.750 16.26  | 9.83   2.03
       0.667  2.03  | 3.750  3.05 | 6.833  7.11  | 9.92   2.03
       0.750  2.03  | 3.833  4.06 | 6.917  7.11  |10.00   2.03
       0.833  1.02  | 3.917  4.06 | 7.000  7.11  |10.08   3.05
       0.917  1.02  | 4.000  4.06 | 7.083  7.11  |10.17   3.05
       1.000  1.02  | 4.083  3.05 | 7.167  7.11  |10.25   3.05
       1.083  2.03  | 4.167  3.05 | 7.250  7.11  |10.33   2.03
       1.167  2.03  | 4.250  3.05 | 7.333  5.08  |10.42   2.03
       1.250  2.03  | 4.333  7.11 | 7.417  5.08  |10.50   2.03
       1.333  2.03  | 4.417  7.11 | 7.500  5.08  |10.58   1.02
       1.417  2.03  | 4.500  7.11 | 7.583  5.08  |10.67   1.02
       1.500  2.03  | 4.583  6.10 | 7.667  5.08  |10.75   1.02
       1.583  2.03  | 4.667  6.10 | 7.750  5.08  |10.83   2.03
       1.667  2.03  | 4.750  6.10 | 7.833  6.10  |10.92   2.03
       1.750  2.03  | 4.833  6.10 | 7.917  6.10  |11.00   2.03
       1.833  1.02  | 4.917  6.10 | 8.000  6.10  |11.08   2.03
       1.917  1.02  | 5.000  6.10 | 8.083  5.08  |11.17   2.03
       2.000  2.03  | 5.083  6.10 | 8.167  5.08  |11.25   2.03
       2.083  2.03  | 5.167  6.10 | 8.250  5.08  |11.33   2.03
       2.167  2.03  | 5.250  6.10 | 8.333  4.06  |11.42   2.03
       2.250  2.03  | 5.333 11.18 | 8.417  4.06  |11.50   2.03
       2.333  4.06  | 5.417 11.18 | 8.500  4.06  |11.58   1.02
       2.417  4.06  | 5.500 11.18 | 8.583  3.05  |11.67   1.02
       2.500  4.06  | 5.583 11.18 | 8.667  3.05  |11.75   1.02
       2.583  3.05  | 5.667 11.18 | 8.750  3.05  |11.83   2.03
       2.667  3.05  | 5.750 11.18 | 8.833  4.06  |11.92   2.03
       2.750  3.05  | 5.833 80.26 | 8.917  4.06  |12.00   2.03
       2.833  4.06  | 5.917 80.26 | 9.000  4.06  |12.08   2.03
       2.917  4.06  | 6.000 80.26 | 9.083  3.05  |12.17   2.03
       3.000  4.06  | 6.083 81.28 | 9.167  3.05  |12.25   2.03
       3.083  3.05  | 6.167 81.28 | 9.250  3.05  |

   Max.Eff.Inten.(mm/hr)=     81.28         60.55
              over (min)       5.00         15.00
   Storage Coeff.  (min)=      5.78 (ii)    11.48 (ii)
   Unit Hyd. Tpeak (min)=      5.00         15.00
   Unit Hyd. peak  (cms)=      0.20          0.09
                                                         *TOTALS*
   PEAK FLOW      (cms)=       0.07          0.06         0.135 (iii)
   TIME TO PEAK   (hrs)=       6.25          6.33         6.25
```

```
   RUNOFF VOLUME   (mm)=      87.92         52.66        67.46
   TOTAL RAINFALL  (mm)=      89.92         89.92        89.92
   RUNOFF COEFFICIENT  =       0.98          0.59         0.75

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* = 83.0   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  ( 0455)|
|  1 + 2 = 3      |        AREA   QPEAK   TPEAK    R.V.
--------------------        (ha)   (cms)   (hrs)   (mm)
         ID1= 1 ( 0190):    0.86  0.134    6.25   67.45
       + ID2= 2 ( 0195):    0.79  0.135    6.25   67.46
         ===============================================
         ID = 3 ( 0455):    1.65  0.269    6.25   67.45

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------------
--------------------
| ADD HYD  ( 0458)|
|  1 + 2 = 3      |        AREA   QPEAK   TPEAK    R.V.
--------------------        (ha)   (cms)   (hrs)   (mm)
         ID1= 1 ( 0450):    2.15  0.376    6.25   68.01
       + ID2= 2 ( 0455):    1.65  0.269    6.25   67.45
         ===============================================
         ID = 3 ( 0458):    3.80  0.645    6.25   67.77

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0300) |  Area   (ha)= 10.00
|ID= 1 DT= 5.0 min |  Total Imp(%)= 80.00   Dir. Conn.(%)= 80.00
--------------------
                             IMPERVIOUS   PERVIOUS (i)
     Surface Area     (ha)=     8.00        2.00
     Dep. Storage     (mm)=     1.00        5.00
     Average Slope     (%)=     1.00        2.00
     Length            (m)=   258.20       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
```

```
                    LangstaffRd_EA_Existing_WestDonWatershd
        hrs    mm/hr  |  hrs    mm/hr  |'  hrs    mm/hr  |   hrs    mm/hr
        0.083   0.00  | 3.167   3.05   | 6.250   81.28  |  9.33    3.05
        0.167   0.00  | 3.250   3.05   | 6.333   16.26  |  9.42    3.05
        0.250   0.00  | 3.333   4.06   | 6.417   16.26  |  9.50    3.05
        0.333   2.03  | 3.417   4.06   | 6.500   16.26  |  9.58    3.05
        0.417   2.03  | 3.500   4.06   | 6.583   16.26  |  9.67    3.05
        0.500   2.03  | 3.583   3.05   | 6.667   16.26  |  9.75    3.05
        0.583   2.03  | 3.667   3.05   | 6.750   16.26  |  9.83    2.03
        0.667   2.03  | 3.750   3.05   | 6.833    7.11  |  9.92    2.03
        0.750   2.03  | 3.833   4.06   | 6.917    7.11  | 10.00    2.03
        0.833   1.02  | 3.917   4.06   | 7.000    7.11  | 10.08    3.05
        0.917   1.02  | 4.000   4.06   | 7.083    7.11  | 10.17    3.05
        1.000   1.02  | 4.083   3.05   | 7.167    7.11  | 10.25    3.05
        1.083   2.03  | 4.167   3.05   | 7.250    7.11  | 10.33    2.03
        1.167   2.03  | 4.250   3.05   | 7.333    5.08  | 10.42    2.03
        1.250   2.03  | 4.333   7.11   | 7.417    5.08  | 10.50    2.03
        1.333   2.03  | 4.417   7.11   | 7.500    5.08  | 10.58    1.02
        1.417   2.03  | 4.500   7.11   | 7.583    5.08  | 10.67    1.02
        1.500   2.03  | 4.583   6.10   | 7.667    5.08  | 10.75    1.02
        1.583   2.03  | 4.667   6.10   | 7.750    5.08  | 10.83    2.03
        1.667   2.03  | 4.750   6.10   | 7.833    6.10  | 10.92    2.03
        1.750   2.03  | 4.833   6.10   | 7.917    6.10  | 11.00    2.03
        1.833   1.02  | 4.917   6.10   | 8.000    6.10  | 11.08    2.03
        1.917   1.02  | 5.000   6.10   | 8.083    5.08  | 11.17    2.03
        2.000   1.02  | 5.083   6.10   | 8.167    5.08  | 11.25    2.03
        2.083   2.03  | 5.167   6.10   | 8.250    5.08  | 11.33    2.03
        2.167   2.03  | 5.250   6.10   | 8.333    4.06  | 11.42    2.03
        2.250   2.03  | 5.333  11.18   | 8.417    4.06  | 11.50    2.03
        2.333   4.06  | 5.417  11.18   | 8.500    4.06  | 11.58    1.02
        2.417   4.06  | 5.500  11.18   | 8.583    3.05  | 11.67    1.02
        2.500   4.06  | 5.583  11.18   | 8.667    3.05  | 11.75    1.02
        2.583   3.05  | 5.667  11.18   | 8.750    3.05  | 11.83    2.03
        2.667   3.05  | 5.750  11.18   | 8.833    4.06  | 11.92    2.03
        2.750   3.05  | 5.833  80.26   | 8.917    4.06  | 12.00    2.03
        2.833   4.06  | 5.917  80.26   | 9.000    4.06  | 12.08    2.03
        2.917   4.06  | 6.000  80.26   | 9.083    3.05  | 12.17    2.03
        3.000   4.06  | 6.083  81.28   | 9.167    3.05  | 12.25    2.03
        3.083   3.05  | 6.167  81.28   | 9.250    3.05  |

   Max.Eff.Inten.(mm/hr)=     81.28        54.91
             over (min)        5.00        10.00
   Storage Coeff.  (min)=      4.90 (ii)    9.31 (ii)
   Unit Hyd. Tpeak (min)=      5.00        10.00
   Unit Hyd. peak  (cms)=      0.22         0.12
                                                        *TOTALS*
   PEAK FLOW       (cms)=      1.80         0.26      2.067 (iii)
   TIME TO PEAK    (hrs)=      6.25         6.25        6.25
   RUNOFF VOLUME    (mm)=     88.92        47.30       80.59
   TOTAL RAINFALL   (mm)=     89.92        89.92       89.92
   RUNOFF COEFFICIENT  =       0.99         0.53        0.90

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

```
                    LangstaffRd_EA_Existing_WestDonWatershd
         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 79.0   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 ( 0350)|   Area     (ha)=   0.90
|ID= 1 DT= 5.0 min |   Total Imp(%)= 70.00   Dir. Conn.(%)= 70.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area   (ha)=      0.63          0.27
     Dep. Storage   (mm)=      1.00          5.00
     Average Slope   (%)=      1.00          2.00
     Length          (m)=     77.46         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  | 3.167   3.05   | 6.250   81.28  |  9.33    3.05
        0.167   0.00  | 3.250   3.05   | 6.333   16.26  |  9.42    3.05
        0.250   0.00  | 3.333   4.06   | 6.417   16.26  |  9.50    3.05
        0.333   2.03  | 3.417   4.06   | 6.500   16.26  |  9.58    3.05
        0.417   2.03  | 3.500   4.06   | 6.583   16.26  |  9.67    3.05
        0.500   2.03  | 3.583   3.05   | 6.667   16.26  |  9.75    3.05
        0.583   2.03  | 3.667   3.05   | 6.750   16.26  |  9.83    2.03
        0.667   2.03  | 3.750   3.05   | 6.833    7.11  |  9.92    2.03
        0.750   2.03  | 3.833   4.06   | 6.917    7.11  | 10.00    2.03
        0.833   1.02  | 3.917   4.06   | 7.000    7.11  | 10.08    3.05
        0.917   1.02  | 4.000   4.06   | 7.083    7.11  | 10.17    3.05
        1.000   1.02  | 4.083   3.05   | 7.167    7.11  | 10.25    3.05
        1.083   2.03  | 4.167   3.05   | 7.250    7.11  | 10.33    2.03
        1.167   2.03  | 4.250   3.05   | 7.333    5.08  | 10.42    2.03
        1.250   2.03  | 4.333   7.11   | 7.417    5.08  | 10.50    2.03
        1.333   2.03  | 4.417   7.11   | 7.500    5.08  | 10.58    1.02
        1.417   2.03  | 4.500   7.11   | 7.583    5.08  | 10.67    1.02
        1.500   2.03  | 4.583   6.10   | 7.667    5.08  | 10.75    1.02
        1.583   2.03  | 4.667   6.10   | 7.750    5.08  | 10.83    2.03
        1.667   2.03  | 4.750   6.10   | 7.833    6.10  | 10.92    2.03
        1.750   2.03  | 4.833   6.10   | 7.917    6.10  | 11.00    2.03
        1.833   1.02  | 4.917   6.10   | 8.000    6.10  | 11.08    2.03
        1.917   1.02  | 5.000   6.10   | 8.083    5.08  | 11.17    2.03
        2.000   1.02  | 5.083   6.10   | 8.167    5.08  | 11.25    2.03
        2.083   2.03  | 5.167   6.10   | 8.250    5.08  | 11.33    2.03
        2.167   2.03  | 5.250   6.10   | 8.333    4.06  | 11.42    2.03
        2.250   2.03  | 5.333  11.18   | 8.417    4.06  | 11.50    2.03
        2.333   4.06  | 5.417  11.18   | 8.500    4.06  | 11.58    1.02
```

```
                    LangstaffRd_EA_Existing_WestDonWatershd
        2.417   4.06  | 5.500  11.18   | 8.583    3.05  | 11.67    1.02
        2.500   4.06  | 5.583  11.18   | 8.667    3.05  | 11.75    1.02
        2.583   3.05  | 5.667  11.18   | 8.750    3.05  | 11.83    2.03
        2.667   3.05  | 5.750  11.18   | 8.833    4.06  | 11.92    2.03
        2.750   3.05  | 5.833  80.26   | 8.917    4.06  | 12.00    2.03
        2.833   4.06  | 5.917  80.26   | 9.000    4.06  | 12.08    2.03
        2.917   4.06  | 6.000  80.26   | 9.083    3.05  | 12.17    2.03
        3.000   4.06  | 6.083  81.28   | 9.167    3.05  | 12.25    2.03
        3.083   3.05  | 6.167  81.28   | 9.250    3.05  |

   Max.Eff.Inten.(mm/hr)=     81.28        54.91
             over (min)        5.00        15.00
   Storage Coeff.  (min)=      2.38 (ii)   11.35 (ii)
   Unit Hyd. Tpeak (min)=      5.00        15.00
   Unit Hyd. peak  (cms)=      0.30         0.09
                                                        *TOTALS*
   PEAK FLOW       (cms)=      0.14         0.03      0.174 (iii)
   TIME TO PEAK    (hrs)=      6.25         6.33        6.25
   RUNOFF VOLUME    (mm)=     88.92        47.30       76.42
   TOTAL RAINFALL   (mm)=     89.92        89.92       89.92
   RUNOFF COEFFICIENT  =       0.99         0.53        0.85

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

         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 79.0   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  ( 0375)|
|  1 + 2 = 3       |       AREA    QPEAK    TPEAK    R.V.
--------------------      (ha)    (cms)    (hrs)    (mm)
     ID1= 1 ( 0300):     10.00    2.067     6.25    80.59
   + ID2= 2 ( 0350):      0.90    0.174     6.25    76.42
     ============================================
     ID = 3 ( 0375):     10.90    2.240     6.25    80.25

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
----------------------------------------------------------------------------
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Proposed Conditions Hydrologic Summary

Summary of Proposed Conditions Hydrologic Modelling Parameters

16M-01457-01 Langstaff Rd EA

Sub-Catchment ID	IUH Class	Drainage Area (ha)	Imperviousness (%) Direct	+	Indirect	=	Total	SCS Curve Number	Initial Abstraction (mm) Pervious	Impervious	Manning's 'n' Pervious	Impervious	Time to Peak (hours)	Number of Linear Reservoirs	Flow Length (m) Pervious	Impervious	Slope (%) Pervious	Impervious	CN AMC III
105	Standard	1.63	69	+	0	=	69	86	5.0	2.0	0.25	0.013	n/a	n/a	25	650	2.0	1.0	
110	Standard	1.58	70	+	0	=	70	85	5.0	2.0	0.25	0.013	n/a	n/a	25	650	2.0	1.0	
115	Standard	1.00	63	+	0	=	63	83	5.0	2.0	0.25	0.013	n/a	n/a	17	475	2.0	1.0	
120	Standard	1.24	73	+	0	=	73	83	5.0	2.0	0.25	0.013	n/a	n/a	17	475	2.0	1.0	
125	Standard	2.27	77	+	0	=	77	83	5.0	2.0	0.25	0.013	n/a	n/a	20	800	2.0	1.0	
130	Standard	2.08	82	+	0	=	82	83	5.0	2.0	0.25	0.013	n/a	n/a	20	800	2.0	1.0	
135	Standard	1.43	99	+	0	=	99	84	5.0	2.0	0.25	0.013	n/a	n/a	30	503	2.0	1.0	
140	Standard	1.27	91	+	0	=	91	83	5.0	2.0	0.25	0.013	n/a	n/a	25	503	2.0	1.0	
145	Standard	3.05	76	+	0	=	76	86	5.0	2.0	0.25	0.013	n/a	n/a	40	531	2.0	1.0	
150	Standard	3.81	95	+	0	=	95	88	5.0	2.0	0.25	0.013	n/a	n/a	40	150	2.0	1.0	
155	Standard	0.56	93	+	0	=	93	87	5.0	2.0	0.29	0.013	n/a	n/a	25	260	2.0	1.0	
160	Standard	0.43	95	+	0	=	95	89	5.0	2.0	0.25	0.013	n/a	n/a	20	260	2.0	1.0	
165	Standard	0.60	72	+	0	=	72	83	5.0	2.0	0.25	0.013	n/a	n/a	20	250	2.0	1.0	
170	Standard	0.43	98	+	0	=	98	89	5.0	2.0	0.25	0.013	n/a	n/a	20	250	2.0	1.0	
180	Standard	0.65	52	+	0	=	52	83	5.0	2.0	0.25	0.013	n/a	n/a	40	66	2.0	1.0	
185	Standard	0.47	72	+	0	=	72	79	5.0	2.0	0.35	0.013	n/a	n/a	20	240	2.0	1.0	
190	Standard	0.86	57	+	0	=	57	83	5.0	2.0	0.25	0.013	n/a	n/a	50	340	2.0	1.0	
195	Standard	0.79	75	+	0	=	75	83	5.0	2.0	0.25	0.013	n/a	n/a	20	340	2.0	1.0	
205	Standard	1.11	77	+	0	=	77	83	5.0	2.0	0.25	0.013	n/a	n/a	20	470	2.0	1.0	
210	Standard	0.96	78	+	0	=	78	83	5.0	2.0	0.25	0.013	n/a	n/a	20	470	2.0	1.0	
215	Standard	0.58	81	+	0	=	81	83	5.0	2.0	0.25	0.013	n/a	n/a	30	260	2.0	1.0	
220	Standard	0.65	66	+	0	=	66	83	5.0	2.0	0.25	0.013	n/a	n/a	20	260	2.0	1.0	
225	Standard	0.90	53	+	0	=	53	83	5.0	2.0	0.25	0.013	n/a	n/a	25	320	2.0	1.0	
230	Standard	0.70	66	+	0	=	66	81	5.0	2.0	0.30	0.013	n/a	n/a	25	320	2.0	1.0	
235	Standard	0.66	67	+	0	=	67	83	5.0	2.0	0.25	0.013	n/a	n/a	20	320	2.0	1.0	
240	Standard	0.72	67	+	0	=	67	83	5.0	2.0	0.25	0.013	n/a	n/a	20	320	2.0	1.0	
350	Standard	0.90	70	+	0	=	70	79	5.0	2.0	0.25	0.013	n/a	n/a	40	77	2.0	1.0	
Total/Ave		41.33	78	+	0	=	78	83	5.00										

Humber River Watershed
Visual OTTHYMO Summary - Proposed

```
*********************************
** SIMULATION:Run 02        **
*********************************

---------------------
|  READ STORM    |   Filename: C:\Users\ray.zhao\AppD
|                |        ata\Local\Temp\
|                |        efddf5d6-df0e-43ba-b139-2f589a28109d\f5bec23e
| Ptotal= 42.00 mm |   Comments: 2Y12
---------------------
          TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
          hrs     mm/hr |  hrs    mm/hr |'  hrs    mm/hr |  hrs    mm/hr
          0.25    0.00  |  3.50   7.14  |  6.75    2.94  | 10.00   0.42
          0.50    0.42  |  3.75   7.14  |  7.00    2.94  | 10.25   0.42
          0.75    0.42  |  4.00   7.14  |  7.25    2.94  | 10.50   0.42
          1.00    0.42  |  4.25   7.14  |  7.50    1.68  | 10.75   0.42
          1.25    0.42  |  4.50  19.32  |  7.75    1.68  | 11.00   0.42
          1.50    0.42  |  4.75  19.32  |  8.00    1.68  | 11.25   0.42
          1.75    0.42  |  5.00  19.32  |  8.25    1.68  | 11.50   0.42
          2.00    0.42  |  5.25  19.32  |  8.50    0.84  | 11.75   0.42
          2.25    0.42  |  5.50   5.46  |  8.75    0.84  | 12.00   0.42
          2.50    2.52  |  5.75   5.46  |  9.00    0.84  | 12.25   0.42
          2.75    2.52  |  6.00   5.46  |  9.25    0.84  |
          3.00    2.52  |  6.25   5.46  |  9.50    0.42  |
          3.25    2.52  |  6.50   2.94  |  9.75    0.42  |

-------------------------------------------------------------------------------
---------------------
|  CALIB         |
| STANDHYD ( 0105)|  Area     (ha)=   1.63
|ID= 1 DT= 5.0 min |  Total Imp(%)=  69.00   Dir. Conn.(%)=  69.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=    1.12          0.51
        Dep. Storage   (mm)=    2.00          5.00
        Average Slope  (%)=     1.00          2.00
        Length         (m)=   650.00         25.00
        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  |  3.167   2.52 |  6.250   5.46 |  9.33   0.42
          0.167   0.00  |  3.250   2.52 |  6.333   2.94 |  9.42   0.42
          0.250   0.00  |  3.333   7.14 |  6.417   2.94 |  9.50   0.42
          0.333   0.42  |  3.417   7.14 |  6.500   2.94 |  9.58   0.42
          0.417   0.42  |  3.500   7.14 |  6.583   2.94 |  9.67   0.42
          0.500   0.42  |  3.583   7.14 |  6.667   2.94 |  9.75   0.42
          0.583   0.42  |  3.667   7.14 |  6.750   2.94 |  9.83   0.42
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          0.667   0.42  |  3.750   7.14 |  6.833   2.94 |  9.92   0.42
          0.750   0.42  |  3.833   7.14 |  6.917   2.94 | 10.00   0.42
          0.833   0.42  |  3.917   7.14 |  7.000   2.94 | 10.08   0.42
          0.917   0.42  |  4.000   7.14 |  7.083   2.94 | 10.17   0.42
          1.000   0.42  |  4.083   7.14 |  7.167   2.94 | 10.25   0.42
          1.083   0.42  |  4.167   7.14 |  7.250   2.94 | 10.33   0.42
          1.167   0.42  |  4.250   7.14 |  7.333   1.68 | 10.42   0.42
          1.250   0.42  |  4.333  19.32 |  7.417   1.68 | 10.50   0.42
          1.333   0.42  |  4.417  19.32 |  7.500   1.68 | 10.58   0.42
          1.417   0.42  |  4.500  19.32 |  7.583   1.68 | 10.67   0.42
          1.500   0.42  |  4.583  19.32 |  7.667   1.68 | 10.75   0.42
          1.583   0.42  |  4.667  19.32 |  7.750   1.68 | 10.83   0.42
          1.667   0.42  |  4.750  19.32 |  7.833   1.68 | 10.92   0.42
          1.750   0.42  |  4.833  19.32 |  7.917   1.68 | 11.00   0.42
          1.833   0.42  |  4.917  19.32 |  8.000   1.68 | 11.08   0.42
          1.917   0.42  |  5.000  19.32 |  8.083   1.68 | 11.17   0.42
          2.000   0.42  |  5.083  19.32 |  8.167   1.68 | 11.25   0.42
          2.083   0.42  |  5.167  19.32 |  8.250   1.68 | 11.33   0.42
          2.167   0.42  |  5.250  19.32 |  8.333   0.84 | 11.42   0.42
          2.250   0.42  |  5.333   5.46 |  8.417   0.84 | 11.50   0.42
          2.333   2.52  |  5.417   5.46 |  8.500   0.84 | 11.58   0.42
          2.417   2.52  |  5.500   5.46 |  8.583   0.84 | 11.67   0.42
          2.500   2.52  |  5.583   5.46 |  8.667   0.84 | 11.75   0.42
          2.583   2.52  |  5.667   5.46 |  8.750   0.84 | 11.83   0.42
          2.667   2.52  |  5.750   5.46 |  8.833   0.84 | 11.92   0.42
          2.750   2.52  |  5.833   5.46 |  8.917   0.84 | 12.00   0.42
          2.833   2.52  |  5.917   5.46 |  9.000   0.84 | 12.08   0.42
          2.917   2.52  |  6.000   5.46 |  9.083   0.84 | 12.17   0.42
          3.000   2.52  |  6.083   5.46 |  9.167   0.84 | 12.25   0.42
          3.083   2.52  |  6.167   5.46 |  9.250   0.84 |

     Max.Eff.Inten.(mm/hr)=     19.32         11.18
            over (min)=        15.00         30.00
     Storage Coeff.   (min)=   15.16 (ii)    27.95 (ii)
     Unit Hyd. Tpeak (min)=    15.00         30.00
     Unit Hyd. peak  (cms)=     0.07          0.04

                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.06          0.01      0.069 (iii)
     TIME TO PEAK    (hrs)=      5.25          5.50      5.25
     RUNOFF VOLUME    (mm)=     40.00         17.47     33.01
     TOTAL RAINFALL   (mm)=     42.00         42.00     42.00
     RUNOFF COEFFICIENT  =       0.95          0.42      0.79


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 86.0   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.

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| RESERVOIR( 0520)|    OVERFLOW IS OFF
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| IN= 2---> OUT= 1 |
| DT= 5.0 min    |   OUTFLOW    STORAGE  |  OUTFLOW    STORAGE
---------------------  (cms)     (ha.m.)  |   (cms)     (ha.m.)
                      0.0000     0.0000   |  0.0181     0.0161
                      0.0081     0.0031   |  0.0584     0.0204
                      0.0123     0.0074   |  0.0920     0.0259
                      0.0155     0.0118   |  0.0000     0.0000

                          AREA     QPEAK     TPEAK      R.V.
                          (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 ( 0105)   1.630    0.069      5.25     33.01
     OUTFLOW: ID= 1 ( 0520)   1.630    0.050      5.50     32.95

          PEAK  FLOW  REDUCTION [Qout/Qin](%)= 72.39
          TIME SHIFT OF PEAK FLOW      (min)= 15.00
          MAXIMUM STORAGE   USED    (ha.m.)= 0.0195

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|  CALIB         |
| STANDHYD ( 0130)|  Area     (ha)=   2.08
|ID= 1 DT= 5.0 min |  Total Imp(%)=  82.00   Dir. Conn.(%)=  82.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=    1.71          0.37
        Dep. Storage   (mm)=    2.00          5.00
        Average Slope  (%)=     1.00          2.00
        Length         (m)=   800.00         20.00
        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  |  3.167   2.52 |  6.250   5.46 |  9.33   0.42
          0.167   0.00  |  3.250   2.52 |  6.333   2.94 |  9.42   0.42
          0.250   0.00  |  3.333   7.14 |  6.417   2.94 |  9.50   0.42
          0.333   0.42  |  3.417   7.14 |  6.500   2.94 |  9.58   0.42
          0.417   0.42  |  3.500   7.14 |  6.583   2.94 |  9.67   0.42
          0.500   0.42  |  3.583   7.14 |  6.667   2.94 |  9.75   0.42
          0.583   0.42  |  3.667   7.14 |  6.750   2.94 |  9.83   0.42
          0.667   0.42  |  3.750   7.14 |  6.833   2.94 |  9.92   0.42
          0.750   0.42  |  3.833   7.14 |  6.917   2.94 | 10.00   0.42
          0.833   0.42  |  3.917   7.14 |  7.000   2.94 | 10.08   0.42
          0.917   0.42  |  4.000   7.14 |  7.083   2.94 | 10.17   0.42
          1.000   0.42  |  4.083   7.14 |  7.167   2.94 | 10.25   0.42
          1.083   0.42  |  4.167   7.14 |  7.250   2.94 | 10.33   0.42
          1.167   0.42  |  4.250   7.14 |  7.333   1.68 | 10.42   0.42
          1.250   0.42  |  4.333  19.32 |  7.417   1.68 | 10.50   0.42
          1.333   0.42  |  4.417  19.32 |  7.500   1.68 | 10.58   0.42
          1.417   0.42  |  4.500  19.32 |  7.583   1.68 | 10.67   0.42
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          1.500   0.42  |  4.583  19.32 |  7.667   1.68 | 10.75   0.42
          1.583   0.42  |  4.667  19.32 |  7.750   1.68 | 10.83   0.42
          1.667   0.42  |  4.750  19.32 |  7.833   1.68 | 10.92   0.42
          1.750   0.42  |  4.833  19.32 |  7.917   1.68 | 11.00   0.42
          1.833   0.42  |  4.917  19.32 |  8.000   1.68 | 11.08   0.42
          1.917   0.42  |  5.000  19.32 |  8.083   1.68 | 11.17   0.42
          2.000   0.42  |  5.083  19.32 |  8.167   1.68 | 11.25   0.42
          2.083   0.42  |  5.167  19.32 |  8.250   1.68 | 11.33   0.42
          2.167   0.42  |  5.250  19.32 |  8.333   0.84 | 11.42   0.42
          2.250   0.42  |  5.333   5.46 |  8.417   0.84 | 11.50   0.42
          2.333   2.52  |  5.417   5.46 |  8.500   0.84 | 11.58   0.42
          2.417   2.52  |  5.500   5.46 |  8.583   0.84 | 11.67   0.42
          2.500   2.52  |  5.583   5.46 |  8.667   0.84 | 11.75   0.42
          2.583   2.52  |  5.667   5.46 |  8.750   0.84 | 11.83   0.42
          2.667   2.52  |  5.750   5.46 |  8.833   0.84 | 11.92   0.42
          2.750   2.52  |  5.833   5.46 |  8.917   0.84 | 12.00   0.42
          2.833   2.52  |  5.917   5.46 |  9.000   0.84 | 12.08   0.42
          2.917   2.52  |  6.000   5.46 |  9.083   0.84 | 12.17   0.42
          3.000   2.52  |  6.083   5.46 |  9.167   0.84 | 12.25   0.42
          3.083   2.52  |  6.167   5.46 |  9.250   0.84 |

     Max.Eff.Inten.(mm/hr)=     19.32         10.08
            over (min)=        15.00         25.00
     Storage Coeff.   (min)=   17.17 (ii)    22.07 (ii)
     Unit Hyd. Tpeak (min)=    15.00         25.00
     Unit Hyd. peak  (cms)=     0.07          0.05

                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.09          0.01      0.096 (iii)
     TIME TO PEAK    (hrs)=      5.25          5.42      5.25
     RUNOFF VOLUME    (mm)=     40.00         15.38     35.56
     TOTAL RAINFALL   (mm)=     42.00         42.00     42.00
     RUNOFF COEFFICIENT  =       0.95          0.37      0.85


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0   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 ( 0125)|  Area     (ha)=   2.27
|ID= 1 DT= 5.0 min |  Total Imp(%)=  77.00   Dir. Conn.(%)=  77.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=    1.75          0.52
        Dep. Storage   (mm)=    2.00          5.00
        Average Slope  (%)=     1.00          2.00
        Length         (m)=   800.00         20.00
        Mannings n     =      0.013          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  2.52 | 6.250  5.46 | 9.33   0.42
        0.167  0.00 | 3.250  2.52 | 6.333  2.94 | 9.42   0.42
        0.250  0.00 | 3.333  7.14 | 6.417  2.94 | 9.50   0.42
        0.333  0.42 | 3.417  7.14 | 6.500  2.94 | 9.58   0.42
        0.417  0.42 | 3.500  7.14 | 6.583  2.94 | 9.67   0.42
        0.500  0.42 | 3.583  7.14 | 6.667  2.94 | 9.75   0.42
        0.583  0.42 | 3.667  7.14 | 6.750  2.94 | 9.83   0.42
        0.667  0.42 | 3.750  7.14 | 6.833  2.94 | 9.92   0.42
        0.750  0.42 | 3.833  7.14 | 6.917  2.94 | 10.00  0.42
        0.833  0.42 | 3.917  7.14 | 7.000  2.94 | 10.08  0.42
        0.917  0.42 | 4.000  7.14 | 7.083  2.94 | 10.17  0.42
        1.000  0.42 | 4.083  7.14 | 7.167  2.94 | 10.25  0.42
        1.083  0.42 | 4.167  7.14 | 7.250  2.94 | 10.33  0.42
        1.167  0.42 | 4.250  7.14 | 7.333  1.68 | 10.42  0.42
        1.250  0.42 | 4.333 19.32 | 7.417  1.68 | 10.50  0.42
        1.333  0.42 | 4.417 19.32 | 7.500  1.68 | 10.58  0.42
        1.417  0.42 | 4.500 19.32 | 7.583  1.68 | 10.67  0.42
        1.500  0.42 | 4.583 19.32 | 7.667  1.68 | 10.75  0.42
        1.583  0.42 | 4.667 19.32 | 7.750  1.68 | 10.83  0.42
        1.667  0.42 | 4.750 19.32 | 7.833  1.68 | 10.92  0.42
        1.750  0.42 | 4.833 19.32 | 7.917  1.68 | 11.00  0.42
        1.833  0.42 | 4.917 19.32 | 8.000  1.68 | 11.08  0.42
        1.917  0.42 | 5.000 19.32 | 8.083  1.68 | 11.17  0.42
        2.000  0.42 | 5.083 19.32 | 8.167  1.68 | 11.25  0.42
        2.083  0.42 | 5.167 19.32 | 8.250  1.68 | 11.33  0.42
        2.167  0.42 | 5.250 19.32 | 8.333  0.84 | 11.42  0.42
        2.250  0.42 | 5.333  5.46 | 8.417  0.84 | 11.50  0.42
        2.333  2.52 | 5.417  5.46 | 8.500  0.84 | 11.58  0.42
        2.417  2.52 | 5.500  5.46 | 8.583  0.84 | 11.67  0.42
        2.500  2.52 | 5.583  5.46 | 8.667  0.84 | 11.75  0.42
        2.583  2.52 | 5.667  5.46 | 8.750  0.84 | 11.83  0.42
        2.667  2.52 | 5.750  5.46 | 8.833  0.84 | 11.92  0.42
        2.750  2.52 | 5.833  5.46 | 8.917  0.84 | 12.00  0.42
        2.833  2.52 | 5.917  5.46 | 9.000  0.84 | 12.08  0.42
        2.917  2.52 | 6.000  5.46 | 9.083  0.84 | 12.17  0.42
        3.000  2.52 | 6.083  5.46 | 9.167  0.84 | 12.25  0.42
        3.083  2.52 | 6.167  5.46 | 9.250  0.84 |

Max.Eff.Inten.(mm/hr)=        19.32         9.87
         over (min)           15.00        30.00
Storage Coeff.  (min)=   17.17 (ii)   28.93 (ii)
Unit Hyd. Tpeak (min)=        15.00        30.00
Unit Hyd. peak  (cms)=         0.07         0.04
                                                     *TOTALS*
PEAK FLOW       (cms)=          0.09         0.01      0.100 (iii)
TIME TO PEAK    (hrs)=          5.25         5.50      5.25
RUNOFF VOLUME   (mm)=          40.00        15.38     34.33
```

```
TOTAL RAINFALL   (mm)=       42.00        42.00        42.00
RUNOFF COEFFICIENT   =        0.95         0.37         0.82


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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  ( 0405)|
|  1 + 2 = 3      |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 ( 0125):     2.27    0.100    5.25    34.33
      + ID2= 2 ( 0130):     2.08    0.096    5.25    35.56
        =================================================
        ID = 3 ( 0405):     4.35    0.196    5.25    34.92

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------
--------------------
| RESERVOIR( 0505)|     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   |  0.2110    0.0383
                       0.0185    0.0030   |  0.2743    0.0515
                       0.0302    0.0120   |  0.3250    0.0792
                       0.1102    0.0251   |  0.0000    0.0000

                          AREA     QPEAK    TPEAK     R.V.
                          (ha)     (cms)    (hrs)     (mm)
   INFLOW : ID= 2 ( 0405)  4.350    0.196    5.25    34.92
   OUTFLOW: ID= 1 ( 0505)  4.350    0.171    5.42    34.91

        PEAK   FLOW   REDUCTION [Qout/Qin](%)= 87.03
        TIME SHIFT OF PEAK FLOW     (min)= 10.00
        MAXIMUM STORAGE   USED    (ha.m.)=  0.0331

-----------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0120)|   Area   (ha)= 1.24
|ID= 1 DT= 5.0 min|   Total Imp(%)= 73.00   Dir. Conn.(%)= 73.00
--------------------
                        IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=    0.91        0.33
   Dep. Storage   (mm)=    2.00        5.00
   Average Slope   (%)=    1.00        2.00
   Length          (m)=  475.00       17.00
```

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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  2.52 | 6.250  5.46 | 9.33   0.42
        0.167  0.00 | 3.250  2.52 | 6.333  2.94 | 9.42   0.42
        0.250  0.00 | 3.333  7.14 | 6.417  2.94 | 9.50   0.42
        0.333  0.42 | 3.417  7.14 | 6.500  2.94 | 9.58   0.42
        0.417  0.42 | 3.500  7.14 | 6.583  2.94 | 9.67   0.42
        0.500  0.42 | 3.583  7.14 | 6.667  2.94 | 9.75   0.42
        0.583  0.42 | 3.667  7.14 | 6.750  2.94 | 9.83   0.42
        0.667  0.42 | 3.750  7.14 | 6.833  2.94 | 9.92   0.42
        0.750  0.42 | 3.833  7.14 | 6.917  2.94 | 10.00  0.42
        0.833  0.42 | 3.917  7.14 | 7.000  2.94 | 10.08  0.42
        0.917  0.42 | 4.000  7.14 | 7.083  2.94 | 10.17  0.42
        1.000  0.42 | 4.083  7.14 | 7.167  2.94 | 10.25  0.42
        1.083  0.42 | 4.167  7.14 | 7.250  2.94 | 10.33  0.42
        1.167  0.42 | 4.250  7.14 | 7.333  1.68 | 10.42  0.42
        1.250  0.42 | 4.333 19.32 | 7.417  1.68 | 10.50  0.42
        1.333  0.42 | 4.417 19.32 | 7.500  1.68 | 10.58  0.42
        1.417  0.42 | 4.500 19.32 | 7.583  1.68 | 10.67  0.42
        1.500  0.42 | 4.583 19.32 | 7.667  1.68 | 10.75  0.42
        1.583  0.42 | 4.667 19.32 | 7.750  1.68 | 10.83  0.42
        1.667  0.42 | 4.750 19.32 | 7.833  1.68 | 10.92  0.42
        1.750  0.42 | 4.833 19.32 | 7.917  1.68 | 11.00  0.42
        1.833  0.42 | 4.917 19.32 | 8.000  1.68 | 11.08  0.42
        1.917  0.42 | 5.000 19.32 | 8.083  1.68 | 11.17  0.42
        2.000  0.42 | 5.083 19.32 | 8.167  1.68 | 11.25  0.42
        2.083  0.42 | 5.167 19.32 | 8.250  1.68 | 11.33  0.42
        2.167  0.42 | 5.250 19.32 | 8.333  0.84 | 11.42  0.42
        2.250  0.42 | 5.333  5.46 | 8.417  0.84 | 11.50  0.42
        2.333  2.52 | 5.417  5.46 | 8.500  0.84 | 11.58  0.42
        2.417  2.52 | 5.500  5.46 | 8.583  0.84 | 11.67  0.42
        2.500  2.52 | 5.583  5.46 | 8.667  0.84 | 11.75  0.42
        2.583  2.52 | 5.667  5.46 | 8.750  0.84 | 11.83  0.42
        2.667  2.52 | 5.750  5.46 | 8.833  0.84 | 11.92  0.42
        2.750  2.52 | 5.833  5.46 | 8.917  0.84 | 12.00  0.42
        2.833  2.52 | 5.917  5.46 | 9.000  0.84 | 12.08  0.42
        2.917  2.52 | 6.000  5.46 | 9.083  0.84 | 12.17  0.42
        3.000  2.52 | 6.083  5.46 | 9.167  0.84 | 12.25  0.42
        3.083  2.52 | 6.167  5.46 | 9.250  0.84 |

Max.Eff.Inten.(mm/hr)=        19.32         9.87
         over (min)           15.00        25.00
Storage Coeff.  (min)=   12.56 (ii)   23.22 (ii)
Unit Hyd. Tpeak (min)=        15.00        25.00
Unit Hyd. peak  (cms)=         0.08         0.05
                                                     *TOTALS*
PEAK FLOW       (cms)=          0.05         0.01      0.055 (iii)
```

```
TIME TO PEAK   (hrs)=         5.25         5.42         5.25
RUNOFF VOLUME   (mm)=        40.00        15.38        33.34
TOTAL RAINFALL  (mm)=        42.00        42.00        42.00
RUNOFF COEFFICIENT   =        0.95         0.37         0.79


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 ( 0115)|   Area   (ha)= 1.00
|ID= 1 DT= 5.0 min|   Total Imp(%)= 63.00   Dir. Conn.(%)= 63.00
--------------------
                        IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=    0.63        0.37
   Dep. Storage   (mm)=    2.00        5.00
   Average Slope   (%)=    1.00        2.00
   Length          (m)=  475.00       17.00
   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 | 3.167  2.52 | 6.250  5.46 | 9.33   0.42
        0.167  0.00 | 3.250  2.52 | 6.333  2.94 | 9.42   0.42
        0.250  0.00 | 3.333  7.14 | 6.417  2.94 | 9.50   0.42
        0.333  0.42 | 3.417  7.14 | 6.500  2.94 | 9.58   0.42
        0.417  0.42 | 3.500  7.14 | 6.583  2.94 | 9.67   0.42
        0.500  0.42 | 3.583  7.14 | 6.667  2.94 | 9.75   0.42
        0.583  0.42 | 3.667  7.14 | 6.750  2.94 | 9.83   0.42
        0.667  0.42 | 3.750  7.14 | 6.833  2.94 | 9.92   0.42
        0.750  0.42 | 3.833  7.14 | 6.917  2.94 | 10.00  0.42
        0.833  0.42 | 3.917  7.14 | 7.000  2.94 | 10.08  0.42
        0.917  0.42 | 4.000  7.14 | 7.083  2.94 | 10.17  0.42
        1.000  0.42 | 4.083  7.14 | 7.167  2.94 | 10.25  0.42
        1.083  0.42 | 4.167  7.14 | 7.250  2.94 | 10.33  0.42
        1.167  0.42 | 4.250  7.14 | 7.333  1.68 | 10.42  0.42
        1.250  0.42 | 4.333 19.32 | 7.417  1.68 | 10.50  0.42
        1.333  0.42 | 4.417 19.32 | 7.500  1.68 | 10.58  0.42
        1.417  0.42 | 4.500 19.32 | 7.583  1.68 | 10.67  0.42
        1.500  0.42 | 4.583 19.32 | 7.667  1.68 | 10.75  0.42
        1.583  0.42 | 4.667 19.32 | 7.750  1.68 | 10.83  0.42
        1.667  0.42 | 4.750 19.32 | 7.833  1.68 | 10.92  0.42
        1.750  0.42 | 4.833 19.32 | 7.917  1.68 | 11.00  0.42
        1.833  0.42 | 4.917 19.32 | 8.000  1.68 | 11.08  0.42
```

```
                    LangstaffRd_EA_Proposed_HumberWatershed
        1.917  0.42 | 5.000  19.32 | 8.083  1.68 | 11.17  0.42
        2.000  0.42 | 5.083  19.32 | 8.167  1.68 | 11.25  0.42
        2.083  0.42 | 5.167  19.32 | 8.250  1.68 | 11.33  0.42
        2.167  0.42 | 5.250  19.32 | 8.333  0.84 | 11.42  0.42
        2.250  0.42 | 5.333   5.46 | 8.417  0.84 | 11.50  0.42
        2.333  2.52 | 5.417   5.46 | 8.500  0.84 | 11.58  0.42
        2.417  2.52 | 5.500   5.46 | 8.583  0.84 | 11.67  0.42
        2.500  2.52 | 5.583   5.46 | 8.667  0.84 | 11.75  0.42
        2.583  2.52 | 5.667   5.46 | 8.750  0.84 | 11.83  0.42
        2.667  2.52 | 5.750   5.46 | 8.833  0.84 | 11.92  0.42
        2.750  2.52 | 5.833   5.46 | 8.917  0.84 | 12.00  0.42
        2.833  2.52 | 5.917   5.46 | 9.000  0.84 | 12.08  0.42
        2.917  2.52 | 6.000   5.46 | 9.083  0.84 | 12.17  0.42
        3.000  2.52 | 6.083   5.46 | 9.167  0.84 | 12.25  0.42
        3.083  2.52 | 6.167   5.46 | 9.250  0.84 |

   Max.Eff.Inten.(mm/hr)=   19.32       9.87
             over (min)     15.00      25.00
   Storage Coeff.  (min)=   12.56 (ii) 23.22 (ii)
   Unit Hyd. Tpeak (min)=   15.00      25.00
   Unit Hyd. peak  (cms)=    0.08       0.05
                                                 *TOTALS*
   PEAK FLOW       (cms)=    0.03       0.01       0.041 (iii)
   TIME TO PEAK    (hrs)=    5.25       5.42       5.25
   RUNOFF VOLUME    (mm)=   40.00      15.38      30.88
   TOTAL RAINFALL   (mm)=   42.00      42.00      42.00
   RUNOFF COEFFICIENT  =     0.95       0.37       0.74


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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  ( 0410)|
   |  1 + 2 = 3      |         AREA   QPEAK   TPEAK    R.V.
   --------------------        (ha)   (cms)   (hrs)    (mm)
        ID1= 1 ( 0115):   1.00  0.041   5.25   30.88
      + ID2= 2 ( 0120):   1.24  0.055   5.25   33.34
        ===============================================
        ID = 3 ( 0410):   2.24  0.095   5.25   32.24

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
   ----------------------------------------------------------------
   --------------------
   | RESERVOIR( 0510)|   OVERFLOW IS OFF
   | IN= 2---> OUT= 1 |
   | DT= 5.0 min      |  OUTFLOW   STORAGE  |  OUTFLOW   STORAGE
   --------------------   (cms)    (ha.m.)  |   (cms)    (ha.m.)
```

```
                    LangstaffRd_EA_Proposed_HumberWatershed
               0.0000   0.0000 |  0.0699   0.0309
               0.0264   0.0024 |  0.0792   0.0414
               0.0457   0.0099 |  0.0876   0.0666
               0.0590   0.0204 |  0.0000   0.0000

                              AREA   QPEAK   TPEAK    R.V.
                             (ha)    (cms)   (hrs)    (mm)
   INFLOW : ID= 2 ( 0410)    2.240   0.095   5.25   32.24
   OUTFLOW: ID= 1 ( 0510)    2.240   0.056   5.58   32.24

           PEAK  FLOW   REDUCTION [Qout/Qin](%)= 58.59
           TIME SHIFT OF PEAK FLOW      (min)= 20.00
           MAXIMUM STORAGE   USED    (ha.m.)= 0.0179
   ----------------------------------------------------------------
   --------------------
   | ADD HYD  ( 0420)|
   |  1 + 2 = 3      |         AREA   QPEAK   TPEAK    R.V.
   --------------------        (ha)   (cms)   (hrs)    (mm)
        ID1= 1 ( 0505):   4.35  0.171   5.42   34.91
      + ID2= 2 ( 0510):   2.24  0.056   5.58   32.24
        ===============================================
        ID = 3 ( 0420):   6.59  0.226   5.42   34.00

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
   ----------------------------------------------------------------
   --------------------
   | CALIB            |
   | STANDHYD ( 0110)|   Area  (ha)= 1.58
   |ID= 1 DT= 5.0 min |  Total Imp(%)= 70.00  Dir. Conn.(%)= 70.00
   --------------------
                        IMPERVIOUS    PERVIOUS (i)
   Surface Area   (ha)=    1.11         0.47
   Dep. Storage   (mm)=    2.00         5.00
   Average Slope  (%)=     1.00         2.00
   Length         (m)=   650.00        25.00
   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 | 3.167  2.52 | 6.250  5.46 | 9.33   0.42
           0.167  0.00 | 3.250  2.52 | 6.333  2.94 | 9.42   0.42
           0.250  0.00 | 3.333  7.14 | 6.417  2.94 | 9.50   0.42
           0.333  0.42 | 3.417  7.14 | 6.500  2.94 | 9.58   0.42
           0.417  0.42 | 3.500  7.14 | 6.583  2.94 | 9.67   0.42
           0.500  0.42 | 3.583  7.14 | 6.667  2.94 | 9.75   0.42
           0.583  0.42 | 3.667  7.14 | 6.750  2.94 | 9.83   0.42
           0.667  0.42 | 3.750  7.14 | 6.833  2.94 | 9.92   0.42
```

```
                    LangstaffRd_EA_Proposed_HumberWatershed
        0.750  0.42 | 3.833  7.14 | 6.917  2.94 | 10.00  0.42
        0.833  0.42 | 3.917  7.14 | 7.000  2.94 | 10.08  0.42
        0.917  0.42 | 4.000  7.14 | 7.083  2.94 | 10.17  0.42
        1.000  0.42 | 4.083  7.14 | 7.167  2.94 | 10.25  0.42
        1.083  0.42 | 4.167  7.14 | 7.250  2.94 | 10.33  0.42
        1.167  0.42 | 4.250  7.14 | 7.333  1.68 | 10.42  0.42
        1.250  0.42 | 4.333 19.32 | 7.417  1.68 | 10.50  0.42
        1.333  0.42 | 4.417 19.32 | 7.500  1.68 | 10.58  0.42
        1.417  0.42 | 4.500 19.32 | 7.583  1.68 | 10.67  0.42
        1.500  0.42 | 4.583 19.32 | 7.667  1.68 | 10.75  0.42
        1.583  0.42 | 4.667 19.32 | 7.750  1.68 | 10.83  0.42
        1.667  0.42 | 4.750 19.32 | 7.833  1.68 | 10.92  0.42
        1.750  0.42 | 4.833 19.32 | 7.917  1.68 | 11.00  0.42
        1.833  0.42 | 4.917 19.32 | 8.000  1.68 | 11.08  0.42
        1.917  0.42 | 5.000 19.32 | 8.083  1.68 | 11.17  0.42
        2.000  0.42 | 5.083 19.32 | 8.167  1.68 | 11.25  0.42
        2.083  0.42 | 5.167 19.32 | 8.250  1.68 | 11.33  0.42
        2.167  0.42 | 5.250 19.32 | 8.333  0.84 | 11.42  0.42
        2.250  0.42 | 5.333  5.46 | 8.417  0.84 | 11.50  0.42
        2.333  2.52 | 5.417  5.46 | 8.500  0.84 | 11.58  0.42
        2.417  2.52 | 5.500  5.46 | 8.583  0.84 | 11.67  0.42
        2.500  2.52 | 5.583  5.46 | 8.667  0.84 | 11.75  0.42
        2.583  2.52 | 5.667  5.46 | 8.750  0.84 | 11.83  0.42
        2.667  2.52 | 5.750  5.46 | 8.833  0.84 | 11.92  0.42
        2.750  2.52 | 5.833  5.46 | 8.917  0.84 | 12.00  0.42
        2.833  2.52 | 5.917  5.46 | 9.000  0.84 | 12.08  0.42
        2.917  2.52 | 6.000  5.46 | 9.083  0.84 | 12.17  0.42
        3.000  2.52 | 6.083  5.46 | 9.167  0.84 | 12.25  0.42
        3.083  2.52 | 6.167  5.46 | 9.250  0.84 |

   Max.Eff.Inten.(mm/hr)=   19.32      10.72
             over (min)     15.00      30.00
   Storage Coeff.  (min)=   15.16 (ii) 28.16 (ii)
   Unit Hyd. Tpeak (min)=   15.00      30.00
   Unit Hyd. peak  (cms)=    0.07       0.04
                                                 *TOTALS*
   PEAK FLOW       (cms)=    0.06       0.01       0.067 (iii)
   TIME TO PEAK    (hrs)=    5.25       5.50       5.25
   RUNOFF VOLUME    (mm)=   40.00      16.73      33.01
   TOTAL RAINFALL   (mm)=   42.00      42.00      42.00
   RUNOFF COEFFICIENT  =     0.95       0.40       0.79


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 85.0   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( 0525)|   OVERFLOW IS OFF
   | IN= 2---> OUT= 1 |
```

```
                    LangstaffRd_EA_Proposed_HumberWatershed
   | DT= 5.0 min      |  OUTFLOW   STORAGE  |  OUTFLOW   STORAGE
   --------------------   (cms)    (ha.m.)  |   (cms)    (ha.m.)
                         0.0000   0.0000 |  0.0181   0.0161
                         0.0081   0.0031 |  0.0584   0.0204
                         0.0123   0.0074 |  0.0920   0.0259
                         0.0155   0.0118 |  0.0000   0.0000

                              AREA   QPEAK   TPEAK    R.V.
                             (ha)    (cms)   (hrs)    (mm)
   INFLOW : ID= 2 ( 0110)    1.580   0.067   5.25   33.01
   OUTFLOW: ID= 1 ( 0525)    1.580   0.048   5.50   32.95

           PEAK  FLOW   REDUCTION [Qout/Qin](%)= 70.81
           TIME SHIFT OF PEAK FLOW      (min)= 15.00
           MAXIMUM STORAGE   USED    (ha.m.)= 0.0193

   ----------------------------------------------------------------
   ********************************
   ** SIMULATION:Run 04          **
   ********************************

   --------------------
   | READ STORM      |  Filename: C:\Users\ray.zhao\AppD
   |                 |            ata\Local\Temp\
   |                 |            efddf5d6-df0e-43ba-b139-2f589a28109d\4ca76be2
   | Ptotal= 54.38 mm|  Comments: 5Y12
   --------------------
            TIME   RAIN | TIME   RAIN |'  TIME  RAIN | TIME   RAIN
            hrs   mm/hr | hrs   mm/hr |'  hrs  mm/hr | hrs   mm/hr
            0.25   0.00 | 3.50   9.25 | 6.75   3.81 | 10.00  0.54
            0.50   0.54 | 3.75   9.25 | 7.00   3.81 | 10.25  0.54
            0.75   0.54 | 4.00   9.25 | 7.25   3.81 | 10.50  0.54
            1.00   0.54 | 4.25   9.25 | 7.50   2.18 | 10.75  0.54
            1.25   0.54 | 4.50  25.02 | 7.75   2.18 | 11.00  0.54
            1.50   0.54 | 4.75  25.02 | 8.00   2.18 | 11.25  0.54
            1.75   0.54 | 5.00  25.02 | 8.25   2.18 | 11.50  0.54
            2.00   0.54 | 5.25  25.02 | 8.50   1.09 | 11.75  0.54
            2.25   0.54 | 5.50   7.07 | 8.75   1.09 | 12.00  0.54
            2.50   3.26 | 5.75   7.07 | 9.00   1.09 | 12.25  0.54
            2.75   3.26 | 6.00   7.07 | 9.25   1.09 |
            3.00   3.26 | 6.25   7.07 | 9.50   0.54 |
            3.25   3.26 | 6.50   3.81 | 9.75   0.54 |

   ----------------------------------------------------------------
   --------------------
   | CALIB            |
   | STANDHYD ( 0105)|   Area  (ha)= 1.63
   |ID= 1 DT= 5.0 min |  Total Imp(%)= 69.00  Dir. Conn.(%)= 69.00
   --------------------
                        IMPERVIOUS    PERVIOUS (i)
   Surface Area   (ha)=    1.12         0.51
   Dep. Storage   (mm)=    2.00         5.00
```

```
                 LangstaffRd_EA_Proposed_HumberWatershed
Average Slope    (%)=     1.00         2.00
Length           (m)=   650.00        25.00
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 | 3.167  3.26 | 6.250  7.07 | 9.33   0.54
         0.167   0.00 | 3.250  3.26 | 6.333  3.81 | 9.42   0.54
         0.250   0.00 | 3.333  9.25 | 6.417  3.81 | 9.50   0.54
         0.333   0.54 | 3.417  9.25 | 6.500  3.81 | 9.58   0.54
         0.417   0.54 | 3.500  9.25 | 6.583  3.81 | 9.67   0.54
         0.500   0.54 | 3.583  9.25 | 6.667  3.81 | 9.75   0.54
         0.583   0.54 | 3.667  9.25 | 6.750  3.81 | 9.83   0.54
         0.667   0.54 | 3.750  9.25 | 6.833  3.81 | 9.92   0.54
         0.750   0.54 | 3.833  9.25 | 6.917  3.81 | 10.00  0.54
         0.833   0.54 | 3.917  9.25 | 7.000  3.81 | 10.08  0.54
         0.917   0.54 | 4.000  9.25 | 7.083  3.81 | 10.17  0.54
         1.000   0.54 | 4.083  9.25 | 7.167  3.81 | 10.25  0.54
         1.083   0.54 | 4.167  9.25 | 7.250  3.81 | 10.33  0.54
         1.167   0.54 | 4.250  9.25 | 7.333  2.18 | 10.42  0.54
         1.250   0.54 | 4.333 25.02 | 7.417  2.18 | 10.50  0.54
         1.333   0.54 | 4.417 25.02 | 7.500  2.18 | 10.58  0.54
         1.417   0.54 | 4.500 25.02 | 7.583  2.18 | 10.67  0.54
         1.500   0.54 | 4.583 25.02 | 7.667  2.18 | 10.75  0.54
         1.583   0.54 | 4.667 25.02 | 7.750  2.18 | 10.83  0.54
         1.667   0.54 | 4.750 25.02 | 7.833  2.18 | 10.92  0.54
         1.750   0.54 | 4.833 25.02 | 7.917  2.18 | 11.00  0.54
         1.833   0.54 | 4.917 25.02 | 8.000  2.18 | 11.08  0.54
         1.917   0.54 | 5.000 25.02 | 8.083  2.18 | 11.17  0.54
         2.000   0.54 | 5.083 25.02 | 8.167  2.18 | 11.25  0.54
         2.083   0.54 | 5.167 25.02 | 8.250  2.18 | 11.33  0.54
         2.167   0.54 | 5.250 25.02 | 8.333  1.09 | 11.42  0.54
         2.250   0.54 | 5.333  7.07 | 8.417  1.09 | 11.50  0.54
         2.333   3.26 | 5.417  7.07 | 8.500  1.09 | 11.58  0.54
         2.417   3.26 | 5.500  7.07 | 8.583  1.09 | 11.67  0.54
         2.500   3.26 | 5.583  7.07 | 8.667  1.09 | 11.75  0.54
         2.583   3.26 | 5.667  7.07 | 8.750  1.09 | 11.83  0.54
         2.667   3.26 | 5.750  7.07 | 8.833  1.09 | 11.92  0.54
         2.750   3.26 | 5.833  7.07 | 8.917  1.09 | 12.00  0.54
         2.833   3.26 | 5.917  7.07 | 9.000  1.09 | 12.08  0.54
         2.917   3.26 | 6.000  7.07 | 9.083  1.09 | 12.17  0.54
         3.000   3.26 | 6.083  7.07 | 9.167  1.09 | 12.25  0.54
         3.083   3.26 | 6.167  7.07 | 9.250  1.09 |

Max.Eff.Inten.(mm/hr)=   25.02        16.71
       over (min)        15.00        25.00
Storage Coeff.  (min)=   13.67 (ii)   24.56 (ii)
Unit Hyd. Tpeak (min)=   15.00        25.00
Unit Hyd. peak  (cms)=    0.08         0.05
```

```
                 LangstaffRd_EA_Proposed_HumberWatershed
                                             *TOTALS*
PEAK FLOW       (cms)=    0.08         0.02        0.094 (iii)
TIME TO PEAK    (hrs)=    5.25         5.42        5.25
RUNOFF VOLUME   (mm)=    52.38        26.88       44.47
TOTAL RAINFALL  (mm)=    54.38        54.38       54.38
RUNOFF COEFFICIENT  =     0.96         0.49        0.82


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  86.0   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( 0520)|    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   |  0.0181    0.0161
                        0.0081   0.0031   |  0.0584    0.0204
                        0.0123   0.0074   |  0.0920    0.0259
                        0.0155   0.0118   |  0.0000    0.0000

                        AREA    QPEAK    TPEAK     R.V.
                        (ha)    (cms)    (hrs)     (mm)
    INFLOW : ID= 2 ( 0105)  1.630    0.094    5.25     44.47
    OUTFLOW: ID= 1 ( 0520)  1.630    0.075    5.50     44.41

          PEAK  FLOW  REDUCTION [Qout/Qin](%)= 79.51
          TIME SHIFT OF PEAK FLOW      (min)= 15.00
          MAXIMUM STORAGE   USED    (ha.m.)= 0.0232

-----------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0130)|   Area   (ha)=  2.08
|ID= 1 DT= 5.0 min |   Total Imp(%)= 82.00   Dir. Conn.(%)= 82.00
--------------------
                       IMPERVIOUS    PERVIOUS (i)
    Surface Area  (ha)=    1.71         0.37
    Dep. Storage  (mm)=    2.00         5.00
    Average Slope (%)=     1.00         2.00
    Length        (m)=   800.00        20.00
    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
```

```
                 LangstaffRd_EA_Proposed_HumberWatershed
         0.083   0.00 | 3.167  3.26 | 6.250  7.07 | 9.33   0.54
         0.167   0.00 | 3.250  3.26 | 6.333  3.81 | 9.42   0.54
         0.250   0.00 | 3.333  9.25 | 6.417  3.81 | 9.50   0.54
         0.333   0.54 | 3.417  9.25 | 6.500  3.81 | 9.58   0.54
         0.417   0.54 | 3.500  9.25 | 6.583  3.81 | 9.67   0.54
         0.500   0.54 | 3.583  9.25 | 6.667  3.81 | 9.75   0.54
         0.583   0.54 | 3.667  9.25 | 6.750  3.81 | 9.83   0.54
         0.667   0.54 | 3.750  9.25 | 6.833  3.81 | 9.92   0.54
         0.750   0.54 | 3.833  9.25 | 6.917  3.81 | 10.00  0.54
         0.833   0.54 | 3.917  9.25 | 7.000  3.81 | 10.08  0.54
         0.917   0.54 | 4.000  9.25 | 7.083  3.81 | 10.17  0.54
         1.000   0.54 | 4.083  9.25 | 7.167  3.81 | 10.25  0.54
         1.083   0.54 | 4.167  9.25 | 7.250  3.81 | 10.33  0.54
         1.167   0.54 | 4.250  9.25 | 7.333  2.18 | 10.42  0.54
         1.250   0.54 | 4.333 25.02 | 7.417  2.18 | 10.50  0.54
         1.333   0.54 | 4.417 25.02 | 7.500  2.18 | 10.58  0.54
         1.417   0.54 | 4.500 25.02 | 7.583  2.18 | 10.67  0.54
         1.500   0.54 | 4.583 25.02 | 7.667  2.18 | 10.75  0.54
         1.583   0.54 | 4.667 25.02 | 7.750  2.18 | 10.83  0.54
         1.667   0.54 | 4.750 25.02 | 7.833  2.18 | 10.92  0.54
         1.750   0.54 | 4.833 25.02 | 7.917  2.18 | 11.00  0.54
         1.833   0.54 | 4.917 25.02 | 8.000  2.18 | 11.08  0.54
         1.917   0.54 | 5.000 25.02 | 8.083  2.18 | 11.17  0.54
         2.000   0.54 | 5.083 25.02 | 8.167  2.18 | 11.25  0.54
         2.083   0.54 | 5.167 25.02 | 8.250  2.18 | 11.33  0.54
         2.167   0.54 | 5.250 25.02 | 8.333  1.09 | 11.42  0.54
         2.250   0.54 | 5.333  7.07 | 8.417  1.09 | 11.50  0.54
         2.333   3.26 | 5.417  7.07 | 8.500  1.09 | 11.58  0.54
         2.417   3.26 | 5.500  7.07 | 8.583  1.09 | 11.67  0.54
         2.500   3.26 | 5.583  7.07 | 8.667  1.09 | 11.75  0.54
         2.583   3.26 | 5.667  7.07 | 8.750  1.09 | 11.83  0.54
         2.667   3.26 | 5.750  7.07 | 8.833  1.09 | 11.92  0.54
         2.750   3.26 | 5.833  7.07 | 8.917  1.09 | 12.00  0.54
         2.833   3.26 | 5.917  7.07 | 9.000  1.09 | 12.08  0.54
         2.917   3.26 | 6.000  7.07 | 9.083  1.09 | 12.17  0.54
         3.000   3.26 | 6.083  7.07 | 9.167  1.09 | 12.25  0.54
         3.083   3.26 | 6.167  7.07 | 9.250  1.09 |

Max.Eff.Inten.(mm/hr)=   25.02        15.31
       over (min)        15.00        20.00
Storage Coeff.  (min)=   15.48 (ii)   19.90 (ii)
Unit Hyd. Tpeak (min)=   15.00        20.00
Unit Hyd. peak  (cms)=    0.07         0.06
                                             *TOTALS*
PEAK FLOW       (cms)=    0.12         0.01        0.129 (iii)
TIME TO PEAK    (hrs)=    5.25         5.33        5.25
RUNOFF VOLUME   (mm)=    52.38        24.05       47.28
TOTAL RAINFALL  (mm)=    54.38        54.38       54.38
RUNOFF COEFFICIENT  =     0.96         0.44        0.87


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  83.0   Ia = Dep. Storage  (Above)
```

```
                 LangstaffRd_EA_Proposed_HumberWatershed
  (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
       THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0125)|   Area   (ha)=  2.27
|ID= 1 DT= 5.0 min |   Total Imp(%)= 77.00   Dir. Conn.(%)= 77.00
--------------------
                       IMPERVIOUS    PERVIOUS (i)
    Surface Area  (ha)=    1.75         0.52
    Dep. Storage  (mm)=    2.00         5.00
    Average Slope (%)=     1.00         2.00
    Length        (m)=   800.00        20.00
    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 | 3.167  3.26 | 6.250  7.07 | 9.33   0.54
         0.167   0.00 | 3.250  3.26 | 6.333  3.81 | 9.42   0.54
         0.250   0.00 | 3.333  9.25 | 6.417  3.81 | 9.50   0.54
         0.333   0.54 | 3.417  9.25 | 6.500  3.81 | 9.58   0.54
         0.417   0.54 | 3.500  9.25 | 6.583  3.81 | 9.67   0.54
         0.500   0.54 | 3.583  9.25 | 6.667  3.81 | 9.75   0.54
         0.583   0.54 | 3.667  9.25 | 6.750  3.81 | 9.83   0.54
         0.667   0.54 | 3.750  9.25 | 6.833  3.81 | 9.92   0.54
         0.750   0.54 | 3.833  9.25 | 6.917  3.81 | 10.00  0.54
         0.833   0.54 | 3.917  9.25 | 7.000  3.81 | 10.08  0.54
         0.917   0.54 | 4.000  9.25 | 7.083  3.81 | 10.17  0.54
         1.000   0.54 | 4.083  9.25 | 7.167  3.81 | 10.25  0.54
         1.083   0.54 | 4.167  9.25 | 7.250  3.81 | 10.33  0.54
         1.167   0.54 | 4.250  9.25 | 7.333  2.18 | 10.42  0.54
         1.250   0.54 | 4.333 25.02 | 7.417  2.18 | 10.50  0.54
         1.333   0.54 | 4.417 25.02 | 7.500  2.18 | 10.58  0.54
         1.417   0.54 | 4.500 25.02 | 7.583  2.18 | 10.67  0.54
         1.500   0.54 | 4.583 25.02 | 7.667  2.18 | 10.75  0.54
         1.583   0.54 | 4.667 25.02 | 7.750  2.18 | 10.83  0.54
         1.667   0.54 | 4.750 25.02 | 7.833  2.18 | 10.92  0.54
         1.750   0.54 | 4.833 25.02 | 7.917  2.18 | 11.00  0.54
         1.833   0.54 | 4.917 25.02 | 8.000  2.18 | 11.08  0.54
         1.917   0.54 | 5.000 25.02 | 8.083  2.18 | 11.17  0.54
         2.000   0.54 | 5.083 25.02 | 8.167  2.18 | 11.25  0.54
         2.083   0.54 | 5.167 25.02 | 8.250  2.18 | 11.33  0.54
         2.167   0.54 | 5.250 25.02 | 8.333  1.09 | 11.42  0.54
         2.250   0.54 | 5.333  7.07 | 8.417  1.09 | 11.50  0.54
         2.333   3.26 | 5.417  7.07 | 8.500  1.09 | 11.58  0.54
         2.417   3.26 | 5.500  7.07 | 8.583  1.09 | 11.67  0.54
         2.500   3.26 | 5.583  7.07 | 8.667  1.09 | 11.75  0.54
```

```
                    2.583   3.26 | 5.667   7.07 | 8.750   1.09 | 11.83   0.54
                    2.667   3.26 | 5.750   7.07 | 8.833   1.09 | 11.92   0.54
                    2.750   3.26 | 5.833   7.07 | 8.917   1.09 | 12.00   0.54
                    2.833   3.26 | 5.917   7.07 | 9.000   1.09 | 12.08   0.54
                    2.917   3.26 | 6.000   7.07 | 9.083   1.09 | 12.17   0.54
                    3.000   3.26 | 6.083   7.07 | 9.167   1.09 | 12.25   0.54
                    3.083   3.26 | 6.167   7.07 | 9.250   1.09 |

   Max.Eff.Inten.(mm/hr)=      25.02        15.31
             over (min)       15.00        25.00
   Storage Coeff.  (min)=     15.48 (ii)   20.48 (ii)
   Unit Hyd. Tpeak (min)=     15.00        25.00
   Unit Hyd. peak  (cms)=      0.07         0.05
                                                      *TOTALS*
   PEAK FLOW       (cms)=      0.12         0.02       0.136 (iii)
   TIME TO PEAK    (hrs)=      5.25         5.33        5.25
   RUNOFF VOLUME   (mm)=      52.38        24.05       45.86
   TOTAL RAINFALL  (mm)=      54.38        54.38       54.38
   RUNOFF COEFFICIENT  =       0.96         0.44        0.84


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0    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 ( 0405)|
|   1 + 2 = 3    |       AREA    QPEAK    TPEAK    R.V.
--------------------       (ha)   (cms)    (hrs)    (mm)
        ID1= 1 ( 0125):    2.27   0.136    5.25    45.86
      + ID2= 2 ( 0130):    2.08   0.129    5.25    47.28
                        ======================================
        ID = 3 ( 0405):    4.35   0.265    5.25    46.54

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------
--------------------
| RESERVOIR( 0505)|    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   |  0.2110    0.0383
                       0.0185    0.0030   |  0.2743    0.0515
                       0.0302    0.0120   |  0.3250    0.0792
                       0.1102    0.0251   |  0.0000    0.0000

                         AREA    QPEAK    TPEAK     R.V.
                         (ha)    (cms)    (hrs)     (mm)
   INFLOW : ID= 2 ( 0405)   4.350    0.265    5.25    46.54
```

```
   OUTFLOW: ID= 1 ( 0505)    4.350    0.227    5.42    46.53

                PEAK  FLOW  REDUCTION [Qout/Qin](%)= 85.84
                TIME SHIFT OF PEAK FLOW      (min)= 10.00
                MAXIMUM STORAGE   USED     (ha.m.)= 0.0417
-----------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0120)|   Area   (ha)= 1.24
|ID= 1 DT= 5.0 min |   Total Imp(%)= 73.00  Dir. Conn.(%)= 73.00
--------------------
                              IMPERVIOUS   PERVIOUS (i)
   Surface Area    (ha)=        0.91        0.33
   Dep. Storage    (mm)=        2.00        5.00
   Average Slope   (%)=         1.00        2.00
   Length          (m)=       475.00       17.00
   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 | 3.167  3.26 | 6.250  7.07 | 9.33   0.54
          0.167  0.00 | 3.250  3.26 | 6.333  3.81 | 9.42   0.54
          0.250  0.00 | 3.333  9.25 | 6.417  3.81 | 9.50   0.54
          0.333  0.54 | 3.417  9.25 | 6.500  3.81 | 9.58   0.54
          0.417  0.54 | 3.500  9.25 | 6.583  3.81 | 9.67   0.54
          0.500  0.54 | 3.583  9.25 | 6.667  3.81 | 9.75   0.54
          0.583  0.54 | 3.667  9.25 | 6.750  3.81 | 9.83   0.54
          0.667  0.54 | 3.750  9.25 | 6.833  3.81 | 9.92   0.54
          0.750  0.54 | 3.833  9.25 | 6.917  3.81 | 10.00  0.54
          0.833  0.54 | 3.917  9.25 | 7.000  3.81 | 10.08  0.54
          0.917  0.54 | 4.000  9.25 | 7.083  3.81 | 10.17  0.54
          1.000  0.54 | 4.083  9.25 | 7.167  3.81 | 10.25  0.54
          1.083  0.54 | 4.167  9.25 | 7.250  3.81 | 10.33  0.54
          1.167  0.54 | 4.250  9.25 | 7.333  2.18 | 10.42  0.54
          1.250  0.54 | 4.333  25.02 | 7.417  2.18 | 10.50  0.54
          1.333  0.54 | 4.417  25.02 | 7.500  2.18 | 10.58  0.54
          1.417  0.54 | 4.500  25.02 | 7.583  2.18 | 10.67  0.54
          1.500  0.54 | 4.583  25.02 | 7.667  2.18 | 10.75  0.54
          1.583  0.54 | 4.667  25.02 | 7.750  2.18 | 10.83  0.54
          1.667  0.54 | 4.750  25.02 | 7.833  2.18 | 10.92  0.54
          1.750  0.54 | 4.833  25.02 | 7.917  2.18 | 11.00  0.54
          1.833  0.54 | 4.917  25.02 | 8.000  2.18 | 11.08  0.54
          1.917  0.54 | 5.000  25.02 | 8.083  2.18 | 11.17  0.54
          2.000  0.54 | 5.083  25.02 | 8.167  2.18 | 11.25  0.54
          2.083  0.54 | 5.167  25.02 | 8.250  2.18 | 11.33  0.54
          2.167  0.54 | 5.250  25.02 | 8.333  1.09 | 11.42  0.54
          2.250  0.54 | 5.333  7.07 | 8.417  1.09 | 11.50  0.54
          2.333  3.26 | 5.417  7.07 | 8.500  1.09 | 11.58  0.54
```

```
                    2.417   3.26 | 5.500   7.07 | 8.583   1.09 | 11.67   0.54
                    2.500   3.26 | 5.583   7.07 | 8.667   1.09 | 11.75   0.54
                    2.583   3.26 | 5.667   7.07 | 8.750   1.09 | 11.83   0.54
                    2.667   3.26 | 5.750   7.07 | 8.833   1.09 | 11.92   0.54
                    2.750   3.26 | 5.833   7.07 | 8.917   1.09 | 12.00   0.54
                    2.833   3.26 | 5.917   7.07 | 9.000   1.09 | 12.08   0.54
                    2.917   3.26 | 6.000   7.07 | 9.083   1.09 | 12.17   0.54
                    3.000   3.26 | 6.083   7.07 | 9.167   1.09 | 12.25   0.54
                    3.083   3.26 | 6.167   7.07 | 9.250   1.09 |

   Max.Eff.Inten.(mm/hr)=      25.02        15.31
             over (min)       10.00        20.00
   Storage Coeff.  (min)=     11.33 (ii)   16.26 (ii)
   Unit Hyd. Tpeak (min)=     10.00        20.00
   Unit Hyd. peak  (cms)=      0.10         0.06
                                                      *TOTALS*
   PEAK FLOW       (cms)=      0.06         0.01       0.074 (iii)
   TIME TO PEAK    (hrs)=      5.25         5.33        5.25
   RUNOFF VOLUME   (mm)=      52.38        24.05       44.72
   TOTAL RAINFALL  (mm)=      54.38        54.38       54.38
   RUNOFF COEFFICIENT  =       0.96         0.44        0.82


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0    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 ( 0115)|   Area   (ha)= 1.00
|ID= 1 DT= 5.0 min |   Total Imp(%)= 63.00  Dir. Conn.(%)= 63.00
--------------------
                              IMPERVIOUS   PERVIOUS (i)
   Surface Area    (ha)=        0.63        0.37
   Dep. Storage    (mm)=        2.00        5.00
   Average Slope   (%)=         1.00        2.00
   Length          (m)=       475.00       17.00
   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 | 3.167  3.26 | 6.250  7.07 | 9.33   0.54
          0.167  0.00 | 3.250  3.26 | 6.333  3.81 | 9.42   0.54
          0.250  0.00 | 3.333  9.25 | 6.417  3.81 | 9.50   0.54
          0.333  0.54 | 3.417  9.25 | 6.500  3.81 | 9.58   0.54
          0.417  0.54 | 3.500  9.25 | 6.583  3.81 | 9.67   0.54
```

```
                    0.500   0.54 | 3.583  9.25 | 6.667  3.81 | 9.75   0.54
                    0.583   0.54 | 3.667  9.25 | 6.750  3.81 | 9.83   0.54
                    0.667   0.54 | 3.750  9.25 | 6.833  3.81 | 9.92   0.54
                    0.750   0.54 | 3.833  9.25 | 6.917  3.81 | 10.00  0.54
                    0.833   0.54 | 3.917  9.25 | 7.000  3.81 | 10.08  0.54
                    0.917   0.54 | 4.000  9.25 | 7.083  3.81 | 10.17  0.54
                    1.000   0.54 | 4.083  9.25 | 7.167  3.81 | 10.25  0.54
                    1.083   0.54 | 4.167  9.25 | 7.250  3.81 | 10.33  0.54
                    1.167   0.54 | 4.250  9.25 | 7.333  2.18 | 10.42  0.54
                    1.250   0.54 | 4.333  25.02 | 7.417  2.18 | 10.50  0.54
                    1.333   0.54 | 4.417  25.02 | 7.500  2.18 | 10.58  0.54
                    1.417   0.54 | 4.500  25.02 | 7.583  2.18 | 10.67  0.54
                    1.500   0.54 | 4.583  25.02 | 7.667  2.18 | 10.75  0.54
                    1.583   0.54 | 4.667  25.02 | 7.750  2.18 | 10.83  0.54
                    1.667   0.54 | 4.750  25.02 | 7.833  2.18 | 10.92  0.54
                    1.750   0.54 | 4.833  25.02 | 7.917  2.18 | 11.00  0.54
                    1.833   0.54 | 4.917  25.02 | 8.000  2.18 | 11.08  0.54
                    1.917   0.54 | 5.000  25.02 | 8.083  2.18 | 11.17  0.54
                    2.000   0.54 | 5.083  25.02 | 8.167  2.18 | 11.25  0.54
                    2.083   0.54 | 5.167  25.02 | 8.250  2.18 | 11.33  0.54
                    2.167   0.54 | 5.250  25.02 | 8.333  1.09 | 11.42  0.54
                    2.250   0.54 | 5.333  7.07 | 8.417  1.09 | 11.50  0.54
                    2.333   3.26 | 5.417  7.07 | 8.500  1.09 | 11.58  0.54
                    2.417   3.26 | 5.500  7.07 | 8.583  1.09 | 11.67  0.54
                    2.500   3.26 | 5.583  7.07 | 8.667  1.09 | 11.75  0.54
                    2.583   3.26 | 5.667  7.07 | 8.750  1.09 | 11.83  0.54
                    2.667   3.26 | 5.750  7.07 | 8.833  1.09 | 11.92  0.54
                    2.750   3.26 | 5.833  7.07 | 8.917  1.09 | 12.00  0.54
                    2.833   3.26 | 5.917  7.07 | 9.000  1.09 | 12.08  0.54
                    2.917   3.26 | 6.000  7.07 | 9.083  1.09 | 12.17  0.54
                    3.000   3.26 | 6.083  7.07 | 9.167  1.09 | 12.25  0.54
                    3.083   3.26 | 6.167  7.07 | 9.250  1.09 |

   Max.Eff.Inten.(mm/hr)=      25.02        15.31
             over (min)       10.00        25.00
   Storage Coeff.  (min)=     11.33 (ii)   20.27 (ii)
   Unit Hyd. Tpeak (min)=     10.00        25.00
   Unit Hyd. peak  (cms)=      0.10         0.05
                                                      *TOTALS*
   PEAK FLOW       (cms)=      0.04         0.01       0.055 (iii)
   TIME TO PEAK    (hrs)=      5.25         5.33        5.25
   RUNOFF VOLUME   (mm)=      52.38        24.05       41.89
   TOTAL RAINFALL  (mm)=      54.38        54.38       54.38
   RUNOFF COEFFICIENT  =       0.96         0.44        0.77


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0    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 ( 0410)|
|  1 + 2 = 3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 ( 0115):    1.00    0.055    5.25    41.89
      + ID2= 2 ( 0120):    1.24    0.074    5.25    44.72
                        ====================================
         ID = 3 ( 0410):    2.24    0.130    5.25    43.46

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------------
--------------------
| RESERVOIR( 0510)|   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   |  0.0699    0.0309
                      0.0264    0.0024   |  0.0792    0.0414
                      0.0457    0.0099   |  0.0876    0.0666
                      0.0590    0.0204   |  0.0000    0.0000

                        AREA    QPEAK    TPEAK     R.V.
                        (ha)    (cms)    (hrs)     (mm)
   INFLOW : ID= 2 ( 0410)    2.240    0.130    5.25    43.46
   OUTFLOW: ID= 1 ( 0510)    2.240    0.067    5.58    43.45

           PEAK   FLOW   REDUCTION [Qout/Qin](%)= 51.77
           TIME SHIFT OF PEAK FLOW      (min)= 20.00
           MAXIMUM STORAGE   USED   (ha.m.)= 0.0283
-----------------------------------------------------------------------------
--------------------
| ADD HYD ( 0420)|
|  1 + 2 = 3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 ( 0505):    4.35    0.227    5.42    46.53
      + ID2= 2 ( 0510):    2.24    0.067    5.58    43.45
                        ====================================
         ID = 3 ( 0420):    6.59    0.293    5.42    45.48

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0110)|   Area   (ha)=  1.58
|ID= 1 DT= 5.0 min |   Total Imp(%)= 70.00   Dir. Conn.(%)= 70.00
--------------------
                        IMPERVIOUS    PERVIOUS (i)
   Surface Area   (ha)=    1.11         0.47
   Dep. Storage   (mm)=    2.00         5.00
   Average Slope  (%)=    1.00         2.00
```

```
Length        (m)=  650.00        25.00
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	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

```
Max.Eff.Inten.(mm/hr)=     25.02         16.14
            over (min)     15.00         25.00
Storage Coeff.  (min)=   13.67 (ii)    24.71 (ii)
Unit Hyd. Tpeak (min)=     15.00         25.00
Unit Hyd. peak  (cms)=      0.08          0.05
                                        *TOTALS*
```

```
PEAK FLOW      (cms)=     0.08       0.02      0.091 (iii)
TIME TO PEAK   (hrs)=     5.25       5.42      5.25
RUNOFF VOLUME  (mm)=     52.38      25.88     44.42
TOTAL RAINFALL (mm)=     54.38      54.38     54.38
RUNOFF COEFFICIENT  =     0.96       0.48      0.82


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 85.0   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( 0525)|   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   |  0.0181    0.0161
                      0.0081    0.0031   |  0.0584    0.0204
                      0.0123    0.0074   |  0.0920    0.0259
                      0.0155    0.0118   |  0.0000    0.0000

                        AREA    QPEAK    TPEAK     R.V.
                        (ha)    (cms)    (hrs)     (mm)
   INFLOW : ID= 2 ( 0110)    1.580    0.091    5.25    44.42
   OUTFLOW: ID= 1 ( 0525)    1.580    0.073    5.50    44.37

           PEAK   FLOW   REDUCTION [Qout/Qin](%)= 79.32
           TIME SHIFT OF PEAK FLOW      (min)= 15.00
           MAXIMUM STORAGE   USED   (ha.m.)= 0.0228
-----------------------------------------------------------------------------
*******************************
** SIMULATION:Run 06       **
*******************************

--------------------
| READ STORM    |   Filename: C:\Users\ray.zhao\AppD
|               |            ata\Local\Temp\
|               |            efddf5d6-df0e-43ba-b139-2f589a28109d\1f25e1d6
| Ptotal= 62.71 mm |   Comments: 10Y12
--------------------
```

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.25	0.00	3.50	10.66	6.75	4.39	10.00	0.63
0.50	0.63	3.75	10.66	7.00	4.39	10.25	0.63
0.75	0.63	4.00	10.66	7.25	4.39	10.50	0.63
1.00	0.63	4.25	10.66	7.50	2.51	10.75	0.63
1.25	0.63	4.50	28.84	7.75	2.51	11.00	0.63
1.50	0.63	4.75	28.84	8.00	2.51	11.25	0.63
1.75	0.63	5.00	28.84	8.25	2.51	11.50	0.63

2.00	0.63	5.25	28.84	8.50	1.25	11.75	0.63
2.25	0.63	5.50	8.15	8.75	1.25	12.00	0.63
2.50	3.76	5.75	8.15	9.00	1.25	12.25	0.63
2.75	3.76	6.00	8.15	9.25	1.25		
3.00	3.76	6.25	8.15	9.50	0.63		
3.25	3.76	6.50	4.39	9.75	0.63		

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-----------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0105)|   Area   (ha)=  1.63
|ID= 1 DT= 5.0 min |   Total Imp(%)= 69.00   Dir. Conn.(%)= 69.00
--------------------
                        IMPERVIOUS    PERVIOUS (i)
   Surface Area   (ha)=    1.12         0.51
   Dep. Storage   (mm)=    2.00         5.00
   Average Slope  (%)=    1.00         2.00
   Length        (m)=  650.00        25.00
   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	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63

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                    LangstaffRd_EA_Proposed_HumberWatershed
          2.250   0.63 | 5.333   8.15 | 8.417   1.25 | 11.50   0.63
          2.333   3.76 | 5.417   8.15 | 8.583   1.25 | 11.58   0.63
          2.417   3.76 | 5.500   8.15 | 8.583   1.25 | 11.67   0.63
          2.500   3.76 | 5.583   8.15 | 8.667   1.25 | 11.75   0.63
          2.583   3.76 | 5.667   8.15 | 8.750   1.25 | 11.83   0.63
          2.667   3.76 | 5.750   8.15 | 8.833   1.25 | 11.92   0.63
          2.750   3.76 | 5.833   8.15 | 8.917   1.25 | 12.00   0.63
          2.833   3.76 | 5.917   8.15 | 9.000   1.25 | 12.08   0.63
          2.917   3.76 | 6.000   8.15 | 9.083   1.25 | 12.17   0.63
          3.000   3.76 | 6.083   8.15 | 9.167   1.25 | 12.25   0.63
          3.083   3.76 | 6.167   8.15 | 9.250   1.25 |

     Max.Eff.Inten.(mm/hr)=       28.84        20.82
              over (min)          15.00        25.00
     Storage Coeff.  (min)=    12.91 (ii)   22.89 (ii)
     Unit Hyd. Tpeak (min)=       15.00        25.00
     Unit Hyd. peak  (cms)=        0.08         0.05
                                                           *TOTALS*
     PEAK FLOW       (cms)=        0.09         0.02      0.111 (iii)
     TIME TO PEAK   (hrs)=         5.25         5.33       5.25
     RUNOFF VOLUME   (mm)=        60.71        33.62      52.30
     TOTAL RAINFALL  (mm)=        62.71        62.71      62.71
     RUNOFF COEFFICIENT  =         0.97         0.54       0.83


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 86.0   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( 0520)|    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   |   0.0181     0.0161
                        0.0081     0.0031   |   0.0584     0.0204
                        0.0123     0.0074   |   0.0920     0.0259
                        0.0155     0.0118   |   0.0000     0.0000
                                   AREA    QPEAK     TPEAK      R.V.
                                   (ha)    (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (  0105)       1.630    0.111     5.25      52.30
     OUTFLOW: ID= 1 (  0520)       1.630    0.091     5.42      52.25

                 PEAK  FLOW   REDUCTION [Qout/Qin](%)= 81.20
                 TIME SHIFT OF PEAK FLOW       (min)= 10.00
                 MAXIMUM  STORAGE   USED   (ha.m.)= 0.0257

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                              Page 25
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                    LangstaffRd_EA_Proposed_HumberWatershed
| CALIB            |
| STANDHYD ( 0130)|   Area   (ha)=   2.08
|ID= 1 DT= 5.0 min |   Total Imp(%)= 82.00   Dir. Conn.(%)= 82.00
 --------------------
                            IMPERVIOUS    PERVIOUS (i)
      Surface Area  (ha)=      1.71          0.37
      Dep. Storage  (mm)=      2.00          5.00
      Average Slope (%)=       1.00          2.00
      Length        (m)=     800.00         20.00
      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 | 3.167  3.76 | 6.250  8.15 | 9.33   0.63
              0.167   0.00 | 3.250  3.76 | 6.333  4.39 | 9.42   0.63
              0.250   0.00 | 3.333 10.66 | 6.417  4.39 | 9.50   0.63
              0.333   0.63 | 3.417 10.66 | 6.500  4.39 | 9.58   0.63
              0.417   0.63 | 3.500 10.66 | 6.583  4.39 | 9.67   0.63
              0.500   0.63 | 3.583 10.66 | 6.667  4.39 | 9.75   0.63
              0.583   0.63 | 3.667 10.66 | 6.750  4.39 | 9.83   0.63
              0.667   0.63 | 3.750 10.66 | 6.833  4.39 | 9.92   0.63
              0.750   0.63 | 3.833 10.66 | 6.917  4.39 | 10.00  0.63
              0.833   0.63 | 3.917 10.66 | 7.000  4.39 | 10.08  0.63
              0.917   0.63 | 4.000 10.66 | 7.083  4.39 | 10.17  0.63
              1.000   0.63 | 4.083 10.66 | 7.167  4.39 | 10.25  0.63
              1.083   0.63 | 4.167 10.66 | 7.250  4.39 | 10.33  0.63
              1.167   0.63 | 4.250 10.66 | 7.333  2.51 | 10.42  0.63
              1.250   0.63 | 4.333 28.84 | 7.417  2.51 | 10.50  0.63
              1.333   0.63 | 4.417 28.84 | 7.500  2.51 | 10.58  0.63
              1.417   0.63 | 4.500 28.84 | 7.583  2.51 | 10.67  0.63
              1.500   0.63 | 4.583 28.84 | 7.667  2.51 | 10.75  0.63
              1.583   0.63 | 4.667 28.84 | 7.750  2.51 | 10.83  0.63
              1.667   0.63 | 4.750 28.84 | 7.833  2.51 | 10.92  0.63
              1.750   0.63 | 4.833 28.84 | 7.917  2.51 | 11.00  0.63
              1.833   0.63 | 4.917 28.84 | 8.000  2.51 | 11.08  0.63
              1.917   0.63 | 5.000 28.84 | 8.083  2.51 | 11.17  0.63
              2.000   0.63 | 5.083 28.84 | 8.167  2.51 | 11.25  0.63
              2.083   0.63 | 5.167 28.84 | 8.250  2.51 | 11.33  0.63
              2.167   0.63 | 5.250 28.84 | 8.333  1.25 | 11.42  0.63
              2.250   0.63 | 5.333  8.15 | 8.417  1.25 | 11.50  0.63
              2.333   3.76 | 5.417  8.15 | 8.500  1.25 | 11.58  0.63
              2.417   3.76 | 5.500  8.15 | 8.583  1.25 | 11.67  0.63
              2.500   3.76 | 5.583  8.15 | 8.667  1.25 | 11.75  0.63
              2.583   3.76 | 5.667  8.15 | 8.750  1.25 | 11.83  0.63
              2.667   3.76 | 5.750  8.15 | 8.833  1.25 | 11.92  0.63
              2.750   3.76 | 5.833  8.15 | 8.917  1.25 | 12.00  0.63
              2.833   3.76 | 5.917  8.15 | 9.000  1.25 | 12.08  0.63
              2.917   3.76 | 6.000  8.15 | 9.083  1.25 | 12.17  0.63
              3.000   3.76 | 6.083  8.15 | 9.167  1.25 | 12.25  0.63

                              Page 26
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                    LangstaffRd_EA_Proposed_HumberWatershed
          3.083   3.76 | 6.167   8.15 | 9.250   1.25 |

     Max.Eff.Inten.(mm/hr)=       28.84        19.01
              over (min)          15.00        20.00
     Storage Coeff.  (min)=    14.63 (ii)   18.80 (ii)
     Unit Hyd. Tpeak (min)=       15.00        20.00
     Unit Hyd. peak  (cms)=        0.08         0.06
                                                           *TOTALS*
     PEAK FLOW       (cms)=        0.13         0.02      0.151 (iii)
     TIME TO PEAK   (hrs)=         5.25         5.33       5.25
     RUNOFF VOLUME   (mm)=        60.71        30.35      55.24
     TOTAL RAINFALL  (mm)=        62.71        62.71      62.71
     RUNOFF COEFFICIENT  =         0.97         0.48       0.88


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0   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 ( 0125)|   Area   (ha)=   2.27
|ID= 1 DT= 5.0 min |   Total Imp(%)= 77.00   Dir. Conn.(%)= 77.00
 --------------------
                            IMPERVIOUS    PERVIOUS (i)
      Surface Area  (ha)=      1.75          0.52
      Dep. Storage  (mm)=      2.00          5.00
      Average Slope (%)=       1.00          2.00
      Length        (m)=     800.00         20.00
      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 | 3.167  3.76 | 6.250  8.15 | 9.33   0.63
              0.167   0.00 | 3.250  3.76 | 6.333  4.39 | 9.42   0.63
              0.250   0.00 | 3.333 10.66 | 6.417  4.39 | 9.50   0.63
              0.333   0.63 | 3.417 10.66 | 6.500  4.39 | 9.58   0.63
              0.417   0.63 | 3.500 10.66 | 6.583  4.39 | 9.67   0.63
              0.500   0.63 | 3.583 10.66 | 6.667  4.39 | 9.75   0.63
              0.583   0.63 | 3.667 10.66 | 6.750  4.39 | 9.83   0.63
              0.667   0.63 | 3.750 10.66 | 6.833  4.39 | 9.92   0.63
              0.750   0.63 | 3.833 10.66 | 6.917  4.39 | 10.00  0.63
              0.833   0.63 | 3.917 10.66 | 7.000  4.39 | 10.08  0.63
              0.917   0.63 | 4.000 10.66 | 7.083  4.39 | 10.17  0.63
              1.000   0.63 | 4.083 10.66 | 7.167  4.39 | 10.25  0.63
              1.083   0.63 | 4.167 10.66 | 7.250  4.39 | 10.33  0.63

                              Page 27
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                    LangstaffRd_EA_Proposed_HumberWatershed
              1.167   0.63 | 4.250 10.66 | 7.333  2.51 | 10.42  0.63
              1.250   0.63 | 4.333 28.84 | 7.417  2.51 | 10.50  0.63
              1.333   0.63 | 4.417 28.84 | 7.500  2.51 | 10.58  0.63
              1.417   0.63 | 4.500 28.84 | 7.583  2.51 | 10.67  0.63
              1.500   0.63 | 4.583 28.84 | 7.667  2.51 | 10.75  0.63
              1.583   0.63 | 4.667 28.84 | 7.750  2.51 | 10.83  0.63
              1.667   0.63 | 4.750 28.84 | 7.833  2.51 | 10.92  0.63
              1.750   0.63 | 4.833 28.84 | 7.917  2.51 | 11.00  0.63
              1.833   0.63 | 4.917 28.84 | 8.000  2.51 | 11.08  0.63
              1.917   0.63 | 5.000 28.84 | 8.083  2.51 | 11.17  0.63
              2.000   0.63 | 5.083 28.84 | 8.167  2.51 | 11.25  0.63
              2.083   0.63 | 5.167 28.84 | 8.250  2.51 | 11.33  0.63
              2.167   0.63 | 5.250 28.84 | 8.333  1.25 | 11.42  0.63
              2.250   0.63 | 5.333  8.15 | 8.417  1.25 | 11.50  0.63
              2.333   3.76 | 5.417  8.15 | 8.500  1.25 | 11.58  0.63
              2.417   3.76 | 5.500  8.15 | 8.583  1.25 | 11.67  0.63
              2.500   3.76 | 5.583  8.15 | 8.667  1.25 | 11.75  0.63
              2.583   3.76 | 5.667  8.15 | 8.750  1.25 | 11.83  0.63
              2.667   3.76 | 5.750  8.15 | 8.833  1.25 | 11.92  0.63
              2.750   3.76 | 5.833  8.15 | 8.917  1.25 | 12.00  0.63
              2.833   3.76 | 5.917  8.15 | 9.000  1.25 | 12.08  0.63
              2.917   3.76 | 6.000  8.15 | 9.083  1.25 | 12.17  0.63
              3.000   3.76 | 6.083  8.15 | 9.167  1.25 | 12.25  0.63
              3.083   3.76 | 6.167  8.15 | 9.250  1.25 |

     Max.Eff.Inten.(mm/hr)=       28.84        19.01
              over (min)          15.00        20.00
     Storage Coeff.  (min)=    14.63 (ii)   19.35 (ii)
     Unit Hyd. Tpeak (min)=       15.00        20.00
     Unit Hyd. peak  (cms)=        0.08         0.06
                                                           *TOTALS*
     PEAK FLOW       (cms)=        0.14         0.02      0.160 (iii)
     TIME TO PEAK   (hrs)=         5.25         5.33       5.25
     RUNOFF VOLUME   (mm)=        60.71        30.35      53.72
     TOTAL RAINFALL  (mm)=        62.71        62.71      62.71
     RUNOFF COEFFICIENT  =         0.97         0.48       0.86


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0   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  ( 0405)|
|  1 + 2 = 3      |        AREA    QPEAK    TPEAK     R.V.
 --------------------       (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0125):    2.27    0.160     5.25    53.72
      + ID2= 2 (  0130):    2.08    0.151     5.25    55.24
       ================================================

                              Page 28
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                    LangstaffRd_EA_Proposed_HumberWatershed
      ID = 3 (  0405):    4.35   0.311    5.25    54.45

      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------------
--------------------
| RESERVOIR( 0505)|   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   |  0.2110    0.0383
                       0.0185    0.0030   |  0.2743    0.0515
                       0.0302    0.0120   |  0.3250    0.0792
                       0.1102    0.0251   |  0.0000    0.0000

                             AREA     QPEAK    TPEAK     R.V.
                             (ha)     (cms)    (hrs)     (mm)
       INFLOW : ID= 2 ( 0405)  4.350    0.311    5.25    54.45
       OUTFLOW: ID= 1 ( 0505)  4.350    0.261    5.42    54.44

            PEAK  FLOW  REDUCTION [Qout/Qin](%)= 83.93
            TIME SHIFT OF PEAK FLOW      (min)= 10.00
            MAXIMUM STORAGE   USED   (ha.m.)= 0.0488

---------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0120) |  Area    (ha)=  1.24
|ID= 1 DT= 5.0 min |  Total Imp(%)= 73.00   Dir. Conn.(%)= 73.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
       Surface Area    (ha)=     0.91          0.33
       Dep. Storage    (mm)=     2.00          5.00
       Average Slope   (%)=      1.00          2.00
       Length          (m)=    475.00         17.00
       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 | 3.167  3.76 | 6.250  8.15 | 9.33   0.63
         0.167   0.00 | 3.250  3.76 | 6.333  4.39 | 9.42   0.63
         0.250   0.00 | 3.333 10.66 | 6.417  4.39 | 9.50   0.63
         0.333   0.63 | 3.417 10.66 | 6.500  4.39 | 9.58   0.63
         0.417   0.63 | 3.500 10.66 | 6.583  4.39 | 9.67   0.63
         0.500   0.63 | 3.583 10.66 | 6.667  4.39 | 9.75   0.63
         0.583   0.63 | 3.667 10.66 | 6.750  4.39 | 9.83   0.63
         0.667   0.63 | 3.750 10.66 | 6.833  4.39 | 9.92   0.63
         0.750   0.63 | 3.833 10.66 | 6.917  4.39 |10.00   0.63
         0.833   0.63 | 3.917 10.66 | 7.000  4.39 |10.08   0.63
         0.917   0.63 | 4.000 10.66 | 7.083  4.39 |10.17   0.63

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                    LangstaffRd_EA_Proposed_HumberWatershed
         1.000   0.63 | 4.083 10.66 | 7.167  4.39 |10.25   0.63
         1.083   0.63 | 4.167 10.66 | 7.250  4.39 |10.33   0.63
         1.167   0.63 | 4.250 10.66 | 7.333  2.51 |10.42   0.63
         1.250   0.63 | 4.333 28.84 | 7.417  2.51 |10.50   0.63
         1.333   0.63 | 4.417 28.84 | 7.500  2.51 |10.58   0.63
         1.417   0.63 | 4.500 28.84 | 7.583  2.51 |10.67   0.63
         1.500   0.63 | 4.583 28.84 | 7.667  2.51 |10.75   0.63
         1.583   0.63 | 4.667 28.84 | 7.750  2.51 |10.83   0.63
         1.667   0.63 | 4.750 28.84 | 7.833  2.51 |10.92   0.63
         1.750   0.63 | 4.833 28.84 | 7.917  2.51 |11.00   0.63
         1.833   0.63 | 4.917 28.84 | 8.000  2.51 |11.08   0.63
         1.917   0.63 | 5.000 28.84 | 8.083  2.51 |11.17   0.63
         2.000   0.63 | 5.083 28.84 | 8.167  2.51 |11.25   0.63
         2.083   0.63 | 5.167 28.84 | 8.250  2.51 |11.33   0.63
         2.167   0.63 | 5.250 28.84 | 8.333  1.25 |11.42   0.63
         2.250   0.63 | 5.333  8.15 | 8.417  1.25 |11.50   0.63
         2.333   3.76 | 5.417  8.15 | 8.500  1.25 |11.58   0.63
         2.417   3.76 | 5.500  8.15 | 8.583  1.25 |11.67   0.63
         2.500   3.76 | 5.583  8.15 | 8.667  1.25 |11.75   0.63
         2.583   3.76 | 5.667  8.15 | 8.750  1.25 |11.83   0.63
         2.667   3.76 | 5.750  8.15 | 8.833  1.25 |11.92   0.63
         2.750   3.76 | 5.833  8.15 | 8.917  1.25 |12.00   0.63
         2.833   3.76 | 5.917  8.15 | 9.000  1.25 |12.08   0.63
         2.917   3.76 | 6.000  8.15 | 9.083  1.25 |12.17   0.63
         3.000   3.76 | 6.083  8.15 | 9.167  1.25 |12.25   0.63
         3.083   3.76 | 6.167  8.15 | 9.250  1.25 |

       Max.Eff.Inten.(mm/hr)=    28.84        19.01
              over (min)         10.00        20.00
       Storage Coeff. (min)=     10.70 (ii)   15.37 (ii)
       Unit Hyd. Tpeak (min)=    10.00        20.00
       Unit Hyd. peak  (cms)=     0.11         0.07
                                                     *TOTALS*
       PEAK FLOW      (cms)=      0.07         0.02      0.087 (iii)
       TIME TO PEAK   (hrs)=      5.25         5.33      5.25
       RUNOFF VOLUME   (mm)=     60.71        30.35     52.51
       TOTAL RAINFALL  (mm)=     62.71        62.71     62.71
       RUNOFF COEFFICIENT =       0.97         0.48      0.84

           (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
               CN* = 83.0   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 ( 0115) |  Area    (ha)=  1.00
|ID= 1 DT= 5.0 min |  Total Imp(%)= 63.00   Dir. Conn.(%)= 63.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)

                               Page 30
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                    LangstaffRd_EA_Proposed_HumberWatershed
       Surface Area    (ha)=     0.63          0.37
       Dep. Storage    (mm)=     2.00          5.00
       Average Slope   (%)=      1.00          2.00
       Length          (m)=    475.00         17.00
       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 | 3.167  3.76 | 6.250  8.15 | 9.33   0.63
         0.167   0.00 | 3.250  3.76 | 6.333  4.39 | 9.42   0.63
         0.250   0.00 | 3.333 10.66 | 6.417  4.39 | 9.50   0.63
         0.333   0.63 | 3.417 10.66 | 6.500  4.39 | 9.58   0.63
         0.417   0.63 | 3.500 10.66 | 6.583  4.39 | 9.67   0.63
         0.500   0.63 | 3.583 10.66 | 6.667  4.39 | 9.75   0.63
         0.583   0.63 | 3.667 10.66 | 6.750  4.39 | 9.83   0.63
         0.667   0.63 | 3.750 10.66 | 6.833  4.39 | 9.92   0.63
         0.750   0.63 | 3.833 10.66 | 6.917  4.39 |10.00   0.63
         0.833   0.63 | 3.917 10.66 | 7.000  4.39 |10.08   0.63
         0.917   0.63 | 4.000 10.66 | 7.083  4.39 |10.17   0.63
         1.000   0.63 | 4.083 10.66 | 7.167  4.39 |10.25   0.63
         1.083   0.63 | 4.167 10.66 | 7.250  4.39 |10.33   0.63
         1.167   0.63 | 4.250 10.66 | 7.333  2.51 |10.42   0.63
         1.250   0.63 | 4.333 28.84 | 7.417  2.51 |10.50   0.63
         1.333   0.63 | 4.417 28.84 | 7.500  2.51 |10.58   0.63
         1.417   0.63 | 4.500 28.84 | 7.583  2.51 |10.67   0.63
         1.500   0.63 | 4.583 28.84 | 7.667  2.51 |10.75   0.63
         1.583   0.63 | 4.667 28.84 | 7.750  2.51 |10.83   0.63
         1.667   0.63 | 4.750 28.84 | 7.833  2.51 |10.92   0.63
         1.750   0.63 | 4.833 28.84 | 7.917  2.51 |11.00   0.63
         1.833   0.63 | 4.917 28.84 | 8.000  2.51 |11.08   0.63
         1.917   0.63 | 5.000 28.84 | 8.083  2.51 |11.17   0.63
         2.000   0.63 | 5.083 28.84 | 8.167  2.51 |11.25   0.63
         2.083   0.63 | 5.167 28.84 | 8.250  2.51 |11.33   0.63
         2.167   0.63 | 5.250 28.84 | 8.333  1.25 |11.42   0.63
         2.250   0.63 | 5.333  8.15 | 8.417  1.25 |11.50   0.63
         2.333   3.76 | 5.417  8.15 | 8.500  1.25 |11.58   0.63
         2.417   3.76 | 5.500  8.15 | 8.583  1.25 |11.67   0.63
         2.500   3.76 | 5.583  8.15 | 8.667  1.25 |11.75   0.63
         2.583   3.76 | 5.667  8.15 | 8.750  1.25 |11.83   0.63
         2.667   3.76 | 5.750  8.15 | 8.833  1.25 |11.92   0.63
         2.750   3.76 | 5.833  8.15 | 8.917  1.25 |12.00   0.63
         2.833   3.76 | 5.917  8.15 | 9.000  1.25 |12.08   0.63
         2.917   3.76 | 6.000  8.15 | 9.083  1.25 |12.17   0.63
         3.000   3.76 | 6.083  8.15 | 9.167  1.25 |12.25   0.63
         3.083   3.76 | 6.167  8.15 | 9.250  1.25 |

       Max.Eff.Inten.(mm/hr)=    28.84        19.01
              over (min)         10.00        20.00
       Storage Coeff. (min)=     10.70 (ii)   18.90 (ii)

                               Page 31
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                    LangstaffRd_EA_Proposed_HumberWatershed
       Unit Hyd. Tpeak (min)=    10.00        20.00
       Unit Hyd. peak  (cms)=     0.11         0.06
                                                     *TOTALS*
       PEAK FLOW      (cms)=      0.05         0.02      0.066 (iii)
       TIME TO PEAK   (hrs)=      5.25         5.33      5.25
       RUNOFF VOLUME   (mm)=     60.71        30.35     49.47
       TOTAL RAINFALL  (mm)=     62.71        62.71     62.71
       RUNOFF COEFFICIENT =       0.97         0.48      0.79

           (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
               CN* = 83.0   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 ( 0410)  |
|  1 + 2 = 3       |       AREA    QPEAK   TPEAK    R.V.
--------------------       (ha)    (cms)   (hrs)    (mm)
       ID1= 1 ( 0115):     1.00    0.066    5.25    49.47
     + ID2= 2 ( 0120):     1.24    0.087    5.25    52.51
       ===================================================
       ID = 3 ( 0410):     2.24    0.154    5.25    51.15

      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------------
--------------------
| RESERVOIR( 0510)|   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   |  0.0699    0.0309
                       0.0264    0.0024   |  0.0792    0.0414
                       0.0457    0.0099   |  0.0876    0.0666
                       0.0590    0.0204   |  0.0000    0.0000

                             AREA     QPEAK    TPEAK     R.V.
                             (ha)     (cms)    (hrs)     (mm)
       INFLOW : ID= 2 ( 0410)  2.240    0.154    5.25    51.15
       OUTFLOW: ID= 1 ( 0510)  2.240    0.074    5.58    51.14

            PEAK  FLOW  REDUCTION [Qout/Qin](%)= 48.52
            TIME SHIFT OF PEAK FLOW      (min)= 20.00
            MAXIMUM STORAGE   USED   (ha.m.)= 0.0361

---------------------------------------------------------------------------
--------------------
| ADD HYD ( 0420)  |
|  1 + 2 = 3       |       AREA    QPEAK   TPEAK    R.V.

                               Page 32
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```
                    LangstaffRd_EA_Proposed_HumberWatershed
--------------------          (ha)    (cms)    (hrs)    (mm)
   ID1= 1 (  0505):    4.35    0.261    5.42    54.44
 + ID2= 2 (  0510):    2.24    0.074    5.58    51.14
   ==================================================
   ID = 3 (  0420):    6.59    0.334    5.42    53.32

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD (  0110)|   Area    (ha)=   1.58
|ID= 1 DT= 5.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area    (ha)=    1.11          0.47
    Dep. Storage    (mm)=    2.00          5.00
    Average Slope   (%)=    1.00          2.00
    Length          (m)=  650.00         25.00
    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| 3.167   3.76| 6.250   8.15| 9.33    0.63
         0.167   0.00| 3.250   3.76| 6.333   4.39| 9.42    0.63
         0.250   0.00| 3.333  10.66| 6.417   4.39| 9.50    0.63
         0.333   0.63| 3.417  10.66| 6.500   4.39| 9.58    0.63
         0.417   0.63| 3.500  10.66| 6.583   4.39| 9.67    0.63
         0.500   0.63| 3.583  10.66| 6.667   4.39| 9.75    0.63
         0.583   0.63| 3.667  10.66| 6.750   4.39| 9.83    0.63
         0.667   0.63| 3.750  10.66| 6.833   4.39| 9.92    0.63
         0.750   0.63| 3.833  10.66| 6.917   4.39|10.00    0.63
         0.833   0.63| 3.917  10.66| 7.000   4.39|10.08    0.63
         0.917   0.63| 4.000  10.66| 7.083   4.39|10.17    0.63
         1.000   0.63| 4.083  10.66| 7.167   4.39|10.25    0.63
         1.083   0.63| 4.167  10.66| 7.250   4.39|10.33    0.63
         1.167   0.63| 4.250  10.66| 7.333   2.51|10.42    0.63
         1.250   0.63| 4.333  28.84| 7.417   2.51|10.50    0.63
         1.333   0.63| 4.417  28.84| 7.500   2.51|10.58    0.63
         1.417   0.63| 4.500  28.84| 7.583   2.51|10.67    0.63
         1.500   0.63| 4.583  28.84| 7.667   2.51|10.75    0.63
         1.583   0.63| 4.667  28.84| 7.750   2.51|10.83    0.63
         1.667   0.63| 4.750  28.84| 7.833   2.51|10.92    0.63
         1.750   0.63| 4.833  28.84| 7.917   2.51|11.00    0.63
         1.833   0.63| 4.917  28.84| 8.000   2.51|11.08    0.63
         1.917   0.63| 5.000  28.84| 8.083   2.51|11.17    0.63
         2.000   0.63| 5.083  28.84| 8.167   2.51|11.25    0.63
         2.083   0.63| 5.167  28.84| 8.250   2.51|11.33    0.63
         2.167   0.63| 5.250  28.84| 8.333   1.25|11.42    0.63
         2.250   0.63| 5.333   8.15| 8.417   1.25|11.50    0.63
                                Page 33
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                    LangstaffRd_EA_Proposed_HumberWatershed
         2.333   3.76| 5.417   8.15| 8.500   1.25|11.58    0.63
         2.417   3.76| 5.500   8.15| 8.583   1.25|11.67    0.63
         2.500   3.76| 5.583   8.15| 8.667   1.25|11.75    0.63
         2.583   3.76| 5.667   8.15| 8.750   1.25|11.83    0.63
         2.667   3.76| 5.750   8.15| 8.833   1.25|11.92    0.63
         2.750   3.76| 5.833   8.15| 8.917   1.25|12.00    0.63
         2.833   3.76| 5.917   8.15| 9.000   1.25|12.08    0.63
         2.917   3.76| 6.000   8.15| 9.083   1.25|12.17    0.63
         3.000   3.76| 6.083   8.15| 9.167   1.25|12.25    0.63
         3.083   3.76| 6.167   8.15| 9.250   1.25|

    Max.Eff.Inten.(mm/hr)=   28.84         19.93
              over (min)=    15.00         25.00
    Storage Coeff.  (min)=   12.91 (ii)    23.06 (ii)
    Unit Hyd. Tpeak (min)=   15.00         25.00
    Unit Hyd. peak  (cms)=    0.08          0.05
                                                       *TOTALS*
    PEAK FLOW       (cms)=    0.09          0.02         0.108 (iii)
    TIME TO PEAK    (hrs)=    5.25          5.33         5.25
    RUNOFF VOLUME   (mm)=    60.71         32.48        52.23
    TOTAL RAINFALL  (mm)=    62.71         62.71        62.71
    RUNOFF COEFFICIENT  =     0.97          0.52         0.83


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  = 85.0   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(  0525)|    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      0.0181    0.0161
                         0.0081    0.0031      0.0584    0.0204
                         0.0123    0.0074      0.0920    0.0259
                         0.0155    0.0118      0.0000    0.0000

                          AREA    QPEAK    TPEAK     R.V.
                          (ha)    (cms)    (hrs)     (mm)
    INFLOW : ID= 2 (  0110)   1.580    0.108    5.25     52.23
    OUTFLOW: ID= 1 (  0525)   1.580    0.087    5.42     52.17

           PEAK  FLOW  REDUCTION [Qout/Qin](%)= 81.13
           TIME SHIFT OF PEAK FLOW     (min)= 10.00
           MAXIMUM  STORAGE   USED    (ha.m.)=  0.0252

---------------------------------------------------------------------------
*******************************
** SIMULATION:Run 08        **
                                Page 34
```

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                    LangstaffRd_EA_Proposed_HumberWatershed
*******************************
--------------------
|   READ STORM     |    Filename: C:\Users\ray.zhao\AppD
|                  |           ata\Local\Temp\
|                  |        efddf5d6-df0e-43ba-b139-2f589a28109d\4f82851c
| Ptotal= 73.10 mm |    Comments: 25Y12
--------------------
         TIME   RAIN | TIME   RAIN |' TIME   RAIN | TIME   RAIN
          hrs   mm/hr|  hrs   mm/hr|  hrs   mm/hr|  hrs   mm/hr
         0.25   0.00| 3.50   12.43| 6.75    5.12|10.00    0.73
         0.50   0.73| 3.75   12.43| 7.00    5.12|10.25    0.73
         0.75   0.73| 4.00   12.43| 7.25    5.12|10.50    0.73
         1.00   0.73| 4.25   12.43| 7.50    2.92|10.75    0.73
         1.25   0.73| 4.50   33.63| 7.75    2.92|11.00    0.73
         1.50   0.73| 4.75   33.63| 8.00    2.92|11.25    0.73
         1.75   0.73| 5.00   33.63| 8.25    2.92|11.50    0.73
         2.00   0.73| 5.25   33.63| 8.50    1.46|11.75    0.73
         2.25   0.73| 5.50    9.50| 8.75    1.46|12.00    0.73
         2.50   4.39| 5.75    9.50| 9.00    1.46|12.25    0.73
         2.75   4.39| 6.00    9.50| 9.25    1.46|
         3.00   4.39| 6.25    9.50| 9.50    0.73|
         3.25   4.39| 6.50    5.12| 9.75    0.73|

---------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD (  0105)|   Area    (ha)=   1.63
|ID= 1 DT= 5.0 min |   Total Imp(%)=  69.00   Dir. Conn.(%)=  69.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area    (ha)=    1.12          0.51
    Dep. Storage    (mm)=    2.00          5.00
    Average Slope   (%)=    1.00          2.00
    Length          (m)=  650.00         25.00
    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| 3.167   4.39| 6.250   9.50| 9.33    0.73
         0.167   0.00| 3.250   4.39| 6.333   5.12| 9.42    0.73
         0.250   0.00| 3.333  12.43| 6.417   5.12| 9.50    0.73
         0.333   0.73| 3.417  12.43| 6.500   5.12| 9.58    0.73
         0.417   0.73| 3.500  12.43| 6.583   5.12| 9.67    0.73
         0.500   0.73| 3.583  12.43| 6.667   5.12| 9.75    0.73
         0.583   0.73| 3.667  12.43| 6.750   5.12| 9.83    0.73
         0.667   0.73| 3.750  12.43| 6.833   5.12| 9.92    0.73
         0.750   0.73| 3.833  12.43| 6.917   5.12|10.00    0.73
                                Page 35
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                    LangstaffRd_EA_Proposed_HumberWatershed
         0.833   0.73| 3.917  12.43| 7.000   5.12|10.08    0.73
         0.917   0.73| 4.000  12.43| 7.083   5.12|10.17    0.73
         1.000   0.73| 4.083  12.43| 7.167   5.12|10.25    0.73
         1.083   0.73| 4.167  12.43| 7.250   5.12|10.33    0.73
         1.167   0.73| 4.250  12.43| 7.333   2.92|10.42    0.73
         1.250   0.73| 4.333  33.63| 7.417   2.92|10.50    0.73
         1.333   0.73| 4.417  33.63| 7.500   2.92|10.58    0.73
         1.417   0.73| 4.500  33.63| 7.583   2.92|10.67    0.73
         1.500   0.73| 4.583  33.63| 7.667   2.92|10.75    0.73
         1.583   0.73| 4.667  33.63| 7.750   2.92|10.83    0.73
         1.667   0.73| 4.750  33.63| 7.833   2.92|10.92    0.73
         1.750   0.73| 4.833  33.63| 7.917   2.92|11.00    0.73
         1.833   0.73| 4.917  33.63| 8.000   2.92|11.08    0.73
         1.917   0.73| 5.000  33.63| 8.083   2.92|11.17    0.73
         2.000   0.73| 5.083  33.63| 8.167   2.92|11.25    0.73
         2.083   0.73| 5.167  33.63| 8.250   2.92|11.33    0.73
         2.167   0.73| 5.250  33.63| 8.333   1.46|11.42    0.73
         2.250   0.73| 5.333   9.50| 8.417   1.46|11.50    0.73
         2.333   4.39| 5.417   9.50| 8.500   1.46|11.58    0.73
         2.417   4.39| 5.500   9.50| 8.583   1.46|11.67    0.73
         2.500   4.39| 5.583   9.50| 8.667   1.46|11.75    0.73
         2.583   4.39| 5.667   9.50| 8.750   1.46|11.83    0.73
         2.667   4.39| 5.750   9.50| 8.833   1.46|11.92    0.73
         2.750   4.39| 5.833   9.50| 8.917   1.46|12.00    0.73
         2.833   4.39| 5.917   9.50| 9.000   1.46|12.08    0.73
         2.917   4.39| 6.000   9.50| 9.083   1.46|12.17    0.73
         3.000   4.39| 6.083   9.50| 9.167   1.46|12.25    0.73
         3.083   4.39| 6.167   9.50| 9.250   1.46|

    Max.Eff.Inten.(mm/hr)=   33.63         25.75
              over (min)=    10.00         25.00
    Storage Coeff.  (min)=   12.14 (ii)    21.31 (ii)
    Unit Hyd. Tpeak (min)=   10.00         25.00
    Unit Hyd. peak  (cms)=    0.10          0.05
                                                       *TOTALS*
    PEAK FLOW       (cms)=    0.10          0.03         0.133 (iii)
    TIME TO PEAK    (hrs)=    5.25          5.33         5.25
    RUNOFF VOLUME   (mm)=    71.10         42.37        62.19
    TOTAL RAINFALL  (mm)=    73.10         73.10        73.10
    RUNOFF COEFFICIENT  =     0.97          0.58         0.85


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  = 86.0   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(  0520)|    OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |    OUTFLOW    STORAGE  | OUTFLOW    STORAGE
                                Page 36
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                         LangstaffRd_EA_Proposed_HumberWatershed
-------------------      (cms)     (ha.m.)  |   (cms)     (ha.m.)
                         0.0000    0.0000   |  0.0181    0.0161
                         0.0081    0.0031   |  0.0584    0.0204
                         0.0123    0.0074   |  0.0920    0.0259
                         0.0155    0.0118   |  0.0000    0.0000
       **** WARNING : STORAGE-DISCHARGE TABLE WAS EXCEEDED.

                              AREA      QPEAK     TPEAK      R.V.
                              (ha)      (cms)     (hrs)      (mm)
    INFLOW : ID= 2 ( 0105)    1.630     0.133     5.25      62.19
    OUTFLOW: ID= 1 ( 0520)    1.630     0.110     5.42      62.13

              PEAK   FLOW   REDUCTION [Qout/Qin](%)= 82.36
              TIME SHIFT OF PEAK FLOW      (min)= 10.00
              MAXIMUM STORAGE   USED    (ha.m.)= 0.0289

-------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD ( 0130) |   Area    (ha)=  2.08
|ID= 1 DT= 5.0 min |   Total Imp(%)= 82.00   Dir. Conn.(%)= 82.00
-------------------
                                 IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=         1.71          0.37
       Dep. Storage   (mm)=         2.00          5.00
       Average Slope   (%)=         1.00          2.00
       Length          (m)=       800.00         20.00
       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 | 3.167   4.39 | 6.250   9.50 | 9.33    0.73
       0.167   0.00 | 3.250   4.39 | 6.333   5.12 | 9.42    0.73
       0.250   0.00 | 3.333  12.43 | 6.417   5.12 | 9.50    0.73
       0.333   0.73 | 3.417  12.43 | 6.500   5.12 | 9.58    0.73
       0.417   0.73 | 3.500  12.43 | 6.583   5.12 | 9.67    0.73
       0.500   0.73 | 3.583  12.43 | 6.667   5.12 | 9.75    0.73
       0.583   0.73 | 3.667  12.43 | 6.750   5.12 | 9.83    0.73
       0.667   0.73 | 3.750  12.43 | 6.833   5.12 | 9.92    0.73
       0.750   0.73 | 3.833  12.43 | 6.917   5.12 | 10.00   0.73
       0.833   0.73 | 3.917  12.43 | 7.000   5.12 | 10.08   0.73
       0.917   0.73 | 4.000  12.43 | 7.083   5.12 | 10.17   0.73
       1.000   0.73 | 4.083  12.43 | 7.167   5.12 | 10.25   0.73
       1.083   0.73 | 4.167  12.43 | 7.250   5.12 | 10.33   0.73
       1.167   0.73 | 4.250  12.43 | 7.333   2.92 | 10.42   0.73
       1.250   0.73 | 4.333  33.63 | 7.417   2.92 | 10.50   0.73
       1.333   0.73 | 4.417  33.63 | 7.500   2.92 | 10.58   0.73
       1.417   0.73 | 4.500  33.63 | 7.583   2.92 | 10.67   0.73
       1.500   0.73 | 4.583  33.63 | 7.667   2.92 | 10.75   0.73
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                         LangstaffRd_EA_Proposed_HumberWatershed
       1.583   0.73 | 4.667  33.63 | 7.750   2.92 | 10.83   0.73
       1.667   0.73 | 4.750  33.63 | 7.833   2.92 | 10.92   0.73
       1.750   0.73 | 4.833  33.63 | 7.917   2.92 | 11.00   0.73
       1.833   0.73 | 4.917  33.63 | 8.000   2.92 | 11.08   0.73
       1.917   0.73 | 5.000  33.63 | 8.083   2.92 | 11.17   0.73
       2.000   0.73 | 5.083  33.63 | 8.167   2.92 | 11.25   0.73
       2.083   0.73 | 5.167  33.63 | 8.250   2.92 | 11.33   0.73
       2.167   0.73 | 5.250  33.63 | 8.333   1.46 | 11.42   0.73
       2.250   0.73 | 5.333   9.50 | 8.417   1.46 | 11.50   0.73
       2.333   4.39 | 5.417   9.50 | 8.500   1.46 | 11.58   0.73
       2.417   4.39 | 5.500   9.50 | 8.583   1.46 | 11.67   0.73
       2.500   4.39 | 5.583   9.50 | 8.667   1.46 | 11.75   0.73
       2.583   4.39 | 5.667   9.50 | 8.750   1.46 | 11.83   0.73
       2.667   4.39 | 5.750   9.50 | 8.833   1.46 | 11.92   0.73
       2.750   4.39 | 5.833   9.50 | 8.917   1.46 | 12.00   0.73
       2.833   4.39 | 5.917   9.50 | 9.000   1.46 | 12.08   0.73
       2.917   4.39 | 6.000   9.50 | 9.083   1.46 | 12.17   0.73
       3.000   4.39 | 6.083   9.50 | 9.167   1.46 | 12.25   0.73
       3.083   4.39 | 6.167   9.50 | 9.250   1.46 |

    Max.Eff.Inten.(mm/hr)=       33.63        23.77
               over (min)        15.00        20.00
    Storage Coeff.  (min)=       13.76 (ii)   17.68 (ii)
    Unit Hyd. Tpeak (min)=       15.00        20.00
    Unit Hyd. peak  (cms)=        0.08         0.06
                                                           *TOTALS*
    PEAK FLOW       (cms)=        0.16         0.02        0.178 (iii)
    TIME TO PEAK    (hrs)=        5.25         5.33         5.25
    RUNOFF VOLUME    (mm)=       71.10        38.61        65.25
    TOTAL RAINFALL   (mm)=       73.10        73.10        73.10
    RUNOFF COEFFICIENT  =         0.97         0.53         0.89


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* = 83.0   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 ( 0125) |   Area    (ha)=  2.27
|ID= 1 DT= 5.0 min |   Total Imp(%)= 77.00   Dir. Conn.(%)= 77.00
-------------------
                                 IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=         1.75          0.52
       Dep. Storage   (mm)=         2.00          5.00
       Average Slope   (%)=         1.00          2.00
       Length          (m)=       800.00         20.00
       Mannings n       =          0.013          0.250

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

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                         LangstaffRd_EA_Proposed_HumberWatershed


                      ---- 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   4.39 | 6.250   9.50 | 9.33    0.73
       0.167   0.00 | 3.250   4.39 | 6.333   5.12 | 9.42    0.73
       0.250   0.00 | 3.333  12.43 | 6.417   5.12 | 9.50    0.73
       0.333   0.73 | 3.417  12.43 | 6.500   5.12 | 9.58    0.73
       0.417   0.73 | 3.500  12.43 | 6.583   5.12 | 9.67    0.73
       0.500   0.73 | 3.583  12.43 | 6.667   5.12 | 9.75    0.73
       0.583   0.73 | 3.667  12.43 | 6.750   5.12 | 9.83    0.73
       0.667   0.73 | 3.750  12.43 | 6.833   5.12 | 9.92    0.73
       0.750   0.73 | 3.833  12.43 | 6.917   5.12 | 10.00   0.73
       0.833   0.73 | 3.917  12.43 | 7.000   5.12 | 10.08   0.73
       0.917   0.73 | 4.000  12.43 | 7.083   5.12 | 10.17   0.73
       1.000   0.73 | 4.083  12.43 | 7.167   5.12 | 10.25   0.73
       1.083   0.73 | 4.167  12.43 | 7.250   5.12 | 10.33   0.73
       1.167   0.73 | 4.250  12.43 | 7.333   2.92 | 10.42   0.73
       1.250   0.73 | 4.333  33.63 | 7.417   2.92 | 10.50   0.73
       1.333   0.73 | 4.417  33.63 | 7.500   2.92 | 10.58   0.73
       1.417   0.73 | 4.500  33.63 | 7.583   2.92 | 10.67   0.73
       1.500   0.73 | 4.583  33.63 | 7.667   2.92 | 10.75   0.73
       1.583   0.73 | 4.667  33.63 | 7.750   2.92 | 10.83   0.73
       1.667   0.73 | 4.750  33.63 | 7.833   2.92 | 10.92   0.73
       1.750   0.73 | 4.833  33.63 | 7.917   2.92 | 11.00   0.73
       1.833   0.73 | 4.917  33.63 | 8.000   2.92 | 11.08   0.73
       1.917   0.73 | 5.000  33.63 | 8.083   2.92 | 11.17   0.73
       2.000   0.73 | 5.083  33.63 | 8.167   2.92 | 11.25   0.73
       2.083   0.73 | 5.167  33.63 | 8.250   2.92 | 11.33   0.73
       2.167   0.73 | 5.250  33.63 | 8.333   1.46 | 11.42   0.73
       2.250   0.73 | 5.333   9.50 | 8.417   1.46 | 11.50   0.73
       2.333   4.39 | 5.417   9.50 | 8.500   1.46 | 11.58   0.73
       2.417   4.39 | 5.500   9.50 | 8.583   1.46 | 11.67   0.73
       2.500   4.39 | 5.583   9.50 | 8.667   1.46 | 11.75   0.73
       2.583   4.39 | 5.667   9.50 | 8.750   1.46 | 11.83   0.73
       2.667   4.39 | 5.750   9.50 | 8.833   1.46 | 11.92   0.73
       2.750   4.39 | 5.833   9.50 | 8.917   1.46 | 12.00   0.73
       2.833   4.39 | 5.917   9.50 | 9.000   1.46 | 12.08   0.73
       2.917   4.39 | 6.000   9.50 | 9.083   1.46 | 12.17   0.73
       3.000   4.39 | 6.083   9.50 | 9.167   1.46 | 12.25   0.73
       3.083   4.39 | 6.167   9.50 | 9.250   1.46 |

    Max.Eff.Inten.(mm/hr)=       33.63        23.77
               over (min)        15.00        20.00
    Storage Coeff.  (min)=       13.76 (ii)   18.20 (ii)
    Unit Hyd. Tpeak (min)=       15.00        20.00
    Unit Hyd. peak  (cms)=        0.08         0.06
                                                           *TOTALS*
    PEAK FLOW       (cms)=        0.16         0.03        0.190 (iii)
    TIME TO PEAK    (hrs)=        5.25         5.33         5.25
    RUNOFF VOLUME    (mm)=       71.10        38.61        63.62
    TOTAL RAINFALL   (mm)=       73.10        73.10        73.10
```

```
                         LangstaffRd_EA_Proposed_HumberWatershed
    RUNOFF COEFFICIENT  =         0.97         0.53         0.87


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* = 83.0   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  ( 0405) |
|  1 + 2  = 3      |           AREA     QPEAK    TPEAK     R.V.
-------------------               (ha)     (cms)    (hrs)     (mm)
           ID1= 1 ( 0125):        2.27     0.190    5.25     63.62
         + ID2= 2 ( 0130):        2.08     0.178    5.25     65.25
           =======================================================
           ID = 3 ( 0405):        4.35     0.368    5.25     64.40

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
-------------------
| RESERVOIR( 0505) |    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   |   0.2110     0.0383
                        0.0185     0.0030   |   0.2743     0.0515
                        0.0302     0.0120   |   0.3250     0.0792
                        0.1102     0.0251   |   0.0000     0.0000

                              AREA      QPEAK     TPEAK      R.V.
                              (ha)      (cms)     (hrs)      (mm)
    INFLOW : ID= 2 ( 0405)    4.350     0.368     5.25      64.40
    OUTFLOW: ID= 1 ( 0505)    4.350     0.288     5.42      64.39

              PEAK   FLOW   REDUCTION [Qout/Qin](%)= 78.25
              TIME SHIFT OF PEAK FLOW      (min)= 10.00
              MAXIMUM STORAGE   USED    (ha.m.)= 0.0594

-------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD ( 0120) |   Area    (ha)=  1.24
|ID= 1 DT= 5.0 min |   Total Imp(%)= 73.00   Dir. Conn.(%)= 73.00
-------------------
                                 IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=         0.91          0.33
       Dep. Storage   (mm)=         2.00          5.00
       Average Slope   (%)=         1.00          2.00
       Length          (m)=       475.00         17.00
       Mannings n       =          0.013          0.250
```

LangstaffRd_EA_Proposed_HumberWatershed

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	4.39		6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39		6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43		6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43		6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43		6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43		6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43		6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43		6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43		6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43		7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43		7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43		7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43		7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43		7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63		7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63		7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63		7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63		7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63		7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63		7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63		7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63		8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63		8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63		8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63		8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63		8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50		8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50		8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50		8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50		8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50		8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50		8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50		8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50		9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50		9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50		9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50		9.250	1.46		

```
Max.Eff.Inten.(mm/hr)=    33.63        23.77
         over (min)       10.00        15.00
Storage Coeff.  (min)=    10.06 (ii)   14.45 (ii)
Unit Hyd. Tpeak (min)=    10.00        15.00
Unit Hyd. peak  (cms)=     0.11         0.08
                                                  *TOTALS*
PEAK FLOW      (cms)=      0.08         0.02     0.104 (iii)
TIME TO PEAK   (hrs)=      5.25         5.25     5.25
```

LangstaffRd_EA_Proposed_HumberWatershed

```
RUNOFF VOLUME    (mm)=    71.10        38.61        62.32
TOTAL RAINFALL   (mm)=    73.10        73.10        73.10
RUNOFF COEFFICIENT  =      0.97         0.53         0.85
```

```
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 ( 0115)|   Area   (ha)=  1.00
|ID= 1 DT= 5.0 min |   Total Imp(%)= 63.00   Dir. Conn.(%)= 63.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=    0.63         0.37
    Dep. Storage   (mm)=    2.00         5.00
    Average Slope  (%)=     1.00         2.00
    Length         (m)=   475.00        17.00
    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	3.167	4.39		6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39		6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43		6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43		6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43		6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43		6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43		6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43		6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43		6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43		7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43		7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43		7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43		7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43		7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63		7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63		7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63		7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63		7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63		7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63		7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63		7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63		8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63		8.083	2.92	11.17	0.73

LangstaffRd_EA_Proposed_HumberWatershed

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
2.000	0.73	5.083	33.63		8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63		8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63		8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50		8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50		8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50		8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50		8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50		8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50		8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50		8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50		9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50		9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50		9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50		9.250	1.46		

```
Max.Eff.Inten.(mm/hr)=    33.63        23.77
         over (min)       10.00        20.00
Storage Coeff.  (min)=    10.06 (ii)   17.57 (ii)
Unit Hyd. Tpeak (min)=    10.00        20.00
Unit Hyd. peak  (cms)=     0.11         0.06
                                                  *TOTALS*
PEAK FLOW      (cms)=      0.06         0.02     0.079 (iii)
TIME TO PEAK   (hrs)=      5.25         5.33     5.25
RUNOFF VOLUME  (mm)=      71.10        38.61       59.07
TOTAL RAINFALL (mm)=      73.10        73.10       73.10
RUNOFF COEFFICIENT  =      0.97         0.53        0.81
```

```
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 ( 0410)|
|  1 + 2 = 3      |          AREA    QPEAK   TPEAK    R.V.
--------------------          (ha)    (cms)   (hrs)    (mm)
       ID1= 1 ( 0115):       1.00    0.079    5.25    59.07
     + ID2= 2 ( 0120):       1.24    0.104    5.25    62.32
       =================================================
       ID = 3 ( 0410):       2.24    0.183    5.25    60.87
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| RESERVOIR( 0510)|   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   |  0.0699     0.0309
```

LangstaffRd_EA_Proposed_HumberWatershed

```
          0.0264    0.0024  |   0.0792     0.0414
          0.0457    0.0099  |   0.0876     0.0666
          0.0590    0.0204  |   0.0000     0.0000
```

```
                      AREA    QPEAK   TPEAK    R.V.
                      (ha)    (cms)   (hrs)    (mm)
   INFLOW : ID= 2 ( 0410)    2.240   0.183    5.25    60.87
   OUTFLOW: ID= 1 ( 0510)    2.240   0.081    5.67    60.86
```

```
         PEAK  FLOW  REDUCTION [Qout/Qin](%)= 44.09
         TIME SHIFT OF PEAK FLOW      (min)= 25.00
         MAXIMUM STORAGE   USED     (ha.m.)= 0.0465
```

```
--------------------
| ADD HYD ( 0420)|
|  1 + 2 = 3      |          AREA    QPEAK   TPEAK    R.V.
--------------------          (ha)    (cms)   (hrs)    (mm)
       ID1= 1 ( 0505):       4.35    0.288    5.42    64.39
     + ID2= 2 ( 0510):       2.24    0.081    5.67    60.86
       =================================================
       ID = 3 ( 0420):       6.59    0.369    5.50    63.19
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| CALIB            |
| STANDHYD ( 0110)|   Area   (ha)= 1.58
|ID= 1 DT= 5.0 min |   Total Imp(%)= 70.00   Dir. Conn.(%)= 70.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=    1.11         0.47
    Dep. Storage   (mm)=    2.00         5.00
    Average Slope  (%)=     1.00         2.00
    Length         (m)=   650.00        25.00
    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	3.167	4.39		6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39		6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43		6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43		6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43		6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43		6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43		6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43		6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43		6.917	5.12	10.00	0.73

```
                    LangstaffRd_EA_Proposed_HumberWatershed
        0.833   0.73 | 3.917  12.43 | 7.000   5.12 | 10.08   0.73
        0.917   0.73 | 4.000  12.43 | 7.083   5.12 | 10.17   0.73
        1.000   0.73 | 4.083  12.43 | 7.167   5.12 | 10.25   0.73
        1.083   0.73 | 4.167  12.43 | 7.250   5.12 | 10.33   0.73
        1.167   0.73 | 4.250  12.43 | 7.333   2.92 | 10.42   0.73
        1.250   0.73 | 4.333  33.63 | 7.417   2.92 | 10.50   0.73
        1.333   0.73 | 4.417  33.63 | 7.500   2.92 | 10.58   0.73
        1.417   0.73 | 4.500  33.63 | 7.583   2.92 | 10.67   0.73
        1.500   0.73 | 4.583  33.63 | 7.667   2.92 | 10.75   0.73
        1.583   0.73 | 4.667  33.63 | 7.750   2.92 | 10.83   0.73
        1.667   0.73 | 4.750  33.63 | 7.833   2.92 | 10.92   0.73
        1.750   0.73 | 4.833  33.63 | 7.917   2.92 | 11.00   0.73
        1.833   0.73 | 4.917  33.63 | 8.000   2.92 | 11.08   0.73
        1.917   0.73 | 5.000  33.63 | 8.083   2.92 | 11.17   0.73
        2.000   0.73 | 5.083  33.63 | 8.167   2.92 | 11.25   0.73
        2.083   0.73 | 5.167  33.63 | 8.250   2.92 | 11.33   0.73
        2.167   0.73 | 5.250  33.63 | 8.333   1.46 | 11.42   0.73
        2.250   0.73 | 5.333   9.50 | 8.417   1.46 | 11.50   0.73
        2.333   4.39 | 5.417   9.50 | 8.500   1.46 | 11.58   0.73
        2.417   4.39 | 5.500   9.50 | 8.583   1.46 | 11.67   0.73
        2.500   4.39 | 5.583   9.50 | 8.667   1.46 | 11.75   0.73
        2.583   4.39 | 5.667   9.50 | 8.750   1.46 | 11.83   0.73
        2.667   4.39 | 5.750   9.50 | 8.833   1.46 | 11.92   0.73
        2.750   4.39 | 5.833   9.50 | 8.917   1.46 | 12.00   0.73
        2.833   4.39 | 5.917   9.50 | 9.000   1.46 | 12.08   0.73
        2.917   4.39 | 6.000   9.50 | 9.083   1.46 | 12.17   0.73
        3.000   4.39 | 6.083   9.50 | 9.167   1.46 | 12.25   0.73
        3.083   4.39 | 6.167   9.50 | 9.250   1.46 |

    Max.Eff.Inten.(mm/hr)=     33.63        25.08
           over (min)         10.00        25.00
    Storage Coeff. (min)=     12.14 (ii)   21.40 (ii)
    Unit Hyd. Tpeak (min)=    10.00        25.00
    Unit Hyd. peak  (cms)=     0.10         0.05
                                                      *TOTALS*
    PEAK FLOW      (cms)=      0.10         0.03       0.129 (iii)
    TIME TO PEAK   (hrs)=      5.25         5.33       5.25
    RUNOFF VOLUME   (mm)=     71.10        41.07      62.08
    TOTAL RAINFALL  (mm)=     73.10        73.10      73.10
    RUNOFF COEFFICIENT  =      0.97         0.56       0.85


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 85.0   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( 0525)|   OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |      OUTFLOW   STORAGE | OUTFLOW   STORAGE
                            Page 45
```

```
                    LangstaffRd_EA_Proposed_HumberWatershed
--------------------   (cms)    (ha.m.) |  (cms)    (ha.m.)
                      0.0000    0.0000  | 0.0181    0.0161
                      0.0081    0.0031  | 0.0584    0.0204
                      0.0123    0.0074  | 0.0920    0.0259
                      0.0155    0.0118  | 0.0000    0.0000

                       AREA     QPEAK    TPEAK     R.V.
                       (ha)     (cms)    (hrs)     (mm)
    INFLOW : ID= 2 (  0110)    1.580    0.129    5.25    62.08
    OUTFLOW: ID= 1 (  0525)    1.580    0.106    5.42    62.03

         PEAK  FLOW  REDUCTION [Qout/Qin](%)= 82.30
         TIME SHIFT OF PEAK FLOW      (min)= 10.00
         MAXIMUM STORAGE   USED    (ha.m.)= 0.0283

--------------------------------------------------------------------------
*******************************
** SIMULATION:Run 10        **
*******************************

--------------------
| READ STORM    |  Filename: C:\Users\ray.zhao\AppD
|               |            ata\Local\Temp\
|               |            efddf5d6-df0e-43ba-b139-2f589a28109d\5040be70
| Ptotal= 80.82 mm |  Comments: 50Y12
--------------------
         TIME   RAIN | TIME   RAIN |'  TIME  RAIN | TIME   RAIN
          hrs  mm/hr |  hrs  mm/hr |'   hrs  mm/hr |  hrs  mm/hr
         0.25   0.00 | 3.50  13.74 |  6.75  5.66 | 10.00   0.81
         0.50   0.81 | 3.75  13.74 |  7.00  5.66 | 10.25   0.81
         0.75   0.81 | 4.00  13.74 |  7.25  5.66 | 10.50   0.81
         1.00   0.81 | 4.25  13.74 |  7.50  3.23 | 10.75   0.81
         1.25   0.81 | 4.50  37.17 |  7.75  3.23 | 11.00   0.81
         1.50   0.81 | 4.75  37.17 |  8.00  3.23 | 11.25   0.81
         1.75   0.81 | 5.00  37.17 |  8.25  3.23 | 11.50   0.81
         2.00   0.81 | 5.25  37.17 |  8.50  1.62 | 11.75   0.81
         2.25   0.81 | 5.50  10.50 |  8.75  1.62 | 12.00   0.81
         2.50   4.85 | 5.75  10.50 |  9.00  1.62 | 12.25   0.81
         2.75   4.85 | 6.00  10.50 |  9.25  1.62 |
         3.00   4.85 | 6.25  10.50 |  9.50  0.81 |
         3.25   4.85 | 6.50   5.66 |  9.75  0.81 |

--------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0105)|  Area   (ha)= 1.63
|ID= 1 DT= 5.0 min |  Total Imp(%)= 69.00  Dir. Conn.(%)= 69.00
--------------------
                       IMPERVIOUS    PERVIOUS (i)
    Surface Area  (ha)=    1.12         0.51
    Dep. Storage  (mm)=    2.00         5.00
    Average Slope (%)=     1.00         2.00
                            Page 46
```

```
                    LangstaffRd_EA_Proposed_HumberWatershed
    Length       (m)=   650.00        25.00
    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 | 3.167  4.85 | 6.250 10.50 | 9.33   0.81
         0.167  0.00 | 3.250  4.85 | 6.333  5.66 | 9.42   0.81
         0.250  0.00 | 3.333 13.74 | 6.417  5.66 | 9.50   0.81
         0.333  0.81 | 3.417 13.74 | 6.500  5.66 | 9.58   0.81
         0.417  0.81 | 3.500 13.74 | 6.583  5.66 | 9.67   0.81
         0.500  0.81 | 3.583 13.74 | 6.667  5.66 | 9.75   0.81
         0.583  0.81 | 3.667 13.74 | 6.750  5.66 | 9.83   0.81
         0.667  0.81 | 3.750 13.74 | 6.833  5.66 | 9.92   0.81
         0.750  0.81 | 3.833 13.74 | 6.917  5.66 | 10.00  0.81
         0.833  0.81 | 3.917 13.74 | 7.000  5.66 | 10.08  0.81
         0.917  0.81 | 4.000 13.74 | 7.083  5.66 | 10.17  0.81
         1.000  0.81 | 4.083 13.74 | 7.167  5.66 | 10.25  0.81
         1.083  0.81 | 4.167 13.74 | 7.250  5.66 | 10.33  0.81
         1.167  0.81 | 4.250 13.74 | 7.333  3.23 | 10.42  0.81
         1.250  0.81 | 4.333 37.17 | 7.417  3.23 | 10.50  0.81
         1.333  0.81 | 4.417 37.17 | 7.500  3.23 | 10.58  0.81
         1.417  0.81 | 4.500 37.17 | 7.583  3.23 | 10.67  0.81
         1.500  0.81 | 4.583 37.17 | 7.667  3.23 | 10.75  0.81
         1.583  0.81 | 4.667 37.17 | 7.750  3.23 | 10.83  0.81
         1.667  0.81 | 4.750 37.17 | 7.833  3.23 | 10.92  0.81
         1.750  0.81 | 4.833 37.17 | 7.917  3.23 | 11.00  0.81
         1.833  0.81 | 4.917 37.17 | 8.000  3.23 | 11.08  0.81
         1.917  0.81 | 5.000 37.17 | 8.083  3.23 | 11.17  0.81
         2.000  0.81 | 5.083 37.17 | 8.167  3.23 | 11.25  0.81
         2.083  0.81 | 5.167 37.17 | 8.250  3.23 | 11.33  0.81
         2.167  0.81 | 5.250 37.17 | 8.333  1.62 | 11.42  0.81
         2.250  0.81 | 5.333 10.50 | 8.417  1.62 | 11.50  0.81
         2.333  4.85 | 5.417 10.50 | 8.500  1.62 | 11.58  0.81
         2.417  4.85 | 5.500 10.50 | 8.583  1.62 | 11.67  0.81
         2.500  4.85 | 5.583 10.50 | 8.667  1.62 | 11.75  0.81
         2.583  4.85 | 5.667 10.50 | 8.750  1.62 | 11.83  0.81
         2.667  4.85 | 5.750 10.50 | 8.833  1.62 | 11.92  0.81
         2.750  4.85 | 5.833 10.50 | 8.917  1.62 | 12.00  0.81
         2.833  4.85 | 5.917 10.50 | 9.000  1.62 | 12.08  0.81
         2.917  4.85 | 6.000 10.50 | 9.083  1.62 | 12.17  0.81
         3.000  4.85 | 6.083 10.50 | 9.167  1.62 | 12.25  0.81
         3.083  4.85 | 6.167 10.50 | 9.250  1.62 |

    Max.Eff.Inten.(mm/hr)=     37.17        29.42
           over (min)         10.00        25.00
    Storage Coeff. (min)=     11.67 (ii)   20.35 (ii)
    Unit Hyd. Tpeak (min)=    10.00        25.00
    Unit Hyd. peak  (cms)=     0.10         0.05
                                                      *TOTALS*
                            Page 47
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                    LangstaffRd_EA_Proposed_HumberWatershed
    PEAK FLOW      (cms)=      0.12         0.03       0.149 (iii)
    TIME TO PEAK   (hrs)=      5.25         5.33       5.25
    RUNOFF VOLUME   (mm)=     78.82        49.06      69.59
    TOTAL RAINFALL  (mm)=     80.82        80.82      80.82
    RUNOFF COEFFICIENT  =      0.98         0.61       0.86


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 86.0   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( 0520)|   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  | 0.0181    0.0161
                      0.0081    0.0031  | 0.0584    0.0204
                      0.0123    0.0074  | 0.0920    0.0259
                      0.0155    0.0118  | 0.0000    0.0000
    **** WARNING : STORAGE-DISCHARGE TABLE WAS EXCEEDED.

                       AREA     QPEAK    TPEAK     R.V.
                       (ha)     (cms)    (hrs)     (mm)
    INFLOW : ID= 2 (  0105)    1.630    0.149    5.25    69.59
    OUTFLOW: ID= 1 (  0520)    1.630    0.124    5.42    69.53

         PEAK  FLOW  REDUCTION [Qout/Qin](%)= 83.03
         TIME SHIFT OF PEAK FLOW      (min)= 10.00
         MAXIMUM STORAGE   USED    (ha.m.)= 0.0313

--------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0130)|  Area   (ha)= 2.08
|ID= 1 DT= 5.0 min |  Total Imp(%)= 82.00  Dir. Conn.(%)= 82.00
--------------------
                       IMPERVIOUS    PERVIOUS (i)
    Surface Area  (ha)=    1.71         0.37
    Dep. Storage  (mm)=    2.00         5.00
    Average Slope (%)=     1.00         2.00
    Length       (m)=    800.00        20.00
    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
                            Page 48
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                  LangstaffRd_EA_Proposed_HumberWatershed
        0.083   0.00 | 3.167    4.85 | 6.250   10.50 | 9.33    0.81
        0.167   0.00 | 3.250    4.85 | 6.333    5.66 | 9.42    0.81
        0.250   0.00 | 3.333   13.74 | 6.417    5.66 | 9.50    0.81
        0.333   0.81 | 3.417   13.74 | 6.500    5.66 | 9.58    0.81
        0.417   0.81 | 3.500   13.74 | 6.583    5.66 | 9.67    0.81
        0.500   0.81 | 3.583   13.74 | 6.667    5.66 | 9.75    0.81
        0.583   0.81 | 3.667   13.74 | 6.750    5.66 | 9.83    0.81
        0.667   0.81 | 3.750   13.74 | 6.833    5.66 | 9.92    0.81
        0.750   0.81 | 3.833   13.74 | 6.917    5.66 | 10.00   0.81
        0.833   0.81 | 3.917   13.74 | 7.000    5.66 | 10.08   0.81
        0.917   0.81 | 4.000   13.74 | 7.083    5.66 | 10.17   0.81
        1.000   0.81 | 4.083   13.74 | 7.167    5.66 | 10.25   0.81
        1.083   0.81 | 4.167   13.74 | 7.250    5.66 | 10.33   0.81
        1.167   0.81 | 4.250   13.74 | 7.333    3.23 | 10.42   0.81
        1.250   0.81 | 4.333   37.17 | 7.417    3.23 | 10.50   0.81
        1.333   0.81 | 4.417   37.17 | 7.500    3.23 | 10.58   0.81
        1.417   0.81 | 4.500   37.17 | 7.583    3.23 | 10.67   0.81
        1.500   0.81 | 4.583   37.17 | 7.667    3.23 | 10.75   0.81
        1.583   0.81 | 4.667   37.17 | 7.750    3.23 | 10.83   0.81
        1.667   0.81 | 4.750   37.17 | 7.833    3.23 | 10.92   0.81
        1.750   0.81 | 4.833   37.17 | 7.917    3.23 | 11.00   0.81
        1.833   0.81 | 4.917   37.17 | 8.000    3.23 | 11.08   0.81
        1.917   0.81 | 5.000   37.17 | 8.083    3.23 | 11.17   0.81
        2.000   0.81 | 5.083   37.17 | 8.167    3.23 | 11.25   0.81
        2.083   0.81 | 5.167   37.17 | 8.250    3.23 | 11.33   0.81
        2.167   0.81 | 5.250   37.17 | 8.333    1.62 | 11.42   0.81
        2.250   0.81 | 5.333   10.50 | 8.417    1.62 | 11.50   0.81
        2.333   4.85 | 5.417   10.50 | 8.500    1.62 | 11.58   0.81
        2.417   4.85 | 5.500   10.50 | 8.583    1.62 | 11.67   0.81
        2.500   4.85 | 5.583   10.50 | 8.667    1.62 | 11.75   0.81
        2.583   4.85 | 5.667   10.50 | 8.750    1.62 | 11.83   0.81
        2.667   4.85 | 5.750   10.50 | 8.833    1.62 | 11.92   0.81
        2.750   4.85 | 5.833   10.50 | 8.917    1.62 | 12.00   0.81
        2.833   4.85 | 5.917   10.50 | 9.000    1.62 | 12.08   0.81
        2.917   4.85 | 6.000   10.50 | 9.083    1.62 | 12.17   0.81
        3.000   4.85 | 6.083   10.50 | 9.167    1.62 | 12.25   0.81
        3.083   4.85 | 6.167   10.50 | 9.250    1.62 |

     Max.Eff.Inten.(mm/hr)=     37.17          27.36
            over (min)         15.00          20.00
     Storage Coeff.  (min)=    13.22 (ii)     16.99 (ii)
     Unit Hyd. Tpeak (min)=    15.00          20.00
     Unit Hyd. peak  (cms)=     0.08           0.06
                                                           *TOTALS*
     PEAK FLOW     (cms)=       0.17           0.02        0.199 (iii)
     TIME TO PEAK  (hrs)=       5.25           5.33        5.25
     RUNOFF VOLUME  (mm)=      78.82          44.97       72.72
     TOTAL RAINFALL (mm)=      80.82          80.82       80.82
     RUNOFF COEFFICIENT =       0.98           0.56        0.90

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0    Ia = Dep. Storage  (Above)
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                  LangstaffRd_EA_Proposed_HumberWatershed
        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
             THAN THE STORAGE COEFFICIENT.
        (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

  --------------------------------------------------------------------------
  --------------------
  | CALIB            |
  | STANDHYD ( 0125)|  Area    (ha)=  2.27
  |ID= 1 DT= 5.0 min |  Total Imp(%)= 77.00   Dir. Conn.(%)= 77.00
  --------------------
                            IMPERVIOUS      PERVIOUS (i)
       Surface Area   (ha)=    1.75           0.52
       Dep. Storage   (mm)=    2.00           5.00
       Average Slope  (%)=     1.00           2.00
       Length         (m)=   800.00          20.00
       Mannings n      =      0.013           0.250

       NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
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                        ---- 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   4.85 | 6.250   10.50 | 9.33   0.81
       0.167  0.00 | 3.250   4.85 | 6.333    5.66 | 9.42   0.81
       0.250  0.00 | 3.333  13.74 | 6.417    5.66 | 9.50   0.81
       0.333  0.81 | 3.417  13.74 | 6.500    5.66 | 9.58   0.81
       0.417  0.81 | 3.500  13.74 | 6.583    5.66 | 9.67   0.81
       0.500  0.81 | 3.583  13.74 | 6.667    5.66 | 9.75   0.81
       0.583  0.81 | 3.667  13.74 | 6.750    5.66 | 9.83   0.81
       0.667  0.81 | 3.750  13.74 | 6.833    5.66 | 9.92   0.81
       0.750  0.81 | 3.833  13.74 | 6.917    5.66 | 10.00  0.81
       0.833  0.81 | 3.917  13.74 | 7.000    5.66 | 10.08  0.81
       0.917  0.81 | 4.000  13.74 | 7.083    5.66 | 10.17  0.81
       1.000  0.81 | 4.083  13.74 | 7.167    5.66 | 10.25  0.81
       1.083  0.81 | 4.167  13.74 | 7.250    5.66 | 10.33  0.81
       1.167  0.81 | 4.250  13.74 | 7.333    3.23 | 10.42  0.81
       1.250  0.81 | 4.333  37.17 | 7.417    3.23 | 10.50  0.81
       1.333  0.81 | 4.417  37.17 | 7.500    3.23 | 10.58  0.81
       1.417  0.81 | 4.500  37.17 | 7.583    3.23 | 10.67  0.81
       1.500  0.81 | 4.583  37.17 | 7.667    3.23 | 10.75  0.81
       1.583  0.81 | 4.667  37.17 | 7.750    3.23 | 10.83  0.81
       1.667  0.81 | 4.750  37.17 | 7.833    3.23 | 10.92  0.81
       1.750  0.81 | 4.833  37.17 | 7.917    3.23 | 11.00  0.81
       1.833  0.81 | 4.917  37.17 | 8.000    3.23 | 11.08  0.81
       1.917  0.81 | 5.000  37.17 | 8.083    3.23 | 11.17  0.81
       2.000  0.81 | 5.083  37.17 | 8.167    3.23 | 11.25  0.81
       2.083  0.81 | 5.167  37.17 | 8.250    3.23 | 11.33  0.81
       2.167  0.81 | 5.250  37.17 | 8.333    1.62 | 11.42  0.81
       2.250  0.81 | 5.333  10.50 | 8.417    1.62 | 11.50  0.81
       2.333  4.85 | 5.417  10.50 | 8.500    1.62 | 11.58  0.81
       2.417  4.85 | 5.500  10.50 | 8.583    1.62 | 11.67  0.81
       2.500  4.85 | 5.583  10.50 | 8.667    1.62 | 11.75  0.81
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                  LangstaffRd_EA_Proposed_HumberWatershed
        2.583   4.85 | 5.667   10.50 | 8.750    1.62 | 11.83   0.81
        2.667   4.85 | 5.750   10.50 | 8.833    1.62 | 11.92   0.81
        2.750   4.85 | 5.833   10.50 | 8.917    1.62 | 12.00   0.81
        2.833   4.85 | 5.917   10.50 | 9.000    1.62 | 12.08   0.81
        2.917   4.85 | 6.000   10.50 | 9.083    1.62 | 12.17   0.81
        3.000   4.85 | 6.083   10.50 | 9.167    1.62 | 12.25   0.81
        3.083   4.85 | 6.167   10.50 | 9.250    1.62 |

     Max.Eff.Inten.(mm/hr)=     37.17          27.36
            over (min)         15.00          20.00
     Storage Coeff.  (min)=    13.22 (ii)     17.48 (ii)
     Unit Hyd. Tpeak (min)=    15.00          20.00
     Unit Hyd. peak  (cms)=     0.08           0.06
                                                           *TOTALS*
     PEAK FLOW     (cms)=       0.18           0.03        0.212 (iii)
     TIME TO PEAK  (hrs)=       5.25           5.33        5.25
     RUNOFF VOLUME  (mm)=      78.82          44.97       71.03
     TOTAL RAINFALL (mm)=      80.82          80.82       80.82
     RUNOFF COEFFICIENT =       0.98           0.56        0.88

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0    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 ( 0405)|
  |  1 + 2 = 3      |         AREA    QPEAK    TPEAK     R.V.
  --------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 0125):        2.27    0.212    5.25     71.03
     + ID2= 2 ( 0130):        2.08    0.199    5.25     72.72
                          ================================================
       ID = 3 ( 0405):        4.35    0.411    5.25     71.84

     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

  --------------------
  | RESERVOIR( 0505)|    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   |  0.2110    0.0383
                         0.0185    0.0030   |  0.2743    0.0515
                         0.0302    0.0120   |  0.3250    0.0792
                         0.1102    0.0251   |  0.0000    0.0000

                         AREA     QPEAK    TPEAK     R.V.
                         (ha)     (cms)    (hrs)     (mm)
    INFLOW : ID= 2 ( 0405):  4.350    0.411    5.25     71.84
```

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                  LangstaffRd_EA_Proposed_HumberWatershed
  OUTFLOW: ID= 1 ( 0505)    4.350    0.306    5.50     71.83

           PEAK  FLOW  REDUCTION [Qout/Qin](%)= 74.38
           TIME SHIFT OF PEAK FLOW      (min)= 15.00
           MAXIMUM STORAGE  USED     (ha.m.)= 0.0689

  --------------------------------------------------------------------------
  --------------------
  | CALIB            |
  | STANDHYD ( 0120)|  Area    (ha)= 1.24
  |ID= 1 DT= 5.0 min |  Total Imp(%)= 73.00   Dir. Conn.(%)= 73.00
  --------------------
                            IMPERVIOUS      PERVIOUS (i)
       Surface Area   (ha)=    0.91           0.33
       Dep. Storage   (mm)=    2.00           5.00
       Average Slope  (%)=     1.00           2.00
       Length         (m)=   475.00          17.00
       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 | 3.167   4.85 | 6.250   10.50 | 9.33   0.81
       0.167  0.00 | 3.250   4.85 | 6.333    5.66 | 9.42   0.81
       0.250  0.00 | 3.333  13.74 | 6.417    5.66 | 9.50   0.81
       0.333  0.81 | 3.417  13.74 | 6.500    5.66 | 9.58   0.81
       0.417  0.81 | 3.500  13.74 | 6.583    5.66 | 9.67   0.81
       0.500  0.81 | 3.583  13.74 | 6.667    5.66 | 9.75   0.81
       0.583  0.81 | 3.667  13.74 | 6.750    5.66 | 9.83   0.81
       0.667  0.81 | 3.750  13.74 | 6.833    5.66 | 9.92   0.81
       0.750  0.81 | 3.833  13.74 | 6.917    5.66 | 10.00  0.81
       0.833  0.81 | 3.917  13.74 | 7.000    5.66 | 10.08  0.81
       0.917  0.81 | 4.000  13.74 | 7.083    5.66 | 10.17  0.81
       1.000  0.81 | 4.083  13.74 | 7.167    5.66 | 10.25  0.81
       1.083  0.81 | 4.167  13.74 | 7.250    5.66 | 10.33  0.81
       1.167  0.81 | 4.250  13.74 | 7.333    3.23 | 10.42  0.81
       1.250  0.81 | 4.333  37.17 | 7.417    3.23 | 10.50  0.81
       1.333  0.81 | 4.417  37.17 | 7.500    3.23 | 10.58  0.81
       1.417  0.81 | 4.500  37.17 | 7.583    3.23 | 10.67  0.81
       1.500  0.81 | 4.583  37.17 | 7.667    3.23 | 10.75  0.81
       1.583  0.81 | 4.667  37.17 | 7.750    3.23 | 10.83  0.81
       1.667  0.81 | 4.750  37.17 | 7.833    3.23 | 10.92  0.81
       1.750  0.81 | 4.833  37.17 | 7.917    3.23 | 11.00  0.81
       1.833  0.81 | 4.917  37.17 | 8.000    3.23 | 11.08  0.81
       1.917  0.81 | 5.000  37.17 | 8.083    3.23 | 11.17  0.81
       2.000  0.81 | 5.083  37.17 | 8.167    3.23 | 11.25  0.81
       2.083  0.81 | 5.167  37.17 | 8.250    3.23 | 11.33  0.81
       2.167  0.81 | 5.250  37.17 | 8.333    1.62 | 11.42  0.81
       2.250  0.81 | 5.333  10.50 | 8.417    1.62 | 11.50  0.81
       2.333  4.85 | 5.417  10.50 | 8.500    1.62 | 11.58  0.81
```

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                 2.417  4.85 | 5.500  10.50 | 8.583  1.62 | 11.67  0.81
                 2.500  4.85 | 5.583  10.50 | 8.667  1.62 | 11.75  0.81
                 2.583  4.85 | 5.667  10.50 | 8.750  1.62 | 11.83  0.81
                 2.667  4.85 | 5.750  10.50 | 8.833  1.62 | 11.92  0.81
                 2.750  4.85 | 5.833  10.50 | 8.917  1.62 | 12.00  0.81
                 2.833  4.85 | 5.917  10.50 | 9.000  1.62 | 12.08  0.81
                 2.917  4.85 | 6.000  10.50 | 9.083  1.62 | 12.17  0.81
                 3.000  4.85 | 6.083  10.50 | 9.167  1.62 | 12.25  0.81
                 3.083  4.85 | 6.167  10.50 | 9.250  1.62 |

   Max.Eff.Inten.(mm/hr)=      37.17      27.36
           over (min)         10.00      15.00
   Storage Coeff.  (min)=      9.67 (ii) 13.88 (ii)
   Unit Hyd. Tpeak (min)=     10.00      15.00
   Unit Hyd. peak  (cms)=      0.11       0.08
                                                      *TOTALS*
   PEAK FLOW       (cms)=      0.09       0.02       0.116 (iii)
   TIME TO PEAK    (hrs)=      5.25       5.25        5.25
   RUNOFF VOLUME    (mm)=     78.82      44.97       69.67
   TOTAL RAINFALL   (mm)=     80.82      80.82       80.82
   RUNOFF COEFFICIENT  =       0.98       0.56        0.86


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 ( 0115)|   Area    (ha)=  1.00
|ID= 1 DT= 5.0 min |  Total Imp(%)= 63.00  Dir. Conn.(%)= 63.00
--------------------
                            IMPERVIOUS  PERVIOUS (i)
    Surface Area    (ha)=      0.63       0.37
    Dep. Storage    (mm)=      2.00       5.00
    Average Slope   (%)=       1.00       2.00
    Length          (m)=     475.00      17.00
    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 | 3.167  4.85 | 6.250  10.50 | 9.33   0.81
       0.167  0.00 | 3.250  4.85 | 6.333  5.66 | 9.42   0.81
       0.250  0.00 | 3.333  13.74 | 6.417  5.66 | 9.50   0.81
       0.333  0.81 | 3.417  13.74 | 6.500  5.66 | 9.58   0.81
       0.417  0.81 | 3.500  13.74 | 6.583  5.66 | 9.67   0.81
```

```
       0.500  0.81 | 3.583  13.74 | 6.667  5.66 | 9.75   0.81
       0.583  0.81 | 3.667  13.74 | 6.750  5.66 | 9.83   0.81
       0.667  0.81 | 3.750  13.74 | 6.833  5.66 | 9.92   0.81
       0.750  0.81 | 3.833  13.74 | 6.917  5.66 | 10.00  0.81
       0.833  0.81 | 3.917  13.74 | 7.000  5.66 | 10.08  0.81
       0.917  0.81 | 4.000  13.74 | 7.083  5.66 | 10.17  0.81
       1.000  0.81 | 4.083  13.74 | 7.167  5.66 | 10.25  0.81
       1.083  0.81 | 4.167  13.74 | 7.250  5.66 | 10.33  0.81
       1.167  0.81 | 4.250  13.74 | 7.333  3.23 | 10.42  0.81
       1.250  0.81 | 4.333  37.17 | 7.417  3.23 | 10.50  0.81
       1.333  0.81 | 4.417  37.17 | 7.500  3.23 | 10.58  0.81
       1.417  0.81 | 4.500  37.17 | 7.583  3.23 | 10.67  0.81
       1.500  0.81 | 4.583  37.17 | 7.667  3.23 | 10.75  0.81
       1.583  0.81 | 4.667  37.17 | 7.750  3.23 | 10.83  0.81
       1.667  0.81 | 4.750  37.17 | 7.833  3.23 | 10.92  0.81
       1.750  0.81 | 4.833  37.17 | 7.917  3.23 | 11.00  0.81
       1.833  0.81 | 4.917  37.17 | 8.000  3.23 | 11.08  0.81
       1.917  0.81 | 5.000  37.17 | 8.083  3.23 | 11.17  0.81
       2.000  0.81 | 5.083  37.17 | 8.167  3.23 | 11.25  0.81
       2.083  0.81 | 5.167  37.17 | 8.250  3.23 | 11.33  0.81
       2.167  0.81 | 5.250  37.17 | 8.333  3.23 | 11.42  0.81
       2.250  0.81 | 5.333  10.50 | 8.417  1.62 | 11.50  0.81
       2.333  0.81 | 5.417  10.50 | 8.500  1.62 | 11.58  0.81
       2.417  4.85 | 5.500  10.50 | 8.583  1.62 | 11.67  0.81
       2.500  4.85 | 5.583  10.50 | 8.667  1.62 | 11.75  0.81
       2.583  4.85 | 5.667  10.50 | 8.750  1.62 | 11.83  0.81
       2.667  4.85 | 5.750  10.50 | 8.833  1.62 | 11.92  0.81
       2.750  4.85 | 5.833  10.50 | 8.917  1.62 | 12.00  0.81
       2.833  4.85 | 5.917  10.50 | 9.000  1.62 | 12.08  0.81
       2.917  4.85 | 6.000  10.50 | 9.083  1.62 | 12.17  0.81
       3.000  4.85 | 6.083  10.50 | 9.167  1.62 | 12.25  0.81
       3.083  4.85 | 6.167  10.50 | 9.250  1.62 |

   Max.Eff.Inten.(mm/hr)=      37.17      27.36
           over (min)         10.00      20.00
   Storage Coeff.  (min)=      9.67 (ii) 16.76 (ii)
   Unit Hyd. Tpeak (min)=     10.00      20.00
   Unit Hyd. peak  (cms)=      0.11       0.06
                                                      *TOTALS*
   PEAK FLOW       (cms)=      0.06       0.02       0.089 (iii)
   TIME TO PEAK    (hrs)=      5.25       5.33        5.25
   RUNOFF VOLUME    (mm)=     78.82      44.97       66.29
   TOTAL RAINFALL   (mm)=     80.82      80.82       80.82
   RUNOFF COEFFICIENT  =       0.98       0.56        0.82


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 ( 0410)|
|  1 + 2 = 3     |        AREA   QPEAK   TPEAK    R.V.
--------------------      (ha)   (cms)   (hrs)    (mm)
     ID1= 1 ( 0115):      1.00   0.089    5.25   66.29
   + ID2= 2 ( 0120):      1.24   0.116    5.25   69.67
    ====================================================
     ID = 3 ( 0410):      2.24   0.205    5.25   68.16

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------
--------------------
| RESERVOIR( 0510)|    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   | 0.0699    0.0309
                       0.0264   0.0024   | 0.0792    0.0414
                       0.0457   0.0099   | 0.0876    0.0666
                       0.0590   0.0204   | 0.0000    0.0000

                        AREA   QPEAK   TPEAK    R.V.
                        (ha)   (cms)   (hrs)    (mm)
   INFLOW : ID= 2 ( 0410)  2.240  0.205   5.25   68.16
   OUTFLOW: ID= 1 ( 0510)  2.240  0.084   5.67   68.15

          PEAK  FLOW  REDUCTION [Qout/Qin](%)= 40.73
          TIME SHIFT OF PEAK FLOW      (min)= 25.00
          MAXIMUM  STORAGE  USED    (ha.m.)=  0.0548

--------------------------------------------------------------------
--------------------
| ADD HYD ( 0420)|
|  1 + 2 = 3     |        AREA   QPEAK   TPEAK    R.V.
--------------------      (ha)   (cms)   (hrs)    (mm)
     ID1= 1 ( 0505):      4.35   0.306    5.50   71.83
   + ID2= 2 ( 0510):      2.24   0.084    5.67   68.15
    ====================================================
     ID = 3 ( 0420):      6.59   0.389    5.50   70.58

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0110)|   Area    (ha)=  1.58
|ID= 1 DT= 5.0 min |  Total Imp(%)= 70.00  Dir. Conn.(%)= 70.00
--------------------
                            IMPERVIOUS  PERVIOUS (i)
    Surface Area    (ha)=      1.11       0.47
    Dep. Storage    (mm)=      2.00       5.00
    Average Slope   (%)=       1.00       2.00
```

```
    Length          (m)=    650.00      25.00
    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 | 3.167  4.85 | 6.250  10.50 | 9.33   0.81
       0.167  0.00 | 3.250  4.85 | 6.333  5.66 | 9.42   0.81
       0.250  0.00 | 3.333  13.74 | 6.417  5.66 | 9.50   0.81
       0.333  0.81 | 3.417  13.74 | 6.500  5.66 | 9.58   0.81
       0.417  0.81 | 3.500  13.74 | 6.583  5.66 | 9.67   0.81
       0.500  0.81 | 3.583  13.74 | 6.667  5.66 | 9.75   0.81
       0.583  0.81 | 3.667  13.74 | 6.750  5.66 | 9.83   0.81
       0.667  0.81 | 3.750  13.74 | 6.833  5.66 | 9.92   0.81
       0.750  0.81 | 3.833  13.74 | 6.917  5.66 | 10.00  0.81
       0.833  0.81 | 3.917  13.74 | 7.000  5.66 | 10.08  0.81
       0.917  0.81 | 4.000  13.74 | 7.083  5.66 | 10.17  0.81
       1.000  0.81 | 4.083  13.74 | 7.167  5.66 | 10.25  0.81
       1.083  0.81 | 4.167  13.74 | 7.250  5.66 | 10.33  0.81
       1.167  0.81 | 4.250  13.74 | 7.333  3.23 | 10.42  0.81
       1.250  0.81 | 4.333  37.17 | 7.417  3.23 | 10.50  0.81
       1.333  0.81 | 4.417  37.17 | 7.500  3.23 | 10.58  0.81
       1.417  0.81 | 4.500  37.17 | 7.583  3.23 | 10.67  0.81
       1.500  0.81 | 4.583  37.17 | 7.667  3.23 | 10.75  0.81
       1.583  0.81 | 4.667  37.17 | 7.750  3.23 | 10.83  0.81
       1.667  0.81 | 4.750  37.17 | 7.833  3.23 | 10.92  0.81
       1.750  0.81 | 4.833  37.17 | 7.917  3.23 | 11.00  0.81
       1.833  0.81 | 4.917  37.17 | 8.000  3.23 | 11.08  0.81
       1.917  0.81 | 5.000  37.17 | 8.083  3.23 | 11.17  0.81
       2.000  0.81 | 5.083  37.17 | 8.167  3.23 | 11.25  0.81
       2.083  0.81 | 5.167  37.17 | 8.250  3.23 | 11.33  0.81
       2.167  0.81 | 5.250  37.17 | 8.333  1.62 | 11.42  0.81
       2.250  0.81 | 5.333  10.50 | 8.417  1.62 | 11.50  0.81
       2.333  4.85 | 5.417  10.50 | 8.500  1.62 | 11.58  0.81
       2.417  4.85 | 5.500  10.50 | 8.583  1.62 | 11.67  0.81
       2.500  4.85 | 5.583  10.50 | 8.667  1.62 | 11.75  0.81
       2.583  4.85 | 5.667  10.50 | 8.750  1.62 | 11.83  0.81
       2.667  4.85 | 5.750  10.50 | 8.833  1.62 | 11.92  0.81
       2.750  4.85 | 5.833  10.50 | 8.917  1.62 | 12.00  0.81
       2.833  4.85 | 5.917  10.50 | 9.000  1.62 | 12.08  0.81
       2.917  4.85 | 6.000  10.50 | 9.083  1.62 | 12.17  0.81
       3.000  4.85 | 6.083  10.50 | 9.167  1.62 | 12.25  0.81
       3.083  4.85 | 6.167  10.50 | 9.250  1.62 |

   Max.Eff.Inten.(mm/hr)=      37.17      28.73
           over (min)         10.00      25.00
   Storage Coeff.  (min)=     11.67 (ii) 20.44 (ii)
   Unit Hyd. Tpeak (min)=     10.00      25.00
   Unit Hyd. peak  (cms)=      0.10       0.05
                                                      *TOTALS*
```

```
                LangstaffRd_EA_Proposed_HumberWatershed
  PEAK FLOW      (cms)=     0.11        0.03        0.144 (iii)
  TIME TO PEAK   (hrs)=     5.25        5.33        5.25
  RUNOFF VOLUME  (mm)=     78.82       47.65       69.46
  TOTAL RAINFALL (mm)=     80.82       80.82       80.82
  RUNOFF COEFFICIENT =      0.98        0.59        0.86


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* =  85.0    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( 0525)|    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  |  0.0181    0.0161
                      0.0081     0.0031  |  0.0584    0.0204
                      0.0123     0.0074  |  0.0920    0.0259
                      0.0155     0.0118  |  0.0000    0.0000

                        AREA    QPEAK    TPEAK     R.V.
                        (ha)    (cms)    (hrs)     (mm)
   INFLOW : ID= 2 ( 0110)  1.580   0.144    5.25     69.46
   OUTFLOW: ID= 1 ( 0525)  1.580   0.120    5.42     69.40

        PEAK  FLOW  REDUCTION [Qout/Qin](%)= 82.99
        TIME SHIFT OF PEAK FLOW      (min)= 10.00
        MAXIMUM STORAGE   USED   (ha.m.)= 0.0306

----------------------------------------------------------------------
********************************
** SIMULATION:Run 12      **
********************************

--------------------
|  READ STORM  |   Filename: C:\Users\ray.zhao\AppD
|              |            ata\Local\Temp\
|              |            efddf5d6-df0e-43ba-b139-2f589a28109d\69ca7235
| Ptotal= 88.54 mm |  Comments: 100Y12
--------------------
            TIME    RAIN |  TIME    RAIN |' TIME   RAIN |  TIME    RAIN
            hrs    mm/hr |  hrs    mm/hr |' hrs    mm/hr |  hrs    mm/hr
            0.25    0.00 |  3.50   15.05 | 6.75    6.20 | 10.00    0.89
            0.50    0.89 |  3.75   15.05 | 7.00    6.20 | 10.25    0.89
            0.75    0.89 |  4.00   15.05 | 7.25    6.20 | 10.50    0.89
            1.00    0.89 |  4.25   15.05 | 7.50    3.54 | 10.75    0.89
            1.25    0.89 |  4.50   40.71 | 7.75    3.54 | 11.00    0.89
            1.50    0.89 |  4.75   40.71 | 8.00    3.54 | 11.25    0.89
            1.75    0.89 |  5.00   40.71 | 8.25    3.54 | 11.50    0.89

                              Page 57
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                LangstaffRd_EA_Proposed_HumberWatershed
            2.00    0.89 |  5.25   40.71 | 8.50    1.77 | 11.75    0.89
            2.25    0.89 |  5.50   11.51 | 8.75    1.77 | 12.00    0.89
            2.50    5.31 |  5.75   11.51 | 9.00    1.77 | 12.25    0.89
            2.75    5.31 |  6.00   11.51 | 9.25    1.77 |
            3.00    5.31 |  6.25   11.51 | 9.50    0.89 |
            3.25    5.31 |  6.50    6.20 | 9.75    0.89 |

----------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0105)|  Area   (ha)= 1.63
|ID= 1 DT= 5.0 min |  Total Imp(%)= 69.00  Dir. Conn.(%)= 69.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
   Surface Area    (ha)=    1.12         0.51
   Dep. Storage    (mm)=    2.00         5.00
   Average Slope   (%)=    1.00         2.00
   Length          (m)=  650.00        25.00
   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 |  3.167   5.31 | 6.250   11.51 | 9.33    0.89
            0.167   0.00 |  3.250   5.31 | 6.333    6.20 | 9.42    0.89
            0.250   0.00 |  3.333  15.05 | 6.417    6.20 | 9.50    0.89
            0.333   0.89 |  3.417  15.05 | 6.500    6.20 | 9.58    0.89
            0.417   0.89 |  3.500  15.05 | 6.583    6.20 | 9.67    0.89
            0.500   0.89 |  3.583  15.05 | 6.667    6.20 | 9.75    0.89
            0.583   0.89 |  3.667  15.05 | 6.750    6.20 | 9.83    0.89
            0.667   0.89 |  3.750  15.05 | 6.833    6.20 | 9.92    0.89
            0.750   0.89 |  3.833  15.05 | 6.917    6.20 | 10.00   0.89
            0.833   0.89 |  3.917  15.05 | 7.000    6.20 | 10.08   0.89
            0.917   0.89 |  4.000  15.05 | 7.083    6.20 | 10.17   0.89
            1.000   0.89 |  4.083  15.05 | 7.167    6.20 | 10.25   0.89
            1.083   0.89 |  4.167  15.05 | 7.250    6.20 | 10.33   0.89
            1.167   0.89 |  4.250  15.05 | 7.333    3.54 | 10.42   0.89
            1.250   0.89 |  4.333  40.71 | 7.417    3.54 | 10.50   0.89
            1.333   0.89 |  4.417  40.71 | 7.500    3.54 | 10.58   0.89
            1.417   0.89 |  4.500  40.71 | 7.583    3.54 | 10.67   0.89
            1.500   0.89 |  4.583  40.71 | 7.667    3.54 | 10.75   0.89
            1.583   0.89 |  4.667  40.71 | 7.750    3.54 | 10.83   0.89
            1.667   0.89 |  4.750  40.71 | 7.833    3.54 | 10.92   0.89
            1.750   0.89 |  4.833  40.71 | 7.917    3.54 | 11.00   0.89
            1.833   0.89 |  4.917  40.71 | 8.000    3.54 | 11.08   0.89
            1.917   0.89 |  5.000  40.71 | 8.083    3.54 | 11.17   0.89
            2.000   0.89 |  5.083  40.71 | 8.167    3.54 | 11.25   0.89
            2.083   0.89 |  5.167  40.71 | 8.250    3.54 | 11.33   0.89
            2.167   0.89 |  5.250  40.71 | 8.333    1.77 | 11.42   0.89

                              Page 58
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                LangstaffRd_EA_Proposed_HumberWatershed
            2.250   0.89 |  5.333  11.51 | 8.417    1.77 | 11.50   0.89
            2.333   5.31 |  5.417  11.51 | 8.500    1.77 | 11.58   0.89
            2.417   5.31 |  5.500  11.51 | 8.583    1.77 | 11.67   0.89
            2.500   5.31 |  5.583  11.51 | 8.667    1.77 | 11.75   0.89
            2.583   5.31 |  5.667  11.51 | 8.750    1.77 | 11.83   0.89
            2.667   5.31 |  5.750  11.51 | 8.833    1.77 | 11.92   0.89
            2.750   5.31 |  5.833  11.51 | 8.917    1.77 | 12.00   0.89
            2.833   5.31 |  5.917  11.51 | 9.000    1.77 | 12.08   0.89
            2.917   5.31 |  6.000  11.51 | 9.083    1.77 | 12.17   0.89
            3.000   5.31 |  6.083  11.51 | 9.167    1.77 | 12.25   0.89
            3.083   5.31 |  6.167  11.51 | 9.250    1.77 |

   Max.Eff.Inten.(mm/hr)=   40.71        33.12
            over (min)      10.00        20.00
   Storage Coeff. (min)=   11.25 (ii)   19.53 (ii)
   Unit Hyd. Tpeak (min)=   10.00        20.00
   Unit Hyd. peak  (cms)=    0.10         0.06
                                                   *TOTALS*
   PEAK FLOW      (cms)=     0.13         0.04        0.166 (iii)
   TIME TO PEAK   (hrs)=     5.25         5.33        5.25
   RUNOFF VOLUME  (mm)=     86.54        55.88       77.03
   TOTAL RAINFALL (mm)=     88.54        88.54       88.54
   RUNOFF COEFFICIENT =      0.98         0.63        0.87


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* =  86.0    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( 0520)|    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  |  0.0181    0.0161
                      0.0081     0.0031  |  0.0584    0.0204
                      0.0123     0.0074  |  0.0920    0.0259
                      0.0155     0.0118  |  0.0000    0.0000
   **** WARNING : STORAGE-DISCHARGE TABLE WAS EXCEEDED.

                        AREA    QPEAK    TPEAK     R.V.
                        (ha)    (cms)    (hrs)     (mm)
   INFLOW : ID= 2 ( 0105)  1.630   0.166    5.25     77.03
   OUTFLOW: ID= 1 ( 0520)  1.630   0.139    5.33     76.98

        PEAK  FLOW  REDUCTION [Qout/Qin](%)= 83.80
        TIME SHIFT OF PEAK FLOW      (min)= 5.00
        MAXIMUM STORAGE   USED   (ha.m.)= 0.0339

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                              Page 59
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                LangstaffRd_EA_Proposed_HumberWatershed
--------------------
| CALIB            |
| STANDHYD ( 0130)|  Area   (ha)= 2.08
|ID= 1 DT= 5.0 min |  Total Imp(%)= 82.00  Dir. Conn.(%)= 82.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
   Surface Area    (ha)=    1.71         0.37
   Dep. Storage    (mm)=    2.00         5.00
   Average Slope   (%)=    1.00         2.00
   Length          (m)=  800.00        20.00
   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 |  3.167   5.31 | 6.250   11.51 | 9.33    0.89
            0.167   0.00 |  3.250   5.31 | 6.333    6.20 | 9.42    0.89
            0.250   0.00 |  3.333  15.05 | 6.417    6.20 | 9.50    0.89
            0.333   0.89 |  3.417  15.05 | 6.500    6.20 | 9.58    0.89
            0.417   0.89 |  3.500  15.05 | 6.583    6.20 | 9.67    0.89
            0.500   0.89 |  3.583  15.05 | 6.667    6.20 | 9.75    0.89
            0.583   0.89 |  3.667  15.05 | 6.750    6.20 | 9.83    0.89
            0.667   0.89 |  3.750  15.05 | 6.833    6.20 | 9.92    0.89
            0.750   0.89 |  3.833  15.05 | 6.917    6.20 | 10.00   0.89
            0.833   0.89 |  3.917  15.05 | 7.000    6.20 | 10.08   0.89
            0.917   0.89 |  4.000  15.05 | 7.083    6.20 | 10.17   0.89
            1.000   0.89 |  4.083  15.05 | 7.167    6.20 | 10.25   0.89
            1.083   0.89 |  4.167  15.05 | 7.250    6.20 | 10.33   0.89
            1.167   0.89 |  4.250  15.05 | 7.333    3.54 | 10.42   0.89
            1.250   0.89 |  4.333  40.71 | 7.417    3.54 | 10.50   0.89
            1.333   0.89 |  4.417  40.71 | 7.500    3.54 | 10.58   0.89
            1.417   0.89 |  4.500  40.71 | 7.583    3.54 | 10.67   0.89
            1.500   0.89 |  4.583  40.71 | 7.667    3.54 | 10.75   0.89
            1.583   0.89 |  4.667  40.71 | 7.750    3.54 | 10.83   0.89
            1.667   0.89 |  4.750  40.71 | 7.833    3.54 | 10.92   0.89
            1.750   0.89 |  4.833  40.71 | 7.917    3.54 | 11.00   0.89
            1.833   0.89 |  4.917  40.71 | 8.000    3.54 | 11.08   0.89
            1.917   0.89 |  5.000  40.71 | 8.083    3.54 | 11.17   0.89
            2.000   0.89 |  5.083  40.71 | 8.167    3.54 | 11.25   0.89
            2.083   0.89 |  5.167  40.71 | 8.250    3.54 | 11.33   0.89
            2.167   0.89 |  5.250  40.71 | 8.333    1.77 | 11.42   0.89
            2.250   0.89 |  5.333  11.51 | 8.417    1.77 | 11.50   0.89
            2.333   5.31 |  5.417  11.51 | 8.500    1.77 | 11.58   0.89
            2.417   5.31 |  5.500  11.51 | 8.583    1.77 | 11.67   0.89
            2.500   5.31 |  5.583  11.51 | 8.667    1.77 | 11.75   0.89
            2.583   5.31 |  5.667  11.51 | 8.750    1.77 | 11.83   0.89
            2.667   5.31 |  5.750  11.51 | 8.833    1.77 | 11.92   0.89
            2.750   5.31 |  5.833  11.51 | 8.917    1.77 | 12.00   0.89
            2.833   5.31 |  5.917  11.51 | 9.000    1.77 | 12.08   0.89
            2.917   5.31 |  6.000  11.51 | 9.083    1.77 | 12.17   0.89

                              Page 60
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                    LangstaffRd_EA_Proposed_HumberWatershed
              3.000   5.31 | 6.083   11.51 | 9.167    1.77 | 12.25   0.89
              3.083   5.31 | 6.167   11.51 | 9.250    1.77 |

        Max.Eff.Inten.(mm/hr)=    40.71         30.98
                 over (min)       15.00         20.00
        Storage Coeff.  (min)=    12.74 (ii)    16.38 (ii)
        Unit Hyd. Tpeak (min)=    15.00         20.00
        Unit Hyd. peak  (cms)=     0.08          0.06
                                                              *TOTALS*
        PEAK FLOW       (cms)=     0.19          0.03      0.219 (iii)
        TIME TO PEAK    (hrs)=     5.25          5.25          5.25
        RUNOFF VOLUME    (mm)=    86.54         51.48         80.22
        TOTAL RAINFALL   (mm)=    88.54         88.54         88.54
        RUNOFF COEFFICIENT  =      0.98          0.58          0.91


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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 ( 0125)|  Area    (ha)=  2.27
|ID= 1 DT= 5.0 min |  Total Imp(%)= 77.00   Dir. Conn.(%)= 77.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=    1.75          0.52
        Dep. Storage    (mm)=    2.00          5.00
        Average Slope   (%)=     1.00          2.00
        Length          (m)=   800.00         20.00
        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 | 3.167  5.31 | 6.250  11.51 | 9.33   0.89
         0.167  0.00 | 3.250  5.31 | 6.333   6.20 | 9.42   0.89
         0.250  0.00 | 3.333 15.05 | 6.417   6.20 | 9.50   0.89
         0.333  0.89 | 3.417 15.05 | 6.500   6.20 | 9.58   0.89
         0.417  0.89 | 3.500 15.05 | 6.583   6.20 | 9.67   0.89
         0.500  0.89 | 3.583 15.05 | 6.667   6.20 | 9.75   0.89
         0.583  0.89 | 3.667 15.05 | 6.750   6.20 | 9.83   0.89
         0.667  0.89 | 3.750 15.05 | 6.833   6.20 | 9.92   0.89
         0.750  0.89 | 3.833 15.05 | 6.917   6.20 | 10.00  0.89
         0.833  0.89 | 3.917 15.05 | 7.000   6.20 | 10.08  0.89
         0.917  0.89 | 4.000 15.05 | 7.083   6.20 | 10.17  0.89
         1.000  0.89 | 4.083 15.05 | 7.167   6.20 | 10.25  0.89

                                Page 61
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                    LangstaffRd_EA_Proposed_HumberWatershed
              1.083   0.89 | 4.167  15.05 | 7.250    6.20 | 10.33   0.89
              1.167   0.89 | 4.250  15.05 | 7.333    3.54 | 10.42   0.89
              1.250   0.89 | 4.333  40.71 | 7.417    3.54 | 10.50   0.89
              1.333   0.89 | 4.417  40.71 | 7.500    3.54 | 10.58   0.89
              1.417   0.89 | 4.500  40.71 | 7.583    3.54 | 10.67   0.89
              1.500   0.89 | 4.583  40.71 | 7.667    3.54 | 10.75   0.89
              1.583   0.89 | 4.667  40.71 | 7.750    3.54 | 10.83   0.89
              1.667   0.89 | 4.750  40.71 | 7.833    3.54 | 10.92   0.89
              1.750   0.89 | 4.833  40.71 | 7.917    3.54 | 11.00   0.89
              1.833   0.89 | 4.917  40.71 | 8.000    3.54 | 11.08   0.89
              1.917   0.89 | 5.000  40.71 | 8.083    3.54 | 11.17   0.89
              2.000   0.89 | 5.083  40.71 | 8.167    3.54 | 11.25   0.89
              2.083   0.89 | 5.167  40.71 | 8.250    3.54 | 11.33   0.89
              2.167   0.89 | 5.250  40.71 | 8.333    1.77 | 11.42   0.89
              2.250   0.89 | 5.333  40.71 | 8.417    1.77 | 11.50   0.89
              2.333   5.31 | 5.417  11.51 | 8.500    1.77 | 11.58   0.89
              2.417   5.31 | 5.500  11.51 | 8.583    1.77 | 11.67   0.89
              2.500   5.31 | 5.583  11.51 | 8.667    1.77 | 11.75   0.89
              2.583   5.31 | 5.667  11.51 | 8.750    1.77 | 11.83   0.89
              2.667   5.31 | 5.750  11.51 | 8.833    1.77 | 11.92   0.89
              2.750   5.31 | 5.833  11.51 | 8.917    1.77 | 12.00   0.89
              2.833   5.31 | 5.917  11.51 | 9.000    1.77 | 12.08   0.89
              2.917   5.31 | 6.000  11.51 | 9.083    1.77 | 12.17   0.89
              3.000   5.31 | 6.083  11.51 | 9.167    1.77 | 12.25   0.89
              3.083   5.31 | 6.167  11.51 | 9.250    1.77 |

        Max.Eff.Inten.(mm/hr)=    40.71         30.98
                 over (min)       15.00         20.00
        Storage Coeff.  (min)=    12.74 (ii)    16.86 (ii)
        Unit Hyd. Tpeak (min)=    15.00         20.00
        Unit Hyd. peak  (cms)=     0.08          0.06
                                                              *TOTALS*
        PEAK FLOW       (cms)=     0.20          0.04      0.235 (iii)
        TIME TO PEAK    (hrs)=     5.25          5.25          5.25
        RUNOFF VOLUME    (mm)=    86.54         51.48         78.47
        TOTAL RAINFALL   (mm)=    88.54         88.54         88.54
        RUNOFF COEFFICIENT  =      0.98          0.58          0.89


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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 ( 0405)|
|  1 + 2 = 3     |           AREA    QPEAK    TPEAK     R.V.
--------------------            (ha)    (cms)    (hrs)     (mm)
          ID1= 1 ( 0125):     2.27    0.235     5.25    78.47
        + ID2= 2 ( 0130):     2.08    0.219     5.25    80.22

                                Page 62
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                    LangstaffRd_EA_Proposed_HumberWatershed
              ==================================================
              ID = 3 ( 0405):     4.35    0.454     5.25    79.31

        NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------
--------------------
| RESERVOIR( 0505)|    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   |   0.2110    0.0383
                      0.0185    0.0030   |   0.2743    0.0515
                      0.0302    0.0120   |   0.3250    0.0792
                      0.1102    0.0251   |   0.0000    0.0000

                              AREA    QPEAK    TPEAK     R.V.
                              (ha)    (cms)    (hrs)     (mm)
        INFLOW : ID= 2 ( 0405)   4.350   0.454     5.25    79.31
        OUTFLOW: ID= 1 ( 0505)   4.350   0.325     5.50    79.30

           PEAK  FLOW   REDUCTION [Qout/Qin](%)= 71.51
           TIME SHIFT OF PEAK FLOW      (min)= 15.00
           MAXIMUM STORAGE   USED    (ha.m.)= 0.0792

--------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0120)|  Area    (ha)=  1.24
|ID= 1 DT= 5.0 min |  Total Imp(%)= 73.00   Dir. Conn.(%)= 73.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=    0.91          0.33
        Dep. Storage    (mm)=    2.00          5.00
        Average Slope   (%)=     1.00          2.00
        Length          (m)=   475.00         17.00
        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 | 3.167  5.31 | 6.250  11.51 | 9.33   0.89
         0.167  0.00 | 3.250  5.31 | 6.333   6.20 | 9.42   0.89
         0.250  0.00 | 3.333 15.05 | 6.417   6.20 | 9.50   0.89
         0.333  0.89 | 3.417 15.05 | 6.500   6.20 | 9.58   0.89
         0.417  0.89 | 3.500 15.05 | 6.583   6.20 | 9.67   0.89
         0.500  0.89 | 3.583 15.05 | 6.667   6.20 | 9.75   0.89
         0.583  0.89 | 3.667 15.05 | 6.750   6.20 | 9.83   0.89
         0.667  0.89 | 3.750 15.05 | 6.833   6.20 | 9.92   0.89
         0.750  0.89 | 3.833 15.05 | 6.917   6.20 | 10.00  0.89
         0.833  0.89 | 3.917 15.05 | 7.000   6.20 | 10.08  0.89

                                Page 63
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                    LangstaffRd_EA_Proposed_HumberWatershed
              0.917   0.89 | 4.000  15.05 | 7.083    6.20 | 10.17   0.89
              1.000   0.89 | 4.083  15.05 | 7.167    6.20 | 10.25   0.89
              1.083   0.89 | 4.167  15.05 | 7.250    6.20 | 10.33   0.89
              1.167   0.89 | 4.250  15.05 | 7.333    3.54 | 10.42   0.89
              1.250   0.89 | 4.333  40.71 | 7.417    3.54 | 10.50   0.89
              1.333   0.89 | 4.417  40.71 | 7.500    3.54 | 10.58   0.89
              1.417   0.89 | 4.500  40.71 | 7.583    3.54 | 10.67   0.89
              1.500   0.89 | 4.583  40.71 | 7.667    3.54 | 10.75   0.89
              1.583   0.89 | 4.667  40.71 | 7.750    3.54 | 10.83   0.89
              1.667   0.89 | 4.750  40.71 | 7.833    3.54 | 10.92   0.89
              1.750   0.89 | 4.833  40.71 | 7.917    3.54 | 11.00   0.89
              1.833   0.89 | 4.917  40.71 | 8.000    3.54 | 11.08   0.89
              1.917   0.89 | 5.000  40.71 | 8.083    3.54 | 11.17   0.89
              2.000   0.89 | 5.083  40.71 | 8.167    3.54 | 11.25   0.89
              2.083   0.89 | 5.167  40.71 | 8.250    3.54 | 11.33   0.89
              2.167   0.89 | 5.250  40.71 | 8.333    1.77 | 11.42   0.89
              2.250   0.89 | 5.333  40.71 | 8.417    1.77 | 11.50   0.89
              2.333   5.31 | 5.417  11.51 | 8.500    1.77 | 11.58   0.89
              2.417   5.31 | 5.500  11.51 | 8.583    1.77 | 11.67   0.89
              2.500   5.31 | 5.583  11.51 | 8.667    1.77 | 11.75   0.89
              2.583   5.31 | 5.667  11.51 | 8.750    1.77 | 11.83   0.89
              2.667   5.31 | 5.750  11.51 | 8.833    1.77 | 11.92   0.89
              2.750   5.31 | 5.833  11.51 | 8.917    1.77 | 12.00   0.89
              2.833   5.31 | 5.917  11.51 | 9.000    1.77 | 12.08   0.89
              2.917   5.31 | 6.000  11.51 | 9.083    1.77 | 12.17   0.89
              3.000   5.31 | 6.083  11.51 | 9.167    1.77 | 12.25   0.89
              3.083   5.31 | 6.167  11.51 | 9.250    1.77 |

        Max.Eff.Inten.(mm/hr)=    40.71         30.98
                 over (min)       10.00         15.00
        Storage Coeff.  (min)=     9.32 (ii)    13.39 (ii)
        Unit Hyd. Tpeak (min)=    10.00         15.00
        Unit Hyd. peak  (cms)=     0.12          0.08
                                                              *TOTALS*
        PEAK FLOW       (cms)=     0.10          0.03      0.129 (iii)
        TIME TO PEAK    (hrs)=     5.25          5.25          5.25
        RUNOFF VOLUME    (mm)=    86.54         51.48         77.07
        TOTAL RAINFALL   (mm)=    88.54         88.54         88.54
        RUNOFF COEFFICIENT  =      0.98          0.58          0.87


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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 ( 0115)|  Area    (ha)=  1.00
|ID= 1 DT= 5.0 min |  Total Imp(%)= 63.00   Dir. Conn.(%)= 63.00
--------------------
                                Page 64
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```
                        LangstaffRd_EA_Proposed_HumberWatershed
                               IMPERVIOUS    PERVIOUS (i)
            Surface Area    (ha)=    0.63        0.37
            Dep. Storage    (mm)=    2.00        5.00
            Average Slope   (%)=     1.00        2.00
            Length          (m)=   475.00       17.00
            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 | 3.167   5.31 | 6.250  11.51 | 9.33    0.89
              0.167   0.00 | 3.250   5.31 | 6.333   6.20 | 9.42    0.89
              0.250   0.00 | 3.333  15.05 | 6.417   6.20 | 9.50    0.89
              0.333   0.89 | 3.417  15.05 | 6.500   6.20 | 9.58    0.89
              0.417   0.89 | 3.500  15.05 | 6.583   6.20 | 9.67    0.89
              0.500   0.89 | 3.583  15.05 | 6.667   6.20 | 9.75    0.89
              0.583   0.89 | 3.667  15.05 | 6.750   6.20 | 9.83    0.89
              0.667   0.89 | 3.750  15.05 | 6.833   6.20 | 9.92    0.89
              0.750   0.89 | 3.833  15.05 | 6.917   6.20 |10.00    0.89
              0.833   0.89 | 3.917  15.05 | 7.000   6.20 |10.08    0.89
              0.917   0.89 | 4.000  15.05 | 7.083   6.20 |10.17    0.89
              1.000   0.89 | 4.083  15.05 | 7.167   6.20 |10.25    0.89
              1.083   0.89 | 4.167  15.05 | 7.250   6.20 |10.33    0.89
              1.167   0.89 | 4.250  15.05 | 7.333   3.54 |10.42    0.89
              1.250   0.89 | 4.333  40.71 | 7.417   3.54 |10.50    0.89
              1.333   0.89 | 4.417  40.71 | 7.500   3.54 |10.58    0.89
              1.417   0.89 | 4.500  40.71 | 7.583   3.54 |10.67    0.89
              1.500   0.89 | 4.583  40.71 | 7.667   3.54 |10.75    0.89
              1.583   0.89 | 4.667  40.71 | 7.750   3.54 |10.83    0.89
              1.667   0.89 | 4.750  40.71 | 7.833   3.54 |10.92    0.89
              1.750   0.89 | 4.833  40.71 | 7.917   3.54 |11.00    0.89
              1.833   0.89 | 4.917  40.71 | 8.000   3.54 |11.08    0.89
              1.917   0.89 | 5.000  40.71 | 8.083   3.54 |11.17    0.89
              2.000   0.89 | 5.083  40.71 | 8.167   3.54 |11.25    0.89
              2.083   0.89 | 5.167  40.71 | 8.250   3.54 |11.33    0.89
              2.167   0.89 | 5.250  40.71 | 8.333   1.77 |11.42    0.89
              2.250   0.89 | 5.333  11.51 | 8.417   1.77 |11.50    0.89
              2.333   5.31 | 5.417  11.51 | 8.500   1.77 |11.58    0.89
              2.417   5.31 | 5.500  11.51 | 8.583   1.77 |11.67    0.89
              2.500   5.31 | 5.583  11.51 | 8.667   1.77 |11.75    0.89
              2.583   5.31 | 5.667  11.51 | 8.750   1.77 |11.83    0.89
              2.667   5.31 | 5.750  11.51 | 8.833   1.77 |11.92    0.89
              2.750   5.31 | 5.833  11.51 | 8.917   1.77 |12.00    0.89
              2.833   5.31 | 5.917  11.51 | 9.000   1.77 |12.08    0.89
              2.917   5.31 | 6.000  11.51 | 9.083   1.77 |12.17    0.89
              3.000   5.31 | 6.083  11.51 | 9.167   1.77 |12.25    0.89
              3.083   5.31 | 6.167  11.51 | 9.250   1.77 |

         Max.Eff.Inten.(mm/hr)=     40.71       30.98
                 over (min)         10.00       15.00
```

```
                        LangstaffRd_EA_Proposed_HumberWatershed
            Storage Coeff.  (min)=    9.32 (ii)   14.21 (ii)
            Unit Hyd. Tpeak (min)=   10.00        15.00
            Unit Hyd. peak  (cms)=    0.12         0.08
                                                             *TOTALS*
            PEAK FLOW      (cms)=     0.07         0.03      0.100 (iii)
            TIME TO PEAK   (hrs)=     5.25         5.25      5.25
            RUNOFF VOLUME  (mm)=     86.54        51.48     73.56
            TOTAL RAINFALL (mm)=     88.54        88.54     88.54
            RUNOFF COEFFICIENT  =     0.98         0.58      0.83


               (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                   CN*  = 83.0    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  ( 0410)|
        |  1 +  2 =  3     |           AREA     QPEAK    TPEAK    R.V.
        --------------------           (ha)     (cms)    (hrs)    (mm)
                           ID1= 1 ( 0115):  1.00  0.100   5.25   73.56
                         + ID2= 2 ( 0120):  1.24  0.129   5.25   77.07
                           ====================================
                           ID = 3 ( 0410):  2.24  0.229   5.25   75.50

           NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
        ---------------------------------------------------------------
        --------------------
        | RESERVOIR( 0510)|      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   |  0.0699    0.0309
                                  0.0264    0.0024   |  0.0792    0.0414
                                  0.0457    0.0099   |  0.0876    0.0666
                                  0.0590    0.0204   |  0.0000    0.0000

                                   AREA     QPEAK    TPEAK     R.V.
                                   (ha)     (cms)    (hrs)     (mm)
              INFLOW : ID= 2 ( 0410)   2.240   0.229    5.25    75.50
              OUTFLOW: ID= 1 ( 0510)   2.240   0.087    5.67    75.50

                    PEAK  FLOW   REDUCTION [Qout/Qin](%)= 37.90
                    TIME SHIFT OF PEAK FLOW      (min)= 25.00
                    MAXIMUM STORAGE   USED  (ha.m.)= 0.0640

        ---------------------------------------------------------------
        --------------------
        | ADD HYD  ( 0420)|
```

```
                        LangstaffRd_EA_Proposed_HumberWatershed
        |  1 +  2 =  3     |           AREA     QPEAK    TPEAK    R.V.
        --------------------           (ha)     (cms)    (hrs)    (mm)
                           ID1= 1 ( 0505):  4.35  0.325   5.50   79.30
                         + ID2= 2 ( 0510):  2.24  0.087   5.67   75.50
                           ====================================
                           ID = 3 ( 0420):  6.59  0.411   5.50   78.01

           NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
        ---------------------------------------------------------------
        --------------------
        | CALIB            |
        | STANDHYD ( 0110)|  Area   (ha)=  1.58
        | ID= 1 DT= 5.0 min |  Total Imp(%)= 70.00  Dir. Conn.(%)= 70.00
        --------------------
                               IMPERVIOUS    PERVIOUS (i)
            Surface Area    (ha)=    1.11        0.47
            Dep. Storage    (mm)=    2.00        5.00
            Average Slope   (%)=     1.00        2.00
            Length          (m)=   650.00       25.00
            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 | 3.167   5.31 | 6.250  11.51 | 9.33    0.89
              0.167   0.00 | 3.250   5.31 | 6.333   6.20 | 9.42    0.89
              0.250   0.00 | 3.333  15.05 | 6.417   6.20 | 9.50    0.89
              0.333   0.89 | 3.417  15.05 | 6.500   6.20 | 9.58    0.89
              0.417   0.89 | 3.500  15.05 | 6.583   6.20 | 9.67    0.89
              0.500   0.89 | 3.583  15.05 | 6.667   6.20 | 9.75    0.89
              0.583   0.89 | 3.667  15.05 | 6.750   6.20 | 9.83    0.89
              0.667   0.89 | 3.750  15.05 | 6.833   6.20 | 9.92    0.89
              0.750   0.89 | 3.833  15.05 | 6.917   6.20 |10.00    0.89
              0.833   0.89 | 3.917  15.05 | 7.000   6.20 |10.08    0.89
              0.917   0.89 | 4.000  15.05 | 7.083   6.20 |10.17    0.89
              1.000   0.89 | 4.083  15.05 | 7.167   6.20 |10.25    0.89
              1.083   0.89 | 4.167  15.05 | 7.250   6.20 |10.33    0.89
              1.167   0.89 | 4.250  15.05 | 7.333   3.54 |10.42    0.89
              1.250   0.89 | 4.333  40.71 | 7.417   3.54 |10.50    0.89
              1.333   0.89 | 4.417  40.71 | 7.500   3.54 |10.58    0.89
              1.417   0.89 | 4.500  40.71 | 7.583   3.54 |10.67    0.89
              1.500   0.89 | 4.583  40.71 | 7.667   3.54 |10.75    0.89
              1.583   0.89 | 4.667  40.71 | 7.750   3.54 |10.83    0.89
              1.667   0.89 | 4.750  40.71 | 7.833   3.54 |10.92    0.89
              1.750   0.89 | 4.833  40.71 | 7.917   3.54 |11.00    0.89
              1.833   0.89 | 4.917  40.71 | 8.000   3.54 |11.08    0.89
              1.917   0.89 | 5.000  40.71 | 8.083   3.54 |11.17    0.89
              2.000   0.89 | 5.083  40.71 | 8.167   3.54 |11.25    0.89
              2.083   0.89 | 5.167  40.71 | 8.250   3.54 |11.33    0.89
              2.167   0.89 | 5.250  40.71 | 8.333   1.77 |11.42    0.89
```

```
                        LangstaffRd_EA_Proposed_HumberWatershed
              2.250   0.89 | 5.333  11.51 | 8.417   1.77 |11.50    0.89
              2.333   5.31 | 5.417  11.51 | 8.500   1.77 |11.58    0.89
              2.417   5.31 | 5.500  11.51 | 8.583   1.77 |11.67    0.89
              2.500   5.31 | 5.583  11.51 | 8.667   1.77 |11.75    0.89
              2.583   5.31 | 5.667  11.51 | 8.750   1.77 |11.83    0.89
              2.667   5.31 | 5.750  11.51 | 8.833   1.77 |11.92    0.89
              2.750   5.31 | 5.833  11.51 | 8.917   1.77 |12.00    0.89
              2.833   5.31 | 5.917  11.51 | 9.000   1.77 |12.08    0.89
              2.917   5.31 | 6.000  11.51 | 9.083   1.77 |12.17    0.89
              3.000   5.31 | 6.083  11.51 | 9.167   1.77 |12.25    0.89
              3.083   5.31 | 6.167  11.51 | 9.250   1.77 |

         Max.Eff.Inten.(mm/hr)=     40.71       32.40
                 over (min)         10.00       20.00
            Storage Coeff.  (min)=   11.25 (ii)   19.61 (ii)
            Unit Hyd. Tpeak (min)=   10.00        20.00
            Unit Hyd. peak  (cms)=    0.10         0.06
                                                             *TOTALS*
            PEAK FLOW      (cms)=     0.12         0.04      0.161 (iii)
            TIME TO PEAK   (hrs)=     5.25         5.33      5.25
            RUNOFF VOLUME  (mm)=     86.54        54.37     76.88
            TOTAL RAINFALL (mm)=     88.54        88.54     88.54
            RUNOFF COEFFICIENT  =     0.98         0.61      0.87


               (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                   CN*  = 85.0    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( 0525)|      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   |  0.0181    0.0161
                                  0.0081    0.0031   |  0.0584    0.0204
                                  0.0123    0.0074   |  0.0920    0.0259
                                  0.0155    0.0118   |  0.0000    0.0000

                                   AREA     QPEAK    TPEAK     R.V.
                                   (ha)     (cms)    (hrs)     (mm)
              INFLOW : ID= 2 ( 0110)   1.580   0.161    5.25    76.88
              OUTFLOW: ID= 1 ( 0525)   1.580   0.135    5.33    76.82

                    PEAK  FLOW   REDUCTION [Qout/Qin](%)= 83.80
                    TIME SHIFT OF PEAK FLOW      (min)= 5.00
                    MAXIMUM STORAGE   USED  (ha.m.)= 0.0331

        ---------------------------------------------------------------
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Don River Watershed
Visual OTTHYMO Summary- Proposed

PCSWMM Modelling for Culvert LC1 Don River Watershed

LangstaffRd_EA_Proposed_WestDonWatershd
```
********************************
** SIMULATION:Run 02         **
********************************
```

```
--------------------
|  READ STORM       |   Filename: C:\Users\ray.zhao\AppD
|                   |            ata\Local\Temp\
|                   |            e8da0adc-3b43-467d-984d-5ab4a7d3492c\e8708d30
| Ptotal= 42.93 mm  |   Comments: 2yr-12hrSCS
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	3.50	1.02	6.75	8.13	10.00	1.02
0.50	1.02	3.75	2.03	7.00	3.05	10.25	1.02
0.75	1.02	4.00	2.03	7.25	3.05	10.50	1.02
1.00	1.02	4.25	1.02	7.50	3.05	10.75	1.02
1.25	0.00	4.50	3.05	7.75	2.03	11.00	1.02
1.50	1.02	4.75	3.05	8.00	3.05	11.25	1.02
1.75	1.02	5.00	3.05	8.25	2.03	11.50	0.00
2.00	1.02	5.25	3.05	8.50	2.03	11.75	1.02
2.25	1.02	5.50	5.08	8.75	2.03	12.00	1.02
2.50	1.02	5.75	5.08	9.00	1.02	12.25	1.02
2.75	2.03	6.00	38.61	9.25	2.03		
3.00	2.03	6.25	38.61	9.50	1.02		
3.25	2.03	6.50	8.13	9.75	2.03		

```
-----------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD ( 0165)  |   Area     (ha)=   0.60
|ID= 1 DT= 5.0 min  |   Total Imp(%)= 72.00   Dir. Conn.(%)= 72.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area   (ha)=     0.43         0.17
     Dep. Storage   (mm)=     2.00         5.00
     Average Slope  (%)=      1.00         2.00
     Length         (m)=    250.00        20.00
     Mannings n      =        0.013        0.250

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

```
                    ---- TRANSFORMED HYETOGRAPH ----
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	2.03	6.250	38.61	9.33	1.02
0.167	0.00	3.250	2.03	6.333	8.13	9.42	1.02
0.250	0.00	3.333	1.02	6.417	8.13	9.50	1.02
0.333	1.02	3.417	1.02	6.500	8.13	9.58	2.03
0.417	1.02	3.500	1.02	6.583	8.13	9.67	2.03
0.500	1.02	3.583	2.03	6.667	8.13	9.75	2.03
0.583	1.02	3.667	2.03	6.750	8.13	9.83	1.02

LangstaffRd_EA_Proposed_WestDonWatershd

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.667	1.02	3.750	2.03	6.833	3.05	9.92	1.02
0.750	1.02	3.833	2.03	6.917	3.05	10.00	1.02
0.833	1.02	3.917	2.03	7.000	3.05	10.08	1.02
0.917	1.02	4.000	2.03	7.083	3.05	10.17	1.02
1.000	1.02	4.083	1.02	7.167	3.05	10.25	1.02
1.083	0.00	4.167	1.02	7.250	3.05	10.33	1.02
1.167	0.00	4.250	1.02	7.333	3.05	10.42	1.02
1.250	0.00	4.333	3.05	7.417	3.05	10.50	1.02
1.333	1.02	4.417	3.05	7.500	3.05	10.58	1.02
1.417	1.02	4.500	3.05	7.583	2.03	10.67	1.02
1.500	1.02	4.583	3.05	7.667	2.03	10.75	1.02
1.583	1.02	4.667	3.05	7.750	2.03	10.83	1.02
1.667	1.02	4.750	3.05	7.833	3.05	10.92	1.02
1.750	1.02	4.833	3.05	7.917	3.05	11.00	1.02
1.833	1.02	4.917	3.05	8.000	3.05	11.08	1.02
1.917	1.02	5.000	3.05	8.083	2.03	11.17	1.02
2.000	1.02	5.083	3.05	8.167	2.03	11.25	1.02
2.083	1.02	5.167	3.05	8.250	2.03	11.33	0.00
2.167	1.02	5.250	3.05	8.333	2.03	11.42	0.00
2.250	1.02	5.333	5.08	8.417	2.03	11.50	0.00
2.333	1.02	5.417	5.08	8.500	2.03	11.58	1.02
2.417	1.02	5.500	5.08	8.583	2.03	11.67	1.02
2.500	1.02	5.583	5.08	8.667	2.03	11.75	1.02
2.583	2.03	5.667	5.08	8.750	2.03	11.83	1.02
2.667	2.03	5.750	5.08	8.833	1.02	11.92	1.02
2.750	2.03	5.833	38.61	8.917	1.02	12.00	1.02
2.833	2.03	5.917	38.61	9.000	1.02	12.08	1.02
2.917	2.03	6.000	38.61	9.083	2.03	12.17	1.02
3.000	2.03	6.083	38.61	9.167	2.03	12.25	1.02
3.083	2.03	6.167	38.61	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      38.61         19.37
          over (min)=       5.00         15.00
Storage Coeff. (min)=       6.48 (ii)    11.15 (ii)
Unit Hyd. Tpeak (min)=      5.00         15.00
Unit Hyd. peak  (cms)=      0.18          0.09

                                                     *TOTALS*
PEAK FLOW      (cms)=       0.05          0.01       0.052 (iii)
TIME TO PEAK   (hrs)=       6.25          6.33       6.25
RUNOFF VOLUME   (mm)=      40.93         15.99      33.93
TOTAL RAINFALL  (mm)=      42.93         42.93      42.93
RUNOFF COEFFICIENT  =       0.95          0.37       0.79


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0    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.

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| CALIB             |
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LangstaffRd_EA_Proposed_WestDonWatershd
```
| STANDHYD ( 0170)|   Area     (ha)=   0.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 98.00   Dir. Conn.(%)= 98.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area   (ha)=     0.42         0.01
     Dep. Storage   (mm)=     2.00         5.00
     Average Slope  (%)=      1.00         2.00
     Length         (m)=    250.00        20.00
     Mannings n      =        0.013        0.250

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

```
                    ---- TRANSFORMED HYETOGRAPH ----
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	2.03	6.250	38.61	9.33	1.02
0.167	0.00	3.250	2.03	6.333	8.13	9.42	1.02
0.250	0.00	3.333	1.02	6.417	8.13	9.50	1.02
0.333	1.02	3.417	1.02	6.500	8.13	9.58	2.03
0.417	1.02	3.500	1.02	6.583	8.13	9.67	2.03
0.500	1.02	3.583	2.03	6.667	8.13	9.75	2.03
0.583	1.02	3.667	2.03	6.750	8.13	9.83	1.02
0.667	1.02	3.750	2.03	6.833	3.05	9.92	1.02
0.750	1.02	3.833	2.03	6.917	3.05	10.00	1.02
0.833	1.02	3.917	2.03	7.000	3.05	10.08	1.02
0.917	1.02	4.000	2.03	7.083	3.05	10.17	1.02
1.000	1.02	4.083	1.02	7.167	3.05	10.25	1.02
1.083	0.00	4.167	1.02	7.250	3.05	10.33	1.02
1.167	0.00	4.250	1.02	7.333	3.05	10.42	1.02
1.250	0.00	4.333	3.05	7.417	3.05	10.50	1.02
1.333	1.02	4.417	3.05	7.500	3.05	10.58	1.02
1.417	1.02	4.500	3.05	7.583	2.03	10.67	1.02
1.500	1.02	4.583	3.05	7.667	2.03	10.75	1.02
1.583	1.02	4.667	3.05	7.750	2.03	10.83	1.02
1.667	1.02	4.750	3.05	7.833	3.05	10.92	1.02
1.750	1.02	4.833	3.05	7.917	3.05	11.00	1.02
1.833	1.02	4.917	3.05	8.000	3.05	11.08	1.02
1.917	1.02	5.000	3.05	8.083	2.03	11.17	1.02
2.000	1.02	5.083	3.05	8.167	2.03	11.25	1.02
2.083	1.02	5.167	3.05	8.250	2.03	11.33	0.00
2.167	1.02	5.250	3.05	8.333	2.03	11.42	0.00
2.250	1.02	5.333	5.08	8.417	2.03	11.50	0.00
2.333	1.02	5.417	5.08	8.500	2.03	11.58	1.02
2.417	1.02	5.500	5.08	8.583	2.03	11.67	1.02
2.500	1.02	5.583	5.08	8.667	2.03	11.75	1.02
2.583	2.03	5.667	5.08	8.750	2.03	11.83	1.02
2.667	2.03	5.750	5.08	8.833	1.02	11.92	1.02
2.750	2.03	5.833	38.61	8.917	1.02	12.00	1.02
2.833	2.03	5.917	38.61	9.000	1.02	12.08	1.02
2.917	2.03	6.000	38.61	9.083	2.03	12.17	1.02
3.000	2.03	6.083	38.61	9.167	2.03	12.25	1.02
3.083	2.03	6.167	38.61	9.250	2.03		

LangstaffRd_EA_Proposed_WestDonWatershd

```
Max.Eff.Inten.(mm/hr)=      38.61         25.09
          over (min)=       5.00         10.00
Storage Coeff. (min)=       6.48 (ii)     7.91 (ii)
Unit Hyd. Tpeak (min)=      5.00         10.00
Unit Hyd. peak  (cms)=      0.18          0.13

                                                     *TOTALS*
PEAK FLOW      (cms)=       0.04          0.00       0.045 (iii)
TIME TO PEAK   (hrs)=       6.25          6.25       6.25
RUNOFF VOLUME   (mm)=      40.93         20.75      40.52
TOTAL RAINFALL  (mm)=      42.93         42.93      42.93
RUNOFF COEFFICIENT  =       0.95          0.48       0.94


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 89.0    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 ( 0180)|   Area     (ha)=   0.65
|ID= 1 DT= 5.0 min |   Total Imp(%)= 52.00   Dir. Conn.(%)= 52.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area   (ha)=     0.34         0.31
     Dep. Storage   (mm)=     2.00         5.00
     Average Slope  (%)=      1.00         2.00
     Length         (m)=     65.83        40.00
     Mannings n      =        0.013        0.250

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

```
                    ---- TRANSFORMED HYETOGRAPH ----
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	2.03	6.250	38.61	9.33	1.02
0.167	0.00	3.250	2.03	6.333	8.13	9.42	1.02
0.250	0.00	3.333	1.02	6.417	8.13	9.50	1.02
0.333	1.02	3.417	1.02	6.500	8.13	9.58	2.03
0.417	1.02	3.500	1.02	6.583	8.13	9.67	2.03
0.500	1.02	3.583	2.03	6.667	8.13	9.75	2.03
0.583	1.02	3.667	2.03	6.750	8.13	9.83	1.02
0.667	1.02	3.750	2.03	6.833	3.05	9.92	1.02
0.750	1.02	3.833	2.03	6.917	3.05	10.00	1.02
0.833	1.02	3.917	2.03	7.000	3.05	10.08	1.02
0.917	1.02	4.000	2.03	7.083	3.05	10.17	1.02
1.000	1.02	4.083	1.02	7.167	3.05	10.25	1.02
1.083	0.00	4.167	1.02	7.250	3.05	10.33	1.02
1.167	0.00	4.250	1.02	7.333	3.05	10.42	1.02

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
         1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50   1.02
         1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58   1.02
         1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67   1.02
         1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75   1.02
         1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83   1.02
         1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92   1.02
         1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00   1.02
         1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08   1.02
         1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17   1.02
         2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25   1.02
         2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33   0.00
         2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   0.00
         2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50   0.00
         2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58   1.02
         2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67   1.02
         2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75   1.02
         2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83   1.02
         2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92   1.02
         2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00   1.02
         2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08   1.02
         2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17   1.02
         3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25   1.02
         3.083   2.03 | 6.167  38.61 | 9.250   2.03 |

      Max.Eff.Inten.(mm/hr)=   38.61        18.46
             over (min)         5.00        20.00
      Storage Coeff.  (min)=    2.91 (ii)  16.78 (ii)
      Unit Hyd. Tpeak (min)=    5.00        20.00
      Unit Hyd. peak  (cms)=    0.28         0.06
                                                         *TOTALS*
      PEAK FLOW       (cms)=    0.04         0.01        0.045 (iii)
      TIME TO PEAK   (hrs)=     6.25         6.42        6.25
      RUNOFF VOLUME    (mm)=   40.93        15.99       28.94
      TOTAL RAINFALL   (mm)=   42.93        42.93       42.93
      RUNOFF COEFFICIENT  =     0.95         0.37        0.67

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0   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 ( 0185)|   Area     (ha)=  0.47
|ID= 1 DT= 5.0 min |  Total Imp(%)= 72.00  Dir. Conn.(%)= 72.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
      Surface Area   (ha)=    0.34         0.13
      Dep. Storage   (mm)=    2.00         5.00
                            Page 5
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                    LangstaffRd_EA_Proposed_WestDonWatershd
      Average Slope   (%)=     1.00         2.00
      Length          (m)=   240.00        20.00
      Mannings n      =        0.013        0.350

      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   2.03 | 6.250  38.61 | 9.33   1.02
        0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42   1.02
        0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50   1.02
        0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58   2.03
        0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67   2.03
        0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75   2.03
        0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83   1.02
        0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92   1.02
        0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00  1.02
        0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08  1.02
        0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17  1.02
        1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25  1.02
        1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33  1.02
        1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42  1.02
        1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50  1.02
        1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58  1.02
        1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67  1.02
        1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75  1.02
        1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83  1.02
        1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92  1.02
        1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00  1.02
        1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08  1.02
        1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17  1.02
        2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25  1.02
        2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33  0.00
        2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  0.00
        2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50  0.00
        2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58  1.02
        2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67  1.02
        2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75  1.02
        2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83  1.02
        2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92  1.02
        2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00  1.02
        2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08  1.02
        2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17  1.02
        3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25  1.02
        3.083   2.03 | 6.167  38.61 | 9.250   2.03 |

      Max.Eff.Inten.(mm/hr)=   38.61        15.64
             over (min)         5.00        20.00
      Storage Coeff.  (min)=    6.32 (ii)  18.29 (ii)
      Unit Hyd. Tpeak (min)=    5.00        20.00
      Unit Hyd. peak  (cms)=    0.19         0.06
                            Page 6
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                    LangstaffRd_EA_Proposed_WestDonWatershd
                                                     *TOTALS*
      PEAK FLOW       (cms)=    0.04         0.00        0.039 (iii)
      TIME TO PEAK   (hrs)=     6.25         6.42        6.25
      RUNOFF VOLUME    (mm)=   40.93        13.64       33.27
      TOTAL RAINFALL   (mm)=   42.93        42.93       42.93
      RUNOFF COEFFICIENT  =     0.95         0.32        0.77

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 79.0   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 ( 0445)|
|  1 + 2 = 3      |      AREA    QPEAK   TPEAK    R.V.
--------------------     (ha)    (cms)   (hrs)    (mm)
        ID1= 1 ( 0180):   0.65    0.045    6.25   28.94
      + ID2= 2 ( 0185):   0.47    0.039    6.25   33.27
      ================================================
        ID = 3 ( 0445):   1.12    0.084    6.25   30.76

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------
--------------------
| ADD HYD ( 0450)|
|  1 + 2 = 3      |      AREA    QPEAK   TPEAK    R.V.
--------------------     (ha)    (cms)   (hrs)    (mm)
        ID1= 1 ( 0165):   0.60    0.052    6.25   33.93
      + ID2= 2 ( 0170):   0.43    0.045    6.25   40.52
      ================================================
        ID = 3 ( 0450):   1.03    0.098    6.25   36.68

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------
--------------------
| ADD HYD ( 0450)|
|  3 + 2 = 1      |      AREA    QPEAK   TPEAK    R.V.
--------------------     (ha)    (cms)   (hrs)    (mm)
        ID1= 3 ( 0450):   1.03    0.098    6.25   36.68
      + ID2= 2 ( 0445):   1.12    0.084    6.25   30.76
      ================================================
        ID = 1 ( 0450):   2.15    0.182    6.25   33.59

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------
--------------------
| RESERVOIR( 0520)|   OVERFLOW IS OFF
                            Page 7
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                    LangstaffRd_EA_Proposed_WestDonWatershd
| IN= 2---> OUT= 1 |
| DT=  5.0 min    |     OUTFLOW   STORAGE  |   OUTFLOW   STORAGE
--------------------     (cms)    (ha.m.)  |    (cms)    (ha.m.)
                        0.0000    0.0000   |   0.0181    0.0552
                        0.0081    0.0048   |   0.0203    0.0732
                        0.0123    0.0192   |   0.0224    0.1152
                        0.0155    0.0372   |   0.0000    0.0000

                          AREA    QPEAK    TPEAK     R.V.
                          (ha)    (cms)    (hrs)     (mm)
      INFLOW : ID= 2 ( 0450)   2.150    0.182    6.25   33.59
      OUTFLOW: ID= 1 ( 0520)   2.150    0.016    7.50   33.53

           PEAK  FLOW   REDUCTION [Qout/Qin](%)=  9.03
           TIME SHIFT OF PEAK FLOW      (min)= 75.00
           MAXIMUM STORAGE   USED    (ha.m.)= 0.0437

-------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0145)|   Area     (ha)=  3.05
|ID= 1 DT= 5.0 min |  Total Imp(%)= 76.00  Dir. Conn.(%)= 76.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
      Surface Area   (ha)=    2.32         0.73
      Dep. Storage   (mm)=    2.00         5.00
      Average Slope   (%)=    1.00         2.00
      Length          (m)=  531.00        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 | 3.167   2.03 | 6.250  38.61 | 9.33   1.02
        0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42   1.02
        0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50   1.02
        0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58   2.03
        0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67   2.03
        0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75   2.03
        0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83   1.02
        0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92   1.02
        0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00  1.02
        0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08  1.02
        0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17  1.02
        1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25  1.02
        1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33  1.02
        1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42  1.02
        1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50  1.02
        1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58  1.02
        1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67  1.02
                            Page 8
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LangstaffRd_EA_Proposed_WestDonWatershd

1.500	1.02	4.583	3.05	7.667	2.03	10.75	1.02
1.583	1.02	4.667	3.05	7.750	2.03	10.83	1.02
1.667	1.02	4.750	3.05	7.833	3.05	10.92	1.02
1.750	1.02	4.833	3.05	7.917	3.05	11.00	1.02
1.833	1.02	4.917	3.05	8.000	3.05	11.08	1.02
1.917	1.02	5.000	3.05	8.083	2.03	11.17	1.02
2.000	1.02	5.083	3.05	8.167	2.03	11.25	1.02
2.083	1.02	5.167	3.05	8.250	2.03	11.33	0.00
2.167	1.02	5.250	3.05	8.333	2.03	11.42	0.00
2.250	1.02	5.333	5.08	8.417	2.03	11.50	0.00
2.333	1.02	5.417	5.08	8.500	2.03	11.58	1.02
2.417	1.02	5.500	5.08	8.583	2.03	11.67	1.02
2.500	1.02	5.583	5.08	8.667	2.03	11.75	1.02
2.583	2.03	5.667	5.08	8.750	2.03	11.83	1.02
2.667	2.03	5.750	5.08	8.833	1.02	11.92	1.02
2.750	2.03	5.833	38.61	8.917	1.02	12.00	1.02
2.833	2.03	5.917	38.61	9.000	1.02	12.08	1.02
2.917	2.03	6.000	38.61	9.083	2.03	12.17	1.02
3.000	2.03	6.083	38.61	9.167	2.03	12.25	1.02
3.083	2.03	6.167	38.61	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      38.61         21.04
          over (min)       10.00         25.00
Storage Coeff.  (min)=     10.18 (ii)    23.34 (ii)
Unit Hyd. Tpeak (min)=     10.00         25.00
Unit Hyd. peak  (cms)=      0.11          0.05
                                                *TOTALS*
PEAK FLOW       (cms)=      0.23          0.02      0.251 (iii)
TIME TO PEAK    (hrs)=      6.25          6.50      6.25
RUNOFF VOLUME    (mm)=     40.93         18.14     35.45
TOTAL RAINFALL   (mm)=     42.93         42.93     42.93
RUNOFF COEFFICIENT  =       0.95          0.42      0.83


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN* = 86.0   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.
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--------------------
| CALIB            |
| STANDHYD ( 0135)|   Area     (ha)= 1.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 99.00   Dir. Conn.(%)= 99.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
   Surface Area    (ha)=        1.42          0.01
   Dep. Storage    (mm)=        2.00          5.00
   Average Slope   (%)=         1.00          2.00
   Length          (m)=       503.00         30.00
   Mannings n      =           0.013          0.250
```

LangstaffRd_EA_Proposed_WestDonWatershd
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	2.03	6.250	38.61	9.33	1.02
0.167	0.00	3.250	2.03	6.333	8.13	9.42	1.02
0.250	0.00	3.333	1.02	6.417	8.13	9.50	1.02
0.333	1.02	3.417	1.02	6.500	8.13	9.58	2.03
0.417	1.02	3.500	1.02	6.583	8.13	9.67	2.03
0.500	1.02	3.583	2.03	6.667	8.13	9.75	2.03
0.583	1.02	3.667	2.03	6.750	8.13	9.83	1.02
0.667	1.02	3.750	2.03	6.833	3.05	9.92	1.02
0.750	1.02	3.833	2.03	6.917	3.05	10.00	1.02
0.833	1.02	3.917	2.03	7.000	3.05	10.08	1.02
0.917	1.02	4.000	2.03	7.083	3.05	10.17	1.02
1.000	1.02	4.083	1.02	7.167	3.05	10.25	1.02
1.083	0.00	4.167	1.02	7.250	3.05	10.33	1.02
1.167	0.00	4.250	1.02	7.333	3.05	10.42	1.02
1.250	0.00	4.333	3.05	7.417	3.05	10.50	1.02
1.333	1.02	4.417	3.05	7.500	3.05	10.58	1.02
1.417	1.02	4.500	3.05	7.583	2.03	10.67	1.02
1.500	1.02	4.583	3.05	7.667	2.03	10.75	1.02
1.583	1.02	4.667	3.05	7.750	2.03	10.83	1.02
1.667	1.02	4.750	3.05	7.833	3.05	10.92	1.02
1.750	1.02	4.833	3.05	7.917	3.05	11.00	1.02
1.833	1.02	4.917	3.05	8.000	3.05	11.08	1.02
1.917	1.02	5.000	3.05	8.083	2.03	11.17	1.02
2.000	1.02	5.083	3.05	8.167	2.03	11.25	1.02
2.083	1.02	5.167	3.05	8.250	2.03	11.33	0.00
2.167	1.02	5.250	3.05	8.333	2.03	11.42	0.00
2.250	1.02	5.333	5.08	8.417	2.03	11.50	0.00
2.333	1.02	5.417	5.08	8.500	2.03	11.58	1.02
2.417	1.02	5.500	5.08	8.583	2.03	11.67	1.02
2.500	1.02	5.583	5.08	8.667	2.03	11.75	1.02
2.583	2.03	5.667	5.08	8.750	2.03	11.83	1.02
2.667	2.03	5.750	5.08	8.833	1.02	11.92	1.02
2.750	2.03	5.833	38.61	8.917	1.02	12.00	1.02
2.833	2.03	5.917	38.61	9.000	1.02	12.08	1.02
2.917	2.03	6.000	38.61	9.083	2.03	12.17	1.02
3.000	2.03	6.083	38.61	9.167	2.03	12.25	1.02
3.083	2.03	6.167	38.61	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      38.61         20.20
          over (min)       10.00         15.00
Storage Coeff.  (min)=      9.85 (ii)    11.24 (ii)
Unit Hyd. Tpeak (min)=     10.00         15.00
Unit Hyd. peak  (cms)=      0.11          0.09
                                                *TOTALS*
PEAK FLOW       (cms)=      0.14          0.00      0.144 (iii)
TIME TO PEAK    (hrs)=      6.25          6.33      6.25
RUNOFF VOLUME    (mm)=     40.93          0.00     40.68
```

LangstaffRd_EA_Proposed_WestDonWatershd
```
TOTAL RAINFALL   (mm)=     42.93         42.93     42.93
RUNOFF COEFFICIENT  =       0.95          0.39      0.95


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN* = 84.0   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.
```

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--------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0140)|   Area     (ha)= 1.27
|ID= 1 DT= 5.0 min |   Total Imp(%)= 91.00   Dir. Conn.(%)= 91.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
   Surface Area    (ha)=        1.16          0.11
   Dep. Storage    (mm)=        2.00          5.00
   Average Slope   (%)=         1.00          2.00
   Length          (m)=       503.00         25.00
   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	3.167	2.03	6.250	38.61	9.33	1.02
0.167	0.00	3.250	2.03	6.333	8.13	9.42	1.02
0.250	0.00	3.333	1.02	6.417	8.13	9.50	1.02
0.333	1.02	3.417	1.02	6.500	8.13	9.58	2.03
0.417	1.02	3.500	1.02	6.583	8.13	9.67	2.03
0.500	1.02	3.583	2.03	6.667	8.13	9.75	2.03
0.583	1.02	3.667	2.03	6.750	8.13	9.83	1.02
0.667	1.02	3.750	2.03	6.833	3.05	9.92	1.02
0.750	1.02	3.833	2.03	6.917	3.05	10.00	1.02
0.833	1.02	3.917	2.03	7.000	3.05	10.08	1.02
0.917	1.02	4.000	2.03	7.083	3.05	10.17	1.02
1.000	1.02	4.083	1.02	7.167	3.05	10.25	1.02
1.083	0.00	4.167	1.02	7.250	3.05	10.33	1.02
1.167	0.00	4.250	1.02	7.333	3.05	10.42	1.02
1.250	0.00	4.333	3.05	7.417	3.05	10.50	1.02
1.333	1.02	4.417	3.05	7.500	3.05	10.58	1.02
1.417	1.02	4.500	3.05	7.583	2.03	10.67	1.02
1.500	1.02	4.583	3.05	7.667	2.03	10.75	1.02
1.583	1.02	4.667	3.05	7.750	2.03	10.83	1.02
1.667	1.02	4.750	3.05	7.833	3.05	10.92	1.02
1.750	1.02	4.833	3.05	7.917	3.05	11.00	1.02
1.833	1.02	4.917	3.05	8.000	3.05	11.08	1.02
1.917	1.02	5.000	3.05	8.083	2.03	11.17	1.02
2.000	1.02	5.083	3.05	8.167	2.03	11.25	1.02

LangstaffRd_EA_Proposed_WestDonWatershd

2.083	1.02	5.167	3.05	8.250	2.03	11.33	0.00
2.167	1.02	5.250	3.05	8.333	2.03	11.42	0.00
2.250	1.02	5.333	5.08	8.417	2.03	11.50	0.00
2.333	1.02	5.417	5.08	8.500	2.03	11.58	1.02
2.417	1.02	5.500	5.08	8.583	2.03	11.67	1.02
2.500	1.02	5.583	5.08	8.667	2.03	11.75	1.02
2.583	2.03	5.667	5.08	8.750	2.03	11.83	1.02
2.667	2.03	5.750	5.08	8.833	1.02	11.92	1.02
2.750	2.03	5.833	38.61	8.917	1.02	12.00	1.02
2.833	2.03	5.917	38.61	9.000	1.02	12.08	1.02
2.917	2.03	6.000	38.61	9.083	2.03	12.17	1.02
3.000	2.03	6.083	38.61	9.167	2.03	12.25	1.02
3.083	2.03	6.167	38.61	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      38.61         19.37
          over (min)       10.00         15.00
Storage Coeff.  (min)=      9.85 (ii)    12.94 (ii)
Unit Hyd. Tpeak (min)=     10.00         15.00
Unit Hyd. peak  (cms)=      0.11          0.08
                                                *TOTALS*
PEAK FLOW       (cms)=      0.12          0.00      0.121 (iii)
TIME TO PEAK    (hrs)=      6.25          6.33      6.25
RUNOFF VOLUME    (mm)=     40.93         15.99     38.68
TOTAL RAINFALL   (mm)=     42.93         42.93     42.93
RUNOFF COEFFICIENT  =       0.95          0.37      0.90


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN* = 83.0   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 ( 0420)|
|  1 + 2 = 3     |           AREA    QPEAK    TPEAK     R.V.
--------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 ( 0135):       1.43    0.144     6.25     40.68
      + ID2= 2 ( 0140):       1.27    0.121     6.25     38.68
        ========================================================
        ID = 3 ( 0420):       2.70    0.265     6.25     39.74

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

```
--------------------------------------------------------------------------
--------------------
| RESERVOIR( 0530)|    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   |   0.0122    0.0823
                        0.0056    0.0072   |   0.0382    0.1093
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
                  0.0084      0.0283   |   0.0516      0.1598
                  0.0105      0.0553   |   0.0000      0.0000

                              AREA      QPEAK     TPEAK       R.V.
                              (ha)      (cms)     (hrs)       (mm)
        INFLOW : ID= 2 ( 0420)   2.700     0.265     6.25      39.74
        OUTFLOW: ID= 1 ( 0530)   2.700     0.012     8.92      39.62

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 4.55
                   TIME SHIFT OF PEAK FLOW      (min)=160.00
                   MAXIMUM STORAGE   USED      (ha.m.)= 0.0796

--------------------------------------------------------------------------------
--------------------
| ADD HYD ( 0425)|
|  1 + 2  =  3   |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
        ID1= 1 ( 0145):   3.05     0.251     6.25      35.45
      + ID2= 2 ( 0530):   2.70     0.012     8.92      39.62
                       =========================================
        ID = 3 ( 0425):   5.75     0.261     6.25      37.41

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 0512)|    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   |  0.0471     0.1003
                       0.0071     0.0165   |  0.0636     0.1284
                       0.0098     0.0331   |  0.0763     0.1594
                       0.0119     0.0526   |  0.0870     0.1934
                       0.0138     0.0750   |  0.0964     0.2308
                              AREA      QPEAK     TPEAK       R.V.
                              (ha)      (cms)     (hrs)       (mm)
        INFLOW : ID= 2 ( 0425)   5.750     0.261     6.25      37.41
        OUTFLOW: ID= 1 ( 0512)   5.750     0.028     8.75      37.31

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.92
                   TIME SHIFT OF PEAK FLOW      (min)=150.00
                   MAXIMUM STORAGE   USED      (ha.m.)= 0.0861

--------------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0215)|   Area    (ha)=  0.58
|ID= 1 DT= 5.0 min |  Total Imp(%)= 81.00   Dir. Conn.(%)= 81.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=    0.47         0.11
                                  Page 13
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
        Dep. Storage    (mm)=     2.00       5.00
        Average Slope   (%)=      1.00       2.00
        Length          (m)=    260.00      30.00
        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 | 3.167    2.03 | 6.250   38.61 | 9.33    1.02
           0.167    0.00 | 3.250    2.03 | 6.333    8.13 | 9.42    1.02
           0.250    0.00 | 3.333    1.02 | 6.417    8.13 | 9.50    1.02
           0.333    1.02 | 3.417    1.02 | 6.500    8.13 | 9.58    2.03
           0.417    1.02 | 3.500    1.02 | 6.583    8.13 | 9.67    2.03
           0.500    1.02 | 3.583    2.03 | 6.667    8.13 | 9.75    2.03
           0.583    1.02 | 3.667    2.03 | 6.750    8.13 | 9.83    1.02
           0.667    1.02 | 3.750    2.03 | 6.833    3.05 | 9.92    1.02
           0.750    1.02 | 3.833    2.03 | 6.917    3.05 | 10.00   1.02
           0.833    1.02 | 3.917    2.03 | 7.000    3.05 | 10.08   1.02
           0.917    1.02 | 4.000    2.03 | 7.083    3.05 | 10.17   1.02
           1.000    1.02 | 4.083    1.02 | 7.167    3.05 | 10.25   1.02
           1.083    0.00 | 4.167    1.02 | 7.250    3.05 | 10.33   1.02
           1.167    0.00 | 4.250    1.02 | 7.333    3.05 | 10.42   1.02
           1.250    0.00 | 4.333    3.05 | 7.417    3.05 | 10.50   1.02
           1.333    1.02 | 4.417    3.05 | 7.500    3.05 | 10.58   1.02
           1.417    1.02 | 4.500    3.05 | 7.583    2.03 | 10.67   1.02
           1.500    1.02 | 4.583    3.05 | 7.667    2.03 | 10.75   1.02
           1.583    1.02 | 4.667    3.05 | 7.750    2.03 | 10.83   1.02
           1.667    1.02 | 4.750    3.05 | 7.833    3.05 | 10.92   1.02
           1.750    1.02 | 4.833    3.05 | 7.917    3.05 | 11.00   1.02
           1.833    1.02 | 4.917    3.05 | 8.000    3.05 | 11.08   1.02
           1.917    1.02 | 5.000    3.05 | 8.083    2.03 | 11.17   1.02
           2.000    1.02 | 5.083    3.05 | 8.167    2.03 | 11.25   1.02
           2.083    1.02 | 5.167    3.05 | 8.250    2.03 | 11.33   0.00
           2.167    1.02 | 5.250    3.05 | 8.333    2.03 | 11.42   0.00
           2.250    1.02 | 5.333    5.08 | 8.417    2.03 | 11.50   0.00
           2.333    1.02 | 5.417    5.08 | 8.500    2.03 | 11.58   1.02
           2.417    1.02 | 5.500    5.08 | 8.583    2.03 | 11.67   1.02
           2.500    1.02 | 5.583    5.08 | 8.667    2.03 | 11.75   1.02
           2.583    2.03 | 5.667    5.08 | 8.750    2.03 | 11.83   1.02
           2.667    2.03 | 5.750    5.08 | 8.833    1.02 | 11.92   1.02
           2.750    2.03 | 5.833   38.61 | 8.917    1.02 | 12.00   1.02
           2.833    2.03 | 5.917   38.61 | 9.000    1.02 | 12.08   1.02
           2.917    2.03 | 6.000   38.61 | 9.083    2.03 | 12.17   1.02
           3.000    2.03 | 6.083   38.61 | 9.167    2.03 | 12.25   1.02
           3.083    2.03 | 6.167   38.61 | 9.250    2.03 |

        Max.Eff.Inten.(mm/hr)=    38.61      19.37
              over (min)         5.00       15.00
        Storage Coeff.  (min)=    6.63 (ii) 11.50 (ii)
        Unit Hyd. Tpeak (min)=    5.00       15.00
                                  Page 14
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                    LangstaffRd_EA_Proposed_WestDonWatershd
        Unit Hyd. peak  (cms)=    0.18       0.09

                                                     *TOTALS*
        PEAK FLOW      (cms)=     0.05       0.00     0.054 (iii)
        TIME TO PEAK   (hrs)=     6.25       6.33     6.25
        RUNOFF VOLUME   (mm)=    40.93      15.99    36.18
        TOTAL RAINFALL  (mm)=    42.93      42.93    42.93
        RUNOFF COEFFICIENT  =     0.95       0.37     0.84


          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0  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 ( 0220)|   Area    (ha)=  0.65
|ID= 1 DT= 5.0 min |  Total Imp(%)= 66.00   Dir. Conn.(%)= 66.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=    0.43         0.22
        Dep. Storage    (mm)=    2.00         5.00
        Average Slope   (%)=     1.00         2.00
        Length          (m)=   260.00        20.00
        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 | 3.167    2.03 | 6.250   38.61 | 9.33    1.02
           0.167    0.00 | 3.250    2.03 | 6.333    8.13 | 9.42    1.02
           0.250    0.00 | 3.333    1.02 | 6.417    8.13 | 9.50    1.02
           0.333    1.02 | 3.417    1.02 | 6.500    8.13 | 9.58    2.03
           0.417    1.02 | 3.500    1.02 | 6.583    8.13 | 9.67    2.03
           0.500    1.02 | 3.583    2.03 | 6.667    8.13 | 9.75    2.03
           0.583    1.02 | 3.667    2.03 | 6.750    8.13 | 9.83    1.02
           0.667    1.02 | 3.750    2.03 | 6.833    3.05 | 9.92    1.02
           0.750    1.02 | 3.833    2.03 | 6.917    3.05 | 10.00   1.02
           0.833    1.02 | 3.917    2.03 | 7.000    3.05 | 10.08   1.02
           0.917    1.02 | 4.000    2.03 | 7.083    3.05 | 10.17   1.02
           1.000    1.02 | 4.083    1.02 | 7.167    3.05 | 10.25   1.02
           1.083    0.00 | 4.167    1.02 | 7.250    3.05 | 10.33   1.02
           1.167    0.00 | 4.250    1.02 | 7.333    3.05 | 10.42   1.02
           1.250    0.00 | 4.333    3.05 | 7.417    3.05 | 10.50   1.02
           1.333    1.02 | 4.417    3.05 | 7.500    3.05 | 10.58   1.02
           1.417    1.02 | 4.500    3.05 | 7.583    2.03 | 10.67   1.02
           1.500    1.02 | 4.583    3.05 | 7.667    2.03 | 10.75   1.02
           1.583    1.02 | 4.667    3.05 | 7.750    2.03 | 10.83   1.02
                                  Page 15
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
           1.667    1.02 | 4.750    3.05 | 7.833    3.05 | 10.92   1.02
           1.750    1.02 | 4.833    3.05 | 7.917    3.05 | 11.00   1.02
           1.833    1.02 | 4.917    3.05 | 8.000    3.05 | 11.08   1.02
           1.917    1.02 | 5.000    3.05 | 8.083    2.03 | 11.17   1.02
           2.000    1.02 | 5.083    3.05 | 8.167    2.03 | 11.25   1.02
           2.083    1.02 | 5.167    3.05 | 8.250    2.03 | 11.33   0.00
           2.167    1.02 | 5.250    3.05 | 8.333    2.03 | 11.42   0.00
           2.250    1.02 | 5.333    5.08 | 8.417    2.03 | 11.50   0.00
           2.333    1.02 | 5.417    5.08 | 8.500    2.03 | 11.58   1.02
           2.417    1.02 | 5.500    5.08 | 8.583    2.03 | 11.67   1.02
           2.500    1.02 | 5.583    5.08 | 8.667    2.03 | 11.75   1.02
           2.583    2.03 | 5.667    5.08 | 8.750    2.03 | 11.83   1.02
           2.667    2.03 | 5.750    5.08 | 8.833    1.02 | 11.92   1.02
           2.750    2.03 | 5.833   38.61 | 8.917    1.02 | 12.00   1.02
           2.833    2.03 | 5.917   38.61 | 9.000    1.02 | 12.08   1.02
           2.917    2.03 | 6.000   38.61 | 9.083    2.03 | 12.17   1.02
           3.000    2.03 | 6.083   38.61 | 9.167    2.03 | 12.25   1.02
           3.083    2.03 | 6.167   38.61 | 9.250    2.03 |

        Max.Eff.Inten.(mm/hr)=    38.61      19.37
              over (min)         5.00       20.00
        Storage Coeff.  (min)=    6.63 (ii) 15.61 (ii)
        Unit Hyd. Tpeak (min)=    5.00       20.00
        Unit Hyd. peak  (cms)=    0.18       0.07
                                                     *TOTALS*
        PEAK FLOW      (cms)=     0.05       0.01     0.052 (iii)
        TIME TO PEAK   (hrs)=     6.25       6.42     6.25
        RUNOFF VOLUME   (mm)=    40.93      15.99    32.43
        TOTAL RAINFALL  (mm)=    42.93      42.93    42.93
        RUNOFF COEFFICIENT  =     0.95       0.37     0.76


          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0  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 ( 0470)|
|  1 + 2  =  3   |      AREA     QPEAK     TPEAK      R.V.
--------------------      (ha)     (cms)     (hrs)      (mm)
        ID1= 1 ( 0215):   0.58     0.054     6.25      36.18
      + ID2= 2 ( 0220):   0.65     0.052     6.25      32.43
                       =========================================
        ID = 3 ( 0470):   1.23     0.106     6.25      34.20

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 0535)|    OVERFLOW IS OFF
                                  Page 16
```

```
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE  |  OUTFLOW    STORAGE
--------------------        (cms)    (ha.m.)  |   (cms)    (ha.m.)
                           0.0000    0.0000   |  0.0116    0.0367
                           0.0053    0.0048   |  0.0131    0.0474
                           0.0080    0.0154   |  0.0202    0.0639
                           0.0100    0.0261   |  0.0000    0.0000

                                   AREA     QPEAK    TPEAK     R.V.
                                   (ha)     (cms)    (hrs)     (mm)
        INFLOW : ID= 2 (  0470)    1.230    0.106     6.25    34.20
        OUTFLOW: ID= 1 (  0535)    1.230    0.010     7.33    34.02

              PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.39
              TIME SHIFT OF PEAK FLOW      (min)= 65.00
              MAXIMUM STORAGE   USED    (ha.m.)= 0.0260

-----------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0225)|   Area    (ha)=   0.60
|ID= 1 DT= 5.0 min |  Total Imp(%)= 83.00   Dir. Conn.(%)= 83.00
--------------------
                              IMPERVIOUS       PERVIOUS (i)
        Surface Area   (ha)=     0.50             0.10
        Dep. Storage   (mm)=     2.00             5.00
        Average Slope  (%)=      1.00             2.00
        Length         (m)=    320.00            10.00
        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  | 3.167  2.03  | 6.250  38.61 | 9.33   1.02
           0.167  0.00  | 3.250  2.03  | 6.333  8.13  | 9.42   1.02
           0.250  0.00  | 3.333  1.02  | 6.417  8.13  | 9.50   1.02
           0.333  1.02  | 3.417  1.02  | 6.500  8.13  | 9.58   2.03
           0.417  1.02  | 3.500  1.02  | 6.583  8.13  | 9.67   2.03
           0.500  1.02  | 3.583  2.03  | 6.667  8.13  | 9.75   2.03
           0.583  1.02  | 3.667  2.03  | 6.750  8.13  | 9.83   1.02
           0.667  1.02  | 3.750  2.03  | 6.833  3.05  | 9.92   1.02
           0.750  1.02  | 3.833  2.03  | 6.917  3.05  | 10.00  1.02
           0.833  1.02  | 3.917  2.03  | 7.000  3.05  | 10.08  1.02
           0.917  1.02  | 4.000  2.03  | 7.083  3.05  | 10.17  1.02
           1.000  1.02  | 4.083  1.02  | 7.167  3.05  | 10.25  1.02
           1.083  0.00  | 4.167  1.02  | 7.250  3.05  | 10.33  1.02
           1.167  0.00  | 4.250  1.02  | 7.333  3.05  | 10.42  1.02
           1.250  0.00  | 4.333  3.05  | 7.417  3.05  | 10.50  1.02
           1.333  1.02  | 4.417  3.05  | 7.500  3.05  | 10.58  1.02
           1.417  1.02  | 4.500  3.05  | 7.583  2.03  | 10.67  1.02
```

```
           1.500  1.02  | 4.583  3.05  | 7.667  2.03  | 10.75  1.02
           1.583  1.02  | 4.667  3.05  | 7.750  2.03  | 10.83  1.02
           1.667  1.02  | 4.750  3.05  | 7.833  3.05  | 10.92  1.02
           1.750  1.02  | 4.833  3.05  | 7.917  3.05  | 11.00  1.02
           1.833  1.02  | 4.917  3.05  | 8.000  3.05  | 11.08  1.02
           1.917  1.02  | 5.000  3.05  | 8.083  2.03  | 11.17  1.02
           2.000  1.02  | 5.083  3.05  | 8.167  2.03  | 11.25  1.02
           2.083  1.02  | 5.167  3.05  | 8.250  2.03  | 11.33  0.00
           2.167  1.02  | 5.250  3.05  | 8.333  2.03  | 11.42  0.00
           2.250  1.02  | 5.333  5.08  | 8.417  2.03  | 11.50  0.00
           2.333  1.02  | 5.417  5.08  | 8.500  2.03  | 11.58  1.02
           2.417  1.02  | 5.500  5.08  | 8.583  2.03  | 11.67  1.02
           2.500  1.02  | 5.583  5.08  | 8.667  2.03  | 11.75  1.02
           2.583  2.03  | 5.667  5.08  | 8.750  2.03  | 11.83  1.02
           2.667  2.03  | 5.750  5.08  | 8.833  1.02  | 11.92  1.02
           2.750  2.03  | 5.833  38.61 | 8.917  1.02  | 12.00  1.02
           2.833  2.03  | 5.917  38.61 | 9.000  1.02  | 12.08  1.02
           2.917  2.03  | 6.000  38.61 | 9.083  2.03  | 12.17  1.02
           3.000  2.03  | 6.083  38.61 | 9.167  2.03  | 12.25  1.02
           3.083  2.03  | 6.167  38.61 | 9.250  2.03  |

        Max.Eff.Inten.(mm/hr)=      38.61           19.37
                 over (min)         10.00           10.00
        Storage Coeff.  (min)=       7.51 (ii)       9.90 (ii)
        Unit Hyd. Tpeak (min)=      10.00           10.00
        Unit Hyd. peak  (cms)=       0.13            0.11
                                                           *TOTALS*
        PEAK FLOW      (cms)=        0.05            0.00      0.057 (iii)
        TIME TO PEAK   (hrs)=        6.25            6.25      6.25
        RUNOFF VOLUME  (mm)=        40.93           15.99     36.68
        TOTAL RAINFALL (mm)=        42.93           42.93     42.93
        RUNOFF COEFFICIENT  =        0.95            0.37      0.85


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  83.0   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 ( 0230)|   Area    (ha)=   0.70
|ID= 1 DT= 5.0 min |  Total Imp(%)= 66.00   Dir. Conn.(%)= 66.00
--------------------
                              IMPERVIOUS       PERVIOUS (i)
        Surface Area   (ha)=     0.46             0.24
        Dep. Storage   (mm)=     2.00             5.00
        Average Slope  (%)=      1.00             2.00
        Length         (m)=    320.00            25.00
        Mannings n      =        0.013            0.300
```

```
                          ---- 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  2.03  | 6.250  38.61 | 9.33   1.02
           0.167  0.00  | 3.250  2.03  | 6.333  8.13  | 9.42   1.02
           0.250  0.00  | 3.333  1.02  | 6.417  8.13  | 9.50   1.02
           0.333  1.02  | 3.417  1.02  | 6.500  8.13  | 9.58   2.03
           0.417  1.02  | 3.500  1.02  | 6.583  8.13  | 9.67   2.03
           0.500  1.02  | 3.583  2.03  | 6.667  8.13  | 9.75   2.03
           0.583  1.02  | 3.667  2.03  | 6.750  8.13  | 9.83   1.02
           0.667  1.02  | 3.750  2.03  | 6.833  3.05  | 9.92   1.02
           0.750  1.02  | 3.833  2.03  | 6.917  3.05  | 10.00  1.02
           0.833  1.02  | 3.917  2.03  | 7.000  3.05  | 10.08  1.02
           0.917  1.02  | 4.000  2.03  | 7.083  3.05  | 10.17  1.02
           1.000  1.02  | 4.083  1.02  | 7.167  3.05  | 10.25  1.02
           1.083  0.00  | 4.167  1.02  | 7.250  3.05  | 10.33  1.02
           1.167  0.00  | 4.250  1.02  | 7.333  3.05  | 10.42  1.02
           1.250  0.00  | 4.333  3.05  | 7.417  3.05  | 10.50  1.02
           1.333  1.02  | 4.417  3.05  | 7.500  3.05  | 10.58  1.02
           1.417  1.02  | 4.500  3.05  | 7.583  2.03  | 10.67  1.02
           1.500  1.02  | 4.583  3.05  | 7.667  2.03  | 10.75  1.02
           1.583  1.02  | 4.667  3.05  | 7.750  2.03  | 10.83  1.02
           1.667  1.02  | 4.750  3.05  | 7.833  3.05  | 10.92  1.02
           1.750  1.02  | 4.833  3.05  | 7.917  3.05  | 11.00  1.02
           1.833  1.02  | 4.917  3.05  | 8.000  3.05  | 11.08  1.02
           1.917  1.02  | 5.000  3.05  | 8.083  2.03  | 11.17  1.02
           2.000  1.02  | 5.083  3.05  | 8.167  2.03  | 11.25  1.02
           2.083  1.02  | 5.167  3.05  | 8.250  2.03  | 11.33  0.00
           2.167  1.02  | 5.250  3.05  | 8.333  2.03  | 11.42  0.00
           2.250  1.02  | 5.333  5.08  | 8.417  2.03  | 11.50  0.00
           2.333  1.02  | 5.417  5.08  | 8.500  2.03  | 11.58  1.02
           2.417  1.02  | 5.500  5.08  | 8.583  2.03  | 11.67  1.02
           2.500  1.02  | 5.583  5.08  | 8.667  2.03  | 11.75  1.02
           2.583  2.03  | 5.667  5.08  | 8.750  2.03  | 11.83  1.02
           2.667  2.03  | 5.750  5.08  | 8.833  1.02  | 11.92  1.02
           2.750  2.03  | 5.833  38.61 | 8.917  1.02  | 12.00  1.02
           2.833  2.03  | 5.917  38.61 | 9.000  1.02  | 12.08  1.02
           2.917  2.03  | 6.000  38.61 | 9.083  2.03  | 12.17  1.02
           3.000  2.03  | 6.083  38.61 | 9.167  2.03  | 12.25  1.02
           3.083  2.03  | 6.167  38.61 | 9.250  2.03  |

        Max.Eff.Inten.(mm/hr)=      38.61           16.97
                 over (min)         10.00           20.00
        Storage Coeff.  (min)=       7.51 (ii)      19.59 (ii)
        Unit Hyd. Tpeak (min)=      10.00           20.00
        Unit Hyd. peak  (cms)=       0.13            0.06
                                                           *TOTALS*
        PEAK FLOW      (cms)=        0.05            0.01      0.054 (iii)
        TIME TO PEAK   (hrs)=        6.25            6.42      6.25
        RUNOFF VOLUME  (mm)=        40.93           14.75     32.01
```

```
        TOTAL RAINFALL (mm)=        42.93           42.93     42.93
        RUNOFF COEFFICIENT  =        0.95            0.34      0.75


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  81.0   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  ( 0475)|
|  1 + 2 = 3      |          AREA     QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
        ID1= 1 ( 0225):       0.60     0.057     6.25    36.68
      + ID2= 2 ( 0230):       0.70     0.054     6.25    32.01
      ==================================================
        ID = 3 ( 0475):       1.30     0.111     6.25    34.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------------
--------------------
| RESERVOIR( 0540)|    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   |  0.0271    0.0367
                           0.0118    0.0048   |  0.0306    0.0474
                           0.0184    0.0154   |  0.0415    0.0639
                           0.0232    0.0261   |  0.0000    0.0000

                                   AREA     QPEAK    TPEAK     R.V.
                                   (ha)     (cms)    (hrs)     (mm)
        INFLOW : ID= 2 (  0475)    1.300    0.111     6.25    34.16
        OUTFLOW: ID= 1 (  0540)    1.300    0.021     6.92    34.09

              PEAK   FLOW   REDUCTION [Qout/Qin](%)= 19.22
              TIME SHIFT OF PEAK FLOW      (min)= 40.00
              MAXIMUM STORAGE   USED    (ha.m.)= 0.0218

-----------------------------------------------------------------------------
--------------------
| ADD HYD  ( 0480)|
|  1 + 2 = 3      |          AREA     QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
        ID1= 1 ( 0535):       1.23     0.010     7.33    34.02
      + ID2= 2 ( 0540):       1.30     0.021     6.92    34.09
      ==================================================
        ID = 3 ( 0480):       2.53     0.031     6.92    34.05
```

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                    LangstaffRd_EA_Proposed_WestDonWatershd
      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0155)|   Area    (ha)=  0.56
|ID= 1 DT= 5.0 min |   Total Imp(%)= 93.00   Dir. Conn.(%)= 93.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area    (ha)=     0.52          0.04
     Dep. Storage    (mm)=     2.00          5.00
     Average Slope   (%)=      1.00          2.00
     Length          (m)=    260.00         25.00
     Mannings n       =       0.013         0.290

        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   2.03 | 6.250  38.61 | 9.33   1.02
         0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42   1.02
         0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50   1.02
         0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58   2.03
         0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67   2.03
         0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75   2.03
         0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83   1.02
         0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92   1.02
         0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00  1.02
         0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08  1.02
         0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17  1.02
         1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25  1.02
         1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33  1.02
         1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42  1.02
         1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50  1.02
         1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58  1.02
         1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67  1.02
         1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75  1.02
         1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83  1.02
         1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92  1.02
         1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00  1.02
         1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08  1.02
         1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17  1.02
         2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25  1.02
         2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33  0.00
         2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  0.00
         2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50  0.00
         2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58  1.02
         2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67  1.02
         2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75  1.02
         2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83  1.02
         2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92  1.02
         2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00  1.02
                                        Page 21
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                    LangstaffRd_EA_Proposed_WestDonWatershd
         2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08  1.02
         2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17  1.02
         3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25  1.02
         3.083   2.03 | 6.167  38.61 | 9.250   2.03 |

     Max.Eff.Inten.(mm/hr)=     38.61         22.96
              over (min)         5.00         10.00
     Storage Coeff. (min)=       6.63 (ii)    9.66 (ii)
     Unit Hyd. Tpeak (min)=      5.00         10.00
     Unit Hyd. peak (cms)=       0.18          0.11

                                                    *TOTALS*
     PEAK FLOW     (cms)=        0.06          0.00         0.057 (iii)
     TIME TO PEAK  (hrs)=        6.25          6.25         6.25
     RUNOFF VOLUME  (mm)=       40.93         18.96        39.38
     TOTAL RAINFALL (mm)=       42.93         42.93        42.93
     RUNOFF COEFFICIENT =        0.95          0.44         0.92


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 87.0   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 ( 0160)|   Area    (ha)=  0.43
    |ID= 1 DT= 5.0 min |   Total Imp(%)= 95.00   Dir. Conn.(%)= 95.00
    --------------------
                                IMPERVIOUS    PERVIOUS (i)
         Surface Area    (ha)=     0.41          0.02
         Dep. Storage    (mm)=     2.00          5.00
         Average Slope   (%)=      1.00          2.00
         Length          (m)=    260.00         20.00
         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 | 3.167   2.03 | 6.250  38.61 | 9.33   1.02
             0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42   1.02
             0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50   1.02
             0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58   2.03
             0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67   2.03
             0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75   2.03
             0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83   1.02
             0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92   1.02
             0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00  1.02
             0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08  1.02
                                        Page 22
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                    LangstaffRd_EA_Proposed_WestDonWatershd
         0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17  1.02
         1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25  1.02
         1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33  1.02
         1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42  1.02
         1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50  1.02
         1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58  1.02
         1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67  1.02
         1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75  1.02
         1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83  1.02
         1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92  1.02
         1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00  1.02
         1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08  1.02
         1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17  1.02
         2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25  1.02
         2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33  0.00
         2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  0.00
         2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50  0.00
         2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58  1.02
         2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67  1.02
         2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75  1.02
         2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83  1.02
         2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92  1.02
         2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00  1.02
         2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08  1.02
         2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17  1.02
         3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25  1.02
         3.083   2.03 | 6.167  38.61 | 9.250   2.03 |

     Max.Eff.Inten.(mm/hr)=     38.61         25.09
              over (min)         5.00         10.00
     Storage Coeff. (min)=       6.63 (ii)    8.73 (ii)
     Unit Hyd. Tpeak (min)=      5.00         10.00
     Unit Hyd. peak (cms)=       0.18          0.12
                                                    *TOTALS*
     PEAK FLOW     (cms)=        0.04          0.00         0.045 (iii)
     TIME TO PEAK  (hrs)=        6.25          6.25         6.25
     RUNOFF VOLUME  (mm)=       40.93         20.75        39.91
     TOTAL RAINFALL (mm)=       42.93         42.93        42.93
     RUNOFF COEFFICIENT =        0.95          0.48         0.93


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 89.0   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 ( 0430)|
    |  1 + 2 = 3      |       AREA    QPEAK   TPEAK    R.V.
    --------------------       (ha)   (cms)   (hrs)    (mm)
                                        Page 23
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                    LangstaffRd_EA_Proposed_WestDonWatershd
      ID1= 1 ( 0155):    0.56    0.057    6.25    39.38
    + ID2= 2 ( 0160):    0.43    0.045    6.25    39.91
      ========================================================
      ID = 3 ( 0430):    0.99    0.102    6.25    39.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
    ---------------------------------------------------------------------------
    --------------------
    | CALIB            |
    | STANDHYD ( 0150)|   Area    (ha)=  3.81
    |ID= 1 DT= 5.0 min |   Total Imp(%)= 95.00   Dir. Conn.(%)= 95.00
    --------------------
                                IMPERVIOUS    PERVIOUS (i)
         Surface Area    (ha)=     3.62          0.19
         Dep. Storage    (mm)=     2.00          5.00
         Average Slope   (%)=      1.00          2.00
         Length          (m)=    150.00         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 | 3.167   2.03 | 6.250  38.61 | 9.33   1.02
             0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42   1.02
             0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50   1.02
             0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58   2.03
             0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67   2.03
             0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75   2.03
             0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83   1.02
             0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92   1.02
             0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00  1.02
             0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08  1.02
             0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17  1.02
             1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25  1.02
             1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33  1.02
             1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42  1.02
             1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50  1.02
             1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58  1.02
             1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67  1.02
             1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75  1.02
             1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83  1.02
             1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92  1.02
             1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00  1.02
             1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08  1.02
             1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17  1.02
             2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25  1.02
             2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33  0.00
             2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  0.00
             2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50  0.00
             2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58  1.02
                                        Page 24
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2.417	1.02	5.500	5.08	8.583	2.03	11.67	1.02
2.500	1.02	5.583	5.08	8.667	2.03	11.75	1.02
2.583	2.03	5.667	5.08	8.750	2.03	11.83	1.02
2.667	2.03	5.750	5.08	8.833	1.02	11.92	1.02
2.750	2.03	5.833	38.61	8.917	1.02	12.00	1.02
2.833	2.03	5.917	38.61	9.000	1.02	12.08	1.02
2.917	2.03	6.000	38.61	9.083	2.03	12.17	1.02
3.000	2.03	6.083	38.61	9.167	2.03	12.25	1.02
3.083	2.03	6.167	38.61	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      38.61          23.99
           over (min)        5.00          10.00
Storage Coeff.  (min)=       4.77 (ii)      7.95 (ii)
Unit Hyd. Tpeak (min)=       5.00          10.00
Unit Hyd. peak  (cms)=       0.22           0.13
                                                      *TOTALS*
PEAK FLOW       (cms)=       0.39           0.01       0.399 (iii)
TIME TO PEAK    (hrs)=       6.25           6.25       6.25
RUNOFF VOLUME    (mm)=      40.93          19.82      39.87
TOTAL RAINFALL   (mm)=      42.93          42.93      42.93
RUNOFF COEFFICIENT   =       0.95           0.46       0.93

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

    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* =  88.0     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( 0515)|   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   |  0.0091     0.1797
                       0.0013    0.0157   |  0.0095     0.2004
                       0.0033    0.0320   |  0.0100     0.2216
                       0.0044    0.0487   |  0.0104     0.2433
                       0.0053    0.0659   |  0.0109     0.2655
                       0.0061    0.0837   |  0.0113     0.2882
                       0.0068    0.1019   |  0.0116     0.3114
                       0.0074    0.1206   |  0.1520     0.3592
                       0.0080    0.1398   |  0.5654     0.4336
                       0.0086    0.1595   |  1.1316     0.5100

                          AREA    QPEAK     TPEAK      R.V.
                          (ha)    (cms)     (hrs)      (mm)
         INFLOW : ID= 2 ( 0150)  3.810     0.399      6.25      39.87
         OUTFLOW: ID= 1 ( 0515)  3.810     0.008     12.25      39.06

           PEAK  FLOW  REDUCTION [Qout/Qin](%)=  1.95
```

```
                TIME SHIFT OF PEAK FLOW        (min)=360.00
                MAXIMUM STORAGE   USED      (ha.m.)= 0.1333
```

```
--------------------
| ADD HYD ( 0440)|
|  1 + 2 = 3     |            AREA     QPEAK     TPEAK      R.V.
--------------------          (ha)     (cms)     (hrs)      (mm)
      ID1= 1 ( 0430):         0.99     0.102      6.25     39.61
    + ID2= 2 ( 0515):         3.81     0.008     12.25     39.06
      ============================================================
      ID = 3 ( 0440):         4.80     0.108      6.25     39.18

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

```
--------------------
| CALIB           |
| STANDHYD ( 0210)|  Area    (ha)=  0.96
|ID= 1 DT= 5.0 min |  Total Imp(%)= 78.00   Dir. Conn.(%)= 78.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
    Surface Area    (ha)=       0.75          0.21
    Dep. Storage    (mm)=       2.00          5.00
    Average Slope   (%)=        1.00          2.00
    Length          (m)=      470.00         20.00
    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	3.167	2.03	6.250	38.61	9.33	1.02
0.167	0.00	3.250	2.03	6.333	8.13	9.42	1.02
0.250	0.00	3.333	1.02	6.417	8.13	9.50	1.02
0.333	1.02	3.417	1.02	6.500	8.13	9.58	2.03
0.417	1.02	3.500	1.02	6.583	8.13	9.67	2.03
0.500	1.02	3.583	2.03	6.667	8.13	9.75	2.03
0.583	1.02	3.667	2.03	6.750	8.13	9.83	1.02
0.667	1.02	3.750	2.03	6.833	3.05	9.92	1.02
0.750	1.02	3.833	2.03	6.917	3.05	10.00	1.02
0.833	1.02	3.917	2.03	7.000	3.05	10.08	1.02
0.917	1.02	4.000	2.03	7.083	3.05	10.17	1.02
1.000	1.02	4.083	1.02	7.167	3.05	10.25	1.02
1.083	0.00	4.167	1.02	7.250	3.05	10.33	1.02
1.167	0.00	4.250	1.02	7.333	3.05	10.42	1.02
1.250	0.00	4.333	3.05	7.417	3.05	10.50	1.02
1.333	1.02	4.417	3.05	7.500	3.05	10.58	1.02
1.417	1.02	4.500	3.05	7.583	2.03	10.67	1.02
1.500	1.02	4.583	3.05	7.667	2.03	10.75	1.02
1.583	1.02	4.667	3.05	7.750	2.03	10.83	1.02

1.667	1.02	4.750	3.05	7.833	3.05	10.92	1.02
1.750	1.02	4.833	3.05	7.917	3.05	11.00	1.02
1.833	1.02	4.917	3.05	8.000	3.05	11.08	1.02
1.917	1.02	5.000	3.05	8.083	2.03	11.17	1.02
2.000	1.02	5.083	3.05	8.167	2.03	11.25	1.02
2.083	1.02	5.167	3.05	8.250	2.03	11.33	0.00
2.167	1.02	5.250	3.05	8.333	2.03	11.42	0.00
2.250	1.02	5.333	5.08	8.417	2.03	11.50	0.00
2.333	1.02	5.417	5.08	8.500	2.03	11.58	1.02
2.417	1.02	5.500	5.08	8.583	2.03	11.67	1.02
2.500	1.02	5.583	5.08	8.667	2.03	11.75	1.02
2.583	2.03	5.667	5.08	8.750	2.03	11.83	1.02
2.667	2.03	5.750	5.08	8.833	1.02	11.92	1.02
2.750	2.03	5.833	38.61	8.917	1.02	12.00	1.02
2.833	2.03	5.917	38.61	9.000	1.02	12.08	1.02
2.917	2.03	6.000	38.61	9.083	2.03	12.17	1.02
3.000	2.03	6.083	38.61	9.167	2.03	12.25	1.02
3.083	2.03	6.167	38.61	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      38.61          19.37
           over (min)       10.00          15.00
Storage Coeff.  (min)=       9.46 (ii)     13.57 (ii)
Unit Hyd. Tpeak (min)=      10.00          15.00
Unit Hyd. peak  (cms)=       0.12           0.08
                                                      *TOTALS*
PEAK FLOW       (cms)=       0.08           0.01       0.084 (iii)
TIME TO PEAK    (hrs)=       6.25           6.33       6.25
RUNOFF VOLUME    (mm)=      40.93          15.99      35.43
TOTAL RAINFALL   (mm)=      42.93          42.93      42.93
RUNOFF COEFFICIENT   =       0.95           0.37       0.83

    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* =  83.0     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 ( 0205)|  Area    (ha)=  1.11
|ID= 1 DT= 5.0 min |  Total Imp(%)= 77.00   Dir. Conn.(%)= 77.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
    Surface Area    (ha)=       0.85          0.26
    Dep. Storage    (mm)=       2.00          5.00
    Average Slope   (%)=        1.00          2.00
    Length          (m)=      470.00         20.00
    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	3.167	2.03	6.250	38.61	9.33	1.02
0.167	0.00	3.250	2.03	6.333	8.13	9.42	1.02
0.250	0.00	3.333	1.02	6.417	8.13	9.50	1.02
0.333	1.02	3.417	1.02	6.500	8.13	9.58	2.03
0.417	1.02	3.500	1.02	6.583	8.13	9.67	2.03
0.500	1.02	3.583	2.03	6.667	8.13	9.75	2.03
0.583	1.02	3.667	2.03	6.750	8.13	9.83	1.02
0.667	1.02	3.750	2.03	6.833	3.05	9.92	1.02
0.750	1.02	3.833	2.03	6.917	3.05	10.00	1.02
0.833	1.02	3.917	2.03	7.000	3.05	10.08	1.02
0.917	1.02	4.000	2.03	7.083	3.05	10.17	1.02
1.000	1.02	4.083	1.02	7.167	3.05	10.25	1.02
1.083	0.00	4.167	1.02	7.250	3.05	10.33	1.02
1.167	0.00	4.250	1.02	7.333	3.05	10.42	1.02
1.250	0.00	4.333	3.05	7.417	3.05	10.50	1.02
1.333	1.02	4.417	3.05	7.500	3.05	10.58	1.02
1.417	1.02	4.500	3.05	7.583	2.03	10.67	1.02
1.500	1.02	4.583	3.05	7.667	2.03	10.75	1.02
1.583	1.02	4.667	3.05	7.750	2.03	10.83	1.02
1.667	1.02	4.750	3.05	7.833	3.05	10.92	1.02
1.750	1.02	4.833	3.05	7.917	3.05	11.00	1.02
1.833	1.02	4.917	3.05	8.000	3.05	11.08	1.02
1.917	1.02	5.000	3.05	8.083	2.03	11.17	1.02
2.000	1.02	5.083	3.05	8.167	2.03	11.25	1.02
2.083	1.02	5.167	3.05	8.250	2.03	11.33	0.00
2.167	1.02	5.250	3.05	8.333	2.03	11.42	0.00
2.250	1.02	5.333	5.08	8.417	2.03	11.50	0.00
2.333	1.02	5.417	5.08	8.500	2.03	11.58	1.02
2.417	1.02	5.500	5.08	8.583	2.03	11.67	1.02
2.500	1.02	5.583	5.08	8.667	2.03	11.75	1.02
2.583	2.03	5.667	5.08	8.750	2.03	11.83	1.02
2.667	2.03	5.750	5.08	8.833	1.02	11.92	1.02
2.750	2.03	5.833	38.61	8.917	1.02	12.00	1.02
2.833	2.03	5.917	38.61	9.000	1.02	12.08	1.02
2.917	2.03	6.000	38.61	9.083	2.03	12.17	1.02
3.000	2.03	6.083	38.61	9.167	2.03	12.25	1.02
3.083	2.03	6.167	38.61	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      38.61          19.37
           over (min)       10.00          15.00
Storage Coeff.  (min)=       9.46 (ii)     13.66 (ii)
Unit Hyd. Tpeak (min)=      10.00          15.00
Unit Hyd. peak  (cms)=       0.12           0.08
                                                      *TOTALS*
PEAK FLOW       (cms)=       0.09           0.01       0.096 (iii)
TIME TO PEAK    (hrs)=       6.25           6.33       6.25
RUNOFF VOLUME    (mm)=      40.93          15.99      35.18
TOTAL RAINFALL   (mm)=      42.93          42.93      42.93
RUNOFF COEFFICIENT   =       0.95           0.37       0.82
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                    LangstaffRd_EA_Proposed_WestDonWatershd


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 ( 0460)|
|  1 + 2 = 3     |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)    (mm)
     ID1= 1 ( 0205):      1.11    0.096     6.25     35.18
    + ID2= 2 ( 0210):     0.96    0.084     6.25     35.43
                        ====================================
      ID = 3 ( 0460):     2.07    0.180     6.25     35.30

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------
--------------------
| RESERVOIR( 0525)|    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  |  0.0733    0.0214
                        0.0274    0.0026  |  0.0831    0.0278
                        0.0478    0.0084  |  0.1449    0.0374
                        0.0619    0.0149  |  0.0000    0.0000

                          AREA    QPEAK    TPEAK      R.V.
                          (ha)    (cms)    (hrs)     (mm)
   INFLOW : ID= 2 ( 0460)   2.070    0.180    6.25     35.30
   OUTFLOW: ID= 1 ( 0525)   2.070    0.074    6.58     35.29

         PEAK  FLOW   REDUCTION [Qout/Qin](%)= 41.39
         TIME SHIFT OF PEAK FLOW     (min)= 20.00
         MAXIMUM STORAGE   USED  (ha.m.)= 0.0222

-------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0190)|  Area   (ha)=  0.86
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=     0.49          0.37
    Dep. Storage   (mm)=     2.00          5.00
    Average Slope  (%)=      1.00          2.00
    Length         (m)=    340.00         50.00
    Mannings n     =        0.013         0.250

                            Page 29
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                    LangstaffRd_EA_Proposed_WestDonWatershd
          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   2.03 | 6.250  38.61 | 9.33    1.02
          0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42    1.02
          0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50    1.02
          0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58    2.03
          0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67    2.03
          0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75    2.03
          0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83    1.02
          0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92    1.02
          0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00   1.02
          0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08   1.02
          0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17   1.02
          1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25   1.02
          1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33   1.02
          1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42   1.02
          1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50   1.02
          1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58   1.02
          1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67   1.02
          1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75   1.02
          1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83   1.02
          1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92   1.02
          1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00   1.02
          1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08   1.02
          1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17   1.02
          2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25   1.02
          2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33   0.00
          2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   0.00
          2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50   0.00
          2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58   1.02
          2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67   1.02
          2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75   1.02
          2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83   1.02
          2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92   1.02
          2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00   1.02
          2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08   1.02
          2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17   1.02
          3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25   1.02
          3.083   2.03 | 6.167  38.61 | 9.250   2.03 |

     Max.Eff.Inten.(mm/hr)=      38.61        17.44
            over (min)            10.00        25.00
     Storage Coeff.  (min)=        7.79 (ii)  24.01 (ii)
     Unit Hyd. Tpeak (min)=       10.00        25.00
     Unit Hyd. peak  (cms)=        0.13         0.05
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.05         0.01      0.059 (iii)
     TIME TO PEAK    (hrs)=        6.25         6.50       6.25
     RUNOFF VOLUME   (mm)=        40.93        15.99      30.19

                            Page 30
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                    LangstaffRd_EA_Proposed_WestDonWatershd
   TOTAL RAINFALL   (mm)=       42.93        42.93        42.93
   RUNOFF COEFFICIENT  =         0.95         0.37         0.70


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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.

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--------------------
| CALIB           |
| STANDHYD ( 0195)|  Area   (ha)=  0.79
|ID= 1 DT= 5.0 min |  Total Imp(%)= 75.00   Dir. Conn.(%)= 75.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=     0.59          0.20
    Dep. Storage   (mm)=     2.00          5.00
    Average Slope  (%)=      1.00          2.00
    Length         (m)=    340.00         20.00
    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 | 3.167   2.03 | 6.250  38.61 | 9.33    1.02
          0.167   0.00 | 3.250   2.03 | 6.333   8.13 | 9.42    1.02
          0.250   0.00 | 3.333   1.02 | 6.417   8.13 | 9.50    1.02
          0.333   1.02 | 3.417   1.02 | 6.500   8.13 | 9.58    2.03
          0.417   1.02 | 3.500   1.02 | 6.583   8.13 | 9.67    2.03
          0.500   1.02 | 3.583   2.03 | 6.667   8.13 | 9.75    2.03
          0.583   1.02 | 3.667   2.03 | 6.750   8.13 | 9.83    1.02
          0.667   1.02 | 3.750   2.03 | 6.833   3.05 | 9.92    1.02
          0.750   1.02 | 3.833   2.03 | 6.917   3.05 | 10.00   1.02
          0.833   1.02 | 3.917   2.03 | 7.000   3.05 | 10.08   1.02
          0.917   1.02 | 4.000   2.03 | 7.083   3.05 | 10.17   1.02
          1.000   1.02 | 4.083   1.02 | 7.167   3.05 | 10.25   1.02
          1.083   0.00 | 4.167   1.02 | 7.250   3.05 | 10.33   1.02
          1.167   0.00 | 4.250   1.02 | 7.333   3.05 | 10.42   1.02
          1.250   0.00 | 4.333   3.05 | 7.417   3.05 | 10.50   1.02
          1.333   1.02 | 4.417   3.05 | 7.500   3.05 | 10.58   1.02
          1.417   1.02 | 4.500   3.05 | 7.583   2.03 | 10.67   1.02
          1.500   1.02 | 4.583   3.05 | 7.667   2.03 | 10.75   1.02
          1.583   1.02 | 4.667   3.05 | 7.750   2.03 | 10.83   1.02
          1.667   1.02 | 4.750   3.05 | 7.833   3.05 | 10.92   1.02
          1.750   1.02 | 4.833   3.05 | 7.917   3.05 | 11.00   1.02
          1.833   1.02 | 4.917   3.05 | 8.000   3.05 | 11.08   1.02
          1.917   1.02 | 5.000   3.05 | 8.083   2.03 | 11.17   1.02
          2.000   1.02 | 5.083   3.05 | 8.167   2.03 | 11.25   1.02

                            Page 31
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                    LangstaffRd_EA_Proposed_WestDonWatershd
          2.083   1.02 | 5.167   3.05 | 8.250   2.03 | 11.33   0.00
          2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   0.00
          2.250   1.02 | 5.333   5.08 | 8.417   2.03 | 11.50   0.00
          2.333   1.02 | 5.417   5.08 | 8.500   2.03 | 11.58   1.02
          2.417   1.02 | 5.500   5.08 | 8.583   2.03 | 11.67   1.02
          2.500   1.02 | 5.583   5.08 | 8.667   2.03 | 11.75   1.02
          2.583   2.03 | 5.667   5.08 | 8.750   2.03 | 11.83   1.02
          2.667   2.03 | 5.750   5.08 | 8.833   1.02 | 11.92   1.02
          2.750   2.03 | 5.833  38.61 | 8.917   1.02 | 12.00   1.02
          2.833   2.03 | 5.917  38.61 | 9.000   1.02 | 12.08   1.02
          2.917   2.03 | 6.000  38.61 | 9.083   2.03 | 12.17   1.02
          3.000   2.03 | 6.083  38.61 | 9.167   2.03 | 12.25   1.02
          3.083   2.03 | 6.167  38.61 | 9.250   2.03 |

     Max.Eff.Inten.(mm/hr)=      38.61        19.37
            over (min)            10.00        15.00
     Storage Coeff.  (min)=        7.79 (ii)  12.18 (ii)
     Unit Hyd. Tpeak (min)=       10.00        15.00
     Unit Hyd. peak  (cms)=        0.13         0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.06         0.01      0.069 (iii)
     TIME TO PEAK    (hrs)=        6.25         6.33       6.25
     RUNOFF VOLUME   (mm)=        40.93        15.99      34.69
     TOTAL RAINFALL  (mm)=        42.93        42.93       42.93
     RUNOFF COEFFICIENT  =         0.95         0.37        0.81


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 83.0   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 ( 0455)|
|  1 + 2 = 3     |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)    (mm)
     ID1= 1 ( 0190):      0.86    0.059     6.25     30.19
    + ID2= 2 ( 0195):     0.79    0.069     6.25     34.69
                        ====================================
      ID = 3 ( 0455):     1.65    0.128     6.25     32.34

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------
--------------------
| RESERVOIR( 0555)|    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  |  0.0238    0.0199
                        0.0104    0.0024  |  0.0268    0.0259

                            Page 32
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                    LangstaffRd_EA_Proposed_WestDonWatershd
                  0.0162      0.0079   |    0.0825      0.0346
                  0.0203      0.0139   |    0.0000      0.0000

                              AREA     QPEAK      TPEAK       R.V.
                              (ha)     (cms)      (hrs)       (mm)
       INFLOW : ID= 2 ( 0455)  1.650   0.128      6.25       32.34
       OUTFLOW: ID= 1 ( 0555)  1.650   0.026      6.92       32.31

                PEAK  FLOW   REDUCTION [Qout/Qin](%)= 20.36
                TIME SHIFT OF PEAK FLOW        (min)= 40.00
                MAXIMUM STORAGE    USED   (ha.m.)= 0.0244
------------------------------------------------------------------------
--------------------
| ADD HYD ( 0465)|
|  1 + 2 = 3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 ( 0525):    2.07    0.074    6.58     35.29
       + ID2= 2 ( 0555):    1.65    0.026    6.92     32.31
                           =================================
         ID = 3 ( 0465):    3.72    0.100    6.58     33.97

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------
*********************************
** SIMULATION:Run 03        **
*********************************

--------------------
|  READ STORM    |  Filename: C:\Users\ray.zhao\AppD
|                |            ata\Local\Temp\
|                |            e8da0adc-3b43-467d-984d-5ab4a7d3492c\526be1c0
| Ptotal= 55.37 mm |  Comments: 5yr-12hrSCS
--------------------
               TIME   RAIN | TIME   RAIN |' TIME   RAIN | TIME   RAIN
               hrs   mm/hr | hrs   mm/hr |' hrs   mm/hr | hrs   mm/hr
               0.25   0.00 | 3.50   3.05 | 6.75  10.16 | 10.00  2.03
               0.50   1.02 | 3.75   2.03 | 7.00   5.08 | 10.25  1.02
               0.75   1.02 | 4.00   2.03 | 7.25   4.06 | 10.50  1.02
               1.00   1.02 | 4.25   2.03 | 7.50   3.05 | 10.75  1.02
               1.25   1.02 | 4.50   4.06 | 7.75   3.05 | 11.00  2.03
               1.50   1.02 | 4.75   4.06 | 8.00   4.06 | 11.25  1.02
               1.75   2.03 | 5.00   4.06 | 8.25   3.05 | 11.50  1.02
               2.00   1.02 | 5.25   3.05 | 8.50   2.03 | 11.75  1.02
               2.25   1.02 | 5.50   7.11 | 8.75   2.03 | 12.00  1.02
               2.50   2.03 | 5.75   7.11 | 9.00   3.05 | 12.25  1.02
               2.75   2.03 | 6.00  49.78 | 9.25   2.03 |
               3.00   2.03 | 6.25  49.78 | 9.50   1.02 |
               3.25   2.03 | 6.50   9.14 | 9.75   2.03 |
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                              Page 33
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                    LangstaffRd_EA_Proposed_WestDonWatershd
--------------------
| CALIB          |
| STANDHYD ( 0165)|  Area    (ha)=  0.60
|ID= 1 DT= 5.0 min |  Total Imp(%)= 72.00  Dir. Conn.(%)= 72.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
       Surface Area    (ha)=   0.43        0.17
       Dep. Storage    (mm)=   2.00        5.00
       Average Slope   (%)=    1.00        2.00
       Length          (m)=  250.00       20.00
       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 | 3.167  2.03 | 6.250 49.78 | 9.33   1.02
               0.167  0.00 | 3.250  2.03 | 6.333  9.14 | 9.42   1.02
               0.250  0.00 | 3.333  3.05 | 6.417  9.14 | 9.50   1.02
               0.333  1.02 | 3.417  3.05 | 6.500  9.14 | 9.58   2.03
               0.417  1.02 | 3.500  3.05 | 6.583 10.16 | 9.67   2.03
               0.500  1.02 | 3.583  2.03 | 6.667 10.16 | 9.75   2.03
               0.583  1.02 | 3.667  2.03 | 6.750 10.16 | 9.83   2.03
               0.667  1.02 | 3.750  2.03 | 6.833  5.08 | 9.92   2.03
               0.750  1.02 | 3.833  2.03 | 6.917  5.08 | 10.00  2.03
               0.833  1.02 | 3.917  2.03 | 7.000  5.08 | 10.08  1.02
               0.917  1.02 | 4.000  2.03 | 7.083  4.06 | 10.17  1.02
               1.000  1.02 | 4.083  2.03 | 7.167  4.06 | 10.25  1.02
               1.083  1.02 | 4.167  2.03 | 7.250  4.06 | 10.33  1.02
               1.167  1.02 | 4.250  2.03 | 7.333  3.05 | 10.42  1.02
               1.250  1.02 | 4.333  4.06 | 7.417  3.05 | 10.50  1.02
               1.333  1.02 | 4.417  4.06 | 7.500  3.05 | 10.58  1.02
               1.417  1.02 | 4.583  4.06 | 7.583  3.05 | 10.67  1.02
               1.500  1.02 | 4.583  4.06 | 7.667  3.05 | 10.75  1.02
               1.583  2.03 | 4.667  4.06 | 7.750  3.05 | 10.83  2.03
               1.667  2.03 | 4.750  4.06 | 7.833  4.06 | 10.92  2.03
               1.750  2.03 | 4.833  4.06 | 7.917  4.06 | 11.00  2.03
               1.833  1.02 | 4.917  4.06 | 8.000  4.06 | 11.08  1.02
               1.917  1.02 | 5.000  4.06 | 8.083  3.05 | 11.17  1.02
               2.000  1.02 | 5.083  3.05 | 8.167  3.05 | 11.25  1.02
               2.083  1.02 | 5.167  3.05 | 8.250  3.05 | 11.33  1.02
               2.167  1.02 | 5.250  3.05 | 8.333  2.03 | 11.42  1.02
               2.250  1.02 | 5.333  7.11 | 8.417  2.03 | 11.50  1.02
               2.333  2.03 | 5.417  7.11 | 8.500  2.03 | 11.58  1.02
               2.417  2.03 | 5.500  7.11 | 8.583  2.03 | 11.67  1.02
               2.500  2.03 | 5.583  7.11 | 8.667  2.03 | 11.75  1.02
               2.583  2.03 | 5.667  7.11 | 8.750  2.03 | 11.83  1.02
               2.667  2.03 | 5.750  7.11 | 8.833  3.05 | 11.92  1.02
               2.750  2.03 | 5.833 49.78 | 8.917  3.05 | 12.00  1.02
               2.833  2.03 | 5.917 49.78 | 9.000  3.05 | 12.08  1.02
               2.917  2.03 | 6.000 49.78 | 9.083  2.03 | 12.17  1.02
                              Page 34
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                    LangstaffRd_EA_Proposed_WestDonWatershd
                  3.000   2.03 | 6.083 49.78 | 9.167  2.03 | 12.25  1.02
                  3.083   2.03 | 6.167 49.78 | 9.250  2.03 |

       Max.Eff.Inten.(mm/hr)=   49.78        29.56
                over (min)      5.00         15.00
       Storage Coeff.  (min)=   5.85 (ii)   10.07 (ii)
       Unit Hyd. Tpeak (min)=   5.00         15.00
       Unit Hyd. peak  (cms)=   0.20          0.10
                                                      *TOTALS*
       PEAK FLOW      (cms)=    0.06          0.01    0.070 (iii)
       TIME TO PEAK   (hrs)=    6.25          6.33    6.25
       RUNOFF VOLUME   (mm)=   53.37         24.78    45.36
       TOTAL RAINFALL  (mm)=   55.37         55.37    55.37
       RUNOFF COEFFICIENT =     0.96          0.45    0.82

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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 ( 0170)|  Area    (ha)=  0.43
|ID= 1 DT= 5.0 min |  Total Imp(%)= 98.00  Dir. Conn.(%)= 98.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
       Surface Area    (ha)=   0.42        0.01
       Dep. Storage    (mm)=   2.00        5.00
       Average Slope   (%)=    1.00        2.00
       Length          (m)=  250.00       20.00
       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 | 3.167  2.03 | 6.250 49.78 | 9.33   1.02
               0.167  0.00 | 3.250  2.03 | 6.333  9.14 | 9.42   1.02
               0.250  0.00 | 3.333  3.05 | 6.417  9.14 | 9.50   1.02
               0.333  1.02 | 3.417  3.05 | 6.500  9.14 | 9.58   2.03
               0.417  1.02 | 3.500  3.05 | 6.583 10.16 | 9.67   2.03
               0.500  1.02 | 3.583  2.03 | 6.667 10.16 | 9.75   2.03
               0.583  1.02 | 3.667  2.03 | 6.750 10.16 | 9.83   2.03
               0.667  1.02 | 3.750  2.03 | 6.833  5.08 | 9.92   2.03
               0.750  1.02 | 3.833  2.03 | 6.917  5.08 | 10.00  2.03
               0.833  1.02 | 3.917  2.03 | 7.000  5.08 | 10.08  1.02
               0.917  1.02 | 4.000  2.03 | 7.083  4.06 | 10.17  1.02
               1.000  1.02 | 4.083  2.03 | 7.167  4.06 | 10.25  1.02
                              Page 35
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                    LangstaffRd_EA_Proposed_WestDonWatershd
                  1.083   1.02 | 4.250  2.03 | 7.250  4.06 | 10.33  1.02
                  1.167   1.02 | 4.250  2.03 | 7.333  3.05 | 10.42  1.02
                  1.250   1.02 | 4.333  4.06 | 7.417  3.05 | 10.50  1.02
                  1.333   1.02 | 4.417  4.06 | 7.500  3.05 | 10.58  1.02
                  1.417   1.02 | 4.500  4.06 | 7.583  3.05 | 10.67  1.02
                  1.500   1.02 | 4.583  4.06 | 7.667  3.05 | 10.75  1.02
                  1.583   2.03 | 4.667  4.06 | 7.750  3.05 | 10.83  2.03
                  1.667   2.03 | 4.750  4.06 | 7.833  4.06 | 10.92  2.03
                  1.750   2.03 | 4.833  4.06 | 7.917  4.06 | 11.00  2.03
                  1.833   1.02 | 4.917  4.06 | 8.000  4.06 | 11.08  1.02
                  1.917   1.02 | 5.000  4.06 | 8.083  3.05 | 11.17  1.02
                  2.000   1.02 | 5.083  3.05 | 8.167  3.05 | 11.25  1.02
                  2.083   1.02 | 5.167  3.05 | 8.250  3.05 | 11.33  1.02
                  2.167   1.02 | 5.250  3.05 | 8.333  2.03 | 11.42  1.02
                  2.250   1.02 | 5.333  7.11 | 8.417  2.03 | 11.50  1.02
                  2.333   2.03 | 5.417  7.11 | 8.500  2.03 | 11.58  1.02
                  2.417   2.03 | 5.500  7.11 | 8.583  2.03 | 11.67  1.02
                  2.500   2.03 | 5.583  7.11 | 8.667  2.03 | 11.75  1.02
                  2.583   2.03 | 5.667  7.11 | 8.750  2.03 | 11.83  1.02
                  2.667   2.03 | 5.750  7.11 | 8.833  3.05 | 11.92  1.02
                  2.750   2.03 | 5.833 49.78 | 8.917  3.05 | 12.00  1.02
                  2.833   2.03 | 5.917 49.78 | 9.000  3.05 | 12.08  1.02
                  2.917   2.03 | 6.000 49.78 | 9.083  2.03 | 12.17  1.02
                  3.000   2.03 | 6.083 49.78 | 9.167  2.03 | 12.25  1.02
                  3.083   2.03 | 6.167 49.78 | 9.250  2.03 |

       Max.Eff.Inten.(mm/hr)=   49.78        36.58
                over (min)      5.00         10.00
       Storage Coeff.  (min)=   5.85 (ii)    7.15 (ii)
       Unit Hyd. Tpeak (min)=   5.00         10.00
       Unit Hyd. peak  (cms)=   0.20          0.14
                                                      *TOTALS*
       PEAK FLOW      (cms)=    0.06          0.00    0.059 (iii)
       TIME TO PEAK   (hrs)=    6.25          6.25    6.25
       RUNOFF VOLUME   (mm)=   53.37         31.03    52.91
       TOTAL RAINFALL  (mm)=   55.37         55.37    55.37
       RUNOFF COEFFICIENT =     0.96          0.56    0.96

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 89.0   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 ( 0180)|  Area    (ha)=  0.65
|ID= 1 DT= 5.0 min |  Total Imp(%)= 52.00  Dir. Conn.(%)= 52.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
       Surface Area    (ha)=   0.34        0.31
                              Page 36
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                    LangstaffRd_EA_Proposed_WestDonWatershd
 Dep. Storage      (mm)=      2.00         5.00
 Average Slope     (%)=       1.00         2.00
 Length            (m)=      65.83        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 | 3.167  2.03 | 6.250  49.78 | 9.33   1.02
            0.167   0.00 | 3.250  2.03 | 6.333  9.14  | 9.42   1.02
            0.250   0.00 | 3.333  3.05 | 6.417  9.14  | 9.50   1.02
            0.333   1.02 | 3.417  3.05 | 6.500  9.14  | 9.58   2.03
            0.417   1.02 | 3.500  3.05 | 6.583  10.16 | 9.67   2.03
            0.500   1.02 | 3.583  2.03 | 6.667  10.16 | 9.75   2.03
            0.583   1.02 | 3.667  2.03 | 6.750  10.16 | 9.83   2.03
            0.667   1.02 | 3.750  2.03 | 6.833  5.08  | 9.92   2.03
            0.750   1.02 | 3.833  2.03 | 6.917  5.08  | 10.00  2.03
            0.833   1.02 | 3.917  2.03 | 7.000  5.08  | 10.08  1.02
            0.917   1.02 | 4.000  2.03 | 7.083  4.06  | 10.17  1.02
            1.000   1.02 | 4.083  2.03 | 7.167  4.06  | 10.25  1.02
            1.083   1.02 | 4.167  2.03 | 7.250  4.06  | 10.33  1.02
            1.167   1.02 | 4.250  2.03 | 7.333  3.05  | 10.42  1.02
            1.250   1.02 | 4.333  4.06 | 7.417  3.05  | 10.50  1.02
            1.333   1.02 | 4.417  4.06 | 7.500  3.05  | 10.58  1.02
            1.417   1.02 | 4.500  4.06 | 7.583  3.05  | 10.67  1.02
            1.500   1.02 | 4.583  4.06 | 7.667  3.05  | 10.75  1.02
            1.583   2.03 | 4.667  4.06 | 7.750  3.05  | 10.83  2.03
            1.667   2.03 | 4.750  4.06 | 7.833  4.06  | 10.92  2.03
            1.750   2.03 | 4.833  4.06 | 7.917  4.06  | 11.00  2.03
            1.833   1.02 | 4.917  4.06 | 8.000  4.06  | 11.08  1.02
            1.917   1.02 | 5.000  4.06 | 8.083  3.05  | 11.17  1.02
            2.000   1.02 | 5.083  3.05 | 8.167  3.05  | 11.25  1.02
            2.083   1.02 | 5.167  3.05 | 8.250  3.05  | 11.33  1.02
            2.167   1.02 | 5.250  3.05 | 8.333  2.03  | 11.42  1.02
            2.250   1.02 | 5.333  7.11 | 8.417  2.03  | 11.50  1.02
            2.333   2.03 | 5.417  7.11 | 8.500  2.03  | 11.58  1.02
            2.417   2.03 | 5.500  7.11 | 8.583  2.03  | 11.67  1.02
            2.500   2.03 | 5.583  7.11 | 8.667  2.03  | 11.75  1.02
            2.583   2.03 | 5.667  7.11 | 8.750  2.03  | 11.83  1.02
            2.667   2.03 | 5.750  7.11 | 8.833  3.05  | 11.92  1.02
            2.750   2.03 | 5.833  49.78| 8.917  3.05  | 12.00  1.02
            2.833   2.03 | 5.917  49.78| 9.000  3.05  | 12.08  1.02
            2.917   2.03 | 6.000  49.78| 9.083  2.03  | 12.17  1.02
            3.000   2.03 | 6.083  49.78| 9.167  2.03  | 12.25  1.02
            3.083   2.03 | 6.167  49.78| 9.250  2.03  |

    Max.Eff.Inten.(mm/hr)=     49.78        28.42
                over (min)      5.00        15.00
    Storage Coeff.  (min)=      2.63 (ii)   14.30 (ii)
    Unit Hyd. Tpeak (min)=      5.00        15.00
                              Page 37
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                    LangstaffRd_EA_Proposed_WestDonWatershd
 Unit Hyd. peak   (cms)=      0.29         0.08
                                                        *TOTALS*
 PEAK FLOW        (cms)=      0.05         0.02       0.064 (iii)
 TIME TO PEAK     (hrs)=      6.25         6.33         6.25
 RUNOFF VOLUME    (mm)=      53.37        24.78        39.63
 TOTAL RAINFALL   (mm)=      55.37        55.37        55.37
 RUNOFF COEFFICIENT =        0.96         0.45         0.72

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 ( 0185)|   Area   (ha)=  0.47
 |ID= 1 DT= 5.0 min |   Total Imp(%)= 72.00   Dir. Conn.(%)= 72.00
 --------------------
                            IMPERVIOUS   PERVIOUS (i)
      Surface Area  (ha)=      0.34         0.13
      Dep. Storage  (mm)=      2.00         5.00
      Average Slope (%)=       1.00         2.00
      Length        (m)=     240.00        20.00
      Mannings n    =         0.013        0.350

     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  2.03 | 6.250  49.78 | 9.33   1.02
            0.167   0.00 | 3.250  2.03 | 6.333  9.14  | 9.42   1.02
            0.250   0.00 | 3.333  3.05 | 6.417  9.14  | 9.50   1.02
            0.333   1.02 | 3.417  3.05 | 6.500  9.14  | 9.58   2.03
            0.417   1.02 | 3.500  3.05 | 6.583  10.16 | 9.67   2.03
            0.500   1.02 | 3.583  2.03 | 6.667  10.16 | 9.75   2.03
            0.583   1.02 | 3.667  2.03 | 6.750  10.16 | 9.83   2.03
            0.667   1.02 | 3.750  2.03 | 6.833  5.08  | 9.92   2.03
            0.750   1.02 | 3.833  2.03 | 6.917  5.08  | 10.00  2.03
            0.833   1.02 | 3.917  2.03 | 7.000  5.08  | 10.08  1.02
            0.917   1.02 | 4.000  2.03 | 7.083  4.06  | 10.17  1.02
            1.000   1.02 | 4.083  2.03 | 7.167  4.06  | 10.25  1.02
            1.083   1.02 | 4.167  2.03 | 7.250  4.06  | 10.33  1.02
            1.167   1.02 | 4.250  2.03 | 7.333  3.05  | 10.42  1.02
            1.250   1.02 | 4.333  4.06 | 7.417  3.05  | 10.50  1.02
            1.333   1.02 | 4.417  4.06 | 7.500  3.05  | 10.58  1.02
            1.417   1.02 | 4.500  4.06 | 7.583  3.05  | 10.67  1.02
            1.500   1.02 | 4.583  4.06 | 7.667  3.05  | 10.75  1.02
                              Page 38
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                    LangstaffRd_EA_Proposed_WestDonWatershd
            1.583   2.03 | 4.667  4.06 | 7.750  3.05  | 10.83  2.03
            1.667   2.03 | 4.750  4.06 | 7.833  4.06  | 10.92  2.03
            1.750   2.03 | 4.833  4.06 | 7.917  4.06  | 11.00  2.03
            1.833   1.02 | 4.917  4.06 | 8.000  4.06  | 11.08  1.02
            1.917   1.02 | 5.000  4.06 | 8.083  3.05  | 11.17  1.02
            2.000   1.02 | 5.083  3.05 | 8.167  3.05  | 11.25  1.02
            2.083   1.02 | 5.167  3.05 | 8.250  3.05  | 11.33  1.02
            2.167   1.02 | 5.250  3.05 | 8.333  2.03  | 11.42  1.02
            2.250   1.02 | 5.333  7.11 | 8.417  2.03  | 11.50  1.02
            2.333   2.03 | 5.417  7.11 | 8.500  2.03  | 11.58  1.02
            2.417   2.03 | 5.500  7.11 | 8.583  2.03  | 11.67  1.02
            2.500   2.03 | 5.583  7.11 | 8.667  2.03  | 11.75  1.02
            2.583   2.03 | 5.667  7.11 | 8.750  2.03  | 11.83  1.02
            2.667   2.03 | 5.750  7.11 | 8.833  3.05  | 11.92  1.02
            2.750   2.03 | 5.833  49.78| 8.917  3.05  | 12.00  1.02
            2.833   2.03 | 5.917  49.78| 9.000  3.05  | 12.08  1.02
            2.917   2.03 | 6.000  49.78| 9.083  2.03  | 12.17  1.02
            3.000   2.03 | 6.083  49.78| 9.167  2.03  | 12.25  1.02
            3.083   2.03 | 6.167  49.78| 9.250  2.03  |

    Max.Eff.Inten.(mm/hr)=     49.78        25.73
                over (min)      5.00        20.00
    Storage Coeff.  (min)=      5.71 (ii)   15.52 (ii)
    Unit Hyd. Tpeak (min)=      5.00        20.00
    Unit Hyd. peak  (cms)=      0.20         0.07
                                                        *TOTALS*
 PEAK FLOW        (cms)=      0.05         0.01       0.052 (iii)
 TIME TO PEAK     (hrs)=      6.25         6.42         6.25
 RUNOFF VOLUME    (mm)=      53.37        21.52        44.44
 TOTAL RAINFALL   (mm)=      55.37        55.37        55.37
 RUNOFF COEFFICIENT =        0.96         0.39         0.80

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 79.0   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  ( 0445)|
 |  1 + 2 = 3      |      AREA    QPEAK    TPEAK     R.V.
 --------------------      (ha)    (cms)    (hrs)    (mm)
      ID1= 1 ( 0180):     0.65    0.064     6.25    39.63
    + ID2= 2 ( 0185):     0.47    0.052     6.25    44.44
      =================================================
      ID = 3 ( 0445):     1.12    0.116     6.25    41.65

 NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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                              Page 39
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                    LangstaffRd_EA_Proposed_WestDonWatershd
 --------------------
 | ADD HYD  ( 0450)|
 |  1 + 2 = 3      |      AREA    QPEAK    TPEAK     R.V.
 --------------------      (ha)    (cms)    (hrs)    (mm)
      ID1= 1 ( 0165):     0.60    0.070     6.25    45.36
    + ID2= 2 ( 0170):     0.43    0.059     6.25    52.91
      =================================================
      ID = 3 ( 0450):     1.03    0.129     6.25    48.51

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

 --------------------
 | ADD HYD  ( 0450)|
 |  3 + 2 = 1      |      AREA    QPEAK    TPEAK     R.V.
 --------------------      (ha)    (cms)    (hrs)    (mm)
      ID1= 3 ( 0450):     1.03    0.129     6.25    48.51
    + ID2= 2 ( 0445):     1.12    0.116     6.25    41.65
      =================================================
      ID = 1 ( 0450):     2.15    0.245     6.25    44.94

 NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 -------------------------------------------------------------------------
 --------------------
 | RESERVOIR( 0520)|   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    | 0.0181    0.0552
                        0.0081    0.0048    | 0.0203    0.0732
                        0.0123    0.0192    | 0.0224    0.1152
                        0.0155    0.0372    | 0.0000    0.0000

                            AREA    QPEAK    TPEAK     R.V.
                            (ha)    (cms)    (hrs)    (mm)
      INFLOW : ID= 2 ( 0450)  2.150   0.245    6.25    44.94
      OUTFLOW: ID= 1 ( 0520)  2.150   0.019    8.08    44.87

              PEAK  FLOW   REDUCTION [Qout/Qin](%)= 7.66
              TIME SHIFT OF PEAK FLOW     (min)=110.00
              MAXIMUM  STORAGE  USED    (ha.m.)= 0.0607

 -------------------------------------------------------------------------
 --------------------
 | CALIB              |
 | STANDHYD ( 0145)|   Area   (ha)=  3.05
 |ID= 1 DT= 5.0 min |   Total Imp(%)= 76.00   Dir. Conn.(%)= 76.00
 --------------------
                            IMPERVIOUS   PERVIOUS (i)
      Surface Area  (ha)=      2.32         0.73
      Dep. Storage  (mm)=      2.00         5.00
      Average Slope (%)=       1.00         2.00
      Length        (m)=     531.00        40.00
                              Page 40
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Page 41

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                   LangstaffRd_EA_Proposed_WestDonWatershd
        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   2.03 | 6.250  49.78 | 9.33   1.02
           0.167   0.00 | 3.250   2.03 | 6.333   9.14 | 9.42   1.02
           0.250   0.00 | 3.333   3.05 | 6.417   9.14 | 9.50   1.02
           0.333   1.02 | 3.417   3.05 | 6.500   9.14 | 9.58   2.03
           0.417   1.02 | 3.500   3.05 | 6.583  10.16 | 9.67   2.03
           0.500   1.02 | 3.583   2.03 | 6.667  10.16 | 9.75   2.03
           0.583   1.02 | 3.667   2.03 | 6.750  10.16 | 9.83   2.03
           0.667   1.02 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
           0.750   1.02 | 3.833   2.03 | 6.917   5.08 | 10.00  2.03
           0.833   1.02 | 3.917   2.03 | 7.000   5.08 | 10.08  1.02
           0.917   1.02 | 4.000   2.03 | 7.083   4.06 | 10.17  1.02
           1.000   1.02 | 4.083   2.03 | 7.167   4.06 | 10.25  1.02
           1.083   1.02 | 4.167   2.03 | 7.250   4.06 | 10.33  1.02
           1.167   1.02 | 4.250   2.03 | 7.333   3.05 | 10.42  1.02
           1.250   1.02 | 4.333   4.06 | 7.417   3.05 | 10.50  1.02
           1.333   1.02 | 4.417   4.06 | 7.500   3.05 | 10.58  1.02
           1.417   1.02 | 4.500   4.06 | 7.583   3.05 | 10.67  1.02
           1.500   1.02 | 4.583   4.06 | 7.667   3.05 | 10.75  1.02
           1.583   2.03 | 4.667   4.06 | 7.750   3.05 | 10.83  2.03
           1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92  2.03
           1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00  2.03
           1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08  1.02
           1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17  1.02
           2.000   1.02 | 5.083   3.05 | 8.167   3.05 | 11.25  1.02
           2.083   1.02 | 5.167   3.05 | 8.250   3.05 | 11.33  1.02
           2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  1.02
           2.250   1.02 | 5.333   7.11 | 8.417   2.03 | 11.50  1.02
           2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58  1.02
           2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67  1.02
           2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75  1.02
           2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83  1.02
           2.667   2.03 | 5.750   7.11 | 8.833   3.05 | 11.92  1.02
           2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00  1.02
           2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08  1.02
           2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17  1.02
           3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25  1.02
           3.083   2.03 | 6.167  49.78 | 9.250   2.03 |

        Max.Eff.Inten.(mm/hr)=     49.78        31.75
              over (min)           10.00        25.00
        Storage Coeff. (min)=       9.20 (ii)   20.36 (ii)
        Unit Hyd. Tpeak (min)=     10.00        25.00
        Unit Hyd. peak (cms)=       0.12         0.05
                                                          *TOTALS*
        PEAK FLOW      (cms)=       0.31         0.04      0.337 (iii)
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Page 41

Page 42

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                   LangstaffRd_EA_Proposed_WestDonWatershd
        TIME TO PEAK    (hrs)=      6.25         6.50         6.25
        RUNOFF VOLUME   (mm)=      53.37        27.66        47.20
        TOTAL RAINFALL  (mm)=      55.37        55.37        55.37
        RUNOFF COEFFICIENT  =       0.96         0.50         0.85


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* =  86.0   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 ( 0135)|   Area    (ha)=  1.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 99.00  Dir. Conn.(%)= 99.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=     1.42         0.01
        Dep. Storage    (mm)=     2.00         5.00
        Average Slope   (%)=      1.00         2.00
        Length          (m)=    503.00        30.00
        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 | 3.167   2.03 | 6.250  49.78 | 9.33   1.02
           0.167   0.00 | 3.250   2.03 | 6.333   9.14 | 9.42   1.02
           0.250   0.00 | 3.333   3.05 | 6.417   9.14 | 9.50   1.02
           0.333   1.02 | 3.417   3.05 | 6.500   9.14 | 9.58   2.03
           0.417   1.02 | 3.500   3.05 | 6.583  10.16 | 9.67   2.03
           0.500   1.02 | 3.583   2.03 | 6.667  10.16 | 9.75   2.03
           0.583   1.02 | 3.667   2.03 | 6.750  10.16 | 9.83   2.03
           0.667   1.02 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
           0.750   1.02 | 3.833   2.03 | 6.917   5.08 | 10.00  2.03
           0.833   1.02 | 3.917   2.03 | 7.000   5.08 | 10.08  1.02
           0.917   1.02 | 4.000   2.03 | 7.083   4.06 | 10.17  1.02
           1.000   1.02 | 4.083   2.03 | 7.167   4.06 | 10.25  1.02
           1.083   1.02 | 4.167   2.03 | 7.250   4.06 | 10.33  1.02
           1.167   1.02 | 4.250   2.03 | 7.333   3.05 | 10.42  1.02
           1.250   1.02 | 4.333   4.06 | 7.417   3.05 | 10.50  1.02
           1.333   1.02 | 4.417   4.06 | 7.500   3.05 | 10.58  1.02
           1.417   1.02 | 4.500   4.06 | 7.583   3.05 | 10.67  1.02
           1.500   1.02 | 4.583   4.06 | 7.667   3.05 | 10.75  1.02
           1.583   2.03 | 4.667   4.06 | 7.750   3.05 | 10.83  2.03
           1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92  2.03
           1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00  2.03
           1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08  1.02
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Page 42

Page 43

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                   LangstaffRd_EA_Proposed_WestDonWatershd
           1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17  1.02
           2.000   1.02 | 5.083   3.05 | 8.167   3.05 | 11.25  1.02
           2.083   1.02 | 5.167   3.05 | 8.250   3.05 | 11.33  1.02
           2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  1.02
           2.250   1.02 | 5.333   7.11 | 8.417   2.03 | 11.50  1.02
           2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58  1.02
           2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67  1.02
           2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75  1.02
           2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83  1.02
           2.667   2.03 | 5.750   7.11 | 8.833   3.05 | 11.92  1.02
           2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00  1.02
           2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08  1.02
           2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17  1.02
           3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25  1.02
           3.083   2.03 | 6.167  49.78 | 9.250   2.03 |

        Max.Eff.Inten.(mm/hr)=     49.78        30.62
              over (min)           10.00        15.00
        Storage Coeff. (min)=       8.90 (ii)   10.15 (ii)
        Unit Hyd. Tpeak (min)=     10.00        15.00
        Unit Hyd. peak (cms)=       0.12         0.10
                                                          *TOTALS*
        PEAK FLOW      (cms)=       0.19         0.00      0.188 (iii)
        TIME TO PEAK    (hrs)=      6.25         6.33         6.25
        RUNOFF VOLUME   (mm)=      53.37        25.69        53.09
        TOTAL RAINFALL  (mm)=      55.37        55.37        55.37
        RUNOFF COEFFICIENT  =       0.96         0.46         0.96


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* =  84.0   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 ( 0140)|   Area    (ha)=  1.27
|ID= 1 DT= 5.0 min |   Total Imp(%)= 91.00  Dir. Conn.(%)= 91.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=     1.16         0.11
        Dep. Storage    (mm)=     2.00         5.00
        Average Slope   (%)=      1.00         2.00
        Length          (m)=    503.00        25.00
        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
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Page 43

Page 44

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                   LangstaffRd_EA_Proposed_WestDonWatershd
            hrs    mm/hr |  hrs    mm/hr |'  hrs    mm/hr |  hrs    mm/hr
           0.083   0.00 | 3.167   2.03 | 6.250  49.78 | 9.33   1.02
           0.167   0.00 | 3.250   2.03 | 6.333   9.14 | 9.42   1.02
           0.250   0.00 | 3.333   3.05 | 6.417   9.14 | 9.50   1.02
           0.333   1.02 | 3.417   3.05 | 6.500   9.14 | 9.58   2.03
           0.417   1.02 | 3.500   3.05 | 6.583  10.16 | 9.67   2.03
           0.500   1.02 | 3.583   2.03 | 6.667  10.16 | 9.75   2.03
           0.583   1.02 | 3.667   2.03 | 6.750  10.16 | 9.83   2.03
           0.667   1.02 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
           0.750   1.02 | 3.833   2.03 | 6.917   5.08 | 10.00  2.03
           0.833   1.02 | 3.917   2.03 | 7.000   5.08 | 10.08  1.02
           0.917   1.02 | 4.000   2.03 | 7.083   4.06 | 10.17  1.02
           1.000   1.02 | 4.083   2.03 | 7.167   4.06 | 10.25  1.02
           1.083   1.02 | 4.167   2.03 | 7.250   4.06 | 10.33  1.02
           1.167   1.02 | 4.250   2.03 | 7.333   3.05 | 10.42  1.02
           1.250   1.02 | 4.333   4.06 | 7.417   3.05 | 10.50  1.02
           1.333   1.02 | 4.417   4.06 | 7.500   3.05 | 10.58  1.02
           1.417   1.02 | 4.500   4.06 | 7.583   3.05 | 10.67  1.02
           1.500   1.02 | 4.583   4.06 | 7.667   3.05 | 10.75  1.02
           1.583   2.03 | 4.667   4.06 | 7.750   3.05 | 10.83  2.03
           1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92  2.03
           1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00  2.03
           1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08  1.02
           1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17  1.02
           2.000   1.02 | 5.083   3.05 | 8.167   3.05 | 11.25  1.02
           2.083   1.02 | 5.167   3.05 | 8.250   3.05 | 11.33  1.02
           2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  1.02
           2.250   1.02 | 5.333   7.11 | 8.417   2.03 | 11.50  1.02
           2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58  1.02
           2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67  1.02
           2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75  1.02
           2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83  1.02
           2.667   2.03 | 5.750   7.11 | 8.833   3.05 | 11.92  1.02
           2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00  1.02
           2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08  1.02
           2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17  1.02
           3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25  1.02
           3.083   2.03 | 6.167  49.78 | 9.250   2.03 |

        Max.Eff.Inten.(mm/hr)=     49.78        29.56
              over (min)           10.00        15.00
        Storage Coeff. (min)=       8.90 (ii)   11.69 (ii)
        Unit Hyd. Tpeak (min)=     10.00        15.00
        Unit Hyd. peak (cms)=       0.12         0.09
                                                          *TOTALS*
        PEAK FLOW      (cms)=       0.15         0.01      0.160 (iii)
        TIME TO PEAK    (hrs)=      6.25         6.33         6.25
        RUNOFF VOLUME   (mm)=      53.37        24.78        50.79
        TOTAL RAINFALL  (mm)=      55.37        55.37        55.37
        RUNOFF COEFFICIENT  =       0.96         0.45         0.92


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

Page 44

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
             CN* =  83.0    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 ( 0420)|
      |  1 + 2 =  3    |       AREA    QPEAK    TPEAK     R.V.
      ---------------------     (ha)    (cms)    (hrs)     (mm)
            ID1= 1 ( 0135):    1.43    0.188     6.25    53.09
          + ID2= 2 ( 0140):    1.27    0.160     6.25    50.79
                               ====================================
            ID = 3 ( 0420):    2.70    0.348     6.25    52.01

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
      -----------------------------------------------------------------
      ---------------------
      | RESERVOIR( 0530)|    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   |  0.0122    0.0823
                              0.0056     0.0072   |  0.0382    0.1093
                              0.0084     0.0283   |  0.0516    0.1598
                              0.0105     0.0553   |  0.0000    0.0000

                              AREA    QPEAK    TPEAK     R.V.
                              (ha)    (cms)    (hrs)     (mm)
       INFLOW : ID= 2 ( 0420)  2.700   0.348     6.25    52.01
       OUTFLOW: ID= 1 ( 0530)  2.700   0.028     7.42    51.89

            PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.91
            TIME SHIFT OF PEAK FLOW       (min)= 70.00
            MAXIMUM STORAGE  USED    (ha.m.)=  0.0983
      -----------------------------------------------------------------
      ---------------------
      | ADD HYD ( 0425)|
      |  1 + 2 =  3    |       AREA    QPEAK    TPEAK     R.V.
      ---------------------     (ha)    (cms)    (hrs)     (mm)
            ID1= 1 ( 0145):    3.05    0.337     6.25    47.20
          + ID2= 2 ( 0530):    2.70    0.028     7.42    51.89
                               ====================================
            ID = 3 ( 0425):    5.75    0.348     6.25    49.40

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
      -----------------------------------------------------------------
      ---------------------
      | RESERVOIR( 0512)|    OVERFLOW IS OFF
      | IN= 2---> OUT= 1 |
                                  Page 45
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```
                    LangstaffRd_EA_Proposed_WestDonWatershd
  | DT=  5.0 min     |  OUTFLOW   STORAGE  |  OUTFLOW   STORAGE
  ---------------------   (cms)    (ha.m.)  |   (cms)    (ha.m.)
                         0.0000    0.0000   |  0.0471    0.1003
                         0.0071    0.0165   |  0.0636    0.1284
                         0.0098    0.0331   |  0.0763    0.1594
                         0.0119    0.0526   |  0.0870    0.1934
                         0.0138    0.0750   |  0.0964    0.2308

                         AREA    QPEAK    TPEAK     R.V.
                         (ha)    (cms)    (hrs)     (mm)
     INFLOW : ID= 2 ( 0425)  5.750   0.348     6.25    49.40
     OUTFLOW: ID= 1 ( 0512)  5.750   0.052     8.33    49.30

          PEAK   FLOW   REDUCTION [Qout/Qin](%)= 14.98
          TIME SHIFT OF PEAK FLOW       (min)=125.00
          MAXIMUM STORAGE  USED    (ha.m.)=  0.1088
  -----------------------------------------------------------------
  ---------------------
  | CALIB            |
  | STANDHYD ( 0215)|  Area   (ha)=  0.58
  |ID= 1 DT= 5.0 min |  Total Imp(%)= 81.00   Dir. Conn.(%)= 81.00
  ---------------------
                               IMPERVIOUS    PERVIOUS (i)
       Surface Area    (ha)=     0.47          0.11
       Dep. Storage    (mm)=     2.00          5.00
       Average Slope   (%)=      1.00          2.00
       Length          (m)=    260.00         30.00
       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 | 3.167   2.03 | 6.250  49.78 | 9.33   1.02
         0.167   0.00 | 3.250   2.03 | 6.333   9.14 | 9.42   1.02
         0.250   0.00 | 3.333   3.05 | 6.417   9.14 | 9.50   1.02
         0.333   1.02 | 3.417   3.05 | 6.500   9.14 | 9.58   2.03
         0.417   1.02 | 3.500   3.05 | 6.583  10.16 | 9.67   2.03
         0.500   1.02 | 3.583   2.03 | 6.667  10.16 | 9.75   2.03
         0.583   1.02 | 3.667   2.03 | 6.750  10.16 | 9.83   2.03
         0.667   1.02 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
         0.750   1.02 | 3.833   2.03 | 6.917   5.08 | 10.00  2.03
         0.833   1.02 | 3.917   2.03 | 7.000   5.08 | 10.08  1.02
         0.917   1.02 | 4.000   2.03 | 7.083   4.06 | 10.17  1.02
         1.000   1.02 | 4.083   2.03 | 7.167   4.06 | 10.25  1.02
         1.083   1.02 | 4.167   2.03 | 7.250   4.06 | 10.33  1.02
         1.167   1.02 | 4.250   2.03 | 7.333   3.05 | 10.42  1.02
         1.250   1.02 | 4.333   4.06 | 7.417   3.05 | 10.50  1.02
         1.333   1.02 | 4.417   4.06 | 7.500   3.05 | 10.58  1.02
         1.417   1.02 | 4.500   4.06 | 7.583   3.05 | 10.67  1.02
                                  Page 46
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                    LangstaffRd_EA_Proposed_WestDonWatershd
         1.500   1.02 | 4.583   4.06 | 7.667   3.05 | 10.75  1.02
         1.583   2.03 | 4.667   4.06 | 7.750   3.05 | 10.83  2.03
         1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92  2.03
         1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00  2.03
         1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08  1.02
         1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17  1.02
         2.000   1.02 | 5.083   3.05 | 8.167   3.05 | 11.25  1.02
         2.083   1.02 | 5.167   3.05 | 8.250   3.05 | 11.33  1.02
         2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  1.02
         2.250   1.02 | 5.333   7.11 | 8.417   2.03 | 11.50  1.02
         2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58  1.02
         2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67  1.02
         2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75  1.02
         2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83  1.02
         2.667   2.03 | 5.750   7.11 | 8.833   3.05 | 11.92  1.02
         2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00  1.02
         2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08  1.02
         2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17  1.02
         3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25  1.02
         3.083   2.03 | 6.167  49.78 | 9.250   2.03 |

       Max.Eff.Inten.(mm/hr)=    49.78         29.56
                over (min)       5.00         15.00
       Storage Coeff.  (min)=    5.99 (ii)    10.39 (ii)
       Unit Hyd. Tpeak (min)=    5.00         15.00
       Unit Hyd. peak  (cms)=    0.19          0.09
                                                      *TOTALS*
       PEAK FLOW       (cms)=    0.06          0.01       0.072 (iii)
       TIME TO PEAK    (hrs)=    6.25          6.33       6.25
       RUNOFF VOLUME   (mm)=    53.37         24.78      47.93
       TOTAL RAINFALL  (mm)=    55.37         55.37      55.37
       RUNOFF COEFFICIENT  =     0.96          0.45       0.87


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  83.0    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 ( 0220)|  Area   (ha)=  0.65
      |ID= 1 DT= 5.0 min |  Total Imp(%)= 66.00   Dir. Conn.(%)= 66.00
      ---------------------
                               IMPERVIOUS    PERVIOUS (i)
       Surface Area    (ha)=     0.43          0.22
       Dep. Storage    (mm)=     2.00          5.00
       Average Slope   (%)=      1.00          2.00
       Length          (m)=    260.00         20.00
       Mannings n      =        0.013          0.250
                                  Page 47
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                    LangstaffRd_EA_Proposed_WestDonWatershd
      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   2.03 | 6.250  49.78 | 9.33   1.02
         0.167   0.00 | 3.250   2.03 | 6.333   9.14 | 9.42   1.02
         0.250   0.00 | 3.333   3.05 | 6.417   9.14 | 9.50   1.02
         0.333   1.02 | 3.417   3.05 | 6.500   9.14 | 9.58   2.03
         0.417   1.02 | 3.500   3.05 | 6.583  10.16 | 9.67   2.03
         0.500   1.02 | 3.583   2.03 | 6.667  10.16 | 9.75   2.03
         0.583   1.02 | 3.667   2.03 | 6.750  10.16 | 9.83   2.03
         0.667   1.02 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
         0.750   1.02 | 3.833   2.03 | 6.917   5.08 | 10.00  2.03
         0.833   1.02 | 3.917   2.03 | 7.000   5.08 | 10.08  1.02
         0.917   1.02 | 4.000   2.03 | 7.083   4.06 | 10.17  1.02
         1.000   1.02 | 4.083   2.03 | 7.167   4.06 | 10.25  1.02
         1.083   1.02 | 4.167   2.03 | 7.250   4.06 | 10.33  1.02
         1.167   1.02 | 4.250   2.03 | 7.333   3.05 | 10.42  1.02
         1.250   1.02 | 4.333   4.06 | 7.417   3.05 | 10.50  1.02
         1.333   1.02 | 4.417   4.06 | 7.500   3.05 | 10.58  1.02
         1.417   1.02 | 4.500   4.06 | 7.583   3.05 | 10.67  1.02
         1.500   1.02 | 4.583   4.06 | 7.667   3.05 | 10.75  1.02
         1.583   2.03 | 4.667   4.06 | 7.750   3.05 | 10.83  2.03
         1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92  2.03
         1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00  2.03
         1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08  1.02
         1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17  1.02
         2.000   1.02 | 5.083   3.05 | 8.167   3.05 | 11.25  1.02
         2.083   1.02 | 5.167   3.05 | 8.250   3.05 | 11.33  1.02
         2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42  1.02
         2.250   1.02 | 5.333   7.11 | 8.417   2.03 | 11.50  1.02
         2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58  1.02
         2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67  1.02
         2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75  1.02
         2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83  1.02
         2.667   2.03 | 5.750   7.11 | 8.833   3.05 | 11.92  1.02
         2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00  1.02
         2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08  1.02
         2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17  1.02
         3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25  1.02
         3.083   2.03 | 6.167  49.78 | 9.250   2.03 |

       Max.Eff.Inten.(mm/hr)=    49.78         29.56
                over (min)       5.00         15.00
       Storage Coeff.  (min)=    5.99 (ii)    10.71 (ii)
       Unit Hyd. Tpeak (min)=    5.00         15.00
       Unit Hyd. peak  (cms)=    0.19          0.09
                                                      *TOTALS*
       PEAK FLOW       (cms)=    0.06          0.01       0.073 (iii)
       TIME TO PEAK    (hrs)=    6.25          6.33       6.25
       RUNOFF VOLUME   (mm)=    53.37         24.78      43.64
                                  Page 48
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                        LangstaffRd_EA_Proposed_WestDonWatershd
        TOTAL RAINFALL    (mm)=     55.37          55.37           55.37
        RUNOFF COEFFICIENT  =       0.96           0.45            0.79


          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
               CN* = 83.0   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 ( 0470)|
    | 1 + 2 = 3     |           AREA   QPEAK   TPEAK    R.V.
     --------------------         (ha)   (cms)   (hrs)    (mm)
            ID1= 1 ( 0215):       0.58   0.072    6.25    47.93
          + ID2= 2 ( 0220):       0.65   0.073    6.25    43.64
            =================================================
            ID = 3 ( 0470):       1.23   0.144    6.25    45.67

        NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
     -----------------------------------------------------------------------
     --------------------
    | RESERVOIR( 0535)|    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  |  0.0116    0.0367
                          0.0053    0.0048  |  0.0131    0.0474
                          0.0080    0.0154  |  0.0202    0.0639
                          0.0100    0.0261  |  0.0000    0.0000

                            AREA     QPEAK    TPEAK      R.V.
                            (ha)     (cms)    (hrs)      (mm)
         INFLOW : ID= 2 ( 0470)    1.230   0.144    6.25    45.67
         OUTFLOW: ID= 1 ( 0535)    1.230   0.011    7.33    45.49

              PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.95
              TIME SHIFT OF PEAK FLOW      (min)= 65.00
              MAXIMUM STORAGE   USED    (ha.m.)= 0.0358

     -----------------------------------------------------------------------
     --------------------
    | CALIB          |
    | STANDHYD ( 0225)|  Area    (ha)=   0.60
    |ID= 1 DT= 5.0 min |  Total Imp(%)= 83.00   Dir. Conn.(%)= 83.00
     --------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=    0.50         0.10
        Dep. Storage    (mm)=    2.00         5.00
        Average Slope   (%)=     1.00         2.00
        Length          (m)=   320.00        10.00
                                Page 49
```

```
                        LangstaffRd_EA_Proposed_WestDonWatershd
        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  2.03 | 6.250  49.78 | 9.33   1.02
           0.167   0.00 | 3.250  2.03 | 6.333   9.14 | 9.42   1.02
           0.250   0.00 | 3.333  3.05 | 6.417   9.14 | 9.50   1.02
           0.333   1.02 | 3.417  3.05 | 6.500   9.14 | 9.58   2.03
           0.417   1.02 | 3.500  3.05 | 6.583  10.16 | 9.67   2.03
           0.500   1.02 | 3.583  2.03 | 6.667  10.16 | 9.75   2.03
           0.583   1.02 | 3.667  2.03 | 6.750  10.16 | 9.83   2.03
           0.667   1.02 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
           0.750   1.02 | 3.833  2.03 | 6.917   5.08 | 10.00  2.03
           0.833   1.02 | 3.917  2.03 | 7.000   5.08 | 10.08  1.02
           0.917   1.02 | 4.000  2.03 | 7.083   4.06 | 10.17  1.02
           1.000   1.02 | 4.083  2.03 | 7.167   4.06 | 10.25  1.02
           1.083   1.02 | 4.167  2.03 | 7.250   4.06 | 10.33  1.02
           1.167   1.02 | 4.250  2.03 | 7.333   3.05 | 10.42  1.02
           1.250   1.02 | 4.333  4.06 | 7.417   3.05 | 10.50  1.02
           1.333   1.02 | 4.417  4.06 | 7.500   3.05 | 10.58  1.02
           1.417   1.02 | 4.500  4.06 | 7.583   3.05 | 10.67  1.02
           1.500   1.02 | 4.583  4.06 | 7.667   3.05 | 10.75  1.02
           1.583   2.03 | 4.667  4.06 | 7.750   3.05 | 10.83  2.03
           1.667   2.03 | 4.750  4.06 | 7.833   4.06 | 10.92  2.03
           1.750   2.03 | 4.833  4.06 | 7.917   4.06 | 11.00  2.03
           1.833   1.02 | 4.917  4.06 | 8.000   4.06 | 11.08  1.02
           1.917   1.02 | 5.000  4.06 | 8.083   3.05 | 11.17  1.02
           2.000   1.02 | 5.083  3.05 | 8.167   3.05 | 11.25  1.02
           2.083   1.02 | 5.167  3.05 | 8.250   3.05 | 11.33  1.02
           2.167   1.02 | 5.250  3.05 | 8.333   2.03 | 11.42  1.02
           2.250   1.02 | 5.333  7.11 | 8.417   2.03 | 11.50  1.02
           2.333   2.03 | 5.417  7.11 | 8.500   2.03 | 11.58  1.02
           2.417   2.03 | 5.500  7.11 | 8.583   2.03 | 11.67  1.02
           2.500   2.03 | 5.583  7.11 | 8.667   2.03 | 11.75  1.02
           2.583   2.03 | 5.667  7.11 | 8.750   2.03 | 11.83  1.02
           2.667   2.03 | 5.750  7.11 | 8.833   3.05 | 11.92  1.02
           2.750   2.03 | 5.833 49.78 | 8.917   3.05 | 12.00  1.02
           2.833   2.03 | 5.917 49.78 | 9.000   3.05 | 12.08  1.02
           2.917   2.03 | 6.000 49.78 | 9.083   2.03 | 12.17  1.02
           3.000   2.03 | 6.083 49.78 | 9.167   2.03 | 12.25  1.02
           3.083   2.03 | 6.167 49.78 | 9.250   2.03 |

        Max.Eff.Inten.(mm/hr)=     49.78          29.56
                  over (min)        5.00          10.00
        Storage Coeff.  (min)=      6.79 (ii)      8.94 (ii)
        Unit Hyd. Tpeak (min)=      5.00          10.00
        Unit Hyd. peak  (cms)=      0.18           0.12
                                                        *TOTALS*
        PEAK FLOW       (cms)=      0.07           0.01      0.075 (iii)
                                Page 50
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```
                        LangstaffRd_EA_Proposed_WestDonWatershd
        TIME TO PEAK   (hrs)=      6.25           6.25           6.25
        RUNOFF VOLUME   (mm)=     53.37          24.78          48.51
        TOTAL RAINFALL  (mm)=     55.37          55.37          55.37
        RUNOFF COEFFICIENT  =      0.96           0.45           0.88


          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
               CN* = 83.0   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 ( 0230)|  Area    (ha)=   0.70
    |ID= 1 DT= 5.0 min |  Total Imp(%)= 66.00   Dir. Conn.(%)= 66.00
     --------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=    0.46         0.24
        Dep. Storage    (mm)=    2.00         5.00
        Average Slope   (%)=     1.00         2.00
        Length          (m)=   320.00        25.00
        Mannings n       =      0.013         0.300

          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  2.03 | 6.250  49.78 | 9.33   1.02
           0.167   0.00 | 3.250  2.03 | 6.333   9.14 | 9.42   1.02
           0.250   0.00 | 3.333  3.05 | 6.417   9.14 | 9.50   1.02
           0.333   1.02 | 3.417  3.05 | 6.500   9.14 | 9.58   2.03
           0.417   1.02 | 3.500  3.05 | 6.583  10.16 | 9.67   2.03
           0.500   1.02 | 3.583  2.03 | 6.667  10.16 | 9.75   2.03
           0.583   1.02 | 3.667  2.03 | 6.750  10.16 | 9.83   2.03
           0.667   1.02 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
           0.750   1.02 | 3.833  2.03 | 6.917   5.08 | 10.00  2.03
           0.833   1.02 | 3.917  2.03 | 7.000   5.08 | 10.08  1.02
           0.917   1.02 | 4.000  2.03 | 7.083   4.06 | 10.17  1.02
           1.000   1.02 | 4.083  2.03 | 7.167   4.06 | 10.25  1.02
           1.083   1.02 | 4.167  2.03 | 7.250   4.06 | 10.33  1.02
           1.167   1.02 | 4.250  2.03 | 7.333   3.05 | 10.42  1.02
           1.250   1.02 | 4.333  4.06 | 7.417   3.05 | 10.50  1.02
           1.333   1.02 | 4.417  4.06 | 7.500   3.05 | 10.58  1.02
           1.417   1.02 | 4.500  4.06 | 7.583   3.05 | 10.67  1.02
           1.500   1.02 | 4.583  4.06 | 7.667   3.05 | 10.75  1.02
           1.583   2.03 | 4.667  4.06 | 7.750   3.05 | 10.83  2.03
           1.667   2.03 | 4.750  4.06 | 7.833   4.06 | 10.92  2.03
           1.750   2.03 | 4.833  4.06 | 7.917   4.06 | 11.00  2.03
           1.833   1.02 | 4.917  4.06 | 8.000   4.06 | 11.08  1.02
                                Page 51
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                        LangstaffRd_EA_Proposed_WestDonWatershd
           1.917   1.02 | 5.000  4.06 | 8.083   3.05 | 11.17  1.02
           2.000   1.02 | 5.083  3.05 | 8.167   3.05 | 11.25  1.02
           2.083   1.02 | 5.167  3.05 | 8.250   3.05 | 11.33  1.02
           2.167   1.02 | 5.250  3.05 | 8.333   2.03 | 11.42  1.02
           2.250   1.02 | 5.333  7.11 | 8.417   2.03 | 11.50  1.02
           2.333   2.03 | 5.417  7.11 | 8.500   2.03 | 11.58  1.02
           2.417   2.03 | 5.500  7.11 | 8.583   2.03 | 11.67  1.02
           2.500   2.03 | 5.583  7.11 | 8.667   2.03 | 11.75  1.02
           2.583   2.03 | 5.667  7.11 | 8.750   2.03 | 11.83  1.02
           2.667   2.03 | 5.750  7.11 | 8.833   3.05 | 11.92  1.02
           2.750   2.03 | 5.833 49.78 | 8.917   3.05 | 12.00  1.02
           2.833   2.03 | 5.917 49.78 | 9.000   3.05 | 12.08  1.02
           2.917   2.03 | 6.000 49.78 | 9.083   2.03 | 12.17  1.02
           3.000   2.03 | 6.083 49.78 | 9.167   2.03 | 12.25  1.02
           3.083   2.03 | 6.167 49.78 | 9.250   2.03 |

        Max.Eff.Inten.(mm/hr)=     49.78          27.57
                  over (min)        5.00          20.00
        Storage Coeff.  (min)=      6.79 (ii)     16.73 (ii)
        Unit Hyd. Tpeak (min)=      5.00          20.00
        Unit Hyd. peak  (cms)=      0.18           0.06
                                                        *TOTALS*
        PEAK FLOW       (cms)=      0.06           0.01      0.073 (iii)
        TIME TO PEAK   (hrs)=       6.25           6.42      6.25
        RUNOFF VOLUME   (mm)=      53.37          23.08     43.06
        TOTAL RAINFALL  (mm)=      55.37          55.37     55.37
        RUNOFF COEFFICIENT  =       0.96           0.42      0.78


          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
               CN* = 81.0   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 ( 0475)|
    | 1 + 2 = 3     |           AREA   QPEAK   TPEAK    R.V.
     --------------------         (ha)   (cms)   (hrs)    (mm)
            ID1= 1 ( 0225):       0.60   0.075    6.25    48.51
          + ID2= 2 ( 0230):       0.70   0.073    6.25    43.06
            =================================================
            ID = 3 ( 0475):       1.30   0.149    6.25    45.57

        NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
     -----------------------------------------------------------------------
     --------------------
    | RESERVOIR( 0540)|    OVERFLOW IS OFF
    | IN= 2--->OUT= 1 |
    | DT= 5.0 min    |   OUTFLOW   STORAGE  |  OUTFLOW    STORAGE
     --------------------   (cms)    (ha.m.)  |   (cms)    (ha.m.)
                                Page 52
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```
                        0.0000     0.0000  |  0.0271     0.0367
                        0.0118     0.0048  |  0.0306     0.0474
                        0.0184     0.0154  |  0.0415     0.0639
                        0.0232     0.0261  |  0.0000     0.0000

                           AREA      QPEAK     TPEAK      R.V.
                           (ha)      (cms)     (hrs)      (mm)
     INFLOW : ID= 2 ( 0475)  1.300     0.149     6.25     45.57
     OUTFLOW: ID= 1 ( 0540)  1.300     0.025     6.92     45.50

              PEAK  FLOW   REDUCTION [Qout/Qin](%)= 16.53
              TIME SHIFT OF PEAK FLOW     (min)= 40.00
              MAXIMUM  STORAGE   USED   (ha.m.)= 0.0299
```

```
--------------------
| ADD HYD ( 0480)|
|  1 + 2 = 3     |        AREA      QPEAK     TPEAK      R.V.
--------------------        (ha)      (cms)     (hrs)      (mm)
     ID1= 1 ( 0535):  1.23      0.011     7.33     45.49
   + ID2= 2 ( 0540):  1.30      0.025     6.92     45.50
     ========================================================
     ID = 3 ( 0480):  2.53      0.036     7.00     45.49

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

```
--------------------
| CALIB          |
| STANDHYD ( 0155)|  Area   (ha)=  0.56
|ID= 1 DT= 5.0 min |  Total Imp(%)= 93.00   Dir. Conn.(%)= 93.00
--------------------
                          IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=    0.52          0.04
     Dep. Storage    (mm)=    2.00          5.00
     Average Slope   (%)=    1.00          2.00
     Length          (m)=  260.00         25.00
     Mannings n       =    0.013          0.290

      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   2.03 | 6.250  49.78 | 9.33   1.02
            0.167   0.00 | 3.250   2.03 | 6.333   9.14 | 9.42   1.02
            0.250   0.00 | 3.333   3.05 | 6.417   9.14 | 9.50   1.02
            0.333   1.02 | 3.417   3.05 | 6.500   9.14 | 9.58   2.03
            0.417   1.02 | 3.500   3.05 | 6.583  10.16 | 9.67   2.03
            0.500   1.02 | 3.583   2.03 | 6.667  10.16 | 9.75   2.03
            0.583   1.02 | 3.667   2.03 | 6.750  10.16 | 9.83   2.03
            0.667   1.02 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
```

```
            0.750   1.02 | 3.833   2.03 | 6.917   5.08 | 10.00   2.03
            0.833   1.02 | 3.917   2.03 | 7.000   5.08 | 10.08   1.02
            0.917   1.02 | 4.000   2.03 | 7.083   4.06 | 10.17   1.02
            1.000   1.02 | 4.083   2.03 | 7.167   4.06 | 10.25   1.02
            1.083   1.02 | 4.167   2.03 | 7.250   4.06 | 10.33   1.02
            1.167   1.02 | 4.250   2.03 | 7.333   3.05 | 10.42   1.02
            1.250   1.02 | 4.333   4.06 | 7.417   3.05 | 10.50   1.02
            1.333   1.02 | 4.417   4.06 | 7.500   3.05 | 10.58   1.02
            1.417   1.02 | 4.500   4.06 | 7.583   3.05 | 10.67   1.02
            1.500   1.02 | 4.583   4.06 | 7.667   3.05 | 10.75   1.02
            1.583   2.03 | 4.667   4.06 | 7.750   3.05 | 10.83   2.03
            1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
            1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
            1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
            1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
            2.000   1.02 | 5.083   3.05 | 8.167   3.05 | 11.25   1.02
            2.083   1.02 | 5.167   3.05 | 8.250   3.05 | 11.33   1.02
            2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   1.02
            2.250   1.02 | 5.333   7.11 | 8.417   2.03 | 11.50   1.02
            2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58   1.02
            2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
            2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75   1.02
            2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83   1.02
            2.667   2.03 | 5.750   7.11 | 8.833   3.05 | 11.92   1.02
            2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00   1.02
            2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08   1.02
            2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17   1.02
            3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25   1.02
            3.083   2.03 | 6.167  49.78 | 9.250   2.03 |

     Max.Eff.Inten.(mm/hr)=   49.78         34.06
           over (min)        5.00          10.00
     Storage Coeff. (min)=    5.99 (ii)     8.72 (ii)
     Unit Hyd. Tpeak (min)=   5.00          10.00
     Unit Hyd. peak (cms)=    0.19          0.12

                                                  *TOTALS*
     PEAK FLOW      (cms)=    0.07          0.00      0.075 (iii)
     TIME TO PEAK   (hrs)=    6.25          6.25      6.25
     RUNOFF VOLUME  (mm)=    53.37         28.73     51.64
     TOTAL RAINFALL (mm)=    55.37         55.37     55.37
     RUNOFF COEFFICIENT =     0.96          0.52      0.93


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 87.0   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 ( 0160)|  Area   (ha)=  0.43
```

```
|ID= 1 DT= 5.0 min |  Total Imp(%)= 95.00   Dir. Conn.(%)= 95.00
--------------------
                          IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=    0.41          0.02
     Dep. Storage    (mm)=    2.00          5.00
     Average Slope   (%)=    1.00          2.00
     Length          (m)=  260.00         20.00
     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 | 3.167   2.03 | 6.250  49.78 | 9.33   1.02
            0.167   0.00 | 3.250   2.03 | 6.333   9.14 | 9.42   1.02
            0.250   0.00 | 3.333   3.05 | 6.417   9.14 | 9.50   1.02
            0.333   1.02 | 3.417   3.05 | 6.500   9.14 | 9.58   2.03
            0.417   1.02 | 3.500   3.05 | 6.583  10.16 | 9.67   2.03
            0.500   1.02 | 3.583   2.03 | 6.667  10.16 | 9.75   2.03
            0.583   1.02 | 3.667   2.03 | 6.750  10.16 | 9.83   2.03
            0.667   1.02 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
            0.750   1.02 | 3.833   2.03 | 6.917   5.08 | 10.00   2.03
            0.833   1.02 | 3.917   2.03 | 7.000   5.08 | 10.08   1.02
            0.917   1.02 | 4.000   2.03 | 7.083   4.06 | 10.17   1.02
            1.000   1.02 | 4.083   2.03 | 7.167   4.06 | 10.25   1.02
            1.083   1.02 | 4.167   2.03 | 7.250   4.06 | 10.33   1.02
            1.167   1.02 | 4.250   2.03 | 7.333   3.05 | 10.42   1.02
            1.250   1.02 | 4.333   4.06 | 7.417   3.05 | 10.50   1.02
            1.333   1.02 | 4.417   4.06 | 7.500   3.05 | 10.58   1.02
            1.417   1.02 | 4.500   4.06 | 7.583   3.05 | 10.67   1.02
            1.500   1.02 | 4.583   4.06 | 7.667   3.05 | 10.75   2.03
            1.583   2.03 | 4.667   4.06 | 7.750   3.05 | 10.83   2.03
            1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
            1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
            1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
            1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
            2.000   1.02 | 5.083   3.05 | 8.167   3.05 | 11.25   1.02
            2.083   1.02 | 5.167   3.05 | 8.250   3.05 | 11.33   1.02
            2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   1.02
            2.250   1.02 | 5.333   7.11 | 8.417   2.03 | 11.50   1.02
            2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58   1.02
            2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
            2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75   1.02
            2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83   1.02
            2.667   2.03 | 5.750   7.11 | 8.833   3.05 | 11.92   1.02
            2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00   1.02
            2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08   1.02
            2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17   1.02
            3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25   1.02
            3.083   2.03 | 6.167  49.78 | 9.250   2.03 |
```

```
     Max.Eff.Inten.(mm/hr)=   49.78         36.58
           over (min)        5.00          10.00
     Storage Coeff. (min)=    5.99 (ii)     7.89 (ii)
     Unit Hyd. Tpeak (min)=   5.00          10.00
     Unit Hyd. peak (cms)=    0.19          0.13
                                                  *TOTALS*
     PEAK FLOW      (cms)=    0.06          0.00      0.058 (iii)
     TIME TO PEAK   (hrs)=    6.25          6.25      6.25
     RUNOFF VOLUME  (mm)=    53.37         31.03     52.25
     TOTAL RAINFALL (mm)=    55.37         55.37     55.37
     RUNOFF COEFFICIENT =     0.96          0.56      0.94


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 89.0   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 ( 0430)|
|  1 + 2 = 3     |        AREA      QPEAK     TPEAK      R.V.
--------------------        (ha)      (cms)     (hrs)      (mm)
     ID1= 1 ( 0155):  0.56      0.075     6.25     51.64
   + ID2= 2 ( 0160):  0.43      0.058     6.25     52.25
     ========================================================
     ID = 3 ( 0430):  0.99      0.133     6.25     51.90

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

```
--------------------
| CALIB          |
| STANDHYD ( 0150)|  Area   (ha)=  3.81
|ID= 1 DT= 5.0 min |  Total Imp(%)= 95.00   Dir. Conn.(%)= 95.00
--------------------
                          IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=    3.62          0.19
     Dep. Storage    (mm)=    2.00          5.00
     Average Slope   (%)=    1.00          2.00
     Length          (m)=  150.00         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 | 3.167   2.03 | 6.250  49.78 | 9.33   1.02
            0.167   0.00 | 3.250   2.03 | 6.333   9.14 | 9.42   1.02
            0.250   0.00 | 3.333   3.05 | 6.417   9.14 | 9.50   1.02
```

```
        0.333   1.02 | 3.417    3.05 | 6.500    9.14 |  9.58    2.03
        0.417   1.02 | 3.500    3.05 | 6.583   10.16 |  9.67    2.03
        0.500   1.02 | 3.583    2.03 | 6.667   10.16 |  9.75    2.03
        0.583   1.02 | 3.667    2.03 | 6.750   10.16 |  9.83    2.03
        0.667   1.02 | 3.750    2.03 | 6.833    5.08 |  9.92    2.03
        0.750   1.02 | 3.833    2.03 | 6.917    5.08 | 10.00    2.03
        0.833   1.02 | 3.917    2.03 | 7.000    5.08 | 10.08    1.02
        0.917   1.02 | 4.000    2.03 | 7.083    4.06 | 10.17    1.02
        1.000   1.02 | 4.083    2.03 | 7.167    4.06 | 10.25    1.02
        1.083   1.02 | 4.167    2.03 | 7.250    4.06 | 10.33    1.02
        1.167   1.02 | 4.250    2.03 | 7.333    3.05 | 10.42    1.02
        1.250   1.02 | 4.333    4.06 | 7.417    3.05 | 10.50    1.02
        1.333   1.02 | 4.417    4.06 | 7.500    3.05 | 10.58    1.02
        1.417   1.02 | 4.500    4.06 | 7.583    3.05 | 10.67    1.02
        1.500   1.02 | 4.583    4.06 | 7.667    3.05 | 10.75    1.02
        1.583   2.03 | 4.667    4.06 | 7.750    3.05 | 10.83    2.03
        1.667   2.03 | 4.750    4.06 | 7.833    4.06 | 10.92    2.03
        1.750   2.03 | 4.833    4.06 | 7.917    4.06 | 11.00    2.03
        1.833   1.02 | 4.917    4.06 | 8.000    4.06 | 11.08    1.02
        1.917   1.02 | 5.000    4.06 | 8.083    3.05 | 11.17    1.02
        2.000   1.02 | 5.083    3.05 | 8.167    3.05 | 11.25    1.02
        2.083   1.02 | 5.167    3.05 | 8.250    3.05 | 11.33    1.02
        2.167   1.02 | 5.250    3.05 | 8.333    2.03 | 11.42    1.02
        2.250   1.02 | 5.333    7.11 | 8.417    2.03 | 11.50    1.02
        2.333   2.03 | 5.417    7.11 | 8.500    2.03 | 11.58    1.02
        2.417   2.03 | 5.500    7.11 | 8.583    2.03 | 11.67    1.02
        2.500   2.03 | 5.583    7.11 | 8.667    2.03 | 11.75    1.02
        2.583   2.03 | 5.667    7.11 | 8.750    2.03 | 11.83    1.02
        2.667   2.03 | 5.750    7.11 | 8.833    3.05 | 11.92    1.02
        2.750   2.03 | 5.833   49.78 | 8.917    3.05 | 12.00    1.02
        2.833   2.03 | 5.917   49.78 | 9.000    3.05 | 12.08    1.02
        2.917   2.03 | 6.000   49.78 | 9.083    2.03 | 12.17    1.02
        3.000   2.03 | 6.083   49.78 | 9.167    2.03 | 12.25    1.02
        3.083   2.03 | 6.167   49.78 | 9.250    2.03 |
```

```
   Max.Eff.Inten.(mm/hr)=     49.78         35.30
              over (min)=      5.00         10.00
   Storage Coeff.  (min)=      4.31 (ii)     7.18 (ii)
   Unit Hyd. Tpeak (min)=      5.00         10.00
   Unit Hyd. peak  (cms)=      0.23          0.14
                                                         *TOTALS*
   PEAK FLOW       (cms)=      0.50          0.02         0.517 (iii)
   TIME TO PEAK    (hrs)=      6.25          6.25         6.25
   RUNOFF VOLUME    (mm)=     53.37         29.85        52.20
   TOTAL RAINFALL   (mm)=     55.37         55.37        55.37
   RUNOFF COEFFICIENT  =       0.96          0.54         0.94

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

   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 88.0    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( 0515)|    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        0.0091     0.1797
                        0.0013     0.0157        0.0095     0.2004
                        0.0033     0.0320        0.0100     0.2216
                        0.0044     0.0487        0.0104     0.2433
                        0.0053     0.0659        0.0109     0.2655
                        0.0061     0.0837        0.0113     0.2882
                        0.0068     0.1019        0.0116     0.3114
                        0.0074     0.1206        0.1520     0.3592
                        0.0080     0.1398        0.5654     0.4336
                        0.0086     0.1595        1.1316     0.5100

                         AREA     QPEAK    TPEAK      R.V.
                         (ha)     (cms)    (hrs)      (mm)
      INFLOW : ID= 2 ( 0150)    3.810    0.517     6.25     52.20
      OUTFLOW: ID= 1 ( 0515)    3.810    0.009    12.25     51.39

             PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.75
             TIME SHIFT OF PEAK FLOW    (min)=360.00
             MAXIMUM STORAGE   USED    (ha.m.)=  0.1768

-------------------------------------------------------------------------
--------------------
| ADD HYD ( 0440)|
|  1 + 2 = 3     |             AREA    QPEAK    TPEAK     R.V.
--------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 ( 0430):      0.99    0.133     6.25    51.90
        + ID2= 2 ( 0515):      3.81    0.009    12.25    51.39
          ========================================================
          ID= 3 ( 0440):       4.80    0.140     6.25    51.50

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0210)|   Area   (ha)=  0.96
|ID= 1 DT= 5.0 min|   Total Imp(%)= 78.00   Dir. Conn.(%)= 78.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
      Surface Area    (ha)=     0.75          0.21
      Dep. Storage    (mm)=     2.00          5.00
      Average Slope   (%)=      1.00          2.00
      Length          (m)=    470.00         20.00
      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 | 3.167    2.03 | 6.250   49.78 |  9.33    1.02
        0.167   0.00 | 3.250    2.03 | 6.333    9.14 |  9.42    1.02
        0.250   0.00 | 3.333    3.05 | 6.417    9.14 |  9.50    1.02
        0.333   1.02 | 3.417    3.05 | 6.500    9.14 |  9.58    2.03
        0.417   1.02 | 3.500    3.05 | 6.583   10.16 |  9.67    2.03
        0.500   1.02 | 3.583    2.03 | 6.667   10.16 |  9.75    2.03
        0.583   1.02 | 3.667    2.03 | 6.750   10.16 |  9.83    2.03
        0.667   1.02 | 3.750    2.03 | 6.833    5.08 |  9.92    2.03
        0.750   1.02 | 3.833    2.03 | 6.917    5.08 | 10.00    2.03
        0.833   1.02 | 3.917    2.03 | 7.000    5.08 | 10.08    1.02
        0.917   1.02 | 4.000    2.03 | 7.083    4.06 | 10.17    1.02
        1.000   1.02 | 4.083    2.03 | 7.167    4.06 | 10.25    1.02
        1.083   1.02 | 4.167    2.03 | 7.250    4.06 | 10.33    1.02
        1.167   1.02 | 4.250    2.03 | 7.333    3.05 | 10.42    1.02
        1.250   1.02 | 4.333    4.06 | 7.417    3.05 | 10.50    1.02
        1.333   1.02 | 4.417    4.06 | 7.500    3.05 | 10.58    1.02
        1.417   1.02 | 4.500    4.06 | 7.583    3.05 | 10.67    1.02
        1.500   1.02 | 4.583    4.06 | 7.667    3.05 | 10.75    1.02
        1.583   2.03 | 4.667    4.06 | 7.750    3.05 | 10.83    2.03
        1.667   2.03 | 4.750    4.06 | 7.833    4.06 | 10.92    2.03
        1.750   2.03 | 4.833    4.06 | 7.917    4.06 | 11.00    2.03
        1.833   1.02 | 4.917    4.06 | 8.000    4.06 | 11.08    1.02
        1.917   1.02 | 5.000    4.06 | 8.083    3.05 | 11.17    1.02
        2.000   1.02 | 5.083    3.05 | 8.167    3.05 | 11.25    1.02
        2.083   1.02 | 5.167    3.05 | 8.250    3.05 | 11.33    1.02
        2.167   1.02 | 5.250    3.05 | 8.333    2.03 | 11.42    1.02
        2.250   1.02 | 5.333    7.11 | 8.417    2.03 | 11.50    1.02
        2.333   2.03 | 5.417    7.11 | 8.500    2.03 | 11.58    1.02
        2.417   2.03 | 5.500    7.11 | 8.583    2.03 | 11.67    1.02
        2.500   2.03 | 5.583    7.11 | 8.667    2.03 | 11.75    1.02
        2.583   2.03 | 5.667    7.11 | 8.750    2.03 | 11.83    1.02
        2.667   2.03 | 5.750    7.11 | 8.833    3.05 | 11.92    1.02
        2.750   2.03 | 5.833   49.78 | 8.917    3.05 | 12.00    1.02
        2.833   2.03 | 5.917   49.78 | 9.000    3.05 | 12.08    1.02
        2.917   2.03 | 6.000   49.78 | 9.083    2.03 | 12.17    1.02
        3.000   2.03 | 6.083   49.78 | 9.167    2.03 | 12.25    1.02
        3.083   2.03 | 6.167   49.78 | 9.250    2.03 |
```

```
   Max.Eff.Inten.(mm/hr)=     49.78         29.56
              over (min)=     10.00         15.00
   Storage Coeff.  (min)=      8.55 (ii)    12.26 (ii)
   Unit Hyd. Tpeak (min)=     10.00         15.00
   Unit Hyd. peak  (cms)=      0.12          0.09
                                                         *TOTALS*
   PEAK FLOW       (cms)=      0.10          0.01         0.112 (iii)
   TIME TO PEAK    (hrs)=      6.25          6.33         6.25
   RUNOFF VOLUME    (mm)=     53.37         24.78        47.07
```

```
   TOTAL RAINFALL   (mm)=     55.37         55.37         55.37
   RUNOFF COEFFICIENT  =       0.96          0.45          0.85


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0    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 ( 0205)|   Area   (ha)=  1.11
|ID= 1 DT= 5.0 min|   Total Imp(%)= 77.00   Dir. Conn.(%)= 77.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
      Surface Area    (ha)=    0.85          0.26
      Dep. Storage    (mm)=    2.00          5.00
      Average Slope   (%)=     1.00          2.00
      Length          (m)=   470.00         20.00
      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 | 3.167    2.03 | 6.250   49.78 |  9.33    1.02
        0.167   0.00 | 3.250    2.03 | 6.333    9.14 |  9.42    1.02
        0.250   0.00 | 3.333    3.05 | 6.417    9.14 |  9.50    1.02
        0.333   1.02 | 3.417    3.05 | 6.500    9.14 |  9.58    2.03
        0.417   1.02 | 3.500    3.05 | 6.583   10.16 |  9.67    2.03
        0.500   1.02 | 3.583    2.03 | 6.667   10.16 |  9.75    2.03
        0.583   1.02 | 3.667    2.03 | 6.750   10.16 |  9.83    2.03
        0.667   1.02 | 3.750    2.03 | 6.833    5.08 |  9.92    2.03
        0.750   1.02 | 3.833    2.03 | 6.917    5.08 | 10.00    2.03
        0.833   1.02 | 3.917    2.03 | 7.000    5.08 | 10.08    1.02
        0.917   1.02 | 4.000    2.03 | 7.083    4.06 | 10.17    1.02
        1.000   1.02 | 4.083    2.03 | 7.167    4.06 | 10.25    1.02
        1.083   1.02 | 4.167    2.03 | 7.250    4.06 | 10.33    1.02
        1.167   1.02 | 4.250    2.03 | 7.333    3.05 | 10.42    1.02
        1.250   1.02 | 4.333    4.06 | 7.417    3.05 | 10.50    1.02
        1.333   1.02 | 4.417    4.06 | 7.500    3.05 | 10.58    1.02
        1.417   1.02 | 4.500    4.06 | 7.583    3.05 | 10.67    1.02
        1.500   1.02 | 4.583    4.06 | 7.667    3.05 | 10.75    1.02
        1.583   2.03 | 4.667    4.06 | 7.750    3.05 | 10.83    2.03
        1.667   2.03 | 4.750    4.06 | 7.833    4.06 | 10.92    2.03
        1.750   2.03 | 4.833    4.06 | 7.917    4.06 | 11.00    2.03
        1.833   1.02 | 4.917    4.06 | 8.000    4.06 | 11.08    1.02
        1.917   1.02 | 5.000    4.06 | 8.083    3.05 | 11.17    1.02
        2.000   1.02 | 5.083    3.05 | 8.167    3.05 | 11.25    1.02
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                    LangstaffRd_EA_Proposed_WestDonWatershd
           2.083   1.02 | 5.167   3.05 | 8.250   3.05 | 11.33   1.02
           2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   1.02
           2.250   1.02 | 5.333   7.11 | 8.417   2.03 | 11.50   1.02
           2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58   1.02
           2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
           2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75   1.02
           2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83   1.02
           2.667   2.03 | 5.750   7.11 | 8.833   3.05 | 11.92   1.02
           2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00   1.02
           2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08   1.02
           2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17   1.02
           3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25   1.02
           3.083   2.03 | 6.167  49.78 | 9.250   2.03 |

     Max.Eff.Inten.(mm/hr)=      49.78          29.56
             over (min)          10.00          15.00
     Storage Coeff.  (min)=       8.55 (ii)     12.34 (ii)
     Unit Hyd. Tpeak (min)=      10.00          15.00
     Unit Hyd. peak  (cms)=       0.12           0.08
                                                              *TOTALS*
     PEAK FLOW       (cms)=       0.11           0.02        0.129 (iii)
     TIME TO PEAK    (hrs)=       6.25           6.33          6.25
     RUNOFF VOLUME    (mm)=      53.37          24.78         46.79
     TOTAL RAINFALL   (mm)=      55.37          55.37         55.37
     RUNOFF COEFFICIENT  =        0.96           0.45          0.85


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 83.0    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 ( 0460)|
     |  1 + 2 = 3    |          AREA    QPEAK    TPEAK     R.V.
     --------------------          (ha)    (cms)    (hrs)     (mm)
           ID1= 1 ( 0205):   1.11    0.129     6.25     46.79
         + ID2= 2 ( 0210):   0.96    0.112     6.25     47.07
                            =======================================
           ID = 3 ( 0460):   2.07    0.241     6.25     46.92

       NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
     ------------------------------------------------------------------
     --------------------
     | RESERVOIR( 0525)|   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  |  0.0733     0.0214
                           0.0274     0.0026  |  0.0831     0.0278
                                   Page 61
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                    LangstaffRd_EA_Proposed_WestDonWatershd
                0.0478      0.0084   |   0.1449      0.0374
                0.0619      0.0149   |   0.0000      0.0000

                            AREA     QPEAK     TPEAK      R.V.
                            (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (  0460)   2.070    0.241     6.25     46.92
     OUTFLOW: ID= 1 (  0525)   2.070    0.103     6.50     46.91

               PEAK  FLOW  REDUCTION [Qout/Qin](%)= 42.89
               TIME SHIFT OF PEAK FLOW      (min)= 15.00
               MAXIMUM STORAGE   USED   (ha.m.)= 0.0310

     ------------------------------------------------------------------
     --------------------
     | CALIB          |
     | STANDHYD ( 0190)|   Area   (ha)=  0.86
     |ID= 1 DT= 5.0 min |   Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
     --------------------
                             IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=     0.49        0.37
       Dep. Storage   (mm)=     2.00        5.00
       Average Slope   (%)=     1.00        2.00
       Length          (m)=   340.00       50.00
       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 | 3.167    2.03 | 6.250   49.78 | 9.33    1.02
         0.167    0.00 | 3.250    3.05 | 6.333    9.14 | 9.42    1.02
         0.250    0.00 | 3.333    3.05 | 6.417    9.14 | 9.50    1.02
         0.333    1.02 | 3.417    3.05 | 6.500    9.14 | 9.58    2.03
         0.417    1.02 | 3.500    3.05 | 6.583   10.16 | 9.67    2.03
         0.500    1.02 | 3.583    2.03 | 6.667   10.16 | 9.75    2.03
         0.583    1.02 | 3.667    2.03 | 6.750   10.16 | 9.83    2.03
         0.667    1.02 | 3.750    2.03 | 6.833    5.08 | 9.92    2.03
         0.750    1.02 | 3.833    2.03 | 6.917    5.08 | 10.00   2.03
         0.833    1.02 | 3.917    2.03 | 7.000    5.08 | 10.08   1.02
         0.917    1.02 | 4.000    2.03 | 7.083    4.06 | 10.17   1.02
         1.000    1.02 | 4.083    2.03 | 7.167    4.06 | 10.25   1.02
         1.083    1.02 | 4.167    2.03 | 7.250    4.06 | 10.33   1.02
         1.167    1.02 | 4.250    2.03 | 7.333    3.05 | 10.42   1.02
         1.250    1.02 | 4.333    4.06 | 7.417    3.05 | 10.50   1.02
         1.333    1.02 | 4.417    4.06 | 7.500    3.05 | 10.58   1.02
         1.417    1.02 | 4.500    4.06 | 7.583    3.05 | 10.67   1.02
         1.500    1.02 | 4.583    4.06 | 7.667    3.05 | 10.75   1.02
         1.583    2.03 | 4.667    4.06 | 7.750    3.05 | 10.83   2.03
         1.667    2.03 | 4.750    4.06 | 7.833    4.06 | 10.92   2.03
         1.750    2.03 | 4.833    4.06 | 7.917    4.06 | 11.00   2.03
         1.833    1.02 | 4.917    4.06 | 8.000    4.06 | 11.08   1.02
                                   Page 62
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                    LangstaffRd_EA_Proposed_WestDonWatershd
           1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
           2.000   1.02 | 5.083   3.05 | 8.167   3.05 | 11.25   1.02
           2.083   1.02 | 5.167   3.05 | 8.250   3.05 | 11.33   1.02
           2.167   1.02 | 5.250   3.05 | 8.333   2.03 | 11.42   1.02
           2.250   1.02 | 5.333   7.11 | 8.417   2.03 | 11.50   1.02
           2.333   2.03 | 5.417   7.11 | 8.500   2.03 | 11.58   1.02
           2.417   2.03 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
           2.500   2.03 | 5.583   7.11 | 8.667   2.03 | 11.75   1.02
           2.583   2.03 | 5.667   7.11 | 8.750   2.03 | 11.83   1.02
           2.667   2.03 | 5.750   7.11 | 8.833   3.05 | 11.92   1.02
           2.750   2.03 | 5.833  49.78 | 8.917   3.05 | 12.00   1.02
           2.833   2.03 | 5.917  49.78 | 9.000   3.05 | 12.08   1.02
           2.917   2.03 | 6.000  49.78 | 9.083   2.03 | 12.17   1.02
           3.000   2.03 | 6.083  49.78 | 9.167   2.03 | 12.25   1.02
           3.083   2.03 | 6.167  49.78 | 9.250   2.03 |

     Max.Eff.Inten.(mm/hr)=      49.78          28.42
             over (min)           5.00          25.00
     Storage Coeff.  (min)=       7.04 (ii)     20.38 (ii)
     Unit Hyd. Tpeak (min)=       5.00          25.00
     Unit Hyd. peak  (cms)=       0.17           0.05
                                                              *TOTALS*
     PEAK FLOW       (cms)=       0.07           0.02        0.081 (iii)
     TIME TO PEAK    (hrs)=       6.25           6.50          6.25
     RUNOFF VOLUME    (mm)=      53.37          24.78         41.06
     TOTAL RAINFALL   (mm)=      55.37          55.37         55.37
     RUNOFF COEFFICIENT  =        0.96           0.45          0.74


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 83.0    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 ( 0195)|   Area   (ha)=  0.79
     |ID= 1 DT= 5.0 min |   Total Imp(%)= 75.00   Dir. Conn.(%)= 75.00
     --------------------
                             IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=     0.59        0.20
       Dep. Storage   (mm)=     2.00        5.00
       Average Slope   (%)=     1.00        2.00
       Length          (m)=   340.00       20.00
       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
                                   Page 63
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                    LangstaffRd_EA_Proposed_WestDonWatershd
          hrs    mm/hr |  hrs    mm/hr |'  hrs    mm/hr |  hrs    mm/hr
         0.083    0.00 | 3.167    2.03 | 6.250   49.78 | 9.33    1.02
         0.167    0.00 | 3.250    2.03 | 6.333    9.14 | 9.42    1.02
         0.250    0.00 | 3.333    3.05 | 6.417    9.14 | 9.50    1.02
         0.333    1.02 | 3.417    3.05 | 6.500    9.14 | 9.58    2.03
         0.417    1.02 | 3.500    3.05 | 6.583   10.16 | 9.67    2.03
         0.500    1.02 | 3.583    2.03 | 6.667   10.16 | 9.75    2.03
         0.583    1.02 | 3.667    2.03 | 6.750   10.16 | 9.83    2.03
         0.667    1.02 | 3.750    2.03 | 6.833    5.08 | 9.92    2.03
         0.750    1.02 | 3.833    2.03 | 6.917    5.08 | 10.00   2.03
         0.833    1.02 | 3.917    2.03 | 7.000    5.08 | 10.08   1.02
         0.917    1.02 | 4.000    2.03 | 7.083    4.06 | 10.17   1.02
         1.000    1.02 | 4.083    2.03 | 7.167    4.06 | 10.25   1.02
         1.083    1.02 | 4.167    2.03 | 7.250    4.06 | 10.33   1.02
         1.167    1.02 | 4.250    2.03 | 7.333    3.05 | 10.42   1.02
         1.250    1.02 | 4.333    4.06 | 7.417    3.05 | 10.50   1.02
         1.333    1.02 | 4.417    4.06 | 7.500    3.05 | 10.58   1.02
         1.417    1.02 | 4.500    4.06 | 7.583    3.05 | 10.67   1.02
         1.500    1.02 | 4.583    4.06 | 7.667    3.05 | 10.75   1.02
         1.583    2.03 | 4.667    4.06 | 7.750    3.05 | 10.83   2.03
         1.667    2.03 | 4.750    4.06 | 7.833    4.06 | 10.92   2.03
         1.750    2.03 | 4.833    4.06 | 7.917    4.06 | 11.00   2.03
         1.833    1.02 | 4.917    4.06 | 8.000    4.06 | 11.08   1.02
         1.917    1.02 | 5.000    4.06 | 8.083    3.05 | 11.17   1.02
         2.000    1.02 | 5.083    3.05 | 8.167    3.05 | 11.25   1.02
         2.083    1.02 | 5.167    3.05 | 8.250    3.05 | 11.33   1.02
         2.167    1.02 | 5.250    3.05 | 8.333    2.03 | 11.42   1.02
         2.250    1.02 | 5.333    7.11 | 8.417    2.03 | 11.50   1.02
         2.333    2.03 | 5.417    7.11 | 8.500    2.03 | 11.58   1.02
         2.417    2.03 | 5.500    7.11 | 8.583    2.03 | 11.67   1.02
         2.500    2.03 | 5.583    7.11 | 8.667    2.03 | 11.75   1.02
         2.583    2.03 | 5.667    7.11 | 8.750    2.03 | 11.83   1.02
         2.667    2.03 | 5.750    7.11 | 8.833    3.05 | 11.92   1.02
         2.750    2.03 | 5.833   49.78 | 8.917    3.05 | 12.00   1.02
         2.833    2.03 | 5.917   49.78 | 9.000    3.05 | 12.08   1.02
         2.917    2.03 | 6.000   49.78 | 9.083    2.03 | 12.17   1.02
         3.000    2.03 | 6.083   49.78 | 9.167    2.03 | 12.25   1.02
         3.083    2.03 | 6.167   49.78 | 9.250    2.03 |

     Max.Eff.Inten.(mm/hr)=      49.78          29.56
             over (min)           5.00          15.00
     Storage Coeff.  (min)=       7.04 (ii)     11.00 (ii)
     Unit Hyd. Tpeak (min)=       5.00          15.00
     Unit Hyd. peak  (cms)=       0.17           0.09
                                                              *TOTALS*
     PEAK FLOW       (cms)=       0.08           0.01        0.093 (iii)
     TIME TO PEAK    (hrs)=       6.25           6.33          6.25
     RUNOFF VOLUME    (mm)=      53.37          24.78         46.22
     TOTAL RAINFALL   (mm)=      55.37          55.37         55.37
     RUNOFF COEFFICIENT  =        0.96           0.45          0.83


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                                   Page 64
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
            CN* =  83.0    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 ( 0455)|
        |  1 + 2 = 3     |         AREA    QPEAK   TPEAK    R.V.
        --------------------|         (ha)    (cms)   (hrs)    (mm)
             ID1= 1 ( 0190):   0.86    0.081    6.25    41.06
           + ID2= 2 ( 0195):   0.79    0.093    6.25    46.22
                              ============================================
             ID = 3 ( 0455):   1.65    0.174    6.25    43.53

          NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
        ------------------------------------------------------------------------
        --------------------|
        | RESERVOIR( 0555)|   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  | 0.0238    0.0199
                              0.0104    0.0024  | 0.0268    0.0259
                              0.0162    0.0079  | 0.0825    0.0346
                              0.0203    0.0139  | 0.0000    0.0000

                                   AREA    QPEAK   TPEAK    R.V.
                                   (ha)    (cms)   (hrs)    (mm)
          INFLOW : ID= 2 ( 0455)   1.650   0.174    6.25    43.53
          OUTFLOW: ID= 1 ( 0555)   1.650   0.055    6.67    43.50

                     PEAK   FLOW   REDUCTION [Qout/Qin](%)= 31.63
                     TIME SHIFT OF PEAK FLOW         (min)= 25.00
                     MAXIMUM  STORAGE   USED      (ha.m.)= 0.0303

        ------------------------------------------------------------------------
        --------------------|
        | ADD HYD ( 0465)|
        |  1 + 2 = 3     |         AREA    QPEAK   TPEAK    R.V.
        --------------------|         (ha)    (cms)   (hrs)    (mm)
             ID1= 1 ( 0525):   2.07    0.103    6.50    46.91
           + ID2= 2 ( 0555):   1.65    0.055    6.67    43.50
                              ============================================
             ID = 3 ( 0465):   3.72    0.156    6.58    45.40

          NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
        ------------------------------------------------------------------------
        *******************************
        ** SIMULATION:Run 04       **
        *******************************
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
        --------------------
        | READ STORM    |  Filename: C:\Users\ray.zhao\AppD
        |               |           ata\Local\Temp\
        |               |           e8da0adc-3b43-467d-984d-5ab4a7d3492c\c585f216
        | Ptotal= 63.75 mm |  Comments: 10yr-12hrSCS
        --------------------
              TIME   RAIN |  TIME   RAIN |' TIME   RAIN |  TIME   RAIN
              hrs   mm/hr |  hrs   mm/hr |  hrs   mm/hr |  hrs   mm/hr
              0.25   0.00 | 3.50   3.05 | 6.75  11.18 | 10.00   2.03
              0.50   1.02 | 3.75   2.03 | 7.00   5.08 | 10.25   2.03
              0.75   2.03 | 4.00   3.05 | 7.25   5.08 | 10.50   1.02
              1.00   1.02 | 4.25   2.03 | 7.50   4.06 | 10.75   1.02
              1.25   1.02 | 4.50   5.08 | 7.75   4.06 | 11.00   2.03
              1.50   1.02 | 4.75   4.06 | 8.00   4.06 | 11.25   1.02
              1.75   2.03 | 5.00   4.06 | 8.25   3.05 | 11.50   1.02
              2.00   1.02 | 5.25   5.08 | 8.50   3.05 | 11.75   1.02
              2.25   1.02 | 5.50   7.11 | 8.75   2.03 | 12.00   2.03
              2.50   3.05 | 5.75   8.13 | 9.00   3.05 | 12.25   1.02
              2.75   3.05 | 6.00  56.90 | 9.25   2.03 |
              3.00   3.05 | 6.25  57.91 | 9.50   2.03 |
              3.25   2.03 | 6.50  11.18 | 9.75   2.03 |

        ------------------------------------------------------------------------
        --------------------
        | CALIB          |
        | STANDHYD ( 0165)|   Area    (ha)=  0.60
        |ID= 1 DT= 5.0 min |   Total Imp(%)= 72.00   Dir. Conn.(%)= 72.00
        --------------------
                                 IMPERVIOUS    PERVIOUS (i)
              Surface Area   (ha)=     0.43         0.17
              Dep. Storage   (mm)=     2.00         5.00
              Average Slope   (%)=     1.00         2.00
              Length          (m)=   250.00        20.00
              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 | 3.167   2.03 | 6.250  57.91 | 9.33   2.03
              0.167  0.00 | 3.250   2.03 | 6.333  11.18 | 9.42   2.03
              0.250  0.00 | 3.333   3.05 | 6.417  11.18 | 9.50   2.03
              0.333  1.02 | 3.417   3.05 | 6.500  11.18 | 9.58   2.03
              0.417  1.02 | 3.500   3.05 | 6.583  11.18 | 9.67   2.03
              0.500  1.02 | 3.583   2.03 | 6.667  11.18 | 9.75   2.03
              0.583  2.03 | 3.667   2.03 | 6.750  11.18 | 9.83   2.03
              0.667  2.03 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
              0.750  2.03 | 3.833   3.05 | 6.917   5.08 | 10.00   2.03
              0.833  1.02 | 3.917   3.05 | 7.000   5.08 | 10.08   2.03
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
        0.917  1.02 | 4.000   3.05 | 7.083   5.08 | 10.17   2.03
        1.000  1.02 | 4.083   2.03 | 7.167   5.08 | 10.25   2.03
        1.083  1.02 | 4.167   2.03 | 7.250   5.08 | 10.33   1.02
        1.167  1.02 | 4.250   2.03 | 7.333   4.06 | 10.42   1.02
        1.250  1.02 | 4.333   5.08 | 7.417   4.06 | 10.50   1.02
        1.333  1.02 | 4.417   5.08 | 7.500   4.06 | 10.58   1.02
        1.417  1.02 | 4.500   5.08 | 7.583   4.06 | 10.67   1.02
        1.500  1.02 | 4.583   4.06 | 7.667   4.06 | 10.75   1.02
        1.583  2.03 | 4.667   4.06 | 7.750   4.06 | 10.83   2.03
        1.667  2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
        1.750  2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
        1.833  1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
        1.917  1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
        2.000  1.02 | 5.083   5.08 | 8.167   3.05 | 11.25   1.02
        2.083  1.02 | 5.167   5.08 | 8.250   3.05 | 11.33   1.02
        2.167  1.02 | 5.250   5.08 | 8.333   3.05 | 11.42   1.02
        2.250  1.02 | 5.333   7.11 | 8.417   3.05 | 11.50   1.02
        2.333  3.05 | 5.417   7.11 | 8.500   3.05 | 11.58   1.02
        2.417  3.05 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
        2.500  3.05 | 5.583   8.13 | 8.667   2.03 | 11.75   1.02
        2.583  2.03 | 5.667   8.13 | 8.750   2.03 | 11.83   2.03
        2.667  2.03 | 5.750   8.13 | 8.833   3.05 | 11.92   2.03
        2.750  2.03 | 5.833  56.90 | 8.917   3.05 | 12.00   2.03
        2.833  3.05 | 5.917  56.90 | 9.000   3.05 | 12.08   1.02
        2.917  3.05 | 6.000  56.90 | 9.083   2.03 | 12.17   1.02
        3.000  3.05 | 6.083  57.91 | 9.167   2.03 | 12.25   1.02
        3.083  2.03 | 6.167  57.91 | 9.250   2.03 |

        Max.Eff.Inten.(mm/hr)=     57.91        37.09
                 over (min)         5.00        10.00
        Storage Coeff.  (min)=      5.51 (ii)    9.48 (ii)
        Unit Hyd. Tpeak (min)=      5.00        10.00
        Unit Hyd. peak  (cms)=      0.20         0.12
                                                        *TOTALS*
        PEAK FLOW      (cms)=       0.07         0.01     0.084 (iii)
        TIME TO PEAK   (hrs)=       6.25         6.25      6.25
        RUNOFF VOLUME   (mm)=      61.75        31.16     53.18
        TOTAL RAINFALL  (mm)=      63.75        63.75     63.75
        RUNOFF COEFFICIENT =        0.97         0.49      0.83


          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* =  83.0    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 ( 0170)|   Area    (ha)=  0.43
        |ID= 1 DT= 5.0 min |   Total Imp(%)= 98.00   Dir. Conn.(%)= 98.00
        --------------------
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
                                 IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=     0.42         0.01
        Dep. Storage   (mm)=     2.00         5.00
        Average Slope   (%)=     1.00         2.00
        Length          (m)=   250.00        20.00
        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 | 3.167   2.03 | 6.250  57.91 | 9.33   2.03
              0.167  0.00 | 3.250   2.03 | 6.333  11.18 | 9.42   2.03
              0.250  0.00 | 3.333   3.05 | 6.417  11.18 | 9.50   2.03
              0.333  1.02 | 3.417   3.05 | 6.500  11.18 | 9.58   2.03
              0.417  1.02 | 3.500   3.05 | 6.583  11.18 | 9.67   2.03
              0.500  1.02 | 3.583   2.03 | 6.667  11.18 | 9.75   2.03
              0.583  2.03 | 3.667   2.03 | 6.750  11.18 | 9.83   2.03
              0.667  2.03 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
              0.750  2.03 | 3.833   3.05 | 6.917   5.08 | 10.00   2.03
              0.833  1.02 | 3.917   3.05 | 7.000   5.08 | 10.08   2.03
              0.917  1.02 | 4.000   3.05 | 7.083   5.08 | 10.17   2.03
              1.000  1.02 | 4.083   2.03 | 7.167   5.08 | 10.25   2.03
              1.083  1.02 | 4.167   2.03 | 7.250   5.08 | 10.33   1.02
              1.167  1.02 | 4.250   2.03 | 7.333   4.06 | 10.42   1.02
              1.250  1.02 | 4.333   5.08 | 7.417   4.06 | 10.50   1.02
              1.333  1.02 | 4.417   5.08 | 7.500   4.06 | 10.58   1.02
              1.417  1.02 | 4.500   5.08 | 7.583   4.06 | 10.67   1.02
              1.500  1.02 | 4.583   4.06 | 7.667   4.06 | 10.75   1.02
              1.583  2.03 | 4.667   4.06 | 7.750   4.06 | 10.83   2.03
              1.667  2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
              1.750  2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
              1.833  1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
              1.917  1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
              2.000  1.02 | 5.083   5.08 | 8.167   3.05 | 11.25   1.02
              2.083  1.02 | 5.167   5.08 | 8.250   3.05 | 11.33   1.02
              2.167  1.02 | 5.250   5.08 | 8.333   3.05 | 11.42   1.02
              2.250  1.02 | 5.333   7.11 | 8.417   3.05 | 11.50   1.02
              2.333  3.05 | 5.417   7.11 | 8.500   3.05 | 11.58   1.02
              2.417  3.05 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
              2.500  3.05 | 5.583   8.13 | 8.667   2.03 | 11.75   1.02
              2.583  2.03 | 5.667   8.13 | 8.750   2.03 | 11.83   2.03
              2.667  2.03 | 5.750   8.13 | 8.833   3.05 | 11.92   2.03
              2.750  2.03 | 5.833  56.90 | 8.917   3.05 | 12.00   2.03
              2.833  3.05 | 5.917  56.90 | 9.000   3.05 | 12.08   1.02
              2.917  3.05 | 6.000  56.90 | 9.083   2.03 | 12.17   1.02
              3.000  3.05 | 6.083  57.91 | 9.167   2.03 | 12.25   1.02
              3.083  2.03 | 6.167  57.91 | 9.250   2.03 |

        Max.Eff.Inten.(mm/hr)=     57.91        44.85
                 over (min)         5.00        10.00
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
      Storage Coeff.  (min)=    5.51 (ii)    6.73 (ii)
      Unit Hyd. Tpeak (min)=    5.00         10.00
      Unit Hyd. peak  (cms)=    0.20          0.14
                                                          *TOTALS*
      PEAK FLOW       (cms)=    0.07          0.00         0.068 (iii)
      TIME TO PEAK    (hrs)=    6.25          6.25         6.25
      RUNOFF VOLUME   (mm)=    61.75         38.29        61.27
      TOTAL RAINFALL  (mm)=    63.75         63.75        63.75
      RUNOFF COEFFICIENT  =    0.97          0.60         0.96


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 89.0   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 ( 0180)|  Area    (ha)=  0.65
|ID= 1 DT= 5.0 min |  Total Imp(%)= 52.00   Dir. Conn.(%)= 52.00
--------------------
                          IMPERVIOUS     PERVIOUS (i)
      Surface Area    (ha)=    0.34          0.31
      Dep. Storage    (mm)=    2.00          5.00
      Average Slope   (%)=     1.00          2.00
      Length          (m)=    65.83         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 | 3.167  2.03 | 6.250 57.91 | 9.33   2.03
         0.167   0.00 | 3.250  2.03 | 6.333 11.18 | 9.42   2.03
         0.250   0.00 | 3.333  3.05 | 6.417 11.18 | 9.50   2.03
         0.333   1.02 | 3.417  3.05 | 6.500 11.18 | 9.58   2.03
         0.417   1.02 | 3.500  3.05 | 6.583 11.18 | 9.67   2.03
         0.500   1.02 | 3.583  2.03 | 6.667 11.18 | 9.75   2.03
         0.583   2.03 | 3.667  2.03 | 6.750 11.18 | 9.83   2.03
         0.667   2.03 | 3.750  2.03 | 6.833  5.08 | 9.92   2.03
         0.750   2.03 | 3.833  3.05 | 6.917  5.08 | 10.00  2.03
         0.833   1.02 | 3.917  3.05 | 7.000  5.08 | 10.08  2.03
         0.917   1.02 | 4.000  3.05 | 7.083  5.08 | 10.17  2.03
         1.000   1.02 | 4.083  2.03 | 7.167  5.08 | 10.25  2.03
         1.083   1.02 | 4.167  2.03 | 7.250  5.08 | 10.33  1.02
         1.167   1.02 | 4.250  2.03 | 7.333  4.06 | 10.42  1.02
         1.250   1.02 | 4.333  5.08 | 7.417  4.06 | 10.50  1.02
         1.333   1.02 | 4.417  5.08 | 7.500  4.06 | 10.58  1.02
         1.417   1.02 | 4.500  5.08 | 7.583  4.06 | 10.67  1.02
                                 Page 69
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                    LangstaffRd_EA_Proposed_WestDonWatershd
         1.500   1.02 | 4.583  4.06 | 7.667  4.06 | 10.75  1.02
         1.583   2.03 | 4.667  4.06 | 7.750  4.06 | 10.83  2.03
         1.667   2.03 | 4.750  4.06 | 7.833  4.06 | 10.92  2.03
         1.750   2.03 | 4.833  4.06 | 7.917  4.06 | 11.00  2.03
         1.833   1.02 | 4.917  4.06 | 8.000  4.06 | 11.08  1.02
         1.917   1.02 | 5.000  4.06 | 8.083  3.05 | 11.17  1.02
         2.000   1.02 | 5.083  5.08 | 8.167  3.05 | 11.25  1.02
         2.083   1.02 | 5.167  5.08 | 8.250  3.05 | 11.33  1.02
         2.167   1.02 | 5.250  5.08 | 8.333  3.05 | 11.42  1.02
         2.250   1.02 | 5.333  7.11 | 8.417  3.05 | 11.50  1.02
         2.333   3.05 | 5.417  7.11 | 8.500  3.05 | 11.58  1.02
         2.417   3.05 | 5.500  7.11 | 8.583  2.03 | 11.67  1.02
         2.500   3.05 | 5.583  8.13 | 8.667  2.03 | 11.75  1.02
         2.583   2.03 | 5.667  8.13 | 8.750  2.03 | 11.83  2.03
         2.667   2.03 | 5.750  8.13 | 8.833  3.05 | 11.92  2.03
         2.750   2.03 | 5.833 56.90 | 8.917  3.05 | 12.00  2.03
         2.833   3.05 | 5.917 56.90 | 9.000  3.05 | 12.08  1.02
         2.917   3.05 | 6.000 56.90 | 9.083  2.03 | 12.17  1.02
         3.000   3.05 | 6.083 57.91 | 9.167  2.03 | 12.25  1.02
         3.083   2.03 | 6.167 57.91 | 9.250  2.03 |

      Max.Eff.Inten.(mm/hr)=    57.91         35.79
              over (min)       5.00          15.00
      Storage Coeff.  (min)=    2.47 (ii)    13.12 (ii)
      Unit Hyd. Tpeak (min)=    5.00         15.00
      Unit Hyd. peak  (cms)=    0.29          0.08
                                                          *TOTALS*
      PEAK FLOW       (cms)=    0.05          0.02         0.077 (iii)
      TIME TO PEAK    (hrs)=    6.25          6.33         6.25
      RUNOFF VOLUME   (mm)=    61.75         31.16        47.06
      TOTAL RAINFALL  (mm)=    63.75         63.75        63.75
      RUNOFF COEFFICIENT  =    0.97          0.49         0.74

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 83.0   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 ( 0185)|  Area    (ha)=  0.47
|ID= 1 DT= 5.0 min |  Total Imp(%)= 72.00   Dir. Conn.(%)= 72.00
--------------------
                          IMPERVIOUS     PERVIOUS (i)
      Surface Area    (ha)=    0.34          0.13
      Dep. Storage    (mm)=    2.00          5.00
      Average Slope   (%)=     1.00          2.00
      Length          (m)=   240.00         20.00
      Mannings n      =       0.013         0.350
                                 Page 70
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                    LangstaffRd_EA_Proposed_WestDonWatershd

     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  2.03 | 6.250 57.91 | 9.33   2.03
         0.167   0.00 | 3.250  2.03 | 6.333 11.18 | 9.42   2.03
         0.250   0.00 | 3.333  3.05 | 6.417 11.18 | 9.50   2.03
         0.333   1.02 | 3.417  3.05 | 6.500 11.18 | 9.58   2.03
         0.417   1.02 | 3.500  3.05 | 6.583 11.18 | 9.67   2.03
         0.500   1.02 | 3.583  2.03 | 6.667 11.18 | 9.75   2.03
         0.583   2.03 | 3.667  2.03 | 6.750 11.18 | 9.83   2.03
         0.667   2.03 | 3.750  2.03 | 6.833  5.08 | 9.92   2.03
         0.750   2.03 | 3.833  3.05 | 6.917  5.08 | 10.00  2.03
         0.833   1.02 | 3.917  3.05 | 7.000  5.08 | 10.08  2.03
         0.917   1.02 | 4.000  3.05 | 7.083  5.08 | 10.17  2.03
         1.000   1.02 | 4.083  2.03 | 7.167  5.08 | 10.25  2.03
         1.083   1.02 | 4.167  2.03 | 7.250  5.08 | 10.33  1.02
         1.167   1.02 | 4.250  2.03 | 7.333  4.06 | 10.42  1.02
         1.250   1.02 | 4.333  5.08 | 7.417  4.06 | 10.50  1.02
         1.333   1.02 | 4.417  5.08 | 7.500  4.06 | 10.58  1.02
         1.417   1.02 | 4.500  5.08 | 7.583  4.06 | 10.67  1.02
         1.500   1.02 | 4.583  4.06 | 7.667  4.06 | 10.75  1.02
         1.583   2.03 | 4.667  4.06 | 7.750  4.06 | 10.83  2.03
         1.667   2.03 | 4.750  4.06 | 7.833  4.06 | 10.92  2.03
         1.750   2.03 | 4.833  4.06 | 7.917  4.06 | 11.00  2.03
         1.833   1.02 | 4.917  4.06 | 8.000  4.06 | 11.08  1.02
         1.917   1.02 | 5.000  4.06 | 8.083  3.05 | 11.17  1.02
         2.000   1.02 | 5.083  5.08 | 8.167  3.05 | 11.25  1.02
         2.083   1.02 | 5.167  5.08 | 8.250  3.05 | 11.33  1.02
         2.167   1.02 | 5.250  5.08 | 8.333  3.05 | 11.42  1.02
         2.250   1.02 | 5.333  7.11 | 8.417  3.05 | 11.50  1.02
         2.333   3.05 | 5.417  7.11 | 8.500  3.05 | 11.58  1.02
         2.417   3.05 | 5.500  7.11 | 8.583  2.03 | 11.67  1.02
         2.500   3.05 | 5.583  8.13 | 8.667  2.03 | 11.75  1.02
         2.583   2.03 | 5.667  8.13 | 8.750  2.03 | 11.83  2.03
         2.667   2.03 | 5.750  8.13 | 8.833  3.05 | 11.92  2.03
         2.750   2.03 | 5.833 56.90 | 8.917  3.05 | 12.00  2.03
         2.833   3.05 | 5.917 56.90 | 9.000  3.05 | 12.08  1.02
         2.917   3.05 | 6.000 56.90 | 9.083  2.03 | 12.17  1.02
         3.000   3.05 | 6.083 57.91 | 9.167  2.03 | 12.25  1.02
         3.083   2.03 | 6.167 57.91 | 9.250  2.03 |

      Max.Eff.Inten.(mm/hr)=    57.91         32.68
              over (min)       5.00          15.00
      Storage Coeff.  (min)=    5.37 (ii)    10.23 (ii)
      Unit Hyd. Tpeak (min)=    5.00         15.00
      Unit Hyd. peak  (cms)=    0.21          0.09
                                                          *TOTALS*
      PEAK FLOW       (cms)=    0.05          0.01         0.063 (iii)
      TIME TO PEAK    (hrs)=    6.25          6.33         6.25
                                 Page 71
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
      RUNOFF VOLUME   (mm)=    61.75         27.34        52.11
      TOTAL RAINFALL  (mm)=    63.75         63.75        63.75
      RUNOFF COEFFICIENT  =    0.97          0.43         0.82


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 79.0   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  ( 0445)|
|  1 + 2 = 3      |         AREA    QPEAK   TPEAK    R.V.
--------------------         (ha)    (cms)   (hrs)    (mm)
       ID1= 1 ( 0180):      0.65    0.077    6.25    47.06
     + ID2= 2 ( 0185):      0.47    0.063    6.25    52.11
       ================================================
       ID = 3 ( 0445):      1.12    0.141    6.25    49.18

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

--------------------
| ADD HYD  ( 0450)|
|  1 + 2 = 3      |         AREA    QPEAK   TPEAK    R.V.
--------------------         (ha)    (cms)   (hrs)    (mm)
       ID1= 1 ( 0165):      0.60    0.084    6.25    53.18
     + ID2= 2 ( 0170):      0.43    0.068    6.25    61.27
       ================================================
       ID = 3 ( 0450):      1.03    0.152    6.25    56.56

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

--------------------
| ADD HYD  ( 0450)|
|  3 + 2 = 1      |         AREA    QPEAK   TPEAK    R.V.
--------------------         (ha)    (cms)   (hrs)    (mm)
       ID1= 3 ( 0450):      1.03    0.152    6.25    56.56
     + ID2= 2 ( 0445):      1.12    0.141    6.25    49.18
       ================================================
       ID = 1 ( 0450):      2.15    0.293    6.25    52.71

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------
--------------------
| RESERVOIR( 0520)|   OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |   OUTFLOW   STORAGE  | OUTFLOW   STORAGE
--------------------    (cms)    (ha.m.)  |  (cms)    (ha.m.)
                                 Page 72
```

```
                    0.0000      0.0000  |   0.0181      0.0552
                    0.0081      0.0048  |   0.0203      0.0732
                    0.0123      0.0192  |   0.0224      0.1152
                    0.0155      0.0372  |   0.0000      0.0000

                          AREA      QPEAK     TPEAK       R.V.
                          (ha)      (cms)     (hrs)       (mm)
   INFLOW : ID= 2 ( 0450)  2.150    0.293      6.25      52.71
   OUTFLOW: ID= 1 ( 0520)  2.150    0.020      8.08      52.65

              PEAK  FLOW  REDUCTION [Qout/Qin](%)=  6.92
              TIME SHIFT OF PEAK FLOW     (min)=110.00
              MAXIMUM STORAGE   USED   (ha.m.)=  0.0731
```


| CALIB |
| STANDHYD (0145)| Area   (ha)= 3.05
|ID= 1 DT= 5.0 min | Total Imp(%)= 76.00   Dir. Conn.(%)= 76.00

```
                          IMPERVIOUS   PERVIOUS (i)
   Surface Area    (ha)=     2.32        0.73
   Dep. Storage    (mm)=     2.00        5.00
   Average Slope    (%)=     1.00        2.00
   Length           (m)=   531.00       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 | 3.167  2.03 | 6.250  57.91 | 9.33   2.03
     0.167   0.00 | 3.250  2.03 | 6.333  11.18 | 9.42   2.03
     0.250   0.00 | 3.333  3.05 | 6.417  11.18 | 9.50   2.03
     0.333   1.02 | 3.417  3.05 | 6.500  11.18 | 9.58   2.03
     0.417   1.02 | 3.500  3.05 | 6.583  11.18 | 9.67   2.03
     0.500   1.02 | 3.583  2.03 | 6.667  11.18 | 9.75   2.03
     0.583   2.03 | 3.667  2.03 | 6.750  11.18 | 9.83   2.03
     0.667   2.03 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
     0.750   2.03 | 3.833  3.05 | 6.917   5.08 | 10.00  2.03
     0.833   1.02 | 3.917  3.05 | 7.000   5.08 | 10.08  2.03
     0.917   1.02 | 4.000  3.05 | 7.083   5.08 | 10.17  2.03
     1.000   1.02 | 4.083  2.03 | 7.167   5.08 | 10.25  2.03
     1.083   1.02 | 4.167  2.03 | 7.250   5.08 | 10.33  1.02
     1.167   1.02 | 4.250  2.03 | 7.333   4.06 | 10.42  1.02
     1.250   1.02 | 4.333  5.08 | 7.417   4.06 | 10.50  1.02
     1.333   1.02 | 4.417  5.08 | 7.500   4.06 | 10.58  1.02
     1.417   1.02 | 4.500  5.08 | 7.583   4.06 | 10.67  1.02
     1.500   1.02 | 4.583  4.06 | 7.667   4.06 | 10.75  1.02
     1.583   2.03 | 4.667  4.06 | 7.750   4.06 | 10.83  2.03
     1.667   2.03 | 4.750  4.06 | 7.833   4.06 | 10.92  2.03
```

```
     1.750   2.03 | 4.833  4.06 | 7.917   4.06 | 11.00  2.03
     1.833   1.02 | 4.917  4.06 | 8.000   4.06 | 11.08  1.02
     1.917   1.02 | 5.000  4.06 | 8.083   3.05 | 11.17  1.02
     2.000   1.02 | 5.083  5.08 | 8.167   3.05 | 11.25  1.02
     2.083   1.02 | 5.167  5.08 | 8.250   3.05 | 11.33  1.02
     2.167   1.02 | 5.250  5.08 | 8.333   3.05 | 11.42  1.02
     2.250   1.02 | 5.333  7.11 | 8.417   3.05 | 11.50  1.02
     2.333   3.05 | 5.417  7.11 | 8.500   3.05 | 11.58  1.02
     2.417   3.05 | 5.500  7.11 | 8.583   2.03 | 11.67  1.02
     2.500   3.05 | 5.583  8.13 | 8.667   2.03 | 11.75  1.02
     2.583   2.03 | 5.667  8.13 | 8.750   2.03 | 11.83  2.03
     2.667   2.03 | 5.750  8.13 | 8.833   3.05 | 11.92  2.03
     2.750   2.03 | 5.833 56.90 | 8.917   3.05 | 12.00  2.03
     2.833   3.05 | 5.917 56.90 | 9.000   3.05 | 12.08  1.02
     2.917   3.05 | 6.000 56.90 | 9.083   2.03 | 12.17  1.02
     3.000   3.05 | 6.083 57.91 | 9.167   2.03 | 12.25  1.02
     3.083   2.03 | 6.167 57.91 | 9.250   2.03 |
```

```
   Max.Eff.Inten.(mm/hr)=    57.91        39.56
            over (min)       10.00        20.00
   Storage Coeff.  (min)=     8.66 (ii)   18.88 (ii)
   Unit Hyd. Tpeak (min)=    10.00        20.00
   Unit Hyd. peak  (cms)=     0.12         0.06
                                                *TOTALS*
   PEAK FLOW       (cms)=     0.36         0.05     0.403 (iii)
   TIME TO PEAK    (hrs)=     6.25         6.42      6.25
   RUNOFF VOLUME   (mm)=     61.75        34.48     55.21
   TOTAL RAINFALL  (mm)=     63.75        63.75     63.75
   RUNOFF COEFFICIENT  =      0.97         0.54      0.87


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 86.0   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 (0135)| Area   (ha)= 1.43
|ID= 1 DT= 5.0 min | Total Imp(%)= 99.00   Dir. Conn.(%)= 99.00

```
                          IMPERVIOUS   PERVIOUS (i)
   Surface Area    (ha)=     1.42        0.01
   Dep. Storage    (mm)=     2.00        5.00
   Average Slope    (%)=     1.00        2.00
   Length           (m)=   503.00       30.00
   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 | 3.167  2.03 | 6.250  57.91 | 9.33   2.03
     0.167   0.00 | 3.250  2.03 | 6.333  11.18 | 9.42   2.03
     0.250   0.00 | 3.333  3.05 | 6.417  11.18 | 9.50   2.03
     0.333   1.02 | 3.417  3.05 | 6.500  11.18 | 9.58   2.03
     0.417   1.02 | 3.500  3.05 | 6.583  11.18 | 9.67   2.03
     0.500   1.02 | 3.583  2.03 | 6.667  11.18 | 9.75   2.03
     0.583   2.03 | 3.667  2.03 | 6.750  11.18 | 9.83   2.03
     0.667   2.03 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
     0.750   2.03 | 3.833  3.05 | 6.917   5.08 | 10.00  2.03
     0.833   1.02 | 3.917  3.05 | 7.000   5.08 | 10.08  2.03
     0.917   1.02 | 4.000  3.05 | 7.083   5.08 | 10.17  2.03
     1.000   1.02 | 4.083  2.03 | 7.167   5.08 | 10.25  2.03
     1.083   1.02 | 4.167  2.03 | 7.250   5.08 | 10.33  1.02
     1.167   1.02 | 4.250  2.03 | 7.333   4.06 | 10.42  1.02
     1.250   1.02 | 4.333  5.08 | 7.417   4.06 | 10.50  1.02
     1.333   1.02 | 4.417  5.08 | 7.500   4.06 | 10.58  1.02
     1.417   1.02 | 4.500  5.08 | 7.583   4.06 | 10.67  1.02
     1.500   1.02 | 4.583  4.06 | 7.667   4.06 | 10.75  1.02
     1.583   2.03 | 4.667  4.06 | 7.750   4.06 | 10.83  2.03
     1.667   2.03 | 4.750  4.06 | 7.833   4.06 | 10.92  2.03
     1.750   2.03 | 4.833  4.06 | 7.917   4.06 | 11.00  2.03
     1.833   1.02 | 4.917  4.06 | 8.000   4.06 | 11.08  1.02
     1.917   1.02 | 5.000  4.06 | 8.083   3.05 | 11.17  1.02
     2.000   1.02 | 5.083  5.08 | 8.167   3.05 | 11.25  1.02
     2.083   1.02 | 5.167  5.08 | 8.250   3.05 | 11.33  1.02
     2.167   1.02 | 5.250  5.08 | 8.333   3.05 | 11.42  1.02
     2.250   1.02 | 5.333  7.11 | 8.417   3.05 | 11.50  1.02
     2.333   3.05 | 5.417  7.11 | 8.500   3.05 | 11.58  1.02
     2.417   3.05 | 5.500  7.11 | 8.583   2.03 | 11.67  1.02
     2.500   3.05 | 5.583  8.13 | 8.667   2.03 | 11.75  1.02
     2.583   2.03 | 5.667  8.13 | 8.750   2.03 | 11.83  2.03
     2.667   2.03 | 5.750  8.13 | 8.833   3.05 | 11.92  2.03
     2.750   2.03 | 5.833 56.90 | 8.917   3.05 | 12.00  2.03
     2.833   3.05 | 5.917 56.90 | 9.000   3.05 | 12.08  1.02
     2.917   3.05 | 6.000 56.90 | 9.083   2.03 | 12.17  1.02
     3.000   3.05 | 6.083 57.91 | 9.167   2.03 | 12.25  1.02
     3.083   2.03 | 6.167 57.91 | 9.250   2.03 |
```

```
   Max.Eff.Inten.(mm/hr)=    57.91        38.29
            over (min)       10.00        10.00
   Storage Coeff.  (min)=     8.38 (ii)    9.55 (ii)
   Unit Hyd. Tpeak (min)=    10.00        10.00
   Unit Hyd. peak  (cms)=     0.12         0.12
                                                *TOTALS*
   PEAK FLOW       (cms)=     0.22         0.00     0.220 (iii)
   TIME TO PEAK    (hrs)=     6.25         6.25      6.25
   RUNOFF VOLUME   (mm)=     61.75        32.22     61.46
   TOTAL RAINFALL  (mm)=     63.75        63.75     63.75
   RUNOFF COEFFICIENT  =      0.97         0.51      0.96
```

```
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 84.0   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 (0140)| Area   (ha)= 1.27
|ID= 1 DT= 5.0 min | Total Imp(%)= 91.00   Dir. Conn.(%)= 91.00

```
                          IMPERVIOUS   PERVIOUS (i)
   Surface Area    (ha)=     1.16        0.11
   Dep. Storage    (mm)=     2.00        5.00
   Average Slope    (%)=     1.00        2.00
   Length           (m)=   503.00       25.00
   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 | 3.167  2.03 | 6.250  57.91 | 9.33   2.03
     0.167   0.00 | 3.250  2.03 | 6.333  11.18 | 9.42   2.03
     0.250   0.00 | 3.333  3.05 | 6.417  11.18 | 9.50   2.03
     0.333   1.02 | 3.417  3.05 | 6.500  11.18 | 9.58   2.03
     0.417   1.02 | 3.500  3.05 | 6.583  11.18 | 9.67   2.03
     0.500   1.02 | 3.583  2.03 | 6.667  11.18 | 9.75   2.03
     0.583   2.03 | 3.667  2.03 | 6.750  11.18 | 9.83   2.03
     0.667   2.03 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
     0.750   2.03 | 3.833  3.05 | 6.917   5.08 | 10.00  2.03
     0.833   1.02 | 3.917  3.05 | 7.000   5.08 | 10.08  2.03
     0.917   1.02 | 4.000  3.05 | 7.083   5.08 | 10.17  2.03
     1.000   1.02 | 4.083  2.03 | 7.167   5.08 | 10.25  2.03
     1.083   1.02 | 4.167  2.03 | 7.250   5.08 | 10.33  1.02
     1.167   1.02 | 4.250  2.03 | 7.333   4.06 | 10.42  1.02
     1.250   1.02 | 4.333  5.08 | 7.417   4.06 | 10.50  1.02
     1.333   1.02 | 4.417  5.08 | 7.500   4.06 | 10.58  1.02
     1.417   1.02 | 4.500  5.08 | 7.583   4.06 | 10.67  1.02
     1.500   1.02 | 4.583  4.06 | 7.667   4.06 | 10.75  1.02
     1.583   2.03 | 4.667  4.06 | 7.750   4.06 | 10.83  2.03
     1.667   2.03 | 4.750  4.06 | 7.833   4.06 | 10.92  2.03
     1.750   2.03 | 4.833  4.06 | 7.917   4.06 | 11.00  2.03
     1.833   1.02 | 4.917  4.06 | 8.000   4.06 | 11.08  1.02
     1.917   1.02 | 5.000  4.06 | 8.083   3.05 | 11.17  1.02
     2.000   1.02 | 5.083  5.08 | 8.167   3.05 | 11.25  1.02
     2.083   1.02 | 5.167  5.08 | 8.250   3.05 | 11.33  1.02
     2.167   1.02 | 5.250  5.08 | 8.333   3.05 | 11.42  1.02
     2.250   1.02 | 5.333  7.11 | 8.417   3.05 | 11.50  1.02
```

```
                    2.333  3.05 | 5.417   7.11 | 8.500   3.05 | 11.58   1.02
                    2.417  3.05 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
                    2.500  3.05 | 5.583   8.13 | 8.667   2.03 | 11.75   1.02
                    2.583  2.03 | 5.667   8.13 | 8.750   2.03 | 11.83   2.03
                    2.667  2.03 | 5.750   8.13 | 8.833   3.05 | 11.92   2.03
                    2.750  2.03 | 5.833  56.90 | 8.917   3.05 | 12.00   2.03
                    2.833  3.05 | 5.917  56.90 | 9.000   3.05 | 12.08   1.02
                    2.917  3.05 | 6.000  56.90 | 9.083   2.03 | 12.17   1.02
                    3.000  3.05 | 6.083  57.91 | 9.167   2.03 | 12.25   1.02
                    3.083  2.03 | 6.167  57.91 | 9.250   2.03 |

        Max.Eff.Inten.(mm/hr)=    57.91          37.09
                  over (min)      10.00          15.00
        Storage Coeff.  (min)=     8.38 (ii)     11.00 (ii)
        Unit Hyd. Tpeak (min)=    10.00          15.00
        Unit Hyd. peak  (cms)=     0.12           0.09
                                                              *TOTALS*
        PEAK FLOW       (cms)=     0.18           0.01         0.188 (iii)
        TIME TO PEAK    (hrs)=     6.25           6.33         6.25
        RUNOFF VOLUME   (mm)=     61.75          31.16        59.00
        TOTAL RAINFALL  (mm)=     63.75          63.75        63.75
        RUNOFF COEFFICIENT  =      0.97           0.49         0.93


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0    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 ( 0420)|
|  1 + 2 = 3     |              AREA    QPEAK   TPEAK    R.V.
--------------------              (ha)    (cms)   (hrs)   (mm)
         ID1= 1 ( 0135):    1.43    0.220    6.25   61.46
       + ID2= 2 ( 0140):    1.27    0.188    6.25   59.00
                           ================================
         ID = 3 ( 0420):    2.70    0.408    6.25   60.30

      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 0530)|     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  |  0.0122    0.0823
                        0.0056    0.0072  |  0.0382    0.1093
                        0.0084    0.0283  |  0.0516    0.1598
                        0.0105    0.0553  |  0.0000    0.0000
```

```
                             AREA    QPEAK   TPEAK    R.V.
                             (ha)    (cms)   (hrs)    (mm)
      INFLOW : ID= 2 ( 0420)  2.700   0.408    6.25   60.30
      OUTFLOW: ID= 1 ( 0530)  2.700   0.039    7.33   60.18

              PEAK  FLOW   REDUCTION [Qout/Qin](%)=  9.48
              TIME SHIFT OF PEAK FLOW    (min)= 65.00
              MAXIMUM STORAGE   USED    (ha.m.)=  0.1109

--------------------------------------------------------------------------------
--------------------
| ADD HYD ( 0425)|
|  1 + 2 = 3     |              AREA    QPEAK   TPEAK    R.V.
--------------------              (ha)    (cms)   (hrs)   (mm)
         ID1= 1 ( 0145):    3.05    0.403    6.25   55.21
       + ID2= 2 ( 0530):    2.70    0.039    7.33   60.18
                           ================================
         ID = 3 ( 0425):    5.75    0.415    6.25   57.54

      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 0512)|     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  |  0.0471    0.1003
                        0.0071    0.0165  |  0.0636    0.1284
                        0.0098    0.0331  |  0.0763    0.1594
                        0.0119    0.0526  |  0.0870    0.1934
                        0.0138    0.0750  |  0.0964    0.2308

                             AREA    QPEAK   TPEAK    R.V.
                             (ha)    (cms)   (hrs)    (mm)
      INFLOW : ID= 2 ( 0425)  5.750   0.415    6.25   57.54
      OUTFLOW: ID= 1 ( 0512)  5.750   0.064    8.33   57.44

              PEAK  FLOW  REDUCTION [Qout/Qin](%)= 15.40
              TIME SHIFT OF PEAK FLOW    (min)=125.00
              MAXIMUM STORAGE   USED    (ha.m.)=  0.1292

--------------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0215)|    Area   (ha)=  0.58
|ID= 1 DT= 5.0 min |    Total Imp(%)= 81.00   Dir. Conn.(%)= 81.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=      0.47          0.11
        Dep. Storage   (mm)=      2.00          5.00
        Average Slope  (%)=       1.00          2.00
        Length         (m)=     260.00         30.00
```

```
        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 | 3.167   2.03 | 6.250  57.91 | 9.33   2.03
              0.167   0.00 | 3.250   2.03 | 6.333  11.18 | 9.42   2.03
              0.250   0.00 | 3.333   3.05 | 6.417  11.18 | 9.50   2.03
              0.333   1.02 | 3.417   3.05 | 6.500  11.18 | 9.58   2.03
              0.417   1.02 | 3.500   3.05 | 6.583  11.18 | 9.67   2.03
              0.500   1.02 | 3.583   2.03 | 6.667  11.18 | 9.75   2.03
              0.583   2.03 | 3.667   2.03 | 6.750  11.18 | 9.83   2.03
              0.667   2.03 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
              0.750   2.03 | 3.833   3.05 | 6.917   5.08 | 10.00  2.03
              0.833   2.03 | 3.917   3.05 | 7.000   5.08 | 10.08  2.03
              0.917   1.02 | 4.000   3.05 | 7.083   5.08 | 10.17  2.03
              1.000   1.02 | 4.083   2.03 | 7.167   5.08 | 10.25  2.03
              1.083   1.02 | 4.167   2.03 | 7.250   5.08 | 10.33  1.02
              1.167   1.02 | 4.250   2.03 | 7.333   4.06 | 10.42  1.02
              1.250   1.02 | 4.333   5.08 | 7.417   4.06 | 10.50  1.02
              1.333   1.02 | 4.417   5.08 | 7.500   4.06 | 10.58  1.02
              1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67  1.02
              1.500   1.02 | 4.583   4.06 | 7.667   4.06 | 10.75  1.02
              1.583   2.03 | 4.667   4.06 | 7.750   4.06 | 10.83  2.03
              1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92  2.03
              1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00  2.03
              1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08  1.02
              1.917   1.02 | 5.000   4.06 | 8.083   3.05 | 11.17  1.02
              2.000   1.02 | 5.083   5.08 | 8.167   3.05 | 11.25  1.02
              2.083   1.02 | 5.167   5.08 | 8.250   3.05 | 11.33  1.02
              2.167   1.02 | 5.250   5.08 | 8.333   3.05 | 11.42  1.02
              2.250   1.02 | 5.333   7.11 | 8.417   3.05 | 11.50  1.02
              2.333   3.05 | 5.417   7.11 | 8.500   3.05 | 11.58  1.02
              2.417   3.05 | 5.500   7.11 | 8.583   2.03 | 11.67  1.02
              2.500   3.05 | 5.583   8.13 | 8.667   2.03 | 11.75  1.02
              2.583   2.03 | 5.667   8.13 | 8.750   2.03 | 11.83  2.03
              2.667   2.03 | 5.750   8.13 | 8.833   3.05 | 11.92  2.03
              2.750   2.03 | 5.833  56.90 | 8.917   3.05 | 12.00  2.03
              2.833   3.05 | 5.917  56.90 | 9.000   3.05 | 12.08  1.02
              2.917   3.05 | 6.000  56.90 | 9.083   2.03 | 12.17  1.02
              3.000   3.05 | 6.083  57.91 | 9.167   2.03 | 12.25  1.02
              3.083   2.03 | 6.167  57.91 | 9.250   2.03 |

        Max.Eff.Inten.(mm/hr)=    57.91          37.09
                  over (min)       5.00          10.00
        Storage Coeff.  (min)=     5.64 (ii)      9.78 (ii)
        Unit Hyd. Tpeak (min)=     5.00          10.00
        Unit Hyd. peak  (cms)=     0.20           0.11
                                                              *TOTALS*
        PEAK FLOW       (cms)=     0.08           0.01         0.085 (iii)
```

```
        TIME TO PEAK    (hrs)=     6.25           6.25         6.25
        RUNOFF VOLUME   (mm)=     61.75          31.16        55.93
        TOTAL RAINFALL  (mm)=     63.75          63.75        63.75
        RUNOFF COEFFICIENT  =      0.97           0.49         0.88


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0    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 ( 0220)|    Area   (ha)=  0.65
|ID= 1 DT= 5.0 min |    Total Imp(%)= 66.00   Dir. Conn.(%)= 66.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=      0.43          0.22
        Dep. Storage   (mm)=      2.00          5.00
        Average Slope  (%)=       1.00          2.00
        Length         (m)=     260.00         20.00
        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 | 3.167   2.03 | 6.250  57.91 | 9.33   2.03
              0.167   0.00 | 3.250   2.03 | 6.333  11.18 | 9.42   2.03
              0.250   0.00 | 3.333   3.05 | 6.417  11.18 | 9.50   2.03
              0.333   1.02 | 3.417   3.05 | 6.500  11.18 | 9.58   2.03
              0.417   1.02 | 3.500   3.05 | 6.583  11.18 | 9.67   2.03
              0.500   1.02 | 3.583   2.03 | 6.667  11.18 | 9.75   2.03
              0.583   2.03 | 3.750   2.03 | 6.750  11.18 | 9.83   2.03
              0.667   2.03 | 3.750   2.03 | 6.833   5.08 | 9.92   2.03
              0.750   2.03 | 3.833   3.05 | 6.917   5.08 | 10.00  2.03
              0.833   1.02 | 3.917   3.05 | 7.000   5.08 | 10.08  2.03
              0.917   1.02 | 4.000   3.05 | 7.083   5.08 | 10.17  2.03
              1.000   1.02 | 4.083   2.03 | 7.167   5.08 | 10.25  2.03
              1.083   1.02 | 4.167   2.03 | 7.250   5.08 | 10.33  1.02
              1.167   1.02 | 4.250   2.03 | 7.333   4.06 | 10.42  1.02
              1.250   1.02 | 4.333   5.08 | 7.417   4.06 | 10.50  1.02
              1.333   1.02 | 4.417   5.08 | 7.500   4.06 | 10.58  1.02
              1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67  1.02
              1.500   1.02 | 4.583   4.06 | 7.667   4.06 | 10.75  1.02
              1.583   2.03 | 4.667   4.06 | 7.750   4.06 | 10.83  2.03
              1.667   2.03 | 4.750   4.06 | 7.833   4.06 | 10.92  2.03
              1.750   2.03 | 4.833   4.06 | 7.917   4.06 | 11.00  2.03
              1.833   1.02 | 4.917   4.06 | 8.000   4.06 | 11.08  1.02
```

```
              1.917   1.02 | 5.000    4.06 | 8.083    3.05 | 11.17   1.02
              2.000   1.02 | 5.083    5.08 | 8.167    3.05 | 11.25   1.02
              2.083   1.02 | 5.167    5.08 | 8.250    3.05 | 11.33   1.02
              2.167   1.02 | 5.250    5.08 | 8.333    3.05 | 11.42   1.02
              2.250   1.02 | 5.333    7.11 | 8.417    3.05 | 11.50   1.02
              2.333   3.05 | 5.417    7.11 | 8.500    3.05 | 11.58   1.02
              2.417   3.05 | 5.500    7.11 | 8.583    2.03 | 11.67   1.02
              2.500   3.05 | 5.583    8.13 | 8.667    2.03 | 11.75   1.02
              2.583   2.03 | 5.667    8.13 | 8.750    2.03 | 11.83   2.03
              2.667   2.03 | 5.750    8.13 | 8.833    3.05 | 11.92   2.03
              2.750   2.03 | 5.833   56.90 | 8.917    3.05 | 12.00   2.03
              2.833   3.05 | 5.917   56.90 | 9.000    3.05 | 12.08   1.02
              2.917   3.05 | 6.000   56.90 | 9.083    2.03 | 12.17   1.02
              3.000   3.05 | 6.083   57.91 | 9.167    2.03 | 12.25   1.02
              3.083   2.03 | 6.167   57.91 | 9.250    2.03 |

        Max.Eff.Inten.(mm/hr)=      57.91          37.09
              over (min)             5.00          15.00
        Storage Coeff.  (min)=       5.64 (ii)     10.08 (ii)
        Unit Hyd. Tpeak (min)=       5.00          15.00
        Unit Hyd. peak  (cms)=       0.20           0.10
                                                                *TOTALS*
        PEAK FLOW       (cms)=       0.07           0.02        0.086 (iii)
        TIME TO PEAK    (hrs)=       6.25           6.33        6.25
        RUNOFF VOLUME   (mm)=       61.75          31.16       51.35
        TOTAL RAINFALL  (mm)=       63.75          63.75       63.75
        RUNOFF COEFFICIENT  =        0.97           0.49        0.81


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 ( 0470)|
|  1 + 2  =  3   |        AREA    QPEAK   TPEAK     R.V.
--------------------        (ha)    (cms)   (hrs)     (mm)
        ID1= 1 ( 0215):    0.58    0.085    6.25     55.93
      + ID2= 2 ( 0220):    0.65    0.086    6.25     51.35
                      ===============================================
        ID = 3 ( 0470):    1.23    0.171    6.25     53.51

    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------
--------------------
| RESERVOIR( 0535)|   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  |  0.0116    0.0367
              0.0053    0.0048  |  0.0131    0.0474
              0.0080    0.0154  |  0.0202    0.0639
              0.0100    0.0261  |  0.0000    0.0000

                           AREA    QPEAK    TPEAK      R.V.
                           (ha)    (cms)    (hrs)      (mm)
        INFLOW : ID= 2 ( 0470)   1.230   0.171    6.25      53.51
        OUTFLOW: ID= 1 ( 0535)   1.230   0.012    8.00      53.33

            PEAK FLOW  REDUCTION [Qout/Qin](%)= 7.26
            TIME SHIFT OF PEAK FLOW      (min)=105.00
            MAXIMUM STORAGE  USED     (ha.m.)= 0.0426

-------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0225)|  Area   (ha)=  0.60
|ID= 1 DT= 5.0 min |  Total Imp(%)= 83.00   Dir. Conn.(%)= 83.00
--------------------
                        IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=   0.50        0.10
        Dep. Storage    (mm)=   2.00        5.00
        Average Slope   (%)=    1.00        1.00
        Length          (m)=  320.00       10.00
        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 | 3.167   2.03 | 6.250   57.91 | 9.33    2.03
         0.167   0.00 | 3.250   2.03 | 6.333   11.18 | 9.42    2.03
         0.250   0.00 | 3.333   3.05 | 6.417   11.18 | 9.50    2.03
         0.333   1.02 | 3.417   3.05 | 6.500   11.18 | 9.58    2.03
         0.417   1.02 | 3.500   3.05 | 6.583   11.18 | 9.67    2.03
         0.500   1.02 | 3.583   2.03 | 6.667   11.18 | 9.75    2.03
         0.583   2.03 | 3.667   2.03 | 6.750   11.18 | 9.83    2.03
         0.667   2.03 | 3.750   2.03 | 6.833    5.08 | 9.92    2.03
         0.750   2.03 | 3.833   3.05 | 6.917    5.08 | 10.00   2.03
         0.833   1.02 | 3.917   3.05 | 7.000    5.08 | 10.08   2.03
         0.917   1.02 | 4.000   3.05 | 7.083    5.08 | 10.17   2.03
         1.000   1.02 | 4.083   2.03 | 7.167    5.08 | 10.25   2.03
         1.083   1.02 | 4.167   2.03 | 7.250    5.08 | 10.33   1.02
         1.167   1.02 | 4.250   2.03 | 7.333    4.06 | 10.42   1.02
         1.250   1.02 | 4.333   5.08 | 7.417    4.06 | 10.50   1.02
         1.333   1.02 | 4.417   5.08 | 7.500    4.06 | 10.58   1.02
         1.417   1.02 | 4.500   5.08 | 7.583    4.06 | 10.67   1.02
         1.500   1.02 | 4.583   4.06 | 7.667    4.06 | 10.75   1.02
         1.583   2.03 | 4.667   4.06 | 7.750    4.06 | 10.83   2.03
         1.667   2.03 | 4.750   4.06 | 7.833    4.06 | 10.92   2.03
```

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              1.750   2.03 | 4.833    4.06 | 7.917    4.06 | 11.00   2.03
              1.833   1.02 | 4.917    4.06 | 8.000    4.06 | 11.08   1.02
              1.917   1.02 | 5.000    4.06 | 8.083    3.05 | 11.17   1.02
              2.000   1.02 | 5.083    5.08 | 8.167    3.05 | 11.25   1.02
              2.083   1.02 | 5.167    5.08 | 8.250    3.05 | 11.33   1.02
              2.167   1.02 | 5.250    5.08 | 8.333    3.05 | 11.42   1.02
              2.250   1.02 | 5.333    7.11 | 8.417    3.05 | 11.50   1.02
              2.333   3.05 | 5.417    7.11 | 8.500    3.05 | 11.58   1.02
              2.417   3.05 | 5.500    7.11 | 8.583    2.03 | 11.67   1.02
              2.500   3.05 | 5.583    8.13 | 8.667    2.03 | 11.75   1.02
              2.583   2.03 | 5.667    8.13 | 8.750    2.03 | 11.83   2.03
              2.667   2.03 | 5.750    8.13 | 8.833    3.05 | 11.92   2.03
              2.750   2.03 | 5.833   56.90 | 8.917    3.05 | 12.00   2.03
              2.833   3.05 | 5.917   56.90 | 9.000    3.05 | 12.08   1.02
              2.917   3.05 | 6.000   56.90 | 9.083    2.03 | 12.17   1.02
              3.000   3.05 | 6.083   57.91 | 9.167    2.03 | 12.25   1.02
              3.083   2.03 | 6.167   57.91 | 9.250    2.03 |

        Max.Eff.Inten.(mm/hr)=      57.91          37.09
              over (min)             5.00          10.00
        Storage Coeff.  (min)=       6.39 (ii)      8.41 (ii)
        Unit Hyd. Tpeak (min)=       5.00          10.00
        Unit Hyd. peak  (cms)=       0.18           0.12
                                                                *TOTALS*
        PEAK FLOW       (cms)=       0.08           0.01        0.089 (iii)
        TIME TO PEAK    (hrs)=       6.25           6.25        6.25
        RUNOFF VOLUME   (mm)=       61.75          31.16       56.55
        TOTAL RAINFALL  (mm)=       63.75          63.75       63.75
        RUNOFF COEFFICIENT  =        0.97           0.49        0.89


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 ( 0230)|  Area   (ha)=  0.70
|ID= 1 DT= 5.0 min |  Total Imp(%)= 66.00   Dir. Conn.(%)= 66.00
--------------------
                        IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=   0.46        0.24
        Dep. Storage    (mm)=   2.00        5.00
        Average Slope   (%)=    1.00        2.00
        Length          (m)=  320.00       25.00
        Mannings n      =       0.013       0.300

        NOTE: RAINFALL WAS TRANSFORMED TO  5.0 MIN. TIME STEP.
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                     ---- 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   2.03 | 6.250   57.91 | 9.33    2.03
         0.167   0.00 | 3.250   2.03 | 6.333   11.18 | 9.42    2.03
         0.250   0.00 | 3.333   3.05 | 6.417   11.18 | 9.50    2.03
         0.333   1.02 | 3.417   3.05 | 6.500   11.18 | 9.58    2.03
         0.417   1.02 | 3.500   3.05 | 6.583   11.18 | 9.67    2.03
         0.500   1.02 | 3.583   2.03 | 6.667   11.18 | 9.75    2.03
         0.583   2.03 | 3.667   2.03 | 6.750   11.18 | 9.83    2.03
         0.667   2.03 | 3.750   2.03 | 6.833    5.08 | 9.92    2.03
         0.750   2.03 | 3.833   3.05 | 6.917    5.08 | 10.00   2.03
         0.833   1.02 | 3.917   3.05 | 7.000    5.08 | 10.08   2.03
         0.917   1.02 | 4.000   3.05 | 7.083    5.08 | 10.17   2.03
         1.000   1.02 | 4.083   2.03 | 7.167    5.08 | 10.25   2.03
         1.083   1.02 | 4.167   2.03 | 7.250    5.08 | 10.33   1.02
         1.167   1.02 | 4.250   2.03 | 7.333    4.06 | 10.42   1.02
         1.250   1.02 | 4.333   5.08 | 7.417    4.06 | 10.50   1.02
         1.333   1.02 | 4.417   5.08 | 7.500    4.06 | 10.58   1.02
         1.417   1.02 | 4.500   5.08 | 7.583    4.06 | 10.67   1.02
         1.500   1.02 | 4.583   4.06 | 7.667    4.06 | 10.75   1.02
         1.583   2.03 | 4.667   4.06 | 7.750    4.06 | 10.83   2.03
         1.667   2.03 | 4.750   4.06 | 7.833    4.06 | 10.92   2.03
         1.750   2.03 | 4.833   4.06 | 7.917    4.06 | 11.00   2.03
         1.833   1.02 | 4.917   4.06 | 8.000    4.06 | 11.08   1.02
         1.917   1.02 | 5.000   4.06 | 8.083    3.05 | 11.17   1.02
         2.000   1.02 | 5.083   5.08 | 8.167    3.05 | 11.25   1.02
         2.083   1.02 | 5.167   5.08 | 8.250    3.05 | 11.33   1.02
         2.167   1.02 | 5.250   5.08 | 8.333    3.05 | 11.42   1.02
         2.250   1.02 | 5.333   7.11 | 8.417    3.05 | 11.50   1.02
         2.333   3.05 | 5.417   7.11 | 8.500    3.05 | 11.58   1.02
         2.417   3.05 | 5.500   7.11 | 8.583    2.03 | 11.67   1.02
         2.500   3.05 | 5.583   8.13 | 8.667    2.03 | 11.75   1.02
         2.583   2.03 | 5.667   8.13 | 8.750    2.03 | 11.83   2.03
         2.667   2.03 | 5.750   8.13 | 8.833    3.05 | 11.92   2.03
         2.750   2.03 | 5.833  56.90 | 8.917    3.05 | 12.00   2.03
         2.833   3.05 | 5.917  56.90 | 9.000    3.05 | 12.08   1.02
         2.917   3.05 | 6.000  56.90 | 9.083    2.03 | 12.17   1.02
         3.000   3.05 | 6.083  57.91 | 9.167    2.03 | 12.25   1.02
         3.083   2.03 | 6.167  57.91 | 9.250    2.03 |

        Max.Eff.Inten.(mm/hr)=      57.91          34.81
              over (min)             5.00          20.00
        Storage Coeff.  (min)=       6.39 (ii)     15.45 (ii)
        Unit Hyd. Tpeak (min)=       5.00          20.00
        Unit Hyd. peak  (cms)=       0.18           0.07
                                                                *TOTALS*
        PEAK FLOW       (cms)=       0.07           0.02        0.087 (iii)
        TIME TO PEAK    (hrs)=       6.25           6.42        6.25
        RUNOFF VOLUME   (mm)=       61.75          29.17       50.66
        TOTAL RAINFALL  (mm)=       63.75          63.75       63.75
        RUNOFF COEFFICIENT  =        0.97           0.46        0.79
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                  CN* = 81.0   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 ( 0475)|
    |  1 + 2 = 3    |          AREA    QPEAK   TPEAK    R.V.
    --------------------          (ha)    (cms)   (hrs)    (mm)
          ID1= 1 ( 0225):     0.60   0.089    6.25    56.55
        + ID2= 2 ( 0230):     0.70   0.087    6.25    50.66
                          ===========================================
            ID = 3 ( 0475):   1.30   0.176    6.25    53.38

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

    --------------------
    | RESERVOIR( 0540)|    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  |  0.0271    0.0367
                          0.0118    0.0048  |  0.0306    0.0474
                          0.0184    0.0154  |  0.0415    0.0639
                          0.0232    0.0261  |  0.0000    0.0000

                               AREA    QPEAK    TPEAK     R.V.
                               (ha)    (cms)    (hrs)     (mm)
        INFLOW : ID= 2 ( 0475)   1.300   0.176    6.25    53.38
        OUTFLOW: ID= 1 ( 0540)   1.300   0.027    6.92    53.30

              PEAK  FLOW   REDUCTION [Qout/Qin](%)= 15.21
              TIME SHIFT OF PEAK FLOW       (min)= 40.00
              MAXIMUM STORAGE   USED     (ha.m.)= 0.0358

    ----------------------------------------------------------------------

    --------------------
    | ADD HYD ( 0480)|
    |  1 + 2 = 3    |          AREA    QPEAK   TPEAK    R.V.
    --------------------          (ha)    (cms)   (hrs)    (mm)
          ID1= 1 ( 0535):     1.23   0.012    8.00    53.33
        + ID2= 2 ( 0540):     1.30   0.027    6.92    53.30
                          ===========================================
            ID = 3 ( 0480):   2.53   0.039    7.00    53.32

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
    ----------------------------------------------------------------------
    --------------------
                                    Page 85
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                    LangstaffRd_EA_Proposed_WestDonWatershd
    | CALIB           |
    | STANDHYD ( 0155)|   Area    (ha)=  0.56
    |ID= 1 DT= 5.0 min |   Total Imp(%)= 93.00   Dir. Conn.(%)= 93.00
    --------------------
                           IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=    0.52         0.04
        Dep. Storage   (mm)=    2.00         5.00
        Average Slope  (%)=     1.00         2.00
        Length         (m)=   260.00        25.00
        Mannings n     =       0.013        0.290

        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  2.03 | 6.250  57.91 | 9.33   2.03
                  0.167   0.00 | 3.250  2.03 | 6.333  11.18 | 9.42   2.03
                  0.250   0.00 | 3.333  3.05 | 6.417  11.18 | 9.50   2.03
                  0.333   1.02 | 3.417  3.05 | 6.500  11.18 | 9.58   2.03
                  0.417   1.02 | 3.500  3.05 | 6.583  11.18 | 9.67   2.03
                  0.500   1.02 | 3.583  2.03 | 6.667  11.18 | 9.75   2.03
                  0.583   2.03 | 3.667  2.03 | 6.750  11.18 | 9.83   2.03
                  0.667   2.03 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
                  0.750   2.03 | 3.833  3.05 | 6.917   5.08 | 10.00  2.03
                  0.833   1.02 | 3.917  3.05 | 7.000   5.08 | 10.08  2.03
                  0.917   1.02 | 4.000  3.05 | 7.083   5.08 | 10.17  2.03
                  1.000   1.02 | 4.083  2.03 | 7.167   5.08 | 10.25  2.03
                  1.083   1.02 | 4.167  2.03 | 7.250   5.08 | 10.33  1.02
                  1.167   1.02 | 4.250  2.03 | 7.333   4.06 | 10.42  1.02
                  1.250   1.02 | 4.333  5.08 | 7.417   4.06 | 10.50  1.02
                  1.333   1.02 | 4.417  5.08 | 7.500   4.06 | 10.58  1.02
                  1.417   1.02 | 4.500  5.08 | 7.583   4.06 | 10.67  1.02
                  1.500   1.02 | 4.583  4.06 | 7.667   4.06 | 10.75  1.02
                  1.583   2.03 | 4.667  4.06 | 7.750   4.06 | 10.83  2.03
                  1.667   2.03 | 4.750  4.06 | 7.833   4.06 | 10.92  2.03
                  1.750   2.03 | 4.833  4.06 | 7.917   4.06 | 11.00  2.03
                  1.833   1.02 | 4.917  4.06 | 8.000   4.06 | 11.08  1.02
                  1.917   1.02 | 5.000  4.06 | 8.083   3.05 | 11.17  1.02
                  2.000   1.02 | 5.083  5.08 | 8.167   3.05 | 11.25  1.02
                  2.083   1.02 | 5.167  5.08 | 8.250   3.05 | 11.33  1.02
                  2.167   1.02 | 5.250  5.08 | 8.333   3.05 | 11.42  1.02
                  2.250   1.02 | 5.333  7.11 | 8.417   3.05 | 11.50  1.02
                  2.333   3.05 | 5.417  7.11 | 8.500   3.05 | 11.58  1.02
                  2.417   3.05 | 5.500  7.11 | 8.583   2.03 | 11.67  1.02
                  2.500   3.05 | 5.583  8.13 | 8.667   2.03 | 11.75  1.02
                  2.583   2.03 | 5.667  8.13 | 8.750   2.03 | 11.83  2.03
                  2.667   2.03 | 5.750  8.13 | 8.833   3.05 | 11.92  2.03
                  2.750   2.03 | 5.833  56.90 | 8.917   3.05 | 12.00  2.03
                  2.833   3.05 | 5.917  56.90 | 9.000   3.05 | 12.08  1.02
                  2.917   3.05 | 6.000  56.90 | 9.083   2.03 | 12.17  1.02
                  3.000   3.05 | 6.083  57.91 | 9.167   2.03 | 12.25  1.02
                                    Page 86
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                    LangstaffRd_EA_Proposed_WestDonWatershd
        3.083   2.03 | 6.167  57.91 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=     57.91        42.12
             over (min)        5.00        10.00
    Storage Coeff. (min)=      5.64 (ii)    8.21 (ii)
    Unit Hyd. Tpeak (min)=     5.00        10.00
    Unit Hyd. peak  (cms)=     0.20         0.13
                                                    *TOTALS*
    PEAK FLOW      (cms)=      0.08         0.00      0.087 (iii)
    TIME TO PEAK   (hrs)=      6.25         6.25      6.25
    RUNOFF VOLUME   (mm)=     61.75        35.70     59.92
    TOTAL RAINFALL  (mm)=     63.75        63.75     63.75
    RUNOFF COEFFICIENT  =      0.97         0.56      0.94


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                CN* = 87.0   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 ( 0160)|   Area    (ha)=  0.43
    |ID= 1 DT= 5.0 min |   Total Imp(%)= 95.00   Dir. Conn.(%)= 95.00
    --------------------
                           IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=    0.41         0.02
        Dep. Storage   (mm)=    2.00         5.00
        Average Slope  (%)=     1.00         2.00
        Length         (m)=   260.00        20.00
        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 | 3.167  2.03 | 6.250  57.91 | 9.33   2.03
                  0.167   0.00 | 3.250  2.03 | 6.333  11.18 | 9.42   2.03
                  0.250   0.00 | 3.333  3.05 | 6.417  11.18 | 9.50   2.03
                  0.333   1.02 | 3.417  3.05 | 6.500  11.18 | 9.58   2.03
                  0.417   1.02 | 3.500  3.05 | 6.583  11.18 | 9.67   2.03
                  0.500   1.02 | 3.583  2.03 | 6.667  11.18 | 9.75   2.03
                  0.583   2.03 | 3.667  2.03 | 6.750  11.18 | 9.83   2.03
                  0.667   2.03 | 3.750  2.03 | 6.833   5.08 | 9.92   2.03
                  0.750   2.03 | 3.833  3.05 | 6.917   5.08 | 10.00  2.03
                  0.833   1.02 | 3.917  3.05 | 7.000   5.08 | 10.08  2.03
                  0.917   1.02 | 4.000  3.05 | 7.083   5.08 | 10.17  2.03
                  1.000   1.02 | 4.083  2.03 | 7.167   5.08 | 10.25  2.03
                  1.083   1.02 | 4.167  2.03 | 7.250   5.08 | 10.33  1.02
                                    Page 87
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                    LangstaffRd_EA_Proposed_WestDonWatershd
                  1.167   1.02 | 4.250  2.03 | 7.333   4.06 | 10.42  1.02
                  1.250   1.02 | 4.333  5.08 | 7.417   4.06 | 10.50  1.02
                  1.333   1.02 | 4.417  5.08 | 7.500   4.06 | 10.58  1.02
                  1.417   1.02 | 4.500  5.08 | 7.583   4.06 | 10.67  1.02
                  1.500   1.02 | 4.583  4.06 | 7.667   4.06 | 10.75  1.02
                  1.583   2.03 | 4.667  4.06 | 7.750   4.06 | 10.83  2.03
                  1.667   2.03 | 4.750  4.06 | 7.833   4.06 | 10.92  2.03
                  1.750   2.03 | 4.833  4.06 | 7.917   4.06 | 11.00  2.03
                  1.833   1.02 | 4.917  4.06 | 8.000   4.06 | 11.08  1.02
                  1.917   1.02 | 5.000  4.06 | 8.083   3.05 | 11.17  1.02
                  2.000   1.02 | 5.083  5.08 | 8.167   3.05 | 11.25  1.02
                  2.083   1.02 | 5.167  5.08 | 8.250   3.05 | 11.33  1.02
                  2.167   1.02 | 5.250  5.08 | 8.333   3.05 | 11.42  1.02
                  2.250   1.02 | 5.333  7.11 | 8.417   3.05 | 11.50  1.02
                  2.333   3.05 | 5.417  7.11 | 8.500   3.05 | 11.58  1.02
                  2.417   3.05 | 5.500  7.11 | 8.583   2.03 | 11.67  1.02
                  2.500   3.05 | 5.583  8.13 | 8.667   2.03 | 11.75  1.02
                  2.583   2.03 | 5.667  8.13 | 8.750   2.03 | 11.83  2.03
                  2.667   2.03 | 5.750  8.13 | 8.833   3.05 | 11.92  2.03
                  2.750   2.03 | 5.833  56.90 | 8.917   3.05 | 12.00  2.03
                  2.833   3.05 | 5.917  56.90 | 9.000   3.05 | 12.08  1.02
                  2.917   3.05 | 6.000  56.90 | 9.083   2.03 | 12.17  1.02
                  3.000   3.05 | 6.083  57.91 | 9.167   2.03 | 12.25  1.02
                  3.083   2.03 | 6.167  57.91 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=     57.91        44.85
             over (min)        5.00        10.00
    Storage Coeff. (min)=      5.64 (ii)    7.42 (ii)
    Unit Hyd. Tpeak (min)=     5.00        10.00
    Unit Hyd. peak  (cms)=     0.20         0.13
                                                    *TOTALS*
    PEAK FLOW      (cms)=      0.07         0.00      0.068 (iii)
    TIME TO PEAK   (hrs)=      6.25         6.25      6.25
    RUNOFF VOLUME   (mm)=     61.75        38.29     60.57
    TOTAL RAINFALL  (mm)=     63.75        63.75     63.75
    RUNOFF COEFFICIENT  =      0.97         0.60      0.95


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
                CN* = 89.0   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 ( 0430)|
    |  1 + 2 = 3    |          AREA    QPEAK   TPEAK    R.V.
    --------------------          (ha)    (cms)   (hrs)    (mm)
          ID1= 1 ( 0155):     0.56   0.087    6.25    59.92
        + ID2= 2 ( 0160):     0.43   0.068    6.25    60.57
                          ===========================================
                                    Page 88
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                    LangstaffRd_EA_Proposed_WestDonWatershd
        ID = 3 ( 0430):    0.99   0.155    6.25   60.20

     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
----------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0150) |  Area    (ha)=  3.81
|ID= 1 DT= 5.0 min |  Total Imp(%)= 95.00   Dir. Conn.(%)= 95.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=    3.62          0.19
        Dep. Storage    (mm)=    2.00          5.00
        Average Slope   (%)=     1.00          2.00
        Length          (m)=   150.00         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 | 3.167   2.03 | 6.250  57.91 | 9.33    2.03
       0.167    0.00 | 3.250   2.03 | 6.333  11.18 | 9.42    2.03
       0.250    0.00 | 3.333   3.05 | 6.417  11.18 | 9.50    2.03
       0.333    1.02 | 3.417   3.05 | 6.500  11.18 | 9.58    2.03
       0.417    1.02 | 3.500   3.05 | 6.583  11.18 | 9.67    2.03
       0.500    1.02 | 3.583   2.03 | 6.667  11.18 | 9.75    2.03
       0.583    2.03 | 3.667   2.03 | 6.750  11.18 | 9.83    2.03
       0.667    2.03 | 3.750   2.03 | 6.833   5.08 | 9.92    2.03
       0.750    2.03 | 3.833   3.05 | 6.917   5.08 | 10.00   2.03
       0.833    1.02 | 3.917   3.05 | 7.000   5.08 | 10.08   2.03
       0.917    1.02 | 4.000   3.05 | 7.083   5.08 | 10.17   2.03
       1.000    1.02 | 4.083   2.03 | 7.167   5.08 | 10.25   2.03
       1.083    1.02 | 4.167   2.03 | 7.250   5.08 | 10.33   1.02
       1.167    1.02 | 4.250   2.03 | 7.333   4.06 | 10.42   1.02
       1.250    1.02 | 4.333   5.08 | 7.417   4.06 | 10.50   1.02
       1.333    1.02 | 4.417   5.08 | 7.500   4.06 | 10.58   1.02
       1.417    1.02 | 4.500   5.08 | 7.583   4.06 | 10.67   1.02
       1.500    1.02 | 4.583   4.06 | 7.667   4.06 | 10.75   1.02
       1.583    2.03 | 4.667   4.06 | 7.750   4.06 | 10.83   2.03
       1.667    2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
       1.750    2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
       1.833    1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
       1.917    1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
       2.000    1.02 | 5.083   5.08 | 8.167   3.05 | 11.25   1.02
       2.083    1.02 | 5.167   5.08 | 8.250   3.05 | 11.33   1.02
       2.167    1.02 | 5.250   5.08 | 8.333   3.05 | 11.42   1.02
       2.250    1.02 | 5.333   7.11 | 8.417   3.05 | 11.50   1.02
       2.333    3.05 | 5.417   7.11 | 8.500   3.05 | 11.58   1.02
       2.417    3.05 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
       2.500    3.05 | 5.583   8.13 | 8.667   2.03 | 11.75   1.02
       2.583    2.03 | 5.667   8.13 | 8.750   2.03 | 11.83   2.03
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                    LangstaffRd_EA_Proposed_WestDonWatershd
       2.667    2.03 | 5.750   8.13 | 8.833   3.05 | 11.92   2.03
       2.750    2.03 | 5.833  56.90 | 8.917   3.05 | 12.00   2.03
       2.833    3.05 | 5.917  56.90 | 9.000   3.05 | 12.08   1.02
       2.917    3.05 | 6.000  56.90 | 9.083   2.03 | 12.17   1.02
       3.000    3.05 | 6.083  57.91 | 9.167   2.03 | 12.25   1.02
       3.083    2.03 | 6.167  57.91 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=    57.91         43.46
                over (min)=     5.00         10.00
    Storage Coeff. (min)=      4.05 (ii)     6.76 (ii)
    Unit Hyd. Tpeak (min)=     5.00         10.00
    Unit Hyd. peak  (cms)=     0.24          0.14                   *TOTALS*

    PEAK FLOW       (cms)=     0.58          0.02         0.603 (iii)
    TIME TO PEAK    (hrs)=     6.25          6.25         6.25
    RUNOFF VOLUME   (mm)=     61.75         36.96        60.51
    TOTAL RAINFALL  (mm)=     63.75         63.75        63.75
    RUNOFF COEFFICIENT  =      0.97          0.58         0.95

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 88.0   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( 0515) |    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   |   0.0091    0.1797
                       0.0013    0.0157   |   0.0095    0.2004
                       0.0033    0.0320   |   0.0100    0.2216
                       0.0044    0.0487   |   0.0104    0.2433
                       0.0053    0.0659   |   0.0109    0.2655
                       0.0061    0.0837   |   0.0113    0.2882
                       0.0068    0.1019   |   0.0116    0.3114
                       0.0074    0.1206   |   0.1520    0.3592
                       0.0080    0.1398   |   0.5654    0.4336
                       0.0086    0.1595   |   1.1316    0.5100

                              AREA     QPEAK    TPEAK     R.V.
                              (ha)     (cms)    (hrs)     (mm)
       INFLOW : ID= 2 (  0150)  3.810    0.603    6.25    60.51
       OUTFLOW: ID= 1 (  0515)  3.810    0.010   12.25    59.71

            PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.60
            TIME SHIFT OF PEAK FLOW      (min)=360.00
            MAXIMUM STORAGE   USED    (ha.m.)= 0.2067
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
----------------------------------------------------------------------------

--------------------
| ADD HYD ( 0440)  |
|  1 + 2 = 3       |         AREA    QPEAK    TPEAK    R.V.
--------------------         (ha)    (cms)    (hrs)    (mm)
        ID1= 1 ( 0430):     0.99    0.155    6.25    60.20
      + ID2= 2 ( 0515):     3.81    0.010   12.25    59.71
        ===========================================
        ID = 3 ( 0440):     4.80    0.163    6.25    59.81

     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
----------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0210) |  Area    (ha)=  0.96
|ID= 1 DT= 5.0 min |  Total Imp(%)= 78.00   Dir. Conn.(%)= 78.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=    0.75          0.21
        Dep. Storage    (mm)=    2.00          5.00
        Average Slope   (%)=     1.00          2.00
        Length          (m)=   470.00         20.00
        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 | 3.167   2.03 | 6.250  57.91 | 9.33    2.03
       0.167    0.00 | 3.250   2.03 | 6.333  11.18 | 9.42    2.03
       0.250    0.00 | 3.333   3.05 | 6.417  11.18 | 9.50    2.03
       0.333    1.02 | 3.417   3.05 | 6.500  11.18 | 9.58    2.03
       0.417    1.02 | 3.500   3.05 | 6.583  11.18 | 9.67    2.03
       0.500    1.02 | 3.583   2.03 | 6.667  11.18 | 9.75    2.03
       0.583    2.03 | 3.667   2.03 | 6.750  11.18 | 9.83    2.03
       0.667    2.03 | 3.750   2.03 | 6.833   5.08 | 9.92    2.03
       0.750    2.03 | 3.833   3.05 | 6.917   5.08 | 10.00   2.03
       0.833    1.02 | 3.917   3.05 | 7.000   5.08 | 10.08   2.03
       0.917    1.02 | 4.000   3.05 | 7.083   5.08 | 10.17   2.03
       1.000    1.02 | 4.083   2.03 | 7.167   5.08 | 10.25   2.03
       1.083    1.02 | 4.167   2.03 | 7.250   5.08 | 10.33   1.02
       1.167    1.02 | 4.250   2.03 | 7.333   4.06 | 10.42   1.02
       1.250    1.02 | 4.333   5.08 | 7.417   4.06 | 10.50   1.02
       1.333    1.02 | 4.417   5.08 | 7.500   4.06 | 10.58   1.02
       1.417    1.02 | 4.500   5.08 | 7.583   4.06 | 10.67   1.02
       1.500    1.02 | 4.583   4.06 | 7.667   4.06 | 10.75   1.02
       1.583    2.03 | 4.667   4.06 | 7.750   4.06 | 10.83   2.03
       1.667    2.03 | 4.750   4.06 | 7.833   4.06 | 10.92   2.03
       1.750    2.03 | 4.833   4.06 | 7.917   4.06 | 11.00   2.03
       1.833    1.02 | 4.917   4.06 | 8.000   4.06 | 11.08   1.02
```

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                    LangstaffRd_EA_Proposed_WestDonWatershd
       1.917    1.02 | 5.000   4.06 | 8.083   3.05 | 11.17   1.02
       2.000    1.02 | 5.083   5.08 | 8.167   3.05 | 11.25   1.02
       2.083    1.02 | 5.167   5.08 | 8.250   3.05 | 11.33   1.02
       2.167    1.02 | 5.250   5.08 | 8.333   3.05 | 11.42   1.02
       2.250    1.02 | 5.333   7.11 | 8.417   3.05 | 11.50   1.02
       2.333    3.05 | 5.417   7.11 | 8.500   3.05 | 11.58   1.02
       2.417    3.05 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
       2.500    3.05 | 5.583   8.13 | 8.667   2.03 | 11.75   1.02
       2.583    2.03 | 5.667   8.13 | 8.750   2.03 | 11.83   2.03
       2.667    2.03 | 5.750   8.13 | 8.833   3.05 | 11.92   2.03
       2.750    2.03 | 5.833  56.90 | 8.917   3.05 | 12.00   2.03
       2.833    3.05 | 5.917  56.90 | 9.000   3.05 | 12.08   1.02
       2.917    3.05 | 6.000  56.90 | 9.083   2.03 | 12.17   1.02
       3.000    3.05 | 6.083  57.91 | 9.167   2.03 | 12.25   1.02
       3.083    2.03 | 6.167  57.91 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=    57.91         37.09
                over (min)=    10.00         15.00
    Storage Coeff. (min)=      8.04 (ii)    11.54 (ii)
    Unit Hyd. Tpeak (min)=    10.00         15.00
    Unit Hyd. peak  (cms)=     0.13          0.09
                                                          *TOTALS*
    PEAK FLOW       (cms)=     0.12          0.02         0.133 (iii)
    TIME TO PEAK    (hrs)=     6.25          6.33         6.25
    RUNOFF VOLUME   (mm)=     61.75         31.16        55.02
    TOTAL RAINFALL  (mm)=     63.75         63.75        63.75
    RUNOFF COEFFICIENT  =      0.97          0.49         0.86


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 ( 0205) |  Area    (ha)=  1.11
|ID= 1 DT= 5.0 min |  Total Imp(%)= 77.00   Dir. Conn.(%)= 77.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=    0.85          0.26
        Dep. Storage    (mm)=    2.00          5.00
        Average Slope   (%)=     1.00          2.00
        Length          (m)=   470.00         20.00
        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	3.167	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=    57.91        37.09
          over (min)     10.00        15.00
Storage Coeff.  (min)=    8.04 (ii)   11.62 (ii)
Unit Hyd. Tpeak (min)=   10.00        15.00
Unit Hyd. peak  (cms)=    0.13         0.09
                                               *TOTALS*
PEAK FLOW      (cms)=     0.13         0.02     0.152 (iii)
TIME TO PEAK   (hrs)=     6.25         6.33     6.25
RUNOFF VOLUME   (mm)=    61.75        31.16    54.71
TOTAL RAINFALL  (mm)=    63.75        63.75    63.75
RUNOFF COEFFICIENT  =     0.97         0.49     0.86
```

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

```
        CN* = 83.0   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  ( 0460)|
|  1 + 2 = 3      |         AREA    QPEAK   TPEAK     R.V.
--------------------         (ha)   (cms)   (hrs)     (mm)
     ID1= 1 ( 0205):        1.11    0.152    6.25    54.71
   + ID2= 2 ( 0210):        0.96    0.133    6.25    55.02
                          =========================================
     ID = 3 ( 0460):        2.07    0.285    6.25    54.85
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| RESERVOIR( 0525)|      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    | 0.0733     0.0214
                       0.0274     0.0026    | 0.0831     0.0278
                       0.0478     0.0084    | 0.1449     0.0374
                       0.0619     0.0149    | 0.0000     0.0000

                           AREA    QPEAK    TPEAK      R.V.
                           (ha)    (cms)    (hrs)      (mm)
   INFLOW : ID= 2 ( 0460)  2.070   0.285    6.25      54.85
   OUTFLOW: ID= 1 ( 0525)  2.070   0.136    6.50      54.85

         PEAK   FLOW   REDUCTION [Qout/Qin](%)= 47.57
         TIME SHIFT OF PEAK FLOW       (min)= 15.00
         MAXIMUM STORAGE   USED    (ha.m.)=  0.0361
```

```
--------------------
| CALIB           |
| STANDHYD ( 0190)|  Area   (ha)=  0.86
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=       0.49          0.37
Dep. Storage    (mm)=       2.00          5.00
Average Slope   (%)=        1.00          2.00
Length          (m)=      340.00         50.00
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	3.167	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02
2.333	3.05	5.417	7.11	8.500	3.05	11.58	1.02
2.417	3.05	5.500	7.11	8.583	2.03	11.67	1.02
2.500	3.05	5.583	8.13	8.667	2.03	11.75	1.02
2.583	2.03	5.667	8.13	8.750	2.03	11.83	2.03
2.667	2.03	5.750	8.13	8.833	3.05	11.92	2.03
2.750	2.03	5.833	56.90	8.917	3.05	12.00	2.03
2.833	3.05	5.917	56.90	9.000	3.05	12.08	1.02
2.917	3.05	6.000	56.90	9.083	2.03	12.17	1.02
3.000	3.05	6.083	57.91	9.167	2.03	12.25	1.02
3.083	2.03	6.167	57.91	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=    57.91        35.79
          over (min)      5.00        20.00
Storage Coeff.  (min)=    6.62 (ii)   18.79 (ii)
Unit Hyd. Tpeak (min)=    5.00        20.00
Unit Hyd. peak  (cms)=    0.18         0.06
                                               *TOTALS*
PEAK FLOW      (cms)=     0.08         0.02     0.099 (iii)
TIME TO PEAK   (hrs)=     6.25         6.42     6.25
RUNOFF VOLUME   (mm)=    61.75        31.16    48.59
TOTAL RAINFALL  (mm)=    63.75        63.75    63.75
RUNOFF COEFFICIENT  =     0.97         0.49     0.76
```

```
   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 ( 0195)|  Area   (ha)=  0.79
|ID= 1 DT= 5.0 min |  Total Imp(%)= 75.00   Dir. Conn.(%)= 75.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=       0.59          0.20
Dep. Storage    (mm)=       2.00          5.00
Average Slope   (%)=        1.00          2.00
Length          (m)=      340.00         20.00
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	3.167	2.03	6.250	57.91	9.33	2.03
0.167	0.00	3.250	2.03	6.333	11.18	9.42	2.03
0.250	0.00	3.333	3.05	6.417	11.18	9.50	2.03
0.333	1.02	3.417	3.05	6.500	11.18	9.58	2.03
0.417	1.02	3.500	3.05	6.583	11.18	9.67	2.03
0.500	1.02	3.583	2.03	6.667	11.18	9.75	2.03
0.583	2.03	3.667	2.03	6.750	11.18	9.83	2.03
0.667	2.03	3.750	2.03	6.833	5.08	9.92	2.03
0.750	2.03	3.833	3.05	6.917	5.08	10.00	2.03
0.833	1.02	3.917	3.05	7.000	5.08	10.08	2.03
0.917	1.02	4.000	3.05	7.083	5.08	10.17	2.03
1.000	1.02	4.083	2.03	7.167	5.08	10.25	2.03
1.083	1.02	4.167	2.03	7.250	5.08	10.33	1.02
1.167	1.02	4.250	2.03	7.333	4.06	10.42	1.02
1.250	1.02	4.333	5.08	7.417	4.06	10.50	1.02
1.333	1.02	4.417	5.08	7.500	4.06	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	4.06	7.667	4.06	10.75	1.02
1.583	2.03	4.667	4.06	7.750	4.06	10.83	2.03
1.667	2.03	4.750	4.06	7.833	4.06	10.92	2.03
1.750	2.03	4.833	4.06	7.917	4.06	11.00	2.03
1.833	1.02	4.917	4.06	8.000	4.06	11.08	1.02
1.917	1.02	5.000	4.06	8.083	3.05	11.17	1.02
2.000	1.02	5.083	5.08	8.167	3.05	11.25	1.02
2.083	1.02	5.167	5.08	8.250	3.05	11.33	1.02
2.167	1.02	5.250	5.08	8.333	3.05	11.42	1.02
2.250	1.02	5.333	7.11	8.417	3.05	11.50	1.02

LangstaffRd_EA_Proposed_WestDonWatershd

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              2.333   3.05 | 5.417   7.11 | 8.500   3.05 | 11.58   1.02
              2.417   3.05 | 5.500   7.11 | 8.583   2.03 | 11.67   1.02
              2.500   3.05 | 5.583   8.13 | 8.667   2.03 | 11.75   1.02
              2.583   2.03 | 5.667   8.13 | 8.750   2.03 | 11.83   2.03
              2.667   2.03 | 5.750   8.13 | 8.833   3.05 | 11.92   2.03
              2.750   2.03 | 5.833  56.90 | 8.917   3.05 | 12.00   2.03
              2.833   2.03 | 5.917  56.90 | 9.000   3.05 | 12.08   1.02
              2.917   3.05 | 6.000  56.90 | 9.083   2.03 | 12.17   1.02
              3.000   3.05 | 6.083  57.91 | 9.167   2.03 | 12.25   1.02
              3.083   2.03 | 6.167  57.91 | 9.250   2.03 |
```

```
  Max.Eff.Inten.(mm/hr)=      57.91          37.09
            over (min)         5.00          15.00
  Storage Coeff.  (min)=       6.62 (ii)     10.36 (ii)
  Unit Hyd. Tpeak (min)=       5.00          15.00
  Unit Hyd. peak  (cms)=       0.18           0.09
                                                           *TOTALS*
  PEAK FLOW       (cms)=       0.09           0.02      0.110 (iii)
  TIME TO PEAK    (hrs)=       6.25           6.33       6.25
  RUNOFF VOLUME   (mm)=       61.75          31.16      54.10
  TOTAL RAINFALL  (mm)=       63.75          63.75      63.75
  RUNOFF COEFFICIENT  =        0.97           0.49       0.85
```

```
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0   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 ( 0455)|
|  1 + 2 = 3     |         AREA    QPEAK   TPEAK    R.V.
--------------------       (ha)    (cms)   (hrs)    (mm)
   ID1= 1 ( 0190):         0.86    0.099    6.25   48.59
 + ID2= 2 ( 0195):         0.79    0.110    6.25   54.10
                      =====================================
   ID = 3 ( 0455):         1.65    0.209    6.25   51.23

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

```
--------------------
| RESERVOIR( 0555)|     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   |  0.0238    0.0199
                         0.0104    0.0024   |  0.0268    0.0259
                         0.0162    0.0079   |  0.0825    0.0346
                         0.0203    0.0139   |  0.0000    0.0000
```

LangstaffRd_EA_Proposed_WestDonWatershd

```
                           AREA    QPEAK   TPEAK     R.V.
                           (ha)    (cms)   (hrs)     (mm)
  INFLOW : ID= 2 ( 0455)   1.650   0.209   6.25     51.23
  OUTFLOW: ID= 1 ( 0555)   1.650   0.080   6.50     51.19

        PEAK  FLOW   REDUCTION [Qout/Qin](%)= 38.44
        TIME SHIFT OF PEAK FLOW     (min)= 15.00
        MAXIMUM STORAGE   USED   (ha.m.)=  0.0343
```

```
--------------------
| ADD HYD ( 0465)|
|  1 + 2 = 3     |         AREA    QPEAK   TPEAK    R.V.
--------------------       (ha)    (cms)   (hrs)    (mm)
   ID1= 1 ( 0525):         2.07    0.136    6.50   54.85
 + ID2= 2 ( 0555):         1.65    0.080    6.50   51.19
                      =====================================
   ID = 3 ( 0465):         3.72    0.216    6.50   53.23

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

```
********************************
** SIMULATION:Run 05      **
********************************
```

```
--------------------
| READ STORM     |   Filename: C:\Users\ray.zhao\AppD
|                |            ata\Local\Temp\
|                |            e8da0adc-3b43-467d-984d-5ab4a7d3492c\d55f05e6
| Ptotal= 74.42 mm |  Comments: 25yr-12hrSCS
--------------------
```

```
       TIME   RAIN | TIME   RAIN |' TIME   RAIN | TIME   RAIN
       hrs    mm/hr|  hrs   mm/hr|'  hrs   mm/hr|  hrs   mm/hr
       0.25   0.00 | 3.50   3.05 | 6.75  13.21 |10.00   2.03
       0.50   1.02 | 3.75   3.05 | 7.00   6.10 |10.25   2.03
       0.75   2.03 | 4.00   3.05 | 7.25   6.10 |10.50   2.03
       1.00   1.02 | 4.25   3.05 | 7.50   5.08 |10.75   1.02
       1.25   2.03 | 4.50   5.08 | 7.75   4.06 |11.00   2.03
       1.50   1.02 | 4.75   5.08 | 8.00   4.06 |11.25   1.02
       1.75   2.03 | 5.00   6.10 | 8.25   5.08 |11.50   2.03
       2.00   1.02 | 5.25   5.08 | 8.50   3.05 |11.75   1.02
       2.25   2.03 | 5.50   8.13 | 8.75   3.05 |12.00   2.03
       2.50   3.05 | 5.75   9.14 | 9.00   3.05 |12.25   1.02
       2.75   3.05 | 6.00  67.06 | 9.25   2.03 |
       3.00   3.05 | 6.25  67.06 | 9.50   3.05 |
       3.25   2.03 | 6.50  13.21 | 9.75   2.03 |
```

```
--------------------
| CALIB          |
| STANDHYD ( 0165)   Area    (ha)=  0.60
```

LangstaffRd_EA_Proposed_WestDonWatershd

```
|ID= 1 DT= 5.0 min |  Total Imp(%)= 72.00  Dir. Conn.(%)= 72.00
--------------------
                              IMPERVIOUS     PERVIOUS (i)
  Surface Area    (ha)=        0.43           0.17
  Dep. Storage    (mm)=        2.00           5.00
  Average Slope   (%)=         1.00           2.00
  Length          (m)=       250.00          20.00
  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 | 3.167  2.03 | 6.250  67.05| 9.33   3.05
       0.167  0.00 | 3.250  2.03 | 6.333  13.21| 9.42   3.05
       0.250  0.00 | 3.333  3.05 | 6.417  13.21| 9.50   3.05
       0.333  1.02 | 3.417  3.05 | 6.500  13.21| 9.58   2.03
       0.417  1.02 | 3.500  3.05 | 6.583  13.21| 9.67   2.03
       0.500  1.02 | 3.583  3.05 | 6.667  13.21| 9.75   2.03
       0.583  2.03 | 3.667  3.05 | 6.750  13.21| 9.83   2.03
       0.667  2.03 | 3.750  3.05 | 6.833   6.10| 9.92   2.03
       0.750  2.03 | 3.833  3.05 | 6.917   6.10|10.00   2.03
       0.833  1.02 | 3.917  3.05 | 7.000   6.10|10.08   2.03
       0.917  1.02 | 4.000  3.05 | 7.083   6.10|10.17   2.03
       1.000  1.02 | 4.083  3.05 | 7.167   6.10|10.25   2.03
       1.083  2.03 | 4.167  3.05 | 7.250   6.10|10.33   2.03
       1.167  2.03 | 4.250  3.05 | 7.333   5.08|10.42   2.03
       1.250  2.03 | 4.333  5.08 | 7.417   5.08|10.50   2.03
       1.333  1.02 | 4.417  5.08 | 7.500   5.08|10.58   1.02
       1.417  1.02 | 4.500  5.08 | 7.583   4.06|10.67   1.02
       1.500  1.02 | 4.583  5.08 | 7.667   4.06|10.75   1.02
       1.583  2.03 | 4.667  5.08 | 7.750   4.06|10.83   2.03
       1.667  2.03 | 4.750  5.08 | 7.833   4.06|10.92   2.03
       1.750  2.03 | 4.833  6.10 | 7.917   4.06|11.00   2.03
       1.833  1.02 | 4.917  6.10 | 8.000   4.06|11.08   1.02
       1.917  1.02 | 5.000  6.10 | 8.083   5.08|11.17   1.02
       2.000  1.02 | 5.083  5.08 | 8.167   5.08|11.25   1.02
       2.083  2.03 | 5.167  5.08 | 8.250   5.08|11.33   2.03
       2.167  2.03 | 5.250  5.08 | 8.333   3.05|11.42   2.03
       2.250  2.03 | 5.333  8.13 | 8.417   3.05|11.50   2.03
       2.333  3.05 | 5.417  8.13 | 8.500   3.05|11.58   1.02
       2.417  3.05 | 5.500  8.13 | 8.583   3.05|11.67   1.02
       2.500  3.05 | 5.583  9.14 | 8.667   3.05|11.75   1.02
       2.583  2.03 | 5.667  9.14 | 8.750   3.05|11.83   2.03
       2.667  2.03 | 5.750  9.15 | 8.833   3.05|11.92   2.03
       2.750  2.03 | 5.833 67.06 | 8.917   3.05|12.00   2.03
       2.833  3.05 | 5.917 67.06 | 9.000   3.05|12.08   1.02
       2.917  3.05 | 6.000 67.06 | 9.083   2.03|12.17   1.02
       3.000  3.05 | 6.083 67.06 | 9.167   2.03|12.25   1.02
       3.083  2.03 | 6.167 67.06 | 9.250   2.03|
```

LangstaffRd_EA_Proposed_WestDonWatershd

```
  Max.Eff.Inten.(mm/hr)=      67.06          46.22
            over (min)         5.00          10.00
  Storage Coeff.  (min)=       5.19 (ii)      8.94 (ii)
  Unit Hyd. Tpeak (min)=       5.00          10.00
  Unit Hyd. peak  (cms)=       0.21           0.12
                                                           *TOTALS*
  PEAK FLOW       (cms)=       0.08           0.02      0.099 (iii)
  TIME TO PEAK    (hrs)=       6.25           6.25       6.25
  RUNOFF VOLUME   (mm)=       72.42          39.68      63.24
  TOTAL RAINFALL  (mm)=       74.42          74.42      74.42
  RUNOFF COEFFICIENT  =        0.97           0.53       0.85
```

```
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0   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 ( 0170)|  Area    (ha)=  0.43
|ID= 1 DT= 5.0 min |  Total Imp(%)= 98.00  Dir. Conn.(%)= 98.00
--------------------
                              IMPERVIOUS     PERVIOUS (i)
  Surface Area    (ha)=        0.42           0.01
  Dep. Storage    (mm)=        2.00           5.00
  Average Slope   (%)=         1.00           2.00
  Length          (m)=       250.00          20.00
  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 | 3.167  2.03 | 6.250  67.05| 9.33   3.05
       0.167  0.00 | 3.250  2.03 | 6.333  13.21| 9.42   3.05
       0.250  0.00 | 3.333  3.05 | 6.417  13.21| 9.50   3.05
       0.333  1.02 | 3.417  3.05 | 6.500  13.21| 9.58   2.03
       0.417  1.02 | 3.500  3.05 | 6.583  13.21| 9.67   2.03
       0.500  1.02 | 3.583  3.05 | 6.667  13.21| 9.75   2.03
       0.583  2.03 | 3.667  3.05 | 6.750  13.21| 9.83   2.03
       0.667  2.03 | 3.750  3.05 | 6.833   6.10| 9.92   2.03
       0.750  2.03 | 3.833  3.05 | 6.917   6.10|10.00   2.03
       0.833  1.02 | 3.917  3.05 | 7.000   6.10|10.08   2.03
       0.917  1.02 | 4.000  3.05 | 7.083   6.10|10.17   2.03
       1.000  1.02 | 4.083  3.05 | 7.167   6.10|10.25   2.03
       1.083  2.03 | 4.167  3.05 | 7.250   6.10|10.33   2.03
       1.167  2.03 | 4.250  3.05 | 7.333   5.08|10.42   2.03
       1.250  2.03 | 4.333  5.08 | 7.417   5.08|10.50   2.03
```

1.333	1.02	4.417	5.08	7.500	5.08	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	5.08	7.667	4.06	10.75	1.02
1.583	2.03	4.667	5.08	7.750	4.06	10.83	2.03
1.667	2.03	4.750	5.08	7.833	4.06	10.92	2.03
1.750	2.03	4.833	6.10	7.917	4.06	11.00	2.03
1.833	1.02	4.917	6.10	8.000	4.06	11.08	1.02
1.917	1.02	5.000	6.10	8.083	5.08	11.17	1.02
2.000	1.02	5.083	5.08	8.167	5.08	11.25	1.02
2.083	2.03	5.167	5.08	8.250	5.08	11.33	2.03
2.167	2.03	5.250	5.08	8.333	3.05	11.42	2.03
2.250	2.03	5.333	8.13	8.417	3.05	11.50	2.03
2.333	3.05	5.417	8.13	8.500	3.05	11.58	1.02
2.417	3.05	5.500	8.13	8.583	3.05	11.67	1.02
2.500	3.05	5.583	9.14	8.667	3.05	11.75	1.02
2.583	3.05	5.667	9.14	8.750	3.05	11.83	2.03
2.667	3.05	5.750	9.15	8.833	3.05	11.92	2.03
2.750	3.05	5.833	67.06	8.917	3.05	12.00	2.03
2.833	3.05	5.917	67.06	9.000	3.05	12.08	1.02
2.917	3.05	6.000	67.06	9.083	2.03	12.17	1.02
3.000	3.05	6.083	67.06	9.167	2.03	12.25	1.02
3.083	2.03	6.167	67.06	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=          67.06          54.54
          over (min)            5.00          10.00
Storage Coeff.  (min)=          5.19 (ii)      6.35 (ii)
Unit Hyd. Tpeak (min)=          5.00          10.00
Unit Hyd. peak  (cms)=          0.21           0.15
                                                          *TOTALS*
PEAK FLOW       (cms)=          0.08           0.00          0.080 (iii)
TIME TO PEAK    (hrs)=          6.25           6.25          6.25
RUNOFF VOLUME    (mm)=         72.42          47.80         71.92
TOTAL RAINFALL   (mm)=         74.42          74.42         74.42
RUNOFF COEFFICIENT  =           0.97           0.64          0.97


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 89.0    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 ( 0180)|   Area    (ha)=  0.65
|ID= 1 DT= 5.0 min |   Total Imp(%)= 52.00   Dir. Conn.(%)= 52.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=     0.34          0.31
    Dep. Storage   (mm)=     2.00          5.00
    Average Slope  (%)=      1.00          2.00
    Length         (m)=     65.83         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	3.167	2.03		6.250	67.05	9.33	3.05
0.167	0.00	3.250	2.03		6.333	13.21	9.42	3.05
0.250	0.00	3.333	3.05		6.417	13.21	9.50	3.05
0.333	1.02	3.417	3.05		6.500	13.21	9.58	2.03
0.417	1.02	3.500	3.05		6.583	13.21	9.67	2.03
0.500	1.02	3.583	3.05		6.667	13.21	9.75	2.03
0.583	2.03	3.667	3.05		6.750	13.21	9.83	2.03
0.667	2.03	3.750	3.05		6.833	6.10	9.92	2.03
0.750	2.03	3.833	3.05		6.917	6.10	10.00	2.03
0.833	1.02	3.917	3.05		7.000	6.10	10.08	2.03
0.917	1.02	4.000	3.05		7.083	6.10	10.17	2.03
1.000	1.02	4.083	3.05		7.167	6.10	10.25	2.03
1.083	2.03	4.167	3.05		7.250	6.10	10.33	2.03
1.167	2.03	4.250	3.05		7.333	5.08	10.42	2.03
1.250	2.03	4.333	5.08		7.417	5.08	10.50	2.03
1.333	1.02	4.417	5.08		7.500	5.08	10.58	1.02
1.417	1.02	4.500	5.08		7.583	4.06	10.67	1.02
1.500	1.02	4.583	5.08		7.667	4.06	10.75	1.02
1.583	2.03	4.667	5.08		7.750	4.06	10.83	2.03
1.667	2.03	4.750	5.08		7.833	4.06	10.92	2.03
1.750	2.03	4.833	6.10		7.917	4.06	11.00	2.03
1.833	1.02	4.917	6.10		8.000	4.06	11.08	1.02
1.917	1.02	5.000	6.10		8.083	5.08	11.17	1.02
2.000	1.02	5.083	5.08		8.167	5.08	11.25	1.02
2.083	2.03	5.167	5.08		8.250	5.08	11.33	2.03
2.167	2.03	5.250	5.08		8.333	3.05	11.42	2.03
2.250	2.03	5.333	8.13		8.417	3.05	11.50	2.03
2.333	3.05	5.417	8.13		8.500	3.05	11.58	1.02
2.417	3.05	5.500	8.13		8.583	3.05	11.67	1.02
2.500	3.05	5.583	9.14		8.667	3.05	11.75	1.02
2.583	3.05	5.667	9.14		8.750	3.05	11.83	2.03
2.667	3.05	5.750	9.15		8.833	3.05	11.92	2.03
2.750	3.05	5.833	67.06		8.917	3.05	12.00	2.03
2.833	3.05	5.917	67.06		9.000	3.05	12.08	1.02
2.917	3.05	6.000	67.06		9.083	2.03	12.17	1.02
3.000	3.05	6.083	67.06		9.167	2.03	12.25	1.02
3.083	2.03	6.167	67.06		9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=          67.06          46.22
          over (min)            5.00          15.00
Storage Coeff.  (min)=          2.33 (ii)     11.94 (ii)
Unit Hyd. Tpeak (min)=          5.00          15.00
Unit Hyd. peak  (cms)=          0.30           0.09
                                                          *TOTALS*
PEAK FLOW       (cms)=          0.06           0.03          0.093 (iii)
```

```
TIME TO PEAK    (hrs)=          6.17           6.33          6.25
RUNOFF VOLUME    (mm)=         72.42          39.68         56.70
TOTAL RAINFALL   (mm)=         74.42          74.42         74.42
RUNOFF COEFFICIENT  =           0.97           0.53          0.76

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

    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0    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 ( 0185)|   Area    (ha)=  0.47
|ID= 1 DT= 5.0 min |   Total Imp(%)= 72.00   Dir. Conn.(%)= 72.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=     0.34          0.13
    Dep. Storage   (mm)=     2.00          5.00
    Average Slope  (%)=      1.00          2.00
    Length         (m)=    240.00         20.00
    Mannings n     =        0.013         0.350

   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	2.03		6.250	67.05	9.33	3.05
0.167	0.00	3.250	2.03		6.333	13.21	9.42	3.05
0.250	0.00	3.333	3.05		6.417	13.21	9.50	3.05
0.333	1.02	3.417	3.05		6.500	13.21	9.58	2.03
0.417	1.02	3.500	3.05		6.583	13.21	9.67	2.03
0.500	1.02	3.583	3.05		6.667	13.21	9.75	2.03
0.583	2.03	3.667	3.05		6.750	13.21	9.83	2.03
0.667	2.03	3.750	3.05		6.833	6.10	9.92	2.03
0.750	2.03	3.833	3.05		6.917	6.10	10.00	2.03
0.833	1.02	3.917	3.05		7.000	6.10	10.08	2.03
0.917	1.02	4.000	3.05		7.083	6.10	10.17	2.03
1.000	1.02	4.083	3.05		7.167	6.10	10.25	2.03
1.083	2.03	4.167	3.05		7.250	6.10	10.33	2.03
1.167	2.03	4.250	3.05		7.333	5.08	10.42	2.03
1.250	2.03	4.333	5.08		7.417	5.08	10.50	2.03
1.333	1.02	4.417	5.08		7.500	5.08	10.58	1.02
1.417	1.02	4.500	5.08		7.583	4.06	10.67	1.02
1.500	1.02	4.583	5.08		7.667	4.06	10.75	1.02
1.583	2.03	4.667	5.08		7.750	4.06	10.83	2.03
1.667	2.03	4.750	5.08		7.833	4.06	10.92	2.03
1.750	2.03	4.833	6.10		7.917	4.06	11.00	2.03

1.833	1.02	4.917	6.10	8.000	4.06	11.08	1.02
1.917	1.02	5.000	6.10	8.083	5.08	11.17	1.02
2.000	1.02	5.083	5.08	8.167	5.08	11.25	1.02
2.083	2.03	5.167	5.08	8.250	5.08	11.33	2.03
2.167	2.03	5.250	5.08	8.333	3.05	11.42	2.03
2.250	2.03	5.333	8.13	8.417	3.05	11.50	2.03
2.333	3.05	5.417	8.13	8.500	3.05	11.58	1.02
2.417	3.05	5.500	8.13	8.583	3.05	11.67	1.02
2.500	3.05	5.583	9.14	8.667	3.05	11.75	1.02
2.583	3.05	5.667	9.14	8.750	3.05	11.83	2.03
2.667	3.05	5.750	9.15	8.833	3.05	11.92	2.03
2.750	3.05	5.833	67.06	8.917	3.05	12.00	2.03
2.833	3.05	5.917	67.06	9.000	3.05	12.08	1.02
2.917	3.05	6.000	67.06	9.083	2.03	12.17	1.02
3.000	3.05	6.083	67.06	9.167	2.03	12.25	1.02
3.083	2.03	6.167	67.06	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=          67.06          41.26
          over (min)            5.00          10.00
Storage Coeff.  (min)=          5.07 (ii)      9.65 (ii)
Unit Hyd. Tpeak (min)=          5.00          10.00
Unit Hyd. peak  (cms)=          0.21           0.11
                                                          *TOTALS*
PEAK FLOW       (cms)=          0.06           0.01          0.076 (iii)
TIME TO PEAK    (hrs)=          6.25           6.25          6.25
RUNOFF VOLUME    (mm)=         72.42          35.19         61.99
TOTAL RAINFALL   (mm)=         74.42          74.42         74.42
RUNOFF COEFFICIENT  =           0.97           0.47           0.83


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 79.0    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  ( 0445)|
|   1 + 2 = 3      |         AREA    QPEAK    TPEAK     R.V.
--------------------                (ha)    (cms)    (hrs)     (mm)
      ID1= 1 ( 0180):        0.65    0.093    6.25     56.70
    + ID2= 2 ( 0185):        0.47    0.076    6.25     61.99
      ==================================================
      ID = 3 ( 0445):        1.12    0.169    6.25     58.92

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  ( 0450)|
|   1 + 2 = 3      |         AREA    QPEAK    TPEAK     R.V.
```

LangstaffRd_EA_Proposed_WestDonWatershd
--------------------   (ha)   (cms)   (hrs)   (mm)
   ID1= 1 (0165):   0.60   0.099   6.25   63.24
 + ID2= 2 (0170):   0.43   0.080   6.25   71.92
   ===
   ID = 3 (0450):   1.03   0.179   6.25   66.87

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0450)|
| 3 + 2 = 1 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
   ID1= 3 (0450):   1.03   0.179   6.25   66.87
 + ID2= 2 (0445):   1.12   0.169   6.25   58.92
   ===
   ID = 1 (0450):   2.15   0.348   6.25   62.73

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| RESERVOIR(0520)| 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 | 0.0181   0.0552
                       0.0081   0.0048 | 0.0203   0.0732
                       0.0123   0.0192 | 0.0224   0.1152
                       0.0155   0.0372 | 0.0000   0.0000

                         AREA   QPEAK   TPEAK   R.V.
                         (ha)   (cms)   (hrs)   (mm)
   INFLOW : ID= 2 (0450)   2.150   0.348   6.25   62.73
   OUTFLOW: ID= 1 (0520)   2.150   0.021   8.33   62.66

          PEAK   FLOW   REDUCTION [Qout/Qin](%)= 6.08
          TIME SHIFT OF PEAK FLOW   (min)=125.00
          MAXIMUM STORAGE   USED   (ha.m.)= 0.0899

| CALIB |
| STANDHYD (0145)| Area   (ha)= 3.05
|ID= 1 DT= 5.0 min | Total Imp(%)= 76.00   Dir. Conn.(%)= 76.00

                         IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=   2.32   0.73
     Dep. Storage   (mm)=   2.00   5.00
     Average Slope   (%)=   1.00   2.00
     Length   (m)= 531.00   40.00
     Mannings n   =   0.013   0.250

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

Page 105

                    LangstaffRd_EA_Proposed_WestDonWatershd

                      ---- 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 2.03 | 6.250 67.05 | 9.33   3.05
         0.167   0.00 | 3.250 2.03 | 6.333 13.21 | 9.42   3.05
         0.250   0.00 | 3.333 3.05 | 6.417 13.21 | 9.50   3.05
         0.333   1.02 | 3.417 3.05 | 6.500 13.21 | 9.58   2.03
         0.417   1.02 | 3.500 3.05 | 6.583 13.21 | 9.67   2.03
         0.500   1.02 | 3.583 3.05 | 6.667 13.21 | 9.75   2.03
         0.583   2.03 | 3.667 3.05 | 6.750 13.21 | 9.83   2.03
         0.667   2.03 | 3.750 3.05 | 6.833   6.10 | 9.92   2.03
         0.750   2.03 | 3.833 3.05 | 6.917   6.10 | 10.00 2.03
         0.833   1.02 | 3.917 3.05 | 7.000   6.10 | 10.08 2.03
         0.917   1.02 | 4.000 3.05 | 7.083   6.10 | 10.17 2.03
         1.000   1.02 | 4.083 3.05 | 7.167   6.10 | 10.25 2.03
         1.083   2.03 | 4.167 3.05 | 7.250   6.10 | 10.33 2.03
         1.167   2.03 | 4.250 3.05 | 7.333   5.08 | 10.42 2.03
         1.250   2.03 | 4.333 5.08 | 7.417   5.08 | 10.50 2.03
         1.333   1.02 | 4.417 5.08 | 7.500   5.08 | 10.58 1.02
         1.417   1.02 | 4.500 5.08 | 7.583   4.06 | 10.67 1.02
         1.500   1.02 | 4.583 5.08 | 7.667   4.06 | 10.75 1.02
         1.583   2.03 | 4.667 5.08 | 7.750   4.06 | 10.83 2.03
         1.667   2.03 | 4.750 5.08 | 7.833   4.06 | 10.92 2.03
         1.750   2.03 | 4.833 6.10 | 7.917   4.06 | 11.00 2.03
         1.833   1.02 | 4.917 6.10 | 8.000   4.06 | 11.08 1.02
         1.917   1.02 | 5.000 6.10 | 8.083   5.08 | 11.17 1.02
         2.000   1.02 | 5.083 5.08 | 8.167   5.08 | 11.25 1.02
         2.083   2.03 | 5.167 5.08 | 8.250   5.08 | 11.33 2.03
         2.167   2.03 | 5.250 5.08 | 8.333   3.05 | 11.42 2.03
         2.250   2.03 | 5.333 5.08 | 8.417   3.05 | 11.50 2.03
         2.333   1.02 | 5.417 8.13 | 8.500   3.05 | 11.58 1.02
         2.417   3.05 | 5.500 8.13 | 8.583   3.05 | 11.67 1.02
         2.500   3.05 | 5.583 9.14 | 8.667   3.05 | 11.75 1.02
         2.583   3.05 | 5.667 9.14 | 8.750   3.05 | 11.83 2.03
         2.667   3.05 | 5.750 9.15 | 8.833   3.05 | 11.92 2.03
         2.750   3.05 | 5.833 67.06 | 8.917   3.05 | 12.00 2.03
         2.833   3.05 | 5.917 67.06 | 9.000   3.05 | 12.08 1.02
         2.917   3.05 | 6.000 67.06 | 9.083   2.03 | 12.17 1.02
         3.000   3.05 | 6.083 67.06 | 9.167   2.03 | 12.25 1.02
         3.083   2.03 | 6.167 67.06 | 9.250   2.03 |

   Max.Eff.Inten.(mm/hr)=   67.06   50.27
              over (min)   10.00   20.00
   Storage Coeff. (min)=   8.16 (ii)   17.46 (ii)
   Unit Hyd. Tpeak (min)=   10.00   20.00
   Unit Hyd. peak (cms)=   0.13   0.06
                                                 TOTALS
   PEAK FLOW   (cms)=   0.42   0.07   0.479 (iii)
   TIME TO PEAK   (hrs)=   6.25   6.42   6.25
   RUNOFF VOLUME   (mm)=   72.42   43.51   65.48
   TOTAL RAINFALL   (mm)=   74.42   74.42   74.42

Page 106

                    LangstaffRd_EA_Proposed_WestDonWatershd
   RUNOFF COEFFICIENT =   0.97   0.58   0.88

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 86.0   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 (0135)| Area   (ha)= 1.43
|ID= 1 DT= 5.0 min | Total Imp(%)= 99.00   Dir. Conn.(%)= 99.00

                         IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=   1.42   0.01
     Dep. Storage   (mm)=   2.00   5.00
     Average Slope   (%)=   1.00   2.00
     Length   (m)= 503.00   30.00
     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 | 3.167 2.03 | 6.250 67.05 | 9.33   3.05
         0.167   0.00 | 3.250 2.03 | 6.333 13.21 | 9.42   3.05
         0.250   0.00 | 3.333 3.05 | 6.417 13.21 | 9.50   3.05
         0.333   1.02 | 3.417 3.05 | 6.500 13.21 | 9.58   2.03
         0.417   1.02 | 3.500 3.05 | 6.583 13.21 | 9.67   2.03
         0.500   1.02 | 3.583 3.05 | 6.667 13.21 | 9.75   2.03
         0.583   2.03 | 3.667 3.05 | 6.750 13.21 | 9.83   2.03
         0.667   2.03 | 3.750 3.05 | 6.833   6.10 | 9.92   2.03
         0.750   2.03 | 3.833 3.05 | 6.917   6.10 | 10.00 2.03
         0.833   1.02 | 3.917 3.05 | 7.000   6.10 | 10.08 2.03
         0.917   1.02 | 4.000 3.05 | 7.083   6.10 | 10.17 2.03
         1.000   1.02 | 4.083 3.05 | 7.167   6.10 | 10.25 2.03
         1.083   2.03 | 4.167 3.05 | 7.250   6.10 | 10.33 2.03
         1.167   2.03 | 4.250 3.05 | 7.333   5.08 | 10.42 2.03
         1.250   2.03 | 4.333 5.08 | 7.417   5.08 | 10.50 2.03
         1.333   1.02 | 4.417 5.08 | 7.500   5.08 | 10.58 1.02
         1.417   1.02 | 4.500 5.08 | 7.583   4.06 | 10.67 1.02
         1.500   1.02 | 4.583 5.08 | 7.667   4.06 | 10.75 1.02
         1.583   2.03 | 4.667 5.08 | 7.750   4.06 | 10.83 2.03
         1.667   2.03 | 4.750 5.08 | 7.833   4.06 | 10.92 2.03
         1.750   2.03 | 4.833 6.10 | 7.917   4.06 | 11.00 2.03
         1.833   1.02 | 4.917 6.10 | 8.000   4.06 | 11.08 1.02
         1.917   1.02 | 5.000 6.10 | 8.083   5.08 | 11.17 1.02
         2.000   1.02 | 5.083 5.08 | 8.167   5.08 | 11.25 1.02
         2.083   2.03 | 5.167 5.08 | 8.250   5.08 | 11.33 2.03

Page 107

                    LangstaffRd_EA_Proposed_WestDonWatershd
         2.167   2.03 | 5.250 5.08 | 8.333   3.05 | 11.42 2.03
         2.250   2.03 | 5.333 8.13 | 8.417   3.05 | 11.50 2.03
         2.333   3.05 | 5.417 8.13 | 8.500   3.05 | 11.58 1.02
         2.417   3.05 | 5.500 8.13 | 8.583   3.05 | 11.67 1.02
         2.500   3.05 | 5.583 9.14 | 8.667   3.05 | 11.75 1.02
         2.583   3.05 | 5.667 9.14 | 8.750   3.05 | 11.83 2.03
         2.667   3.05 | 5.750 9.15 | 8.833   3.05 | 11.92 2.03
         2.750   3.05 | 5.833 67.06 | 8.917   3.05 | 12.00 2.03
         2.833   3.05 | 5.917 67.06 | 9.000   3.05 | 12.08 1.02
         2.917   3.05 | 6.000 67.06 | 9.083   2.03 | 12.17 1.02
         3.000   3.05 | 6.083 67.06 | 9.167   2.03 | 12.25 1.02
         3.083   2.03 | 6.167 67.06 | 9.250   2.03 |

   Max.Eff.Inten.(mm/hr)=   67.06   47.54
              over (min)   10.00   10.00
   Storage Coeff. (min)=   7.90 (ii)   9.01 (ii)
   Unit Hyd. Tpeak (min)=   10.00   10.00
   Unit Hyd. peak (cms)=   0.13   0.12
                                                 TOTALS
   PEAK FLOW   (cms)=   0.26   0.00   0.258 (iii)
   TIME TO PEAK   (hrs)=   6.25   6.25   6.25
   RUNOFF VOLUME   (mm)=   72.42   40.91   72.10
   TOTAL RAINFALL   (mm)=   74.42   74.42   74.42
   RUNOFF COEFFICIENT =   0.97   0.55   0.97

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 84.0   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 (0140)| Area   (ha)= 1.27
|ID= 1 DT= 5.0 min | Total Imp(%)= 91.00   Dir. Conn.(%)= 91.00

                         IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=   1.16   0.11
     Dep. Storage   (mm)=   2.00   5.00
     Average Slope   (%)=   1.00   2.00
     Length   (m)= 503.00   25.00
     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 | 3.167 2.03 | 6.250 67.05 | 9.33   3.05
         0.167   0.00 | 3.250 2.03 | 6.333 13.21 | 9.42   3.05

Page 108

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              0.250   0.00 | 3.333   3.05 | 6.417  13.21 |  9.50   3.05
              0.333   1.02 | 3.417   3.05 | 6.500  13.21 |  9.58   2.03
              0.417   1.02 | 3.500   3.05 | 6.583  13.21 |  9.67   2.03
              0.500   1.02 | 3.583   3.05 | 6.667  13.21 |  9.75   2.03
              0.583   2.03 | 3.667   3.05 | 6.750  13.21 |  9.83   2.03
              0.667   2.03 | 3.750   3.05 | 6.833   6.10 |  9.92   2.03
              0.750   2.03 | 3.833   3.05 | 6.917   6.10 | 10.00   2.03
              0.833   1.02 | 3.917   3.05 | 7.000   6.10 | 10.08   2.03
              0.917   1.02 | 4.000   3.05 | 7.083   6.10 | 10.17   2.03
              1.000   1.02 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
              1.083   2.03 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
              1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
              1.250   2.03 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
              1.333   1.02 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
              1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67   1.02
              1.500   1.02 | 4.583   5.08 | 7.667   4.06 | 10.75   1.02
              1.583   2.03 | 4.667   5.08 | 7.750   4.06 | 10.83   2.03
              1.667   2.03 | 4.750   5.08 | 7.833   4.06 | 10.92   2.03
              1.750   2.03 | 4.833   6.10 | 7.917   4.06 | 11.00   2.03
              1.833   1.02 | 4.917   6.10 | 8.000   4.06 | 11.08   1.02
              1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17   1.02
              2.000   1.02 | 5.083   5.08 | 8.167   5.08 | 11.25   1.02
              2.083   2.03 | 5.167   5.08 | 8.250   5.08 | 11.33   2.03
              2.167   2.03 | 5.250   5.08 | 8.333   3.05 | 11.42   2.03
              2.250   2.03 | 5.333   8.13 | 8.417   3.05 | 11.50   2.03
              2.333   3.05 | 5.417   8.13 | 8.500   3.05 | 11.58   1.02
              2.417   3.05 | 5.500   8.13 | 8.583   3.05 | 11.67   1.02
              2.500   3.05 | 5.583   9.14 | 8.667   3.05 | 11.75   1.02
              2.583   3.05 | 5.667   9.14 | 8.750   3.05 | 11.83   2.03
              2.667   3.05 | 5.750   9.15 | 8.833   3.05 | 11.92   2.03
              2.750   3.05 | 5.833  67.06 | 8.917   3.05 | 12.00   2.03
              2.833   3.05 | 5.917  67.06 | 9.000   3.05 | 12.08   1.02
              2.917   3.05 | 6.000  67.06 | 9.083   2.03 | 12.17   1.02
              3.000   3.05 | 6.083  67.06 | 9.167   2.03 | 12.25   1.02
              3.083   2.03 | 6.167  67.06 | 9.250   2.03 |

        Max.Eff.Inten.(mm/hr)=     67.06          46.22
                 over (min)        10.00          15.00
        Storage Coeff.  (min)=      7.90 (ii)     10.38 (ii)
        Unit Hyd. Tpeak (min)=     10.00          15.00
        Unit Hyd. peak  (cms)=      0.13           0.09
                                                          *TOTALS*
        PEAK FLOW       (cms)=      0.21           0.01      0.220 (iii)
        TIME TO PEAK    (hrs)=      6.25           6.33      6.25
        RUNOFF VOLUME   (mm)=      72.42          39.68     69.47
        TOTAL RAINFALL  (mm)=      74.42          74.42     74.42
        RUNOFF COEFFICIENT  =       0.97           0.53      0.93


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  83.0    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 ( 0420)|
|  1 + 2 = 3     |              AREA    QPEAK    TPEAK    R.V.
--------------------             (ha)    (cms)    (hrs)    (mm)
             ID1= 1 ( 0135):     1.43    0.258     6.25   72.10
           + ID2= 2 ( 0140):     1.27    0.220     6.25   69.47
                               ======================================
             ID = 3 ( 0420):     2.70    0.478     6.25   70.86

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

--------------------
| RESERVOIR( 0530)|     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   |   0.0122    0.0823
                        0.0056    0.0072   |   0.0382    0.1093
                        0.0084    0.0283   |   0.0516    0.1598
                        0.0105    0.0553   |   0.0000    0.0000

                                AREA    QPEAK    TPEAK    R.V.
                                (ha)    (cms)    (hrs)    (mm)
       INFLOW : ID= 2 ( 0420)   2.700    0.478     6.25   70.86
       OUTFLOW: ID= 1 ( 0530)   2.700    0.044     7.33   70.75

             PEAK  FLOW  REDUCTION [Qout/Qin](%)= 9.16
             TIME SHIFT OF PEAK FLOW      (min)= 65.00
             MAXIMUM STORAGE  USED   (ha.m.)= 0.1303

------------------------------------------------------------------------------

--------------------
| ADD HYD ( 0425)|
|  1 + 2 = 3     |              AREA    QPEAK    TPEAK    R.V.
--------------------             (ha)    (cms)    (hrs)    (mm)
             ID1= 1 ( 0145):     3.05    0.479     6.25   65.48
           + ID2= 2 ( 0530):     2.70    0.044     7.33   70.75
                               ======================================
             ID = 3 ( 0425):     5.75    0.498     6.25   67.95

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

--------------------
| RESERVOIR( 0512)|     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   |   0.0471    0.1003
```

```
                        0.0071    0.0165   |   0.0636    0.1284
                        0.0098    0.0331   |   0.0763    0.1594
                        0.0119    0.0526   |   0.0870    0.1934
                        0.0138    0.0750   |   0.0964    0.2308

                                AREA    QPEAK    TPEAK    R.V.
                                (ha)    (cms)    (hrs)    (mm)
       INFLOW : ID= 2 ( 0425)   5.750    0.498     6.25   67.95
       OUTFLOW: ID= 1 ( 0512)   5.750    0.074     8.50   67.85

             PEAK  FLOW  REDUCTION [Qout/Qin](%)= 14.79
             TIME SHIFT OF PEAK FLOW      (min)=135.00
             MAXIMUM STORAGE  USED   (ha.m.)= 0.1531

------------------------------------------------------------------------------

--------------------
| CALIB          |
| STANDHYD ( 0215)|   Area   (ha)=  0.58
|ID= 1 DT= 5.0 min |   Total Imp(%)= 81.00   Dir. Conn.(%)= 81.00
--------------------

                            IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=    0.47          0.11
        Dep. Storage   (mm)=    2.00          5.00
        Average Slope  (%)=     1.00          2.00
        Length         (m)=   260.00         30.00
        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 | 3.167   2.03 | 6.250  67.05 |  9.33   3.05
          0.167   0.00 | 3.250   2.03 | 6.333  13.21 |  9.42   3.05
          0.250   0.00 | 3.333   3.05 | 6.417  13.21 |  9.50   3.05
          0.333   1.02 | 3.417   3.05 | 6.500  13.21 |  9.58   2.03
          0.417   1.02 | 3.500   3.05 | 6.583  13.21 |  9.67   2.03
          0.500   1.02 | 3.583   3.05 | 6.667  13.21 |  9.75   2.03
          0.583   2.03 | 3.667   3.05 | 6.750  13.21 |  9.83   2.03
          0.667   2.03 | 3.750   3.05 | 6.833   6.10 |  9.92   2.03
          0.750   2.03 | 3.833   3.05 | 6.917   6.10 | 10.00   2.03
          0.833   1.02 | 3.917   3.05 | 7.000   6.10 | 10.08   2.03
          0.917   1.02 | 4.000   3.05 | 7.083   6.10 | 10.17   2.03
          1.000   1.02 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
          1.083   2.03 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
          1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
          1.250   2.03 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
          1.333   1.02 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
          1.417   1.02 | 4.500   5.08 | 7.583   4.06 | 10.67   1.02
          1.500   1.02 | 4.583   5.08 | 7.667   4.06 | 10.75   1.02
          1.583   2.03 | 4.667   5.08 | 7.750   4.06 | 10.83   2.03
          1.667   2.03 | 4.750   5.08 | 7.833   4.06 | 10.92   2.03
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          1.750   2.03 | 4.833   6.10 | 7.917   4.06 | 11.00   2.03
          1.833   1.02 | 4.917   6.10 | 8.000   4.06 | 11.08   1.02
          1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17   1.02
          2.000   1.02 | 5.083   5.08 | 8.167   5.08 | 11.25   1.02
          2.083   2.03 | 5.167   5.08 | 8.250   5.08 | 11.33   2.03
          2.167   2.03 | 5.250   5.08 | 8.333   3.05 | 11.42   2.03
          2.250   2.03 | 5.333   8.13 | 8.417   3.05 | 11.50   2.03
          2.333   3.05 | 5.417   8.13 | 8.500   3.05 | 11.58   1.02
          2.417   3.05 | 5.500   8.13 | 8.583   3.05 | 11.67   1.02
          2.500   3.05 | 5.583   9.14 | 8.667   3.05 | 11.75   1.02
          2.583   3.05 | 5.667   9.14 | 8.750   3.05 | 11.83   2.03
          2.667   3.05 | 5.750   9.15 | 8.833   3.05 | 11.92   2.03
          2.750   3.05 | 5.833  67.06 | 8.917   3.05 | 12.00   2.03
          2.833   3.05 | 5.917  67.06 | 9.000   3.05 | 12.08   1.02
          2.917   3.05 | 6.000  67.06 | 9.083   2.03 | 12.17   1.02
          3.000   3.05 | 6.083  67.06 | 9.167   2.03 | 12.25   1.02
          3.083   2.03 | 6.167  67.06 | 9.250   2.03 |

        Max.Eff.Inten.(mm/hr)=     67.06          46.22
                 over (min)        5.00           10.00
        Storage Coeff.  (min)=      5.32 (ii)      9.22 (ii)
        Unit Hyd. Tpeak (min)=      5.00          10.00
        Unit Hyd. peak  (cms)=      0.21           0.12
                                                          *TOTALS*
        PEAK FLOW       (cms)=      0.09           0.01      0.100 (iii)
        TIME TO PEAK    (hrs)=      6.25           6.25      6.25
        RUNOFF VOLUME   (mm)=      72.42          39.68     66.19
        TOTAL RAINFALL  (mm)=      74.42          74.42     74.42
        RUNOFF COEFFICIENT  =       0.97           0.53      0.89


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  83.0    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 ( 0220)|   Area   (ha)=  0.65
|ID= 1 DT= 5.0 min |   Total Imp(%)= 66.00   Dir. Conn.(%)= 66.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=    0.43          0.22
        Dep. Storage   (mm)=    2.00          5.00
        Average Slope  (%)=     1.00          2.00
        Length         (m)=   260.00         20.00
        Mannings n      =       0.013         0.250

        NOTE: RAINFALL WAS TRANSFORMED TO  5.0 MIN. TIME STEP.
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                    LangstaffRd_EA_Proposed_WestDonWatershd
                       ---- 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  2.03 | 6.250  67.05 | 9.33   3.05
          0.167  0.00 | 3.250  2.03 | 6.333  13.21 | 9.42   3.05
          0.250  0.00 | 3.333  3.05 | 6.417  13.21 | 9.50   3.05
          0.333  1.02 | 3.417  3.05 | 6.500  13.21 | 9.58   2.03
          0.417  1.02 | 3.500  3.05 | 6.583  13.21 | 9.67   2.03
          0.500  1.02 | 3.583  3.05 | 6.667  13.21 | 9.75   2.03
          0.583  2.03 | 3.667  3.05 | 6.750  13.21 | 9.83   2.03
          0.667  2.03 | 3.750  3.05 | 6.833  6.10 | 9.92   2.03
          0.750  2.03 | 3.833  3.05 | 6.917  6.10 | 10.00  2.03
          0.833  1.02 | 3.917  3.05 | 7.000  6.10 | 10.08  2.03
          0.917  1.02 | 4.000  3.05 | 7.083  6.10 | 10.17  2.03
          1.000  1.02 | 4.083  3.05 | 7.167  6.10 | 10.25  2.03
          1.083  2.03 | 4.167  3.05 | 7.250  6.10 | 10.33  2.03
          1.167  2.03 | 4.250  3.05 | 7.333  5.08 | 10.42  2.03
          1.250  2.03 | 4.333  5.08 | 7.417  5.08 | 10.50  2.03
          1.333  1.02 | 4.417  5.08 | 7.500  5.08 | 10.58  1.02
          1.417  1.02 | 4.500  5.08 | 7.583  4.06 | 10.67  1.02
          1.500  1.02 | 4.583  5.08 | 7.667  4.06 | 10.75  1.02
          1.583  2.03 | 4.667  5.08 | 7.750  4.06 | 10.83  2.03
          1.667  2.03 | 4.750  5.08 | 7.833  4.06 | 10.92  2.03
          1.750  2.03 | 4.833  6.10 | 7.917  4.06 | 11.00  2.03
          1.833  1.02 | 4.917  6.10 | 8.000  4.06 | 11.08  1.02
          1.917  1.02 | 5.000  6.10 | 8.083  5.08 | 11.17  1.02
          2.000  1.02 | 5.083  5.08 | 8.167  5.08 | 11.25  1.02
          2.083  2.03 | 5.167  5.08 | 8.250  5.08 | 11.33  2.03
          2.167  2.03 | 5.250  5.08 | 8.333  3.05 | 11.42  2.03
          2.250  2.03 | 5.333  8.13 | 8.417  3.05 | 11.50  2.03
          2.333  3.05 | 5.417  8.13 | 8.500  3.05 | 11.58  1.02
          2.417  3.05 | 5.500  8.13 | 8.583  3.05 | 11.67  1.02
          2.500  3.05 | 5.583  9.14 | 8.667  3.05 | 11.75  1.02
          2.583  3.05 | 5.667  9.14 | 8.750  3.05 | 11.83  2.03
          2.667  3.05 | 5.750  9.15 | 8.833  3.05 | 11.92  2.03
          2.750  3.05 | 5.833  67.06 | 8.917  3.05 | 12.00  2.03
          2.833  3.05 | 5.917  67.06 | 9.000  3.05 | 12.08  1.02
          2.917  3.05 | 6.000  67.06 | 9.083  2.03 | 12.17  1.02
          3.000  3.05 | 6.083  67.06 | 9.167  2.03 | 12.25  1.02
          3.083  2.03 | 6.167  67.06 | 9.250  2.03 |

Max.Eff.Inten.(mm/hr)=  67.06         46.22
           over (min)    5.00         10.00
Storage Coeff.  (min)=   5.32 (ii)    9.51 (ii)
Unit Hyd. Tpeak (min)=   5.00         10.00
Unit Hyd. peak  (cms)=   0.21          0.12
                                                   *TOTALS*
PEAK FLOW       (cms)=   0.08          0.02         0.104 (iii)
TIME TO PEAK   (hrs)=    6.25          6.25         6.25
RUNOFF VOLUME   (mm)=   72.42         39.68        61.28
TOTAL RAINFALL  (mm)=   74.42         74.42        74.42
RUNOFF COEFFICIENT =     0.97          0.53         0.82

                              Page 113
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                      LangstaffRd_EA_Proposed_WestDonWatershd

          (i) CN PROCEDURE FOR PERVIOUS LOSSES:
              CN* = 83.0   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 ( 0470)|
   |  1 + 2 = 3     |           AREA    QPEAK    TPEAK     R.V.
   --------------------          (ha)    (cms)    (hrs)    (mm)
        ID1= 1 ( 0215):          0.58    0.100    6.25     66.19
      + ID2= 2 ( 0220):          0.65    0.104    6.25     61.28
        ====================================================
        ID = 3 ( 0470):          1.23    0.204    6.25     63.60

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
   ----------------------------------------------------------------------
   --------------------
   | RESERVOIR( 0535)|     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   |  0.0116     0.0367
                          0.0053    0.0048   |  0.0131     0.0474
                          0.0080    0.0154   |  0.0202     0.0639
                          0.0100    0.0261   |  0.0000     0.0000

                             AREA    QPEAK    TPEAK      R.V.
                             (ha)    (cms)    (hrs)      (mm)
        INFLOW : ID= 2 ( 0470)  1.230    0.204    6.25     63.60
        OUTFLOW: ID= 1 ( 0535)  1.230    0.015    7.58     63.42

            PEAK  FLOW   REDUCTION [Qout/Qin](%)= 7.26
            TIME SHIFT OF PEAK FLOW     (min)= 80.00
            MAXIMUM STORAGE   USED    (ha.m.)=  0.0513

   ----------------------------------------------------------------------
   --------------------
   | CALIB          |
   | STANDHYD ( 0225)|   Area   (ha)=  0.60
   |ID= 1 DT= 5.0 min |   Total Imp(%)= 83.00  Dir. Conn.(%)= 83.00
   --------------------
                             IMPERVIOUS   PERVIOUS (i)
        Surface Area   (ha)=    0.50        0.10
        Dep. Storage   (mm)=    2.00        5.00
        Average Slope  (%)=     1.00        2.00
        Length         (m)=   320.00       10.00
        Mannings n     =        0.013       0.250

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

                              Page 114
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                    LangstaffRd_EA_Proposed_WestDonWatershd


                       ---- 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  2.03 | 6.250  67.05 | 9.33   3.05
          0.167  0.00 | 3.250  2.03 | 6.333  13.21 | 9.42   3.05
          0.250  0.00 | 3.333  3.05 | 6.417  13.21 | 9.50   3.05
          0.333  1.02 | 3.417  3.05 | 6.500  13.21 | 9.58   2.03
          0.417  1.02 | 3.500  3.05 | 6.583  13.21 | 9.67   2.03
          0.500  1.02 | 3.583  3.05 | 6.667  13.21 | 9.75   2.03
          0.583  2.03 | 3.667  3.05 | 6.750  13.21 | 9.83   2.03
          0.667  2.03 | 3.750  3.05 | 6.833  6.10 | 9.92   2.03
          0.750  2.03 | 3.833  3.05 | 6.917  6.10 | 10.00  2.03
          0.833  1.02 | 3.917  3.05 | 7.000  6.10 | 10.08  2.03
          0.917  1.02 | 4.000  3.05 | 7.083  6.10 | 10.17  2.03
          1.000  1.02 | 4.083  3.05 | 7.167  6.10 | 10.25  2.03
          1.083  2.03 | 4.167  3.05 | 7.250  6.10 | 10.33  2.03
          1.167  2.03 | 4.250  3.05 | 7.333  5.08 | 10.42  2.03
          1.250  2.03 | 4.333  5.08 | 7.417  5.08 | 10.50  2.03
          1.333  1.02 | 4.417  5.08 | 7.500  5.08 | 10.58  1.02
          1.417  1.02 | 4.500  5.08 | 7.583  4.06 | 10.67  1.02
          1.500  1.02 | 4.583  5.08 | 7.667  4.06 | 10.75  1.02
          1.583  2.03 | 4.667  5.08 | 7.750  4.06 | 10.83  2.03
          1.667  2.03 | 4.750  5.08 | 7.833  4.06 | 10.92  2.03
          1.750  2.03 | 4.833  6.10 | 7.917  4.06 | 11.00  2.03
          1.833  1.02 | 4.917  6.10 | 8.000  4.06 | 11.08  1.02
          1.917  1.02 | 5.000  6.10 | 8.083  5.08 | 11.17  1.02
          2.000  1.02 | 5.083  5.08 | 8.167  5.08 | 11.25  1.02
          2.083  2.03 | 5.167  5.08 | 8.250  5.08 | 11.33  2.03
          2.167  2.03 | 5.250  5.08 | 8.333  3.05 | 11.42  2.03
          2.250  2.03 | 5.333  8.13 | 8.417  3.05 | 11.50  2.03
          2.333  3.05 | 5.417  8.13 | 8.500  3.05 | 11.58  1.02
          2.417  3.05 | 5.500  8.13 | 8.583  3.05 | 11.67  1.02
          2.500  3.05 | 5.583  9.14 | 8.667  3.05 | 11.75  1.02
          2.583  3.05 | 5.667  9.14 | 8.750  3.05 | 11.83  2.03
          2.667  3.05 | 5.750  9.15 | 8.833  3.05 | 11.92  2.03
          2.750  3.05 | 5.833  67.06 | 8.917  3.05 | 12.00  2.03
          2.833  3.05 | 5.917  67.06 | 9.000  3.05 | 12.08  1.02
          2.917  3.05 | 6.000  67.06 | 9.083  2.03 | 12.17  1.02
          3.000  3.05 | 6.083  67.06 | 9.167  2.03 | 12.25  1.02
          3.083  2.03 | 6.167  67.06 | 9.250  2.03 |

Max.Eff.Inten.(mm/hr)=  67.06         46.22
           over (min)    5.00         10.00
Storage Coeff.  (min)=   6.02 (ii)    7.94 (ii)
Unit Hyd. Tpeak (min)=   5.00         10.00
Unit Hyd. peak  (cms)=   0.19          0.13
                                                   *TOTALS*
PEAK FLOW       (cms)=   0.09          0.01         0.104 (iii)
TIME TO PEAK   (hrs)=    6.25          6.25         6.25
RUNOFF VOLUME   (mm)=   72.42         39.68        66.85
TOTAL RAINFALL  (mm)=   74.42         74.42        74.42
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                      LangstaffRd_EA_Proposed_WestDonWatershd
       RUNOFF COEFFICIENT  =     0.97          0.53         0.90


          (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* = 83.0   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 ( 0230)|   Area   (ha)=  0.70
   |ID= 1 DT= 5.0 min |   Total Imp(%)= 66.00  Dir. Conn.(%)= 66.00
   --------------------
                             IMPERVIOUS   PERVIOUS (i)
        Surface Area   (ha)=    0.46        0.24
        Dep. Storage   (mm)=    2.00        5.00
        Average Slope  (%)=     1.00        2.00
        Length         (m)=   320.00       25.00
        Mannings n     =        0.013       0.300

      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  2.03 | 6.250  67.05 | 9.33   3.05
          0.167  0.00 | 3.250  2.03 | 6.333  13.21 | 9.42   3.05
          0.250  0.00 | 3.333  3.05 | 6.417  13.21 | 9.50   3.05
          0.333  1.02 | 3.417  3.05 | 6.500  13.21 | 9.58   2.03
          0.417  1.02 | 3.500  3.05 | 6.583  13.21 | 9.67   2.03
          0.500  1.02 | 3.583  3.05 | 6.667  13.21 | 9.75   2.03
          0.583  2.03 | 3.667  3.05 | 6.750  13.21 | 9.83   2.03
          0.667  2.03 | 3.750  3.05 | 6.833  6.10 | 9.92   2.03
          0.750  2.03 | 3.833  3.05 | 6.917  6.10 | 10.00  2.03
          0.833  1.02 | 3.917  3.05 | 7.000  6.10 | 10.08  2.03
          0.917  1.02 | 4.000  3.05 | 7.083  6.10 | 10.17  2.03
          1.000  1.02 | 4.083  3.05 | 7.167  6.10 | 10.25  2.03
          1.083  2.03 | 4.167  3.05 | 7.250  6.10 | 10.33  2.03
          1.167  2.03 | 4.250  3.05 | 7.333  5.08 | 10.42  2.03
          1.250  2.03 | 4.333  5.08 | 7.417  5.08 | 10.50  2.03
          1.333  1.02 | 4.417  5.08 | 7.500  5.08 | 10.58  1.02
          1.417  1.02 | 4.500  5.08 | 7.583  4.06 | 10.67  1.02
          1.500  1.02 | 4.583  5.08 | 7.667  4.06 | 10.75  1.02
          1.583  2.03 | 4.667  5.08 | 7.750  4.06 | 10.83  2.03
          1.667  2.03 | 4.750  5.08 | 7.833  4.06 | 10.92  2.03
          1.750  2.03 | 4.833  6.10 | 7.917  4.06 | 11.00  2.03
          1.833  1.02 | 4.917  6.10 | 8.000  4.06 | 11.08  1.02
          1.917  1.02 | 5.000  6.10 | 8.083  5.08 | 11.17  1.02
          2.000  1.02 | 5.083  5.08 | 8.167  5.08 | 11.25  1.02
          2.083  2.03 | 5.167  5.08 | 8.250  5.08 | 11.33  2.03

                              Page 116
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LangstaffRd_EA_Proposed_WestDonWatershd

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                  2.167  2.03 | 5.250    5.08 | 8.333   3.05 | 11.42  2.03
                  2.250  2.03 | 5.333    8.13 | 8.417   3.05 | 11.50  2.03
                  2.333  3.05 | 5.417    8.13 | 8.500   3.05 | 11.58  1.02
                  2.417  3.05 | 5.500    8.13 | 8.583   3.05 | 11.67  1.02
                  2.500  3.05 | 5.583    9.14 | 8.667   3.05 | 11.75  1.02
                  2.583  3.05 | 5.667    9.14 | 8.750   3.05 | 11.83  2.03
                  2.667  3.05 | 5.750    9.15 | 8.833   3.05 | 11.92  2.03
                  2.750  3.05 | 5.833   67.06 | 8.917   3.05 | 12.00  2.03
                  2.833  3.05 | 5.917   67.06 | 9.000   3.05 | 12.08  1.02
                  2.917  3.05 | 6.000   67.06 | 9.083   2.03 | 12.17  1.02
                  3.000  3.05 | 6.083   67.06 | 9.167   2.03 | 12.25  1.02
                  3.083  2.03 | 6.167   67.06 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=    67.06        43.68
           over (min)         5.00        15.00
    Storage Coeff.  (min)=     6.02 (ii)   14.30 (ii)
    Unit Hyd. Tpeak (min)=     5.00        15.00
    Unit Hyd. peak  (cms)=     0.19         0.08
                                                    *TOTALS*
    PEAK FLOW       (cms)=     0.09         0.02      0.106 (iii)
    TIME TO PEAK    (hrs)=     6.25         6.33      6.25
    RUNOFF VOLUME   (mm)=     72.42        37.36     60.49
    TOTAL RAINFALL  (mm)=     74.42        74.42     74.42
    RUNOFF COEFFICIENT =       0.97         0.50      0.81

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 81.0    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 ( 0475)|
| 1 + 2 = 3     |         AREA   QPEAK  TPEAK   R.V.
--------------------      (ha)   (cms)  (hrs)   (mm)
    ID1= 1 ( 0225):    0.60   0.104   6.25   66.85
  + ID2= 2 ( 0230):    0.70   0.106   6.25   60.49
    ====================================================
    ID = 3 ( 0475):    1.30   0.210   6.25   63.42

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------------
--------------------
| RESERVOIR( 0540)|   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   | 0.0271    0.0367
                      0.0118    0.0048   | 0.0306    0.0474
                      0.0184    0.0154   | 0.0415    0.0639
```

LangstaffRd_EA_Proposed_WestDonWatershd

```
                  0.0232    0.0261  | 0.0000    0.0000

                       AREA   QPEAK  TPEAK    R.V.
                       (ha)   (cms)  (hrs)    (mm)
  INFLOW : ID= 2 ( 0475)  1.300  0.210   6.25   63.42
  OUTFLOW: ID= 1 ( 0540)  1.300  0.029   6.92   63.35

         PEAK  FLOW  REDUCTION [Qout/Qin](%)= 14.00
         TIME SHIFT OF PEAK FLOW    (min)= 40.00
         MAXIMUM STORAGE  USED  (ha.m.)= 0.0436
-----------------------------------------------------------------------------
--------------------
| ADD HYD ( 0480)|
| 1 + 2 = 3     |         AREA   QPEAK  TPEAK   R.V.
--------------------      (ha)   (cms)  (hrs)   (mm)
    ID1= 1 ( 0535):    1.23   0.015   7.58   63.42
  + ID2= 2 ( 0540):    1.30   0.029   6.92   63.35
    ====================================================
    ID = 3 ( 0480):    2.53   0.044   7.25   63.38

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0155)|   Area   (ha)= 0.56
|ID= 1 DT= 5.0 min|   Total Imp(%)= 93.00   Dir. Conn.(%)= 93.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
    Surface Area    (ha)=      0.52         0.04
    Dep. Storage    (mm)=      2.00         5.00
    Average Slope   (%)=       1.00         2.00
    Length          (m)=     260.00        25.00
    Mannings n      =          0.013        0.290

    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   2.03 | 6.250  67.05 | 9.33   3.05
      0.167  0.00 | 3.250   2.03 | 6.333  13.21 | 9.42   3.05
      0.250  0.00 | 3.333   3.05 | 6.417  13.21 | 9.50   3.05
      0.333  1.02 | 3.417   3.05 | 6.500  13.21 | 9.58   2.03
      0.417  1.02 | 3.500   3.05 | 6.583  13.21 | 9.67   2.03
      0.500  1.02 | 3.583   3.05 | 6.667  13.21 | 9.75   2.03
      0.583  2.03 | 3.667   3.05 | 6.750  13.21 | 9.83   2.03
      0.667  2.03 | 3.750   3.05 | 6.833   6.10 | 9.92   2.03
      0.750  2.03 | 3.833   3.05 | 6.917   6.10 | 10.00  2.03
      0.833  1.02 | 3.917   3.05 | 7.000   6.10 | 10.08  2.03
      0.917  1.02 | 4.000   3.05 | 7.083   6.10 | 10.17  2.03
```

LangstaffRd_EA_Proposed_WestDonWatershd

```
                  1.000  1.02 | 4.083   3.05 | 7.167   6.10 | 10.25  2.03
                  1.083  2.03 | 4.167   3.05 | 7.250   6.10 | 10.33  2.03
                  1.167  2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
                  1.250  2.03 | 4.333   5.08 | 7.417   5.08 | 10.50  2.03
                  1.333  1.02 | 4.417   5.08 | 7.500   5.08 | 10.58  1.02
                  1.417  1.02 | 4.500   5.08 | 7.583   4.06 | 10.67  1.02
                  1.500  1.02 | 4.583   5.08 | 7.667   4.06 | 10.75  1.02
                  1.583  2.03 | 4.667   5.08 | 7.750   4.06 | 10.83  2.03
                  1.667  2.03 | 4.750   5.08 | 7.833   4.06 | 10.92  2.03
                  1.750  2.03 | 4.833   6.10 | 7.917   4.06 | 11.00  2.03
                  1.833  1.02 | 4.917   6.10 | 8.000   4.06 | 11.08  1.02
                  1.917  1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  1.02
                  2.000  1.02 | 5.083   5.08 | 8.167   5.08 | 11.25  1.02
                  2.083  2.03 | 5.167   5.08 | 8.250   5.08 | 11.33  2.03
                  2.167  2.03 | 5.250   5.08 | 8.333   3.05 | 11.42  2.03
                  2.250  2.03 | 5.333   8.13 | 8.417   3.05 | 11.50  2.03
                  2.333  3.05 | 5.417   8.13 | 8.500   3.05 | 11.58  1.02
                  2.417  3.05 | 5.500   8.13 | 8.583   3.05 | 11.67  1.02
                  2.500  3.05 | 5.583   9.14 | 8.667   3.05 | 11.75  1.02
                  2.583  3.05 | 5.667   9.14 | 8.750   3.05 | 11.83  2.03
                  2.667  3.05 | 5.750   9.15 | 8.833   3.05 | 11.92  2.03
                  2.750  3.05 | 5.833  67.06 | 8.917   3.05 | 12.00  2.03
                  2.833  3.05 | 5.917  67.06 | 9.000   3.05 | 12.08  1.02
                  2.917  3.05 | 6.000  67.06 | 9.083   2.03 | 12.17  1.02
                  3.000  3.05 | 6.083  67.06 | 9.167   2.03 | 12.25  1.02
                  3.083  2.03 | 6.167  67.06 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=    67.06        51.67
           over (min)         5.00        10.00
    Storage Coeff.  (min)=     5.32 (ii)    7.74 (ii)
    Unit Hyd. Tpeak (min)=     5.00        10.00
    Unit Hyd. peak  (cms)=     0.21         0.13
                                                    *TOTALS*
    PEAK FLOW       (cms)=     0.10         0.01      0.102 (iii)
    TIME TO PEAK    (hrs)=     6.25         6.25      6.25
    RUNOFF VOLUME   (mm)=     72.42        44.88     70.49
    TOTAL RAINFALL  (mm)=     74.42        74.42     74.42
    RUNOFF COEFFICIENT =       0.97         0.60      0.95

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 87.0    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 ( 0160)|   Area   (ha)= 0.43
|ID= 1 DT= 5.0 min|   Total Imp(%)= 95.00   Dir. Conn.(%)= 95.00
--------------------
                          IMPERVIOUS   PERVIOUS (i)
```

LangstaffRd_EA_Proposed_WestDonWatershd

```
    Surface Area    (ha)=      0.41         0.02
    Dep. Storage    (mm)=      2.00         5.00
    Average Slope   (%)=       1.00         2.00
    Length          (m)=     260.00        20.00
    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 | 3.167   2.03 | 6.250  67.05 | 9.33   3.05
      0.167  0.00 | 3.250   2.03 | 6.333  13.21 | 9.42   3.05
      0.250  0.00 | 3.333   3.05 | 6.417  13.21 | 9.50   3.05
      0.333  1.02 | 3.417   3.05 | 6.500  13.21 | 9.58   2.03
      0.417  1.02 | 3.500   3.05 | 6.583  13.21 | 9.67   2.03
      0.500  1.02 | 3.583   3.05 | 6.667  13.21 | 9.75   2.03
      0.583  2.03 | 3.667   3.05 | 6.750  13.21 | 9.83   2.03
      0.667  2.03 | 3.750   3.05 | 6.833   6.10 | 9.92   2.03
      0.750  2.03 | 3.833   3.05 | 6.917   6.10 | 10.00  2.03
      0.833  1.02 | 3.917   3.05 | 7.000   6.10 | 10.08  2.03
      0.917  1.02 | 4.000   3.05 | 7.083   6.10 | 10.17  2.03
      1.000  1.02 | 4.083   3.05 | 7.167   6.10 | 10.25  2.03
      1.083  2.03 | 4.167   3.05 | 7.250   6.10 | 10.33  2.03
      1.167  2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
      1.250  2.03 | 4.333   5.08 | 7.417   5.08 | 10.50  2.03
      1.333  1.02 | 4.417   5.08 | 7.500   5.08 | 10.58  1.02
      1.417  1.02 | 4.500   5.08 | 7.583   4.06 | 10.67  1.02
      1.500  1.02 | 4.583   5.08 | 7.667   4.06 | 10.75  1.02
      1.583  2.03 | 4.667   5.08 | 7.750   4.06 | 10.83  2.03
      1.667  2.03 | 4.750   5.08 | 7.833   4.06 | 10.92  2.03
      1.750  2.03 | 4.833   6.10 | 7.917   4.06 | 11.00  2.03
      1.833  1.02 | 4.917   6.10 | 8.000   4.06 | 11.08  1.02
      1.917  1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  1.02
      2.000  1.02 | 5.083   5.08 | 8.167   5.08 | 11.25  1.02
      2.083  2.03 | 5.167   5.08 | 8.250   5.08 | 11.33  2.03
      2.167  2.03 | 5.250   5.08 | 8.333   3.05 | 11.42  2.03
      2.250  2.03 | 5.333   8.13 | 8.417   3.05 | 11.50  2.03
      2.333  3.05 | 5.417   8.13 | 8.500   3.05 | 11.58  1.02
      2.417  3.05 | 5.500   8.13 | 8.583   3.05 | 11.67  1.02
      2.500  3.05 | 5.583   9.14 | 8.667   3.05 | 11.75  1.02
      2.583  3.05 | 5.667   9.14 | 8.750   3.05 | 11.83  2.03
      2.667  3.05 | 5.750   9.15 | 8.833   3.05 | 11.92  2.03
      2.750  3.05 | 5.833  67.06 | 8.917   3.05 | 12.00  2.03
      2.833  3.05 | 5.917  67.06 | 9.000   3.05 | 12.08  1.02
      2.917  3.05 | 6.000  67.06 | 9.083   2.03 | 12.17  1.02
      3.000  3.05 | 6.083  67.06 | 9.167   2.03 | 12.25  1.02
      3.083  2.03 | 6.167  67.06 | 9.250   2.03 |

    Max.Eff.Inten.(mm/hr)=    67.06        54.54
           over (min)         5.00        10.00
    Storage Coeff.  (min)=     5.32 (ii)    7.00 (ii)
```

Page 121

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                    LangstaffRd_EA_Proposed_WestDonWatershd
  Unit Hyd. Tpeak (min)=     5.00          10.00
  Unit Hyd. peak  (cms)=     0.21           0.14
                                                        *TOTALS*
  PEAK FLOW      (cms)=      0.08           0.00        0.079 (iii)
  TIME TO PEAK   (hrs)=      6.25           6.25        6.25
  RUNOFF VOLUME   (mm)=     72.42          47.80       71.18
  TOTAL RAINFALL  (mm)=     74.42          74.42       74.42
  RUNOFF COEFFICIENT  =      0.97           0.64        0.96


    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN* = 89.0   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 ( 0430)|
|  1 + 2 = 3     |        AREA    QPEAK    TPEAK     R.V.
--------------------       (ha)   (cms)    (hrs)     (mm)
        ID1= 1 ( 0155):    0.56   0.102    6.25      70.49
      + ID2= 2 ( 0160):    0.43   0.079    6.25      71.18
                         =================================
        ID = 3 ( 0430):    0.99   0.181    6.25      70.79

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0150)|   Area    (ha)=  3.81
|ID= 1 DT= 5.0 min |   Total Imp(%)= 95.00   Dir. Conn.(%)= 95.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=       3.62         0.19
    Dep. Storage   (mm)=       2.00         5.00
    Average Slope   (%)=       1.00         2.00
    Length          (m)=     150.00        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 | 3.167  2.03 | 6.250 67.05 | 9.33  3.05
         0.167  0.00 | 3.250  2.03 | 6.333 13.21 | 9.42  3.05
         0.250  0.00 | 3.333  3.05 | 6.417 13.21 | 9.50  3.05
         0.333  1.02 | 3.417  3.05 | 6.500 13.21 | 9.58  2.03
         0.417  1.02 | 3.500  3.05 | 6.583 13.21 | 9.67  2.03
         0.500  1.02 | 3.583  3.05 | 6.667 13.21 | 9.75  2.03
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Page 121

Page 122

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                    LangstaffRd_EA_Proposed_WestDonWatershd
     0.583  2.03 | 3.667  3.05 | 6.750 13.21 | 9.83  2.03
     0.667  2.03 | 3.750  3.05 | 6.833  6.10 | 9.92  2.03
     0.750  2.03 | 3.833  3.05 | 6.917  6.10 | 10.00 2.03
     0.833  1.02 | 3.917  3.05 | 7.000  6.10 | 10.08 2.03
     0.917  1.02 | 4.000  3.05 | 7.083  6.10 | 10.17 2.03
     1.000  1.02 | 4.083  3.05 | 7.167  6.10 | 10.25 2.03
     1.083  2.03 | 4.167  3.05 | 7.250  6.10 | 10.33 2.03
     1.167  2.03 | 4.250  3.05 | 7.333  5.08 | 10.42 2.03
     1.250  2.03 | 4.333  5.08 | 7.417  5.08 | 10.50 2.03
     1.333  1.02 | 4.417  5.08 | 7.500  5.08 | 10.58 1.02
     1.417  1.02 | 4.500  5.08 | 7.583  4.06 | 10.67 1.02
     1.500  1.02 | 4.583  5.08 | 7.667  4.06 | 10.75 1.02
     1.583  2.03 | 4.667  5.08 | 7.750  4.06 | 10.83 2.03
     1.667  2.03 | 4.750  5.08 | 7.833  4.06 | 10.92 2.03
     1.750  2.03 | 4.833  6.10 | 7.917  4.06 | 11.00 2.03
     1.833  1.02 | 4.917  6.10 | 8.000  4.06 | 11.08 1.02
     1.917  1.02 | 5.000  6.10 | 8.083  5.08 | 11.17 1.02
     2.000  1.02 | 5.083  5.08 | 8.167  5.08 | 11.25 1.02
     2.083  2.03 | 5.167  5.08 | 8.250  5.08 | 11.33 2.03
     2.167  2.03 | 5.250  5.08 | 8.333  3.05 | 11.42 2.03
     2.250  2.03 | 5.333  8.13 | 8.417  3.05 | 11.50 2.03
     2.333  3.05 | 5.417  8.13 | 8.500  3.05 | 11.58 1.02
     2.417  3.05 | 5.500  8.13 | 8.583  3.05 | 11.67 1.02
     2.500  3.05 | 5.583  9.14 | 8.667  3.05 | 11.75 1.02
     2.583  3.05 | 5.667  9.14 | 8.750  3.05 | 11.83 2.03
     2.667  3.05 | 5.750  9.15 | 8.833  3.05 | 11.92 2.03
     2.750  3.05 | 5.833 67.06 | 8.917  3.05 | 12.00 2.03
     2.833  3.05 | 5.917 67.06 | 9.000  3.05 | 12.08 1.02
     2.917  3.05 | 6.000 67.06 | 9.083  2.03 | 12.17 1.02
     3.000  3.05 | 6.083 67.06 | 9.167  2.03 | 12.25 1.02
     3.083  2.03 | 6.167 67.06 | 9.250  2.03 |

  Max.Eff.Inten.(mm/hr)=     67.06          53.10
            over (min)=       5.00          10.00
  Storage Coeff.  (min)=      3.82 (ii)      6.37 (ii)
  Unit Hyd. Tpeak (min)=      5.00          10.00
  Unit Hyd. peak  (cms)=      0.25           0.15

                                                        *TOTALS*
  PEAK FLOW      (cms)=       0.67           0.03        0.700 (iii)
  TIME TO PEAK   (hrs)=       6.25           6.25        6.25
  RUNOFF VOLUME   (mm)=      72.42          46.31       71.12
  TOTAL RAINFALL  (mm)=      74.42          74.42       74.42
  RUNOFF COEFFICIENT  =       0.97           0.62        0.96

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

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 88.0   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.

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Page 122

Page 123

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                    LangstaffRd_EA_Proposed_WestDonWatershd
--------------------
| RESERVOIR( 0515)|   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   |  0.0091    0.1797
                       0.0013   0.0157   |  0.0095    0.2004
                       0.0033   0.0320   |  0.0100    0.2216
                       0.0044   0.0487   |  0.0104    0.2433
                       0.0053   0.0659   |  0.0109    0.2655
                       0.0061   0.0837   |  0.0113    0.2882
                       0.0068   0.1019   |  0.0116    0.3114
                       0.0074   0.1206   |  0.1520    0.3592
                       0.0080   0.1398   |  0.5654    0.4336
                       0.0086   0.1595   |  1.1316    0.5100

                              AREA   QPEAK    TPEAK      R.V.
                              (ha)   (cms)    (hrs)      (mm)
      INFLOW : ID= 2 ( 0150)  3.810  0.700    6.25      71.12
      OUTFLOW: ID= 1 ( 0515)  3.810  0.010   12.25      70.16

           PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.49
           TIME SHIFT OF PEAK FLOW    (min)=360.00
           MAXIMUM  STORAGE   USED    (ha.m.)=  0.2448

-----------------------------------------------------------------------

--------------------
| ADD HYD ( 0440)|
|  1 + 2 = 3     |        AREA    QPEAK    TPEAK     R.V.
--------------------       (ha)   (cms)    (hrs)     (mm)
        ID1= 1 ( 0430):    0.99   0.181    6.25      70.79
      + ID2= 2 ( 0515):    3.81   0.010   12.25      70.16
                         =================================
        ID = 3 ( 0440):    4.80   0.189    6.25      70.29

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------
--------------------
| CALIB          |
| STANDHYD ( 0210)|   Area    (ha)=  0.96
|ID= 1 DT= 5.0 min |   Total Imp(%)= 78.00   Dir. Conn.(%)= 78.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=       0.75         0.21
    Dep. Storage   (mm)=       2.00         5.00
    Average Slope   (%)=       1.00         2.00
    Length          (m)=     470.00        20.00
    Mannings n       =        0.013        0.250

    NOTE:  RAINFALL WAS TRANSFORMED TO  5.0 MIN. TIME STEP.
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Page 123

Page 124

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                    LangstaffRd_EA_Proposed_WestDonWatershd
                      ---- 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  2.03 | 6.250 67.05 | 9.33  3.05
         0.167  0.00 | 3.250  2.03 | 6.333 13.21 | 9.42  3.05
         0.250  0.00 | 3.333  3.05 | 6.417 13.21 | 9.50  3.05
         0.333  1.02 | 3.417  3.05 | 6.500 13.21 | 9.58  2.03
         0.417  1.02 | 3.500  3.05 | 6.583 13.21 | 9.67  2.03
         0.500  1.02 | 3.583  3.05 | 6.667 13.21 | 9.75  2.03
         0.583  2.03 | 3.667  3.05 | 6.750 13.21 | 9.83  2.03
         0.667  2.03 | 3.750  3.05 | 6.833  6.10 | 9.92  2.03
         0.750  2.03 | 3.833  3.05 | 6.917  6.10 | 10.00 2.03
         0.833  1.02 | 3.917  3.05 | 7.000  6.10 | 10.08 2.03
         0.917  1.02 | 4.000  3.05 | 7.083  6.10 | 10.17 2.03
         1.000  1.02 | 4.083  3.05 | 7.167  6.10 | 10.25 2.03
         1.083  2.03 | 4.167  3.05 | 7.250  6.10 | 10.33 2.03
         1.167  2.03 | 4.250  3.05 | 7.333  5.08 | 10.42 2.03
         1.250  2.03 | 4.333  5.08 | 7.417  5.08 | 10.50 2.03
         1.333  1.02 | 4.417  5.08 | 7.500  5.08 | 10.58 1.02
         1.417  1.02 | 4.500  5.08 | 7.583  4.06 | 10.67 1.02
         1.500  1.02 | 4.583  5.08 | 7.667  4.06 | 10.75 1.02
         1.583  2.03 | 4.667  5.08 | 7.750  4.06 | 10.83 2.03
         1.667  2.03 | 4.750  5.08 | 7.833  4.06 | 10.92 2.03
         1.750  2.03 | 4.833  6.10 | 7.917  4.06 | 11.00 2.03
         1.833  1.02 | 4.917  6.10 | 8.000  4.06 | 11.08 1.02
         1.917  1.02 | 5.000  6.10 | 8.083  5.08 | 11.17 1.02
         2.000  1.02 | 5.083  5.08 | 8.167  5.08 | 11.25 1.02
         2.083  2.03 | 5.167  5.08 | 8.250  5.08 | 11.33 2.03
         2.167  2.03 | 5.250  5.08 | 8.333  3.05 | 11.42 2.03
         2.250  2.03 | 5.333  8.13 | 8.417  3.05 | 11.50 2.03
         2.333  3.05 | 5.417  8.13 | 8.500  3.05 | 11.58 1.02
         2.417  3.05 | 5.500  8.13 | 8.583  3.05 | 11.67 1.02
         2.500  3.05 | 5.583  9.14 | 8.667  3.05 | 11.75 1.02
         2.583  3.05 | 5.667  9.14 | 8.750  3.05 | 11.83 2.03
         2.667  3.05 | 5.750  9.15 | 8.833  3.05 | 11.92 2.03
         2.750  3.05 | 5.833 67.06 | 8.917  3.05 | 12.00 2.03
         2.833  3.05 | 5.917 67.06 | 9.000  3.05 | 12.08 1.02
         2.917  3.05 | 6.000 67.06 | 9.083  2.03 | 12.17 1.02
         3.000  3.05 | 6.083 67.06 | 9.167  2.03 | 12.25 1.02
         3.083  2.03 | 6.167 67.06 | 9.250  2.03 |

  Max.Eff.Inten.(mm/hr)=     67.06          46.22
            over (min)=      10.00          15.00
  Storage Coeff.  (min)=      7.59 (ii)     10.88 (ii)
  Unit Hyd. Tpeak (min)=     10.00          15.00
  Unit Hyd. peak  (cms)=      0.13           0.09
                                                        *TOTALS*
  PEAK FLOW      (cms)=       0.14           0.02        0.157 (iii)
  TIME TO PEAK   (hrs)=       6.25           6.33        6.25
  RUNOFF VOLUME   (mm)=      72.42          39.68       65.21
  TOTAL RAINFALL  (mm)=      74.42          74.42       74.42
  RUNOFF COEFFICIENT  =       0.97           0.53        0.88
```
Page 124

LangstaffRd_EA_Proposed_WestDonWatershd

```
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  83.0    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 (0205)| Area   (ha)= 1.11
|ID= 1 DT= 5.0 min | Total Imp(%)= 77.00   Dir. Conn.(%)= 77.00

```
                              IMPERVIOUS   PERVIOUS (i)
     Surface Area    (ha)=      0.85         0.26
     Dep. Storage    (mm)=      2.00         5.00
     Average Slope   (%)=       1.00         2.00
     Length          (m)=     470.00        20.00
     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	3.167	2.03		6.250	67.05	9.33	3.05
0.167	0.00	3.250	2.03		6.333	13.21	9.42	3.05
0.250	0.00	3.333	3.05		6.417	13.21	9.50	3.05
0.333	1.02	3.417	3.05		6.500	13.21	9.58	2.03
0.417	1.02	3.500	3.05		6.583	13.21	9.67	2.03
0.500	1.02	3.583	3.05		6.667	13.21	9.75	2.03
0.583	2.03	3.667	3.05		6.750	13.21	9.83	2.03
0.667	2.03	3.750	3.05		6.833	6.10	9.92	2.03
0.750	2.03	3.833	3.05		6.917	6.10	10.00	2.03
0.833	1.02	3.917	3.05		7.000	6.10	10.08	2.03
0.917	1.02	4.000	3.05		7.083	6.10	10.17	2.03
1.000	1.02	4.083	3.05		7.167	6.10	10.25	2.03
1.083	2.03	4.167	3.05		7.250	6.10	10.33	2.03
1.167	2.03	4.250	3.05		7.333	5.08	10.42	2.03
1.250	2.03	4.333	5.08		7.417	5.08	10.50	2.03
1.333	1.02	4.417	5.08		7.500	5.08	10.58	1.02
1.417	1.02	4.500	5.08		7.583	4.06	10.67	1.02
1.500	1.02	4.583	5.08		7.667	4.06	10.75	1.02
1.583	2.03	4.667	5.08		7.750	4.06	10.83	2.03
1.667	2.03	4.750	5.08		7.833	4.06	10.92	2.03
1.750	2.03	4.833	6.10		7.917	4.06	11.00	2.03
1.833	1.02	4.917	6.10		8.000	4.06	11.08	1.02
1.917	1.02	5.000	6.10		8.083	5.08	11.17	1.02
2.000	1.02	5.083	6.10		8.167	5.08	11.25	1.02
2.083	2.03	5.167	5.08		8.250	5.08	11.33	2.03
2.167	2.03	5.250	5.08		8.333	3.05	11.42	2.03
2.250	2.03	5.333	8.13		8.417	3.05	11.50	2.03

LangstaffRd_EA_Proposed_WestDonWatershd

2.333	3.05	5.417	8.13	8.500	3.05	11.58	1.02
2.417	3.05	5.500	8.13	8.583	3.05	11.67	1.02
2.500	3.05	5.583	9.14	8.667	3.05	11.75	1.02
2.583	3.05	5.667	9.14	8.750	3.05	11.83	2.03
2.667	3.05	5.750	9.14	8.833	3.05	11.92	2.03
2.750	3.05	5.833	67.06	8.917	3.05	12.00	2.03
2.833	3.05	5.917	67.06	9.000	3.05	12.08	1.02
2.917	3.05	6.000	67.06	9.083	2.03	12.17	1.02
3.000	3.05	6.083	67.06	9.167	2.03	12.25	1.02
3.083	2.03	6.167	67.06	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=    67.06         46.22
         over (min)       10.00         15.00
Storage Coeff. (min)=      7.59 (ii)    10.96 (ii)
Unit Hyd. Tpeak (min)=    10.00         15.00
Unit Hyd. peak  (cms)=     0.13          0.09
                                                  *TOTALS*
PEAK FLOW       (cms)=     0.16          0.03      0.181 (iii)
TIME TO PEAK   (hrs)=      6.25          6.33      6.25
RUNOFF VOLUME  (mm)=      72.42         39.68     64.89
TOTAL RAINFALL (mm)=      74.42         74.42     74.42
RUNOFF COEFFICIENT  =      0.97          0.53      0.87
```

```
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  83.0    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 (0460)|
| 1 + 2 = 3 | AREA   QPEAK   TPEAK   R.V.
--------------------   (ha)   (cms)   (hrs)   (mm)
```
         ID1= 1 ( 0205):     1.11    0.181    6.25    64.89
       + ID2= 2 ( 0210):     0.96    0.157    6.25    65.21
       ===============================================
         ID = 3 ( 0460):     2.07    0.338    6.25    65.04
```

     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| RESERVOIR(0525)| 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   |  0.0733    0.0214
                            0.0274   0.0026   |  0.0831    0.0278
                            0.0478   0.0084   |  0.1449    0.0374
                            0.0619   0.0149   |  0.0000    0.0000
```

LangstaffRd_EA_Proposed_WestDonWatershd

```
                            AREA    QPEAK    TPEAK     R.V.
                            (ha)    (cms)    (hrs)     (mm)
   INFLOW : ID= 2 ( 0460)   2.070   0.338    6.25    65.04
   OUTFLOW: ID= 1 ( 0525)   2.070   0.173    6.42    65.03

           PEAK   FLOW   REDUCTION [Qout/Qin](%)= 51.32
           TIME SHIFT OF PEAK FLOW       (min)= 10.00
           MAXIMUM STORAGE   USED     (ha.m.)= 0.0422
```


| CALIB |
| STANDHYD (0190)| Area   (ha)= 0.86
|ID= 1 DT= 5.0 min | Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00

```
                              IMPERVIOUS   PERVIOUS (i)
     Surface Area    (ha)=      0.49         0.37
     Dep. Storage    (mm)=      2.00         5.00
     Average Slope   (%)=       1.00         2.00
     Length          (m)=     340.00        50.00
     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	3.167	2.03		6.250	67.05	9.33	3.05
0.167	0.00	3.250	2.03		6.333	13.21	9.42	3.05
0.250	0.00	3.333	3.05		6.417	13.21	9.50	3.05
0.333	1.02	3.417	3.05		6.500	13.21	9.58	2.03
0.417	1.02	3.500	3.05		6.583	13.21	9.67	2.03
0.500	1.02	3.583	3.05		6.667	13.21	9.75	2.03
0.583	2.03	3.667	3.05		6.750	13.21	9.83	2.03
0.667	2.03	3.750	3.05		6.833	6.10	9.92	2.03
0.750	2.03	3.833	3.05		6.917	6.10	10.00	2.03
0.833	1.02	3.917	3.05		7.000	6.10	10.08	2.03
0.917	1.02	4.000	3.05		7.083	6.10	10.17	2.03
1.000	1.02	4.083	3.05		7.167	6.10	10.25	2.03
1.083	2.03	4.167	3.05		7.250	6.10	10.33	2.03
1.167	2.03	4.250	3.05		7.333	5.08	10.42	2.03
1.250	2.03	4.333	5.08		7.417	5.08	10.50	2.03
1.333	1.02	4.417	5.08		7.500	5.08	10.58	1.02
1.417	1.02	4.500	5.08		7.583	4.06	10.67	1.02
1.500	1.02	4.583	5.08		7.667	4.06	10.75	1.02
1.583	2.03	4.667	5.08		7.750	4.06	10.83	2.03
1.667	2.03	4.750	5.08		7.833	4.06	10.92	2.03
1.750	2.03	4.833	6.10		7.917	4.06	11.00	2.03
1.833	1.02	4.917	6.10		8.000	4.06	11.08	1.02
1.917	1.02	5.000	6.10		8.083	5.08	11.17	1.02
2.000	1.02	5.083	5.08		8.167	5.08	11.25	1.02
2.083	2.03	5.167	5.08		8.250	5.08	11.33	2.03

LangstaffRd_EA_Proposed_WestDonWatershd

2.167	2.03	5.250	5.08	8.333	3.05	11.42	2.03
2.250	2.03	5.333	8.13	8.417	3.05	11.50	2.03
2.333	3.05	5.417	8.13	8.500	3.05	11.58	1.02
2.417	3.05	5.500	8.13	8.583	3.05	11.67	1.02
2.500	3.05	5.583	9.14	8.667	3.05	11.75	1.02
2.583	3.05	5.667	9.14	8.750	3.05	11.83	2.03
2.667	3.05	5.750	9.15	8.833	3.05	11.92	2.03
2.750	3.05	5.833	67.06	8.917	3.05	12.00	2.03
2.833	3.05	5.917	67.06	9.000	3.05	12.08	1.02
2.917	3.05	6.000	67.06	9.083	2.03	12.17	1.02
3.000	3.05	6.083	67.06	9.167	2.03	12.25	1.02
3.083	2.03	6.167	67.06	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=    67.06         44.81
         over (min)        5.00         20.00
Storage Coeff. (min)=      6.25 (ii)    17.37 (ii)
Unit Hyd. Tpeak (min)=     5.00         20.00
Unit Hyd. peak  (cms)=     0.19          0.06
                                                  *TOTALS*
PEAK FLOW       (cms)=     0.09          0.03      0.119 (iii)
TIME TO PEAK   (hrs)=      6.25          6.42      6.25
RUNOFF VOLUME  (mm)=      72.42         39.68     58.33
TOTAL RAINFALL (mm)=      74.42         74.42     74.42
RUNOFF COEFFICIENT  =      0.97          0.53      0.78
```

```
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  83.0    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 (0195)| Area   (ha)= 0.79
|ID= 1 DT= 5.0 min | Total Imp(%)= 75.00   Dir. Conn.(%)= 75.00

```
                              IMPERVIOUS   PERVIOUS (i)
     Surface Area    (ha)=      0.59         0.20
     Dep. Storage    (mm)=      2.00         5.00
     Average Slope   (%)=       1.00         2.00
     Length          (m)=     340.00        20.00
     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	3.167	2.03		6.250	67.05	9.33	3.05
0.167	0.00	3.250	2.03		6.333	13.21	9.42	3.05

0.250	0.00	3.333	3.05	6.417	13.21	9.50	3.05
0.333	1.02	3.417	3.05	6.500	13.21	9.58	2.03
0.417	1.02	3.500	3.05	6.583	13.21	9.67	2.03
0.500	1.02	3.583	3.05	6.667	13.21	9.75	2.03
0.583	2.03	3.667	3.05	6.750	13.21	9.83	2.03
0.667	2.03	3.750	3.05	6.833	6.10	9.92	2.03
0.750	2.03	3.833	3.05	6.917	6.10	10.00	2.03
0.833	1.02	3.917	3.05	7.000	6.10	10.08	2.03
0.917	1.02	4.000	3.05	7.083	6.10	10.17	2.03
1.000	1.02	4.083	3.05	7.167	6.10	10.25	2.03
1.083	2.03	4.167	3.05	7.250	6.10	10.33	2.03
1.167	2.03	4.250	3.05	7.333	5.08	10.42	2.03
1.250	2.03	4.333	5.08	7.417	5.08	10.50	2.03
1.333	1.02	4.417	5.08	7.500	5.08	10.58	1.02
1.417	1.02	4.500	5.08	7.583	4.06	10.67	1.02
1.500	1.02	4.583	5.08	7.667	4.06	10.75	1.02
1.583	2.03	4.667	5.08	7.750	4.06	10.83	2.03
1.667	2.03	4.750	5.08	7.833	4.06	10.92	2.03
1.750	2.03	4.833	6.10	7.917	4.06	11.00	2.03
1.833	1.02	4.917	6.10	8.000	4.06	11.08	1.02
1.917	1.02	5.000	6.10	8.083	5.08	11.17	1.02
2.000	1.02	5.083	5.08	8.167	5.08	11.25	1.02
2.083	2.03	5.167	5.08	8.250	5.08	11.33	2.03
2.167	2.03	5.250	5.08	8.333	3.05	11.42	2.03
2.250	2.03	5.333	8.13	8.417	3.05	11.50	2.03
2.333	3.05	5.417	8.13	8.500	3.05	11.58	1.02
2.417	3.05	5.500	8.13	8.583	3.05	11.67	1.02
2.500	3.05	5.583	9.14	8.667	3.05	11.75	1.02
2.583	3.05	5.667	9.14	8.750	3.05	11.83	2.03
2.667	3.05	5.750	9.15	8.833	3.05	11.92	2.03
2.750	3.05	5.833	67.06	8.917	3.05	12.00	2.03
2.833	3.05	5.917	67.06	9.000	3.05	12.08	1.02
2.917	3.05	6.000	67.06	9.083	2.03	12.17	1.02
3.000	3.05	6.083	67.06	9.167	2.03	12.25	1.02
3.083	2.03	6.167	67.06	9.250	2.03		

```
Max.Eff.Inten.(mm/hr)=      67.06         46.22
           over (min)        5.00         10.00
Storage Coeff.  (min)=       6.25 (ii)     9.77 (ii)
Unit Hyd. Tpeak (min)=       5.00         10.00
Unit Hyd. peak  (cms)=       0.19          0.11
                                                    *TOTALS*
PEAK FLOW       (cms)=       0.11          0.02     0.131 (iii)
TIME TO PEAK    (hrs)=       6.25          6.25      6.25
RUNOFF VOLUME   (mm)=       72.42         39.68     64.23
TOTAL RAINFALL  (mm)=       74.42         74.42     74.42
RUNOFF COEFFICIENT  =        0.97          0.53      0.86


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 83.0   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 ( 0455)|
|  1 + 2 = 3     |           AREA     QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
            ID1= 1 ( 0190):   0.86     0.119     6.25     58.33
          + ID2= 2 ( 0195):   0.79     0.131     6.25     64.23
            =======================================================
            ID = 3 ( 0455):   1.65     0.250     6.25     61.16

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

--------------------
| RESERVOIR( 0555)|    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   |   0.0238    0.0199
                       0.0104    0.0024   |   0.0268    0.0259
                       0.0162    0.0079   |   0.0825    0.0346
                       0.0203    0.0139   |   0.0000    0.0000

                             AREA     QPEAK    TPEAK     R.V.
                             (ha)     (cms)    (hrs)     (mm)
      INFLOW : ID= 2 ( 0455):  1.650    0.250    6.25     61.16
      OUTFLOW: ID= 1 ( 0555):  1.650    0.112    6.42     61.12

            PEAK  FLOW  REDUCTION [Qout/Qin](%)= 44.72
            TIME SHIFT OF PEAK FLOW      (min)= 10.00
            MAXIMUM STORAGE    USED   (ha.m.)=  0.0393

--------------------------------------------------------------------------------

--------------------
| ADD HYD ( 0465)|
|  1 + 2 = 3     |           AREA     QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
            ID1= 1 ( 0525):   2.07     0.173     6.42     65.03
          + ID2= 2 ( 0555):   1.65     0.112     6.42     61.12
            =======================================================
            ID = 3 ( 0465):   3.72     0.285     6.42     63.30

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
********************************
** SIMULATION:Run 06          **
********************************

--------------------
|   READ STORM   |   Filename: C:\Users\ray.zhao\AppD
```

```
|                 |       ata\Local\Temp\
|                 |       e8da0adc-3b43-467d-984d-5ab4a7d3492c\d7466973
| Ptotal= 82.04 mm |   Comments: 50yr-12hrSCS
--------------------
          TIME    RAIN  |  TIME   RAIN  |'  TIME   RAIN  |  TIME   RAIN
          hrs     mm/hr |  hrs    mm/hr |'  hrs    mm/hr |  hrs    mm/hr
          0.25    0.00  |  3.50   3.05  |  6.75   14.22  | 10.00   3.05
          0.50    2.03  |  3.75   3.05  |  7.00    7.11  | 10.25   2.03
          0.75    1.02  |  4.00   4.06  |  7.25    6.10  | 10.50   2.03
          1.00    2.03  |  4.25   3.05  |  7.50    5.08  | 10.75   1.02
          1.25    1.02  |  4.50   5.08  |  7.75    5.08  | 11.00   2.03
          1.50    2.03  |  4.75   6.10  |  8.00    5.08  | 11.25   2.03
          1.75    2.03  |  5.00   6.10  |  8.25    4.06  | 11.50   1.02
          2.00    1.02  |  5.25   5.08  |  8.50    4.06  | 11.75   2.03
          2.25    2.03  |  5.50  10.16  |  8.75    3.05  | 12.00   1.02
          2.50    3.05  |  5.75  10.16  |  9.00    3.05  | 12.25   2.03
          2.75    3.05  |  6.00  73.15  |  9.25    3.05  |
          3.00    4.06  |  6.25  74.17  |  9.50    3.05  |
          3.25    3.05  |  6.50  15.24  |  9.75    2.03  |

--------------------------------------------------------------------------------

--------------------
| CALIB           |
| STANDHYD ( 0165)|   Area     (ha)=  0.60
| ID=1 DT= 5.0 min |  Total Imp(%)= 72.00  Dir. Conn.(%)= 72.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
        Surface Area  (ha)=    0.43         0.17
        Dep. Storage  (mm)=    2.00         5.00
        Average Slope  (%)=    1.00         2.00
        Length         (m)=  250.00        20.00
        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  |  3.167  3.05  |  6.250  74.17  |  9.33   3.05
          0.167   0.00  |  3.250  3.05  |  6.333  15.24  |  9.42   3.05
          0.250   0.00  |  3.333  3.05  |  6.417  15.24  |  9.50   3.05
          0.333   2.03  |  3.417  3.05  |  6.500  15.24  |  9.58   2.03
          0.417   2.03  |  3.500  3.05  |  6.583  14.22  |  9.67   2.03
          0.500   2.03  |  3.583  3.05  |  6.667  14.22  |  9.75   2.03
          0.583   1.02  |  3.667  3.05  |  6.750  14.22  |  9.83   3.05
          0.667   1.02  |  3.750  3.05  |  6.833   7.11  |  9.92   3.05
          0.750   1.02  |  3.833  4.06  |  6.917   7.11  | 10.00   3.05
          0.833   2.03  |  3.917  4.06  |  7.000   7.11  | 10.08   2.03
          0.917   2.03  |  4.000  4.06  |  7.083   6.10  | 10.17   2.03
          1.000   2.03  |  4.083  3.05  |  7.167   6.10  | 10.25   2.03
          1.083   1.02  |  4.167  3.05  |  7.250   6.10  | 10.33   2.03
```

1.167	1.02	4.250	3.05	7.333	5.08	10.42	2.03
1.250	1.02	4.333	5.08	7.417	5.08	10.50	2.03
1.333	2.03	4.417	5.08	7.500	5.08	10.58	1.02
1.417	2.03	4.500	5.08	7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10	7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10	7.833	5.08	10.92	2.03
1.750	2.03	4.833	6.10	7.917	5.08	11.00	2.03
1.833	1.02	4.917	6.10	8.000	5.08	11.08	2.03
1.917	1.02	5.000	6.10	8.083	4.06	11.17	2.03
2.000	1.02	5.083	5.08	8.167	4.06	11.25	2.03
2.083	2.03	5.167	5.08	8.250	4.06	11.33	1.02
2.167	2.03	5.250	5.08	8.333	4.06	11.42	1.02
2.250	2.03	5.333	10.16	8.417	4.06	11.50	1.02
2.333	3.05	5.417	10.16	8.500	4.06	11.58	2.03
2.417	3.05	5.500	10.16	8.583	3.05	11.67	2.03
2.500	3.05	5.583	10.16	8.667	3.05	11.75	2.03
2.583	3.05	5.667	10.16	8.750	3.05	11.83	1.02
2.667	3.05	5.750	10.16	8.833	3.05	11.92	1.02
2.750	3.05	5.833	73.15	8.917	3.05	12.00	1.02
2.833	4.06	5.917	73.15	9.000	3.05	12.08	2.03
2.917	4.06	6.000	73.15	9.083	3.05	12.17	2.03
3.000	4.06	6.083	74.17	9.167	3.05	12.25	2.03
3.083	3.05	6.167	74.17	9.250	3.05		

```
Max.Eff.Inten.(mm/hr)=      74.17         53.29
           over (min)        5.00         10.00
Storage Coeff.  (min)=       4.99 (ii)     8.59 (ii)
Unit Hyd. Tpeak (min)=       5.00         10.00
Unit Hyd. peak  (cms)=       0.22          0.12
                                                    *TOTALS*
PEAK FLOW       (cms)=       0.09          0.02     0.111 (iii)
TIME TO PEAK    (hrs)=       6.25          6.25      6.25
RUNOFF VOLUME   (mm)=       80.04         45.99     70.50
TOTAL RAINFALL  (mm)=       82.04         82.04     82.04
RUNOFF COEFFICIENT  =        0.98          0.56      0.86

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

    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 ( 0170)|   Area     (ha)=  0.43
| ID=1 DT= 5.0 min |  Total Imp(%)= 98.00  Dir. Conn.(%)= 98.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
        Surface Area  (ha)=    0.42         0.01
```

```
                 LangstaffRd_EA_Proposed_WestDonWatershd
Dep. Storage    (mm)=     2.00         5.00
Average Slope   (%)=      1.00         2.00
Length          (m)=    250.00        20.00
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 | 3.167  3.05 | 6.250  74.17 | 9.33   3.05
       0.167   0.00 | 3.250  3.05 | 6.333  15.24 | 9.42   3.05
       0.250   0.00 | 3.333  3.05 | 6.417  15.24 | 9.50   3.05
       0.333   2.03 | 3.417  3.05 | 6.500  15.24 | 9.58   2.03
       0.417   2.03 | 3.500  3.05 | 6.583  14.22 | 9.67   2.03
       0.500   2.03 | 3.583  3.05 | 6.667  14.22 | 9.75   2.03
       0.583   1.02 | 3.667  3.05 | 6.750  14.22 | 9.83   3.05
       0.667   1.02 | 3.750  3.05 | 6.833   7.11 | 9.92   3.05
       0.750   1.02 | 3.833  4.06 | 6.917   7.11 | 10.00  3.05
       0.833   2.03 | 3.917  4.06 | 7.000   7.11 | 10.08  2.03
       0.917   2.03 | 4.000  4.06 | 7.083   6.10 | 10.17  2.03
       1.000   2.03 | 4.083  3.05 | 7.167   6.10 | 10.25  2.03
       1.083   1.02 | 4.167  3.05 | 7.250   6.10 | 10.33  2.03
       1.167   1.02 | 4.250  3.05 | 7.333   5.08 | 10.42  2.03
       1.250   1.02 | 4.333  5.08 | 7.417   5.08 | 10.50  1.02
       1.333   2.03 | 4.417  5.08 | 7.500   5.08 | 10.58  1.02
       1.417   2.03 | 4.500  5.08 | 7.583   5.08 | 10.67  1.02
       1.500   2.03 | 4.583  6.10 | 7.667   5.08 | 10.75  1.02
       1.583   2.03 | 4.667  6.10 | 7.750   5.08 | 10.83  2.03
       1.667   2.03 | 4.750  6.10 | 7.833   5.08 | 10.92  2.03
       1.750   2.03 | 4.833  6.10 | 7.917   5.08 | 11.00  2.03
       1.833   1.02 | 4.917  6.10 | 8.000   5.08 | 11.08  2.03
       1.917   1.02 | 5.000  6.10 | 8.083   4.06 | 11.17  2.03
       2.000   1.02 | 5.083  5.08 | 8.167   4.06 | 11.25  2.03
       2.083   2.03 | 5.167  5.08 | 8.250   4.06 | 11.33  1.02
       2.167   2.03 | 5.250  5.08 | 8.333   4.06 | 11.42  1.02
       2.250   2.03 | 5.333 10.16 | 8.417   4.06 | 11.50  1.02
       2.333   3.05 | 5.417 10.16 | 8.500   4.06 | 11.58  2.03
       2.417   3.05 | 5.500 10.16 | 8.583   3.05 | 11.67  2.03
       2.500   3.05 | 5.583 10.16 | 8.667   3.05 | 11.75  2.03
       2.583   3.05 | 5.667 10.16 | 8.750   3.05 | 11.83  1.02
       2.667   3.05 | 5.750 10.16 | 8.833   3.05 | 11.92  1.02
       2.750   3.05 | 5.833 73.15 | 8.917   3.05 | 12.00  1.02
       2.833   4.06 | 5.917 73.15 | 9.000   3.05 | 12.08  2.03
       2.917   4.06 | 6.000 73.15 | 9.083   3.05 | 12.17  2.03
       3.000   4.06 | 6.083 74.17 | 9.167   3.05 | 12.25  2.03
       3.083   3.05 | 6.167 74.17 | 9.250   3.05 |

Max.Eff.Inten.(mm/hr)=    74.17         61.96
        over (min)         5.00         10.00
Storage Coeff.  (min)=     4.99 (ii)    6.10 (ii)
Unit Hyd. Tpeak (min)=     5.00         10.00
```

```
                 LangstaffRd_EA_Proposed_WestDonWatershd
Unit Hyd. peak  (cms)=     0.22         0.15
                                                 *TOTALS*
PEAK FLOW       (cms)=     0.09         0.00      0.088 (iii)
TIME TO PEAK    (hrs)=     6.25         6.25      6.25
RUNOFF VOLUME   (mm)=     80.04        54.74     79.53
TOTAL RAINFALL  (mm)=     82.04        82.04     82.04
RUNOFF COEFFICIENT  =      0.98         0.67      0.97

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

    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 89.0   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 ( 0180)|   Area    (ha)=  0.65
|ID= 1 DT= 5.0 min |   Total Imp(%)= 52.00   Dir. Conn.(%)= 52.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=      0.34          0.31
Dep. Storage    (mm)=      2.00          5.00
Average Slope   (%)=       1.00          2.00
Length          (m)=      65.83         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 | 3.167  3.05 | 6.250  74.17 | 9.33   3.05
       0.167   0.00 | 3.250  3.05 | 6.333  15.24 | 9.42   3.05
       0.250   0.00 | 3.333  3.05 | 6.417  15.24 | 9.50   3.05
       0.333   2.03 | 3.417  3.05 | 6.500  15.24 | 9.58   2.03
       0.417   2.03 | 3.500  3.05 | 6.583  14.22 | 9.67   2.03
       0.500   2.03 | 3.583  3.05 | 6.667  14.22 | 9.75   2.03
       0.583   1.02 | 3.667  3.05 | 6.750  14.22 | 9.83   3.05
       0.667   1.02 | 3.750  3.05 | 6.833   7.11 | 9.92   3.05
       0.750   1.02 | 3.833  4.06 | 6.917   7.11 | 10.00  3.05
       0.833   2.03 | 3.917  4.06 | 7.000   7.11 | 10.08  2.03
       0.917   2.03 | 4.000  4.06 | 7.083   6.10 | 10.17  2.03
       1.000   2.03 | 4.083  3.05 | 7.167   6.10 | 10.25  2.03
       1.083   1.02 | 4.167  3.05 | 7.250   6.10 | 10.33  2.03
       1.167   1.02 | 4.250  3.05 | 7.333   5.08 | 10.42  2.03
       1.250   1.02 | 4.333  5.08 | 7.417   5.08 | 10.50  2.03
       1.333   2.03 | 4.417  5.08 | 7.500   5.08 | 10.58  1.02
       1.417   2.03 | 4.500  5.08 | 7.583   5.08 | 10.67  1.02
       1.500   2.03 | 4.583  6.10 | 7.667   5.08 | 10.75  1.02
```

```
                 LangstaffRd_EA_Proposed_WestDonWatershd
       1.583   2.03 | 4.667  6.10 | 7.750   5.08 | 10.83  2.03
       1.667   2.03 | 4.750  6.10 | 7.833   5.08 | 10.92  2.03
       1.750   2.03 | 4.833  6.10 | 7.917   5.08 | 11.00  2.03
       1.833   1.02 | 4.917  6.10 | 8.000   5.08 | 11.08  2.03
       1.917   1.02 | 5.000  6.10 | 8.083   4.06 | 11.17  2.03
       2.000   1.02 | 5.083  5.08 | 8.167   4.06 | 11.25  2.03
       2.083   2.03 | 5.167  5.08 | 8.250   4.06 | 11.33  1.02
       2.167   2.03 | 5.250  5.08 | 8.333   4.06 | 11.42  1.02
       2.250   2.03 | 5.333 10.16 | 8.417   4.06 | 11.50  1.02
       2.333   3.05 | 5.417 10.16 | 8.500   4.06 | 11.58  2.03
       2.417   3.05 | 5.500 10.16 | 8.583   3.05 | 11.67  2.03
       2.500   3.05 | 5.583 10.16 | 8.667   3.05 | 11.75  2.03
       2.583   3.05 | 5.667 10.16 | 8.750   3.05 | 11.83  1.02
       2.667   3.05 | 5.750 10.16 | 8.833   3.05 | 11.92  1.02
       2.750   3.05 | 5.833 73.15 | 8.917   3.05 | 12.00  1.02
       2.833   4.06 | 5.917 73.15 | 9.000   3.05 | 12.08  2.03
       2.917   4.06 | 6.000 73.15 | 9.083   3.05 | 12.17  2.03
       3.000   4.06 | 6.083 74.17 | 9.167   3.05 | 12.25  2.03
       3.083   3.05 | 6.167 74.17 | 9.250   3.05 |

Max.Eff.Inten.(mm/hr)=    74.17         53.29
        over (min)         5.00         15.00
Storage Coeff.  (min)=     2.24 (ii)   11.32 (ii)
Unit Hyd. Tpeak (min)=     5.00         15.00
Unit Hyd. peak  (cms)=     0.30          0.09
                                                 *TOTALS*
PEAK FLOW       (cms)=     0.07         0.04      0.105 (iii)
TIME TO PEAK    (hrs)=     6.25         6.33      6.25
RUNOFF VOLUME   (mm)=     80.04        45.99     63.69
TOTAL RAINFALL  (mm)=     82.04        82.04     82.04
RUNOFF COEFFICIENT  =      0.98         0.56      0.78

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

    (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 83.0   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 ( 0185)|   Area    (ha)=  0.47
|ID= 1 DT= 5.0 min |   Total Imp(%)= 72.00   Dir. Conn.(%)= 72.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
Surface Area    (ha)=      0.34          0.13
Dep. Storage    (mm)=      2.00          5.00
Average Slope   (%)=       1.00          2.00
Length          (m)=     240.00         20.00
Mannings n       =         0.013         0.350
```

```
                 LangstaffRd_EA_Proposed_WestDonWatershd
   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  3.05 | 6.250  74.17 | 9.33   3.05
       0.167   0.00 | 3.250  3.05 | 6.333  15.24 | 9.42   3.05
       0.250   0.00 | 3.333  3.05 | 6.417  15.24 | 9.50   3.05
       0.333   2.03 | 3.417  3.05 | 6.500  15.24 | 9.58   2.03
       0.417   2.03 | 3.500  3.05 | 6.583  14.22 | 9.67   2.03
       0.500   2.03 | 3.583  3.05 | 6.667  14.22 | 9.75   2.03
       0.583   1.02 | 3.667  3.05 | 6.750  14.22 | 9.83   3.05
       0.667   1.02 | 3.750  3.05 | 6.833   7.11 | 9.92   3.05
       0.750   1.02 | 3.833  4.06 | 6.917   7.11 | 10.00  3.05
       0.833   2.03 | 3.917  4.06 | 7.000   7.11 | 10.08  2.03
       0.917   2.03 | 4.000  4.06 | 7.083   6.10 | 10.17  2.03
       1.000   2.03 | 4.083  3.05 | 7.167   6.10 | 10.25  2.03
       1.083   1.02 | 4.167  3.05 | 7.250   6.10 | 10.33  2.03
       1.167   1.02 | 4.250  3.05 | 7.333   5.08 | 10.42  2.03
       1.250   1.02 | 4.333  5.08 | 7.417   5.08 | 10.50  2.03
       1.333   2.03 | 4.417  5.08 | 7.500   5.08 | 10.58  1.02
       1.417   2.03 | 4.500  5.08 | 7.583   5.08 | 10.67  1.02
       1.500   2.03 | 4.583  6.10 | 7.667   5.08 | 10.75  1.02
       1.583   2.03 | 4.667  6.10 | 7.750   5.08 | 10.83  2.03
       1.667   2.03 | 4.750  6.10 | 7.833   5.08 | 10.92  2.03
       1.750   2.03 | 4.833  6.10 | 7.917   5.08 | 11.00  2.03
       1.833   1.02 | 4.917  6.10 | 8.000   5.08 | 11.08  2.03
       1.917   1.02 | 5.000  6.10 | 8.083   4.06 | 11.17  2.03
       2.000   1.02 | 5.083  5.08 | 8.167   4.06 | 11.25  2.03
       2.083   2.03 | 5.167  5.08 | 8.250   4.06 | 11.33  1.02
       2.167   2.03 | 5.250  5.08 | 8.333   4.06 | 11.42  1.02
       2.250   2.03 | 5.333 10.16 | 8.417   4.06 | 11.50  1.02
       2.333   3.05 | 5.417 10.16 | 8.500   4.06 | 11.58  2.03
       2.417   3.05 | 5.500 10.16 | 8.583   3.05 | 11.67  2.03
       2.500   3.05 | 5.583 10.16 | 8.667   3.05 | 11.75  2.03
       2.583   3.05 | 5.667 10.16 | 8.750   3.05 | 11.83  1.02
       2.667   3.05 | 5.750 10.16 | 8.833   3.05 | 11.92  1.02
       2.750   3.05 | 5.833 73.15 | 8.917   3.05 | 12.00  1.02
       2.833   4.06 | 5.917 73.15 | 9.000   3.05 | 12.08  2.03
       2.917   4.06 | 6.000 73.15 | 9.083   3.05 | 12.17  2.03
       3.000   4.06 | 6.083 74.17 | 9.167   3.05 | 12.25  2.03
       3.083   3.05 | 6.167 74.17 | 9.250   3.05 |

Max.Eff.Inten.(mm/hr)=    74.17         47.96
        over (min)         5.00         10.00
Storage Coeff.  (min)=     4.87 (ii)    9.27 (ii)
Unit Hyd. Tpeak (min)=     5.00         10.00
Unit Hyd. peak  (cms)=     0.22          0.12
                                                 *TOTALS*
PEAK FLOW       (cms)=     0.07         0.02      0.085 (iii)
TIME TO PEAK    (hrs)=     6.25         6.25      6.25
RUNOFF VOLUME   (mm)=     80.04        41.06     69.12
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
        TOTAL RAINFALL   (mm)=    82.04        82.04        82.04
        RUNOFF COEFFICIENT  =     0.98         0.50         0.84

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

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* = 79.0   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 ( 0445)|
|  1 + 2 = 3     |          AREA    QPEAK    TPEAK    R.V.
--------------------          (ha)    (cms)    (hrs)    (mm)
        ID1= 1 ( 0180):    0.65    0.105    6.25    63.69
      + ID2= 2 ( 0185):    0.47    0.085    6.25    69.12
                          ===============================
        ID = 3 ( 0445):    1.12    0.190    6.25    65.97

    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------
--------------------
| ADD HYD ( 0450)|
|  1 + 2 = 3     |          AREA    QPEAK    TPEAK    R.V.
--------------------          (ha)    (cms)    (hrs)    (mm)
        ID1= 1 ( 0165):    0.60    0.111    6.25    70.50
      + ID2= 2 ( 0170):    0.43    0.088    6.25    79.53
                          ===============================
        ID = 3 ( 0450):    1.03    0.199    6.25    74.27

    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------
--------------------
| ADD HYD ( 0450)|
|  3 + 2 = 1     |          AREA    QPEAK    TPEAK    R.V.
--------------------          (ha)    (cms)    (hrs)    (mm)
        ID1= 3 ( 0450):    1.03    0.199    6.25    74.27
      + ID2= 2 ( 0445):    1.12    0.190    6.25    65.97
                          ===============================
        ID = 1 ( 0450):    2.15    0.389    6.25    69.94

    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
---------------------------------------------------------------------
--------------------
| RESERVOIR( 0520)|   OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min     |    OUTFLOW   STORAGE  |  OUTFLOW   STORAGE
--------------------     (cms)    (ha.m.)  |   (cms)    (ha.m.)
                            Page 137
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                    LangstaffRd_EA_Proposed_WestDonWatershd
              0.0000    0.0000   |   0.0181     0.0552
              0.0081    0.0048   |   0.0203     0.0732
              0.0123    0.0192   |   0.0224     0.1152
              0.0155    0.0372   |   0.0000     0.0000

                           AREA    QPEAK    TPEAK      R.V.
                           (ha)    (cms)    (hrs)      (mm)
     INFLOW : ID= 2 ( 0450)   2.150    0.389    6.25    69.94
     OUTFLOW: ID= 1 ( 0520)   2.150    0.022    8.50    69.88

           PEAK  FLOW  REDUCTION [Qout/Qin](%)=  5.59
           TIME SHIFT OF PEAK FLOW       (min)=135.00
           MAXIMUM STORAGE  USED     (ha.m.)=  0.1021

---------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0145)|   Area   (ha)=  3.05
|ID= 1 DT= 5.0 min|   Total Imp(%)= 76.00   Dir. Conn.(%)= 76.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
      Surface Area   (ha)=    2.32          0.73
      Dep. Storage   (mm)=    2.00          5.00
      Average Slope  (%)=     1.00          2.00
      Length         (m)=   531.00         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 | 3.167   3.05 | 6.250  74.17 | 9.33    3.05
           0.167   0.00 | 3.250   3.05 | 6.333  15.24 | 9.42    3.05
           0.250   0.00 | 3.333   3.05 | 6.417  15.24 | 9.50    3.05
           0.333   2.03 | 3.417   3.05 | 6.500  15.24 | 9.58    2.03
           0.417   2.03 | 3.500   3.05 | 6.583  14.22 | 9.67    2.03
           0.500   2.03 | 3.583   3.05 | 6.667  14.22 | 9.75    2.03
           0.583   1.02 | 3.667   3.05 | 6.750  14.22 | 9.83    3.05
           0.667   1.02 | 3.750   3.05 | 6.833   7.11 | 9.92    3.05
           0.750   1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
           0.833   2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
           0.917   2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
           1.000   2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
           1.083   1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
           1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
           1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
           1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
           1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
           1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
           1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
           1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
                            Page 138
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                    LangstaffRd_EA_Proposed_WestDonWatershd
             1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
             1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
             1.917   1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
             2.000   1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
             2.083   2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
             2.167   2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
             2.250   2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
             2.333   3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
             2.417   3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
             2.500   3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
             2.583   3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
             2.667   3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
             2.750   3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
             2.833   4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
             2.917   4.06 | 6.000  73.15 | 9.083   3.05 | 12.17   2.03
             3.000   4.06 | 6.083  74.17 | 9.167   3.05 | 12.25   2.03
             3.083   3.05 | 6.167  74.17 | 9.250   3.05 |

      Max.Eff.Inten.(mm/hr)=    74.17        57.55
              over (min)       10.00        20.00
      Storage Coeff.  (min)=    7.84 (ii)   16.64 (ii)
      Unit Hyd. Tpeak (min)=   10.00        20.00
      Unit Hyd. peak  (cms)=    0.13         0.06
                                                    *TOTALS*
      PEAK FLOW     (cms)=      0.46         0.08     0.536 (iii)
      TIME TO PEAK  (hrs)=      6.25         6.42     6.25
      RUNOFF VOLUME  (mm)=     80.04        50.13    72.86
      TOTAL RAINFALL (mm)=     82.04        82.04    82.04
      RUNOFF COEFFICIENT  =     0.98         0.61     0.89


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* = 86.0   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 ( 0135)|   Area   (ha)=  1.43
|ID= 1 DT= 5.0 min|   Total Imp(%)= 99.00   Dir. Conn.(%)= 99.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
      Surface Area   (ha)=    1.42          0.01
      Dep. Storage   (mm)=    2.00          5.00
      Average Slope  (%)=     1.00          2.00
      Length         (m)=   503.00         30.00
      Mannings n      =      0.013          0.250

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

                            Page 139
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                    LangstaffRd_EA_Proposed_WestDonWatershd
                        ---- 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   3.05 | 6.250  74.17 | 9.33    3.05
           0.167   0.00 | 3.250   3.05 | 6.333  15.24 | 9.42    3.05
           0.250   0.00 | 3.333   3.05 | 6.417  15.24 | 9.50    3.05
           0.333   2.03 | 3.417   3.05 | 6.500  15.24 | 9.58    2.03
           0.417   2.03 | 3.500   3.05 | 6.583  14.22 | 9.67    2.03
           0.500   2.03 | 3.583   3.05 | 6.667  14.22 | 9.75    2.03
           0.583   1.02 | 3.667   3.05 | 6.750  14.22 | 9.83    3.05
           0.667   1.02 | 3.750   3.05 | 6.833   7.11 | 9.92    3.05
           0.750   1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
           0.833   2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
           0.917   2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
           1.000   2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
           1.083   1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
           1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
           1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
           1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
           1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
           1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
           1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
           1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
           1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
           1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
           1.917   1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
           2.000   1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
           2.083   2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
           2.167   2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
           2.250   2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
           2.333   3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
           2.417   3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
           2.500   3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
           2.583   3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
           2.667   3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
           2.750   3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
           2.833   4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
           2.917   4.06 | 6.000  73.15 | 9.083   3.05 | 12.17   2.03
           3.000   4.06 | 6.083  74.17 | 9.167   3.05 | 12.25   2.03
           3.083   3.05 | 6.167  74.17 | 9.250   3.05 |

      Max.Eff.Inten.(mm/hr)=    74.17        54.69
              over (min)       10.00        10.00
      Storage Coeff.  (min)=    7.59 (ii)    8.65 (ii)
      Unit Hyd. Tpeak (min)=   10.00        10.00
      Unit Hyd. peak  (cms)=    0.13         0.12
                                                    *TOTALS*
      PEAK FLOW     (cms)=      0.28         0.00     0.285 (iii)
      TIME TO PEAK  (hrs)=      6.25         6.25     6.25
      RUNOFF VOLUME  (mm)=     80.04        47.32    79.71
      TOTAL RAINFALL (mm)=     82.04        82.04    82.04
      RUNOFF COEFFICIENT  =     0.98         0.58     0.97

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Page 141 (top-left)

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                    LangstaffRd_EA_Proposed_WestDonWatershd

         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 84.0   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 ( 0140)|   Area    (ha)= 1.27
|ID= 1 DT= 5.0 min |   Total Imp(%)= 91.00  Dir. Conn.(%)= 91.00
---------------------
                              IMPERVIOUS   PERVIOUS (i)
        Surface Area    (ha)=    1.16         0.11
        Dep. Storage    (mm)=    2.00         5.00
        Average Slope   (%)=     1.00         2.00
        Length          (m)=   503.00        25.00
        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 | 3.167  3.05 | 6.250 74.17 | 9.33   3.05
       0.167   0.00 | 3.250  3.05 | 6.333 15.24 | 9.42   3.05
       0.250   0.00 | 3.333  3.05 | 6.417 15.24 | 9.50   3.05
       0.333   2.03 | 3.417  3.05 | 6.500 15.24 | 9.58   2.03
       0.417   2.03 | 3.500  3.05 | 6.583 14.22 | 9.67   2.03
       0.500   2.03 | 3.583  3.05 | 6.667 14.22 | 9.75   2.03
       0.583   1.02 | 3.667  3.05 | 6.750 14.22 | 9.83   3.05
       0.667   1.02 | 3.750  3.05 | 6.833  7.11 | 9.92   3.05
       0.750   1.02 | 3.833  4.06 | 6.917  7.11 | 10.00  3.05
       0.833   2.03 | 3.917  4.06 | 7.000  7.11 | 10.08  2.03
       0.917   2.03 | 4.000  4.06 | 7.083  6.10 | 10.17  2.03
       1.000   2.03 | 4.083  3.05 | 7.167  6.10 | 10.25  2.03
       1.083   1.02 | 4.167  3.05 | 7.250  6.10 | 10.33  2.03
       1.167   1.02 | 4.250  3.05 | 7.333  5.08 | 10.42  2.03
       1.250   1.02 | 4.333  5.08 | 7.417  5.08 | 10.50  2.03
       1.333   2.03 | 4.417  5.08 | 7.500  5.08 | 10.58  1.02
       1.417   2.03 | 4.500  5.08 | 7.583  5.08 | 10.67  1.02
       1.500   2.03 | 4.583  6.10 | 7.667  5.08 | 10.75  1.02
       1.583   2.03 | 4.667  6.10 | 7.750  5.08 | 10.83  2.03
       1.667   2.03 | 4.750  6.10 | 7.833  5.08 | 10.92  2.03
       1.750   2.03 | 4.833  6.10 | 7.917  5.08 | 11.00  2.03
       1.833   1.02 | 4.917  6.10 | 8.000  5.08 | 11.08  2.03
       1.917   1.02 | 5.000  6.10 | 8.083  4.06 | 11.17  2.03
       2.000   1.02 | 5.083  5.08 | 8.167  4.06 | 11.25  2.03
       2.083   2.03 | 5.167  5.08 | 8.250  4.06 | 11.33  1.02
       2.167   2.03 | 5.250  5.08 | 8.333  4.06 | 11.42  1.02
       2.250   2.03 | 5.333 10.16 | 8.417  4.06 | 11.50  1.02
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Page 142 (top-right)

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                    LangstaffRd_EA_Proposed_WestDonWatershd
       2.333   3.05 | 5.417 10.16 | 8.500  4.06 | 11.58  2.03
       2.417   3.05 | 5.500 10.16 | 8.583  3.05 | 11.67  2.03
       2.500   3.05 | 5.583 10.16 | 8.667  3.05 | 11.75  2.03
       2.583   3.05 | 5.667 10.16 | 8.750  3.05 | 11.83  1.02
       2.667   3.05 | 5.750 10.16 | 8.833  3.05 | 11.92  1.02
       2.750   3.05 | 5.833 73.15 | 8.917  3.05 | 12.00  1.02
       2.833   4.06 | 5.917 73.15 | 9.000  3.05 | 12.08  2.03
       2.917   4.06 | 6.000 73.15 | 9.083  3.05 | 12.17  2.03
       3.000   4.06 | 6.083 74.17 | 9.167  3.05 | 12.25  2.03
       3.083   3.05 | 6.167 74.17 | 9.250  3.05 |

  Max.Eff.Inten.(mm/hr)=   74.17         53.29
            over  (min)=   10.00         10.00
  Storage Coeff. (min)=     7.59 (ii)    9.97 (ii)
  Unit Hyd. Tpeak (min)=   10.00         10.00
  Unit Hyd. peak (cms)=     0.13          0.11
                                                *TOTALS*
  PEAK FLOW      (cms)=     0.23          0.01     0.246 (iii)
  TIME TO PEAK   (hrs)=     6.25          6.25     6.25
  RUNOFF VOLUME  (mm)=     80.04         45.99    76.97
  TOTAL RAINFALL (mm)=     82.04         82.04    82.04
  RUNOFF COEFFICIENT  =     0.98          0.56     0.94


         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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  ( 0420)|
|  1 + 2 = 3      |          AREA    QPEAK   TPEAK    R.V.
---------------------          (ha)   (cms)   (hrs)    (mm)
         ID1= 1 ( 0135):    1.43    0.285    6.25   79.71
       + ID2= 2 ( 0140):    1.27    0.246    6.25   76.97
         =======================================================
         ID = 3 ( 0420):    2.70    0.531    6.25   78.42

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
----------------------------------------------------------------------
---------------------
| RESERVOIR( 0530)|    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   |  0.0122    0.0823
                        0.0056    0.0072   |  0.0382    0.1093
                        0.0084    0.0283   |  0.0516    0.1598
                        0.0105    0.0553   |  0.0000    0.0000
```

Page 143 (bottom-left)

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                    LangstaffRd_EA_Proposed_WestDonWatershd
                            AREA    QPEAK   TPEAK    R.V.
                            (ha)   (cms)   (hrs)    (mm)
   INFLOW : ID= 2 ( 0420)   2.700   0.531    6.25   78.42
   OUTFLOW: ID= 1 ( 0530)   2.700   0.048    7.25   78.31

           PEAK  FLOW  REDUCTION [Qout/Qin](%)= 8.96
           TIME SHIFT OF PEAK FLOW     (min)= 60.00
           MAXIMUM STORAGE  USED    (ha.m.)= 0.1448

----------------------------------------------------------------------
---------------------
| ADD HYD  ( 0425)|
|  1 + 2 = 3      |          AREA    QPEAK   TPEAK    R.V.
---------------------          (ha)   (cms)   (hrs)    (mm)
         ID1= 1 ( 0145):    3.05    0.536    6.25   72.86
       + ID2= 2 ( 0530):    2.70    0.048    7.25   78.31
         =======================================================
         ID = 3 ( 0425):    5.75    0.565    6.25   75.42

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
----------------------------------------------------------------------
---------------------
| RESERVOIR( 0512)|    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   |  0.0471    0.1003
                        0.0071    0.0165   |  0.0636    0.1284
                        0.0098    0.0331   |  0.0763    0.1594
                        0.0119    0.0526   |  0.0870    0.1934
                        0.0138    0.0750   |  0.0964    0.2308

                            AREA    QPEAK   TPEAK    R.V.
                            (ha)   (cms)   (hrs)    (mm)
   INFLOW : ID= 2 ( 0425)   5.750   0.565    6.25   75.42
   OUTFLOW: ID= 1 ( 0512)   5.750   0.080    8.50   75.32

           PEAK  FLOW  REDUCTION [Qout/Qin](%)= 14.11
           TIME SHIFT OF PEAK FLOW     (min)=135.00
           MAXIMUM STORAGE  USED    (ha.m.)= 0.1704

----------------------------------------------------------------------
---------------------
| CALIB             |
| STANDHYD ( 0215)|   Area    (ha)= 0.58
|ID= 1 DT= 5.0 min |   Total Imp(%)= 81.00  Dir. Conn.(%)= 81.00
---------------------
                              IMPERVIOUS   PERVIOUS (i)
        Surface Area    (ha)=    0.47         0.11
        Dep. Storage    (mm)=    2.00         5.00
        Average Slope   (%)=     1.00         2.00
        Length          (m)=   260.00        30.00
```

Page 144 (bottom-right)

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                    LangstaffRd_EA_Proposed_WestDonWatershd
  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  3.05 | 6.250 74.17 | 9.33   3.05
       0.167   0.00 | 3.250  3.05 | 6.333 15.24 | 9.42   3.05
       0.250   0.00 | 3.333  3.05 | 6.417 15.24 | 9.50   3.05
       0.333   2.03 | 3.417  3.05 | 6.500 15.24 | 9.58   2.03
       0.417   2.03 | 3.500  3.05 | 6.583 14.22 | 9.67   2.03
       0.500   2.03 | 3.583  3.05 | 6.667 14.22 | 9.75   2.03
       0.583   1.02 | 3.667  3.05 | 6.750 14.22 | 9.83   3.05
       0.667   1.02 | 3.750  4.06 | 6.833  7.11 | 9.92   3.05
       0.750   1.02 | 3.833  4.06 | 6.917  7.11 | 10.00  3.05
       0.833   2.03 | 3.917  4.06 | 7.000  7.11 | 10.08  2.03
       0.917   2.03 | 4.000  4.06 | 7.083  6.10 | 10.17  2.03
       1.000   2.03 | 4.083  3.05 | 7.167  6.10 | 10.25  2.03
       1.083   1.02 | 4.167  3.05 | 7.250  6.10 | 10.33  2.03
       1.167   1.02 | 4.250  3.05 | 7.333  5.08 | 10.42  2.03
       1.250   1.02 | 4.333  5.08 | 7.417  5.08 | 10.50  2.03
       1.333   2.03 | 4.417  5.08 | 7.500  5.08 | 10.58  1.02
       1.417   2.03 | 4.500  5.08 | 7.583  5.08 | 10.67  1.02
       1.500   2.03 | 4.583  6.10 | 7.667  5.08 | 10.75  1.02
       1.583   2.03 | 4.667  6.10 | 7.750  5.08 | 10.83  2.03
       1.667   2.03 | 4.750  6.10 | 7.833  5.08 | 10.92  2.03
       1.750   2.03 | 4.833  6.10 | 7.917  5.08 | 11.00  2.03
       1.833   1.02 | 4.917  6.10 | 8.000  5.08 | 11.08  2.03
       1.917   1.02 | 5.000  6.10 | 8.083  4.06 | 11.17  2.03
       2.000   1.02 | 5.083  5.08 | 8.167  4.06 | 11.25  2.03
       2.083   2.03 | 5.167  5.08 | 8.250  4.06 | 11.33  1.02
       2.167   2.03 | 5.250  5.08 | 8.333  4.06 | 11.42  1.02
       2.250   2.03 | 5.333 10.16 | 8.417  4.06 | 11.50  1.02
       2.333   3.05 | 5.417 10.16 | 8.500  4.06 | 11.58  2.03
       2.417   3.05 | 5.500 10.16 | 8.583  3.05 | 11.67  2.03
       2.500   3.05 | 5.583 10.16 | 8.667  3.05 | 11.75  2.03
       2.583   3.05 | 5.667 10.16 | 8.750  3.05 | 11.83  1.02
       2.667   3.05 | 5.750 10.16 | 8.833  3.05 | 11.92  1.02
       2.750   3.05 | 5.833 73.15 | 8.917  3.05 | 12.00  1.02
       2.833   4.06 | 5.917 73.15 | 9.000  3.05 | 12.08  2.03
       2.917   4.06 | 6.000 73.15 | 9.083  3.05 | 12.17  2.03
       3.000   4.06 | 6.083 74.17 | 9.167  3.05 | 12.25  2.03
       3.083   3.05 | 6.167 74.17 | 9.250  3.05 |

  Max.Eff.Inten.(mm/hr)=   74.17         53.29
            over  (min)=    5.00         10.00
  Storage Coeff. (min)=     5.11 (ii)    8.86 (ii)
  Unit Hyd. Tpeak (min)=    5.00         10.00
  Unit Hyd. peak (cms)=     0.21          0.12
                                                *TOTALS*
  PEAK FLOW      (cms)=     0.10          0.01     0.111 (iii)
```

Page 145 (top-left)

```
                LangstaffRd_EA_Proposed_WestDonWatershd
TIME TO PEAK    (hrs)=      6.25        6.25        6.25
RUNOFF VOLUME   (mm)=      80.04       45.99       73.56
TOTAL RAINFALL  (mm)=      82.04       82.04       82.04
RUNOFF COEFFICIENT  =       0.98        0.56        0.90


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 ( 0220) |   Area    (ha)=   0.65
|ID= 1 DT= 5.0 min |   Total Imp(%)= 66.00   Dir. Conn.(%)= 66.00
--------------------
                            IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=      0.43         0.22
     Dep. Storage   (mm)=      2.00         5.00
     Average Slope  (%)=       1.00         2.00
     Length         (m)=     260.00        20.00
     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 | 3.167   3.05 | 6.250  74.17 | 9.33   3.05
       0.167   0.00 | 3.250   3.05 | 6.333  15.24 | 9.42   3.05
       0.250   0.00 | 3.333   3.05 | 6.417  15.24 | 9.50   3.05
       0.333   2.03 | 3.417   3.05 | 6.500  15.24 | 9.58   2.03
       0.417   2.03 | 3.500   3.05 | 6.583  14.22 | 9.67   2.03
       0.500   2.03 | 3.583   3.05 | 6.667  14.22 | 9.75   2.03
       0.583   1.02 | 3.667   3.05 | 6.750  14.22 | 9.83   3.05
       0.667   1.02 | 3.750   3.05 | 6.833   7.11 | 9.92   3.05
       0.750   1.02 | 3.833   4.06 | 6.917   7.11 |10.00   3.05
       0.833   2.03 | 3.917   4.06 | 7.000   7.11 |10.08   2.03
       0.917   2.03 | 4.000   4.06 | 7.083   6.10 |10.17   2.03
       1.000   2.03 | 4.083   3.05 | 7.167   6.10 |10.25   2.03
       1.083   1.02 | 4.167   3.05 | 7.250   6.10 |10.33   2.03
       1.167   1.02 | 4.250   3.05 | 7.333   5.08 |10.42   2.03
       1.250   1.02 | 4.333   5.08 | 7.417   5.08 |10.50   2.03
       1.333   2.03 | 4.417   5.08 | 7.500   5.08 |10.58   1.02
       1.417   2.03 | 4.500   5.08 | 7.583   5.08 |10.67   1.02
       1.500   2.03 | 4.583   6.10 | 7.667   5.08 |10.75   1.02
       1.583   2.03 | 4.667   6.10 | 7.750   5.08 |10.83   2.03
       1.667   2.03 | 4.750   6.10 | 7.833   5.08 |10.92   2.03
       1.750   2.03 | 4.833   6.10 | 7.917   5.08 |11.00   2.03
       1.833   1.02 | 4.917   6.10 | 8.000   5.08 |11.08   2.03
```

Page 146 (top-right)

```
                LangstaffRd_EA_Proposed_WestDonWatershd
       1.917   1.02 | 5.000   6.10 | 8.083   4.06 |11.17   2.03
       2.000   1.02 | 5.083   5.08 | 8.167   4.06 |11.25   2.03
       2.083   2.03 | 5.167   5.08 | 8.250   4.06 |11.33   1.02
       2.167   2.03 | 5.250   5.08 | 8.333   4.06 |11.42   1.02
       2.250   2.03 | 5.333  10.16 | 8.417   4.06 |11.50   1.02
       2.333   3.05 | 5.417  10.16 | 8.500   4.06 |11.58   2.03
       2.417   3.05 | 5.500  10.16 | 8.583   3.05 |11.67   2.03
       2.500   3.05 | 5.583  10.16 | 8.667   3.05 |11.75   2.03
       2.583   3.05 | 5.667  10.16 | 8.750   3.05 |11.83   1.02
       2.667   3.05 | 5.750  10.16 | 8.833   3.05 |11.92   1.02
       2.750   3.05 | 5.833  73.15 | 8.917   3.05 |12.00   1.02
       2.833   4.06 | 5.917  73.15 | 9.000   3.05 |12.08   2.03
       2.917   4.06 | 6.000  73.15 | 9.083   3.05 |12.17   2.03
       3.000   4.06 | 6.083  74.17 | 9.167   3.05 |12.25   2.03
       3.083   3.05 | 6.167  74.17 | 9.250   3.05 |
```

```
     Max.Eff.Inten.(mm/hr)=    74.17       53.29
          over (min)=          5.00       10.00
     Storage Coeff. (min)=     5.11 (ii)   9.13 (ii)
     Unit Hyd. Tpeak (min)=    5.00       10.00
     Unit Hyd. peak  (cms)=    0.21        0.12

                                                    *TOTALS*
     PEAK FLOW      (cms)=      0.09        0.03      0.117 (iii)
     TIME TO PEAK   (hrs)=      6.25        6.25        6.25
     RUNOFF VOLUME  (mm)=      80.04       45.99       68.46
     TOTAL RAINFALL (mm)=      82.04       82.04       82.04
     RUNOFF COEFFICIENT  =      0.98        0.56        0.83


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 ( 0470)  |
|   1 + 2 = 3      |          AREA     QPEAK    TPEAK      R.V.
--------------------          (ha)     (cms)    (hrs)      (mm)
       ID1= 1 ( 0215):         0.58    0.111     6.25     73.56
     + ID2= 2 ( 0220):         0.65    0.117     6.25     68.46
                            ========================================
       ID = 3 ( 0470):         1.23    0.228     6.25     70.87

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

```
--------------------
| RESERVOIR( 0535) |    OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |       OUTFLOW   STORAGE  |   OUTFLOW   STORAGE
--------------------       (cms)     (ha.m.)  |   (cms)     (ha.m.)
```

Page 147 (bottom-left)

```
                LangstaffRd_EA_Proposed_WestDonWatershd
        0.0000    0.0000  |   0.0116    0.0367
        0.0053    0.0048  |   0.0131    0.0474
        0.0080    0.0154  |   0.0202    0.0639
        0.0100    0.0261  |   0.0000    0.0000


                        AREA     QPEAK    TPEAK      R.V.
                        (ha)     (cms)    (hrs)      (mm)
     INFLOW : ID= 2 ( 0470)     1.230    0.228     6.25     70.87
     OUTFLOW: ID= 1 ( 0535)     1.230    0.017     7.42     70.69


          PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.58
          TIME SHIFT OF PEAK FLOW       (min)= 70.00
          MAXIMUM  STORAGE   USED    (ha.m.)=  0.0571
```

```
--------------------
| CALIB            |
| STANDHYD ( 0225) |   Area    (ha)=   0.60
|ID= 1 DT= 5.0 min |   Total Imp(%)= 83.00   Dir. Conn.(%)= 83.00
--------------------
                            IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=      0.50         0.10
     Dep. Storage   (mm)=      2.00         5.00
     Average Slope  (%)=       1.00         2.00
     Length         (m)=     320.00        10.00
     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 | 3.167   3.05 | 6.250  74.17 | 9.33   3.05
       0.167   0.00 | 3.250   3.05 | 6.333  15.24 | 9.42   3.05
       0.250   0.00 | 3.333   3.05 | 6.417  15.24 | 9.50   3.05
       0.333   2.03 | 3.417   3.05 | 6.500  15.24 | 9.58   2.03
       0.417   2.03 | 3.500   3.05 | 6.583  14.22 | 9.67   2.03
       0.500   2.03 | 3.583   3.05 | 6.667  14.22 | 9.75   2.03
       0.583   1.02 | 3.667   3.05 | 6.750  14.22 | 9.83   3.05
       0.667   1.02 | 3.750   3.05 | 6.833   7.11 | 9.92   3.05
       0.750   1.02 | 3.833   4.06 | 6.917   7.11 |10.00   3.05
       0.833   2.03 | 3.917   4.06 | 7.000   7.11 |10.08   2.03
       0.917   2.03 | 4.000   4.06 | 7.083   6.10 |10.17   2.03
       1.000   2.03 | 4.083   3.05 | 7.167   6.10 |10.25   2.03
       1.083   1.02 | 4.167   3.05 | 7.250   6.10 |10.33   2.03
       1.167   1.02 | 4.250   3.05 | 7.333   5.08 |10.42   2.03
       1.250   2.03 | 4.333   5.08 | 7.417   5.08 |10.50   2.03
       1.333   2.03 | 4.417   5.08 | 7.500   5.08 |10.58   1.02
       1.417   2.03 | 4.500   5.08 | 7.583   5.08 |10.67   1.02
       1.500   2.03 | 4.583   6.10 | 7.667   5.08 |10.75   1.02
       1.583   2.03 | 4.667   6.10 | 7.750   5.08 |10.83   2.03
       1.667   2.03 | 4.750   6.10 | 7.833   5.08 |10.92   2.03
```

Page 148 (bottom-right)

```
                LangstaffRd_EA_Proposed_WestDonWatershd
       1.750   2.03 | 4.833   6.10 | 7.917   5.08 |11.00   2.03
       1.833   1.02 | 4.917   6.10 | 8.000   5.08 |11.08   2.03
       1.917   1.02 | 5.000   6.10 | 8.083   4.06 |11.17   2.03
       2.000   1.02 | 5.083   5.08 | 8.167   4.06 |11.25   2.03
       2.083   2.03 | 5.167   5.08 | 8.250   4.06 |11.33   1.02
       2.167   2.03 | 5.250   5.08 | 8.333   4.06 |11.42   1.02
       2.250   2.03 | 5.333  10.16 | 8.417   4.06 |11.50   1.02
       2.333   3.05 | 5.417  10.16 | 8.500   4.06 |11.58   2.03
       2.417   3.05 | 5.500  10.16 | 8.583   3.05 |11.67   2.03
       2.500   3.05 | 5.583  10.16 | 8.667   3.05 |11.75   2.03
       2.583   3.05 | 5.667  10.16 | 8.750   3.05 |11.83   1.02
       2.667   3.05 | 5.750  10.16 | 8.833   3.05 |11.92   1.02
       2.750   3.05 | 5.833  73.15 | 8.917   3.05 |12.00   1.02
       2.833   4.06 | 5.917  73.15 | 9.000   3.05 |12.08   2.03
       2.917   4.06 | 6.000  73.15 | 9.083   3.05 |12.17   2.03
       3.000   4.06 | 6.083  74.17 | 9.167   3.05 |12.25   2.03
       3.083   3.05 | 6.167  74.17 | 9.250   3.05 |
```

```
     Max.Eff.Inten.(mm/hr)=    74.17       53.29
          over (min)=          5.00       10.00
     Storage Coeff. (min)=     5.79 (ii)   7.62 (ii)
     Unit Hyd. Tpeak (min)=    5.00       10.00
     Unit Hyd. peak  (cms)=    0.20        0.13
                                                    *TOTALS*
     PEAK FLOW      (cms)=      0.10        0.01      0.116 (iii)
     TIME TO PEAK   (hrs)=      6.25        6.25        6.25
     RUNOFF VOLUME  (mm)=      80.04       45.99       74.25
     TOTAL RAINFALL (mm)=      82.04       82.04       82.04
     RUNOFF COEFFICIENT  =      0.98        0.56        0.90


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* = 83.0   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 ( 0230) |   Area    (ha)=   0.70
|ID= 1 DT= 5.0 min |   Total Imp(%)= 66.00   Dir. Conn.(%)= 66.00
--------------------
                            IMPERVIOUS   PERVIOUS (i)
     Surface Area   (ha)=      0.46         0.24
     Dep. Storage   (mm)=      2.00         5.00
     Average Slope  (%)=       1.00         2.00
     Length         (m)=     320.00        25.00
     Mannings n      =        0.013        0.300

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.05		6.250	74.17	9.33	3.05
0.167	0.00	3.250	3.05		6.333	15.24	9.42	3.05
0.250	0.00	3.333	3.05		6.417	15.24	9.50	3.05
0.333	2.03	3.417	3.05		6.500	15.24	9.58	2.03
0.417	2.03	3.500	3.05		6.583	14.22	9.67	2.03
0.500	2.03	3.583	3.05		6.667	14.22	9.75	2.03
0.583	1.02	3.667	3.05		6.750	14.22	9.83	3.05
0.667	1.02	3.750	3.05		6.833	7.11	9.92	3.05
0.750	1.02	3.833	4.06		6.917	7.11	10.00	3.05
0.833	2.03	3.917	4.06		7.000	7.11	10.08	2.03
0.917	2.03	4.000	4.06		7.083	6.10	10.17	2.03
1.000	2.03	4.083	3.05		7.167	6.10	10.25	2.03
1.083	1.02	4.167	3.05		7.250	6.10	10.33	2.03
1.167	1.02	4.250	3.05		7.333	5.08	10.42	2.03
1.250	1.02	4.333	5.08		7.417	5.08	10.50	2.03
1.333	2.03	4.417	5.08		7.500	5.08	10.58	1.02
1.417	2.03	4.500	5.08		7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10		7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10		7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10		7.833	5.08	10.92	2.03
1.750	2.03	4.833	6.10		7.917	5.08	11.00	2.03
1.833	1.02	4.917	6.10		8.000	5.08	11.08	2.03
1.917	1.02	5.000	6.10		8.083	4.06	11.17	2.03
2.000	1.02	5.083	5.08		8.167	4.06	11.25	2.03
2.083	2.03	5.167	5.08		8.250	4.06	11.33	1.02
2.167	2.03	5.250	5.08		8.333	4.06	11.42	1.02
2.250	2.03	5.333	10.16		8.417	4.06	11.50	1.02
2.333	3.05	5.417	10.16		8.500	4.06	11.58	2.03
2.417	3.05	5.500	10.16		8.583	3.05	11.67	2.03
2.500	3.05	5.583	10.16		8.667	3.05	11.75	2.03
2.583	3.05	5.667	10.16		8.750	3.05	11.83	1.02
2.667	3.05	5.750	10.16		8.833	3.05	11.92	1.02
2.750	3.05	5.833	73.15		8.917	3.05	12.00	1.02
2.833	4.06	5.917	73.15		9.000	3.05	12.08	2.03
2.917	4.06	6.000	73.15		9.083	3.05	12.17	2.03
3.000	4.06	6.083	74.17		9.167	3.05	12.25	2.03
3.083	3.05	6.167	74.17		9.250	3.05		

Max.Eff.Inten.(mm/hr)=	74.17	50.57
over (min)	5.00	15.00
Storage Coeff. (min)=	5.79 (ii)	13.59 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.20	0.08

			TOTALS
PEAK FLOW (cms)=	0.09	0.02	0.119 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.25
RUNOFF VOLUME (mm)=	80.04	43.44	67.59
TOTAL RAINFALL (mm)=	82.04	82.04	82.04
RUNOFF COEFFICIENT =	0.98	0.53	0.82

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
    CN* = 81.0 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 ( 0475)|
|  1 + 2 = 3     |              AREA     QPEAK    TPEAK     R.V.
--------------------              (ha)     (cms)    (hrs)     (mm)
          ID1= 1 ( 0225):        0.60     0.116    6.25     74.25
        + ID2= 2 ( 0230):        0.70     0.119    6.25     67.59
                          ====================================================
          ID = 3 ( 0475):        1.30     0.234    6.25     70.66
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| RESERVOIR( 0540)|     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   |  0.0271    0.0367
                        0.0118    0.0048   |  0.0306    0.0474
                        0.0184    0.0154   |  0.0415    0.0639
                        0.0232    0.0261   |  0.0000    0.0000

                              AREA     QPEAK    TPEAK     R.V.
                              (ha)     (cms)    (hrs)     (mm)
       INFLOW : ID= 2 ( 0475)  1.300    0.234    6.25     70.66
       OUTFLOW: ID= 1 ( 0540)  1.300    0.032    6.92     70.59

             PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.61
             TIME SHIFT OF PEAK FLOW        (min)= 40.00
             MAXIMUM  STORAGE   USED     (ha.m.)=  0.0494
```

```
--------------------
| ADD HYD ( 0480)|
|  1 + 2 = 3     |              AREA     QPEAK    TPEAK     R.V.
--------------------              (ha)     (cms)    (hrs)     (mm)
          ID1= 1 ( 0535):        1.23     0.017    7.42     70.69
        + ID2= 2 ( 0540):        1.30     0.032    6.92     70.59
                          ====================================================
          ID = 3 ( 0480):        2.53     0.049    7.00     70.63
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.


```
--------------------|
| CALIB           |
| STANDHYD ( 0155)|  Area    (ha)=  0.56
|ID= 1 DT= 5.0 min |  Total Imp(%)= 93.00  Dir. Conn.(%)= 93.00
--------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.52	0.04
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	260.00	25.00
Mannings n	=	0.013	0.290

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.05		6.250	74.17	9.33	3.05
0.167	0.00	3.250	3.05		6.333	15.24	9.42	3.05
0.250	0.00	3.333	3.05		6.417	15.24	9.50	3.05
0.333	2.03	3.417	3.05		6.500	15.24	9.58	2.03
0.417	2.03	3.500	3.05		6.583	14.22	9.67	2.03
0.500	2.03	3.583	3.05		6.667	14.22	9.75	2.03
0.583	1.02	3.667	3.05		6.750	14.22	9.83	3.05
0.667	1.02	3.750	3.05		6.833	7.11	9.92	3.05
0.750	1.02	3.833	4.06		6.917	7.11	10.00	3.05
0.833	2.03	3.917	4.06		7.000	7.11	10.08	2.03
0.917	2.03	4.000	4.06		7.083	6.10	10.17	2.03
1.000	2.03	4.083	3.05		7.167	6.10	10.25	2.03
1.083	1.02	4.167	3.05		7.250	6.10	10.33	2.03
1.167	1.02	4.250	3.05		7.333	5.08	10.42	2.03
1.250	1.02	4.333	5.08		7.417	5.08	10.50	2.03
1.333	2.03	4.417	5.08		7.500	5.08	10.58	1.02
1.417	2.03	4.500	5.08		7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10		7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10		7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10		7.833	5.08	10.92	2.03
1.750	2.03	4.833	6.10		7.917	5.08	11.00	2.03
1.833	1.02	4.917	6.10		8.000	5.08	11.08	2.03
1.917	1.02	5.000	6.10		8.083	4.06	11.17	2.03
2.000	1.02	5.083	5.08		8.167	4.06	11.25	2.03
2.083	2.03	5.167	5.08		8.250	4.06	11.33	1.02
2.167	2.03	5.250	5.08		8.333	4.06	11.42	1.02
2.250	2.03	5.333	10.16		8.417	4.06	11.50	1.02
2.333	3.05	5.417	10.16		8.500	4.06	11.58	2.03
2.417	3.05	5.500	10.16		8.583	3.05	11.67	2.03
2.500	3.05	5.583	10.16		8.667	3.05	11.75	2.03
2.583	3.05	5.667	10.16		8.750	3.05	11.83	1.02
2.667	3.05	5.750	10.16		8.833	3.05	11.92	1.02
2.750	3.05	5.833	73.15		8.917	3.05	12.00	1.02
2.833	4.06	5.917	73.15		9.000	3.05	12.08	2.03
2.917	4.06	6.000	73.15		9.083	3.05	12.17	2.03
3.000	4.06	6.083	74.17		9.167	3.05	12.25	2.03

3.083	3.05	6.167	74.17		9.250	3.05		

Max.Eff.Inten.(mm/hr)=	74.17	59.01
over (min)	5.00	10.00
Storage Coeff. (min)=	5.11 (ii)	7.44 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.21	0.13

			TOTALS
PEAK FLOW (cms)=	0.11	0.01	0.113 (iii)
TIME TO PEAK (hrs)=	6.25	6.25	6.25
RUNOFF VOLUME (mm)=	80.04	51.61	78.04
TOTAL RAINFALL (mm)=	82.04	82.04	82.04
RUNOFF COEFFICIENT =	0.98	0.63	0.95

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
    CN* = 87.0 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 ( 0160)|  Area    (ha)=  0.43
|ID= 1 DT= 5.0 min |  Total Imp(%)= 95.00  Dir. Conn.(%)= 95.00
--------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.41	0.02
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	260.00	20.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.05		6.250	74.17	9.33	3.05
0.167	0.00	3.250	3.05		6.333	15.24	9.42	3.05
0.250	0.00	3.333	3.05		6.417	15.24	9.50	3.05
0.333	2.03	3.417	3.05		6.500	15.24	9.58	2.03
0.417	2.03	3.500	3.05		6.583	14.22	9.67	2.03
0.500	2.03	3.583	3.05		6.667	14.22	9.75	2.03
0.583	1.02	3.667	3.05		6.750	14.22	9.83	3.05
0.667	1.02	3.750	3.05		6.833	7.11	9.92	3.05
0.750	1.02	3.833	4.06		6.917	7.11	10.00	3.05
0.833	2.03	3.917	4.06		7.000	7.11	10.08	2.03
0.917	2.03	4.000	4.06		7.083	6.10	10.17	2.03
1.000	2.03	4.083	3.05		7.167	6.10	10.25	2.03
1.083	1.02	4.167	3.05		7.250	6.10	10.33	2.03

LangstaffRd_EA_Proposed_WestDonWatershd

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         1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
         1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
         1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
         1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
         1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
         1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
         1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
         1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
         1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
         1.917   1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
         2.000   1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
         2.083   2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
         2.167   2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
         2.250   2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
         2.333   3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
         2.417   3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
         2.500   3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
         2.583   3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
         2.667   3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
         2.750   3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
         2.833   4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
         2.917   4.06 | 6.000  73.15 | 9.083   3.05 | 12.17   2.03
         3.000   4.06 | 6.083  74.17 | 9.167   3.05 | 12.25   2.03
         3.083   3.05 | 6.167  74.17 | 9.250   3.05 |

     Max.Eff.Inten.(mm/hr)=    74.17        61.96
                over (min)      5.00        10.00
     Storage Coeff.  (min)=     5.11 (ii)    6.72 (ii)
     Unit Hyd. Tpeak (min)=     5.00        10.00
     Unit Hyd. peak  (cms)=     0.21         0.14
                                                       *TOTALS*
     PEAK FLOW      (cms)=      0.08         0.00       0.087 (iii)
     TIME TO PEAK   (hrs)=      6.25         6.25       6.25
     RUNOFF VOLUME    (mm)=    80.04        54.74      78.77
     TOTAL RAINFALL   (mm)=    82.04        82.04      82.04
     RUNOFF COEFFICIENT  =      0.98         0.67       0.96

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 89.0   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 ( 0430)|
|  1 + 2 = 3    |       AREA    QPEAK   TPEAK    R.V.
--------------------     (ha)   (cms)   (hrs)    (mm)
       ID1= 1 ( 0155):   0.56   0.113   6.25    78.04
     + ID2= 2 ( 0160):   0.43   0.087   6.25    78.77
       ============================================================
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LangstaffRd_EA_Proposed_WestDonWatershd

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       ID = 3 ( 0430):   0.99   0.200   6.25    78.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0150)|   Area  (ha)=  3.81
|ID= 1 DT= 5.0 min|   Total Imp(%)= 95.00  Dir. Conn.(%)= 95.00
--------------------
                       IMPERVIOUS    PERVIOUS (i)
   Surface Area  (ha)=    3.62          0.19
   Dep. Storage  (mm)=    2.00          5.00
   Average Slope (%)=     1.00          2.00
   Length        (m)=   150.00         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 | 3.167   3.05 | 6.250  74.17 | 9.33   3.05
      0.167   0.00 | 3.250   3.05 | 6.333  15.24 | 9.42   3.05
      0.250   0.00 | 3.333   3.05 | 6.417  15.24 | 9.50   3.05
      0.333   2.03 | 3.417   3.05 | 6.500  15.24 | 9.58   2.03
      0.417   2.03 | 3.500   3.05 | 6.583  14.22 | 9.67   2.03
      0.500   2.03 | 3.583   3.05 | 6.667  14.22 | 9.75   2.03
      0.583   1.02 | 3.667   3.05 | 6.750  14.22 | 9.83   3.05
      0.667   1.02 | 3.750   3.05 | 6.833   7.11 | 9.92   3.05
      0.750   1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
      0.833   2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
      0.917   2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
      1.000   2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
      1.083   1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
      1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
      1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
      1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
      1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
      1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
      1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
      1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
      1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
      1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
      1.917   1.02 | 5.000   6.10 | 8.083   4.06 | 11.17   2.03
      2.000   1.02 | 5.083   5.08 | 8.167   4.06 | 11.25   2.03
      2.083   2.03 | 5.167   5.08 | 8.250   4.06 | 11.33   1.02
      2.167   2.03 | 5.250   5.08 | 8.333   4.06 | 11.42   1.02
      2.250   2.03 | 5.333  10.16 | 8.417   4.06 | 11.50   1.02
      2.333   3.05 | 5.417  10.16 | 8.500   4.06 | 11.58   2.03
      2.417   3.05 | 5.500  10.16 | 8.583   3.05 | 11.67   2.03
      2.500   3.05 | 5.583  10.16 | 8.667   3.05 | 11.75   2.03
      2.583   3.05 | 5.667  10.16 | 8.750   3.05 | 11.83   1.02
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LangstaffRd_EA_Proposed_WestDonWatershd

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         2.667   3.05 | 5.750  10.16 | 8.833   3.05 | 11.92   1.02
         2.750   3.05 | 5.833  73.15 | 8.917   3.05 | 12.00   1.02
         2.833   4.06 | 5.917  73.15 | 9.000   3.05 | 12.08   2.03
         2.917   4.06 | 6.000  73.15 | 9.083   3.05 | 12.17   2.03
         3.000   4.06 | 6.083  74.17 | 9.167   3.05 | 12.25   2.03
         3.083   3.05 | 6.167  74.17 | 9.250   3.05 |

     Max.Eff.Inten.(mm/hr)=    74.17        60.48
                over (min)      5.00        10.00
     Storage Coeff.  (min)=     3.67 (ii)    6.12 (ii)
     Unit Hyd. Tpeak (min)=     5.00        10.00
     Unit Hyd. peak  (cms)=     0.25         0.15
                                                       *TOTALS*
     PEAK FLOW      (cms)=      0.75         0.03       0.776 (iii)
     TIME TO PEAK   (hrs)=      6.25         6.25       6.25
     RUNOFF VOLUME    (mm)=    80.04        53.15      78.70
     TOTAL RAINFALL   (mm)=    82.04        82.04      82.04
     RUNOFF COEFFICIENT  =      0.98         0.65       0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 88.0   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( 0515)|   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  | 0.0091    0.1797
                      0.0013    0.0157  | 0.0095    0.2004
                      0.0033    0.0320  | 0.0100    0.2216
                      0.0044    0.0487  | 0.0104    0.2433
                      0.0053    0.0659  | 0.0109    0.2655
                      0.0061    0.0837  | 0.0113    0.2882
                      0.0068    0.1019  | 0.0116    0.3114
                      0.0074    0.1206  | 0.1520    0.3592
                      0.0080    0.1398  | 0.5654    0.4336
                      0.0086    0.1595  | 1.1316    0.5100

                          AREA    QPEAK   TPEAK    R.V.
                          (ha)    (cms)   (hrs)    (mm)
     INFLOW : ID= 2 ( 0150)  3.810   0.776    6.25    78.70
     OUTFLOW: ID= 1 ( 0515)  3.810   0.011   12.33    77.51

            PEAK  FLOW  REDUCTION [Qout/Qin](%)=  1.42
            TIME SHIFT OF PEAK FLOW     (min)=365.00
            MAXIMUM STORAGE  USED   (ha.m.)= 0.2720
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LangstaffRd_EA_Proposed_WestDonWatershd

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--------------------
| ADD HYD ( 0440)|
|  1 + 2 = 3    |       AREA    QPEAK   TPEAK    R.V.
--------------------     (ha)   (cms)   (hrs)    (mm)
       ID1= 1 ( 0430):   0.99   0.200   6.25    78.36
     + ID2= 2 ( 0515):   3.81   0.011  12.33    77.51
       ============================================================
       ID = 3 ( 0440):   4.80   0.209   6.25    77.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0210)|   Area  (ha)=  0.96
|ID= 1 DT= 5.0 min|   Total Imp(%)= 78.00  Dir. Conn.(%)= 78.00
--------------------
                       IMPERVIOUS    PERVIOUS (i)
   Surface Area  (ha)=    0.75          0.21
   Dep. Storage  (mm)=    2.00          5.00
   Average Slope (%)=     1.00          2.00
   Length        (m)=   470.00         20.00
   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 | 3.167   3.05 | 6.250  74.17 | 9.33   3.05
      0.167   0.00 | 3.250   3.05 | 6.333  15.24 | 9.42   3.05
      0.250   0.00 | 3.333   3.05 | 6.417  15.24 | 9.50   3.05
      0.333   2.03 | 3.417   3.05 | 6.500  15.24 | 9.58   2.03
      0.417   2.03 | 3.500   3.05 | 6.583  14.22 | 9.67   2.03
      0.500   2.03 | 3.583   3.05 | 6.667  14.22 | 9.75   2.03
      0.583   1.02 | 3.667   3.05 | 6.750  14.22 | 9.83   3.05
      0.667   1.02 | 3.750   3.05 | 6.833   7.11 | 9.92   3.05
      0.750   1.02 | 3.833   4.06 | 6.917   7.11 | 10.00   3.05
      0.833   2.03 | 3.917   4.06 | 7.000   7.11 | 10.08   2.03
      0.917   2.03 | 4.000   4.06 | 7.083   6.10 | 10.17   2.03
      1.000   2.03 | 4.083   3.05 | 7.167   6.10 | 10.25   2.03
      1.083   1.02 | 4.167   3.05 | 7.250   6.10 | 10.33   2.03
      1.167   1.02 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
      1.250   1.02 | 4.333   5.08 | 7.417   5.08 | 10.50   2.03
      1.333   2.03 | 4.417   5.08 | 7.500   5.08 | 10.58   1.02
      1.417   2.03 | 4.500   5.08 | 7.583   5.08 | 10.67   1.02
      1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
      1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
      1.667   2.03 | 4.750   6.10 | 7.833   5.08 | 10.92   2.03
      1.750   2.03 | 4.833   6.10 | 7.917   5.08 | 11.00   2.03
      1.833   1.02 | 4.917   6.10 | 8.000   5.08 | 11.08   2.03
```

1.917	1.02	5.000	6.10	8.083	4.06	11.17	2.03
2.000	1.02	5.083	5.08	8.167	4.06	11.25	2.03
2.083	2.03	5.167	5.08	8.250	4.06	11.33	1.02
2.167	2.03	5.250	5.08	8.333	4.06	11.42	1.02
2.250	2.03	5.333	10.16	8.417	4.06	11.50	1.02
2.333	3.05	5.417	10.16	8.500	4.06	11.58	2.03
2.417	3.05	5.500	10.16	8.583	3.05	11.67	2.03
2.500	3.05	5.583	10.16	8.667	3.05	11.75	2.03
2.583	3.05	5.667	10.16	8.750	3.05	11.83	1.02
2.667	3.05	5.750	10.16	8.833	3.05	11.92	1.02
2.750	3.05	5.833	73.15	8.917	3.05	12.00	1.02
2.833	4.06	5.917	73.15	9.000	3.05	12.08	2.03
2.917	4.06	6.000	73.15	9.083	3.05	12.17	2.03
3.000	4.06	6.083	74.17	9.167	3.05	12.25	2.03
3.083	3.05	6.167	74.17	9.250	3.05		

```
Max.Eff.Inten.(mm/hr)=      74.17         53.29
         over (min)          5.00         15.00
Storage Coeff.  (min)=       7.29 (ii)    10.45 (ii)
Unit Hyd. Tpeak (min)=       5.00         15.00
Unit Hyd. peak  (cms)=       0.17          0.09
                                                        *TOTALS*
PEAK FLOW       (cms)=       0.15          0.02         0.177 (iii)
TIME TO PEAK    (hrs)=       6.25          6.33          6.25
RUNOFF VOLUME    (mm)=      80.04         45.99         72.54
TOTAL RAINFALL   (mm)=      82.04         82.04         82.04
RUNOFF COEFFICIENT  =        0.98          0.56          0.88

  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 83.0   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.
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--------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD ( 0205)|   Area   (ha)=   1.11
|ID= 1 DT= 5.0 min |   Total Imp(%)= 77.00   Dir. Conn.(%)= 77.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
       Surface Area   (ha)=      0.85         0.26
       Dep. Storage   (mm)=      2.00         5.00
       Average Slope   (%)=      1.00         2.00
       Length          (m)=    470.00        20.00
       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	3.167	3.05	6.250	74.17	9.33	3.05
0.167	0.00	3.250	3.05	6.333	15.24	9.42	3.05
0.250	0.00	3.333	3.05	6.417	15.24	9.50	3.05
0.333	2.03	3.417	3.05	6.500	15.24	9.58	2.03
0.417	2.03	3.500	3.05	6.583	14.22	9.67	2.03
0.500	2.03	3.583	3.05	6.667	14.22	9.75	2.03
0.583	1.02	3.667	3.05	6.750	14.22	9.83	3.05
0.667	1.02	3.750	3.05	6.833	7.11	9.92	3.05
0.750	1.02	3.833	4.06	6.917	7.11	10.00	3.05
0.833	2.03	3.917	4.06	7.000	7.11	10.08	2.03
0.917	2.03	4.000	4.06	7.083	6.10	10.17	2.03
1.000	2.03	4.083	3.05	7.167	6.10	10.25	2.03
1.083	1.02	4.167	3.05	7.250	6.10	10.33	2.03
1.167	1.02	4.250	3.05	7.333	5.08	10.42	2.03
1.250	1.02	4.333	5.08	7.417	5.08	10.50	2.03
1.333	2.03	4.417	5.08	7.500	5.08	10.58	1.02
1.417	2.03	4.500	5.08	7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10	7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10	7.833	5.08	10.92	2.03
1.750	2.03	4.833	6.10	7.917	5.08	11.00	2.03
1.833	1.02	4.917	6.10	8.000	5.08	11.08	2.03
1.917	1.02	5.000	6.10	8.083	4.06	11.17	2.03
2.000	1.02	5.083	5.08	8.167	4.06	11.25	2.03
2.083	2.03	5.167	5.08	8.250	4.06	11.33	1.02
2.167	2.03	5.250	5.08	8.333	4.06	11.42	1.02
2.250	2.03	5.333	10.16	8.417	4.06	11.50	1.02
2.333	3.05	5.417	10.16	8.500	4.06	11.58	2.03
2.417	3.05	5.500	10.16	8.583	3.05	11.67	2.03
2.500	3.05	5.583	10.16	8.667	3.05	11.75	2.03
2.583	3.05	5.667	10.16	8.750	3.05	11.83	1.02
2.667	3.05	5.750	10.16	8.833	3.05	11.92	1.02
2.750	3.05	5.833	73.15	8.917	3.05	12.00	1.02
2.833	4.06	5.917	73.15	9.000	3.05	12.08	2.03
2.917	4.06	6.000	73.15	9.083	3.05	12.17	2.03
3.000	4.06	6.083	74.17	9.167	3.05	12.25	2.03
3.083	3.05	6.167	74.17	9.250	3.05		

```
Max.Eff.Inten.(mm/hr)=      74.17         53.29
         over (min)          5.00         15.00
Storage Coeff.  (min)=       7.29 (ii)    10.52 (ii)
Unit Hyd. Tpeak (min)=       5.00         15.00
Unit Hyd. peak  (cms)=       0.17          0.09
                                                        *TOTALS*
PEAK FLOW       (cms)=       0.17          0.03         0.203 (iii)
TIME TO PEAK    (hrs)=       6.25          6.33          6.25
RUNOFF VOLUME    (mm)=      80.04         45.99         72.20
TOTAL RAINFALL   (mm)=      82.04         82.04         82.04
RUNOFF COEFFICIENT  =        0.98          0.56          0.88

  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

```
       CN* = 83.0   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  ( 0460)|
|  1 + 2  = 3      |            AREA    QPEAK    TPEAK      R.V.
--------------------            (ha)    (cms)    (hrs)      (mm)
          ID1= 1 ( 0205):      1.11    0.203     6.25     72.20
        + ID2= 2 ( 0210):      0.96    0.177     6.25     72.54
          =================================================
          ID = 3 ( 0460):      2.07    0.380     6.25     72.36

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
--------------------
| RESERVOIR( 0525)|   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   | 0.0733     0.0214
                      0.0274     0.0026   | 0.0831     0.0278
                      0.0478     0.0084   | 0.1449     0.0374
                      0.0619     0.0149   | 0.0000     0.0000

                           AREA    QPEAK    TPEAK      R.V.
                           (ha)    (cms)    (hrs)      (mm)
       INFLOW : ID= 2 ( 0460)     2.070    0.380     6.25     72.36
       OUTFLOW: ID= 1 ( 0525)     2.070    0.201     6.42     72.35

           PEAK  FLOW  REDUCTION [Qout/Qin](%)= 52.88
           TIME SHIFT OF PEAK FLOW      (min)= 10.00
           MAXIMUM STORAGE   USED    (ha.m.)= 0.0464

--------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD ( 0190)|   Area   (ha)=   0.86
|ID= 1 DT= 5.0 min |   Total Imp(%)= 57.00   Dir. Conn.(%)= 57.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
       Surface Area   (ha)=      0.49         0.37
       Dep. Storage   (mm)=      2.00         5.00
       Average Slope   (%)=      1.00         2.00
       Length          (m)=    340.00        50.00
       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	3.167	3.05	6.250	74.17	9.33	3.05
0.167	0.00	3.250	3.05	6.333	15.24	9.42	3.05
0.250	0.00	3.333	3.05	6.417	15.24	9.50	3.05
0.333	2.03	3.417	3.05	6.500	15.24	9.58	2.03
0.417	2.03	3.500	3.05	6.583	14.22	9.67	2.03
0.500	2.03	3.583	3.05	6.667	14.22	9.75	2.03
0.583	1.02	3.667	3.05	6.750	14.22	9.83	3.05
0.667	1.02	3.750	3.05	6.833	7.11	9.92	3.05
0.750	1.02	3.833	4.06	6.917	7.11	10.00	3.05
0.833	2.03	3.917	4.06	7.000	7.11	10.08	2.03
0.917	2.03	4.000	4.06	7.083	6.10	10.17	2.03
1.000	2.03	4.083	3.05	7.167	6.10	10.25	2.03
1.083	1.02	4.167	3.05	7.250	6.10	10.33	2.03
1.167	1.02	4.250	3.05	7.333	5.08	10.42	2.03
1.250	1.02	4.333	5.08	7.417	5.08	10.50	2.03
1.333	2.03	4.417	5.08	7.500	5.08	10.58	1.02
1.417	2.03	4.500	5.08	7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10	7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10	7.833	5.08	10.92	2.03
1.750	2.03	4.833	6.10	7.917	5.08	11.00	2.03
1.833	1.02	4.917	6.10	8.000	5.08	11.08	2.03
1.917	1.02	5.000	6.10	8.083	4.06	11.17	2.03
2.000	1.02	5.083	5.08	8.167	4.06	11.25	2.03
2.083	2.03	5.167	5.08	8.250	4.06	11.33	1.02
2.167	2.03	5.250	5.08	8.333	4.06	11.42	1.02
2.250	2.03	5.333	10.16	8.417	4.06	11.50	1.02
2.333	3.05	5.417	10.16	8.500	4.06	11.58	2.03
2.417	3.05	5.500	10.16	8.583	3.05	11.67	2.03
2.500	3.05	5.583	10.16	8.667	3.05	11.75	2.03
2.583	3.05	5.667	10.16	8.750	3.05	11.83	1.02
2.667	3.05	5.750	10.16	8.833	3.05	11.92	1.02
2.750	3.05	5.833	73.15	8.917	3.05	12.00	1.02
2.833	4.06	5.917	73.15	9.000	3.05	12.08	2.03
2.917	4.06	6.000	73.15	9.083	3.05	12.17	2.03
3.000	4.06	6.083	74.17	9.167	3.05	12.25	2.03
3.083	3.05	6.167	74.17	9.250	3.05		

```
Max.Eff.Inten.(mm/hr)=      74.17         51.79
         over (min)          5.00         20.00
Storage Coeff.  (min)=       6.00 (ii)    16.50 (ii)
Unit Hyd. Tpeak (min)=       5.00         20.00
Unit Hyd. peak  (cms)=       0.19          0.06
                                                        *TOTALS*
PEAK FLOW       (cms)=       0.10          0.04         0.134 (iii)
TIME TO PEAK    (hrs)=       6.25          6.42          6.25
RUNOFF VOLUME    (mm)=      80.04         45.99         65.39
TOTAL RAINFALL   (mm)=      82.04         82.04         82.04
RUNOFF COEFFICIENT  =        0.98          0.56          0.80
```

Page 161 (top-left)

LangstaffRd_EA_Proposed_WestDonWatershd

```
        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* = 83.0    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 ( 0195)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)= 75.00   Dir. Conn.(%)= 75.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
       Surface Area    (ha)=   0.59          0.20
       Dep. Storage    (mm)=   2.00          5.00
       Average Slope   (%)=    1.00          2.00
       Length          (m)=  340.00         20.00
       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 | 3.167  3.05 | 6.250  74.17| 9.33   3.05
         0.167  0.00 | 3.250  3.05 | 6.333  15.24| 9.42   3.05
         0.250  0.00 | 3.333  3.05 | 6.417  15.24| 9.50   3.05
         0.333  2.03 | 3.417  3.05 | 6.500  15.24| 9.58   2.03
         0.417  2.03 | 3.500  3.05 | 6.583  14.22| 9.67   2.03
         0.500  2.03 | 3.583  3.05 | 6.667  14.22| 9.75   2.03
         0.583  1.02 | 3.667  3.05 | 6.750  14.22| 9.83   3.05
         0.667  1.02 | 3.750  3.05 | 6.833  7.11 | 9.92   3.05
         0.750  1.02 | 3.833  4.06 | 6.917  7.11 | 10.00  3.05
         0.833  2.03 | 3.917  4.06 | 7.000  7.11 | 10.08  2.03
         0.917  2.03 | 4.000  4.06 | 7.083  6.10 | 10.17  2.03
         1.000  2.03 | 4.083  3.05 | 7.167  6.10 | 10.25  2.03
         1.083  1.02 | 4.167  3.05 | 7.250  6.10 | 10.33  2.03
         1.167  1.02 | 4.250  3.05 | 7.333  5.08 | 10.42  2.03
         1.250  1.02 | 4.333  5.08 | 7.417  5.08 | 10.50  2.03
         1.333  2.03 | 4.417  5.08 | 7.500  5.08 | 10.58  1.02
         1.417  2.03 | 4.500  5.08 | 7.583  5.08 | 10.67  1.02
         1.500  2.03 | 4.583  6.10 | 7.667  5.08 | 10.75  1.02
         1.583  2.03 | 4.667  6.10 | 7.750  5.08 | 10.83  2.03
         1.667  2.03 | 4.750  6.10 | 7.833  5.08 | 10.92  2.03
         1.750  2.03 | 4.833  6.10 | 7.917  5.08 | 11.00  2.03
         1.833  1.02 | 4.917  6.10 | 8.000  5.08 | 11.08  2.03
         1.917  1.02 | 5.000  6.10 | 8.083  4.06 | 11.17  2.03
         2.000  1.02 | 5.083  6.10 | 8.167  4.06 | 11.25  2.03
         2.083  2.03 | 5.167  5.08 | 8.250  4.06 | 11.33  1.02
         2.167  2.03 | 5.250  5.08 | 8.333  4.06 | 11.42  1.02
         2.250  2.03 | 5.333  10.16| 8.417  4.06 | 11.50  1.02
```

Page 162 (top-right)

LangstaffRd_EA_Proposed_WestDonWatershd

```
         2.333  3.05 | 5.417  10.16| 8.500  4.06 | 11.58  2.03
         2.417  3.05 | 5.500  10.16| 8.583  3.05 | 11.67  2.03
         2.500  3.05 | 5.583  10.16| 8.667  3.05 | 11.75  2.03
         2.583  3.05 | 5.667  10.16| 8.750  3.05 | 11.83  1.02
         2.667  3.05 | 5.750  10.16| 8.833  3.05 | 11.92  1.02
         2.750  3.05 | 5.833  73.15| 8.917  3.05 | 12.00  1.02
         2.833  4.06 | 5.917  73.15| 9.000  3.05 | 12.08  2.03
         2.917  4.06 | 6.000  73.15| 9.083  3.05 | 12.17  2.03
         3.000  4.06 | 6.083  74.17| 9.167  3.05 | 12.25  2.03
         3.083  3.05 | 6.167  74.17| 9.250  3.05 |
```

```
     Max.Eff.Inten.(mm/hr)=  74.17        53.29
              over (min)=     5.00        10.00
     Storage Coeff.  (min)=   6.00 (ii)   9.38 (ii)
     Unit Hyd. Tpeak (min)=   5.00        10.00
     Unit Hyd. peak  (cms)=   0.19         0.12
                                                   *TOTALS*
     PEAK FLOW      (cms)=   0.12         0.03      0.147 (iii)
     TIME TO PEAK   (hrs)=   6.25         6.25      6.25
     RUNOFF VOLUME  (mm)=   80.04        45.99     71.52
     TOTAL RAINFALL (mm)=   82.04        82.04     82.04
     RUNOFF COEFFICIENT  =   0.98         0.56      0.87


        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
              CN* = 83.0    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 ( 0455)|
|  1 + 2 = 3    |           AREA    QPEAK   TPEAK    R.V.
--------------------          (ha)   (cms)   (hrs)    (mm)
     ID1= 1 ( 0190):  0.86   0.134    6.25    65.39
   + ID2= 2 ( 0195):  0.79   0.147    6.25    71.52
     ===========================================
     ID = 3 ( 0455):  1.65   0.280    6.25    68.32

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------
--------------------
| RESERVOIR( 0555)|   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   | 0.0238    0.0199
                      0.0104    0.0024   | 0.0268    0.0259
                      0.0162    0.0079   | 0.0825    0.0346
                      0.0203    0.0139   | 0.0000    0.0000
```

Page 163 (bottom-left)

LangstaffRd_EA_Proposed_WestDonWatershd

```
                              AREA    QPEAK   TPEAK    R.V.
                              (ha)    (cms)   (hrs)    (mm)
     INFLOW : ID= 2 ( 0455)   1.650   0.280   6.25     68.32
     OUTFLOW: ID= 1 ( 0555)   1.650   0.135   6.42     68.29

           PEAK   FLOW   REDUCTION [Qout/Qin](%)= 48.14
           TIME SHIFT OF PEAK FLOW        (min)= 10.00
           MAXIMUM  STORAGE   USED     (ha.m.)= 0.0428

------------------------------------------------------------------
--------------------
| ADD HYD ( 0465)|
|  1 + 2 = 3    |           AREA    QPEAK   TPEAK    R.V.
--------------------          (ha)   (cms)   (hrs)    (mm)
     ID1= 1 ( 0525):  2.07   0.201    6.42    72.35
   + ID2= 2 ( 0555):  1.65   0.135    6.42    68.29
     ===========================================
     ID = 3 ( 0465):  3.72   0.336    6.42    70.55

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------
*******************************
** SIMULATION:Run 07       **
*******************************

--------------------
| READ STORM      |   Filename: C:\Users\ray.zhao\AppD
|                 |      ata\Local\Temp\
|                 |      e8da0adc-3b43-467d-984d-5ab4a7d3492c\571caf6d
| Ptotal= 89.92 mm |   Comments: 100yr-12hrSCS
--------------------
         TIME   RAIN | TIME   RAIN |' TIME   RAIN | TIME   RAIN
         hrs    mm/hr| hrs    mm/hr|' hrs    mm/hr| hrs    mm/hr
         0.25   0.00 | 3.50   4.06 | 6.75   16.26| 10.00  2.03
         0.50   2.03 | 3.75   3.05 | 7.00   7.11 | 10.25  3.05
         0.75   2.03 | 4.00   4.06 | 7.25   7.11 | 10.50  3.05
         1.00   1.02 | 4.25   3.05 | 7.50   5.08 | 10.75  2.03
         1.25   2.03 | 4.50   7.11 | 7.75   5.08 | 11.00  2.03
         1.50   2.03 | 4.75   6.10 | 8.00   6.10 | 11.25  2.03
         1.75   2.03 | 5.00   6.10 | 8.25   5.08 | 11.50  2.03
         2.00   1.02 | 5.25   6.10 | 8.50   4.06 | 11.75  1.02
         2.25   2.03 | 5.50   11.18| 8.75   3.05 | 12.00  2.03
         2.50   4.06 | 5.75   11.18| 9.00   4.06 | 12.25  2.03
         2.75   3.05 | 6.00   80.26| 9.25   3.05 |
         3.00   4.06 | 6.25   81.28| 9.50   3.05 |
         3.25   3.05 | 6.50   16.26| 9.75   3.05 |

------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD ( 0165)|   Area    (ha)=   0.60
```

Page 164 (bottom-right)

LangstaffRd_EA_Proposed_WestDonWatershd

```
|ID= 1 DT= 5.0 min |   Total Imp(%)= 72.00   Dir. Conn.(%)= 72.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
       Surface Area    (ha)=   0.43          0.17
       Dep. Storage    (mm)=   2.00          5.00
       Average Slope   (%)=    1.00          2.00
       Length          (m)=  250.00         20.00
       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 | 3.167  3.05 | 6.250  81.28| 9.33   3.05
         0.167  0.00 | 3.250  3.05 | 6.333  16.26| 9.42   3.05
         0.250  0.00 | 3.333  4.06 | 6.417  16.26| 9.50   3.05
         0.333  2.03 | 3.417  4.06 | 6.500  16.26| 9.58   3.05
         0.417  2.03 | 3.500  4.06 | 6.583  16.26| 9.67   3.05
         0.500  2.03 | 3.583  3.05 | 6.667  16.26| 9.75   3.05
         0.583  2.03 | 3.667  3.05 | 6.750  16.26| 9.83   2.03
         0.667  2.03 | 3.750  3.05 | 6.833  7.11 | 9.92   2.03
         0.750  2.03 | 3.833  4.06 | 6.917  7.11 | 10.00  2.03
         0.833  1.02 | 3.917  4.06 | 7.000  7.11 | 10.08  3.05
         0.917  1.02 | 4.000  4.06 | 7.083  7.11 | 10.17  3.05
         1.000  1.02 | 4.083  3.05 | 7.167  7.11 | 10.25  3.05
         1.083  2.03 | 4.167  3.05 | 7.250  7.11 | 10.33  2.03
         1.167  2.03 | 4.250  3.05 | 7.333  5.08 | 10.42  2.03
         1.250  2.03 | 4.333  7.11 | 7.417  5.08 | 10.50  2.03
         1.333  2.03 | 4.417  7.11 | 7.500  5.08 | 10.58  1.02
         1.417  2.03 | 4.500  7.11 | 7.583  5.08 | 10.67  1.02
         1.500  2.03 | 4.583  6.10 | 7.667  5.08 | 10.75  1.02
         1.583  2.03 | 4.667  6.10 | 7.750  5.08 | 10.83  2.03
         1.667  2.03 | 4.750  6.10 | 7.833  6.10 | 10.92  2.03
         1.750  2.03 | 4.833  6.10 | 7.917  6.10 | 11.00  2.03
         1.833  1.02 | 4.917  6.10 | 8.000  6.10 | 11.08  2.03
         1.917  1.02 | 5.000  6.10 | 8.083  5.08 | 11.17  2.03
         2.000  1.02 | 5.083  6.10 | 8.167  5.08 | 11.25  2.03
         2.083  2.03 | 5.167  6.10 | 8.250  5.08 | 11.33  2.03
         2.167  2.03 | 5.250  6.10 | 8.333  4.06 | 11.42  2.03
         2.250  2.03 | 5.333  11.18| 8.417  4.06 | 11.50  2.03
         2.333  4.06 | 5.417  11.18| 8.500  4.06 | 11.58  1.02
         2.417  4.06 | 5.500  11.18| 8.583  3.05 | 11.67  1.02
         2.500  4.06 | 5.583  11.18| 8.667  3.05 | 11.75  1.02
         2.583  3.05 | 5.667  11.18| 8.750  3.05 | 11.83  2.03
         2.667  3.05 | 5.750  11.18| 8.833  4.06 | 11.92  2.03
         2.750  3.05 | 5.833  80.26| 8.917  4.06 | 12.00  2.03
         2.833  4.06 | 5.917  80.26| 9.000  4.06 | 12.08  2.03
         2.917  4.06 | 6.000  80.26| 9.083  3.05 | 12.17  2.03
         3.000  4.06 | 6.083  81.28| 9.167  3.05 | 12.25  2.03
         3.083  3.05 | 6.167  81.28| 9.250  3.05 |
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
   Max.Eff.Inten.(mm/hr)=    81.28          60.55
          over (min)          5.00          10.00
   Storage Coeff.  (min)=     4.81 (ii)      8.28 (ii)
   Unit Hyd. Tpeak (min)=     5.00          10.00
   Unit Hyd. peak  (cms)=     0.22           0.13
                                                     *TOTALS*
   PEAK FLOW       (cms)=     0.10           0.03       0.123 (iii)
   TIME TO PEAK    (hrs)=     6.25           6.25       6.25
   RUNOFF VOLUME   (mm)=     87.92          52.66      78.04
   TOTAL RAINFALL  (mm)=     89.92          89.92      89.92
   RUNOFF COEFFICIENT  =      0.98           0.59       0.87

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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 ( 0170)|   Area   (ha)=   0.43
|ID= 1 DT= 5.0 min |   Total Imp(%)= 98.00   Dir. Conn.(%)= 98.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
   Surface Area     (ha)=      0.42          0.01
   Dep. Storage     (mm)=      2.00          5.00
   Average Slope    (%)=       1.00          2.00
   Length           (m)=     250.00         20.00
   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 | 3.167   3.05 | 6.250  81.28 | 9.33   3.05
         0.167   0.00 | 3.250   3.05 | 6.333  16.26 | 9.42   3.05
         0.250   0.00 | 3.333   4.06 | 6.417  16.26 | 9.50   3.05
         0.333   2.03 | 3.417   4.06 | 6.500  16.26 | 9.58   3.05
         0.417   2.03 | 3.500   4.06 | 6.583  16.26 | 9.67   3.05
         0.500   2.03 | 3.583   3.05 | 6.667  16.26 | 9.75   3.05
         0.583   2.03 | 3.667   3.05 | 6.750  16.26 | 9.83   2.03
         0.667   2.03 | 3.750   3.05 | 6.833   7.11 | 9.92   2.03
         0.750   2.03 | 3.833   4.06 | 6.917   7.11 | 10.00  2.03
         0.833   1.02 | 3.917   4.06 | 7.000   7.11 | 10.08  3.05
         0.917   1.02 | 4.000   4.06 | 7.083   7.11 | 10.17  3.05
         1.000   1.02 | 4.083   3.05 | 7.167   7.11 | 10.25  3.05
         1.083   2.03 | 4.167   3.05 | 7.250   7.11 | 10.33  2.03
         1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
```

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                    LangstaffRd_EA_Proposed_WestDonWatershd
         1.250   2.03 | 4.333   7.11 | 7.417   5.08 | 10.50  2.03
         1.333   2.03 | 4.417   7.11 | 7.500   5.08 | 10.58  1.02
         1.417   2.03 | 4.500   7.11 | 7.583   5.08 | 10.67  1.02
         1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75  1.02
         1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83  2.03
         1.667   2.03 | 4.750   6.10 | 7.833   6.10 | 10.92  2.03
         1.750   2.03 | 4.833   6.10 | 7.917   6.10 | 11.00  2.03
         1.833   1.02 | 4.917   6.10 | 8.000   6.10 | 11.08  2.03
         1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  2.03
         2.000   1.02 | 5.083   6.10 | 8.167   5.08 | 11.25  2.03
         2.083   2.03 | 5.167   6.10 | 8.250   5.08 | 11.33  2.03
         2.167   2.03 | 5.250   6.10 | 8.333   4.06 | 11.42  2.03
         2.250   2.03 | 5.333  11.18 | 8.417   4.06 | 11.50  2.03
         2.333   4.06 | 5.417  11.18 | 8.500   4.06 | 11.58  1.02
         2.417   4.06 | 5.500  11.18 | 8.583   3.05 | 11.67  1.02
         2.500   4.06 | 5.583  11.18 | 8.667   3.05 | 11.75  1.02
         2.583   3.05 | 5.667  11.18 | 8.750   3.05 | 11.83  2.03
         2.667   3.05 | 5.750  11.18 | 8.833   4.06 | 11.92  2.03
         2.750   3.05 | 5.833  80.26 | 8.917   4.06 | 12.00  2.03
         2.833   4.06 | 5.917  80.26 | 9.000   4.06 | 12.08  2.03
         2.917   4.06 | 6.000  80.26 | 9.083   3.05 | 12.17  2.03
         3.000   4.06 | 6.083  81.28 | 9.167   3.05 | 12.25  2.03
         3.083   3.05 | 6.167  81.28 | 9.250   3.05 |

   Max.Eff.Inten.(mm/hr)=    81.28          69.46
          over (min)          5.00          10.00
   Storage Coeff.  (min)=     4.81 (ii)      5.88 (ii)
   Unit Hyd. Tpeak (min)=     5.00          10.00
   Unit Hyd. peak  (cms)=     0.22           0.15
                                                     *TOTALS*
   PEAK FLOW       (cms)=     0.09           0.00       0.097 (iii)
   TIME TO PEAK    (hrs)=     6.25           6.25       6.25
   RUNOFF VOLUME   (mm)=     87.92          62.00      87.39
   TOTAL RAINFALL  (mm)=     89.92          89.92      89.92
   RUNOFF COEFFICIENT  =      0.98           0.69       0.97

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 89.0   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 ( 0180)|   Area   (ha)=   0.65
|ID= 1 DT= 5.0 min |   Total Imp(%)= 52.00   Dir. Conn.(%)= 52.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
   Surface Area     (ha)=      0.34          0.31
   Dep. Storage     (mm)=      2.00          5.00
```

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                    LangstaffRd_EA_Proposed_WestDonWatershd
   Average Slope    (%)=       1.00          2.00
   Length           (m)=      65.83         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 | 3.167   3.05 | 6.250  81.28 | 9.33   3.05
         0.167   0.00 | 3.250   3.05 | 6.333  16.26 | 9.42   3.05
         0.250   0.00 | 3.333   4.06 | 6.417  16.26 | 9.50   3.05
         0.333   2.03 | 3.417   4.06 | 6.500  16.26 | 9.58   3.05
         0.417   2.03 | 3.500   4.06 | 6.583  16.26 | 9.67   3.05
         0.500   2.03 | 3.583   3.05 | 6.667  16.26 | 9.75   3.05
         0.583   2.03 | 3.667   3.05 | 6.750  16.26 | 9.83   2.03
         0.667   2.03 | 3.750   3.05 | 6.833   7.11 | 9.92   2.03
         0.750   2.03 | 3.833   4.06 | 6.917   7.11 | 10.00  2.03
         0.833   1.02 | 3.917   4.06 | 7.000   7.11 | 10.08  3.05
         0.917   1.02 | 4.000   4.06 | 7.083   7.11 | 10.17  3.05
         1.000   1.02 | 4.083   3.05 | 7.167   7.11 | 10.25  3.05
         1.083   2.03 | 4.167   3.05 | 7.250   7.11 | 10.33  2.03
         1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
         1.250   2.03 | 4.333   7.11 | 7.417   5.08 | 10.50  2.03
         1.333   2.03 | 4.417   7.11 | 7.500   5.08 | 10.58  1.02
         1.417   2.03 | 4.500   7.11 | 7.583   5.08 | 10.67  1.02
         1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75  1.02
         1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83  2.03
         1.667   2.03 | 4.750   6.10 | 7.833   6.10 | 10.92  2.03
         1.750   2.03 | 4.833   6.10 | 7.917   6.10 | 11.00  2.03
         1.833   1.02 | 4.917   6.10 | 8.000   6.10 | 11.08  2.03
         1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  2.03
         2.000   1.02 | 5.083   6.10 | 8.167   5.08 | 11.25  2.03
         2.083   2.03 | 5.167   6.10 | 8.250   5.08 | 11.33  2.03
         2.167   2.03 | 5.250   6.10 | 8.333   4.06 | 11.42  2.03
         2.250   2.03 | 5.333  11.18 | 8.417   4.06 | 11.50  2.03
         2.333   4.06 | 5.417  11.18 | 8.500   4.06 | 11.58  1.02
         2.417   4.06 | 5.500  11.18 | 8.583   3.05 | 11.67  1.02
         2.500   4.06 | 5.583  11.18 | 8.667   3.05 | 11.75  1.02
         2.583   3.05 | 5.667  11.18 | 8.750   3.05 | 11.83  2.03
         2.667   3.05 | 5.750  11.18 | 8.833   4.06 | 11.92  2.03
         2.750   3.05 | 5.833  80.26 | 8.917   4.06 | 12.00  2.03
         2.833   4.06 | 5.917  80.26 | 9.000   4.06 | 12.08  2.03
         2.917   4.06 | 6.000  80.26 | 9.083   3.05 | 12.17  2.03
         3.000   4.06 | 6.083  81.28 | 9.167   3.05 | 12.25  2.03
         3.083   3.05 | 6.167  81.28 | 9.250   3.05 |

   Max.Eff.Inten.(mm/hr)=    81.28          60.55
          over (min)          5.00          15.00
   Storage Coeff.  (min)=     2.16 (ii)     10.79 (ii)
   Unit Hyd. Tpeak (min)=     5.00          15.00
   Unit Hyd. peak  (cms)=     0.31           0.09
```

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                    LangstaffRd_EA_Proposed_WestDonWatershd
                                                     *TOTALS*
   PEAK FLOW       (cms)=     0.08           0.04       0.118 (iii)
   TIME TO PEAK    (hrs)=     6.25           6.33       6.25
   RUNOFF VOLUME   (mm)=     87.92          52.66      70.98
   TOTAL RAINFALL  (mm)=     89.92          89.92      89.92
   RUNOFF COEFFICIENT  =      0.98           0.59       0.79

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* = 83.0   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 ( 0185)|   Area   (ha)=   0.47
|ID= 1 DT= 5.0 min |   Total Imp(%)= 72.00   Dir. Conn.(%)= 72.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
   Surface Area     (ha)=      0.34          0.13
   Dep. Storage     (mm)=      2.00          5.00
   Average Slope    (%)=       1.00          2.00
   Length           (m)=     240.00         20.00
   Mannings n        =         0.013         0.350

     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   3.05 | 6.250  81.28 | 9.33   3.05
         0.167   0.00 | 3.250   3.05 | 6.333  16.26 | 9.42   3.05
         0.250   0.00 | 3.333   4.06 | 6.417  16.26 | 9.50   3.05
         0.333   2.03 | 3.417   4.06 | 6.500  16.26 | 9.58   3.05
         0.417   2.03 | 3.500   4.06 | 6.583  16.26 | 9.67   3.05
         0.500   2.03 | 3.583   3.05 | 6.667  16.26 | 9.75   3.05
         0.583   2.03 | 3.667   3.05 | 6.750  16.26 | 9.83   2.03
         0.667   2.03 | 3.750   3.05 | 6.833   7.11 | 9.92   2.03
         0.750   2.03 | 3.833   4.06 | 6.917   7.11 | 10.00  2.03
         0.833   1.02 | 3.917   4.06 | 7.000   7.11 | 10.08  3.05
         0.917   1.02 | 4.000   4.06 | 7.083   7.11 | 10.17  3.05
         1.000   1.02 | 4.083   3.05 | 7.167   7.11 | 10.25  3.05
         1.083   2.03 | 4.167   3.05 | 7.250   7.11 | 10.33  2.03
         1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
         1.250   2.03 | 4.333   7.11 | 7.417   5.08 | 10.50  2.03
         1.333   2.03 | 4.417   7.11 | 7.500   5.08 | 10.58  1.02
         1.417   2.03 | 4.500   7.11 | 7.583   5.08 | 10.67  1.02
         1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75  1.02
         1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83  2.03
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Page 169 (top-left)

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                    LangstaffRd_EA_Proposed_WestDonWatershd
        1.667   2.03 | 4.750   6.10 | 7.833   6.10 | 10.92   2.03
        1.750   2.03 | 4.833   6.10 | 7.917   6.10 | 11.00   2.03
        1.833   1.02 | 4.917   6.10 | 8.000   6.10 | 11.08   2.03
        1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17   2.03
        2.000   1.02 | 5.083   6.10 | 8.167   5.08 | 11.25   2.03
        2.083   2.03 | 5.167   6.10 | 8.250   5.08 | 11.33   2.03
        2.167   2.03 | 5.250   6.10 | 8.333   4.06 | 11.42   2.03
        2.250   2.03 | 5.333  11.18 | 8.417   4.06 | 11.50   2.03
        2.333   4.06 | 5.417  11.18 | 8.500   4.06 | 11.58   1.02
        2.417   4.06 | 5.500  11.18 | 8.583   3.05 | 11.67   1.02
        2.500   4.06 | 5.583  11.18 | 8.667   3.05 | 11.75   1.02
        2.583   3.05 | 5.667  11.18 | 8.750   3.05 | 11.83   2.03
        2.667   3.05 | 5.750  11.18 | 8.833   4.06 | 11.92   2.03
        2.750   3.05 | 5.833  80.26 | 8.917   4.06 | 12.00   2.03
        2.833   4.06 | 5.917  80.26 | 9.000   4.06 | 12.08   2.03
        2.917   4.06 | 6.000  80.26 | 9.083   3.05 | 12.17   2.03
        3.000   4.06 | 6.083  81.28 | 9.167   3.05 | 12.25   2.03
        3.083   3.05 | 6.167  81.28 | 9.250   3.05 |
```

```
   Max.Eff.Inten.(mm/hr)=     81.28          54.91
             over (min)        5.00          10.00
   Storage Coeff.  (min)=      4.69 (ii)      8.94 (ii)
   Unit Hyd. Tpeak (min)=      5.00          10.00
   Unit Hyd. peak  (cms)=      0.22           0.12
                                                          *TOTALS*
   PEAK FLOW       (cms)=      0.08           0.02        0.094 (iii)
   TIME TO PEAK    (hrs)=      6.25           6.25        6.25
   RUNOFF VOLUME   (mm)=      87.92          47.30       76.54
   TOTAL RAINFALL  (mm)=      89.92          89.92       89.92
   RUNOFF COEFFICIENT  =       0.98           0.53        0.85

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

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* =  79.0   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 ( 0445)|
|  1 + 2  = 3    |          AREA    QPEAK    TPEAK    R.V.
--------------------          (ha)    (cms)    (hrs)    (mm)
     ID1= 1 ( 0180):         0.65    0.118    6.25    70.98
   + ID2= 2 ( 0185):         0.47    0.094    6.25    76.54
                      ==========================================
     ID = 3 ( 0445):         1.12    0.212    6.25    73.31

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

                              Page 169
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Page 170 (top-right)

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                    LangstaffRd_EA_Proposed_WestDonWatershd
--------------------
| ADD HYD ( 0450)|
|  1 + 2  = 3    |          AREA    QPEAK    TPEAK    R.V.
--------------------          (ha)    (cms)    (hrs)    (mm)
     ID1= 1 ( 0165):         0.60    0.123    6.25    78.04
   + ID2= 2 ( 0170):         0.43    0.097    6.25    87.39
                      ==========================================
     ID = 3 ( 0450):         1.03    0.219    6.25    81.94

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

--------------------
| ADD HYD ( 0450)|
|  3 + 2  = 1    |          AREA    QPEAK    TPEAK    R.V.
--------------------          (ha)    (cms)    (hrs)    (mm)
     ID1= 3 ( 0450):         1.03    0.219    6.25    81.94
   + ID2= 2 ( 0445):         1.12    0.212    6.25    73.31
                      ==========================================
     ID = 1 ( 0450):         2.15    0.431    6.25    77.45

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------
--------------------
| RESERVOIR( 0520)|     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   |   0.0181     0.0552
                        0.0081     0.0048   |   0.0203     0.0732
                        0.0123     0.0192   |   0.0224     0.1152
                        0.0155     0.0372   |   0.0000     0.0000

                              AREA    QPEAK    TPEAK      R.V.
                              (ha)    (cms)    (hrs)      (mm)
   INFLOW : ID= 2 ( 0450):    2.150    0.431    6.25     77.45
   OUTFLOW: ID= 1 ( 0520):    2.150    0.022    8.50     77.38

            PEAK  FLOW   REDUCTION [Qout/Qin](%)=  5.19
            TIME SHIFT OF PEAK FLOW     (min)=135.00
            MAXIMUM STORAGE   USED    (ha.m.)= 0.1152

--------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD ( 0145)|  Area   (ha)=  3.05
|ID= 1 DT= 5.0 min |  Total Imp(%)= 76.00  Dir. Conn.(%)= 76.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=    2.32          0.73
    Dep. Storage   (mm)=    2.00          5.00
    Average Slope  (%)=     1.00          2.00
    Length         (m)=   531.00        40.00
                              Page 170
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Page 171 (bottom-left)

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                    LangstaffRd_EA_Proposed_WestDonWatershd
   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   3.05 | 6.250  81.28 | 9.33   3.05
          0.167   0.00 | 3.250   3.05 | 6.333  16.26 | 9.42   3.05
          0.250   0.00 | 3.333   4.06 | 6.417  16.26 | 9.50   3.05
          0.333   2.03 | 3.417   4.06 | 6.500  16.26 | 9.58   3.05
          0.417   2.03 | 3.500   4.06 | 6.583  16.26 | 9.67   3.05
          0.500   2.03 | 3.583   3.05 | 6.667  16.26 | 9.75   3.05
          0.583   2.03 | 3.667   3.05 | 6.750  16.26 | 9.83   2.03
          0.667   2.03 | 3.750   3.05 | 6.833   7.11 | 9.92   2.03
          0.750   2.03 | 3.833   4.06 | 6.917   7.11 | 10.00   2.03
          0.833   1.02 | 3.917   4.06 | 7.000   7.11 | 10.08   3.05
          0.917   1.02 | 4.000   4.06 | 7.083   7.11 | 10.17   3.05
          1.000   1.02 | 4.083   3.05 | 7.167   7.11 | 10.25   3.05
          1.083   2.03 | 4.167   3.05 | 7.250   7.11 | 10.33   2.03
          1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
          1.250   2.03 | 4.333   7.11 | 7.417   5.08 | 10.50   2.03
          1.333   2.03 | 4.417   7.11 | 7.500   5.08 | 10.58   1.02
          1.417   2.03 | 4.500   7.11 | 7.583   5.08 | 10.67   1.02
          1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
          1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
          1.667   2.03 | 4.750   6.10 | 7.833   6.10 | 10.92   2.03
          1.750   2.03 | 4.833   6.10 | 7.917   6.10 | 11.00   2.03
          1.833   1.02 | 4.917   6.10 | 8.000   6.10 | 11.08   2.03
          1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17   2.03
          2.000   1.02 | 5.083   6.10 | 8.167   5.08 | 11.25   2.03
          2.083   2.03 | 5.167   6.10 | 8.250   5.08 | 11.33   2.03
          2.167   2.03 | 5.250   6.10 | 8.333   4.06 | 11.42   2.03
          2.250   2.03 | 5.333  11.18 | 8.417   4.06 | 11.50   2.03
          2.333   4.06 | 5.417  11.18 | 8.500   4.06 | 11.58   1.02
          2.417   4.06 | 5.500  11.18 | 8.583   3.05 | 11.67   1.02
          2.500   4.06 | 5.583  11.18 | 8.667   3.05 | 11.75   1.02
          2.583   3.05 | 5.667  11.18 | 8.750   3.05 | 11.83   2.03
          2.667   3.05 | 5.750  11.18 | 8.833   4.06 | 11.92   2.03
          2.750   3.05 | 5.833  80.26 | 8.917   4.06 | 12.00   2.03
          2.833   4.06 | 5.917  80.26 | 9.000   4.06 | 12.08   2.03
          2.917   4.06 | 6.000  80.26 | 9.083   3.05 | 12.17   2.03
          3.000   4.06 | 6.083  81.28 | 9.167   3.05 | 12.25   2.03
          3.083   3.05 | 6.167  81.28 | 9.250   3.05 |

   Max.Eff.Inten.(mm/hr)=     81.28          64.97
             over (min)       10.00          15.00
   Storage Coeff.  (min)=      7.56 (ii)     12.39 (ii)
   Unit Hyd. Tpeak (min)=     10.00          15.00
   Unit Hyd. peak  (cms)=      0.13           0.08
                                                          *TOTALS*
   PEAK FLOW       (cms)=      0.51           0.10        0.611 (iii)
                              Page 171
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Page 172 (bottom-right)

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                    LangstaffRd_EA_Proposed_WestDonWatershd
   TIME TO PEAK    (hrs)=      6.25           6.33        6.25
   RUNOFF VOLUME   (mm)=      87.92          57.11       80.52
   TOTAL RAINFALL  (mm)=      89.92          89.92       89.92
   RUNOFF COEFFICIENT  =       0.98           0.64        0.90


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
        CN* =  86.0   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 ( 0135)|  Area   (ha)=  1.43
|ID= 1 DT= 5.0 min |  Total Imp(%)= 99.00  Dir. Conn.(%)= 99.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=    1.42          0.01
    Dep. Storage   (mm)=    2.00          5.00
    Average Slope  (%)=     1.00          2.00
    Length         (m)=   503.00        30.00
    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 | 3.167   3.05 | 6.250  81.28 | 9.33   3.05
          0.167   0.00 | 3.250   3.05 | 6.333  16.26 | 9.42   3.05
          0.250   0.00 | 3.333   4.06 | 6.417  16.26 | 9.50   3.05
          0.333   2.03 | 3.417   4.06 | 6.500  16.26 | 9.58   3.05
          0.417   2.03 | 3.500   4.06 | 6.583  16.26 | 9.67   3.05
          0.500   2.03 | 3.583   3.05 | 6.667  16.26 | 9.75   3.05
          0.583   2.03 | 3.667   3.05 | 6.750  16.26 | 9.83   2.03
          0.667   2.03 | 3.750   3.05 | 6.833   7.11 | 9.92   2.03
          0.750   2.03 | 3.833   4.06 | 6.917   7.11 | 10.00   2.03
          0.833   1.02 | 3.917   4.06 | 7.000   7.11 | 10.08   3.05
          0.917   1.02 | 4.000   4.06 | 7.083   7.11 | 10.17   3.05
          1.000   1.02 | 4.083   3.05 | 7.167   7.11 | 10.25   3.05
          1.083   2.03 | 4.167   3.05 | 7.250   7.11 | 10.33   2.03
          1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
          1.250   2.03 | 4.333   7.11 | 7.417   5.08 | 10.50   2.03
          1.333   2.03 | 4.417   7.11 | 7.500   5.08 | 10.58   1.02
          1.417   2.03 | 4.500   7.11 | 7.583   5.08 | 10.67   1.02
          1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
          1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
          1.667   2.03 | 4.750   6.10 | 7.833   6.10 | 10.92   2.03
          1.750   2.03 | 4.833   6.10 | 7.917   6.10 | 11.00   2.03
          1.833   1.02 | 4.917   6.10 | 8.000   6.10 | 11.08   2.03
                              Page 172
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LangstaffRd_EA_Proposed_WestDonWatershd

1.917	1.02	5.000	6.10	8.083	5.08	11.17	2.03
2.000	1.02	5.083	6.10	8.167	5.08	11.25	2.03
2.083	2.03	5.167	6.10	8.250	5.08	11.33	2.03
2.167	2.03	5.250	6.10	8.333	4.06	11.42	2.03
2.250	2.03	5.333	11.18	8.417	4.06	11.50	2.03
2.333	4.06	5.417	11.18	8.500	4.06	11.58	1.02
2.417	4.06	5.500	11.18	8.583	3.05	11.67	1.02
2.500	4.06	5.583	11.18	8.667	3.05	11.75	1.02
2.583	3.05	5.667	11.18	8.750	3.05	11.83	2.03
2.667	3.05	5.750	11.18	8.833	4.06	11.92	2.03
2.750	3.05	5.833	80.26	8.917	4.06	12.00	2.03
2.833	4.06	5.917	80.26	9.000	4.06	12.08	2.03
2.917	4.06	6.000	80.26	9.083	3.05	12.17	2.03
3.000	4.06	6.083	81.28	9.167	3.05	12.25	2.03
3.083	3.05	6.167	81.28	9.250	3.05		

```
        Max.Eff.Inten.(mm/hr)=      81.28         62.01
               over (min)             5.00         10.00
        Storage Coeff.   (min)=       7.32 (ii)     8.34 (ii)
        Unit Hyd. Tpeak  (min)=       5.00         10.00
        Unit Hyd. peak   (cms)=       0.17          0.13
                                                           *TOTALS*
        PEAK FLOW        (cms)=       0.31          0.00      0.317 (iii)
        TIME TO PEAK     (hrs)=       6.25          6.25      6.25
        RUNOFF VOLUME     (mm)=      87.92         54.10     87.57
        TOTAL RAINFALL    (mm)=      89.92         89.92     89.92
        RUNOFF COEFFICIENT  =         0.98          0.60      0.97

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  84.0   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 ( 0140)|  Area    (ha)=   1.27
|ID= 1 DT= 5.0 min |  Total Imp(%)= 91.00   Dir. Conn.(%)= 91.00
--------------------
                             IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=     1.16         0.11
       Dep. Storage   (mm)=     2.00         5.00
       Average Slope   (%)=     1.00         2.00
       Length          (m)=   503.00        25.00
       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
```

LangstaffRd_EA_Proposed_WestDonWatershd

hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.05	6.250	81.28	9.33	3.05
0.167	0.00	3.250	3.05	6.333	16.26	9.42	3.05
0.250	0.00	3.333	4.06	6.417	16.26	9.50	3.05
0.333	2.03	3.417	4.06	6.500	16.26	9.58	3.05
0.417	2.03	3.500	4.06	6.583	16.26	9.67	3.05
0.500	2.03	3.583	3.05	6.667	16.26	9.75	3.05
0.583	2.03	3.667	3.05	6.750	16.26	9.83	2.03
0.667	2.03	3.750	3.05	6.833	7.11	9.92	2.03
0.750	2.03	3.833	4.06	6.917	7.11	10.00	2.03
0.833	1.02	3.917	4.06	7.000	7.11	10.08	3.05
0.917	1.02	4.000	4.06	7.083	7.11	10.17	3.05
1.000	1.02	4.083	3.05	7.167	7.11	10.25	3.05
1.083	2.03	4.167	3.05	7.250	7.11	10.33	2.03
1.167	2.03	4.250	3.05	7.333	5.08	10.42	2.03
1.250	2.03	4.333	7.11	7.417	5.08	10.50	2.03
1.333	2.03	4.417	7.11	7.500	5.08	10.58	1.02
1.417	2.03	4.500	7.11	7.583	5.08	10.67	1.02
1.500	2.03	4.583	6.10	7.667	5.08	10.75	1.02
1.583	2.03	4.667	6.10	7.750	5.08	10.83	2.03
1.667	2.03	4.750	6.10	7.833	6.10	10.92	2.03
1.750	2.03	4.833	6.10	7.917	6.10	11.00	2.03
1.833	1.02	4.917	6.10	8.000	6.10	11.08	2.03
1.917	1.02	5.000	6.10	8.083	5.08	11.17	2.03
2.000	1.02	5.083	6.10	8.167	5.08	11.25	2.03
2.083	2.03	5.167	6.10	8.250	5.08	11.33	2.03
2.167	2.03	5.250	6.10	8.333	4.06	11.42	2.03
2.250	2.03	5.333	11.18	8.417	4.06	11.50	2.03
2.333	4.06	5.417	11.18	8.500	4.06	11.58	1.02
2.417	4.06	5.500	11.18	8.583	3.05	11.67	1.02
2.500	4.06	5.583	11.18	8.667	3.05	11.75	1.02
2.583	3.05	5.667	11.18	8.750	3.05	11.83	2.03
2.667	3.05	5.750	11.18	8.833	4.06	11.92	2.03
2.750	3.05	5.833	80.26	8.917	4.06	12.00	2.03
2.833	4.06	5.917	80.26	9.000	4.06	12.08	2.03
2.917	4.06	6.000	80.26	9.083	3.05	12.17	2.03
3.000	4.06	6.083	81.28	9.167	3.05	12.25	2.03
3.083	3.05	6.167	81.28	9.250	3.05		

```
        Max.Eff.Inten.(mm/hr)=      81.28         60.55
               over (min)             5.00         10.00
        Storage Coeff.   (min)=       7.32 (ii)     9.61 (ii)
        Unit Hyd. Tpeak  (min)=       5.00         10.00
        Unit Hyd. peak   (cms)=       0.17          0.11
                                                           *TOTALS*
        PEAK FLOW        (cms)=       0.26          0.02      0.274 (iii)
        TIME TO PEAK     (hrs)=       6.25          6.25      6.25
        RUNOFF VOLUME     (mm)=      87.92         52.66     84.74
        TOTAL RAINFALL    (mm)=      89.92         89.92     89.92
        RUNOFF COEFFICIENT  =         0.98          0.59      0.94

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

```
                 LangstaffRd_EA_Proposed_WestDonWatershd
            CN* =  83.0    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 ( 0420)|
| 1 + 2 = 3      |            AREA    QPEAK   TPEAK    R.V.
--------------------            (ha)    (cms)   (hrs)    (mm)
          ID1= 1 ( 0135):     1.43   0.317    6.25    87.57
        + ID2= 2 ( 0140):     1.27   0.274    6.25    84.74
        ==================================================
          ID = 3 ( 0420):     2.70   0.590    6.25    86.24

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

```
--------------------
| RESERVOIR( 0530)|   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  | 0.0122    0.0823
                        0.0056    0.0072  | 0.0382    0.1093
                        0.0084    0.0283  | 0.0516    0.1598
                        0.0105    0.0553  | 0.0000    0.0000
                             AREA    QPEAK   TPEAK    R.V.
                             (ha)    (cms)   (hrs)    (mm)
       INFLOW : ID= 2 ( 0420):  2.700   0.590    6.25    86.24
       OUTFLOW: ID= 1 ( 0530):  2.700   0.052    7.25    86.12

          PEAK   FLOW   REDUCTION [Qout/Qin](%)= 8.73
          TIME SHIFT OF PEAK FLOW      (min)= 60.00
          MAXIMUM STORAGE   USED     (ha.m.)= 0.1597
```

```
--------------------
| ADD HYD ( 0425)|
| 1 + 2 = 3      |            AREA    QPEAK   TPEAK    R.V.
--------------------            (ha)    (cms)   (hrs)    (mm)
          ID1= 1 ( 0145):     3.05   0.611    6.25    80.52
        + ID2= 2 ( 0530):     2.70   0.052    7.25    86.12
        ==================================================
          ID = 3 ( 0425):     5.75   0.653    6.25    83.15

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

```
--------------------
| RESERVOIR( 0512)|   OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
```

```
                 LangstaffRd_EA_Proposed_WestDonWatershd
| DT= 5.0 min      |   OUTFLOW   STORAGE  | OUTFLOW   STORAGE
--------------------     (cms)    (ha.m.)  |  (cms)    (ha.m.)
                        0.0000    0.0000  | 0.0471    0.1003
                        0.0071    0.0165  | 0.0636    0.1284
                        0.0098    0.0331  | 0.0763    0.1594
                        0.0119    0.0526  | 0.0870    0.1934
                        0.0138    0.0750  | 0.0964    0.2308
                             AREA    QPEAK   TPEAK    R.V.
                             (ha)    (cms)   (hrs)    (mm)
       INFLOW : ID= 2 ( 0425):  5.750   0.653    6.25    83.15
       OUTFLOW: ID= 1 ( 0512):  5.750   0.086    8.50    83.05

          PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.16
          TIME SHIFT OF PEAK FLOW      (min)=135.00
          MAXIMUM STORAGE   USED     (ha.m.)= 0.1898
```

```
--------------------
| CALIB           |
| STANDHYD ( 0215)|  Area    (ha)=   0.58
|ID= 1 DT= 5.0 min |  Total Imp(%)= 81.00   Dir. Conn.(%)= 81.00
--------------------
                             IMPERVIOUS   PERVIOUS (i)
       Surface Area   (ha)=     0.47         0.11
       Dep. Storage   (mm)=     2.00         5.00
       Average Slope   (%)=     1.00         2.00
       Length          (m)=   260.00        30.00
       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	3.167	3.05	6.250	81.28	9.33	3.05
0.167	0.00	3.250	3.05	6.333	16.26	9.42	3.05
0.250	0.00	3.333	4.06	6.417	16.26	9.50	3.05
0.333	2.03	3.417	4.06	6.500	16.26	9.58	3.05
0.417	2.03	3.500	4.06	6.583	16.26	9.67	3.05
0.500	2.03	3.583	3.05	6.667	16.26	9.75	3.05
0.583	2.03	3.667	3.05	6.750	16.26	9.83	2.03
0.667	2.03	3.750	3.05	6.833	7.11	9.92	2.03
0.750	2.03	3.833	4.06	6.917	7.11	10.00	2.03
0.833	1.02	3.917	4.06	7.000	7.11	10.08	3.05
0.917	1.02	4.000	4.06	7.083	7.11	10.17	3.05
1.000	1.02	4.083	3.05	7.167	7.11	10.25	3.05
1.083	2.03	4.167	3.05	7.250	7.11	10.33	2.03
1.167	2.03	4.250	3.05	7.333	5.08	10.42	2.03
1.250	2.03	4.333	7.11	7.417	5.08	10.50	2.03
1.333	2.03	4.417	7.11	7.500	5.08	10.58	1.02
1.417	2.03	4.500	7.11	7.583	5.08	10.67	1.02

```
                 1.500  2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
                 1.583  2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
                 1.667  2.03 | 4.750   6.10 | 7.833   6.10 | 10.92   2.03
                 1.750  2.03 | 4.833   6.10 | 7.917   6.10 | 11.00   2.03
                 1.833  1.02 | 4.917   6.10 | 8.000   6.10 | 11.08   2.03
                 1.917  1.02 | 5.000   6.10 | 8.083   5.08 | 11.17   2.03
                 2.000  1.02 | 5.083   6.10 | 8.167   5.08 | 11.25   2.03
                 2.083  2.03 | 5.167   6.10 | 8.250   5.08 | 11.33   2.03
                 2.167  2.03 | 5.250   6.10 | 8.333   4.06 | 11.42   2.03
                 2.250  2.03 | 5.333  11.18 | 8.417   4.06 | 11.50   2.03
                 2.333  4.06 | 5.417  11.18 | 8.500   4.06 | 11.58   1.02
                 2.417  4.06 | 5.500  11.18 | 8.583   3.05 | 11.67   1.02
                 2.500  4.06 | 5.583  11.18 | 8.667   3.05 | 11.75   1.02
                 2.583  3.05 | 5.667  11.18 | 8.750   3.05 | 11.83   2.03
                 2.667  3.05 | 5.750  11.18 | 8.833   4.06 | 11.92   2.03
                 2.750  3.05 | 5.833  80.26 | 8.917   4.06 | 12.00   2.03
                 2.833  4.06 | 5.917  80.26 | 9.000   4.06 | 12.08   2.03
                 2.917  4.06 | 6.000  80.26 | 9.083   3.05 | 12.17   2.03
                 3.000  4.06 | 6.083  81.28 | 9.167   3.05 | 12.25   2.03
                 3.083  3.05 | 6.167  81.28 | 9.250   3.05 |

        Max.Eff.Inten.(mm/hr)=      81.28        60.55
               over (min)            5.00        10.00
        Storage Coeff.  (min)=       4.92 (ii)    8.54 (ii)
        Unit Hyd. Tpeak (min)=       5.00        10.00
        Unit Hyd. peak  (cms)=       0.22         0.12
                                                             *TOTALS*
        PEAK FLOW       (cms)=       0.11         0.02        0.122 (iii)
        TIME TO PEAK    (hrs)=       6.25         6.25        6.25
        RUNOFF VOLUME    (mm)=      87.92        52.66       81.21
        TOTAL RAINFALL   (mm)=      89.92        89.92       89.92
        RUNOFF COEFFICIENT   =       0.98         0.59        0.90

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

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 ( 0220)|   Area    (ha)=  0.65
|ID= 1 DT= 5.0 min |   Total Imp(%)= 66.00   Dir. Conn.(%)= 66.00
---------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=     0.43         0.22
        Dep. Storage    (mm)=     2.00         5.00
        Average Slope    (%)=     1.00         2.00
        Length           (m)=   260.00        20.00
        Mannings n        =       0.013        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   3.05 | 6.250  81.28 | 9.33    3.05
         0.167   0.00 | 3.250   3.05 | 6.333  16.26 | 9.42    3.05
         0.250   0.00 | 3.333   4.06 | 6.417  16.26 | 9.50    3.05
         0.333   2.03 | 3.417   4.06 | 6.500  16.26 | 9.58    3.05
         0.417   2.03 | 3.500   4.06 | 6.583  16.26 | 9.67    3.05
         0.500   2.03 | 3.583   3.05 | 6.667  16.26 | 9.75    3.05
         0.583   2.03 | 3.667   3.05 | 6.750  16.26 | 9.83    2.03
         0.667   2.03 | 3.750   3.05 | 6.833   7.11 | 9.92    2.03
         0.750   2.03 | 3.833   4.06 | 6.917   7.11 | 10.00   2.03
         0.833   1.02 | 3.917   4.06 | 7.000   7.11 | 10.08   3.05
         0.917   1.02 | 4.000   4.06 | 7.083   7.11 | 10.17   3.05
         1.000   1.02 | 4.083   3.05 | 7.167   7.11 | 10.25   3.05
         1.083   2.03 | 4.167   3.05 | 7.250   7.11 | 10.33   2.03
         1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
         1.250   2.03 | 4.333   7.11 | 7.417   5.08 | 10.50   2.03
         1.333   2.03 | 4.417   7.11 | 7.500   5.08 | 10.58   1.02
         1.417   2.03 | 4.500   7.11 | 7.583   5.08 | 10.67   1.02
         1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
         1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
         1.667   2.03 | 4.750   6.10 | 7.833   6.10 | 10.92   2.03
         1.750   2.03 | 4.833   6.10 | 7.917   6.10 | 11.00   2.03
         1.833   1.02 | 4.917   6.10 | 8.000   6.10 | 11.08   2.03
         1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17   2.03
         2.000   1.02 | 5.083   6.10 | 8.167   5.08 | 11.25   2.03
         2.083   2.03 | 5.167   6.10 | 8.250   5.08 | 11.33   2.03
         2.167   2.03 | 5.250   6.10 | 8.333   4.06 | 11.42   2.03
         2.250   2.03 | 5.333  11.18 | 8.417   4.06 | 11.50   2.03
         2.333   4.06 | 5.417  11.18 | 8.500   4.06 | 11.58   1.02
         2.417   4.06 | 5.500  11.18 | 8.583   3.05 | 11.67   1.02
         2.500   4.06 | 5.583  11.18 | 8.667   3.05 | 11.75   1.02
         2.583   3.05 | 5.667  11.18 | 8.750   3.05 | 11.83   2.03
         2.667   3.05 | 5.750  11.18 | 8.833   4.06 | 11.92   2.03
         2.750   3.05 | 5.833  80.26 | 8.917   4.06 | 12.00   2.03
         2.833   4.06 | 5.917  80.26 | 9.000   4.06 | 12.08   2.03
         2.917   4.06 | 6.000  80.26 | 9.083   3.05 | 12.17   2.03
         3.000   4.06 | 6.083  81.28 | 9.167   3.05 | 12.25   2.03
         3.083   3.05 | 6.167  81.28 | 9.250   3.05 |

        Max.Eff.Inten.(mm/hr)=      81.28        60.55
               over (min)            5.00        10.00
        Storage Coeff.  (min)=       4.92 (ii)    8.80 (ii)
        Unit Hyd. Tpeak (min)=       5.00        10.00
        Unit Hyd. peak  (cms)=       0.22         0.12
                                                             *TOTALS*
        PEAK FLOW       (cms)=       0.10         0.03        0.130 (iii)
        TIME TO PEAK    (hrs)=       6.25         6.25        6.25
```

```
        RUNOFF VOLUME    (mm)=      87.92        52.66       75.92
        TOTAL RAINFALL   (mm)=      89.92        89.92       89.92
        RUNOFF COEFFICIENT   =       0.98         0.59        0.84

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

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* = 83.0   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 ( 0470)|
|   1 + 2 = 3     |       AREA    QPEAK   TPEAK    R.V.
---------------------        (ha)   (cms)   (hrs)    (mm)
        ID1= 1 ( 0215):    0.58    0.122    6.25    81.21
      + ID2= 2 ( 0220):    0.65    0.130    6.25    75.92
        ===================================================
        ID = 3 ( 0470):    1.23    0.252    6.25    78.42

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
----------------------------------------------------------------------
---------------------
| RESERVOIR( 0535)|     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  |  0.0116    0.0367
                        0.0053    0.0048  |  0.0131    0.0474
                        0.0080    0.0154  |  0.0202    0.0639
                        0.0100    0.0261  |  0.0000    0.0000

                          AREA    QPEAK   TPEAK    R.V.
                          (ha)   (cms)   (hrs)    (mm)
        INFLOW : ID= 2 ( 0470)  1.230    0.252    6.25    78.42
        OUTFLOW: ID= 1 ( 0535)  1.230    0.020    7.33    78.24

           PEAK  FLOW  REDUCTION [Qout/Qin](%)= 7.89
           TIME SHIFT OF PEAK FLOW      (min)= 65.00
           MAXIMUM  STORAGE  USED    (ha.m.)= 0.0632

----------------------------------------------------------------------
---------------------
| CALIB               |
| STANDHYD ( 0225)|   Area    (ha)=  0.60
|ID= 1 DT= 5.0 min |   Total Imp(%)= 83.00   Dir. Conn.(%)= 83.00
---------------------
                              IMPERVIOUS    PERVIOUS (i)
        Surface Area    (ha)=     0.50         0.10
        Dep. Storage    (mm)=     2.00         5.00
```

```
        Average Slope    (%)=     1.00         2.00
        Length           (m)=   320.00        10.00
        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 | 3.167   3.05 | 6.250  81.28 | 9.33    3.05
         0.167   0.00 | 3.250   3.05 | 6.333  16.26 | 9.42    3.05
         0.250   0.00 | 3.333   4.06 | 6.417  16.26 | 9.50    3.05
         0.333   2.03 | 3.417   4.06 | 6.500  16.26 | 9.58    3.05
         0.417   2.03 | 3.500   4.06 | 6.583  16.26 | 9.67    3.05
         0.500   2.03 | 3.583   3.05 | 6.667  16.26 | 9.75    3.05
         0.583   2.03 | 3.667   3.05 | 6.750  16.26 | 9.83    2.03
         0.667   2.03 | 3.750   3.05 | 6.833   7.11 | 9.92    2.03
         0.750   2.03 | 3.833   4.06 | 6.917   7.11 | 10.00   2.03
         0.833   1.02 | 3.917   4.06 | 7.000   7.11 | 10.08   3.05
         0.917   1.02 | 4.000   4.06 | 7.083   7.11 | 10.17   3.05
         1.000   1.02 | 4.083   3.05 | 7.167   7.11 | 10.25   3.05
         1.083   2.03 | 4.167   3.05 | 7.250   7.11 | 10.33   2.03
         1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42   2.03
         1.250   2.03 | 4.333   7.11 | 7.417   5.08 | 10.50   2.03
         1.333   2.03 | 4.417   7.11 | 7.500   5.08 | 10.58   1.02
         1.417   2.03 | 4.500   7.11 | 7.583   5.08 | 10.67   1.02
         1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75   1.02
         1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83   2.03
         1.667   2.03 | 4.750   6.10 | 7.833   6.10 | 10.92   2.03
         1.750   2.03 | 4.833   6.10 | 7.917   6.10 | 11.00   2.03
         1.833   1.02 | 4.917   6.10 | 8.000   6.10 | 11.08   2.03
         1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17   2.03
         2.000   1.02 | 5.083   6.10 | 8.167   5.08 | 11.25   2.03
         2.083   2.03 | 5.167   6.10 | 8.250   5.08 | 11.33   2.03
         2.167   2.03 | 5.250   6.10 | 8.333   4.06 | 11.42   2.03
         2.250   2.03 | 5.333  11.18 | 8.417   4.06 | 11.50   2.03
         2.333   4.06 | 5.417  11.18 | 8.500   4.06 | 11.58   1.02
         2.417   4.06 | 5.500  11.18 | 8.583   3.05 | 11.67   1.02
         2.500   4.06 | 5.583  11.18 | 8.667   3.05 | 11.75   1.02
         2.583   3.05 | 5.667  11.18 | 8.750   3.05 | 11.83   2.03
         2.667   3.05 | 5.750  11.18 | 8.833   4.06 | 11.92   2.03
         2.750   3.05 | 5.833  80.26 | 8.917   4.06 | 12.00   2.03
         2.833   4.06 | 5.917  80.26 | 9.000   4.06 | 12.08   2.03
         2.917   4.06 | 6.000  80.26 | 9.083   3.05 | 12.17   2.03
         3.000   4.06 | 6.083  81.28 | 9.167   3.05 | 12.25   2.03
         3.083   3.05 | 6.167  81.28 | 9.250   3.05 |

        Max.Eff.Inten.(mm/hr)=      81.28        60.55
               over (min)            5.00        10.00
        Storage Coeff.  (min)=       5.58 (ii)    7.35 (ii)
        Unit Hyd. Tpeak (min)=       5.00        10.00
        Unit Hyd. peak  (cms)=       0.20         0.13
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
                                            *TOTALS*
PEAK FLOW      (cms)=     0.11      0.02     0.128 (iii)
TIME TO PEAK   (hrs)=     6.25      6.25     6.25
RUNOFF VOLUME   (mm)=    87.92     52.66    81.92
TOTAL RAINFALL  (mm)=    89.92     89.92    89.92
RUNOFF COEFFICIENT  =     0.98      0.59     0.91


   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 83.0   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 ( 0230)|  Area    (ha)=  0.70
|ID= 1 DT= 5.0 min |  Total Imp(%)= 66.00  Dir. Conn.(%)= 66.00
---------------------
                          IMPERVIOUS  PERVIOUS (i)
  Surface Area    (ha)=      0.46       0.24
  Dep. Storage    (mm)=      2.00       5.00
  Average Slope   (%)=       1.00       2.00
  Length          (m)=     320.00      25.00
  Mannings n      =         0.013      0.300

   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   3.05 | 6.250  81.28 | 9.33   3.05
    0.167   0.00 | 3.250   3.05 | 6.333  16.26 | 9.42   3.05
    0.250   0.00 | 3.333   4.06 | 6.417  16.26 | 9.50   3.05
    0.333   2.03 | 3.417   4.06 | 6.500  16.26 | 9.58   3.05
    0.417   2.03 | 3.500   4.06 | 6.583  16.26 | 9.67   3.05
    0.500   2.03 | 3.583   3.05 | 6.667  16.26 | 9.75   3.05
    0.583   2.03 | 3.667   3.05 | 6.750  16.26 | 9.83   2.03
    0.667   2.03 | 3.750   3.05 | 6.833   7.11 | 9.92   2.03
    0.750   2.03 | 3.833   4.06 | 6.917   7.11 | 10.00  2.03
    0.833   1.02 | 3.917   4.06 | 7.000   7.11 | 10.08  3.05
    0.917   1.02 | 4.000   4.06 | 7.083   7.11 | 10.17  3.05
    1.000   1.02 | 4.083   3.05 | 7.167   7.11 | 10.25  3.05
    1.083   2.03 | 4.167   3.05 | 7.250   7.11 | 10.33  2.03
    1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
    1.250   2.03 | 4.333   7.11 | 7.417   5.08 | 10.50  2.03
    1.333   2.03 | 4.417   7.11 | 7.500   5.08 | 10.58  1.02
    1.417   2.03 | 4.500   7.11 | 7.583   5.08 | 10.67  1.02
    1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75  1.02
    1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83  2.03
    1.667   2.03 | 4.750   6.10 | 7.833   6.10 | 10.92  2.03
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
    1.750   2.03 | 4.833   6.10 | 7.917   6.10 | 11.00  2.03
    1.833   1.02 | 4.917   6.10 | 8.000   6.10 | 11.08  2.03
    1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  2.03
    2.000   1.02 | 5.083   6.10 | 8.167   5.08 | 11.25  2.03
    2.083   2.03 | 5.167   6.10 | 8.250   5.08 | 11.33  2.03
    2.167   2.03 | 5.250   6.10 | 8.333   4.06 | 11.42  2.03
    2.250   2.03 | 5.333  11.18 | 8.417   4.06 | 11.50  2.03
    2.333   4.06 | 5.417  11.18 | 8.500   4.06 | 11.58  1.02
    2.417   4.06 | 5.500  11.18 | 8.583   3.05 | 11.67  1.02
    2.500   4.06 | 5.583  11.18 | 8.667   3.05 | 11.75  1.02
    2.583   3.05 | 5.667  11.18 | 8.750   3.05 | 11.83  2.03
    2.667   3.05 | 5.750  11.18 | 8.833   4.06 | 11.92  2.03
    2.750   3.05 | 5.833  80.26 | 8.917   4.06 | 12.00  2.03
    2.833   4.06 | 5.917  80.26 | 9.000   4.06 | 12.08  2.03
    2.917   4.06 | 6.000  80.26 | 9.083   3.05 | 12.17  2.03
    3.000   4.06 | 6.083  81.28 | 9.167   3.05 | 12.25  2.03
    3.083   3.05 | 6.167  81.28 | 9.250   3.05 |

Max.Eff.Inten.(mm/hr)=    81.28      57.69
         over (min)=       5.00      15.00
Storage Coeff.  (min)=     5.58 (ii) 10.53 (ii)
Unit Hyd. Tpeak (min)=     5.00      15.00
Unit Hyd. peak  (cms)=     0.20       0.09
                                            *TOTALS*
PEAK FLOW      (cms)=      0.10       0.03     0.134 (iii)
TIME TO PEAK   (hrs)=      6.25       6.33     6.25
RUNOFF VOLUME   (mm)=     87.92      49.90    74.98
TOTAL RAINFALL  (mm)=     89.92      89.92    89.92
RUNOFF COEFFICIENT  =      0.98       0.55     0.83

   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 81.0   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 ( 0475)|
|  1 + 2 = 3   |      AREA    QPEAK   TPEAK    R.V.
---------------------     (ha)    (cms)   (hrs)    (mm)
     ID1= 1 ( 0225):    0.60   0.128    6.25    81.92
   + ID2= 2 ( 0230):    0.70   0.134    6.25    74.98
   =================================================
     ID = 3 ( 0475):    1.30   0.262    6.25    78.18

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------
---------------------
| RESERVOIR( 0540)|   OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
```

```
| DT=  5.0 min  |     LangstaffRd_EA_Proposed_WestDonWatershd
                    OUTFLOW   STORAGE  |  OUTFLOW   STORAGE
---------------------  (cms)   (ha.m.)  |   (cms)   (ha.m.)
                     0.0000   0.0000   |  0.0271    0.0367
                     0.0118   0.0048   |  0.0306    0.0474
                     0.0184   0.0154   |  0.0415    0.0639
                     0.0232   0.0261   |  0.0000    0.0000

                        AREA    QPEAK   TPEAK    R.V.
                        (ha)    (cms)   (hrs)    (mm)
   INFLOW : ID= 2 ( 0475)   1.300   0.262    6.25    78.18
   OUTFLOW: ID= 1 ( 0540)   1.300   0.036    6.92    78.11

        PEAK  FLOW  REDUCTION [Qout/Qin](%)= 13.69
        TIME SHIFT OF PEAK FLOW    (min)= 40.00
        MAXIMUM  STORAGE  USED   (ha.m.)=  0.0553

--------------------------------------------------------------------
---------------------
| ADD HYD ( 0480)|
|  1 + 2 = 3   |      AREA    QPEAK   TPEAK    R.V.
---------------------     (ha)    (cms)   (hrs)    (mm)
     ID1= 1 ( 0535):    1.23   0.020    7.33    78.24
   + ID2= 2 ( 0540):    1.30   0.036    6.92    78.11
   =================================================
     ID = 3 ( 0480):    2.53   0.055    7.00    78.17

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------
---------------------
| CALIB              |
| STANDHYD ( 0155)|  Area    (ha)=  0.56
|ID= 1 DT= 5.0 min |  Total Imp(%)= 93.00  Dir. Conn.(%)= 93.00
---------------------
                          IMPERVIOUS  PERVIOUS (i)
  Surface Area    (ha)=      0.52       0.04
  Dep. Storage    (mm)=      2.00       5.00
  Average Slope   (%)=       1.00       2.00
  Length          (m)=     260.00      25.00
  Mannings n      =         0.013      0.290

   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   3.05 | 6.250  81.28 | 9.33   3.05
    0.167   0.00 | 3.250   3.05 | 6.333  16.26 | 9.42   3.05
    0.250   0.00 | 3.333   4.06 | 6.417  16.26 | 9.50   3.05
    0.333   2.03 | 3.417   4.06 | 6.500  16.26 | 9.58   3.05
    0.417   2.03 | 3.500   4.06 | 6.583  16.26 | 9.67   3.05
    0.500   2.03 | 3.583   3.05 | 6.667  16.26 | 9.75   3.05
```

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
    0.583   2.03 | 3.667   3.05 | 6.750  16.26 | 9.83   2.03
    0.667   2.03 | 3.750   3.05 | 6.833   7.11 | 9.92   2.03
    0.750   2.03 | 3.833   4.06 | 6.917   7.11 | 10.00  2.03
    0.833   1.02 | 3.917   4.06 | 7.000   7.11 | 10.08  3.05
    0.917   1.02 | 4.000   4.06 | 7.083   7.11 | 10.17  3.05
    1.000   1.02 | 4.083   3.05 | 7.167   7.11 | 10.25  3.05
    1.083   2.03 | 4.167   3.05 | 7.250   7.11 | 10.33  2.03
    1.167   2.03 | 4.250   3.05 | 7.333   5.08 | 10.42  2.03
    1.250   2.03 | 4.333   7.11 | 7.417   5.08 | 10.50  2.03
    1.333   2.03 | 4.417   7.11 | 7.500   5.08 | 10.58  1.02
    1.417   2.03 | 4.500   7.11 | 7.583   5.08 | 10.67  1.02
    1.500   2.03 | 4.583   6.10 | 7.667   5.08 | 10.75  1.02
    1.583   2.03 | 4.667   6.10 | 7.750   5.08 | 10.83  2.03
    1.667   2.03 | 4.750   6.10 | 7.833   6.10 | 10.92  2.03
    1.750   2.03 | 4.833   6.10 | 7.917   6.10 | 11.00  2.03
    1.833   1.02 | 4.917   6.10 | 8.000   6.10 | 11.08  2.03
    1.917   1.02 | 5.000   6.10 | 8.083   5.08 | 11.17  2.03
    2.000   1.02 | 5.083   6.10 | 8.167   5.08 | 11.25  2.03
    2.083   2.03 | 5.167   6.10 | 8.250   5.08 | 11.33  2.03
    2.167   2.03 | 5.250   6.10 | 8.333   4.06 | 11.42  2.03
    2.250   2.03 | 5.333  11.18 | 8.417   4.06 | 11.50  2.03
    2.333   4.06 | 5.417  11.18 | 8.500   4.06 | 11.58  1.02
    2.417   4.06 | 5.500  11.18 | 8.583   3.05 | 11.67  1.02
    2.500   4.06 | 5.583  11.18 | 8.667   3.05 | 11.75  1.02
    2.583   3.05 | 5.667  11.18 | 8.750   3.05 | 11.83  2.03
    2.667   3.05 | 5.750  11.18 | 8.833   4.06 | 11.92  2.03
    2.750   3.05 | 5.833  80.26 | 8.917   4.06 | 12.00  2.03
    2.833   4.06 | 5.917  80.26 | 9.000   4.06 | 12.08  2.03
    2.917   4.06 | 6.000  80.26 | 9.083   3.05 | 12.17  2.03
    3.000   4.06 | 6.083  81.28 | 9.167   3.05 | 12.25  2.03
    3.083   3.05 | 6.167  81.28 | 9.250   3.05 |

Max.Eff.Inten.(mm/hr)=    81.28      66.47
         over (min)=       5.00      10.00
Storage Coeff.  (min)=     4.92 (ii)  7.17 (ii)
Unit Hyd. Tpeak (min)=     5.00      10.00
Unit Hyd. peak  (cms)=     0.22       0.14
                                            *TOTALS*
PEAK FLOW      (cms)=      0.12       0.01     0.124 (iii)
TIME TO PEAK   (hrs)=      6.25       6.25     6.25
RUNOFF VOLUME   (mm)=     87.92      58.69    85.86
TOTAL RAINFALL  (mm)=     89.92      89.92    89.92
RUNOFF COEFFICIENT  =      0.98       0.65     0.95

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

   (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 87.0   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.

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--------------------
| CALIB            |
| STANDHYD ( 0160)|   Area    (ha)=   0.43
|ID= 1 DT= 5.0 min |   Total Imp(%)=  95.00   Dir. Conn.(%)=  95.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
          Surface Area   (ha)=    0.41          0.02
          Dep. Storage   (mm)=    2.00          5.00
          Average Slope  (%)=     1.00          2.00
          Length         (m)=   260.00         20.00
          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  | 3.167  3.05  | 6.250  81.28 | 9.33   3.05
           0.167  0.00  | 3.250  3.05  | 6.333  16.26 | 9.42   3.05
           0.250  0.00  | 3.333  4.06  | 6.417  16.26 | 9.50   3.05
           0.333  2.03  | 3.417  4.06  | 6.500  16.26 | 9.58   3.05
           0.417  2.03  | 3.500  4.06  | 6.583  16.26 | 9.67   3.05
           0.500  2.03  | 3.583  3.05  | 6.667  16.26 | 9.75   3.05
           0.583  2.03  | 3.667  3.05  | 6.750  16.26 | 9.83   2.03
           0.667  2.03  | 3.750  3.05  | 6.833  7.11  | 9.92   2.03
           0.750  2.03  | 3.833  4.06  | 6.917  7.11  | 10.00  2.03
           0.833  1.02  | 3.917  4.06  | 7.000  7.11  | 10.08  3.05
           0.917  1.02  | 4.000  4.06  | 7.083  7.11  | 10.17  3.05
           1.000  1.02  | 4.083  3.05  | 7.167  7.11  | 10.25  3.05
           1.083  2.03  | 4.167  3.05  | 7.250  7.11  | 10.33  2.03
           1.167  2.03  | 4.250  3.05  | 7.333  5.08  | 10.42  2.03
           1.250  2.03  | 4.333  7.11  | 7.417  5.08  | 10.50  2.03
           1.333  2.03  | 4.417  7.11  | 7.500  5.08  | 10.58  1.02
           1.417  2.03  | 4.500  7.11  | 7.583  5.08  | 10.67  1.02
           1.500  2.03  | 4.583  6.10  | 7.667  5.08  | 10.75  1.02
           1.583  2.03  | 4.667  6.10  | 7.750  5.08  | 10.83  2.03
           1.667  2.03  | 4.750  6.10  | 7.833  6.10  | 10.92  2.03
           1.750  2.03  | 4.833  6.10  | 7.917  6.10  | 11.00  2.03
           1.833  1.02  | 4.917  6.10  | 8.000  6.10  | 11.08  2.03
           1.917  1.02  | 5.000  6.10  | 8.083  5.08  | 11.17  2.03
           2.000  1.02  | 5.083  6.10  | 8.167  5.08  | 11.25  2.03
           2.083  2.03  | 5.167  6.10  | 8.250  5.08  | 11.33  2.03
           2.167  2.03  | 5.250  6.10  | 8.333  4.06  | 11.42  2.03
           2.250  2.03  | 5.333  11.18 | 8.417  4.06  | 11.50  2.03
           2.333  4.06  | 5.417  11.18 | 8.500  4.06  | 11.58  1.02
           2.417  4.06  | 5.500  11.18 | 8.583  3.05  | 11.67  1.02
           2.500  4.06  | 5.583  11.18 | 8.667  3.05  | 11.75  1.02
           2.583  3.05  | 5.667  11.18 | 8.750  3.05  | 11.83  2.03
           2.667  3.05  | 5.750  11.18 | 8.833  4.06  | 11.92  2.03
           2.750  3.05  | 5.833  80.26 | 8.917  4.06  | 12.00  2.03
           2.833  4.06  | 5.917  80.26 | 9.000  4.06  | 12.08  2.03
           2.917  4.06  | 6.000  80.26 | 9.083  3.05  | 12.17  2.03
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           3.000  4.06  | 6.083  81.28 | 9.167  3.05  | 12.25  2.03
           3.083  3.05  | 6.167  81.28 | 9.250  3.05  |

        Max.Eff.Inten.(mm/hr)=      81.28         69.46
                over (min)           5.00         10.00
        Storage Coeff.  (min)=      4.92 (ii)      6.48 (ii)
        Unit Hyd. Tpeak (min)=      5.00         10.00
        Unit Hyd. peak  (cms)=      0.22          0.14
                                                            *TOTALS*
        PEAK FLOW       (cms)=      0.09          0.00          0.096 (iii)
        TIME TO PEAK    (hrs)=      6.25          6.25          6.25
        RUNOFF VOLUME   (mm)=      87.92         62.00         86.61
        TOTAL RAINFALL  (mm)=      89.92         89.92         89.92
        RUNOFF COEFFICIENT  =       0.98          0.69          0.96

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

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  89.0   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.

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--------------------
| ADD HYD  ( 0430)|
|  1 + 2 = 3      |             AREA    QPEAK    TPEAK     R.V.
--------------------             (ha)    (cms)    (hrs)    (mm)
           ID1= 1 ( 0155):      0.56    0.124    6.25    85.86
         + ID2= 2 ( 0160):      0.43    0.096    6.25    86.61
                          ======================================
           ID = 3 ( 0430):      0.99    0.220    6.25    86.19

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0150)|   Area    (ha)=   3.81
|ID= 1 DT= 5.0 min |   Total Imp(%)=  95.00   Dir. Conn.(%)=  95.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
          Surface Area   (ha)=    3.62          0.19
          Dep. Storage   (mm)=    2.00          5.00
          Average Slope  (%)=     1.00          2.00
          Length         (m)=   150.00         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  | 3.167  3.05  | 6.250  81.28 | 9.33   3.05
           0.167  0.00  | 3.250  3.05  | 6.333  16.26 | 9.42   3.05
           0.250  0.00  | 3.333  4.06  | 6.417  16.26 | 9.50   3.05
           0.333  2.03  | 3.417  4.06  | 6.500  16.26 | 9.58   3.05
           0.417  2.03  | 3.500  4.06  | 6.583  16.26 | 9.67   3.05
           0.500  2.03  | 3.583  3.05  | 6.667  16.26 | 9.75   3.05
           0.583  2.03  | 3.667  3.05  | 6.750  16.26 | 9.83   2.03
           0.667  2.03  | 3.750  3.05  | 6.833  7.11  | 9.92   2.03
           0.750  2.03  | 3.833  4.06  | 6.917  7.11  | 10.00  2.03
           0.833  1.02  | 3.917  4.06  | 7.000  7.11  | 10.08  3.05
           0.917  1.02  | 4.000  4.06  | 7.083  7.11  | 10.17  3.05
           1.000  1.02  | 4.083  3.05  | 7.167  7.11  | 10.25  3.05
           1.083  2.03  | 4.167  3.05  | 7.250  7.11  | 10.33  2.03
           1.167  2.03  | 4.250  3.05  | 7.333  5.08  | 10.42  2.03
           1.250  2.03  | 4.333  7.11  | 7.417  5.08  | 10.50  2.03
           1.333  2.03  | 4.417  7.11  | 7.500  5.08  | 10.58  1.02
           1.417  2.03  | 4.500  7.11  | 7.583  5.08  | 10.67  1.02
           1.500  2.03  | 4.583  6.10  | 7.667  5.08  | 10.75  1.02
           1.583  2.03  | 4.667  6.10  | 7.750  5.08  | 10.83  2.03
           1.667  2.03  | 4.750  6.10  | 7.833  6.10  | 10.92  2.03
           1.750  2.03  | 4.833  6.10  | 7.917  6.10  | 11.00  2.03
           1.833  1.02  | 4.917  6.10  | 8.000  6.10  | 11.08  2.03
           1.917  1.02  | 5.000  6.10  | 8.083  5.08  | 11.17  2.03
           2.000  1.02  | 5.083  6.10  | 8.167  5.08  | 11.25  2.03
           2.083  2.03  | 5.167  6.10  | 8.250  5.08  | 11.33  2.03
           2.167  2.03  | 5.250  6.10  | 8.333  4.06  | 11.42  2.03
           2.250  2.03  | 5.333  11.18 | 8.417  4.06  | 11.50  2.03
           2.333  4.06  | 5.417  11.18 | 8.500  4.06  | 11.58  1.02
           2.417  4.06  | 5.500  11.18 | 8.583  3.05  | 11.67  1.02
           2.500  4.06  | 5.583  11.18 | 8.667  3.05  | 11.75  1.02
           2.583  3.05  | 5.667  11.18 | 8.750  3.05  | 11.83  2.03
           2.667  3.05  | 5.750  11.18 | 8.833  4.06  | 11.92  2.03
           2.750  3.05  | 5.833  80.26 | 8.917  4.06  | 12.00  2.03
           2.833  4.06  | 5.917  80.26 | 9.000  4.06  | 12.08  2.03
           2.917  4.06  | 6.000  80.26 | 9.083  3.05  | 12.17  2.03
           3.000  4.06  | 6.083  81.28 | 9.167  3.05  | 12.25  2.03
           3.083  3.05  | 6.167  81.28 | 9.250  3.05  |

        Max.Eff.Inten.(mm/hr)=      81.28         67.97
                over (min)           5.00         10.00
        Storage Coeff.  (min)=      3.54 (ii)      5.90 (ii)
        Unit Hyd. Tpeak (min)=      5.00         10.00
        Unit Hyd. peak  (cms)=      0.26          0.15
                                                            *TOTALS*
        PEAK FLOW       (cms)=      0.82          0.03          0.851 (iii)
        TIME TO PEAK    (hrs)=      6.25          6.25          6.25
        RUNOFF VOLUME   (mm)=      87.92         60.31         86.54
        TOTAL RAINFALL  (mm)=      89.92         89.92         89.92
        RUNOFF COEFFICIENT  =       0.98          0.67          0.96

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

```
        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  88.0   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( 0515)|   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   |  0.0091    0.1797
                       0.0013    0.0157   |  0.0095    0.2004
                       0.0033    0.0320   |  0.0100    0.2216
                       0.0044    0.0487   |  0.0104    0.2433
                       0.0053    0.0659   |  0.0109    0.2655
                       0.0061    0.0837   |  0.0113    0.2882
                       0.0068    0.1019   |  0.0116    0.3114
                       0.0074    0.1206   |  0.1520    0.3592
                       0.0080    0.1398   |  0.5654    0.4336
                       0.0086    0.1595   |  1.1316    0.5100

                            AREA    QPEAK    TPEAK     R.V.
                            (ha)    (cms)    (hrs)     (mm)
      INFLOW : ID= 2 ( 0150)  3.810    0.851    6.25    86.54
      OUTFLOW: ID= 1 ( 0515)  3.810    0.011   12.33    85.08

            PEAK  FLOW  REDUCTION [Qout/Qin](%)=  1.35
            TIME SHIFT OF PEAK FLOW      (min)=365.00
            MAXIMUM STORAGE  USED        (ha.m.)=  0.3004

-----------------------------------------------------------------------
--------------------
| ADD HYD  ( 0440)|
|  1 + 2 = 3      |             AREA    QPEAK    TPEAK     R.V.
--------------------             (ha)    (cms)    (hrs)    (mm)
           ID1= 1 ( 0430):      0.99    0.220    6.25    86.19
         + ID2= 2 ( 0515):      3.81    0.011   12.33    85.08
                          ======================================
           ID = 3 ( 0440):      4.80    0.229    6.25    85.31

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0210)|   Area    (ha)=   0.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  78.00   Dir. Conn.(%)=  78.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
          Surface Area   (ha)=    0.75          0.21
          Dep. Storage   (mm)=    2.00          5.00
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Page 189 (top-left)

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                    LangstaffRd_EA_Proposed_WestDonWatershd
Average Slope    (%)=      1.00        2.00
Length           (m)=    470.00       20.00
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 | 3.167  3.05 | 6.250  81.28 | 9.33   3.05
          0.167  0.00 | 3.250  3.05 | 6.333  16.26 | 9.42   3.05
          0.250  0.00 | 3.333  4.06 | 6.417  16.26 | 9.50   3.05
          0.333  2.03 | 3.417  4.06 | 6.500  16.26 | 9.58   3.05
          0.417  2.03 | 3.500  4.06 | 6.583  16.26 | 9.67   3.05
          0.500  2.03 | 3.583  3.05 | 6.667  16.26 | 9.75   3.05
          0.583  2.03 | 3.667  3.05 | 6.750  16.26 | 9.83   2.03
          0.667  2.03 | 3.750  3.05 | 6.833  7.11  | 9.92   2.03
          0.750  2.03 | 3.833  4.06 | 6.917  7.11  | 10.00  2.03
          0.833  1.02 | 3.917  4.06 | 7.000  7.11  | 10.08  3.05
          0.917  1.02 | 4.000  4.06 | 7.083  7.11  | 10.17  3.05
          1.000  1.02 | 4.083  3.05 | 7.167  7.11  | 10.25  3.05
          1.083  2.03 | 4.167  3.05 | 7.250  7.11  | 10.33  2.03
          1.167  2.03 | 4.250  3.05 | 7.333  5.08  | 10.42  2.03
          1.250  2.03 | 4.333  7.11 | 7.417  5.08  | 10.50  2.03
          1.333  2.03 | 4.417  7.11 | 7.500  5.08  | 10.58  1.02
          1.417  2.03 | 4.500  7.11 | 7.583  5.08  | 10.67  1.02
          1.500  2.03 | 4.583  6.10 | 7.667  5.08  | 10.75  1.02
          1.583  2.03 | 4.667  6.10 | 7.750  5.08  | 10.83  2.03
          1.667  2.03 | 4.750  6.10 | 7.833  6.10  | 10.92  2.03
          1.750  2.03 | 4.833  6.10 | 7.917  6.10  | 11.00  2.03
          1.833  1.02 | 4.917  6.10 | 8.000  6.10  | 11.08  2.03
          1.917  1.02 | 5.000  6.10 | 8.083  5.08  | 11.17  2.03
          2.000  1.02 | 5.083  6.10 | 8.167  5.08  | 11.25  2.03
          2.083  2.03 | 5.167  6.10 | 8.250  5.08  | 11.33  2.03
          2.167  2.03 | 5.250  6.10 | 8.333  4.06  | 11.42  2.03
          2.250  2.03 | 5.333  11.18| 8.417  4.06  | 11.50  2.03
          2.333  4.06 | 5.417  11.18| 8.500  4.06  | 11.58  1.02
          2.417  4.06 | 5.500  11.18| 8.583  3.05  | 11.67  1.02
          2.500  4.06 | 5.583  11.18| 8.667  3.05  | 11.75  1.02
          2.583  3.05 | 5.667  11.18| 8.750  3.05  | 11.83  2.03
          2.667  3.05 | 5.750  11.18| 8.833  4.06  | 11.92  2.03
          2.750  3.05 | 5.833  80.26| 8.917  4.06  | 12.00  2.03
          2.833  4.06 | 5.917  80.26| 9.000  4.06  | 12.08  2.03
          2.917  4.06 | 6.000  80.26| 9.083  3.05  | 12.17  2.03
          3.000  4.06 | 6.083  81.28| 9.167  3.05  | 12.25  2.03
          3.083  3.05 | 6.167  81.28| 9.250  3.05  |

Max.Eff.Inten.(mm/hr)=    81.28       60.55
          over (min)=      5.00       15.00
Storage Coeff.  (min)=     7.02 (ii) 10.07 (ii)
Unit Hyd. Tpeak (min)=     5.00       15.00
Unit Hyd. peak  (cms)=     0.17        0.10
```

Page 189

Page 190 (top-right)

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                    LangstaffRd_EA_Proposed_WestDonWatershd
                                              *TOTALS*
PEAK FLOW       (cms)=    0.17      0.03      0.196 (iii)
TIME TO PEAK    (hrs)=    6.25      6.25      6.25
RUNOFF VOLUME   (mm)=    87.92     52.66     80.15
TOTAL RAINFALL  (mm)=    89.92     89.92     89.92
RUNOFF COEFFICIENT  =     0.98      0.59      0.89


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 83.0   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 ( 0205) |  Area   (ha)= 1.11
|ID= 1 DT= 5.0 min |  Total Imp(%)= 77.00  Dir. Conn.(%)= 77.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area  (ha)=     0.85        0.26
     Dep. Storage  (mm)=     2.00        5.00
     Average Slope (%)=      1.00        2.00
     Length        (m)=    470.00       20.00
     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 | 3.167  3.05 | 6.250  81.28 | 9.33   3.05
          0.167  0.00 | 3.250  3.05 | 6.333  16.26 | 9.42   3.05
          0.250  0.00 | 3.333  4.06 | 6.417  16.26 | 9.50   3.05
          0.333  2.03 | 3.417  4.06 | 6.500  16.26 | 9.58   3.05
          0.417  2.03 | 3.500  4.06 | 6.583  16.26 | 9.67   3.05
          0.500  2.03 | 3.583  3.05 | 6.667  16.26 | 9.75   3.05
          0.583  2.03 | 3.667  3.05 | 6.750  16.26 | 9.83   2.03
          0.667  2.03 | 3.750  3.05 | 6.833  7.11  | 9.92   2.03
          0.750  2.03 | 3.833  4.06 | 6.917  7.11  | 10.00  2.03
          0.833  1.02 | 3.917  4.06 | 7.000  7.11  | 10.08  3.05
          0.917  1.02 | 4.000  4.06 | 7.083  7.11  | 10.17  3.05
          1.000  1.02 | 4.083  3.05 | 7.167  7.11  | 10.25  3.05
          1.083  2.03 | 4.167  3.05 | 7.250  7.11  | 10.33  2.03
          1.167  2.03 | 4.250  3.05 | 7.333  5.08  | 10.42  2.03
          1.250  2.03 | 4.333  7.11 | 7.417  5.08  | 10.50  2.03
          1.333  2.03 | 4.417  7.11 | 7.500  5.08  | 10.58  1.02
          1.417  2.03 | 4.500  7.11 | 7.583  5.08  | 10.67  1.02
          1.500  2.03 | 4.583  6.10 | 7.667  5.08  | 10.75  1.02
          1.583  2.03 | 4.667  6.10 | 7.750  5.08  | 10.83  2.03
          1.667  2.03 | 4.750  6.10 | 7.833  6.10  | 10.92  2.03
```

Page 190

Page 191 (bottom-left)

```
                    LangstaffRd_EA_Proposed_WestDonWatershd
          1.750  2.03 | 4.833  6.10 | 7.917  6.10  | 11.00  2.03
          1.833  1.02 | 4.917  6.10 | 8.000  6.10  | 11.08  2.03
          1.917  1.02 | 5.000  6.10 | 8.083  5.08  | 11.17  2.03
          2.000  1.02 | 5.083  6.10 | 8.167  5.08  | 11.25  2.03
          2.083  2.03 | 5.167  6.10 | 8.250  5.08  | 11.33  2.03
          2.167  2.03 | 5.250  6.10 | 8.333  4.06  | 11.42  2.03
          2.250  2.03 | 5.333  11.18| 8.417  4.06  | 11.50  2.03
          2.333  4.06 | 5.417  11.18| 8.500  4.06  | 11.58  1.02
          2.417  4.06 | 5.500  11.18| 8.583  3.05  | 11.67  1.02
          2.500  4.06 | 5.583  11.18| 8.667  3.05  | 11.75  1.02
          2.583  3.05 | 5.667  11.18| 8.750  3.05  | 11.83  2.03
          2.667  3.05 | 5.750  11.18| 8.833  4.06  | 11.92  2.03
          2.750  3.05 | 5.833  80.26| 8.917  4.06  | 12.00  2.03
          2.833  4.06 | 5.917  80.26| 9.000  4.06  | 12.08  2.03
          2.917  4.06 | 6.000  80.26| 9.083  3.05  | 12.17  2.03
          3.000  4.06 | 6.083  81.28| 9.167  3.05  | 12.25  2.03
          3.083  3.05 | 6.167  81.28| 9.250  3.05  |

Max.Eff.Inten.(mm/hr)=    81.28       60.55
          over (min)=      5.00       15.00
Storage Coeff.  (min)=     7.02 (ii) 10.14 (ii)
Unit Hyd. Tpeak (min)=     5.00       15.00
Unit Hyd. peak  (cms)=     0.17        0.10
                                              *TOTALS*
PEAK FLOW       (cms)=    0.19      0.03      0.225 (iii)
TIME TO PEAK    (hrs)=    6.25      6.25      6.25
RUNOFF VOLUME   (mm)=    87.92     52.66     79.80
TOTAL RAINFALL  (mm)=    89.92     89.92     89.92
RUNOFF COEFFICIENT  =     0.98      0.59      0.89


     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* = 83.0   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 ( 0460)  |
|  1 + 2 = 3       |      AREA   QPEAK   TPEAK    R.V.
--------------------      (ha)   (cms)   (hrs)    (mm)
     ID1= 1 ( 0205):     1.11   0.225   6.25    79.80
   + ID2= 2 ( 0210):     0.96   0.196   6.25    80.15
     =================================================
     ID = 3 ( 0460):     2.07   0.421   6.25    79.96

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------
--------------------
| RESERVOIR( 0525) |   OVERFLOW IS OFF
| IN= 2---> OUT= 1  |
```

Page 191

Page 192 (bottom-right)

```
| DT= 5.0 min      |  LangstaffRd_EA_Proposed_WestDonWatershd
                     OUTFLOW   STORAGE    OUTFLOW   STORAGE
--------------------  (cms)    (ha.m.)     (cms)    (ha.m.)
                     0.0000    0.0000     0.0733    0.0214
                     0.0274    0.0026     0.0831    0.0278
                     0.0478    0.0084     0.1449    0.0374
                     0.0619    0.0149     0.0000    0.0000

                         AREA    QPEAK   TPEAK    R.V.
                         (ha)    (cms)   (hrs)    (mm)
     INFLOW : ID= 2 ( 0460)  2.070   0.421   6.25    79.96
     OUTFLOW: ID= 1 ( 0525)  2.070   0.228   6.42    79.96

          PEAK   FLOW   REDUCTION [Qout/Qin](%)= 54.27
          TIME SHIFT OF PEAK FLOW       (min)= 10.00
          MAXIMUM STORAGE   USED     (ha.m.)= 0.0508

-------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD ( 0190) |  Area   (ha)= 0.86
|ID= 1 DT= 5.0 min |  Total Imp(%)= 57.00  Dir. Conn.(%)= 57.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area  (ha)=     0.49        0.37
     Dep. Storage  (mm)=     2.00        5.00
     Average Slope (%)=      1.00        2.00
     Length        (m)=    340.00       50.00
     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 | 3.167  3.05 | 6.250  81.28 | 9.33   3.05
          0.167  0.00 | 3.250  3.05 | 6.333  16.26 | 9.42   3.05
          0.250  0.00 | 3.333  4.06 | 6.417  16.26 | 9.50   3.05
          0.333  2.03 | 3.417  4.06 | 6.500  16.26 | 9.58   3.05
          0.417  2.03 | 3.500  4.06 | 6.583  16.26 | 9.67   3.05
          0.500  2.03 | 3.583  3.05 | 6.667  16.26 | 9.75   3.05
          0.583  2.03 | 3.667  3.05 | 6.750  16.26 | 9.83   2.03
          0.667  2.03 | 3.750  3.05 | 6.833  7.11  | 9.92   2.03
          0.750  2.03 | 3.833  4.06 | 6.917  7.11  | 10.00  2.03
          0.833  1.02 | 3.917  4.06 | 7.000  7.11  | 10.08  3.05
          0.917  1.02 | 4.000  4.06 | 7.083  7.11  | 10.17  3.05
          1.000  1.02 | 4.083  3.05 | 7.167  7.11  | 10.25  3.05
          1.083  2.03 | 4.167  3.05 | 7.250  7.11  | 10.33  2.03
          1.167  2.03 | 4.250  3.05 | 7.333  5.08  | 10.42  2.03
          1.250  2.03 | 4.333  7.11 | 7.417  5.08  | 10.50  2.03
          1.333  2.03 | 4.417  7.11 | 7.500  5.08  | 10.58  1.02
          1.417  2.03 | 4.500  7.11 | 7.583  5.08  | 10.67  1.02
          1.500  2.03 | 4.583  6.10 | 7.667  5.08  | 10.75  1.02
```

Page 192

```
               1.583   2.03 | 4.667    6.10 | 7.750    5.08 | 10.83   2.03
               1.667   2.03 | 4.750    6.10 | 7.833    6.10 | 10.92   2.03
               1.750   2.03 | 4.833    6.10 | 7.917    6.10 | 11.00   2.03
               1.833   1.02 | 4.917    6.10 | 8.000    6.10 | 11.08   2.03
               1.917   1.02 | 5.000    6.10 | 8.083    5.08 | 11.17   2.03
               2.000   1.02 | 5.083    6.10 | 8.167    5.08 | 11.25   2.03
               2.083   2.03 | 5.167    6.10 | 8.250    5.08 | 11.33   2.03
               2.167   2.03 | 5.250    6.10 | 8.333    4.06 | 11.42   2.03
               2.250   2.03 | 5.333   11.18 | 8.417    4.06 | 11.50   2.03
               2.333   4.06 | 5.417   11.18 | 8.500    4.06 | 11.58   1.02
               2.417   4.06 | 5.500   11.18 | 8.583    3.05 | 11.67   1.02
               2.500   4.06 | 5.583   11.18 | 8.667    3.05 | 11.75   1.02
               2.583   3.05 | 5.667   11.18 | 8.750    3.05 | 11.83   2.03
               2.667   3.05 | 5.750   11.18 | 8.833    4.06 | 11.92   2.03
               2.750   3.05 | 5.833   80.26 | 8.917    4.06 | 12.00   2.03
               2.833   4.06 | 5.917   80.26 | 9.000    4.06 | 12.08   2.03
               2.917   4.06 | 6.000   80.26 | 9.083    3.05 | 12.17   2.03
               3.000   4.06 | 6.083   81.28 | 9.167    3.05 | 12.25   2.03
               3.083   3.05 | 6.167   81.28 | 9.250    3.05 |
```

```
      Max.Eff.Inten.(mm/hr)=     81.28         60.55
               over (min)         5.00         20.00
      Storage Coeff.  (min)=      5.78 (ii)    15.65 (ii)
      Unit Hyd. Tpeak (min)=      5.00         20.00
      Unit Hyd. peak  (cms)=      0.20          0.07
                                                               *TOTALS*
      PEAK FLOW       (cms)=      0.11          0.04          0.150 (iii)
      TIME TO PEAK    (hrs)=      6.25          6.33          6.25
      RUNOFF VOLUME    (mm)=     87.92         52.66         72.74
      TOTAL RAINFALL   (mm)=     89.92         89.92         89.92
      RUNOFF COEFFICIENT  =       0.98          0.59          0.81


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  83.0    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 ( 0195)|   Area    (ha)=  0.79
|ID= 1 DT= 5.0 min |  Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
---------------------
                           IMPERVIOUS    PERVIOUS (i)
      Surface Area    (ha)=     0.59         0.20
      Dep. Storage    (mm)=     2.00         5.00
      Average Slope   (%)=      1.00         2.00
      Length          (m)=    340.00        20.00
      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 | 3.167    3.05 | 6.250   81.28 | 9.33    3.05
       0.167   0.00 | 3.250    3.05 | 6.333   16.26 | 9.42    3.05
       0.250   0.00 | 3.333    4.06 | 6.417   16.26 | 9.50    3.05
       0.333   2.03 | 3.417    4.06 | 6.500   16.26 | 9.58    3.05
       0.417   2.03 | 3.500    4.06 | 6.583   16.26 | 9.67    3.05
       0.500   2.03 | 3.583    3.05 | 6.667   16.26 | 9.75    3.05
       0.583   2.03 | 3.667    3.05 | 6.750   16.26 | 9.83    2.03
       0.667   2.03 | 3.750    3.05 | 6.833    7.11 | 9.92    2.03
       0.750   2.03 | 3.833    4.06 | 6.917    7.11 | 10.00   2.03
       0.833   1.02 | 4.000    4.06 | 7.000    7.11 | 10.08   3.05
       0.917   1.02 | 4.083    3.05 | 7.083    7.11 | 10.17   3.05
       1.000   1.02 | 4.167    3.05 | 7.167    7.11 | 10.25   3.05
       1.083   2.03 | 4.250    3.05 | 7.250    7.11 | 10.33   2.03
       1.167   2.03 | 4.333    7.11 | 7.333    5.08 | 10.42   2.03
       1.250   2.03 | 4.417    7.11 | 7.417    5.08 | 10.50   2.03
       1.333   2.03 | 4.417    7.11 | 7.500    5.08 | 10.58   1.02
       1.417   2.03 | 4.583    7.11 | 7.583    5.08 | 10.67   1.02
       1.500   2.03 | 4.583    6.10 | 7.667    5.08 | 10.75   1.02
       1.583   2.03 | 4.667    6.10 | 7.750    5.08 | 10.83   2.03
       1.667   2.03 | 4.750    6.10 | 7.833    6.10 | 10.92   2.03
       1.750   2.03 | 4.833    6.10 | 7.917    6.10 | 11.00   2.03
       1.833   1.02 | 4.917    6.10 | 8.000    6.10 | 11.08   2.03
       1.917   1.02 | 5.000    6.10 | 8.083    5.08 | 11.17   2.03
       2.000   1.02 | 5.083    6.10 | 8.167    5.08 | 11.25   2.03
       2.083   2.03 | 5.167    6.10 | 8.250    5.08 | 11.33   2.03
       2.167   2.03 | 5.250    6.10 | 8.333    4.06 | 11.42   2.03
       2.250   2.03 | 5.333   11.18 | 8.417    4.06 | 11.50   2.03
       2.333   4.06 | 5.417   11.18 | 8.500    4.06 | 11.58   1.02
       2.417   4.06 | 5.500   11.18 | 8.583    3.05 | 11.67   1.02
       2.500   4.06 | 5.583   11.18 | 8.667    3.05 | 11.75   1.02
       2.583   3.05 | 5.667   11.18 | 8.750    3.05 | 11.83   2.03
       2.667   3.05 | 5.750   11.18 | 8.833    4.06 | 11.92   2.03
       2.750   3.05 | 5.833   80.26 | 8.917    4.06 | 12.00   2.03
       2.833   4.06 | 5.917   80.26 | 9.000    4.06 | 12.08   2.03
       2.917   4.06 | 6.000   80.26 | 9.083    3.05 | 12.17   2.03
       3.000   4.06 | 6.083   81.28 | 9.167    3.05 | 12.25   2.03
       3.083   3.05 | 6.167   81.28 | 9.250    3.05 |
```

```
      Max.Eff.Inten.(mm/hr)=     81.28         60.55
               over (min)         5.00         10.00
      Storage Coeff.  (min)=      5.78 (ii)     9.04 (ii)
      Unit Hyd. Tpeak (min)=      5.00         10.00
      Unit Hyd. peak  (cms)=      0.20          0.12
                                                               *TOTALS*
      PEAK FLOW       (cms)=      0.13          0.03          0.162 (iii)
      TIME TO PEAK    (hrs)=      6.25          6.25          6.25
      RUNOFF VOLUME    (mm)=     87.92         52.66         79.10
      TOTAL RAINFALL   (mm)=     89.92         89.92         89.92
```

```
      RUNOFF COEFFICIENT  =       0.98          0.59          0.88


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  83.0    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 ( 0455)|
|  1 + 2 = 3      |        AREA    QPEAK   TPEAK    R.V.
---------------------        (ha)   (cms)   (hrs)    (mm)
      ID1= 1 ( 0190):      0.86   0.150    6.25    72.74
     + ID2= 2 ( 0195):     0.79   0.162    6.25    79.10
      =====================================================
      ID = 3 ( 0455):      1.65   0.312    6.25    75.78

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------
---------------------
| RESERVOIR( 0555)|    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   |  0.0238    0.0199
                        0.0104    0.0024   |  0.0268    0.0259
                        0.0162    0.0079   |  0.0825    0.0346
                        0.0203    0.0139   |  0.0000    0.0000

                         AREA    QPEAK   TPEAK    R.V.
                         (ha)    (cms)   (hrs)    (mm)
     INFLOW : ID= 2 ( 0455)   1.650   0.312    6.25    75.78
     OUTFLOW: ID= 1 ( 0555)   1.650   0.158    6.42    75.75

          PEAK  FLOW  REDUCTION [Qout/Qin](%)= 50.70
          TIME SHIFT OF PEAK FLOW      (min)= 10.00
          MAXIMUM STORAGE  USED    (ha.m.)= 0.0466

-------------------------------------------------------------------------

---------------------
| ADD HYD ( 0465)|
|  1 + 2 = 3      |        AREA    QPEAK   TPEAK    R.V.
---------------------        (ha)   (cms)   (hrs)    (mm)
      ID1= 1 ( 0525):      2.07   0.228    6.42    79.96
     + ID2= 2 ( 0555):     1.65   0.158    6.42    75.75
      =====================================================
      ID = 3 ( 0465):      3.72   0.386    6.42    78.09

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

```
-------------------------------------------------------------------------
```

PCSWMM Report

Langstaff_LC1
Model LC1_UpdatedCtchments_Final.inp

WSP Canada Inc.

July 1, 2021

Table of Contents

Figure 1: LC1

Table 1: Culvert LC1_AES_12hr_2yr

Name	Max. Lat. Inflow (m³/s)	Max. Total Inflow (m³/s)	Avg. Flow (m³/s)	Max. Flow (m³/s)	Total Flow (ML)	Contributing Area (ha)	Contributing Imp. Area (ha)	Max. Unit Flow (m³/s/ha)
LC1	1.326	1.326	0.292	1.326	15.943	49.14	46.458	0.027

LC1_UpdatedCtchments_Final
July 1, 2021

WSP Canada Inc.
Page 4 of 5

PCSWMM 7.2.2785
SWMM 5.1.013

Table 2: Catchments_AES_12hr_2yr

Name	X-Coordinate	Y-Coordinate	Rain Gage	Outlet	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Imperv. (%)	N Imperv	N Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Peak Runoff (m³/s)	Runoff Coefficient
325	618589.028	4852952.824	AES_12hr_2yr	300	26.54	2654	100	4.7	95	0.013	0.25	2	5	0.73	0.785
300	618906.664	4852860.121	AES_12hr_2yr	LC1	21.7	1808.333	120	7	95	0.013	0.25	2	5	1.32	0.894
350	619192.465	4852300.707	AES_12hr_2yr	LC1	0.9	180	50	2	70	0.013	0.25	2	5	0.01	0.27

Table 1: Culvert LC1_AES_12hr_5yr

Name	Max. Lat. Inflow (m³/s)	Max. Total Inflow (m³/s)	Avg. Flow (m³/s)	Max. Flow (m³/s)	Total Flow (ML)	Contributing Area (ha)	Contributing Imp. Area (ha)	Max. Unit Flow (m³/s/ha)
LC1	1.782	1.782	0.403	1.782	22.088	49.14	46.458	0.036

LC1_UpdatedCtchments_Final
July 1, 2021

WSP Canada Inc.
Page 4 of 5

PCSWMM 7.2.2785
SWMM 5.1.013

Table 2: Catchments_AES_12hr_5yr

Name	X-Coordinate	Y-Coordinate	Rain Gage	Outlet	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Imperv. (%)	N Imperv	N Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Peak Runoff (m³/s)	Runoff Coefficient
325	618589.028	4852952.824	AES_12hr_5yr	300	26.54	2654	100	4.7	95	0.013	0.25	2	5	0.97	0.832
300	618906.664	4852860.121	AES_12hr_5yr	LC1	21.7	1808.333	120	7	95	0.013	0.25	2	5	1.77	0.919
350	619192.465	4852300.707	AES_12hr_5yr	LC1	0.9	180	50	2	70	0.013	0.25	2	5	0.02	0.353

Table 1: Culvert LC1_AES_12hr_10yr

Name	Max. Lat. Inflow (m³/s)	Max. Total Inflow (m³/s)	Avg. Flow (m³/s)	Max. Flow (m³/s)	Total Flow (ML)	Contributing Area (ha)	Contributing Imp. Area (ha)	Max. Unit Flow (m³/s/ha)
LC1	2.086	2.086	0.477	2.086	26.194	49.14	46.458	0.042

Table 2A: Catchments_AES_12hr_10yr

Name	X-Coordinate	Y-Coordinate	Rain Gage	Outlet	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Imperv. (%)	N Imperv
325	618589.028	4852952.824	AES_12hr_10yr	300	26.54	2654	100	4.7	95	0.013
300	618906.664	4852860.121	AES_12hr_10yr	LC1	21.7	1808.333	120	7	95	0.013
350	619192.465	4852300.707	AES_12hr_10yr	LC1	0.9	180	50	2	70	0.013

Table 2B: Catchments_AES_12hr_10yr

Name	N Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Peak Runoff (m³/s)	Runoff Coefficient
325	0.25	2	5	1.14	0.853
300	0.25	2	5	2.06	0.93
350	0.25	2	5	0.02	0.419

Table 1: Culvert LC1_AES_12hr_25yr

Name	Max. Lat. Inflow (m³/s)	Max. Total Inflow (m³/s)	Avg. Flow (m³/s)	Max. Flow (m³/s)	Total Flow (ML)	Contributing Area (ha)	Contributing Imp. Area (ha)	Max. Unit Flow (m³/s/ha)
LC1	2.464	2.464	0.568	2.464	31.342	49.14	46.458	0.05

Table 2A: Catchments_AES_12hr_25yr

Name	X-Coordinate	Y-Coordinate	Rain Gage	Outlet	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Imperv. (%)	N Imperv
325	618589.028	4852952.824	AES_12hr_25yr	300	26.54	2654	100	4.7	95	0.013
300	618906.664	4852860.121	AES_12hr_25yr	LC1	21.7	1808.333	120	7	95	0.013
350	619192.465	4852300.707	AES_12hr_25yr	LC1	0.9	180	50	2	70	0.013

Table 2B: Catchments_AES_12hr_25yr

Name	N Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Peak Runoff (m³/s)	Runoff Coefficient
325	0.25	2	5	1.34	0.873
300	0.25	2	5	2.43	0.94
350	0.25	2	5	0.03	0.483

Table 1:   Culvert LC1_AES_12hr_50yr

Name	Max. Lat. Inflow (m³/s)	Max. Total Inflow (m³/s)	Avg. Flow (m³/s)	Max. Flow (m³/s)	Total Flow (ML)	Contributing Area (ha)	Contributing Imp. Area (ha)	Max. Unit Flow (m³/s/ha)
LC1	2.817	2.817	0.654	2.817	36.171	49.14	46.458	0.057

Table 2A: Catchments_AES_12hr_50yr

Name	X-Coordinate	Y-Coordinate	Rain Gage	Outlet	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Imperv. (%)	N Imperv
325	618589.028	4852952.824	AES_12hr_50yr	300	26.54	2654	100	4.7	95	0.013
300	618906.664	4852860.121	AES_12hr_50yr	LC1	21.7	1808.333	120	7	95	0.013
350	619192.465	4852300.707	AES_12hr_50yr	LC1	0.9	180	50	2	70	0.013

Table 2B: Catchments_AES_12hr_50yr

Name	N Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Peak Runoff (m³/s)	Runoff Coefficient
325	0.25	2	5	1.53	0.887
300	0.25	2	5	2.78	0.947
350	0.25	2	5	0.04	0.531

Table 1: Culvert LC1_AES_12hr_100yr

Name	Max. Lat. Inflow (m³/s)	Max. Total Inflow (m³/s)	Avg. Flow (m³/s)	Max. Flow (m³/s)	Total Flow (ML)	Contributing Area (ha)	Contributing Imp. Area (ha)	Max. Unit Flow (m³/s/ha)
LC1	3.128	3.128	0.729	3.128	40.445	49.14	46.458	0.064

Table 2A: Catchments_AES_12hr_100yr

Name	X-Coordinate	Y-Coordinate	Rain Gage	Outlet	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Imperv. (%)	N Imperv
325	618589.028	4852952.824	AES_12hr_100yr	300	26.54	2654	100	4.7	95	0.013
300	618906.664	4852860.121	AES_12hr_100yr	LC1	21.7	1808.333	120	7	95	0.013
350	619192.465	4852300.707	AES_12hr_100yr	LC1	0.9	180	50	2	70	0.013

Table 2B: Catchments_AES_12hr_100yr

Name	N Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Peak Runoff (m³/s)	Runoff Coefficient
325	0.25	2	5	1.7	0.898
300	0.25	2	5	3.08	0.952
350	0.25	2	5	0.04	0.567

LC1_UpdatedCtchments_Final
July 1, 2021

WSP Canada Inc.
Page 4 of 4

PCSWMM 7.2.2785
SWMM 5.1.013

Table 1: Culvert LC1_AES_12hr_Region

Name	Max. Lat. Inflow (m³/s)	Max. Total Inflow (m³/s)	Avg. Flow (m³/s)	Max. Flow (m³/s)	Total Flow (ML)	Contributing Area (ha)	Contributing Imp. Area (ha)	Max. Unit Flow (m³/s/ha)
LC1	3.128	3.128	0.729	3.128	40.445	49.14	46.458	0.064

Table 2A: Catchments_AES_12hr_Region

Name	X-Coordinate	Y-Coordinate	Rain Gage	Outlet	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Imperv. (%)	N Imperv
325	618589.028	4852952.824	Design_RG_15min	300	26.54	2654	100	4.7	95	0.013
300	618906.664	4852860.121	Design_RG_15min	LC1	21.7	1808.333	120	7	95	0.013
350	619192.465	4852300.707	Design_RG_15min	LC1	0.9	180	50	2	70	0.013

Table 2B: Catchments_AES_12hr_Region

Name	N Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Peak Runoff (m³/s)	Runoff Coefficient
325	0.25	2	5	1.7	0.898
300	0.25	2	5	3.08	0.952
350	0.25	2	5	0.04	0.567

APPENDIX

C

Hydraulic Assessments

West Don River

April 2020 Update

Model: "Basin5_ExRev2_Apr2020.prj"

Plan: Plan Ex Updated

Geometry: Basin 5-Updated at Langstaff

Steady Flow: 2019 Don River Flow Update

Existing Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	5.53	2 Year	5.89	198.60	200.21		200.23	0.54	14.20	38.57	0.17
Reach-1	5.53	5 Year	7.83	198.60	200.58		200.58	0.44	32.77	60.62	0.12
Reach-1	5.53	10 Year	9.04	198.60	200.73		200.73	0.43	42.34	66.19	0.11
Reach-1	5.53	25 Year	10.55	198.60	200.87		200.88	0.42	52.29	71.52	0.10
Reach-1	5.53	50 Year	12.69	198.60	201.02		201.02	0.44	63.18	76.67	0.10
Reach-1	5.53	100 Year	15.60	198.60	201.20		201.20	0.45	76.88	77.70	0.10
Reach-1	5.53	Regional	198.16	198.60	204.14		204.18	1.41	334.59	107.81	0.20
Reach-1	5.52	2 Year	5.89	198.20	200.15		200.17	0.69	14.16	14.32	0.18
Reach-1	5.52	5 Year	7.83	198.20	200.53		200.55	0.68	19.78	15.17	0.16
Reach-1	5.52	10 Year	9.04	198.20	200.69		200.70	0.71	22.11	15.51	0.16
Reach-1	5.52	25 Year	10.55	198.20	200.83		200.85	0.76	24.34	15.82	0.17
Reach-1	5.52	50 Year	12.69	198.20	200.97		200.99	0.85	26.59	16.13	0.18
Reach-1	5.52	100 Year	15.60	198.20	201.14		201.17	0.95	29.44	18.46	0.19
Reach-1	5.52	Regional	198.16	198.20	202.91	202.34	203.81	5.79	104.94	85.61	0.90
Reach-1	5.51	2 Year	5.89	198.20	199.85	199.46	200.10	2.23	2.70	18.68	0.61
Reach-1	5.51	5 Year	7.83	198.20	200.18	199.67	200.47	2.38	3.37	18.85	0.58
Reach-1	5.51	10 Year	9.04	198.20	200.69	199.78	200.70	0.58	32.48	19.11	0.13
Reach-1	5.51	25 Year	10.55	198.20	200.83	199.93	200.84	0.63	35.22	19.19	0.13
Reach-1	5.51	50 Year	12.69	198.20	200.97	200.11	200.99	0.70	37.95	19.26	0.14
Reach-1	5.51	100 Year	15.60	198.20	201.15	200.36	201.16	0.80	41.24	19.35	0.16
Reach-1	5.51	Regional	198.16	198.20	203.00	201.77	203.65	5.59	84.56	77.30	0.85
Reach-1	5.505		Culvert								
Reach-1	5.50	2 Year	5.89	198.00	199.18	199.00	199.22	0.98	10.77	23.58	0.34
Reach-1	5.50	5 Year	7.83	198.00	199.30	199.00	199.34	1.06	13.64	23.88	0.34
Reach-1	5.50	10 Year	9.04	198.00	199.36	199.03	199.40	1.12	15.08	24.03	0.35
Reach-1	5.50	25 Year	10.55	198.00	199.43	199.08	199.48	1.18	16.72	24.19	0.36
Reach-1	5.50	50 Year	12.69	198.00	199.51	199.13	199.57	1.28	18.76	24.40	0.37
Reach-1	5.50	100 Year	15.60	198.00	199.61	199.20	199.67	1.40	21.09	24.63	0.40
Reach-1	5.50	Regional	198.16	198.00	201.50	201.16	202.33	5.54	72.12	29.18	0.99
Reach-1	5.49	2 Year	5.89	197.91	199.14		199.20	1.15	8.18	24.54	0.41
Reach-1	5.49	5 Year	7.83	197.91	199.26		199.32	1.22	11.46	28.89	0.40
Reach-1	5.49	10 Year	9.04	197.91	199.33		199.39	1.25	13.31	29.64	0.40
Reach-1	5.49	25 Year	10.55	197.91	199.40		199.46	1.30	15.44	30.47	0.40
Reach-1	5.49	50 Year	12.69	197.91	199.49		199.55	1.37	18.16	31.50	0.41
Reach-1	5.49	100 Year	15.60	197.91	199.58		199.66	1.46	21.33	32.67	0.42
Reach-1	5.49	Regional	198.16	197.91	201.69		202.08	4.16	133.74	89.43	0.72
Reach-1	5.48	2 Year	5.89	197.53	198.81		198.86	0.91	6.63	11.48	0.35

Existing Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	5.48	5 Year	7.83	197.53	198.94		198.99	1.01	8.41	19.27	0.36
Reach-1	5.48	10 Year	9.04	197.53	199.01		199.07	1.06	9.96	26.82	0.36
Reach-1	5.48	25 Year	10.55	197.53	199.09		199.15	1.11	12.46	35.79	0.36
Reach-1	5.48	50 Year	12.69	197.53	199.18		199.24	1.18	15.97	45.50	0.37
Reach-1	5.48	100 Year	15.60	197.53	199.27		199.35	1.26	20.93	52.88	0.38
Reach-1	5.48	Regional	198.16	197.53	201.20		201.45	3.11	138.54	69.18	0.57
Reach-1	5.47	2 Year	5.89	197.29	198.23		198.34	1.52	3.90	8.31	0.67
Reach-1	5.47	5 Year	7.83	197.29	198.33		198.47	1.66	4.91	10.76	0.68
Reach-1	5.47	10 Year	9.04	197.29	198.38		198.54	1.75	5.47	11.92	0.70
Reach-1	5.47	25 Year	10.55	197.29	198.42	198.31	198.60	1.93	5.89	13.53	0.76
Reach-1	5.47	50 Year	12.69	197.29	198.50	198.40	198.70	2.03	7.32	22.27	0.75
Reach-1	5.47	100 Year	15.60	197.29	198.58	198.53	198.80	2.16	9.58	29.76	0.76
Reach-1	5.47	Regional	198.16	197.29	201.06		201.14	1.94	206.37	100.47	0.34
Reach-1	5.46	2 Year	5.89	196.43	197.64		197.71	1.15	5.59	18.43	0.45
Reach-1	5.46	5 Year	7.83	196.43	197.76		197.83	1.24	8.16	24.74	0.46
Reach-1	5.46	10 Year	9.04	196.43	197.82	197.47	197.90	1.28	9.79	27.48	0.46
Reach-1	5.46	25 Year	10.55	196.43	197.93	197.54	198.00	1.25	12.93	31.47	0.42
Reach-1	5.46	50 Year	12.69	196.43	197.98	197.70	198.06	1.38	14.75	33.56	0.45
Reach-1	5.46	100 Year	15.60	196.43	198.07	197.80	198.16	1.49	17.71	36.70	0.47
Reach-1	5.46	Regional	198.16	196.43	200.90		201.02	2.31	181.55	67.16	0.37
Reach-1	5.45	2 Year	5.89	196.01	196.92		197.04	1.58	3.73	7.42	0.71
Reach-1	5.45	5 Year	7.83	196.01	197.04		197.18	1.66	4.72	8.34	0.70
Reach-1	5.45	10 Year	9.04	196.01	197.10		197.25	1.73	5.22	8.76	0.72
Reach-1	5.45	25 Year	10.55	196.01	197.18	197.02	197.33	1.72	6.12	15.92	0.89
Reach-1	5.45	50 Year	12.69	196.01	197.27		197.41	1.70	7.49	16.50	0.80
Reach-1	5.45	100 Year	15.60	196.01	197.34		197.50	1.79	8.74	17.02	0.80
Reach-1	5.45	Regional	198.16	196.01	200.73		200.88	1.67	118.36	48.05	0.34
Reach-1	5.44	2 Year	10.32	195.43	196.90		196.91	0.46	29.42	36.53	0.14
Reach-1	5.44	5 Year	13.25	195.43	197.03		197.04	0.53	34.06	38.95	0.15
Reach-1	5.44	10 Year	14.82	195.43	197.09		197.10	0.56	36.39	40.10	0.16
Reach-1	5.44	25 Year	16.70	195.43	197.15		197.17	0.59	39.13	41.42	0.16
Reach-1	5.44	50 Year	18.87	195.43	197.23		197.24	0.62	42.34	42.92	0.17
Reach-1	5.44	100 Year	21.08	195.43	197.30		197.32	0.65	45.82	52.52	0.17
Reach-1	5.44	Regional	252.81	195.43	200.70		200.75	1.44	400.25	178.44	0.21
Reach-1	5.435	2 Year	10.32	195.27	196.81		196.85	0.87	11.81	18.09	0.35
Reach-1	5.435	5 Year	13.25	195.27	196.92		196.97	0.95	13.92	19.78	0.36
Reach-1	5.435	10 Year	14.82	195.27	196.98		197.03	0.99	14.99	20.59	0.37
Reach-1	5.435	25 Year	16.70	195.27	197.04		197.09	1.03	16.36	23.59	0.37
Reach-1	5.435	50 Year	18.87	195.27	197.11		197.17	1.06	18.23	27.73	0.36

3216079 Langstaff Road EA
West Don River - Hydraulic Analysis

April 2020 Update

Model: "Basin5_ExRev2_Apr2020.prj"

Plan: Plan Ex Updated

Geometry: Basin 5-Updated at Langstaff

Steady Flow: 2019 Don River Flow Update

Existing Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	5.435	100 Year	21.08	195.27	197.18		197.24	1.09	20.35	31.80	0.36
Reach-1	5.435	Regional	252.81	195.27	200.65		200.71	1.47	365.31	181.39	0.22
Reach-1	5.43	2 Year	11.20	195.31	196.70		196.72	0.62	17.92	36.02	0.28
Reach-1	5.43	5 Year	14.39	195.31	196.83		196.85	0.64	22.72	41.53	0.26
Reach-1	5.43	10 Year	16.21	195.31	196.89		196.91	0.65	25.23	44.68	0.26
Reach-1	5.43	25 Year	18.42	195.31	196.96		196.98	0.67	28.52	47.93	0.25
Reach-1	5.43	50 Year	20.93	195.31	197.04		197.06	0.68	32.63	51.05	0.24
Reach-1	5.43	100 Year	23.42	195.31	197.12		197.14	0.69	36.80	53.37	0.23
Reach-1	5.43	Regional	259.19	195.31	200.64		200.68	1.05	421.01	208.33	0.16
Reach-1	5.425	2 Year	11.20	195.27	196.51		196.56	0.99	11.30	16.07	0.38
Reach-1	5.425	5 Year	14.39	195.27	196.64		196.70	1.06	13.65	20.12	0.38
Reach-1	5.425	10 Year	16.21	195.27	196.70		196.76	1.11	14.89	21.99	0.38
Reach-1	5.425	25 Year	18.42	195.27	196.78		196.84	1.15	16.64	24.38	0.38
Reach-1	5.425	50 Year	20.93	195.27	196.87		196.94	1.18	19.02	27.40	0.37
Reach-1	5.425	100 Year	23.42	195.27	196.96		197.03	1.20	21.58	30.52	0.36
Reach-1	5.425	Regional	259.19	195.27	200.60		200.66	1.45	328.05	137.33	0.21
Reach-1	5.42	2 Year	11.20	194.93	196.33		196.50	1.83	6.34	12.23	0.71
Reach-1	5.42	5 Year	14.39	194.93	196.47	196.29	196.64	1.86	8.99	24.05	0.66
Reach-1	5.42	10 Year	16.21	194.93	196.55	196.37	196.71	1.85	11.13	30.32	0.62
Reach-1	5.42	25 Year	18.42	194.93	196.70		196.81	1.63	16.27	37.55	0.51
Reach-1	5.42	50 Year	20.93	194.93	196.83		196.92	1.48	21.49	39.55	0.43
Reach-1	5.42	100 Year	23.42	194.93	196.94		197.02	1.40	25.90	41.17	0.39
Reach-1	5.42	Regional	259.19	194.93	200.60		200.65	1.50	352.01	169.47	0.21
Reach-1	5.41	2 Year	11.20	194.93	196.32	196.06	196.46	1.66	7.43	17.46	0.57
Reach-1	5.41	5 Year	14.39	194.93	196.46	196.21	196.61	1.77	9.19	17.71	0.56
Reach-1	5.41	10 Year	16.21	194.93	196.53	196.28	196.69	1.83	10.06	18.09	0.56
Reach-1	5.41	25 Year	18.42	194.93	196.61	196.35	196.78	1.91	11.03	18.54	0.57
Reach-1	5.41	50 Year	20.93	194.93	196.69	196.41	196.88	1.99	12.06	22.12	0.57
Reach-1	5.41	100 Year	23.42	194.93	196.77	196.47	196.97	2.07	13.03	22.84	0.58
Reach-1	5.41	Regional	259.19	194.93	200.55	199.41	200.63	2.09	341.53	264.89	0.30
Reach-1	**5.405**		**Bridge**								
Reach-1	5.40	2 Year	11.20	194.93	196.18	195.75	196.24	1.15	11.03	18.84	0.37
Reach-1	5.40	5 Year	14.39	194.93	196.34	195.84	196.41	1.25	13.08	19.42	0.37
Reach-1	5.40	10 Year	16.21	194.93	196.42	195.88	196.49	1.32	13.95	19.57	0.38
Reach-1	5.40	25 Year	18.42	194.93	196.49	195.93	196.57	1.41	14.82	19.72	0.40
Reach-1	5.40	50 Year	20.93	194.93	196.55	195.99	196.65	1.52	15.64	19.86	0.42
Reach-1	5.40	100 Year	23.42	194.93	196.61	196.04	196.73	1.62	16.39	19.96	0.43
Reach-1	5.40	Regional	259.19	194.93	199.89	199.01	200.09	2.85	224.23	196.02	0.42

3216079 Langstaff Road EA
West Don River - Hydraulic Analysis

April 2020 Update
Model: "Basin5_ExRev2_Apr2020.prj"
Plan: Plan Ex Updated
Geometry: Basin 5-Updated at Langstaff
Steady Flow: 2019 Don River Flow Update

Existing Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	5.38	2 Year	11.20	194.70	195.99		196.08	1.32	8.53	11.75	0.46
Reach-1	5.38	5 Year	14.39	194.70	196.18		196.27	1.34	11.67	20.63	0.43
Reach-1	5.38	10 Year	16.21	194.70	196.26		196.35	1.37	13.45	25.13	0.43
Reach-1	5.38	25 Year	18.42	194.70	196.33		196.43	1.43	15.42	29.34	0.43
Reach-1	5.38	50 Year	20.93	194.70	196.40		196.51	1.50	17.56	33.29	0.44
Reach-1	5.38	100 Year	23.42	194.70	196.46		196.57	1.55	19.70	36.31	0.44
Reach-1	5.38	Regional	259.19	194.70	199.93		199.98	1.51	376.74	229.24	0.22
Reach-1	5.37	2 Year	11.20	194.30	195.55		195.62	1.12	9.96	11.07	0.38
Reach-1	5.37	5 Year	14.39	194.30	195.75		195.82	1.15	12.55	15.30	0.40
Reach-1	5.37	10 Year	16.21	194.30	195.82		195.90	1.18	13.74	16.99	0.42
Reach-1	5.37	25 Year	18.42	194.30	195.89		195.97	1.24	14.92	20.48	0.43
Reach-1	5.37	50 Year	20.93	194.30	195.95		196.03	1.32	16.21	25.25	0.45
Reach-1	5.37	100 Year	23.42	194.30	195.99		196.09	1.39	17.55	29.38	0.46
Reach-1	5.37	Regional	259.19	194.30	199.85		199.93	1.56	340.12	175.71	0.23
Reach-1	5.36	2 Year	11.20	193.95	195.35		195.40	0.98	11.48	11.24	0.30
Reach-1	5.36	5 Year	14.39	193.95	195.54		195.59	1.05	15.26	50.07	0.31
Reach-1	5.36	10 Year	16.21	193.95	195.60		195.66	1.09	19.11	64.99	0.31
Reach-1	5.36	25 Year	18.42	193.95	195.66		195.72	1.13	23.75	88.27	0.32
Reach-1	5.36	50 Year	20.93	193.95	195.73		195.78	1.15	29.97	109.14	0.31
Reach-1	5.36	100 Year	23.42	193.95	195.79		195.84	1.14	36.87	110.89	0.31
Reach-1	5.36	Regional	259.19	193.95	199.86		199.88	0.78	547.97	134.95	0.11
Reach-1	5.35	2 Year	11.20	193.75	195.02		195.12	1.42	8.50	12.85	0.47
Reach-1	5.35	5 Year	14.39	193.75	195.21		195.31	1.44	11.52	25.84	0.49
Reach-1	5.35	10 Year	16.21	193.75	195.30		195.40	1.43	14.95	45.52	0.46
Reach-1	5.35	25 Year	18.42	193.75	195.40		195.48	1.38	19.42	47.95	0.43
Reach-1	5.35	50 Year	20.93	193.75	195.49		195.57	1.34	24.25	50.45	0.40
Reach-1	5.35	100 Year	23.42	193.75	195.58		195.65	1.30	28.91	52.74	0.37
Reach-1	5.35	Regional	259.19	193.75	199.82		199.86	1.24	378.84	110.69	0.17
Reach-1	5.34	2 Year	11.20	193.30	194.88		194.91	0.78	14.32	12.46	0.23
Reach-1	5.34	5 Year	14.39	193.30	195.05		195.09	0.87	16.50	13.25	0.25
Reach-1	5.34	10 Year	16.21	193.30	195.14		195.18	0.92	17.62	13.72	0.26
Reach-1	5.34	25 Year	18.42	193.30	195.23		195.28	0.97	18.92	14.24	0.27
Reach-1	5.34	50 Year	20.93	193.3	195.32		195.38	1.03	20.32	14.84	0.28
Reach-1	5.34	100 Year	23.42	193.3	195.41		195.47	1.08	21.65	15.49	0.29
Reach-1	5.34	Regional	259.19	193.3	199.76		199.82	1.31	323.62	130.21	0.19
Reach-1	5.33	2 Year	11.2	193.3	194.8	194.3	194.89	1.36	8.24	8.7	0.45
Reach-1	5.33	5 Year	14.39	193.3	194.95	194.44	195.06	1.5	9.62	9.31	0.47
Reach-1	5.33	10 Year	16.21	193.3	195.02	194.51	195.15	1.57	10.32	9.6	0.48

Existing Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	5.33	25 Year	18.42	193.3	195.1	194.59	195.24	1.66	11.1	9.93	0.5
Reach-1	5.33	50 Year	20.93	193.3	195.19	194.67	195.34	1.75	11.93	10.25	0.52
Reach-1	5.33	100 Year	23.42	193.3	195.26	194.75	195.43	1.85	12.69	10.55	0.54
Reach-1	5.33	Regional	259.19	193.3	199.23	197.79	199.7	3.01	86.12	26.41	0.53
Reach-1	5.325		Bridge								
Reach-1	5.32	2 Year	11.2	193.29	194.69	194.29	194.81	1.51	7.42	8.31	0.51
Reach-1	5.32	5 Year	14.39	193.29	194.84	194.43	194.98	1.66	8.64	8.88	0.54
Reach-1	5.32	10 Year	16.21	193.29	194.9	194.49	195.06	1.76	9.21	9.13	0.56
Reach-1	5.32	25 Year	18.42	193.29	194.96	194.57	195.14	1.88	9.82	9.39	0.59
Reach-1	5.32	50 Year	20.93	193.29	195.03	194.66	195.23	2.01	10.4	9.64	0.62
Reach-1	5.32	100 Year	23.42	193.29	195.07	194.74	195.31	2.16	10.86	9.82	0.66
Reach-1	5.32	Regional	259.19	193.29	197.78	197.78	199.04	4.97	52.18	20.65	1
Reach-1	5.30	2 Year	11.2	193.2	194.46		194.55	1.35	8.3	15.52	0.46
Reach-1	5.30	5 Year	14.39	193.2	194.62		194.71	1.39	12.68	29.98	0.44
Reach-1	5.30	10 Year	16.21	193.2	194.69		194.78	1.41	14.83	32.44	0.43
Reach-1	5.30	25 Year	18.42	193.2	194.76		194.86	1.44	17.27	39.7	0.43
Reach-1	5.30	50 Year	20.93	193.2	194.83		194.92	1.48	20.51	55.39	0.43
Reach-1	5.30	100 Year	23.42	193.2	194.88		194.98	1.51	23.62	57.5	0.43
Reach-1	5.30	Regional	259.19	193.2	196.4		196.63	3.09	149.26	97.89	0.59

3216079 Langstaff Road EA
West Don River - Hydraulic Analysis

April 2020 Update
Model: "Basin5_Pr_Opt4_Apr2020.prj"
Plan: Proposed at Langstaff
Geometry: Basin 5 Proposed at Langstaff
Steady Flow: 2019 Don River Flow Update

Proposed Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	5.53	2 Year	5.89	198.60	200.21		200.23	0.54	14.20	38.57	0.17
Reach-1	5.53	5 Year	7.83	198.60	200.58		200.58	0.44	32.77	60.62	0.12
Reach-1	5.53	10 Year	9.04	198.60	200.73		200.73	0.43	42.34	66.19	0.11
Reach-1	5.53	25 Year	10.55	198.60	200.87		200.88	0.42	52.29	71.52	0.10
Reach-1	5.53	50 Year	12.69	198.60	201.02		201.02	0.44	63.18	76.67	0.10
Reach-1	5.53	100 Year	15.60	198.60	201.20		201.20	0.45	76.88	77.70	0.10
Reach-1	5.53	Regional	198.16	198.60	204.14		204.18	1.41	334.59	107.81	0.20
Reach-1	5.52	2 Year	5.89	198.20	200.15		200.17	0.69	14.16	14.32	0.18
Reach-1	5.52	5 Year	7.83	198.20	200.53		200.55	0.68	19.78	15.17	0.16
Reach-1	5.52	10 Year	9.04	198.20	200.69		200.70	0.71	22.11	15.51	0.16
Reach-1	5.52	25 Year	10.55	198.20	200.83		200.85	0.76	24.34	15.82	0.17
Reach-1	5.52	50 Year	12.69	198.20	200.97		200.99	0.85	26.59	16.13	0.18
Reach-1	5.52	100 Year	15.60	198.20	201.14		201.17	0.95	29.44	18.46	0.19
Reach-1	5.52	Regional	198.16	198.20	202.91	202.34	203.81	5.79	104.94	85.61	0.90
Reach-1	5.51	2 Year	5.89	198.20	199.85	199.46	200.10	2.23	2.70	18.68	0.61
Reach-1	5.51	5 Year	7.83	198.20	200.18	199.67	200.47	2.38	3.37	18.85	0.58
Reach-1	5.51	10 Year	9.04	198.20	200.69	199.78	200.70	0.58	32.48	19.11	0.13
Reach-1	5.51	25 Year	10.55	198.20	200.83	199.93	200.84	0.63	35.22	19.19	0.13
Reach-1	5.51	50 Year	12.69	198.20	200.97	200.11	200.99	0.70	37.95	19.26	0.14
Reach-1	5.51	100 Year	15.60	198.20	201.15	200.36	201.16	0.80	41.24	19.35	0.16
Reach-1	5.51	Regional	198.16	198.20	203.00	201.77	203.65	5.59	84.56	77.30	0.85
Reach-1	5.505		Culvert								
Reach-1	5.50	2 Year	5.89	198.00	199.18	199.00	199.22	0.98	10.77	23.58	0.34
Reach-1	5.50	5 Year	7.83	198.00	199.30	199.00	199.34	1.06	13.64	23.88	0.34
Reach-1	5.50	10 Year	9.04	198.00	199.36	199.03	199.40	1.12	15.09	24.03	0.35
Reach-1	5.50	25 Year	10.55	198.00	199.43	199.08	199.48	1.18	16.71	24.19	0.36
Reach-1	5.50	50 Year	12.69	198.00	199.51	199.13	199.57	1.28	18.77	24.40	0.37
Reach-1	5.50	100 Year	15.60	198.00	199.61	199.20	199.67	1.40	21.09	24.64	0.40
Reach-1	5.50	Regional	198.16	198.00	201.50	201.16	202.33	5.54	72.04	29.17	0.99
Reach-1	5.49	2 Year	5.89	197.91	199.14		199.20	1.14	8.19	24.55	0.41
Reach-1	5.49	5 Year	7.83	197.91	199.26		199.32	1.22	11.47	28.90	0.40
Reach-1	5.49	10 Year	9.04	197.91	199.33		199.39	1.25	13.32	29.64	0.40
Reach-1	5.49	25 Year	10.55	197.91	199.40		199.46	1.30	15.44	30.47	0.40
Reach-1	5.49	50 Year	12.69	197.91	199.49		199.55	1.37	18.17	31.51	0.41

3216079 Langstaff Road EA
West Don River - Hydraulic Analysis

April 2020 Update

Model: "Basin5_Pr_Opt4_Apr2020.prj"

Plan: Proposed at Langstaff

Geometry: Basin 5 Proposed at Langstaff

Steady Flow: 2019 Don River Flow Update

Proposed Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	5.49	100 Year	15.60	197.91	199.58		199.66	1.46	21.33	32.67	0.42
Reach-1	5.49	Regional	198.16	197.91	201.69		202.07	4.17	133.48	89.41	0.73
Reach-1	5.48	2 Year	5.89	197.53	198.82		198.86	0.91	6.64	11.50	0.35
Reach-1	5.48	5 Year	7.83	197.53	198.94		198.99	1.01	8.42	19.35	0.36
Reach-1	5.48	10 Year	9.04	197.53	199.01		199.07	1.07	9.95	26.78	0.36
Reach-1	5.48	25 Year	10.55	197.53	199.09		199.15	1.11	12.43	35.70	0.36
Reach-1	5.48	50 Year	12.69	197.53	199.18		199.24	1.18	16.08	45.78	0.37
Reach-1	5.48	100 Year	15.60	197.53	199.28		199.35	1.25	21.03	52.90	0.37
Reach-1	5.48	Regional	198.16	197.53	201.19		201.45	3.12	138.00	69.12	0.57
Reach-1	5.47	2 Year	5.89	197.29	198.22		198.34	1.53	3.87	8.25	0.67
Reach-1	5.47	5 Year	7.83	197.29	198.33		198.47	1.67	4.87	10.69	0.69
Reach-1	5.47	10 Year	9.04	197.29	198.38		198.54	1.76	5.44	11.85	0.71
Reach-1	5.47	25 Year	10.55	197.29	198.42	198.31	198.60	1.92	5.94	13.95	0.75
Reach-1	5.47	50 Year	12.69	197.29	198.49	198.40	198.70	2.06	7.13	21.31	0.77
Reach-1	5.47	100 Year	15.60	197.29	198.57	198.53	198.80	2.19	9.30	28.45	0.77
Reach-1	5.47	Regional	198.16	197.29	201.05		201.13	1.95	205.35	100.40	0.34
Reach-1	5.46	2 Year	5.89	196.43	197.65	197.30	197.71	1.13	5.70	19.18	0.44
Reach-1	5.46	5 Year	7.83	196.43	197.76		197.84	1.23	8.32	24.98	0.45
Reach-1	5.46	10 Year	9.04	196.43	197.82	197.47	197.90	1.27	9.94	27.68	0.45
Reach-1	5.46	25 Year	10.55	196.43	197.92	197.54	197.99	1.27	12.68	31.16	0.43
Reach-1	5.46	50 Year	12.69	196.43	198.00	197.69	198.08	1.34	15.41	34.29	0.43
Reach-1	5.46	100 Year	15.60	196.43	198.09	197.80	198.18	1.45	18.55	37.56	0.45
Reach-1	5.46	Regional	198.16	196.43	200.88		201.01	2.32	180.74	67.09	0.38
Reach-1	5.45	2 Year	5.89	196.01	196.90		197.04	1.63	3.60	7.30	0.74
Reach-1	5.45	5 Year	7.83	196.01	197.02		197.17	1.72	4.55	8.19	0.74
Reach-1	5.45	10 Year	9.04	196.01	197.08		197.24	1.80	5.02	8.60	0.75
Reach-1	5.45	25 Year	10.55	196.01	197.15	197.02	197.33	1.86	5.66	11.86	0.86
Reach-1	5.45	50 Year	12.69	196.01	197.23	197.09	197.40	1.84	6.89	16.25	0.90
Reach-1	5.45	100 Year	15.60	196.01	197.29	197.26	197.49	1.96	7.97	16.71	0.90
Reach-1	5.45	Regional	198.16	196.01	200.72		200.86	1.68	117.64	47.99	0.34
Reach-1	5.44	2 Year	10.32	195.43	196.89		196.90	0.47	28.80	36.20	0.14
Reach-1	5.44	5 Year	13.25	195.43	197.01		197.02	0.54	33.26	38.54	0.16
Reach-1	5.44	10 Year	14.82	195.43	197.06		197.08	0.57	35.46	39.65	0.16
Reach-1	5.44	25 Year	16.70	195.43	197.13		197.14	0.60	38.04	40.90	0.17
Reach-1	5.44	50 Year	18.87	195.43	197.19		197.21	0.64	40.82	42.21	0.17

3216079 Langstaff Road EA
West Don River - Hydraulic Analysis

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Proposed Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	5.44	100 Year	21.08	195.43	197.26		197.28	0.68	43.56	45.90	0.18
Reach-1	5.44	Regional	252.81	195.43	200.68		200.73	1.44	397.46	177.06	0.21
Reach-1	5.435	2 Year	10.32	195.27	196.79		196.83	0.91	11.38	17.72	0.36
Reach-1	5.435	5 Year	13.25	195.27	196.89		196.94	0.99	13.32	19.32	0.38
Reach-1	5.435	10 Year	14.82	195.27	196.94		197.00	1.04	14.29	20.07	0.39
Reach-1	5.435	25 Year	16.70	195.27	197.00		197.06	1.08	15.46	21.31	0.40
Reach-1	5.435	50 Year	18.87	195.27	197.06		197.12	1.13	16.82	24.66	0.40
Reach-1	5.435	100 Year	21.08	195.27	197.11		197.19	1.18	18.29	27.86	0.41
Reach-1	5.435	Regional	252.81	195.27	200.63		200.70	1.48	362.22	181.27	0.23
Reach-1	5.43	2 Year	11.20	195.31	196.65		196.68	0.70	16.09	34.38	0.32
Reach-1	5.43	5 Year	14.39	195.31	196.76		196.79	0.71	20.18	38.07	0.31
Reach-1	5.43	10 Year	16.21	195.31	196.82		196.85	0.73	22.40	41.12	0.30
Reach-1	5.43	25 Year	18.42	195.31	196.89		196.91	0.74	25.21	44.66	0.29
Reach-1	5.43	50 Year	20.93	195.31	196.95		196.98	0.76	28.33	47.75	0.29
Reach-1	5.43	100 Year	23.42	195.31	197.02		197.05	0.78	31.43	50.36	0.28
Reach-1	5.43	Regional	259.19	195.31	200.63		200.67	1.06	417.45	206.76	0.16
Reach-1	5.425	2 Year	11.20	195.27	196.26	196.06	196.37	1.47	7.63	13.30	0.62
Reach-1	5.425	5 Year	14.39	195.27	196.41	196.16	196.52	1.46	9.83	15.02	0.58
Reach-1	5.425	10 Year	16.21	195.27	196.48	196.21	196.60	1.48	10.93	15.81	0.57
Reach-1	5.425	25 Year	18.42	195.27	196.56	196.26	196.68	1.52	12.16	16.64	0.57
Reach-1	5.425	50 Year	20.93	195.27	196.63	196.33	196.76	1.56	13.48	19.85	0.56
Reach-1	5.425	100 Year	23.42	195.27	196.70	196.38	196.83	1.61	14.81	21.87	0.56
Reach-1	5.425	Regional	259.19	195.27	200.29	198.39	200.56	2.54	127.03	115.04	0.39
Reach-1	**5.405**		**Bridge**								
Reach-1	5.40	2 Year	11.20	194.93	196.18	195.76	196.22	1.02	14.15	18.84	0.33
Reach-1	5.40	5 Year	14.39	194.93	196.35	195.84	196.40	1.08	17.45	19.43	0.32
Reach-1	5.40	10 Year	16.21	194.93	196.43	195.87	196.48	1.12	18.91	19.59	0.32
Reach-1	5.40	25 Year	18.42	194.93	196.50	195.92	196.56	1.18	20.39	19.75	0.33
Reach-1	5.40	50 Year	20.93	194.93	196.57	195.97	196.64	1.26	21.82	19.90	0.34
Reach-1	5.40	100 Year	23.42	194.93	196.64	196.01	196.71	1.33	23.08	19.99	0.35
Reach-1	5.40	Regional	259.19	194.93	199.89	198.51	200.09	2.81	223.60	196.58	0.41
Reach-1	5.38	2 Year	11.20	194.70	195.99		196.08	1.32	8.53	11.75	0.46
Reach-1	5.38	5 Year	14.39	194.70	196.18		196.27	1.34	11.67	20.63	0.43
Reach-1	5.38	10 Year	16.21	194.70	196.26		196.35	1.37	13.45	25.13	0.43

3216079 Langstaff Road EA
West Don River - Hydraulic Analysis

April 2020 Update

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Steady Flow: 2019 Don River Flow Update

Proposed Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	5.38	25 Year	18.42	194.70	196.33		196.43	1.43	15.42	29.34	0.43
Reach-1	5.38	50 Year	20.93	194.70	196.40		196.51	1.50	17.56	33.29	0.44
Reach-1	5.38	100 Year	23.42	194.70	196.46		196.57	1.55	19.70	36.31	0.44
Reach-1	5.38	Regional	259.19	194.70	199.93		199.98	1.51	376.74	229.24	0.22
Reach-1	5.37	2 Year	11.20	194.30	195.55		195.62	1.12	9.96	11.07	0.38
Reach-1	5.37	5 Year	14.39	194.30	195.75		195.82	1.15	12.55	15.30	0.40
Reach-1	5.37	10 Year	16.21	194.30	195.82		195.90	1.18	13.74	16.99	0.42
Reach-1	5.37	25 Year	18.42	194.30	195.89		195.97	1.24	14.92	20.48	0.43
Reach-1	5.37	50 Year	20.93	194.30	195.95		196.03	1.32	16.21	25.25	0.45
Reach-1	5.37	100 Year	23.42	194.30	195.99		196.09	1.39	17.55	29.38	0.46
Reach-1	5.37	Regional	259.19	194.30	199.85		199.93	1.56	340.12	175.71	0.23
Reach-1	5.36	2 Year	11.20	193.95	195.35		195.40	0.98	11.48	11.24	0.30
Reach-1	5.36	5 Year	14.39	193.95	195.54		195.59	1.05	15.26	50.07	0.31
Reach-1	5.36	10 Year	16.21	193.95	195.60		195.66	1.09	19.11	64.99	0.31
Reach-1	5.36	25 Year	18.42	193.95	195.66		195.72	1.13	23.75	88.27	0.32
Reach-1	5.36	50 Year	20.93	193.95	195.73		195.78	1.15	29.97	109.14	0.31
Reach-1	5.36	100 Year	23.42	193.95	195.79		195.84	1.14	36.87	110.89	0.31
Reach-1	5.36	Regional	259.19	193.95	199.86		199.88	0.78	547.97	134.95	0.11
Reach-1	5.35	2 Year	11.20	193.75	195.02		195.12	1.42	8.50	12.85	0.47
Reach-1	5.35	5 Year	14.39	193.75	195.21		195.31	1.44	11.52	25.84	0.49
Reach-1	5.35	10 Year	16.21	193.75	195.30		195.40	1.43	14.95	45.52	0.46
Reach-1	5.35	25 Year	18.42	193.75	195.40		195.48	1.38	19.42	47.95	0.43
Reach-1	5.35	50 Year	20.93	193.75	195.49		195.57	1.34	24.25	50.45	0.40
Reach-1	5.35	100 Year	23.42	193.75	195.58		195.65	1.30	28.91	52.74	0.37
Reach-1	5.35	Regional	259.19	193.75	199.82		199.86	1.24	378.84	110.69	0.17
Reach-1	5.34	2 Year	11.20	193.30	194.88		194.91	0.78	14.32	12.46	0.23
Reach-1	5.34	5 Year	14.39	193.30	195.05		195.09	0.87	16.50	13.25	0.25
Reach-1	5.34	10 Year	16.21	193.30	195.14		195.18	0.92	17.62	13.72	0.26
Reach-1	5.34	25 Year	18.42	193.30	195.23		195.28	0.97	18.92	14.24	0.27
Reach-1	5.34	50 Year	20.93	193.30	195.32		195.38	1.03	20.32	14.84	0.28
Reach-1	5.34	100 Year	23.42	193.30	195.41		195.47	1.08	21.65	15.49	0.29
Reach-1	5.34	Regional	259.19	193.30	199.76		199.82	1.31	323.62	130.21	0.19
Reach-1	5.33	2 Year	11.20	193.30	194.80	194.30	194.89	1.36	8.24	8.70	0.45
Reach-1	5.33	5 Year	14.39	193.30	194.95	194.44	195.06	1.50	9.62	9.31	0.47
Reach-1	5.33	10 Year	16.21	193.30	195.02	194.51	195.15	1.57	10.32	9.60	0.48

3216079 Langstaff Road EA
West Don River - Hydraulic Analysis

April 2020 Update
Model: "Basin5_Pr_Opt4_Apr2020.prj"
Plan: Proposed at Langstaff
Geometry: Basin 5 Proposed at Langstaff
Steady Flow: 2019 Don River Flow Update

Proposed Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	5.33	25 Year	18.42	193.30	195.10	194.59	195.24	1.66	11.10	9.93	0.50
Reach-1	5.33	50 Year	20.93	193.30	195.19	194.67	195.34	1.75	11.93	10.25	0.52
Reach-1	5.33	100 Year	23.42	193.30	195.26	194.75	195.43	1.85	12.69	10.55	0.54
Reach-1	5.33	Regional	259.19	193.30	199.23	197.79	199.70	3.01	86.12	26.41	0.53
Reach-1	5.325		Bridge								
Reach-1	5.32	2 Year	11.20	193.29	194.69	194.29	194.81	1.51	7.42	8.31	0.51
Reach-1	5.32	5 Year	14.39	193.29	194.84	194.43	194.98	1.66	8.64	8.88	0.54
Reach-1	5.32	10 Year	16.21	193.29	194.90	194.49	195.06	1.76	9.21	9.13	0.56
Reach-1	5.32	25 Year	18.42	193.29	194.96	194.57	195.14	1.88	9.82	9.39	0.59
Reach-1	5.32	50 Year	20.93	193.29	195.03	194.66	195.23	2.01	10.40	9.64	0.62
Reach-1	5.32	100 Year	23.42	193.29	195.07	194.74	195.31	2.16	10.86	9.82	0.66
Reach-1	5.32	Regional	259.19	193.29	197.78	197.78	199.04	4.97	52.18	20.65	1.00
Reach-1	5.30	2 Year	11.20	193.20	194.46		194.55	1.35	8.30	15.52	0.46
Reach-1	5.30	5 Year	14.39	193.20	194.62		194.71	1.39	12.68	29.98	0.44
Reach-1	5.30	10 Year	16.21	193.2	194.69		194.78	1.41	14.83	32.44	0.43
Reach-1	5.30	25 Year	18.42	193.2	194.76		194.86	1.44	17.27	39.7	0.43
Reach-1	5.30	50 Year	20.93	193.2	194.83		194.92	1.48	20.51	55.39	0.43
Reach-1	5.30	100 Year	23.42	193.2	194.88		194.98	1.51	23.62	57.5	0.43
Reach-1	5.30	Regional	259.19	193.2	196.4		196.63	3.09	149.26	97.89	0.59
Reach-1	5.29	2 Year	11.2	192.79	194		194.11	1.44	7.76	8.17	0.47
Reach-1	5.29	5 Year	14.39	192.79	194.16		194.29	1.57	9.63	24.73	0.49
Reach-1	5.29	10 Year	16.21	192.79	194.22	193.76	194.36	1.65	11.24	30.64	0.5
Reach-1	5.29	25 Year	18.42	192.79	194.27	193.83	194.42	1.75	13.1	36.28	0.51
Reach-1	5.29	50 Year	20.93	192.79	194.33	193.91	194.49	1.84	15.25	41.88	0.53
Reach-1	5.29	100 Year	23.42	192.79	194.38	193.99	194.55	1.91	17.5	47	0.54
Reach-1	5.29	Regional	259.19	192.79	196.25		196.36	2.32	214.26	135.01	0.42

Black Creek

Existing Hydraulic Modelling Summary - Black Creek

Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude #
Reach-1	46.45	2-year	3.73	206.50	207.00	207.00	207.14	1.68	2.23	7.96	1.01
Reach-1	46.45	5-year	4.83	206.50	207.06	207.06	207.22	1.74	2.77	8.86	1.00
Reach-1	46.45	10-year	5.61	206.50	207.10	207.10	207.26	1.80	3.12	9.39	1.00
Reach-1	46.45	25-year	6.57	206.50	207.14	207.14	207.32	1.86	3.53	9.99	1.00
Reach-1	46.45	50-year	7.34	206.50	207.17	207.17	207.36	1.92	3.82	10.39	1.01
Reach-1	46.45	100-year	7.79	206.50	207.19	207.19	207.38	1.94	4.02	10.65	1.01
Reach-1	46.45	Regional	42.7	206.50	207.95	207.95	208.17	2.33	31.53	90.67	0.75
Reach-1	46.44	2-year	3.73	203.70	204.99		204.99	0.40	12.94	17.82	0.12
Reach-1	46.44	5-year	4.83	203.70	205.03		205.04	0.49	13.78	18.46	0.14
Reach-1	46.44	10-year	5.61	203.70	205.06		205.07	0.55	14.30	18.86	0.16
Reach-1	46.44	25-year	6.57	203.70	205.10		205.12	0.62	15.16	19.50	0.17
Reach-1	46.44	50-year	7.34	203.70	205.19		205.20	0.63	16.84	20.70	0.17
Reach-1	46.44	100-year	7.79	203.70	205.28		205.29	0.61	18.81	22.02	0.16
Reach-1	46.44	Regional	42.7	203.70	207.45		207.46	0.58	171.57	129.43	0.10
Reach-1	46.43	2-year	3.73	203.50	204.98		204.98	0.24	35.42	59.81	0.07
Reach-1	46.43	5-year	4.83	203.50	205.02		205.02	0.30	38.09	61.15	0.08
Reach-1	46.43	10-year	5.61	203.50	205.05		205.05	0.33	39.67	61.32	0.09
Reach-1	46.43	25-year	6.57	203.50	205.09		205.09	0.36	42.32	61.61	0.10
Reach-1	46.43	50-year	7.34	203.50	205.18		205.18	0.36	47.59	62.17	0.09
Reach-1	46.43	100-year	7.79	203.50	205.27		205.27	0.34	53.53	62.81	0.09
Reach-1	46.43	Regional	42.7	203.50	207.45		207.45	0.47	213.92	99.66	0.08
Reach-1	46.42	2-year	3.73	203.30	204.97		204.98	0.23	23.15	27.52	0.06
Reach-1	46.42	5-year	4.83	203.30	205.01		205.02	0.28	24.31	28.36	0.07
Reach-1	46.42	10-year	5.61	203.30	205.04		205.04	0.32	24.99	28.96	0.08
Reach-1	46.42	25-year	6.57	203.30	205.08		205.09	0.37	26.19	29.98	0.09
Reach-1	46.42	50-year	7.34	203.30	205.16		205.17	0.38	28.82	32.10	0.10
Reach-1	46.42	100-year	7.79	203.30	205.26		205.27	0.38	32.02	34.50	0.09
Reach-1	46.42	Regional	42.7	203.30	207.44		207.45	0.58	174.05	130.97	0.09
Reach-1	46.413	2-year	1.61	203.05	204.97	203.15	204.97	0.06	28.84	50.40	0.01
Reach-1	46.413	5-year	2.01	203.05	205.01	203.17	205.01	0.07	29.46	50.68	0.02
Reach-1	46.413	10-year	2.24	203.05	205.04	203.18	205.04	0.08	29.81	50.83	0.02
Reach-1	46.413	25-year	2.66	203.05	205.08	203.20	205.08	0.09	30.42	51.10	0.02
Reach-1	46.413	50-year	3.59	203.05	205.16	203.23	205.16	0.11	31.68	51.65	0.02
Reach-1	46.413	100-year	4.75	203.05	205.26	203.27	205.26	0.14	33.11	52.28	0.03
Reach-1	46.413	Regional	42.7	203.05	207.43	203.98	207.44	0.35	219.81	99.68	0.05
Reach-1	46.4125		Inl Struct								
Reach-1	46.412	2-year	1.61	203.05	203.32	203.15	203.33	0.39	4.12	16.83	0.24
Reach-1	46.412	5-year	2.01	203.05	203.44	203.17	203.44	0.35	5.79	17.57	0.18
Reach-1	46.412	10-year	2.24	203.05	203.53	203.18	203.53	0.31	7.13	19.31	0.15
Reach-1	46.412	25-year	2.66	203.05	203.66	203.20	203.66	0.29	9.09	26.11	0.12
Reach-1	46.412	50-year	3.59	203.05	203.77	203.23	203.78	0.33	10.86	32.25	0.12
Reach-1	46.412	100-year	4.75	203.05	203.90	203.27	203.91	0.37	12.81	39.03	0.13
Reach-1	46.412	Regional	42.7	203.05	207.37	203.98	207.38	0.42	161.02	94.47	0.07
Reach-1	46.4115		Culvert	@ Credit View Road							
Reach-1	46.411	2-year	1.61	202.96	203.31	203.07	203.31	0.31	5.20	16.93	0.17
Reach-1	46.411	5-year	2.01	202.96	203.42	203.08	203.43	0.29	6.96	17.58	0.14
Reach-1	46.411	10-year	2.24	202.96	203.52	203.09	203.52	0.27	8.34	18.83	0.12
Reach-1	46.411	25-year	2.66	202.96	203.65	203.11	203.65	0.26	10.33	25.72	0.10
Reach-1	46.411	50-year	3.59	202.96	203.76	203.14	203.77	0.30	12.07	31.76	0.11
Reach-1	46.411	100-year	4.75	202.96	203.89	203.18	203.90	0.34	13.99	38.41	0.11
Reach-1	46.411	Regional	42.7	202.96	206.90	203.90	206.91	0.41	179.93	63.12	0.07

Existing Hydraulic Modelling Summary - Black Creek

Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude #
Reach-1	46.41	2-year	3.07	202.50	203.24		203.25	0.56	6.35	19.32	0.24
Reach-1	46.41	5-year	4.07	202.50	203.37		203.39	0.57	9.33	25.52	0.22
Reach-1	46.41	10-year	4.85	202.50	203.47		203.49	0.57	12.15	30.26	0.21
Reach-1	46.41	25-year	5.93	202.50	203.62		203.63	0.53	19.20	76.27	0.18
Reach-1	46.41	50-year	6.83	202.50	203.75		203.75	0.45	29.51	82.90	0.14
Reach-1	46.41	100-year	7.62	202.50	203.88		203.89	0.37	41.32	89.89	0.11
Reach-1	46.41	Regional	47.8	202.50	206.91		206.91	0.20	393.09	131.61	0.03
Reach-1	46.402	2-year	3.07	202.40	203.16	202.64	203.17	0.47	6.47	13.29	0.17
Reach-1	46.402	5-year	4.07	202.40	203.30	202.68	203.31	0.53	7.65	14.40	0.18
Reach-1	46.402	10-year	4.85	202.40	203.41	202.72	203.42	0.57	8.54	15.24	0.18
Reach-1	46.402	25-year	5.93	202.40	203.56	202.77	203.57	0.60	9.82	16.45	0.18
Reach-1	46.402	50-year	6.83	202.40	203.69	202.81	203.71	0.62	10.99	17.54	0.17
Reach-1	46.402	100-year	7.62	202.40	203.84	202.84	203.86	0.62	12.23	18.71	0.17
Reach-1	46.402	Regional	47.8	202.40	206.90	203.88	206.90	0.36	329.94	241.16	0.05
Reach-1	46.4015		Culvert	@ Highway 400, 3 Cell - 2.4 m W x 2.4 m H x 80 m L Concrete Box Culverts							
Reach-1	46.401	2-year	3.07	202.40	203.13	202.64	203.14	0.49	6.23	13.06	0.18
Reach-1	46.401	5-year	4.07	202.40	203.27	202.68	203.28	0.55	7.36	14.13	0.19
Reach-1	46.401	10-year	4.85	202.40	203.37	202.72	203.39	0.59	8.23	14.95	0.19
Reach-1	46.401	25-year	5.93	202.40	203.52	202.77	203.54	0.62	9.49	16.13	0.19
Reach-1	46.401	50-year	6.83	202.40	203.65	202.81	203.67	0.64	10.65	17.22	0.18
Reach-1	46.401	100-year	7.62	202.40	203.80	202.84	203.82	0.64	11.90	18.40	0.17
Reach-1	46.401	Regional	47.8	202.40	206.55	203.88	206.56	0.57	233.89	250.91	0.09
Reach-1	46.392	2-year	3.07	202.50	203.06	202.74	203.08	0.64	4.80	12.32	0.27
Reach-1	46.392	5-year	4.07	202.50	203.20	202.78	203.22	0.68	5.98	13.08	0.26
Reach-1	46.392	10-year	4.85	202.50	203.30	202.82	203.33	0.70	6.90	13.67	0.25
Reach-1	46.392	25-year	5.93	202.50	203.46	202.87	203.49	0.72	8.24	14.52	0.23
Reach-1	46.392	50-year	6.83	202.50	203.60	202.90	203.63	0.72	9.48	15.32	0.22
Reach-1	46.392	100-year	7.62	202.50	203.76	202.93	203.78	0.70	10.82	16.17	0.20
Reach-1	46.392	Regional	47.8	202.50	206.54	203.96	206.55	0.64	140.52	166.93	0.10
Reach-1	**46.3915**		**Mult Opening @Langstaff Road - 3 Cell - 2.4 m W x 2.4 m H x 60 m L Concrete Box Culverts**								
Reach-1	46.391	2-year	3.07	202.40	203.01	202.63	203.03	0.58	5.26	12.06	0.24
Reach-1	46.391	5-year	4.07	202.40	203.15	202.68	203.17	0.64	6.41	12.80	0.23
Reach-1	46.391	10-year	4.85	202.40	203.25	202.72	203.27	0.66	7.33	13.39	0.23
Reach-1	46.391	25-year	5.93	202.40	203.41	202.76	203.43	0.68	8.67	14.25	0.22
Reach-1	46.391	50-year	6.83	202.40	203.55	202.80	203.58	0.69	9.93	15.05	0.20
Reach-1	46.391	100-year	7.62	202.40	203.71	202.83	203.74	0.67	11.30	15.93	0.19
Reach-1	46.391	Regional	47.8	202.40	206.45	203.87	206.46	0.45	130.23	166.34	0.07
Reach-1	46.39	2-year	3.07	202.40	202.96	202.62	202.97	0.51	6.03	12.71	0.24
Reach-1	46.39	5-year	4.07	202.40	203.10	202.67	203.12	0.51	8.04	14.47	0.21
Reach-1	46.39	10-year	4.85	202.40	203.22	202.70	203.23	0.51	9.80	16.09	0.19
Reach-1	46.39	25-year	5.93	202.40	203.39	202.74	203.40	0.50	12.66	18.40	0.17
Reach-1	46.39	50-year	6.83	202.40	203.54	202.77	203.55	0.49	15.63	20.54	0.15
Reach-1	46.39	100-year	7.62	202.40	203.70	202.80	203.71	0.46	19.21	22.85	0.13
Reach-1	46.39	Regional	47.8	202.40	206.45	203.62	206.45	0.38	239.56	219.40	0.06
Reach-1	46.382	2-year	3.07	202.40	202.90	202.63	202.93	0.71	4.31	18.20	0.32
Reach-1	46.382	5-year	4.07	202.40	203.06	202.68	203.09	0.72	5.70	20.75	0.28
Reach-1	46.382	10-year	4.85	202.40	203.18	202.72	203.21	0.72	6.73	22.20	0.26
Reach-1	46.382	25-year	5.93	202.40	203.35	202.76	203.38	0.72	8.20	24.24	0.24
Reach-1	46.382	50-year	6.83	202.40	203.51	202.80	203.54	0.72	9.54	26.12	0.22
Reach-1	46.382	100-year	7.62	202.40	203.68	202.83	203.70	0.69	10.99	28.14	0.20
Reach-1	46.382	Regional	47.8	202.40	206.45	203.86	206.45	0.34	361.60	248.50	0.06

Existing Hydraulic Modelling Summary - Black Creek

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	Vel Chnl	Flow Area	Top Width	Froude #
			(m³/s)	(m)	(m)	(m)	(m)	(m/s)	(m²)	(m)	
Reach-1	46.3815		Culvert	@ Langstaff Road Ramp 3 Cell - 2.4 m W x 2.4 m H x 60 m L Concrete Box Culverts							
Reach-1	46.381	2-year	3.07	202.30	202.84	202.54	202.86	0.66	4.63	17.46	0.29
Reach-1	46.381	5-year	4.07	202.30	203.01	202.59	203.03	0.67	6.08	20.08	0.25
Reach-1	46.381	10-year	4.85	202.30	203.13	202.62	203.15	0.68	7.13	21.55	0.24
Reach-1	46.381	25-year	5.93	202.30	203.30	202.67	203.33	0.69	8.62	23.63	0.22
Reach-1	46.381	50-year	6.83	202.30	203.46	202.70	203.48	0.68	9.98	25.53	0.20
Reach-1	46.381	100-year	7.62	202.30	203.63	202.73	203.66	0.66	11.47	27.61	0.18
Reach-1	46.381	Regional	47.8	202.30	206.08	203.76	206.08	0.29	334.18	237.29	0.05
Reach-1	46.36	2-year	6.21	201.60	202.56		202.59	0.77	9.01	13.27	0.26
Reach-1	46.36	5-year	8.54	201.60	202.77		202.80	0.84	11.96	14.88	0.26
Reach-1	46.36	10-year	10.17	201.60	202.92		202.95	0.86	14.29	16.04	0.25
Reach-1	46.36	25-year	12.32	201.60	203.13		203.16	0.88	17.78	17.63	0.23
Reach-1	46.36	50-year	14.3	201.60	203.31		203.34	0.89	21.11	19.02	0.22
Reach-1	46.36	100-year	16.31	201.60	203.50		203.54	0.89	24.97	20.51	0.21
Reach-1	46.36	Regional	66.49	201.60	206.02		206.05	1.05	128.82	96.09	0.16
Reach-1	46.35	2-year	6.21	201.40	202.44		202.46	0.71	9.52	14.43	0.25
Reach-1	46.35	5-year	8.54	201.40	202.67		202.69	0.76	13.10	16.76	0.23
Reach-1	46.35	10-year	10.17	201.40	202.83		202.86	0.77	16.01	18.44	0.22
Reach-1	46.35	25-year	12.32	201.40	203.05		203.08	0.77	20.40	20.72	0.20
Reach-1	46.35	50-year	14.3	201.40	203.25		203.28	0.77	24.58	22.68	0.19
Reach-1	46.35	100-year	16.31	201.40	203.45		203.48	0.77	29.45	24.77	0.18
Reach-1	46.35	Regional	66.49	201.40	206.00		206.03	0.96	137.63	64.98	0.15
Reach-1	46.34	2-year	6.21	201.20	202.36		202.38	0.63	10.24	14.07	0.22
Reach-1	46.34	5-year	8.54	201.20	202.60		202.62	0.66	13.90	15.52	0.20
Reach-1	46.34	10-year	10.17	201.20	202.78		202.80	0.67	16.71	16.54	0.19
Reach-1	46.34	25-year	12.32	201.20	203.01		203.04	0.67	20.76	17.91	0.18
Reach-1	46.34	50-year	14.3	201.20	203.21		203.23	0.68	24.42	19.07	0.17
Reach-1	46.34	100-year	16.31	201.20	203.42		203.44	0.68	28.56	20.29	0.16
Reach-1	46.34	Regional	66.49	201.20	205.98		206.01	0.92	126.31	107.94	0.14
Reach-1	46.33	2-year	8.66	201.00	202.14		202.19	0.90	9.66	11.92	0.31
Reach-1	46.33	5-year	12.09	201.00	202.44		202.48	0.94	13.43	13.78	0.28
Reach-1	46.33	10-year	14.45	201.00	202.63		202.68	0.95	16.25	15.02	0.26
Reach-1	46.33	25-year	17.55	201.00	202.89		202.94	0.96	20.33	16.65	0.24
Reach-1	46.33	50-year	20.24	201.00	203.10		203.15	0.97	23.98	17.98	0.23
Reach-1	46.33	100-year	22.97	201.00	203.33		203.37	0.97	28.14	19.39	0.22
Reach-1	46.33	Regional	74.78	201.00	205.95		205.98	0.89	179.01	115.00	0.13
Reach-1	46.322	2-year	8.66	201.00	202.05	201.38	202.08	0.65	13.25	14.45	0.21
Reach-1	46.322	5-year	12.09	201.00	202.37	201.47	202.40	0.70	17.39	16.26	0.19
Reach-1	46.322	10-year	14.45	201.00	202.58	201.53	202.61	0.72	20.07	17.43	0.19
Reach-1	46.322	25-year	17.55	201.00	202.85	201.60	202.87	0.75	23.54	18.95	0.18
Reach-1	46.322	50-year	20.24	201.00	203.06	201.66	203.09	0.77	26.35	20.18	0.17
Reach-1	46.322	100-year	22.97	201.00	203.29	201.72	203.32	0.78	29.31	21.47	0.17
Reach-1	46.322	Regional	74.78	201.00	205.92	202.53	205.96	0.98	117.80	57.00	0.14
Reach-1	46.3215		Culvert	Applewood Crescent							
Reach-1	46.321	2-year	8.66	200.60	202.02	200.98	202.03	0.49	17.81	14.27	0.13
Reach-1	46.321	5-year	12.09	200.60	202.33	201.07	202.35	0.55	21.84	16.03	0.14
Reach-1	46.321	10-year	14.45	200.60	202.53	201.13	202.55	0.59	24.46	17.18	0.14
Reach-1	46.321	25-year	17.55	200.60	202.80	201.21	202.82	0.63	27.86	18.66	0.14
Reach-1	46.321	50-year	20.24	200.60	203.01	201.26	203.03	0.66	30.61	19.87	0.14
Reach-1	46.321	100-year	22.97	200.60	203.22	201.32	203.24	0.69	33.37	21.07	0.14
Reach-1	46.321	Regional	74.78	200.60	205.31	202.15	205.36	1.09	95.59	32.96	0.16

Westminster Creek

Langstaff Road EA

Westminster Creek

Existing Conditions Hydraulic Analysis Summary

May 2019 Update

Model: "Basin 5_May2019_Rev Opt 4"

Plan: Proposed at Langstaff

Geometry: Basin 5 Proposed at Langstaff

Steady Flow: 2019 Don River Flow Update

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	50.44	2 Year	0.89	216.18	216.36	216.31	216.37	0.51	1.73	17.85	0.53
Reach-1	50.44	5 Year	1.18	216.18	216.37	216.33	216.39	0.58	2.03	19.31	0.57
Reach-1	50.44	10 Year	1.37	216.18	216.38	216.34	216.40	0.62	2.20	20.11	0.60
Reach-1	50.44	25 Year	1.61	216.18	216.39	216.35	216.41	0.68	2.35	20.78	0.65
Reach-1	50.44	50 Year	1.84	216.18	216.39	216.36	216.42	0.75	2.46	21.23	0.70
Reach-1	50.44	100 Year	2.34	216.18	216.40	216.38	216.44	0.89	2.62	21.92	0.82
Reach-1	50.44	Regional	27.60	216.18	216.75	216.75	216.92	1.84	15.03	44.78	1.01
Reach-1	50.29	2 Year	1.67	205.81	205.80	205.41	205.80		21.65	50.36	0.00
Reach-1	50.29	5 Year	2.27	205.81	205.89	205.42	205.89	0.03	27.16	63.18	0.04
Reach-1	50.29	10 Year	2.66	205.81	205.94	205.43	205.94	0.05	30.36	63.58	0.04
Reach-1	50.29	25 Year	3.16	205.81	205.99	205.44	205.99	0.06	34.03	64.04	0.05
Reach-1	50.29	50 Year	3.69	205.81	206.05	205.44	206.05	0.07	37.64	64.72	0.05
Reach-1	50.29	100 Year	4.42	205.81	206.12	205.45	206.12	0.09	42.14	65.59	0.05
Reach-1	50.29	Regional	36.24	205.81	207.63	205.74	207.63	0.31	155.51	84.64	0.07
Reach-1	50.285		Inl Struct								
Reach-1	50.28	2 Year	1.67	205.75	205.79		205.79	0.02	19.64	57.73	0.04
Reach-1	50.28	5 Year	2.27	205.75	205.88		205.88	0.05	24.94	58.82	0.05
Reach-1	50.28	10 Year	2.66	205.75	205.93		205.93	0.07	27.90	59.42	0.05
Reach-1	50.28	25 Year	3.16	205.75	205.99		205.99	0.08	31.34	60.10	0.05
Reach-1	50.28	50 Year	3.69	205.75	206.05		206.05	0.09	34.74	61.09	0.05
Reach-1	50.28	100 Year	4.42	205.75	206.12		206.12	0.11	39.01	62.37	0.06
Reach-1	50.28	Regional	36.24	205.75	207.63		207.63	0.33	153.57	87.87	0.08
Reach-1	50.27	2 Year	1.67	205.30	205.77		205.78	0.28	5.94	15.60	0.15
Reach-1	50.27	5 Year	2.27	205.30	205.87		205.87	0.31	7.39	16.13	0.15
Reach-1	50.27	10 Year	2.66	205.30	205.92		205.92	0.32	8.20	16.42	0.15
Reach-1	50.27	25 Year	3.16	205.30	205.97		205.98	0.35	9.14	16.75	0.15
Reach-1	50.27	50 Year	3.69	205.30	206.03		206.03	0.37	10.08	17.08	0.15
Reach-1	50.27	100 Year	4.42	205.30	206.10		206.10	0.39	11.25	17.47	0.16
Reach-1	50.27	Regional	36.24	205.30	207.58		207.61	0.84	43.39	25.70	0.21
Reach-1	50.26	2 Year	1.67	205.08	205.72		205.73	0.36	4.70	10.58	0.17
Reach-1	50.26	5 Year	2.27	205.08	205.81		205.82	0.40	5.69	11.42	0.18
Reach-1	50.26	10 Year	2.66	205.08	205.86		205.87	0.43	6.25	11.86	0.19
Reach-1	50.26	25 Year	3.16	205.08	205.91		205.92	0.46	6.91	12.37	0.20
Reach-1	50.26	50 Year	3.69	205.08	205.97		205.98	0.49	7.58	12.86	0.20
Reach-1	50.26	100 Year	4.42	205.08	206.03		206.04	0.52	8.42	13.46	0.21
Reach-1	50.26	Regional	36.24	205.08	207.48		207.54	1.11	36.01	23.65	0.25
Reach-1	50.25	2 Year	1.67	204.54	205.72	204.76	205.73	0.28	5.91	6.25	0.08

Langstaff Road EA

Westminster Creek

Existing Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

May 2019 Update

Model: "Basin 5_May2019_Rev Opt 4"

Plan: Proposed at Langstaff

Geometry: Basin 5 Proposed at Langstaff

Steady Flow: 2019 Don River Flow Update

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	50.25	5 Year	2.27	204.54	205.81	204.82	205.82	0.36	6.35	6.32	0.10
Reach-1	50.25	10 Year	2.66	204.54	205.86	204.85	205.87	0.40	6.59	6.35	0.11
Reach-1	50.25	25 Year	3.16	204.54	205.91	204.88	205.92	0.46	6.86	6.38	0.13
Reach-1	50.25	50 Year	3.69	204.54	205.96	204.92	205.98	0.52	7.11	6.40	0.14
Reach-1	50.25	100 Year	4.42	204.54	206.02	204.97	206.04	0.60	7.42	6.43	0.16
Reach-1	50.25	Regional	36.24	204.54	207.09	206.29	207.50	2.84	12.75	7.72	0.57
Reach-1	50.245		Culvert								
Reach-1	50.24	2 Year	1.67	204.44	205.72	204.67	205.72	0.26	6.40	7.44	0.07
Reach-1	50.24	5 Year	2.27	204.44	205.81	204.72	205.81	0.33	6.84	7.61	0.09
Reach-1	50.24	10 Year	2.66	204.44	205.85	204.75	205.86	0.38	7.07	7.69	0.10
Reach-1	50.24	25 Year	3.16	204.44	205.91	204.78	205.92	0.43	7.34	7.79	0.11
Reach-1	50.24	50 Year	3.69	204.44	205.96	204.82	205.97	0.49	7.59	7.89	0.13
Reach-1	50.24	100 Year	4.42	204.44	206.02	204.87	206.03	0.56	7.88	8.00	0.14
Reach-1	50.24	Regional	36.24	204.44	206.70	206.19	207.22	3.21	11.28	9.17	0.68
Reach-1	50.23	2 Year	1.67	205.05	205.64	205.55	205.72	1.20	1.40	4.50	0.68
Reach-1	50.23	5 Year	2.27	205.05	205.72	205.62	205.80	1.27	1.79	5.33	0.70
Reach-1	50.23	10 Year	2.66	205.05	205.76	205.66	205.85	1.32	2.02	5.76	0.71
Reach-1	50.23	25 Year	3.16	205.05	205.81	205.71	205.91	1.38	2.29	6.23	0.73
Reach-1	50.23	50 Year	3.69	205.05	205.85	205.76	205.96	1.43	2.58	6.70	0.74
Reach-1	50.23	100 Year	4.42	205.05	205.90	205.81	206.02	1.51	2.93	7.24	0.76
Reach-1	50.23	Regional	36.24	205.05	206.75	206.75	207.16	2.86	12.67	15.50	1.01
Reach-1	50.22	2 Year	1.67	203.31	203.66	203.66	203.76	1.42	1.17	5.69	1.00
Reach-1	50.22	5 Year	2.27	203.31	203.72	203.72	203.83	1.44	1.58	7.63	1.01
Reach-1	50.22	10 Year	2.66	203.31	203.75	203.75	203.86	1.46	1.82	8.59	1.01
Reach-1	50.22	25 Year	3.16	203.31	203.78	203.78	203.90	1.48	2.13	9.67	1.01
Reach-1	50.22	50 Year	3.69	203.31	203.81	203.81	203.93	1.53	2.41	10.50	1.02
Reach-1	50.22	100 Year	4.42	203.31	203.84	203.84	203.97	1.61	2.74	10.76	1.02
Reach-1	50.22	Regional	36.24	203.31	204.85		205.11	2.24	16.19	15.29	0.69
Reach-1	50.21	2 Year	1.67	201.65	202.29		202.31	0.61	2.73	7.50	0.32
Reach-1	50.21	5 Year	2.27	201.65	202.35		202.37	0.70	3.23	8.10	0.36
Reach-1	50.21	10 Year	2.66	201.65	202.39		202.42	0.75	3.53	8.41	0.37
Reach-1	50.21	25 Year	3.16	201.65	202.43		202.46	0.81	3.92	8.72	0.38
Reach-1	50.21	50 Year	3.69	201.65	202.49		202.52	0.83	4.43	9.02	0.38
Reach-1	50.21	100 Year	4.42	201.65	202.54		202.59	0.90	4.93	9.31	0.39
Reach-1	50.21	Regional	36.24	201.65	204.84		204.88	0.87	41.85	24.02	0.21
Reach-1	50.20	2 Year	2.63	201.20	201.79		201.85	1.08	2.43	6.81	0.58
Reach-1	50.20	5 Year	3.07	201.20	201.83		201.89	1.14	2.68	7.04	0.59
Reach-1	50.20	10 Year	3.34	201.20	201.85		201.92	1.18	2.83	7.17	0.60
Reach-1	50.20	25 Year	3.80	201.20	201.88		201.96	1.23	3.08	7.39	0.61

Westminster Creek

Plan: Proposed at Langstaff

Existing Conditions Hydraulic Analysis Summary

Geometry: Basin 5 Proposed at Langstaff

Steady Flow: 2019 Don River Flow Update

Based on New 2019 Flows

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	50.20	50 Year	4.56	201.20	201.94		202.02	1.31	3.48	7.72	0.62
Reach-1	50.20	100 Year	5.22	201.20	201.98		202.07	1.37	3.82	8.00	0.63
Reach-1	50.20	Regional	62.64	201.20	204.70		204.78	1.24	51.47	42.13	0.29
Reach-1	50.19	2 Year	2.63	199.73	200.31	200.31	200.49	1.85	1.42	4.16	1.01
Reach-1	50.19	5 Year	3.07	199.73	200.37	200.37	200.54	1.87	1.64	5.09	0.99
Reach-1	50.19	10 Year	3.34	199.73	200.39	200.39	200.57	1.90	1.79	5.67	0.98
Reach-1	50.19	25 Year	3.80	199.73	200.43	200.43	200.62	1.96	2.00	5.78	0.97
Reach-1	50.19	50 Year	4.56	199.73	200.48	200.48	200.69	2.06	2.31	5.96	0.96
Reach-1	50.19	100 Year	5.22	199.73	200.52	200.52	200.75	2.14	2.57	6.09	0.96
Reach-1	50.19	Regional	62.64	199.73	204.59		204.69	1.69	77.31	65.28	0.25
Reach-1	50.18	2 Year	2.63	199.56	200.22	199.95	200.25	0.82	3.20	6.38	0.37
Reach-1	50.18	5 Year	3.07	199.56	200.28	199.98	200.31	0.86	3.56	6.53	0.37
Reach-1	50.18	10 Year	3.34	199.56	200.31	200.00	200.35	0.88	3.78	6.61	0.37
Reach-1	50.18	25 Year	3.80	199.56	200.36	200.03	200.40	0.92	4.12	6.75	0.38
Reach-1	50.18	50 Year	4.56	199.56	200.44	200.08	200.49	0.98	4.65	6.95	0.38
Reach-1	50.18	100 Year	5.22	199.56	200.50	200.11	200.56	1.02	5.10	7.12	0.39
Reach-1	50.18	Regional	62.64	199.56	204.60	201.72	204.66	1.17	84.85	48.28	0.17
Reach-1	**50.175**		**Culvert at Westminster Creek**								
Reach-1	50.17	2 Year	2.63	199.49	200.21	199.99	200.25	0.84	3.12	9.27	0.42
Reach-1	50.17	5 Year	3.07	199.49	200.27	200.02	200.30	0.86	3.57	10.06	0.41
Reach-1	50.17	10 Year	3.34	199.49	200.30	200.04	200.34	0.87	3.85	10.43	0.41
Reach-1	50.17	25 Year	3.8	199.49	200.35	200.07	200.39	0.88	4.30	10.89	0.40
Reach-1	50.17	50 Year	4.56	199.49	200.43	200.12	200.47	0.92	4.98	11.23	0.39
Reach-1	50.17	100 Year	5.22	199.49	200.49	200.16	200.54	0.94	5.54	11.50	0.38
Reach-1	50.17	Regional	62.64	199.49	202.77	201.37	202.90	1.58	42.05	22.30	0.32
Reach-1	50.16	2 Year	2.63	199.48	200.20		200.23	0.76	3.48	7.24	0.34
Reach-1	50.16	5 Year	3.07	199.48	200.26		200.29	0.80	3.90	7.62	0.34
Reach-1	50.16	10 Year	3.34	199.48	200.29		200.33	0.82	4.15	7.73	0.34
Reach-1	50.16	25 Year	3.8	199.48	200.34		200.38	0.85	4.56	7.91	0.34
Reach-1	50.16	50 Year	4.56	199.48	200.42		200.46	0.91	5.23	9.67	0.34
Reach-1	50.16	100 Year	5.22	199.48	200.49		200.53	0.95	5.86	9.99	0.34
Reach-1	50.16	Regional	62.64	199.48	202.72		202.89	2.10	43.61	24.83	0.39
Reach-1	50.15	2 Year	2.63	199.20	200.05		200.08	0.85	3.11	5.85	0.37
Reach-1	50.15	5 Year	3.07	199.20	200.10		200.14	0.89	3.43	6.13	0.38
Reach-1	50.15	10 Year	3.34	199.20	200.13		200.17	0.92	3.62	6.28	0.39
Reach-1	50.15	25 Year	3.8	199.20	200.18		200.23	0.96	3.94	6.54	0.40
Reach-1	50.15	50 Year	4.56	199.20	200.26		200.31	1.02	4.45	6.93	0.41
Reach-1	50.15	100 Year	5.22	199.20	200.32		200.38	1.07	4.90	7.35	0.42
Reach-1	50.15	Regional	62.64	199.20	202.65		202.78	1.76	51.34	45.61	0.36

Langstaff Road EA

Westminster Creek

Existing Conditions Hydraulic Analysis Summary

Based on New 2019 Flows

May 2019 Update

Model: "Basin 5_May2019_Rev Opt 4"

Plan: Proposed at Langstaff

Geometry: Basin 5 Proposed at Langstaff

Steady Flow: 2019 Don River Flow Update

Reach	River Station	Profile	Flow (m³/s)	Min Ch Elevation (m)	W.S. Elevation (m)	Crit W.S. (m)	E.G. Elevation (m)	Velocity Channel (m/s)	Flow Area (m2)	Top Width (m)	Froude #
Reach-1	50.14	2 Year	2.63	198.64	199.24	199.20	199.38	1.68	1.57	4.24	0.88
Reach-1	50.14	5 Year	3.07	198.64	199.30		199.44	1.68	1.83	4.57	0.85
Reach-1	50.14	10 Year	3.34	198.64	199.33		199.48	1.68	1.99	4.75	0.83
Reach-1	50.14	25 Year	3.8	198.64	199.38		199.53	1.69	2.24	5.04	0.81
Reach-1	50.14	50 Year	4.56	198.64	199.46		199.61	1.72	2.65	5.46	0.79
Reach-1	50.14	100 Year	5.22	198.64	199.52		199.68	1.75	2.98	5.79	0.78
Reach-1	50.14	Regional	62.64	198.64	202.66		202.68	0.70	162.65	182.32	0.15
Reach-1	50.13	2 Year	2.63	198.50	199.32	198.76	199.33	0.49	5.36	7.63	0.17
Reach-1	50.13	5 Year	3.07	198.50	199.38	198.78	199.39	0.53	5.74	7.71	0.18
Reach-1	50.13	10 Year	3.34	198.50	199.41	198.80	199.43	0.56	5.95	7.76	0.19
Reach-1	50.13	25 Year	3.8	198.50	199.46	198.83	199.48	0.60	6.29	7.83	0.20
Reach-1	50.13	50 Year	4.56	198.50	199.54	198.87	199.56	0.67	6.80	7.94	0.21
Reach-1	50.13	100 Year	5.22	198.50	199.60	198.90	199.62	0.73	7.18	8.02	0.22
Reach-1	50.13	Regional	62.64	198.50	202.66	200.61	202.68	0.74	185.73	212.04	0.13
Reach-1	50.125		Culvert								
Reach-1	50.12	2 Year	2.63	198.38	199.31	198.64	199.32	0.43	6.09	8.21	0.14
Reach-1	50.12	5 Year	3.07	198.38	199.37	198.66	199.38	0.48	6.45	8.27	0.15
Reach-1	50.12	10 Year	3.34	198.38	199.40	198.68	199.41	0.50	6.66	8.31	0.16
Reach-1	50.12	25 Year	3.8	198.38	199.45	198.71	199.46	0.54	6.99	8.36	0.17
Reach-1	50.12	50 Year	4.56	198.38	199.52	198.75	199.54	0.61	7.47	8.44	0.18
Reach-1	50.12	100 Year	5.22	198.38	199.58	198.78	199.60	0.67	7.83	8.51	0.19
Reach-1	50.12	Regional	62.64	198.38	201.41	200.30	201.69	2.35	27.58	16.95	0.47
Reach-1	50.11	2 Year	2.63	198.50	199.11	199.11	199.30	1.89	1.39	3.92	1.01
Reach-1	50.11	5 Year	3.07	198.50	199.16	199.16	199.35	1.94	1.58	4.17	1.01
Reach-1	50.11	10 Year	3.34	198.50	199.19	199.19	199.39	1.97	1.70	4.38	1.01
Reach-1	50.11	25 Year	3.8	198.50	199.23	199.23	199.44	1.99	1.91	4.73	1.00
Reach-1	50.11	50 Year	4.56	198.50	199.30	199.30	199.51	2.06	2.21	5.22	1.01
Reach-1	50.11	100 Year	5.22	198.50	199.35	199.35	199.57	2.09	2.50	5.63	1.00
Reach-1	50.11	Regional	62.64	198.50	201.43		201.65	2.08	30.13	20.69	0.55
Reach-1	50.10	2 Year	2.72	197.86	198.73		198.76	0.78	3.47	6.80	0.35
Reach-1	50.10	5 Year	3.19	197.86	198.79		198.83	0.82	3.89	7.19	0.36
Reach-1	50.10	10 Year	3.46	197.86	198.82		198.86	0.84	4.11	7.39	0.36
Reach-1	50.10	25 Year	3.94	197.86	198.88		198.91	0.88	4.50	7.72	0.37
Reach-1	50.10	50 Year	4.71	197.86	198.95		198.99	0.92	5.09	8.20	0.37
Reach-1	50.10	100 Year	5.42	197.86	199.01		199.06	0.96	5.63	8.61	0.38
Reach-1	50.10	Regional	63.27	197.86	201.35		201.47	1.49	42.43	23.20	0.35

Culvert Hydraulics

Culvert Designer/Analyzer Report
Culvert LC1

Peak Discharge Method: User-Specified				
Design Discharge	2.8970 m³/s	Check Discharge	3.2140 m³/s	

Grades Model: Inverts				
Invert Upstream	205.35 m	Invert Downstream	205.10 m	
Length	68.00 m	Slope	0.003676 m/m	
Drop	0.25 m			

Headwater Model: Unspecified

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	205.50 m

	Name	Description	Discharge	HW Elev.	Velocity
x	Trial-4	1-2440 x 1520 mm Box	2.8970 m³/s	206.24 m	2.35 m/s
	Trial-1	1-2440 x 1520 mm Box	3.2140 m³/s	206.30 m	2.43 m/s

Culvert Designer/Analyzer Report
Culvert LC1

Design: Trial-4 (50-Year)

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	N/A m	Storm Event	Design	
Computed Headwater Elevation	206.24 m	Discharge	2.8970 m³/s	
Headwater Depth/Height	0.58	Tailwater Elevation	205.50 m	
Inlet Control HW Elev.	206.24 m	Control Type	Inlet Control	
Outlet Control HW Elev.	206.19 m			

Grades

Upstream Invert	205.35 m	Downstream Invert	205.10 m
Length	68.00 m	Constructed Slope	0.003676 m/m

Hydraulic Profile

Profile	S2	Depth, Downstream	0.51 m
Slope Type	Steep	Normal Depth	0.51 m
Flow Regime	Supercritical	Critical Depth	0.52 m
Velocity Downstream	2.35 m/s	Critical Slope	0.003311 m/m

Section

Section Shape	Box	Manning's Coefficient	0.013
Section Material	Concrete	Span	2.44 m
Section Size	2440 x 1520 mm	Rise	1.52 m
Number Sections	1		

Outlet Control Properties

Outlet Control HW Elev.	206.19 m	Upstream Velocity Head	0.26 m
Ke	0.20	Entrance Loss	0.05 m

Inlet Control Properties

Inlet Control HW Elev.	206.24 m	Flow Control	Unsubmerged
Inlet Type	0° wingwall flares	Area Full	3.7 m²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Designer/Analyzer Report
Culvert LC1

Check: Trial-1 (100-year)

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	N/A m	Storm Event	Check
Computed Headwater Elevation	206.30 m	Discharge	3.2140 m³/s
Headwater Depth/Height	0.62	Tailwater Elevation	205.50 m
Inlet Control HW Elev.	206.30 m	Control Type	Inlet Control
Outlet Control HW Elev.	206.25 m		

Grades

Upstream Invert	205.35 m	Downstream Invert	205.10 m
Length	68.00 m	Constructed Slope	0.003676 m/m

Hydraulic Profile

Profile	S2	Depth, Downstream	0.54 m
Slope Type	Steep	Normal Depth	0.54 m
Flow Regime	Supercritical	Critical Depth	0.56 m
Velocity Downstream	2.43 m/s	Critical Slope	0.003329 m/m

Section

Section Shape	Box	Manning's Coefficient	0.013
Section Material	Concrete	Span	2.44 m
Section Size	2440 x 1520 mm	Rise	1.52 m
Number Sections	1		

Outlet Control Properties

Outlet Control HW Elev.	206.25 m	Upstream Velocity Head	0.28 m
Ke	0.20	Entrance Loss	0.06 m

Inlet Control Properties

Inlet Control HW Elev.	206.30 m	Flow Control	Unsubmerged
Inlet Type	0° wingwall flares	Area Full	3.7 m²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Title: Langstaff Rd Widening Ex Conditions
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WSP Global Inc.
Haestad Methods Solution Center

Project Engineer: Hadi Abbasi
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Watertown, CT 06795 USA   +1-203-755-
Page 3

APPENDIX

D
Fluvial Geomorphology Report

Langstaff Road Class Environmental Assessment, Fluvial Geomorphological Support
Vaughan, Ontario

Geomorphological Erosion and Meander Belt Width Assessment

Prepared for:
WSP/MMM Group
610 Chartwell Rd, Suite 300
Oakville, ON

June 30, 2017
PN17032

Report Prepared by:	GEO Morphix Ltd. 2800 High Point Drive Suite 100A Milton, ON L9T 6P4
Report Title:	Langstaff Road Class Environmental Assessment, Fluvial Geomorphological Support Geomorphological Erosion and Meander Belt Width Assessment Vaughan, Ontario
Project Number:	PN17032
Status:	Draft
Version:	0.1
First Submission Date:	June 30, 2017
Revision Date	N/A
Prepared by:	Bryce Molder, M.Sc.
Approved by:	Paul Villard, Ph.D., P.Geo.
Approval Date:	June 30, 2017

Table of Contents

Appendices

1   Introduction

This report outlines the geomorphological study completed to support the Environmental Assessment (EA) associated with improvements along Langstaff Road in Vaughan. Three watercourses were identified and assessed within the project limits, in the road right-of-way, located along Langstaff Road between Dufferin Street and the Highway 400 interchange. The assessed watercourses include Black Creek, the West Branch of the Don River, and Westminster Creek. In addition to the EA, an erosion hazard assessment was completed for the West Branch of the Don River to inform crossing requirements and the potential impact to aquatic habitat.

The geomorphological assessment included the following activities:

- A review of watershed characteristics that directly influence the local geomorphology;
- Field investigation to document channel conditions and determine the meander belt width and erosion hazards, where applicable;
- Rapid field assessments, including a Rapid Geomorphic Assessment to evaluate channel stability, and Rapid Stream Assessment Technique to determine stream 'health'; and
- Preliminary design recommendations for the proposed crossing structures, from a geomorphological perspective.

2   Field Assessment

Black Creek, the West Branch of Don River, and Westminster Creek each cross beneath Langstaff Road within the project limits and were therefore identified as part of the Environmental Assessment. Field observations and channel measurements were completed on April 21th, 2017 by GEO Morphix Ltd. staff to characterize channel conditions and potential erosion issues to assist with informing crossing sizing. As part of the assessment, rapid stream assessment applications were completed to evaluate channel stability and stream health.

Channel instability was semi-quantified through the application of the Ontario Ministry of the Environment's (2003) Rapid Geomorphic Assessment (RGA). Observations were quantified using an index that identifies channel sensitivity based on evidence of aggradation, degradation, channel widening, and planimetric (planform) adjustment. The index produces values that indicate whether the channel is stable/in regime (score <0.20), stressed/transitional (score 0.21-0.40) or adjusting (score >0.41). The Rapid Stream Assessment Technique (RSAT) was also employed to provide a broader view of the system and consider the ecological functioning of the watercourse (Galli, 1996). Observations were made of channel stability, channel scouring or sediment deposition, instream and riparian habitats, and water quality. The RSAT score ranks the channel as maintaining a poor (<13), fair (13-24), good (25-34) or excellent (35-42) degree of stream health.

The field assessment findings are outlined for each stream below. Additionally, site photographs are provided in **Appendix A** and fieldnotes are provided in **Appendix B**.

2.1   West Branch of Don River Field Observations

Field observations for the West Branch of the Don River upstream of the Langstaff Road crossing revealed a meandering channel within an open grass-dominated field. A large meander with an amplitude of 30 m was documented 40 m north of Langstaff Road, with limited potential to impact the crossing. Portions of the channel bank were slumped into the stream along the outer bank of the channel bend. The Langstaff Road crossing consisted of an ~11 m wide concrete box culvert. There was no riparian buffer within the culvert. Downstream of the crossing, stormwater drainage

outlets flanked the sides of the channel. The west outlet was elevated, located midway up the road embankment. Downstream of Langstaff Road, the channel was partially confined on one side by the valley slope, which extended southward to nearby commercial lots. A ~25 m riparian buffer, comprised mainly of large trees existed alongside the channel. A stand of recently planted coniferous trees were noted along the outside bend of the channel. One of the trees and its full root structure had slumped and fallen into the channel, indicative of channel widening processes. The average bankfull widths and depths of the channel were 8.63 m and 1.80 m, respectively. Local meander amplitudes upstream and downstream of the crossing at Langstaff Road were measured in the range of 16 - 30 m.

Rapid stream assessments for the West Branch of Don River were conducted within the vicinity of the Langstaff Road crossing. With a RGA score of 0.39, the study reach was assessed to be "in transition" primarily due to observations that support channel widening, such as bank slumping and fallen trees. Evidence of aggradation / degradation was also observed throughout the reach. With regards to the RSAT, stream health was assessed to be "fair" with a score of 15. Riparian conditions, water quality, and channel stability scored low, while habitat conditions scored relatively higher.

2.2   Black Creek Field Observations

The Black Creek study reach stemmed from a 14 m wide four-cell concrete culvert at Creditview Road, approximately 200 m west of the Highway 400. Downstream (east) of the culvert, the channel had been previously realigned to follow a meandering planimetric form. Arrangements of shrub plantings (e.g., red osier dogwood) were in-place along the channel overbank. At the time of inspection, the channel was at bankfull capacity, due to recent rainfall events. The average bankfull widths and depths of the realigned channel were 3.50 m and 0.75 m, respectively, and the designed meander amplitude measured approximately 10 m. Approximately 150 m east of the Creditview Road crossing, the realigned channel formed into a wide vegetated swale with riprap-reinforced banks. The reinforced swale extended ~100 m south, alongside the Highway 400, before crossing beneath it within a triple-cell concrete culvert. Each cell was 2.4 m in width, for a total opening of 7.2 m. The reinforced swale emerged on the east side of the Highway 400, where it continued south towards Langstaff Road. The Langstaff Road channel crossing consisted of a similar 2.4 m triple-cell concrete culvert (7.2 m total width). The channel was tapered into the crossing by gabion basket wingwalls, which were in good condition. Downstream of Langstaff Road, the swale feature persisted south between the Highway 400 and its interchange to Langstaff Road. The swale passed beneath another 2.4 m triple-cell concrete culvert (7.2 m total width), flanked by gabion basket wingwalls. The channel emerged on the east side of the interchange lane, adjoined by a storm sewer outlet. A concrete meshing in good condition lined the channel banks near the crossing. The vegetated swale continued south, alongside the Highway 400.

Rapid Assessments were not completed for the Black Creek due to channel armouring and stream realignment.

2.3   Westminster Creek Field Observations

The Westminster Creek study reach consisted of a straightened channel armoured with gabion basket. The channel was confined within a narrow valley between commercial lots. Upstream of the Langstaff Road crossing, the channel and valley corridor (including the valley slopes, the overbank, and the channel banks) were armoured with gabion basket. Grasses, shrubs, and trees grew from the gabion, which was partially buried in soil. The gabion baskets were generally in good condition. A few small breaches in the gabion wire meshing were noted along the channel toe. The average bankfull widths and depths of the upstream section of channel were 1.8 m and 0.50 m, respectively. The Langstaff Road crossing consisted of a double-cell concrete box culvert.

Each cell measured 3.4 m in width, for a total opening of 6.8 m. Piped roadside drainage features discharged directly within the culvert to the watercourse. South of Langstaff Road, the valley corridor was armoured with gabion basket from the channel overbanks to midway up the valley slope. The gabion baskets were arranged to form a terrace consisting of multiple courses of baskets. Near the crossing, the gabion basket armouring was offset from the channel by ~1-2 m. This buffer between the channel and gabion baskets was vegetated with grasses, shrubs, and trees. The channel was wider, relative to upstream of Langstaff Road, with an average channel bankfull width and depth of 3.0 m and 0.70 m. Some undercutting of 0.05 – 0.10 m was noted along the channel banks, indicative of widening towards the gabion basket offset protection. ~70 m downstream from the Langstaff Road crossing, the channel narrowed slightly, to a width of 2.2 m, thereby reducing the riparian buffer mentioned above and exposing gabion basket along the channel banks. The straight channel and valley corridor continued south beyond the area of study.

Rapid Assessments were not completed for the Westminster Creek study site due to substantive channel armouring.

3   Geomorphological Erosion Issues and Meander Belt Widths

An assessment of erosion issues and channel meander belt width provides insight into the lateral extent that a meandering channel has historically occupied and may likely occupy in the future. This information, along with estimates of bankfull channel characteristics, helps to inform crossing structure sizing, as the structure span should compensate for any future adjustment to channel planimetric form. However, as each assessed stream was constrained between local infrastructure the full extent of the channel meander belt width could not be realistically applied as a tool to inform crossing structure sizing. As such, the assessment was completed with these constraints in mind. A summary of the findings is outlined in **Table 1**.

Of the three watercourses assessed, only the West Branch of the Don River exhibited a naturally occurring meandering alignment and could be measured for the local meander amplitude. As mentioned previously, a meander bend with an amplitude of approximately 30 m was noted within this section of channel. However, the meander bend was located ~40 m from the roadside and angled such that the bend was not expected to progress towards the road. Downstream from the crossing, the channel was partially-confined on one side by commercial lots but did not pose any adjustment concerns within the vicinity of the crossing. As noted within the rapid assessments, the channel did exhibit signs of bank erosion and slumping throughout. Additionally, there was no riparian buffer under the crossing.

Meander amplitudes were not measured for Black Creek and Westminster Creek due to evidence of channel straightening and substantive channel armouring (e.g., gabion basket / concrete mesh reinforcement). Both Black Creek and Westminster Creek were therefore not expected to migrate laterally or pose any erosion issues.

Table 1: Channel Characteristics and Meander Amplitudes

Stream	Channel Characteristics	Notes
W Branch of Don River	*Max. Meander Amplitude:* 30 m *Bankfull Width:* 8.6 m	• Valley wall contact along right (west) bank downstream of Langstaff Road crossing, constrained by commercial lots. • Bank erosion along both sides of channel • Existing crossing structure: 11 m box culvert
Black Creek	*Max. Meander Amplitude:* N/A (straightened) *Bankfull Width*: 3.5 m	• Unconfined, realigned channel / armoured swale • Stable and vegetated channel banks • Existing crossing structures: Triple-cell concrete box culvert. Cell width = 2.4 m, total width = 7.2 m
Westminster Creek	*Max. Meander Amplitude:* N/A (straightened) *Bankfull width:* 2.3 m	• Confined, armoured corridor • Straightened, armoured channel • Existing crossing structure: Double-cell concrete box culvert. Cell width = 3.4 m, total width = 6.8 m

4   Crossing Recommendations

Culvert crossings are evaluated in the context of limiting or mitigating impact to creek form and function. Crossings should achieve the following:

- Address potential channel migration;
- Maintain sediment transport processes for frequent storm events;
- Provide a span that is respectful of potential future channel erosion/migration;
- Maintain velocity differentials through the culvert for frequent storm events;
- Be placed away from actively migrating meanders; and
- Be placed along a stable and straight length of channel at a perpendicular angle to the watercourse.

Given these considerations, for Black Creek and Westminster Creek we recommend the existing crossing spans of 7.2 m and 6.8 m, respectively, be maintained at minimum. The current crossing sizes are appropriate as both streams are straight and armoured with gabion baskets and/or concrete meshing, and therefore are not expected to migrate laterally. Furthermore, the crossings are in good condition and fully encompass the existing average channel bankfull widths.

With regards to the West Branch of Don River, present channel alignment did not suggest any further planimetric adjustment towards the road. We recommend the current crossing span of 11 m be improved upon to a minimum of 15 m in width. The additional 4 m would provide a buffer against any potential erosion issues to the crossing footings, as the channel currently contacts both walls of the existing crossing. The addition of an overbank buffer would also permit passage for terrestrial wildlife beneath Langstaff Road.

It is important to note that further amendment to the recommended crossing spans is possible. In the case where only a portion of the suggested width can be provided due to other design considerations (e.g., the presence of subsurface infrastructure or the shallowness of the road),

the incorporation of channel bioengineering may also help to reduce a given crossing span while maintaining channel form and function.

We trust this report meets your requirements. Should you have any questions please contact the undersigned.

Respectfully submitted,

Paul Villard Ph.D., P.Geo., CAN-CISEC
Director, Senior Geomorphologist

Bryce Molder M.Sc.,
Earth Scientist in-Training

5   References

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Appendix A
Photographic Record

Photo 1	
	Don River: Downstream from the Langstaff Road crossing, the study reach followed a meandering planimetric form. In-channel woody debris was common.
Photo 2	
	Don River: Channel bank erosion and slumping due to undercutting was observed throughout the study reach.

Photo 3	
	Don River: Fresh sand deposits and sand dominated point bars were noted throughout the study reach.
Photo 4	
	Don River: The channel spanned the entirety of the Langstaff Road crossing.

Photo 5	
	Don River: A stormwater outlet was located adjacent to the Langstaff Road crossing at the downstream end.
Photo 6	
	Don River: A roadside drainage outlet was located midway up the road embankment adjacent to the Langstaff Road crossing.

Photo 7	
	Don River: Upstream from the Langstaff Road crossing, the channel entered an open field. Erosion was generally observed along the outer banks.
Photo 8	
	Don River: A meander amplitude of approximately 30 m was observed within the vicinity of the Langstaff Road crossing.
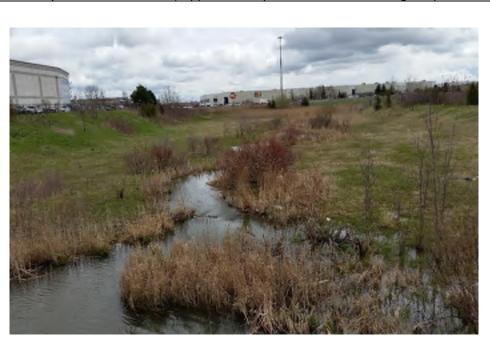
Photo 9	
	Black Creek: The studied reach stemmed from a concrete box culvert (~14 m in total width) at Creditview Road, approximately 200 m west of the Highway 400.
Photo 10	
	Black Creek: The channel was realigned directly downstream of the Creditview Road crossing.

Photo 11	
	Black Creek: The realigned channel design followed a sinuous planform. Flow conditions were at bankfull capacity during the time of assessment due to recent rainfall.
Photo 12	
	Black Creek: A stormwater management pond was located adjacent to the realigned channel, west of the Highway 400.

Photo 13	
	Black Creek: The channel formed into a wide vegetated swale near the Highway 400 crossing. The channel had been previously realigned and reinforced with riprap.
Photo 14	
	Black Creek: The reinforced swale feature persisted downstream of the Highway 400 crossing. The channel veered south towards Langstaff Road.

Photo 15
Black Creek: A wide vegetated swale was observed downstream from the Langstaff Road crossing.
Photo 16
Black Creek: A triple-cell concrete box culvert was observed at the highway interchange crossing, south of Langstaff Road. |
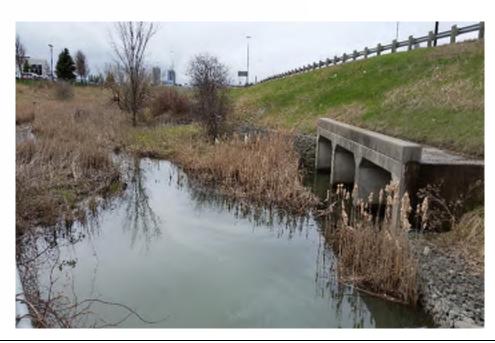
Photo 17	
	Black Creek: Downstream of the Highway 400 interchange crossing, the reinforced swale continued south. A concrete meshing and gabion baskets lined the channel banks near the crossing.
Photo 18	
	Black Creek: The swale was well-vegetated downstream of the Highway 400 interchange crossing.

Photo 19	
	Westminster Creek: Upstream of the Langstaff Road crossing the channel and valley corridor were armoured with gabion basket. The channel was straight.
Photo 20	
	Westminster Creek: Some sections of the gabion basket wire meshing were eroded and missing stone.

Photo 21	
	Westminster Creek: The Langstaff Road crossing consisted of a double-cell concrete box culvert. The gabion baskets near the crossing were in good condition.
Photo 22	
	Westminster Creek: Downstream (south) of the Langstaff Road crossing, there was a ~1-2 m riparian buffer on either side of the channel.

Photo 23	
	Westminster Creek: The channel corridor was armoured with gabion basket. The corridor was constrained between commercial lots.
Photo 24	
	Westminster Creek: Vegetation, including grasses and trees, grew from the gabion baskets. The gabion baskets were in good condition.

Appendix B
Field Observations

General Site Characteristics

Project Code: 17032

Date:	April 21, 2017	Stream/Reach:	Don R. W branch
Weather:	10°C over	Location:	Langstaff Rd
Field Staff:	BM Am	Watershed/Subwatershed:	Don R.

Features

Symbol	Description
⊢━┤	Reach break
×——×	Cross-section
→	Flow direction
∿➤	Riffle
⬭	Pool
▱	Medial bar
⌇⌇⌇	Eroded bank
- - - -	Undercut bank
▦▦▦	Rip rap/stabilization/gabion
⟊	Leaning tree
×-×-×	Fence
⊔	Culvert/outfall
⬯	Swamp/wetland
ᴠᴠᴠ	Grasses
◯	Tree
⬬	Instream log/tree
x x x	Woody debris
�878	Station location
⬭	Vegetated island

Flow Type

H1	Standing water
H2	Scarcely perceptible flow
H3	Smooth surface flow
H4	Upwelling
H5	Rippled
H6	Unbroken standing wave
H7	Broken standing wave
H8	Chute
H9	Free fall

Substrate

S1	Silt	S6	Small boulder
S2	Sand	S7	Large boulder
S3	Gravel	S8	Bimodal
S4	Small cobble	S9	Bedrock/till
S5	Large cobble		

Other

BM	Benchmark	EP	Erosion pin
BS	Backsight	RB	Rebar
DS	Downstream	US	Upstream
WDJ	Woody debris jam	TR	Terrace
VWC	Valley wall contact	FC	Flood chute
BOS	Bottom of slope	FP	Flood plain
TOS	Top of slope	KP	Knick point

Site Sketch:

Additional Notes: Sand deposits noted throughout erosion along both banks MA 16-30m

Completed by: BM   Checked by: _____

Reach Characteristics

GEO | MORPHIX

Geomorphology · Earth Science · Conservation

Project Code/Phase: PN17432

Date:	April 21/2017	Stream/Reach:	Don R
Weather:	Overcast 10°C	Location:	Langstaff Rd. / Keele Vaughan
Field staff:	AM BM	Watershed/Subwatershed:	Don R
UTM (Upstream)		UTM (Downstream)	

Land Use (Table 1): 5
Valley Type (Table 2): 3
Channel Type (Table 3): 8
Channel Zone (Table 4): 2
Flow Type (Table 5): 1
☐ Groundwater Evidence: N/A

Riparian Vegetation

Dominant Type (Table 6): 1

Coverage:
☐ None
☒ Fragmented
☐ Continuous

Species: Willow

Channel widths:
☐ 1-4
☒ 4-10
☐ > 10

Age Class (yrs):
☐ Immature (<5)
☒ Established (5-30)
☐ Mature (>30)

Encroachment (Table 7): 3

Aquatic/Instream Vegetation

Type (Table 8): 1   **Coverage of Reach (%):** >5

Woody Debris
☒ Present in Cutbank
☒ Present in Channel
☐ Not Present

Density of WD:
☐ Low   WDJ/50m:
☒ Moderate
☐ High   3

Water Quality

Odour (Table 16): 1

Turbidity (Table 17): 3

Channel Characteristics

Sinuosity (Type) (Table 9): 2
Sinuosity (Degree) (Table 10): 3
Gradient (Table 11): 1
Number of Channels (Table 12): 1

Entrenchment (Table 13): 2
Type of Bank Failure (Table 14): 1/2
Downs's Classification (Table 15): E

					Clay/Silt	Sand	Gravel	Cobble	Boulder	Parent	Rootlets
Riffle Substrate					☒	☒	☒	☒	☐	☐	☐
Pool Substrate					☒	☒	☒	☐	☐	☐	☐
Bank Material					☒	☒					

Bank Angle
☐ 0 – 30
☒ 30 – 60
☒ 60 – 90
☒ Undercut

Bank Erosion
☐ < 5%
☐ 5 – 30%
☒ 30 – 60%
☐ 60 – 100%

	DS	US			DS	US		
Bankfull Width (m)	7.5	9		**Wetted Width (m)**	5.5	9.4		
Bankfull Depth (m)	2	1.4		**Wetted Depth (m)**	0.75	2		
% Riffles:	80			**% Pools:**	30			
Riffle/Pool Spacing (m)	1m			**Undercuts (m)**	10			
Pool Depth (m)	1m/0.5m/0.45 = 0.34			**Meander Amplitude:**	50			
Velocity (m/s)				**Comments:**	0.25			

(Wiffle ball / ADV / Estimated — Wiffle ball circled)

DS 0.4 DS 45 DS 7
US 1.8 (11m, 26m, 15m, 30m)

Notes:

Completed by: AM   **Checked by:** _____

Rapid Geomorphic Assessment

Project Code: 17032

Date:	April 2l, 2017	Stream/Reach:	Don R. W Branch
Weather:	10° crowels	Location:	Langstaff Rd.
Field Staff:	Am Bm.	Watershed/Subwatershed:	Don R.

Process	Geomorphic Indicator		Present?		Factor Value
	No.	Description	Yes	No	
Evidence of Aggradation (AI)	1	Lobate bar		✓	
	2	Coarse materials in riffles embedded		✓	
	3	Siltation in pools		✓	
	4	Medial bars		✓	
	5	Accretion on point bars	✓		
	6	Poor longitudinal sorting of bed materials		✓	
	7	Deposition in the overbank zone	✓		
		Sum of indices =	2	5	0.29
Evidence of Degradation (DI)	1	Exposed bridge footing(s)		✓	
	2	Exposed sanitary / storm sewer / pipeline / etc.		✓	
	3	Elevated storm sewer outfall(s)	Nb		
	4	Undermined gabion baskets / concrete aprons / etc.	NA		
	5	Scour pools downstream of culverts / storm sewer outlets	✓		
	6	Cut face on bar forms		✓	
	7	Head cutting due to knick point migration		✓	
	8	Terrace cut through older bar material	✓		
	9	Suspended armour layer visible in bank		✓	
	10	Channel worn into undisturbed overburden / bedrock		✓	
		Sum of indices =	2	6	0.25
Evidence of Widening (WI)	1	Fallen / leaning trees / fence posts / etc.	✓		
	2	Occurrence of large organic debris	✓		
	3	Exposed tree roots	✓		
	4	Basal scour on inside meander bends	✓		
	5	Basal scour on both sides of channel through riffle		✓	
	6	Outflanked gabion baskets / concrete walls / etc.		✓	
	7	Length of basal scour >50% through subject reach		✓	
	8	Exposed length of previously buried pipe / cable / etc.	NA		
	9	Fracture lines along top of bank		✓	
	10	Exposed building foundation			
		Sum of indices =	4	4	0.5
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)		✓	
	2	Single thread channel to multiple channel		✓	
	3	Evolution of pool-riffle form to low bed relief form		✓	
	4	Cut-off channel(s)		✓	
	5	Formation of island(s)		✓	
	6	Thalweg alignment out of phase with meander form		✓	
	7	Bar forms poorly formed / reworked / removed	✓		
		Sum of indices =	1	6	0.14

Additional notes:	Stability Index (SI) = (AI+DI+WI+PI)/4 =	0.29

	Condition	In Regime	In Transition/Stress	In Adjustment
	SI score =	☐ 0.00 - 0.20	☑ 0.21 - 0.40	☐ 0.41

Completed by: Bm. Checked by: _____

Rapid Stream Assessment Technique

Project Code: 17022

Date:	April 21, 2017	Stream/Reach:	Don R.
Weather:	12° C clouds	Location:	Langstaff / Keele
Field Staff:	Am Bm	Watershed/Subwatershed:	Don R

Evaluation Category	Poor	Fair	Good	Excellent
Channel Stability	• < 50% of bank network stable • Recent bank sloughing, slumping or failure frequently observed	• 50-70% of bank network stable • Recent signs of bank sloughing, slumping or failure fairly common	• 71-80% of bank network stable • Infrequent signs of bank sloughing, slumping or failure	• > 80% of bank network stable • No evidence of bank sloughing, slumping or failure
	• Stream bend areas highly unstable • Outer bank height 1.2 m above stream bank (2.1 m above stream bank for large mainstem areas) • Bank overhang > 0.8-1.0 m	• Stream bend areas unstable • Outer bank height 0.9-1.2 m above stream bank (1.5-2.1 m above stream bank for large mainstem areas) • Bank overhang 0.8-0.9m	• Stream bend areas stable • Outer bank height 0.6-0.9 m above stream bank (1.2-1.5 m above stream bank for large mainstem areas) • Bank overhang 0.6-0.8 m	• Stream bend areas very stable • Height < 0.6 m above stream (< 1.2 m above stream bank for large mainstem areas) • Bank overhang < 0.6 m
	• Young exposed tree roots abundant • > 6 recent large tree falls per stream mile	• Young exposed tree roots common • 4-5 recent large tree falls per stream mile	• Exposed tree roots predominantly old and large, smaller young roots scarce • 2-3 recent large tree falls per stream mile	• Exposed tree roots old, large and woody • Generally 0-1 recent large tree falls per stream mile
	• Bottom 1/3 of bank is highly erodible material • Plant/soil matrix severely compromised	• Bottom 1/3 of bank is generally highly erodible material • Plant/soil matrix compromised	• Bottom 1/3 of bank is generally highly resistant plant/soil matrix or material	• Bottom 1/3 of bank is generally highly resistant plant/soil matrix or material
	• Channel cross-section is generally trapezoidally-shaped	• Channel cross-section is generally trapezoidally-shaped	• Channel cross-section is generally V- or U-shaped	• Channel cross-section is generally V- or U-shaped
Point range	☐ 0 ☐ 1 ☐ 2	☑ 3 ☐ 4 ☐ 5	☐ 6 ☐ 7 ☐ 8	☐ 9 ☐ 10 ☐ 11
Channel Scouring/ Sediment Deposition	• > 75% embedded (> 85% embedded for large mainstem areas)	• 50-75% embedded (60-85% embedded for large mainstem areas)	• 25-49% embedded (35-59% embedded for large mainstem areas)	• Riffle embeddedness < 25% sand-silt (< 35% embedded for large mainstem areas)
	• Few, if any, deep pools • Pool substrate composition >81% sand-silt	• Low to moderate number of deep pools • Pool substrate composition 60-80% sand-silt	• Moderate number of deep pools • Pool substrate composition 30-59% sand-silt	• High number of deep pools (> 61 cm deep) (> 122 cm deep for large mainstem areas) • Pool substrate composition <30% sand-silt
	• Streambed streak marks and/or "banana"-shaped sediment deposits common	• Streambed streak marks and/or "banana"-shaped sediment deposits common	• Streambed streak marks and/or "banana"-shaped sediment deposits uncommon	• Streambed streak marks and/or "banana"-shaped sediment deposits absent
	• Fresh, large sand deposits very common in channel • Moderate to heavy sand deposition along major portion of overbank area	• Fresh, large sand deposits common in channel • Small localized areas of fresh sand deposits along top of low banks	• Fresh, large sand deposits uncommon in channel • Small localized areas of fresh sand deposits along top of low banks	• Fresh, large sand deposits rare or absent from channel • No evidence of fresh sediment deposition on overbank
	• Point bars present at most stream bends, moderate to large and unstable with high amount of fresh sand	• Point bars common, moderate to large and unstable with high amount of fresh sand	• Point bars small and stable, well-vegetated and/or armoured with little or no fresh sand	• Point bars few, small and stable, well-vegetated and/or armoured with little or no fresh sand
Point range	☐ 0 ☐ 1 ☐ 2	☑ 3 ☐ 4	☐ 5 ☐ 6	☐ 7 ☐ 8

Date:	2017. April 21	Reach:	Don R	Project Code:	17030

Evaluation Category	Poor	Fair	Good	Excellent
Physical Instream Habitat	• Wetted perimeter < 40% of bottom channel width (< 45% for large mainstem areas)	• Wetted perimeter 40-60% of bottom channel width (45-65% for large mainstem areas)	• Wetted perimeter 61-85% of bottom channel width (66-90% for large mainstem areas) *(circled)*	• Wetted perimeter > 85% of bottom channel width (> 90% for large mainstem areas)
	• Dominated by one habitat type (usually runs) and by one velocity and depth condition (slow and shallow) (for large mainstem areas, few riffles present, runs and pools dominant, velocity and depth diversity low)	• Few pools present, riffles and runs dominant. • Velocity and depth generally slow and shallow (for large mainstem areas, runs and pools dominant, velocity and depth diversity intermediate)	• Good mix between riffles, runs and pools • Relatively diverse velocity and depth of flow	• Riffles, runs and pool habitat present • Diverse velocity and depth of flow present (i.e., slow, fast, shallow and deep water)
	• Riffle substrate composition: predominantly gravel with high amount of sand • < 5% cobble	• Riffle substrate composition: predominantly small cobble, gravel and sand • 5-24% cobble	• Riffle substrate composition: good mix of gravel, cobble, and rubble material *(circled)* • 25-49% cobble	• Riffle substrate composition: cobble, gravel, rubble, boulder mix with little sand • > 50% cobble
	• Riffle depth < 10 cm for large mainstem areas	• Riffle depth 10-15 cm for large mainstem areas	• Riffle depth 15-20 cm for large mainstem areas	• Riffle depth > 20 cm for large mainstem areas
	• Large pools generally < 30 cm deep (< 61 cm for large mainstem areas) and devoid of overhead cover/structure	• Large pools generally 30-46 cm deep (61-91 cm for large mainstem areas) with little or no overhead cover/structure	• Large pools generally 46-61 cm deep (91-122 cm for large mainstem areas) with some overhead cover/structure	• Large pools generally > 61 cm deep (> 122 cm for large mainstem areas) with good overhead cover/structure
	• Extensive channel alteration and/or point bar formation/enlargement	• Moderate amount of channel alteration and/or moderate increase in point bar formation/enlargement *(circled)*	• Slight amount of channel alteration and/or slight increase in point bar formation/enlargement	• No channel alteration or significant point bar formation/enlargement
	• Riffle/Pool ratio 0.49:1 ; ≥1.51:1	• Riffle/Pool ratio 0.5-0.69:1 ; 1.31-1.5:1	• Riffle/Pool ratio 0.7-0.89:1 ; 1.11-1.3:1 *(circled)*	• Riffle/Pool ratio 0.9-1.1:1
	• Summer afternoon water temperature > 27°C	• Summer afternoon water temperature 24-27°C	• Summer afternoon water temperature 20-24°C	• Summer afternoon water temperature < 20°C
Point range	☐ 0 ☐ 1 ☐ 2	☐ 3 ☐ 4	☑ 5 ☐ 6	☐ 7 ☐ 8
Water Quality	• Substrate fouling level: High (> 50%)	• Substrate fouling level: Moderate (21-50%) *(circled)*	• Substrate fouling level: Very light (11-20%)	• Substrate fouling level: Rock underside (0-10%)
	• Brown colour • TDS: > 150 mg/L	• Grey colour • TDS: 101-150 mg/L *(circled)*	• Slightly grey colour • TDS: 50-100 mg/L	• Clear flow • TDS: < 50 mg/L
	• Objects visible to depth < 0.15m below surface *(circled)*	• Objects visible to depth 0.15-0.5m below surface	• Objects visible to depth 0.5-1.0m below surface	• Objects visible to depth > 1.0m below surface
	• Moderate to strong organic odour	• Slight to moderate organic odour	• Slight organic odour	• No odour
Point range	☐ 0 ☐ 1 ☑ 2	☐ 3 ☐ 4	☐ 5 ☐ 6	☐ 7 ☐ 8
Riparian Habitat Conditions	• Narrow riparian area of mostly non-woody vegetation	• Riparian area predominantly wooded but with major localized gaps *(circled)*	• Forested buffer generally > 31 m wide along major portion of both banks	• Wide (> 60 m) mature forested buffer along both banks
	• Canopy coverage: <50% shading (30% for large mainstem areas)	• Canopy coverage: 50-60% shading (30-44% for large mainstem areas) *(circled)*	• Canopy coverage: 60-79% shading (45-59% for large mainstem areas)	• Canopy coverage: >80% shading (> 60% for large mainstem areas)
Point range	☐ 0 ☐ 1	☑ 2 ☐ 3	☐ 4 ☐ 5	☐ 6 ☐ 7

Total overall score (0–42) = 15	Poor (<13)	Fair (13-24) *(circled)*	Good (25-34)	Excellent (>35)

Completed by: BM   Checked by: _____

General Site Characteristics

Project Code: 17032

Date:	May 31	Stream/Reach:	Westminster ck
Weather:	20°C	Location:	Langstaff + Dufferin
Field Staff:	BM	Watershed/Subwatershed:	Don R.

Features

⊢——⊣	Reach break
×——	Cross-section
→	Flow direction
〜〜	Riffle
⬯	Pool
⬬	Medial bar
wwww	Eroded bank
- - - -	Undercut bank
▩▩▩▩	Rip rap/stabilization/gabion
✶	Leaning tree
×—×—×	Fence
⊔	Culvert/outfall
⬭	Swamp/wetland
ⱽⱽⱽ	Grasses
◯	Tree
⬭	Instream log/tree
× × ×	Woody debris
ⴽ	Station location
⬯	Vegetated island

Flow Type

H1	Standing water
H2	Scarcely perceptible flow
H3	Smooth surface flow
H4	Upwelling
H5	Rippled
H6	Unbroken standing wave
H7	Broken standing wave
H8	Chute
H9	Free fall

Substrate

S1	Silt	S6	Small boulder
S2	Sand	S7	Large boulder
S3	Gravel	S8	Bimodal
S4	Small cobble	S9	Bedrock/till
S5	Large cobble	S10	Rprap 15cm

Other

BM	Benchmark	EP	Erosion pin
BS	Backsight	RB	Rebar
DS	Downstream	US	Upstream
WDJ	Woody debris jam	TR	Terrace
VWC	Valley wall contact	FC	Flood chute
BOS	Bottom of slope	FP	Flood plain
TOS	Top of slope	KP	Knick point

Site Sketch:

Notes on sketch: exposed gabion, unembedded gabion; commercial; N (arrow); H3; S10; TOS; (2x) 3.55m concrete box culverts aused both; Roadside drainage; hidden bottom to culvert beneath road; Langstaff Rd; man. lawn; S2; H3; S6; US; multiple gabion rows; 1.5m grassy/buffer shrub; commercial; outfall; Scale:

Right margin notes:
US
V = 0.6 m/s
BF: 1.75 x 0.6 m
2m, 4m (sketch) gabion + Rprap
XS
• Pieces of gabion + riprap in channel

DS
V = 0.1 m/s
BF = 3m x 0.7m

Additional Notes:

Completed by: BM   Checked by: _____

GEO | MORPHIX

Geomorphology
Earth Science
Observation

Reach Characteristics

Project Code/Phase: 17032

Date:	May 8, 2017	Stream/Reach:	Westminster dr
Weather:	20°c	Location:	Guyatt Rd.
Field staff:	BM	Watershed/Subwatershed:	
UTM (Upstream)		UTM (Downstream)	

Land Use (Table 1): 9
Valley Type (Table 2): 2
Channel Type (Table 3): 6
Channel Zone (Table 4): 2
Flow Type (Table 5): 1
☐ Groundwater NA   Evidence: _____

Riparian Vegetation

Dominant Type: (Table 6) 1/3
Coverage:
☐ None
☐ Fragmented
☑ Continuous

Species: _____

Age Class (yrs): Channel widths
☐ Immature (<5)   ☑ 1-4
☑ Established (5-30) ☐ 4-10
☐ Mature (>30)   ☐ >10

Encroachment: (Table 7) 1

Aquatic/Instream Vegetation

Type (Table 8): 1
Coverage of Reach (%): 5

Woody Debris
☐ Present in Cutbank
☐ Present in Channel
☑ Not Present

Density of WD: WDJ/50m:
☑ Low   0
☐ Moderate
☐ High

Water Quality

Odour (Table 16): 4
Turbidity (Table 17): 2

Channel Characteristics

Sinuosity (Type) (Table 9): 1
Sinuosity (Degree) (Table 10): 1
Gradient (Table 11): 2

Entrenchment (Table 13): 2
Type of Bank Failure (Table 14): 2
Downs's Classification (Table 15): 4

Number of Channels (Table 12): 1

Bankfull Width (m)	1.75	2.2	3.0	
Bankfull Depth (m)	0.5	0.5	0.7	
Riffle/Pool Spacing (m)	NA	NA	NA	
Pool Depth (m)	NA	0.0	0.10	
Velocity (m/s)	0.6			

Wetted Width (m): 1.70 1.9 2.6
Wetted Depth (m): 0.10 0.15 0.30
% Pools: NA
Undercuts (m): NA
Meander Amplitude: NA
% Riffles: NA
Riffle Length (m): NA

Wiffle ball / ADV / Estimated: 3.05

Comments: Coarse bed channel, _____ Gully _____ _____ US, sand/riprap/gravel _____

	Clay/Silt	Sand	Gravel	Cobble	Boulder	Parent	Rootlets
Riffle Substrate	☐	☐	☐	☐	☐	☐	☐
Pool Substrate	☐	☐	☐	☐	☐	☐	☐
Bank Material	☐	☐	☐	☐	☐	☐	☐

Bank Angle
☐ 0 – 30
☐ 30 – 60
☐ 60 – 90
☑ Undercut

Bank Erosion
☐ < 5%
☐ 5 – 30%
☐ 30 – 60%
☐ 60 – 100%
NA
Gully

Notes: _____

Completed by: BM   **Checked by:** _____

General Site Characteristics

Project Code: 17032

Date:	2017, Apr 21	Stream/Reach:	Black Ck
Weather:	10°C, over	Location:	400 / Langstaff
Field Staff:	AM BM	Watershed/Subwatershed:	Black Ck

Features

Symbol	Description
⊢—⊣	Reach break
×——×	Cross-section
→→	Flow direction
⌵⌵►	Riffle
⬭	Pool
▨	Medial bar
⋀⋀⋀⋀	Eroded bank
- - - -	Undercut bank
⬚⬚⬚⬚	Rip rap/stabilization/gabion
⧫	Leaning tree
×--×--×	Fence
⊔	Culvert/outfall
⬯	Swamp/wetland
⋁⋁⋁	Grasses
◯	Tree
▱	Instream log/tree
× × ×	Woody debris
⌁	Station location
⬭	Vegetated island

Flow Type

H1	Standing water
H2	Scarcely perceptible flow
H3	Smooth surface flow
H4	Upwelling
H5	Rippled
H6	Unbroken standing wave
H7	Broken standing wave
H8	Chute
H9	Free fall

Substrate

S1	Silt	S6	Small boulder
S2	Sand	S7	Large boulder
S3	Gravel	S8	Bimodal
S4	Small cobble	S9	Bedrock/till
S5	Large cobble		

Other

BM	Benchmark	EP	Erosion pin
BS	Backsight	RB	Rebar
DS	Downstream	US	Upstream
WDJ	Woody debris jam	TR	Terrace
VWC	Valley wall contact	FC	Flood chute
BOS	Bottom of slope	FP	Flood plain
TOS	Top of slope	KP	Knick point

Site Sketch:

Additional Notes:

Completed by: BM. Checked by: _____

APPENDIX

E

Stormwater Management

3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Pipe Storage HSP-1

Storage Facility # HSP-1A

Stage	Discharge	Storage Active	Storage Total	Stage	Forebays Area	Forebays Incremental Volume	Forebays Accumulated Volume	Main Pool (Excluding Forebay) Area	Main Pool Incremental Volume	Main Pool Accumulated Volume	Storage Sediment	Storage Total	Estimated Detention Time
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
204.12	0.0000	0	0	204.12					0	0	0	0	
204.32	0.0081	31	31	204.32					0	31	0	31	
204.52	0.0123	74	74	204.52					0	74	0	74	
204.72	0.0155	118	118	204.72					0	118	0	118	
204.92	0.0181	161	161	204.92					0	161	0	161	
205.12	0.0584	204	204	205.12					0	204	0	204	
205.32	0.0920	259	259	205.32					0	259	0	259	

3216079 Langstaff Road EA
Detailed Outlet Structure Discharge Calculations

Elevation	Spillway Weir 1	Spillway Weir 2	Spillway Total	Outlet Riser Orifice 1	Outlet Riser Weir 1	Outlet Riser Orifice 2	Outlet Riser Total	DICB	Total Discharge
(m)	Weir 1	Weir 2	Total	Orifice 1	Weir 1	Orifice 2	Total		Discharge
204.12	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	**0.0000**
204.32	0.000	0.000	0.000	0.00808	0.000	0.000	0.008	0.000	**0.0081**
204.52	0.000	0.000	0.000	0.01235	0.000	0.000	0.012	0.000	**0.0123**
204.72	0.000	0.000	0.000	0.01548	0.000	0.000	0.015	0.000	**0.0155**
204.92	0.000	0.000	0.000	0.01808	0.000	0.000	0.018	0.000	**0.0181**
205.12	0.000	0.000	0.000	0.02034	0.000	0.038	0.058	0.000	**0.0584**
205.32	0.000	0.000	0.000	0.02238	0.000	0.070	0.092	0.000	**0.0920**

Parameters

Overflow Weir 1		Orifice 1	
Crest Elevation		Orifice Centre	Perimeter
9999.00 m		204.17 m	314 mm
Crest Width		Orifice Invert	Area
1 m		204.12 m	7,854 mm²
Slope (x:1)	5	Orifice Diameter	Orifice Coeff.
Weir Coeff.	1.670	100 mm	0.6
Weir Top Width (m)	-97935.8	Orientation	
		Vertical	

Overflow Weir 2		Weir 1	
Crest Elevation		Top of Weir Structure	Max Perimeter
9999.00 m		9999.30 m	1,400 mm
Crest Width		Weir Crest Invert	Max Open Area
3 m		9999.00 m	240,000 mm²
Slope (x:1)	3	Weir Dimensions (Height x Length)	
Weir Coeff.	1.670	300 mm Height	800 mm L
Weir Top Width (m)	-58941.000	Side Walls	Weir Coeff.
		Vertical	1.670

DICB		Orifice 2	
T/G Invert		Orifice Centre	Perimeter
9999.00 m		205.03 m	785 mm
CB Size		Orifice Invert	Area
1200 mm		204.91 m	49,087 mm²
by		Orifice Diameter	Orifice Coeff.
600 mm		250 mm	0.6
Grate Slope		Orientation	Operates Above (m)
4 :1		Vertical	205.03
Area (m²)	0.720		
Perimeter (m)	3.600		

$$Q = CA\sqrt{2g\left(h_2 - h_1 + \frac{D}{2000}\right)}$$

$$Q = CL(h_2 - h_1)^{1.5} + 1.268z(h_2 - h_1)^{2.5}$$

Where, h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)
D = orifice diameter (mm)
C = orifice coefficient
A = orifice open area (m²)

h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)
L = weir crest length (m)
C = weir coefficient
z = weir side slope (z:1)

3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Pipe Storage HSP-1   **Storage Facility # HSP-1B**

| Stage | Discharge | Storage | | Stage | Forebays | | | Main Pool (Excluding Forebay) | | | Storage | | Estimated Detention Time |
| | | Active | Total | | Area | Incremental Volume | Accumulated Volume | Area | Incremental Volume | Accumulated Volume | Sediment | Total | |
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
205.35	0.0000	0	0	205.35					0	0	0	0	
205.55	0.0081	31	31	205.55					0	31	0	31	
205.75	0.0123	74	74	205.75					0	74	0	74	
205.95	0.0155	118	118	205.95					0	118	0	118	
206.15	0.0181	161	161	206.15					0	161	0	161	
206.35	0.0584	204	204	206.35					0	204	0	204	
206.55	0.0920	259	259	206.55					0	259	0	259	

3216079 Langstaff Road EA
Detailed Outlet Structure Discharge Calculations

| Elevation | Discharge (m³/s) | | | | | | | | Total |
| | Spillway | | | Outlet Riser | | | | DICB | Discharge |
(m)	Weir 1	Weir 2	Total	Orifice 1	Weir 1	Orifice 2	Total		
205.35	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	**0.0000**
205.55	0.000	0.000	0.000	0.00808	0.000	0.000	0.008	0.000	**0.0081**
205.75	0.000	0.000	0.000	0.01235	0.000	0.000	0.012	0.000	**0.0123**
205.95	0.000	0.000	0.000	0.01548	0.000	0.000	0.015	0.000	**0.0155**
206.15	0.000	0.000	0.000	0.01808	0.000	0.000	0.018	0.000	**0.0181**
206.35	0.000	0.000	0.000	0.02034	0.000	0.038	0.058	0.000	**0.0584**
206.55	0.000	0.000	0.000	0.02238	0.000	0.070	0.092	0.000	**0.0920**

Parameters

Overflow Weir 1		Orifice 1	
Crest Elevation		Orifice Centre	Perimeter
9999.00 m		205.40 m	314 mm
Crest Width		Orifice Invert	Area
1 m		205.35 m	7,854 mm²
Slope (x:1)	5	Orifice Diameter	Orifice Coeff.
Weir Coeff.	1.670	100 mm	0.6
Weir Top Width (m)	-97923.5	Orientation	
		Vertical	

Overflow Weir 2		Weir 1	
Crest Elevation		Top of Weir Structure	Max Perimeter
9999.00 m		9999.30 m	1,400 mm
Crest Width		Weir Crest Invert	Max Open Area
3 m		9999.00 m	240,000 mm²
Slope (x:1)	3	Weir Dimensions (Height x Length)	
Weir Coeff.	1.670	300 mm Height	800 mm L
Weir Top Width (m)	-58941.000	Side Walls	Weir Coeff.
DICB		Vertical	1.670
T/G Invert		**Orifice 2**	
9999.00 m		Orifice Centre	Perimeter
CB Size		206.26 m	785 mm
1200 mm		Orifice Invert	Area
by		206.14 m	49,087 mm²
600 mm		Orifice Diameter	Orifice Coeff.
Grate Slope		250 mm	0.6
4 :1		Orientation	Operates Above (m)
Area (m²)	0.720	Vertical	206.26
Perimeter (m)	3.600		

$$Q = CA\sqrt{2g\left(h_2 - h_1 + \frac{D}{2000}\right)}$$

$$Q = CL(h_2 - h_1)^{1.5} + 1.268z(h_2 - h_1)^{2.5}$$

Where, h2 = elevation at stage 2 (m)   h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)   h1 = elevation at stage 1 (m)
D = orifice diameter (mm)   L = weir crest length (m)
C = orifice coefficient   C = weir coefficient
A = orifice open area (m²)   z = weir side slope (z:1)

3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Pipe Storage HSP-2 **Facility # HSP-2**

Stage	Discharge	Storage		Stage	Forebays			Main Pool (Excluding Forebay)			Storage		Estimated Detention Time
		Active	Total		Area	Incremental Volume	Accumulated Volume	Area	Incremental Volume	Accumulated Volume	Sediment	Total	
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
204.44	0.0000	0	0	204.44					0	0	0	0	
204.64	0.0264	24	24	204.64					0	24	0	24	
204.84	0.0457	99	99	204.84					0	99	0	99	
205.04	0.0590	204	204	205.04					0	204	0	204	
205.24	0.0699	309	309	205.24					0	309	0	309	
205.44	0.0792	414	414	205.44					0	414	0	414	
205.64	0.0876	666	666	205.64					0	666	0	666	

3216079 Langstaff Road EA

Detailed Outlet Structure Discharge Calculations

Elevation	Discharge (m³/s)								
	Spillway			Outlet Riser				DICB	Total Discharge
(m)	Weir 1	Weir 2	Total	Orifice 1	Weir 1	Orifice 2	Total		
204.44	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	0.0000
204.64	0.000	0.000	0.000	0.02640	0.000	0.000	0.026	0.000	0.0264
204.84	0.000	0.000	0.000	0.04573	0.000	0.000	0.046	0.000	0.0457
205.04	0.000	0.000	0.000	0.05904	0.000	0.000	0.059	0.000	0.0590
205.24	0.000	0.000	0.000	0.06986	0.000	0.000	0.070	0.000	0.0699
205.44	0.000	0.000	0.000	0.07921	0.000	0.000	0.079	0.000	0.0792
205.64	0.000	0.000	0.000	0.08757	0.000	0.000	0.088	0.000	0.0876

Parameters

Overflow Weir 1
- Crest Elevation: 9999.00 m
- Crest Width: 1 m
- Slope (x:1): 5
- Weir Coeff.: 1.670
- Weir Top Width (m): -97932.6

Overflow Weir 2
- Crest Elevation: 9999.00 m
- Crest Width: 3 m
- Slope (x:1): 3
- Weir Coeff.: 1.670
- Weir Top Width (m): -58941.000

DICB
- T/G Invert: 9999.00 m
- CB Size: 1200 mm by 600 mm
- Grate Slope: 4 :1
- Area (m²): 0.720
- Perimeter (m): 3.600

Orifice 1
- Orifice Centre: 204.54 m
- Orifice Invert: 204.44 m
- Orifice Diameter: 200 mm
- Orientation: Vertical
- Perimeter: 628 mm
- Area: 31,416 mm²
- Orifice Coeff.: 0.6

Weir 1
- Top of Weir Structure: 9999.30 m
- Weir Crest Invert: 9999.00 m
- Weir Dimensions (Height x Length): 300 mm Height, 800 mm L
- Side Walls: Vertical
- Max Perimeter: 1,400 mm
- Max Open Area: 240,000 mm²
- Weir Coeff.: 1.670

Orifice 2
- Orifice Centre: 205.67 m
- Orifice Invert: 205.51 m
- Orifice Diameter: 310 mm
- Orientation: Vertical
- Perimeter: 974 mm
- Area: 75,477 mm²
- Orifice Coeff.: 0.6
- Operates Above (m): 205.67

$$Q = CA\sqrt{2g\left(h_2 - h_1 + \frac{D}{2000}\right)}$$

$$Q = CL(h_2 - h_1)^{1.5} + 1.268z(h_2 - h_1)^{2.5}$$

Where,
h2 = elevation at stage 2 (m)	h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)	h1 = elevation at stage 1 (m)
D = orifice diameter (mm)	L = weir crest length (m)
C = orifice coefficient	C = weir coefficient
A = orifice open area (m²)	z = weir side slope (z:1)

3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Pipe Storage HSP-3

Facility # HSP-3

Stage	Discharge	Storage Active	Storage Total	Stage	Forebays Area	Forebays Incremental Volume	Forebays Accumulated Volume	Main Pool (Excl. Forebay) Area	Main Pool Incremental Volume	Main Pool Accumulated Volume	Storage Sediment	Storage Total	Estimated Detention Time
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
204.00	0.0000	0	0	204.00					0	0	0	0	
204.20	0.0185	30	30	204.20					0	30	0	30	
204.40	0.0302	120	120	204.40					0	120	0	120	
204.60	0.1132	251	251	204.60					0	251	0	251	
204.80	0.2123	383	383	204.80					0	383	0	383	
205.00	0.2753	515	515	205.00					0	515	0	515	
205.20	0.3258	792	792	205.20					0	792	0	792	

3216079 Langstaff Road EA
Detailed Outlet Structure Discharge Calculations

Elevation (m)	Spillway Weir 1	Spillway Weir 2	Spillway Total	Outlet Riser Orifice 1	Outlet Riser Weir 1	Outlet Riser Orifice 2	Outlet Riser Total	DICB	Total Discharge
204.00	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	0.0000
204.20	0.000	0.000	0.000	0.01851	0.000	0.000	0.019	0.000	0.0185
204.40	0.000	0.000	0.000	0.03023	0.000	0.000	0.030	0.000	0.0302
204.60	0.000	0.000	0.000	0.03853	0.000	0.075	0.113	0.000	0.1132
204.80	0.000	0.000	0.000	0.04534	0.000	0.167	0.212	0.000	0.2123
205.00	0.000	0.000	0.000	0.05125	0.000	0.224	0.275	0.000	0.2753
205.20	0.000	0.000	0.000	0.05655	0.000	0.269	0.326	0.000	0.3258

Parameters

Overflow Weir 1

Crest Elevation	9999.00 m
Crest Width	1 m
Slope (x:1)	5
Weir Coeff.	1.670
Weir Top Width (m)	-97937.0

Overflow Weir 2

Crest Elevation	9999.00 m
Crest Width	3 m
Slope (x:1)	3
Weir Coeff.	1.670
Weir Top Width (m)	-58941.000

DICB

T/G Invert	9999.00 m
CB Size	1200 mm
by	600 mm
Grate Slope	4 :1
Area (m²)	0.720
Perimeter (m)	3.600

Orifice 1

Orifice Centre	204.08 m
Orifice Invert	204.00 m
Orifice Diameter	160 mm
Orientation	Vertical
Perimeter	503 mm
Area	20,106 mm²
Orifice Coeff.	0.6

Weir 1

Top of Weir Structure	9999.30 m
Weir Crest Invert	9999.00 m
Max Perimeter	1,400 mm
Max Open Area	240,000 mm²
Weir Dimensions (Height x Length)	300 mm Height / 800 mm L
Side Walls	Vertical
Weir Coeff.	1.670

Orifice 2

Orifice Centre	204.55 m
Orifice Invert	204.35 m
Orifice Diameter	400 mm
Orientation	Vertical
Perimeter	1,257 mm
Area	125,664 mm²
Orifice Coeff.	0.6
Operates Above (m)	204.55

$$Q = CA \sqrt{2g\left(h_2 - h_1 + \frac{D}{2000}\right)}$$

$$Q = CL(h_2 - h_1)^{1.5} + 1.268z(h_2 - h_1)^{2.5}$$

Where, h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)
D = orifice diameter (mm)
C = orifice coefficient
A = orifice open area (m²)

h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)
L = weir crest length (m)
C = weir coefficient
z = weir side slope (z:1)

3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Pipe Storage DSP-1   **Facility # DSP-1**

Stage	Discharge	Storage		Stage	Area	Forebays			Main Pool (Excluding Forebay)			Storage		Estimated Detention Time
		Active	Total			Incremental Volume	Accumulated Volume	Area	Incremental Volume	Accumulated Volume	Sediment	Total	
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
207.98	0.0000	0	0	207.98					0	0	0	0	
208.18	0.0056	72	72	208.18					0	72	0	72	
208.38	0.0084	283	283	208.38					0	283	0	283	
208.58	0.0105	553	553	208.58					0	553	0	553	
208.78	0.0122	823	823	208.78					0	823	0	823	
208.98	0.0382	1,093	1,093	208.98					0	1,093	0	1,093	
209.18	0.0516	1,598	1,598	209.18					0	1,598	0	1,598	

3216079 Langstaff Road EA
Detailed Outlet Structure Discharge Calculations

Elevation	Discharge (m³/s)									Parameters			
	Spillway			Outlet Riser				DICB	Total Discharge	Overflow Weir 1		Orifice 1	
(m)	Weir 1	Weir 2	Total	Orifice 1	Weir 1	Orifice 2	Total			Crest Elevation		Orifice Centre	Perimeter
207.98	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	0.0000	9999.00 m		208.02 m	258 mm
208.18	0.000	0.000	0.000	0.00560	0.000	0.000	0.006	0.000	0.0056				
208.38	0.000	0.000	0.000	0.00841	0.000	0.000	0.008	0.000	0.0084	Crest Width		Orifice Invert	Area
208.58	0.000	0.000	0.000	0.01049	0.000	0.000	0.010	0.000	0.0105	1 m		207.98 m	5,281 mm²
208.78	0.000	0.000	0.000	0.01223	0.000	0.000	0.012	0.000	0.0122	Slope (x:1)	5	Orifice Diameter	Orifice Coeff.
208.98	0.000	0.000	0.000	0.01374	0.000	0.025	0.038	0.000	0.0382	Weir Coeff.	1.670	82 mm	0.6
209.18	0.000	0.000	0.000	0.01511	0.000	0.036	0.052	0.000	0.0516	Weir Top Width (m)	-97897.2	Orientation	
										Overflow Weir 2		Vertical	
										Crest Elevation		**Weir 1**	
										9999.00 m		Top of Weir Structure	Max Perimeter
										Crest Width		9999.30 m	1,400 mm
										3 m		Weir Crest Invert	Max Open Area
										Slope (x:1)	3	9999.00 m	240,000 mm²
										Weir Coeff.	1.670	Weir Dimensions (Height x Length)	
										Weir Top Width (m)	-58941.000	300 mm Height	800 mm L
										DICB		Side Walls	Weir Coeff.
										T/G Invert		Vertical	1.670
										9999.00 m		**Orifice 2**	
										CB Size		Orifice Centre	Perimeter
										1200 mm		208.81 m	534 mm
										by		Orifice Invert	Area
										600 mm		208.73 m	22,698 mm²
										Grate Slope		Orifice Diameter	Orifice Coeff.
										4 :1		170 mm	0.6
										Area (m²)	0.720	Orientation	Operates Above (m)
										Perimeter (m)	3.600	Vertical	208.81

$$Q = CA\sqrt{2g\left(h_2 - h_1 + \frac{D}{2000}\right)}$$

$$Q = CL(h_2 - h_1)^{1.5} + 1.268z(h_2 - h_1)^{2.5}$$

Where, h2 = elevation at stage 2 (m)   h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)   h1 = elevation at stage 1 (m)
D = orifice diameter (mm)   L = weir crest length (m)
C = orifice coefficient   C = weir coefficient
A = orifice open area (m²)   z = weir side slope (z:1)

3211026 I3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Dry Pond DDP-1

Dry Pond # DDP-1

Stage	Discharge	Storage Active	Storage Total	Stage	Area	Forebays Incremental Volume	Forebays Accumulated Volume	Main Pool (Excluding Forebay) Area	Main Pool Incremental Volume	Main Pool Accumulated Volume	Storage Sediment	Storage Total	Estimated Detention Time
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
205.60	0.0000	0	0	205.60				447	0	0	0	0	0.0
205.92	0.0071	165	165	205.92				584	165	165	0	165	6.5
206.18	0.0098	331	331	206.18				694	166	331	0	331	11.2
206.44	0.0119	526	526	206.44				805	195	526	0	526	15.7
206.70	0.0138	750	750	206.70				916	224	750	0	750	20.2
206.96	0.0471	1,003	1,003	206.96				1,027	253	1,003	0	1,003	21.7
207.22	0.0636	1,284	1,284	207.22				1,138	282	1,284	0	1,284	23.0
207.48	0.0763	1,594	1,594	207.48				1,249	310	1,594	0	1,594	24.1
207.74	0.0870	1,934	1,934	207.74				1,365	340	1,934	0	1,934	25.2
208.00	0.0964	2,308	2,308	208.00				1,511	374	2,308	0	2,308	26.2

3211026 Fifth Line EA
Detailed Outlet Structure Discharge Calculations

Elevation (m)	Spillway Weir 1	Spillway Weir 2	Spillway Total	Outlet Riser Orifice 1	Outlet Riser Weir 1	Outlet Riser Orifice 2	Outlet Riser Total	DICB	Total Discharge
205.60	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	**0.0000**
205.92	0.000	0.000	0.000	0.00707	0.000	0.000	0.007	0.000	**0.0071**
206.18	0.000	0.000	0.000	0.00982	0.000	0.000	0.010	0.000	**0.0098**
206.44	0.000	0.000	0.000	0.01195	0.000	0.000	0.012	0.000	**0.0119**
206.70	0.000	0.000	0.000	0.01375	0.000	0.000	0.014	0.000	**0.0138**
206.96	0.000	0.000	0.000	0.01535	0.000	0.032	0.047	0.000	**0.0471**
207.22	0.000	0.000	0.000	0.01679	0.000	0.047	0.064	0.000	**0.0636**
207.48	0.000	0.000	0.000	0.01812	0.000	0.058	0.076	0.000	**0.0763**
207.74	0.000	0.000	0.000	0.01936	0.000	0.068	0.087	0.000	**0.0870**
208.00	0.000	0.000	0.000	0.02052	0.000	0.076	0.096	0.000	**0.0964**

Parameters

Overflow Weir 1		Orifice 1	
Crest Elevation	208.00 m	Orifice Centre	205.64 m
		Perimeter	251 mm
Crest Width	1.2 m	Orifice Invert	205.60 m
		Area	5,027 mm²
Slope (x:1)	5	Orifice Diameter	80 mm
Weir Coeff.	1.670	Orifice Coeff.	0.6
Weir Top Width (m)	1.2	Orientation	Vertical

Overflow Weir 2	
Crest Elevation	9999.00 m
Crest Width	3 m
Slope (x:1)	3
Weir Coeff.	1.670
Weir Top Width (m)	-58941.000

Weir 1	
Top of Weir Structure	9999.3 m
Max Perimeter	2,600 mm
Weir Crest Invert	9999.0 m
Max Open Area	600,000 mm²
Side Walls	Vertical
Weir Dimensions (Height x Length)	300 mm Height x 2000 mm L
Weir Coeff.	1.670

DICB	
T/G Invert	9999.00 m
CB Size	1200 mm by 600 mm
Grate Slope	4 :1
Area (m²)	0.720
Perimeter (m)	3.600

Orifice 2	
Orifice Centre	206.74 m
Perimeter	565 mm
Orifice Invert	206.65 m
Area	25,447 mm²
Orifice Diameter	180 mm
Orifice Coeff.	0.6
Orientation	Vertical
Operates Above (m)	206.74

$$Q = CA\sqrt{2g\left(h_2 - h_1 + \frac{D}{2000}\right)}$$

$$Q = CL(h_2 - h_1)^{1.5} + 1.268z(h_2 - h_1)^{2.5}$$

Where, h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)
D = orifice diameter (mm)
C = orifice coefficient
A = orifice open area (m²)

h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)
L = weir crest length (m)
C = weir coefficient
z = weir side slope (z:1)

3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Wet Pond DWP-1

Wet Pond DWP-1

Stage	Discharge	Storage		Stage	Forebays			Main Pool (Excluding Forebay)			Storage		Estimated Detention Time
		Active	Total		Area	Incremental Volume	Accumulated Volume	Area	Incremental Volume	Accumulated Volume	Sediment	Total	
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
206.40	0.0000	0	0	206.40				3,098	0	0		0	0.000
206.45	0.0013	157	157	206.45				3,197	157	157	0	157	0.000
206.50	0.0033	320	320	206.50				3,297	162	320	0	320	13.781
206.55	0.0044	487	487	206.55				3,396	167	487	0	487	24.271
206.60	0.0053	659	659	206.60				3,495	172	659	0	659	33.226
206.65	0.0061	837	837	206.65				3,594	177	837	0	837	41.268
206.70	0.0068	1,019	1,019	206.70				3,694	182	1,019	0	1,019	48.698
206.75	0.0074	1,206	1,206	206.75				3,793	187	1,206	0	1,206	55.688
206.80	0.0080	1,398	1,398	206.80				3,892	192	1,398	0	1,398	62.347
206.85	0.0086	1,595	1,595	206.85				3,992	197	1,595	0	1,595	68.747
206.90	0.0091	1,797	1,797	206.90				4,091	202	1,797	0	1,797	74.942
206.95	0.0095	2,004	2,004	206.95				4,190	207	2,004	0	2,004	80.970
207.00	0.0100	2,216	2,216	207.00				4,289	212	2,216	0	2,216	86.860
207.05	0.0104	2,433	2,433	207.05				4,389	217	2,433	0	2,433	92.636
207.10	0.0109	2,655	2,655	207.10				4,488	222	2,655	0	2,655	98.316
207.15	0.0113	2,882	2,882	207.15				4,587	227	2,882	0	2,882	103.914
207.20	0.0116	3,114	3,114	207.20				4,686	232	3,114	0	3,114	109.444
207.30	0.1520	3,592	3,592	207.30				4,885	479	3,592	0	3,592	110.318
207.45	0.5654	4,336	4,336	207.45				5,026	743	4,336	0	4,336	110.684
207.60	1.1316	5,100	5,100	207.60				5,167	764	5,100	0	5,100	110.871

3216079 Langstaff Road EA

Detailed Outlet Structure Discharge Calculations

Elevation	Spillway			Outlet Riser				DICB	Total Discharge
(m)	Weir 1	Weir 2	Total	Orifice 1	Weir 1	Orifice 2	Total		
206.40	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	0.0000
206.45	0.000	0.000	0.000	0.00134	0.000	0.000	0.001	0.000	0.0013
206.50	0.000	0.000	0.000	0.00327	0.000	0.000	0.003	0.000	0.0033
206.55	0.000	0.000	0.000	0.00443	0.000	0.000	0.004	0.000	0.0044
206.60	0.000	0.000	0.000	0.00534	0.000	0.000	0.005	0.000	0.0053
206.65	0.000	0.000	0.000	0.00612	0.000	0.000	0.006	0.000	0.0061
206.70	0.000	0.000	0.000	0.00681	0.000	0.000	0.007	0.000	0.0068
206.75	0.000	0.000	0.000	0.00744	0.000	0.000	0.007	0.000	0.0074
206.80	0.000	0.000	0.000	0.00802	0.000	0.000	0.008	0.000	0.0080
206.85	0.000	0.000	0.000	0.00855	0.000	0.000	0.009	0.000	0.0086
206.90	0.000	0.000	0.000	0.00906	0.000	0.000	0.009	0.000	0.0091
206.95	0.000	0.000	0.000	0.00954	0.000	0.000	0.010	0.000	0.0095
207.00	0.000	0.000	0.000	0.01000	0.000	0.000	0.010	0.000	0.0100
207.05	0.000	0.000	0.000	0.01043	0.000	0.000	0.010	0.000	0.0104
207.10	0.000	0.000	0.000	0.01085	0.000	0.000	0.011	0.000	0.0109
207.15	0.000	0.000	0.000	0.01126	0.000	0.000	0.011	0.000	0.0113
207.20	0.000	0.000	0.000	0.01165	0.000	0.000	0.012	0.000	0.0116
207.30	0.000	0.000	0.000	0.01239	0.140	0.000	0.152	0.000	0.1520
207.45	0.000	0.000	0.000	0.01343	0.552	0.000	0.565	0.000	0.5654
207.60	0.000	0.000	0.000	0.01439	1.117	0.000	1.132	0.000	1.1316

Parameters

Overflow Weir 1		Orifice 1	
Crest Elevation	207.64 m	Orifice Centre	206.44 m	Perimeter: 251 mm
Crest Width		Orifice Invert: 206.40 m	Area: 5,027 mm²
Slope (x:1)	12.5	Orifice Diameter: 80 mm	Orifice Coeff.: 0.6
Weir Coeff.	1.670	Orientation: Vertical	Obvert: 206.48 m
Weir Top Width (m)	0.2		

Overflow Weir 2 — Crest Elevation 9999.00 m; Crest Width 3 m; Slope (x:1) 3; Weir Coeff. 1.670; Weir Top Width (m) -58941.0

Rectangular Weir 1 — Bottom Weir Crest Invert 207.20 m; Top Weir Width Invert 207.20 m; Bottom Weir Crest Width, L 0.00 m; Top Weir Crest Width, B 2.40 m; Bottom Weir Crest Height 0.00 m High; Weir Coeff. 1.84

DICB — T/G Invert 99999.00 m; CB Size 600 mm by 600 mm; Grate Slope 4:1; Area (m²) 0.360; Perimeter (m) 2.400

Orifice 2 — Orifice Centre 99999.00 m (Perimeter 0 mm); Orifice Invert 99999.00 m (Area 0 mm²); Orifice Diameter 0 mm; Orifice Coeff. 0.60; Orientation Vertical; Obvert 99999.00 m

3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Pipe Storage DSP-2   **Facility # DSP-2**

| Stage | Discharge | Storage | | Stage | Area | Forebays | | | Main Pool (Excluding Forebay) | | | Storage | | Estimated Detention Time |
| | | Active | Total | | | Incremental Volume | Accumulated Volume | Area | Incremental Volume | Accumulated Volume | Sediment | Total | |
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
197.58	0.0000	0	0	197.58					0	0	0	0	
197.78	0.0081	48	48	197.78					0	48	0	48	
197.98	0.0123	192	192	197.98					0	192	0	192	
198.18	0.0155	372	372	198.18					0	372	0	372	
198.38	0.0181	552	552	198.38					0	552	0	552	
198.58	0.0203	732	732	198.58					0	732	0	732	
198.78	0.0224	1,152	1,152	198.78					0	1,152	0	1,152	

3216079 Langstaff Road EA
Detailed Outlet Structure Discharge Calculations

| Elevation | Discharge (m³/s) | | | | | | | | | Parameters | | | |
| | Spillway | | | Outlet Riser | | | | DICB | Total Discharge | Overflow Weir 1 | | Orifice 1 | |
(m)	Weir 1	Weir 2	Total	Orifice 1	Weir 1	Orifice 2	Total			Crest Elevation	Orifice Centre	Perimeter	
197.58	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	0.0000	9999.00 m	197.63 m	314 mm	
197.78	0.000	0.000	0.000	0.00808	0.000	0.000	0.008	0.000	0.0081				
197.98	0.000	0.000	0.000	0.01235	0.000	0.000	0.012	0.000	0.0123	Crest Width	Orifice Invert	Area	
198.18	0.000	0.000	0.000	0.01548	0.000	0.000	0.015	0.000	0.0155	1 m	197.58 m	7,854 mm²	
198.38	0.000	0.000	0.000	0.01808	0.000	0.000	0.018	0.000	0.0181	Slope (x:1) 5	Orifice Diameter	Orifice Coeff.	
198.58	0.000	0.000	0.000	0.02034	0.000	0.000	0.020	0.000	0.0203	Weir Coeff. 1.670	100 mm	0.6	
198.78	0.000	0.000	0.000	0.02238	0.000	0.000	0.022	0.000	0.0224	Weir Top Width (m) -98001.2	Orientation		

Overflow Weir 1 / Orifice 1 parameters (continued):

Overflow Weir 2			
Orientation	Vertical		
Crest Elevation	Weir 1		
9999.00 m	Top of Weir Structure	Max Perimeter	
Crest Width	9999.30 m	1,400 mm	
3 m	Weir Crest Invert	Max Open Area	
Slope (x:1) 3	9999.00 m	240,000 mm²	
Weir Coeff. 1.670	Weir Dimensions (Height x Length)		
Weir Top Width (m) -58941.000	300 mm Height	800 mm L	
DICB	Side Walls	Weir Coeff.	
T/G Invert	Vertical	1.670	
9999.00 m	**Orifice 2**		
CB Size	Orifice Centre	Perimeter	
1200 mm	198.90 m	1,257 mm	
by	Orifice Invert	Area	
600 mm	198.70 m	125,664 mm²	
Grate Slope	Orifice Diameter	Orifice Coeff.	
4 :1	400 mm	0.6	
Area (m²) 0.720	Orientation	Operates Above (m)	
Perimeter (m) 3.600	Vertical	198.90	

$$Q = CA\sqrt{2g\left(h_2 - h_1 + \frac{D}{2000}\right)}$$

$$Q = CL(h_2 - h_1)^{1.5} + 1.268z(h_2 - h_1)^{2.5}$$

Where, h2 = elevation at stage 2 (m)   h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)   h1 = elevation at stage 1 (m)
D = orifice diameter (mm)   L = weir crest length (m)
C = orifice coefficient   C = weir coefficient
A = orifice open area (m²)   z = weir side slope (z:1)

3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Pipe Storage DSP-3   **Storage Facility # DSP-3A**

Stage	Discharge	Storage Active	Storage Total	Stage	Area	Forebays Incremental Volume	Forebays Accumulated Volume	Main Pool (Excluding Forebay) Area	Main Pool Incremental Volume	Main Pool Accumulated Volume	Storage Sediment	Storage Total	Estimated Detention Time
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
201.76	0.0000	0	0	201.76					0	0	0	0	
201.96	0.0104	24	24	201.96					0	24	0	24	
202.16	0.0162	79	79	202.16					0	79	0	79	
202.36	0.0203	139	139	202.36					0	139	0	139	
202.56	0.0238	199	199	202.56					0	199	0	199	
202.76	0.0268	259	259	202.76					0	259	0	259	
202.96	0.0825	346	346	202.96					0	346	0	346	

3216079 Langstaff Road EA
Detailed Outlet Structure Discharge Calculations

Elevation	Spillway Weir 1	Spillway Weir 2	Spillway Total	Outlet Riser Orifice 1	Outlet Riser Weir 1	Outlet Riser Orifice 2	Outlet Riser Total	DICB	Total Discharge
(m)	Weir 1	Weir 2	Total	Orifice 1	Weir 1	Orifice 2	Total	DICB	Discharge
201.76	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	0.0000
201.96	0.000	0.000	0.000	0.01042	0.000	0.000	0.010	0.000	0.0104
202.16	0.000	0.000	0.000	0.01616	0.000	0.000	0.016	0.000	0.0162
202.36	0.000	0.000	0.000	0.02033	0.000	0.000	0.020	0.000	0.0203
202.56	0.000	0.000	0.000	0.02379	0.000	0.000	0.024	0.000	0.0238
202.76	0.000	0.000	0.000	0.02680	0.000	0.000	0.027	0.000	0.0268
202.96	0.000	0.000	0.000	0.02951	0.000	0.053	0.082	0.000	0.0825

Parameters

Overflow Weir 1

Crest Elevation		
9999.00 m		
Crest Width		
1 m		
Slope (x:1)	5	
Weir Coeff.	1.670	
Weir Top Width (m)	-97959.4	

Overflow Weir 2

Crest Elevation	
9999.00 m	
Crest Width	
3 m	
Slope (x:1)	3
Weir Coeff.	1.670
Weir Top Width (m)	-58941.000

DICB

T/G Invert	
9999.00 m	
CB Size	
1200 mm	
by	
600 mm	
Grate Slope	
4 :1	
Area (m²)	0.720
Perimeter (m)	3.600

Orifice 1

Orifice Centre	Perimeter
201.82 m	361 mm
Orifice Invert	Area
201.76 m	10,387 mm²
Orifice Diameter	Orifice Coeff.
115 mm	0.6
Orientation	
Vertical	

Weir 1

Top of Weir Structure	Max Perimeter
9999.27 m	1,340 mm
Weir Crest Invert	Max Open Area
9999.00 m	216,000 mm²
Weir Dimensions (Height x Length)	
270 mm Height	800 mm L
Side Walls	Weir Coeff.
Vertical	1.670

Orifice 2

Orifice Centre	Perimeter
202.80 m	785 mm
Orifice Invert	Area
202.67 m	49,087 mm²
Orifice Diameter	Orifice Coeff.
250 mm	0.6
Orientation	Operates Above (m)
Vertical	202.80

$$Q = CA \sqrt{2g\left(h_2 - h_1 + \frac{D}{2000}\right)}$$

$$Q = CL(h_2 - h_1)^{1.5} + 1.268z(h_2 - h_1)^{2.5}$$

Where, h2 = elevation at stage 2 (m)   h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)   h1 = elevation at stage 1 (m)
D = orifice diameter (mm)   L = weir crest length (m)
C = orifice coefficient   C = weir coefficient
A = orifice open area (m²)   z = weir side slope (z:1)

3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Pipe Storage DSP-3   **Storage Facility # DSP-3B**

| Stage | Discharge | Storage | | Stage | Area | Forebays | | | Main Pool (Excluding Forebay) | | | Storage | | Estimated Detention Time |
| | | Active | Total | | | Incremental Volume | Accumulated Volume | Area | Incremental Volume | Accumulated Volume | Sediment | Total | |
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
202.50	0.0000	0	0	202.50					0	0	0	0	
202.70	0.0274	26	26	202.70					0	26	0	26	
202.90	0.0478	84	84	202.90					0	84	0	84	
203.10	0.0619	149	149	203.10					0	149	0	149	
203.30	0.0733	214	214	203.30					0	214	0	214	
203.50	0.0831	278	278	203.50					0	278	0	278	
203.70	0.1449	374	374	203.70					0	374	0	374	

3216079 Langstaff Road EA
Detailed Outlet Structure Discharge Calculations

| Elevation | Discharge (m³/s) | | | | | | | | Total Discharge | Parameters | | |
| | Spillway | | | Outlet Riser | | | | DICB | | Overflow Weir 1 | Orifice 1 | |
(m)	Weir 1	Weir 2	Total	Orifice 1	Weir 1	Orifice 2	Total			Crest Elevation	Orifice Centre	Perimeter
202.50	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	0.0000	9999.00 m	202.60 m	644 mm
202.70	0.000	0.000	0.000	0.02739	0.000	0.000	0.027	0.000	0.0274			
202.90	0.000	0.000	0.000	0.04785	0.000	0.000	0.048	0.000	0.0478	Crest Width	Orifice Invert	Area
203.10	0.000	0.000	0.000	0.06187	0.000	0.000	0.062	0.000	0.0619	1 m	202.50 m	33,006 mm²
203.30	0.000	0.000	0.000	0.07326	0.000	0.000	0.073	0.000	0.0733	Slope (x:1) — 5	Orifice Diameter	Orifice Coeff.
203.50	0.000	0.000	0.000	0.08310	0.000	0.000	0.083	0.000	0.0831	Weir Top Width (m) — -97952.0	205 mm	0.6
203.70	0.000	0.000	0.000	0.09190	0.000	0.053	0.145	0.000	0.1449		Orientation	

Overflow Weir 1

Parameter	Value
Crest Elevation	9999.00 m
Crest Width	1 m
Slope (x:1)	5
Weir Top Width (m)	-97952.0

Overflow Weir 2

Parameter	Value
Crest Elevation	9999.00 m
Crest Width	3 m
Slope (x:1)	3
Weir Coeff.	1.670
Weir Top Width (m)	-58941.000

DICB

Parameter	Value
T/G Invert	9999.00 m
CB Size	1200 mm by 600 mm
Grate Slope	4 :1
Area (m²)	0.720
Perimeter (m)	3.600

Orifice 1

Parameter	Value
Orifice Centre	202.60 m
Perimeter	644 mm
Orifice Invert	202.50 m
Area	33,006 mm²
Orifice Diameter	205 mm
Orifice Coeff.	0.6
Orientation	Vertical

Weir 1

Parameter	Value
Top of Weir Structure	9999.27 m
Max Perimeter	1,340 mm
Weir Crest Invert	9999.00 m
Max Open Area	216,000 mm²
Weir Dimensions (Height x Length)	270 mm Height × 800 mm L
Side Walls	Vertical
Weir Coeff.	1.670

Orifice 2

Parameter	Value
Orifice Centre	203.54 m
Perimeter	785 mm
Orifice Invert	203.41 m
Area	49,087 mm²
Orifice Diameter	250 mm
Orifice Coeff.	0.6
Orientation	Vertical
Operates Above (m)	203.54

$$Q = CA\sqrt{2g\left(h_2 - h_1 + \frac{D}{2000}\right)}$$

$$Q = CL(h_2 - h_1)^{1.5} + 1.268z(h_2 - h_1)^{2.5}$$

Where, h2 = elevation at stage 2 (m)   h2 = elevation at stage 2 (m)
        h1 = elevation at stage 1 (m)   h1 = elevation at stage 1 (m)
        D = orifice diameter (mm)   L = weir crest length (m)
        C = orifice coefficient   C = weir coefficient
        A = orifice open area (m²)   z = weir side slope (z:1)

3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Pipe Storage DSP-4   **Facility # DSP-4**

| Stage | Discharge | Storage | | Stage | Area | Forebays | | | Main Pool (Excluding Forebay) | | Storage | | Estimated Detention Time |
| | | Active | Total | | | Incremental Volume | Accumulated Volume | Area | Incremental Volume | Accumulated Volume | Sediment | Total | |
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
202.43	0.0000	0	0	202.43					0	0	0	0	
202.63	0.0053	48	48	202.63					0	48	0	48	
202.83	0.0080	154	154	202.83					0	154	0	154	
203.03	0.0100	261	261	203.03					0	261	0	261	
203.23	0.0116	367	367	203.23					0	367	0	367	
203.43	0.0131	474	474	203.43					0	474	0	474	
203.63	0.0202	639	639	203.63					0	639	0	639	

3216079 Langstaff Road EA

Detailed Outlet Structure Discharge Calculations

| Elevation | Discharge (m³/s) | | | | | | | | | Parameters | | | |
| | Spillway | | | Outlet Riser | | | | DICB | Total Discharge | Overflow Weir 1 | | Orifice 1 | |
(m)	Weir 1	Weir 2	Total	Orifice 1	Weir 1	Orifice 2	Total			Crest Elevation		Orifice Centre	Perimeter
202.43	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	**0.0000**	9999.00 m		202.47 m	251 mm
202.63	0.000	0.000	0.000	0.00534	0.000	0.000	0.005	0.000	**0.0053**				
202.83	0.000	0.000	0.000	0.00802	0.000	0.000	0.008	0.000	**0.0080**	Crest Width		Orifice Invert	Area
203.03	0.000	0.000	0.000	0.01000	0.000	0.000	0.010	0.000	**0.0100**	1 m		202.43 m	5,027 mm²
203.23	0.000	0.000	0.000	0.01165	0.000	0.000	0.012	0.000	**0.0116**	Slope (x:1)	5	Orifice Diameter	Orifice Coeff.
203.43	0.000	0.000	0.000	0.01309	0.000	0.000	0.013	0.000	**0.0131**	Weir Coeff.	1.670	80 mm	0.6
203.63	0.000	0.000	0.000	0.01439	0.000	0.006	0.020	0.000	**0.0202**	Weir Top Width (m)	-97952.7	Orientation	

Additional parameter blocks (right side):

Overflow Weir 2		Orifice 1 (cont.)
Crest Elevation		Vertical
9999.00 m		**Weir 1**
Crest Width		Top of Weir Structure — Max Perimeter
3 m		9999.30 m — 1,400 mm
Slope (x:1)	3	Weir Crest Invert — Max Open Area
Weir Coeff.	1.670	9999.00 m — 240,000 mm²
Weir Top Width (m)	-58941.000	Weir Dimensions (Height x Length)
DICB		300 mm Height — 800 mm L
T/G Invert		Side Walls — Weir Coeff.
9999.00 m		Vertical — 1.670
CB Size		**Orifice 2**
1200 mm		Orifice Centre — Perimeter
by		203.61 m — 440 mm
600 mm		Orifice Invert — Area
Grate Slope		203.54 m — 15,394 mm²
4 :1		Orifice Diameter — Orifice Coeff.
Area (m²)	0.720	140 mm — 0.6
Perimeter (m)	3.600	Orientation — Operates Above (m)
		Vertical — 203.61

$$Q = CA \sqrt{2g\left(h_2 - h_1 + \frac{D}{2000}\right)}$$

$$Q = CL(h_2 - h_1)^{1.5} + 1.268z(h_2 - h_1)^{2.5}$$

Where, h2 = elevation at stage 2 (m)   h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)   h1 = elevation at stage 1 (m)
D = orifice diameter (mm)   L = weir crest length (m)
C = orifice coefficient   C = weir coefficient
A = orifice open area (m²)   z = weir side slope (z:1)

3216079 Langstaff Road EA

Stage-Storage-Discharge Summary - Pipe Storage DSP-5   **Facility # DSP-5**

| Stage | Discharge | Storage | | Stage | Area | Forebays | | | Main Pool (Excluding Forebay) | | | Storage | | Estimated Detention Time |
| | | Active | Total | | | Incremental Volume | Accumulated Volume | Area | Incremental Volume | Accumulated Volume | Sediment | Total | |
(m)	(m³/s)	(m³)	(m³)	(m)	(m²)	(m³)	(m³)	(m²)	(m³)	(m³)	(m³)	(m³)	(hrs)
202.05	0.0000	0	0	202.05					0	0	0	0	
202.25	0.0118	48	48	202.25					0	48	0	48	
202.45	0.0184	154	154	202.45					0	154	0	154	
202.65	0.0232	261	261	202.65					0	261	0	261	
202.85	0.0271	367	367	202.85					0	367	0	367	
203.05	0.0306	474	474	203.05					0	474	0	474	
203.25	0.0415	639	639	203.25					0	639	0	639	

3216079 Langstaff Road EA
Detailed Outlet Structure Discharge Calculations

| Elevation | Discharge (m³/s) | | | | | | | | Total Discharge | Parameters | | | |
| | Spillway | | | Outlet Riser | | | | DICB | | Overflow Weir 1 | | Orifice 1 | |
(m)	Weir 1	Weir 2	Total	Orifice 1	Weir 1	Orifice 2	Total			Crest Elevation		Orifice Centre	Perimeter
202.05	0.000	0.000	0.000	0.00000	0.000	0.000	0.000	0.000	0.0000	9999.00 m		202.11 m	386 mm
202.25	0.000	0.000	0.000	0.01175	0.000	0.000	0.012	0.000	0.0118				
202.45	0.000	0.000	0.000	0.01837	0.000	0.000	0.018	0.000	0.0184	Crest Width		Orifice Invert	Area
202.65	0.000	0.000	0.000	0.02317	0.000	0.000	0.023	0.000	0.0232	1 m		202.05 m	11,882 mm²
202.85	0.000	0.000	0.000	0.02714	0.000	0.000	0.027	0.000	0.0271	Slope (x:1)	5	Orifice Diameter	Orifice Coeff.
203.05	0.000	0.000	0.000	0.03059	0.000	0.000	0.031	0.000	0.0306	Weir Coeff.	1.670	123 mm	0.6
203.25	0.000	0.000	0.000	0.03370	0.000	0.008	0.042	0.000	0.0415	Weir Top Width (m)	-97956.5	Orientation	

Additional parameter blocks (right side):

Overflow Weir 2			Weir 1	
Crest Elevation			Top of Weir Structure	Max Perimeter
9999.00 m			9999.30 m	1,400 mm
Crest Width			Weir Crest Invert	Max Open Area
3 m			9999.00 m	240,000 mm²
Slope (x:1)	3		Weir Dimensions (Height x Length)	
Weir Coeff.	1.670		300 mm Height	800 mm L
Weir Top Width (m)	-58941.000		Side Walls	Weir Coeff.
DICB			Vertical	1.670
T/G Invert			**Orifice 2**	
9999.00 m			Orifice Centre	Perimeter
CB Size			203.24 m	723 mm
1200 mm			Orifice Invert	Area
by			203.13 m	41,548 mm²
600 mm			Orifice Diameter	Orifice Coeff.
Grate Slope			230 mm	0.6
4 :1			Orientation	Operates Above (m)
Area (m²)	0.720		Vertical	203.24
Perimeter (m)	3.600			

$$Q = CA \sqrt{2g\left(h_2 - h_1 + \frac{D}{2000}\right)}$$

$$Q = CL(h_2 - h_1)^{1.5} + 1.268z(h_2 - h_1)^{2.5}$$

Where, h2 = elevation at stage 2 (m)   h2 = elevation at stage 2 (m)
h1 = elevation at stage 1 (m)   h1 = elevation at stage 1 (m)
D = orifice diameter (mm)   L = weir crest length (m)
C = orifice coefficient   C = weir coefficient
A = orifice open area (m²)   z = weir side slope (z:1)

Ditch Capacity Worksheet for Existing Channel Section

Project Description	Langstaff Road EA, York Region	North side of Langstaff Road between Westminster Creek and Dufferin Street
Friction Method	Manning Formula	
Solve For	Discharge	

Input Data

Channel Slope	0.007 m/m
Normal Depth	1,000.0 mm

Section Definitions

Station (m)	Elevation (m)
0+0.00	205.75
0+1.52	205.50
0+2.82	205.00
0+4.08	204.50
0+5.34	204.00
0+5.76	204.00
0+7.25	204.50
0+8.71	205.00
0+11.4	205.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 205.75)	(0+11, 205.50)	0.030

Results

Discharge	5,440.40 L/s
Roughness Coefficient	0.030
Elevation Range	204.0 to 205.8 m
Flow Area	3.2 m²
Wetted Perimeter	6.2 m
Hydraulic Radius	506.3 mm
Top Width	5.89 m
Normal Depth	1,000.0 mm
Critical Depth	883.4 mm
Critical Slope	0.012 m/m
Velocity	1.72 m/s
Velocity Head	0.15 m
Specific Energy	1.15 m
Froude Number	0.750
Flow Type	Subcritical

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[10.03.00.03]
Page 1 of 1

Ditch Design Worksheet for Proposed Channel Section

Project Description	Langstaff Road EA, York Region	North side of Langstaff Road between Westminster Creek and Dufferin Street
Friction Method	Manning Formula	
Solve For	Discharge	

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.007 m/m	
Normal Depth	1,000.0 mm	
Left Side Slope	2.500 H:V	
Right Side Slope	0.000 H:V	
Bottom Width	1.75 m	

Results

Discharge	5,461.55 L/s
Flow Area	3.0 m²
Wetted Perimeter	5.4 m
Hydraulic Radius	551.2 mm
Top Width	4.25 m
Critical Depth	815.6 mm
Critical Slope	0.014 m/m
Velocity	1.82 m/s
Velocity Head	0.17 m
Specific Energy	1.17 m
Froude Number	0.692
Flow Type	Subcritical

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Page 1 of 1