

# PRELIMINARY DRAINAGE REPORT

## STRATFORD RANCH TENTATIVE TRACT NO. 38701 City of Perris, California



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Victor Elia, PE

# TABLE OF CONTENTS

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<b><u>Section Name</u></b>	<b><u>Page Number</u></b>
List of Tables .....	ii
List of Figures .....	iii
List of Appendices .....	iii
Section 1 - Introduction.....	1
1.1 Project Description .....	1
1.2 Purpose of Study.....	2
1.3 Design Criteria .....	2
1.4 Floodplain Mapping.....	2
Section 2 – Hydrologic Data and Model Development .....	3
2.1 Existing Condition .....	3
2.2 Proposed Condition .....	3
2.3 Rational Method Hydrology .....	4
2.4 Hydrologic Soil Types .....	4
2.5 Landuse Runoff Coefficient.....	4
2.6 Rainfall Data .....	4
2.7 Rational Method Results.....	4
Section 3 – Unit Hydrograph and Detention Analysis .....	5
3.1 Introduction .....	3
3.2 Approach and Methodology .....	3
3.3 Detention Basin Analysis .....	6

Section 4 – Hydraulic Analysis .....	12
3.1 STORM DRAIN ANALYSIS .....	12
3.2 CATCH BASIN ANALYSIS .....	12
3.3 STREET HYDRAULICS.....	12
Section 5 – References .....	13

## **LIST OF APPENDICES**

- Appendix A: RCFC&WCD Hydrologic Data
- Appendix B: Proposed Condition Rational Method Hydrology Map
- Appendix C: Proposed Condition Rational Method Hydrology Calculations
- Appendix D: Existing Condition Unit Hydrograph Calculations
- Appendix E: Proposed Condition Unit Hydrograph Calculations
- Appendix F: Detention Basins Analysis
- Appendix G: FEMA FIRM Panel 06065C1430H
- Appendix H: Catch Basin Sizing and Street Flow Capacity Calculations
- Appendix I: Storm Drain Hydraulics WSPG Files

# INTRODUCTION

## 1.1 PROJECT DESCRIPTION

Tentative Tract No. 38701 (Stratford Ranch) proposes a subdivision of approximately 48 acres of undeveloped land into 192 single family residential lots and two (2) drainage basins. Offsite drainage improvements are proposed along the southerly boundary by the State of California, Department of Water Resources (DWR) at the location of RCFC&WCD Master Drainage Plan (MDP) Line U. DWR proposes an oversized channel from Lake Perris to the Perris Valley Storm Drain Channel, west of the site. Also, west of the site, currently a regional detention basin for the Perris Valley Storm Drain is under construction to mitigate peak flows.

The site is located east of Evans Road and north of Ramona Expressway in the City of Perris, County of Riverside (see Figure 1).

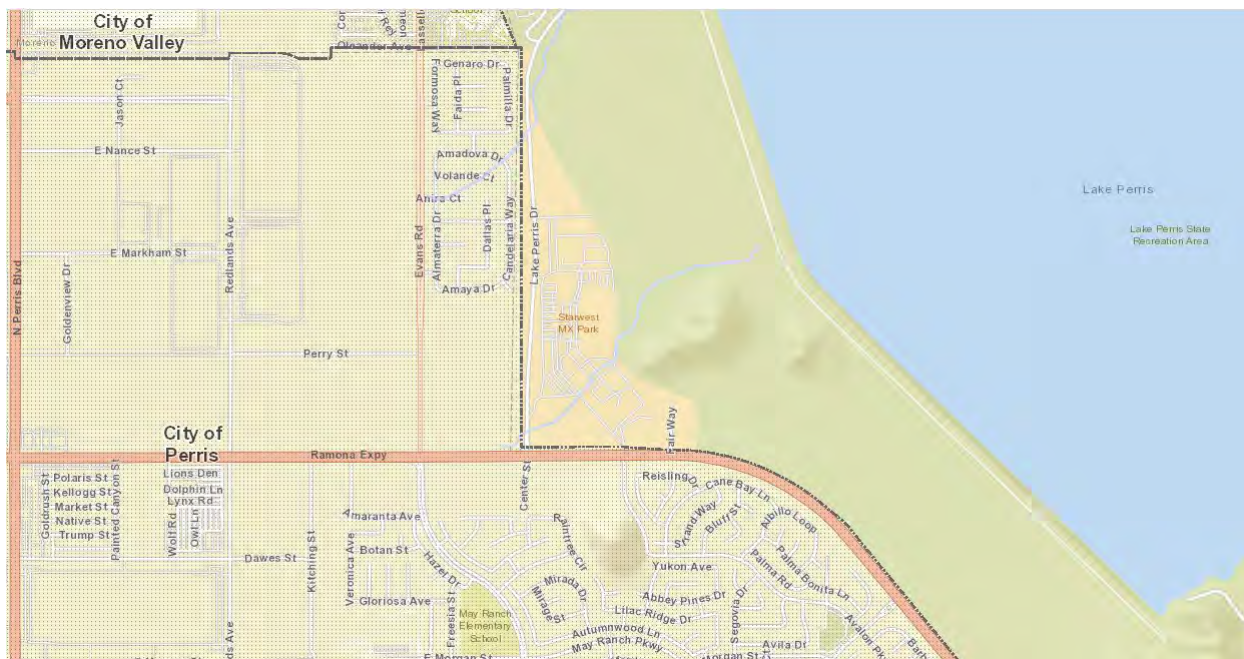
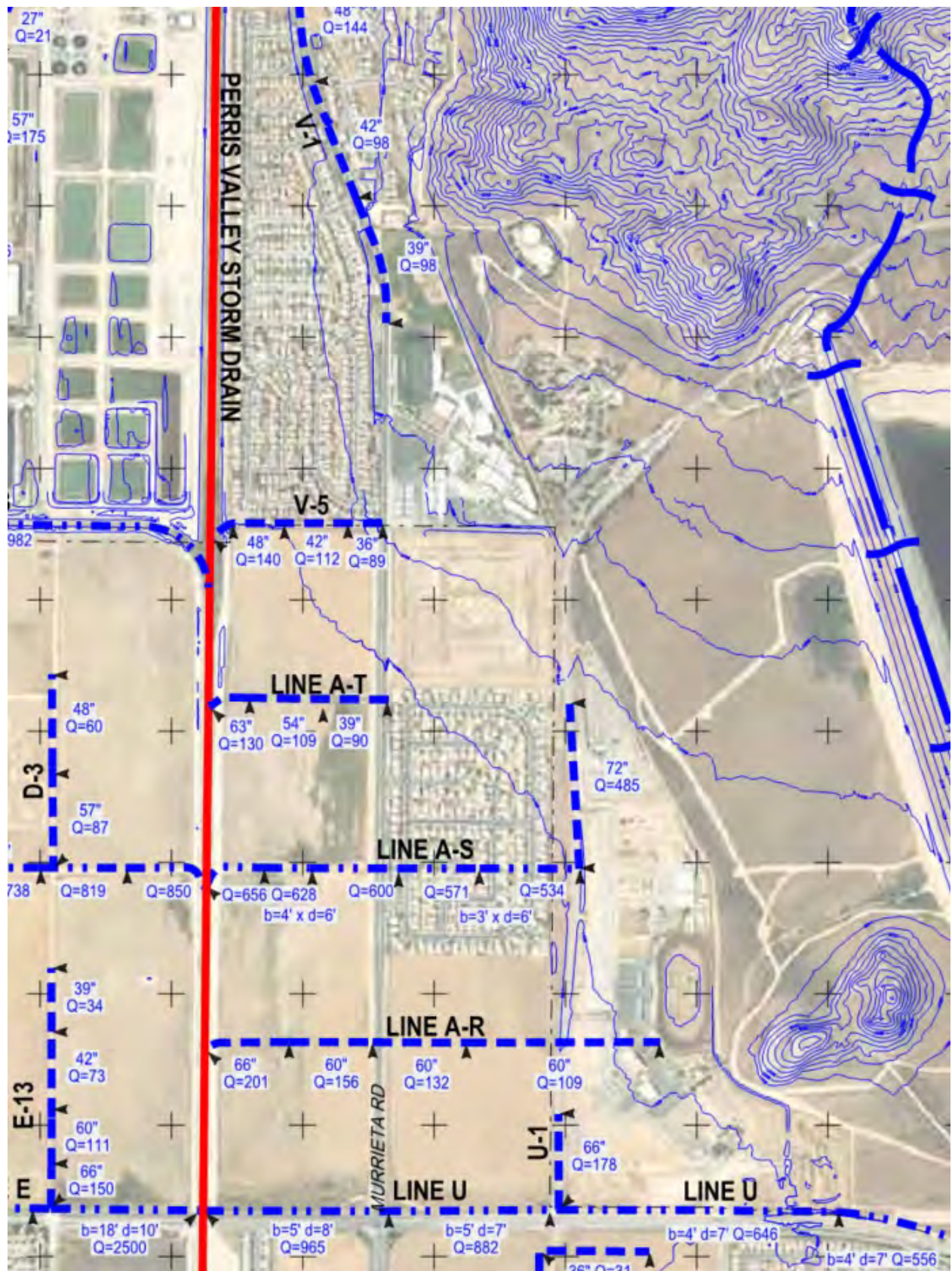


Figure 1: Project Vicinity Map

The site is currently undeveloped, partially covered by sparse growth of weeds and shrubs. Topography of the site is nearly flat, sloping slightly towards the southwest at an approximate slope of 1 percent. Easterly of the site, existing offsite flows sheet flow to the southwest are intercepted by Lake Perris Drive, future RCFC&WCD MDP Line U-1 and conveyed south in the DWR channel. Under proposed conditions, improvements to DWR channel south of the site will provide capacity for this site and convey these offsite flows to the west where Perris Valley Storm Drain will capture the flow. Perris Valley MDP:



## 1.2 PURPOSE OF STUDY

The purpose of this study is to hydrologically model the project onsite tributary drainage flows for existing and proposed conditions for the following conditions:

- 1) Phase 1 – Interim Detention & WQMP Basin 100-year 24-hour needs to be mitigated to/less than existing conditions.
- 2) Ultimate Buildout – WQMP Basin 1 discharge to DWR Channel
- 3) Ultimate Buildout – WQMP Basin 2 discharge to DWR Channel
- 4) Onsite flows in order to determine the 100-year discharges which will be used to size the proposed onsite drainage facilities.

## 1.3 DESIGN CRITERIA

The following design criteria applies to the project, based on the 1978 Riverside County Flood Control and Water Conservation District Hydrology Manual.

Protection Levels:

1. The 100-year flood shall be contained within the street right-of-way
2. The 10-year flood shall be contained within the top of curbs.
3. Building finished floor elevations shall be a minimum of 1' above the 100-year water surface elevations
4. Catch basins and storm drain system shall be designed to convey the 100-year flows.

## 1.4 FLOODPLAIN MAPPING

Review of the latest Flood Insurance Rate Map (FIRM) Panel No. 06065C1430H indicated that a portion of the project is located in Zone AE designated FEMA flood zone. Refer to Appendix G for a copy of the FIRM with project boundary overlaid. A base flood elevation of 1455.0 as shown on FEMA Panel determined per previous LOMR was used to design the pad elevations of the site at a minimum of 1455.5. A LOMR for this site will be filed following grading.

## **HYDROLOGIC DATA AND MODEL DEVELOPMENT**

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### 2.1 EXISTING CONDITION

The Stratford Ranch project is comprised of one drainage area (see Exhibit A, Appendix D). Drainage Area E1 has a total tributary area of approximately

### 2.2 PROPOSED CONDITION

**The storm water runoff in the proposed condition will maintain its existing condition flow patterns and outlet discharge points.** In the proposed condition, the project will discharge into two (2) water quality/storm detention basins named Detention Basin 1 and Detention Basin 2 as shown on the Proposed Condition Unit Hydrograph Map Exhibit B (Appendix E). Per the Water Quality Management Plan, the Hydrologic Conditions of Concern (HCOC) is exempt.

### 2.3 RATIONAL METHOD HYDROLOGY

The hydrologic analysis was performed in accordance with the Riverside County Flood Control and Water Conservation District Hydrology Manual (RCHM) dated 1978. Rational method hydrology computations were performed using the CivilDesign version 7.1 computer program. The 10- and 100-year design discharge at each storm drain inlet was computed by generating a hydrologic “link-node” model which divides the area into hydrologic “node” point determined from the proposed street layout. The hydrology calculations are included in Appendix B.

### 2.4 HYDROLOGIC SOIL TYPES

Hydrologic soil data was obtained from Plate C-1.3 of the RCHM. Review of the soil map indicated the soils consisted entirely of Soil Type C. Plate C-1.3 is included in Appendix A.

## 2.5 LANDUSE RUNOFF COEFFICIENT

The runoff coefficient specified for the “1/4 acre residential lots” was used to describe the proposed development characteristics. Offsite/natural areas were modeled using the “undeveloped-poor” coefficient.

## 2.6 RAINFALL DATA

The Standard Intensity-Duration Curve for the Homeland-Winchester Area (Plate D-4.1 RCHM) was used for the rainfall intensity in the rational method hydrology. Plate D-4.1 is included in Appendix A.

## 2.7 RATIONAL METHOD RESULTS

Table 1 summarizes the 100-year rational method results for the proposed condition at the catch basin inlets. Refer to the Proposed Condition Hydrology Key Map (Appendix B) for locations of the drainage subareas. 100-year rational method calculation are included in Appendix C.

Pipe Sizes From Rational Method (very conservative)			
Hydrology Nodes		Q100	Pipe Dia.
U/S Node	D/S Node	(cfs)	(in)
13	14	7.6	24
14	15	12.7	30
15	16	20.1	36
16	17	22.7	39
17	18	35.1	45
72	73	8.4	18
73	74	15.2	33
102	103	2.4	18
103	104	7.1	24
104	105	14.0	33
105	106	21.2	36
106	107	30.9	42
107	108		
201	202	4.2	18
202	203	11.0	24

## **UNIT HYDROGRAPH AND DETENTION ANALYSIS**

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### 3.1 INTRODUCTION

The purpose of this section is to describe the parameters and modeling methodologies used in the development of the unit hydrograph calculations. KWC Engineers has performed a synthetic unit hydrograph analysis for the Stratford Ranch – Phase 1 Interim Basin project in order to provide final detention basin sizing calculations. The CivilDesign Unit Hydrograph Analysis version 7.0 computer program was used to perform the calculations.

### 3.2 APPROACH AND METHODOLOGY

Unit hydrograph calculations were performed to determine the 100-year for the 1-hour, 3-hour, 6-hour and 24-hour duration storms in accordance with the procedures of the Riverside County Flood Control and Water Conservation District Hydrology Manual (RCHM).

Point precipitations were taken from the Isohyetal maps shown on Plates E-5.1 through E-5.6 and Plate D-4.3 and D-4.4 of the RCHM (see Appendix A). The centroid of the watershed was used as the location on the Isohyetal maps to determine the point precipitation values.

The rainfall-runoff transformation was determined using the s-graph method as outlined in Section E of the RCHM. The RCHM has four S-Graphs (Plates E-4.1 through E-4.4) titled Valley, Foothill, Mountain, and Desert, respectively, to represent the specific runoff characteristics of watersheds. The valley s-graph was selected as the most appropriate s-graph for this study area due to the mild topography. The CivilDesign Unit Hydrograph computer program performs the transformation of s-graph and lag time to unit hydrograph ordinances.

Watershed Lag is defined as the elapsed time in hours from the beginning of unit effective rainfall to the instant that the summation hydrograph for the concentration point of an area reaches 50 percent of ultimate discharge. Lag time for the watersheds were calculated using the equation on Plate E-3 of the RCHM. It is calculated from the physical characteristics of a watershed area by the empirical formula:

$$\text{Log} = 24\bar{n} \left[ \frac{L \cdot L_{ca}}{\sqrt{S}} \right]^{(0.38)}$$

Where:

- Lag = Lag time in hours
- $\bar{n}$  = The visually estimated basin roughness coefficient
- L = Length of longest watercourse (miles)
- Lca = Length along longest watercourse, measured upstream to a point opposite the centroid of the area (miles)
- S = Overall slope of the longest watercourse between headwater and the collection point (feet per mile)

Infiltration rates (loss rates) were based on Plate E-6.2 in the RCHM using the runoff index (RI) determined for each soil and land use condition according to Plate E-6.1. Per the recommendations in the RCHM, Antecedent Soil Moisture Conditions AMC II were used for the 100-year storms. The same land use (“single family residential” and “open brush- poor condition”) and hydrologic soil type (Soil Type C) used in the rational method calculations were used in development of the unit hydrograph calculations.

### 3.3 DETENTION BASIN ANALYSIS

The interim (Phase 1) onsite detention basin was provided with a capacity greater than the volume difference to mitigate the increase runoff due to the proposed development. The detention basin includes an emergency spillway outlet that can pass the 100-year peak flows in the event that the inlet becomes clogged. Appendix F contains the calculations for the detention basin outlet structures stage-outflow relationship that were used in the analysis.

Stratford Ranch 24-Hour Storm Volume Difference

Drainage Area (ac)	Storm		Existing Condition	Proposed Condition	Volume Difference
	Year	Duration	100-Yr 24-Hr Vol (ac-ft)	100-Yr 24-Hr Vol (ac-ft)	(Proposed - Existing) (ac-ft)
30.6	2-Year	24-Hour	0.41	2.04	1.63
30.6	5-Year	24-Hour	0.54	2.59	2.05
30.6	10-Year	24-Hour	1.63	2.79	1.16
30.6	100-Year	24-Hour	4.05	4.77	0.72

The Detention Basin was sized for the proposed condition peak volume to not exceed the existing condition volume for all storm events per the Riverside County Flood Control requirements to protect the capacity of the downstream existing channel.

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## **HYDRAULIC ANALYSIS**

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### 4.1 STORM DRAIN ANALYSIS

All storm drains will be sized for the 100-year flow rates. The hydrologic flow rates were used in the hydraulic calculations. Hydraulic analysis of the storm drains was performed using the Water Surface Pressure Gradient (WSPG) computer program to the two (2) outlet storm drains to the channel to verify the pipe size for DWR.

### 4.2 CATCH BASIN ANALYSIS

Catch basin sizing will be prepared in Final Hydrology & Hydraulics Report

### 4.3 STREET HYDRAULICS

Final Street Hydraulics will be prepared in Final Hydrology & Hydraulics Report however preliminary results are included in the Preliminary Rational Method hydrology calculations.

## **REFERENCES**

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Riverside County Flood Control and Water Conservation District. Hydrology Manual.  
April 1978

RCFC&WCD Master Drainage Plan – Perris Valley Storm Drain

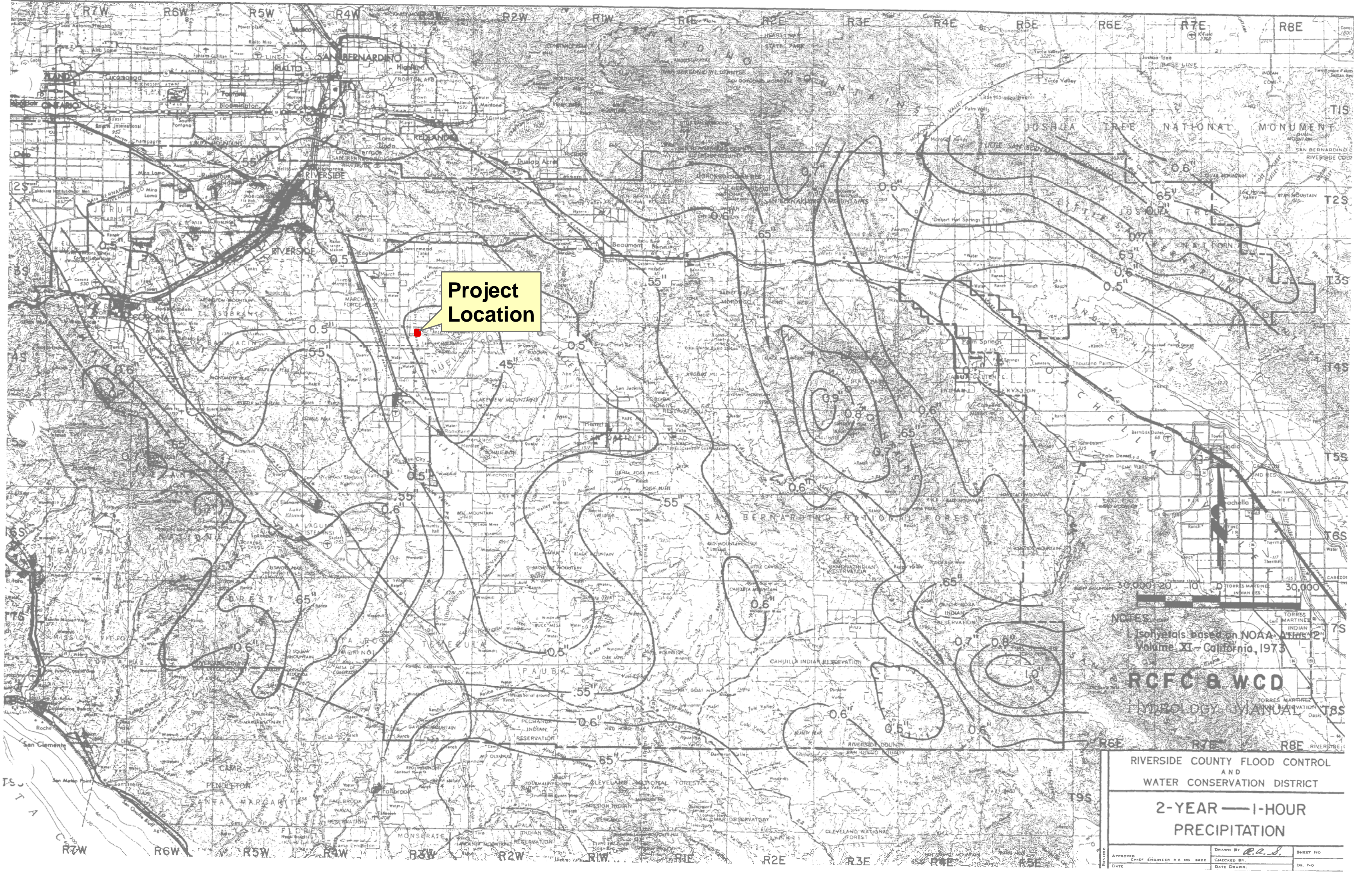
Line U Hydrology Memo, Webb and Associates, 8-2-2018 and RCFC&WCD approval  
letter

*Appendix*

**A**

# **RCFC&WCD HYDROLOGIC DATA**

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**Project Location**



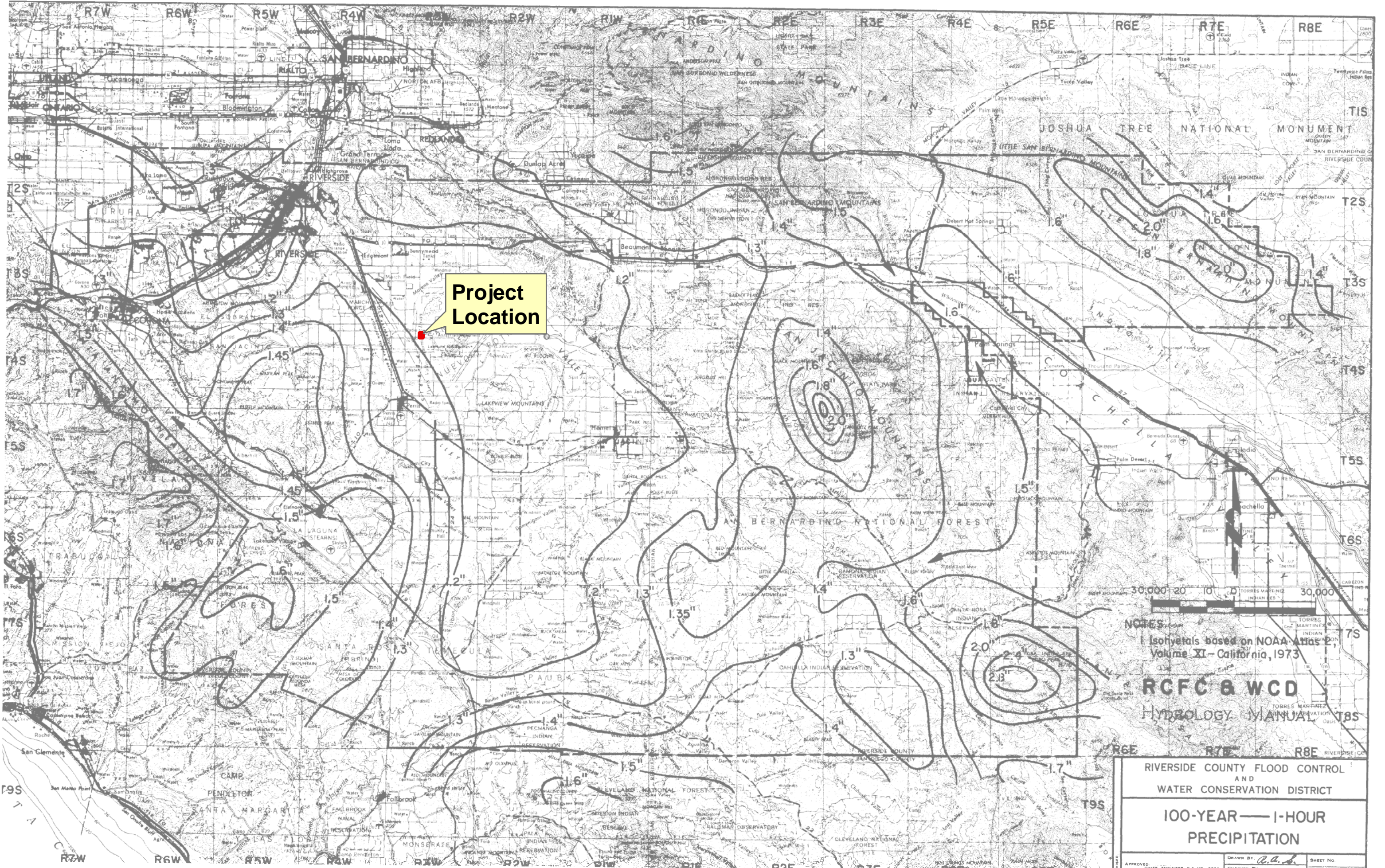
ISOHYETS BASED ON NOAA ATLAS 2,  
VOLUME XI - CALIFORNIA, 1973

**RCFC & WCD**  
HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL  
AND  
WATER CONSERVATION DISTRICT

**2-YEAR — 1-HOUR  
PRECIPITATION**

APPROVED	DRAWN BY <i>R.A.S.</i>	SHEET NO.
DATE	CHECKED BY	DR. NO.



**Project Location**

NOTES:  
 Isohyets based on NOAA Atlas 14,  
 Volume XI - California, 1973

**RCFC & WCD**  
 HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL  
 AND  
 WATER CONSERVATION DISTRICT

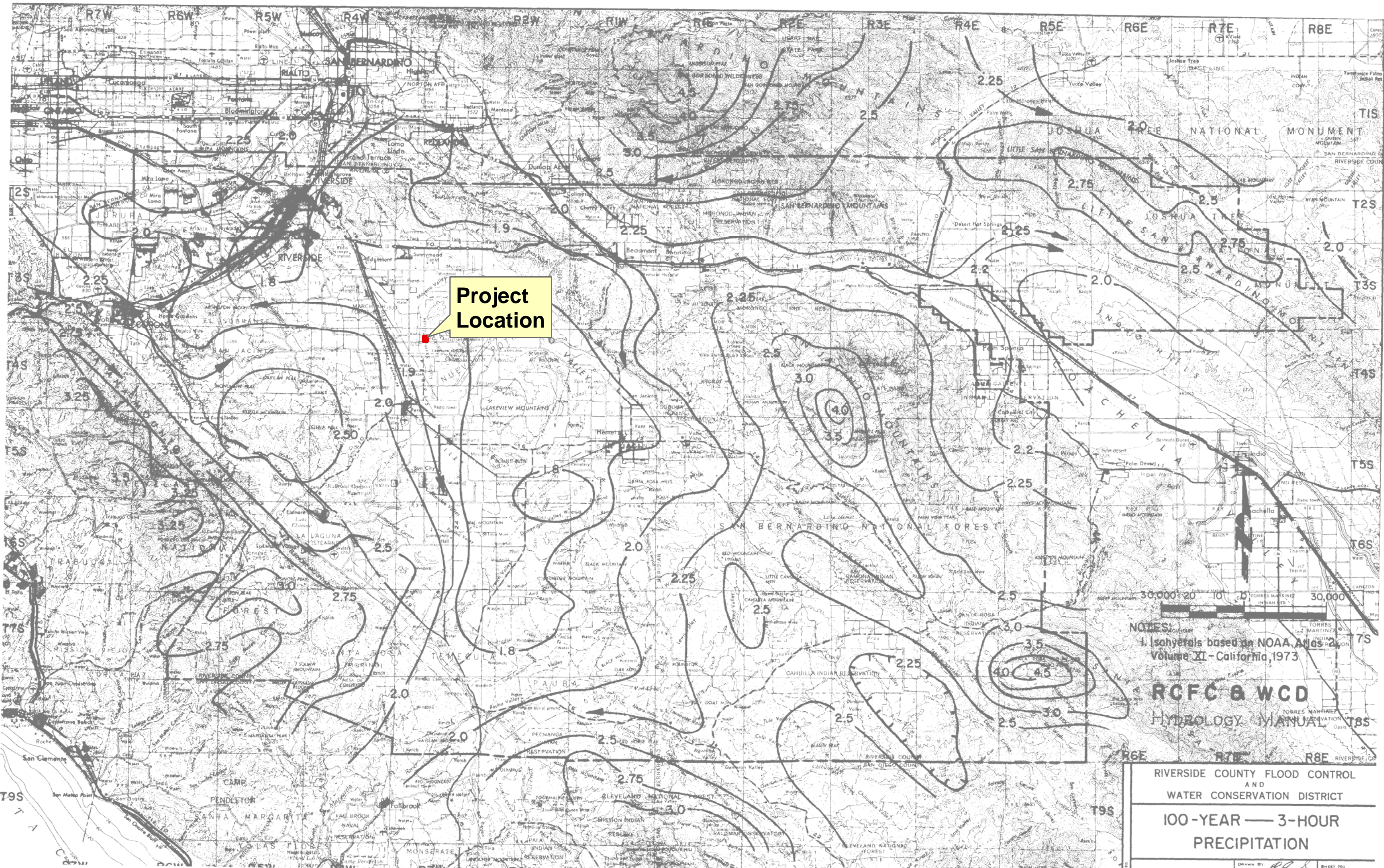
**100-YEAR — 1-HOUR  
 PRECIPITATION**

APPROVED: \_\_\_\_\_  
 CHIEF ENGINEER R.E. NO. 8822

DRAWN BY: *C.A.S.*

CHECKED BY: \_\_\_\_\_

SHEET No. \_\_\_\_\_



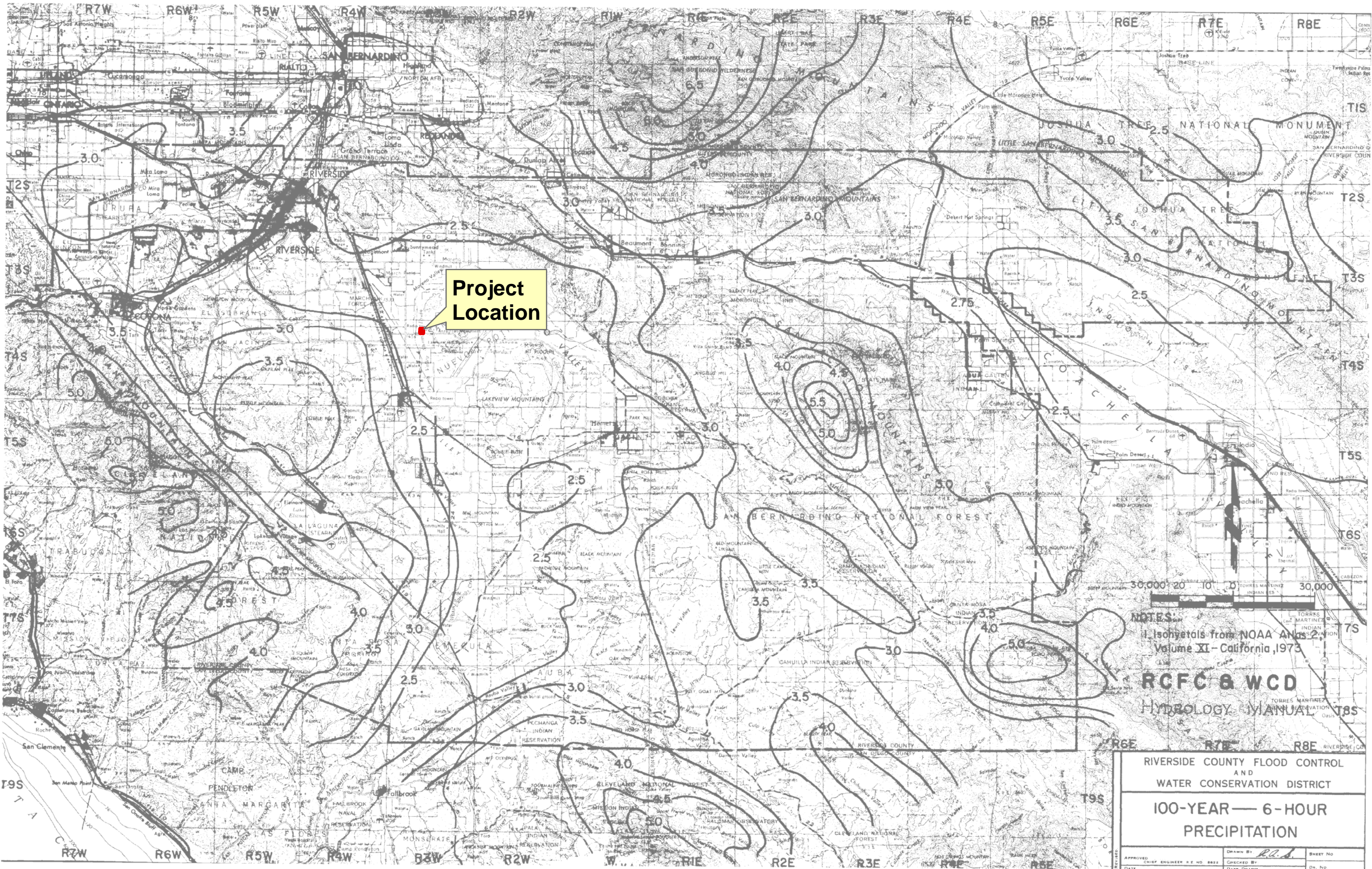
**Project  
Location**

NOTES:  
1. Isohyets based on NOAA Atlas 2,  
Volume XI - California, 1973

**RCFC & WCD**  
HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL  
AND  
WATER CONSERVATION DISTRICT  
**100-YEAR — 3-HOUR  
PRECIPITATION**

APPROVED	DRAWN BY	SHEET NO.
CHIEF ENGINEER P.E. NO. 8822	DATE DRAWN	DR. NO.



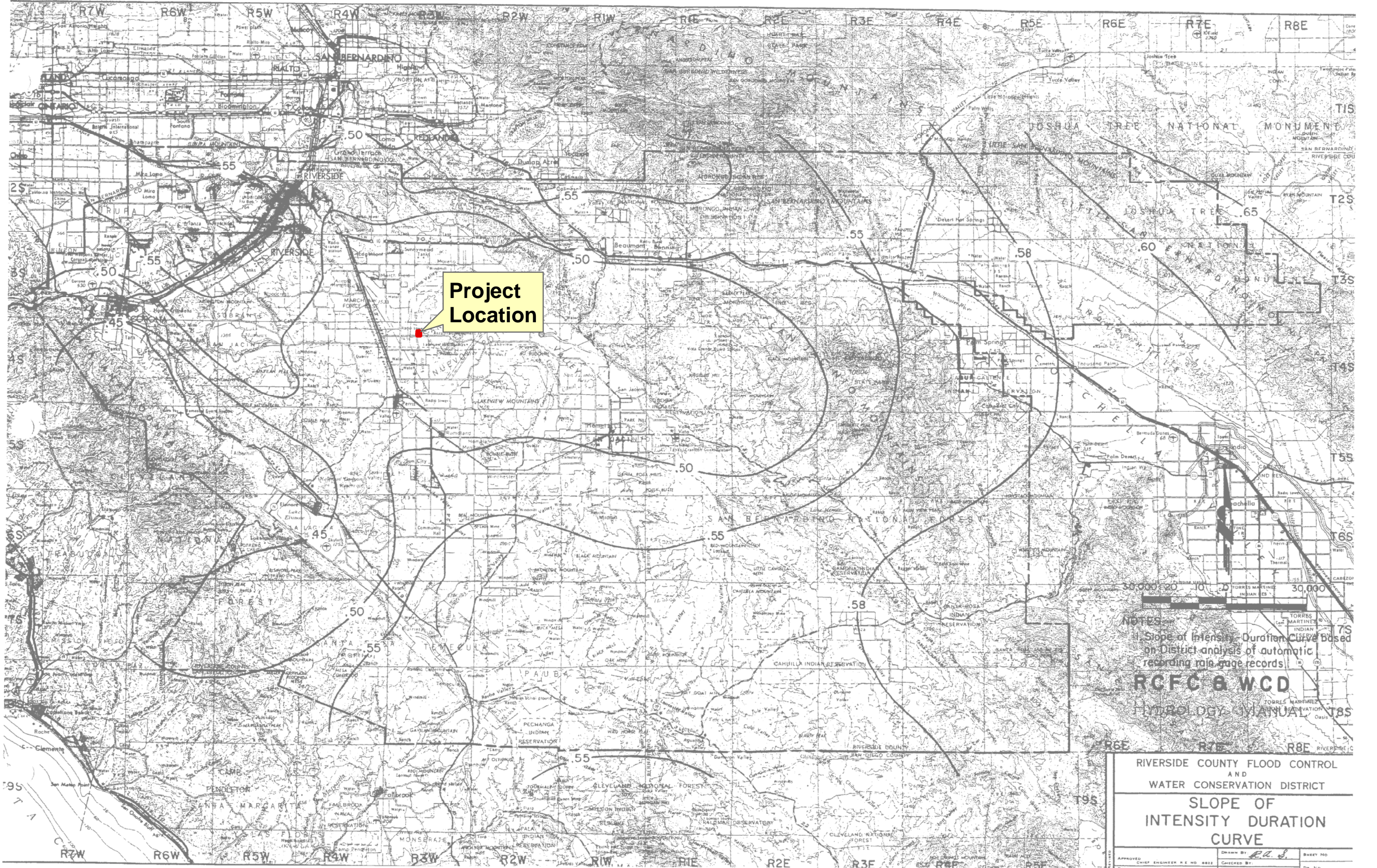
**Project  
Location**



NOTES:  
1. Isohyets from NOAA Atlas 2,  
Volume XI - California, 1973

**RCFC & WCD**  
HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT			
100-YEAR — 6-HOUR PRECIPITATION			
APPROVED	DATE	CHIEF ENGINEER R. E. NO. 8822	DATE DRAWN
DRAWN BY	CHECKED BY	SHEET NO.	DR. NO.
<i>R.A.A.</i>			



**Project Location**

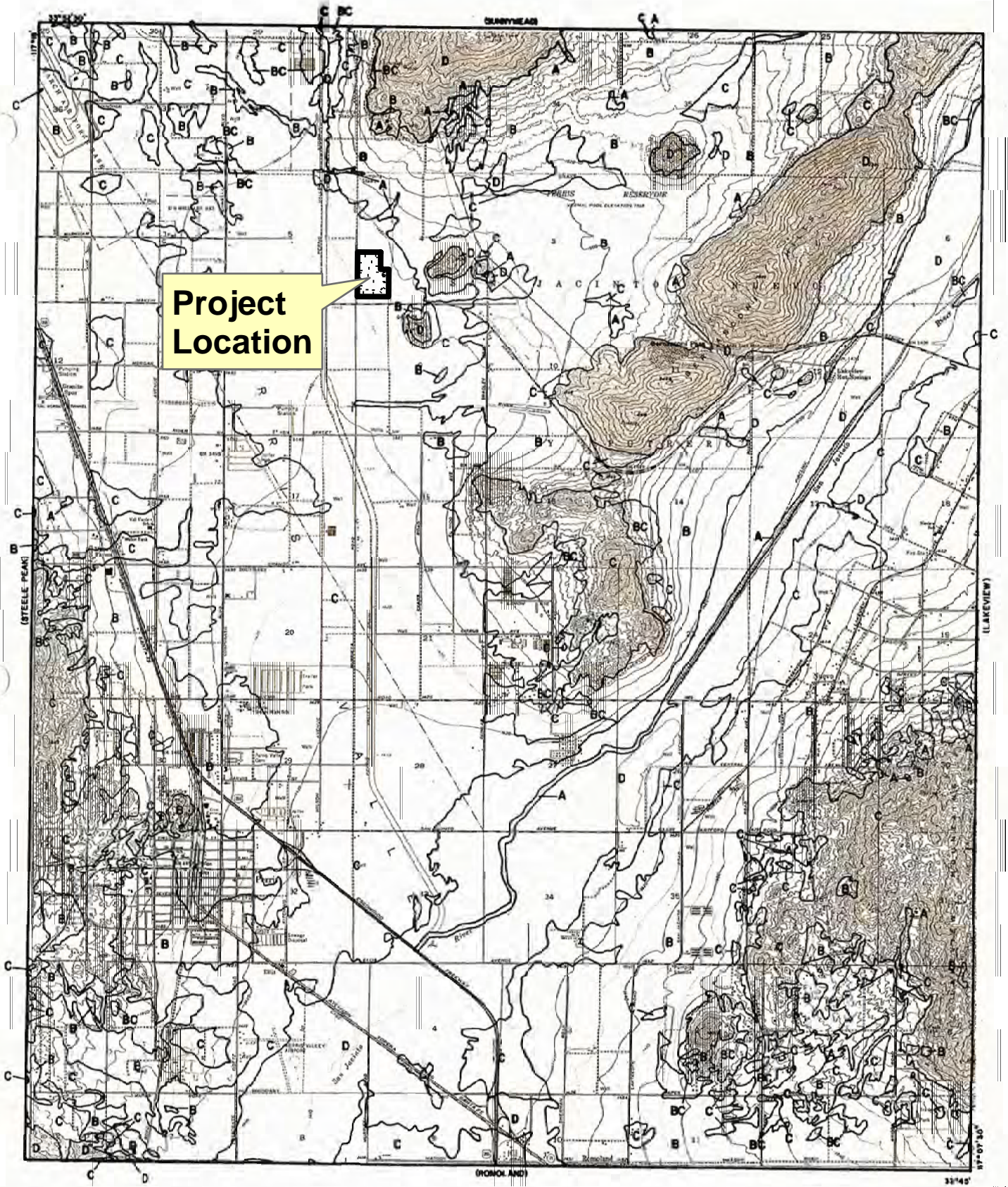
NOTES:  
 1. Slope of Intensity Duration Curve based on District analysis of automatic recording rain gage records.

**RCFC & WCD**

HYDROLOGY MANUAL

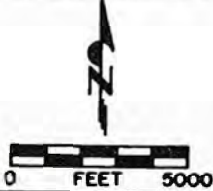
RIVERSIDE COUNTY FLOOD CONTROL  
 AND  
 WATER CONSERVATION DISTRICT  
**SLOPE OF  
 INTENSITY DURATION  
 CURVE**

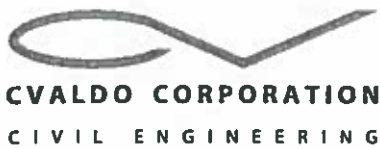
APPROVED	DRAWN BY: <i>R.C.S.</i>	SHEET NO.
CHIEF ENGINEER R.E. NO. 8822	CHECKED BY:	DR. NO.



**Project Location**

<p><b>LEGEND</b></p> <p>— SOILS GROUP BOUNDARY</p> <p>A SOILS GROUP DESIGNATION</p> <p><b>RCFC&amp;WCD</b></p> <p>HYDROLOGY MANUAL</p>	<p><b>HYDROLOGIC SOILS GROUP MAP</b></p> <p><b>FOR</b></p> <p><b>PERRIS</b></p>
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September 20, 2018

Mr. Habib Motlagh  
City of Perris  
101 North D Street  
Perris, CA 92570-1998

Dear Mr. Motlagh:

Re: Tentative Tract Map 36648  
Perris Valley MDP Laterals A-R, A-S, and A-T  
Plan Check Number 3  
Account No. 137-0-3-90199

The Riverside County Flood Control and Water Conservation District received the following plans and documents for review:

- Technical Memorandum regarding Hydrology Study for Line U of the Perris Valley Master Drainage Plan, dated August 2, 2018, submitted digitally via email

As requested by the District, we have completed plan check number three of the subject project and offer no further comments to the project applicant. The scope of this review was limited to the technical memorandum. No supporting plans or other studies were submitted.

Please note that should the construction of Perris Valley MDP Lateral U-1 (modified by the submitted technical memorandum) precede construction by DWR of the Lake Perris emergency outlet along the Line U alignment, the reach of Line U (or an alternative adequate facility) between Lateral U-1 and the PVSD would be required to be built in order to convey the Lateral U-1 and Line U tributary flows.

Sincerely,  
CValdo Corporation

Mike Cairns, P.E.  
Principal



RCFCWCD

Cassandra Sanchez, P.E.  
Engineering Project Manager

c. Joseph Caldwell, Albert A. Webb Associates, 3788 McCray Street, Riverside CA, 92506  
Nathan Perez, City of Perris

ec. Mike Wong, RCFCWCD



## Technical Memorandum

To: Cassandra Sanchez, PE – RCFC&WCD

From: Joseph Caldwell, Director – Stormwater Engineering, Albert A. Webb Associates

Date: August 2, 2018

Re: Hydrology Study for Line U of the Perris Valley Master Drainage Plan

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### Introduction

In the District's review of Tract 36648 questions have been raised regarding regional Master Drainage Plan facilities and offsite regional drainage. Existing development to the east of Tract 36648 prevents future construction of Perris Valley Master Drainage Plan (PVMDP) Lines A-T and A-S. These facilities were originally intended to convey runoff from the region north of the Ramona Expressway, east of the Perris Valley Storm Drain (PVSD), and west of Lake Perris to the PVSD.

While Line A-T has not been constructed, corresponding drainage facilities have been provided for in Tract 36648 and the eastern adjacent development. To compensate for the removal of Line A-S a new facility or facilities will need to be constructed to route flows easterly of Lake Perris Drive to PVMDP Line U. Currently, there are two earthen channels that have been graded to convey runoff to this location (although it does not appear that they have 100-Year conveyance capacity).

It is proposed that Lat U-1 be extended northward. The extension of Lat U-1 would not only convey flows originally intended for Line A-S but would eliminate the need for Line A-R as well. This memorandum has been prepared to document these needed modifications and to verify that Line U and Lat U-1 will have adequate capacity to convey these re-routed storm flows in the absence of Line A-S and Line A-R.

### Hydrologic Analysis

The Riverside County Rational and Synthetic Unit Hydrograph Methods, described in the Riverside County Hydrology Manual, were used to determine peak flows of the 100-Year storm runoff generated from tributary areas north of the Ramona Expressway. The hydrologic calculations are included as Attachments 1 and 2, and the hydrologic maps are included as Attachment 3. A map of the PVMDP is included for reference as Attachment 4.

The Riverside County Rational Method was used to calculate the peak 100-Year flow rate for the 370 acre subarea east of Lake Perris Drive that will be re-routed to Line U. Based upon this analysis, a facility will need to be constructed along the east side of Lake Perris Drive, Lateral U-1, that can convey a peak 100-Year flow rate of **542 cfs**.

The diversion of additional tributary area to Line U will result in a larger flow rate for Line U. With flow re-routed as described above, the Line U tributary area at the intersection of Lake Perris Drive and Ramona

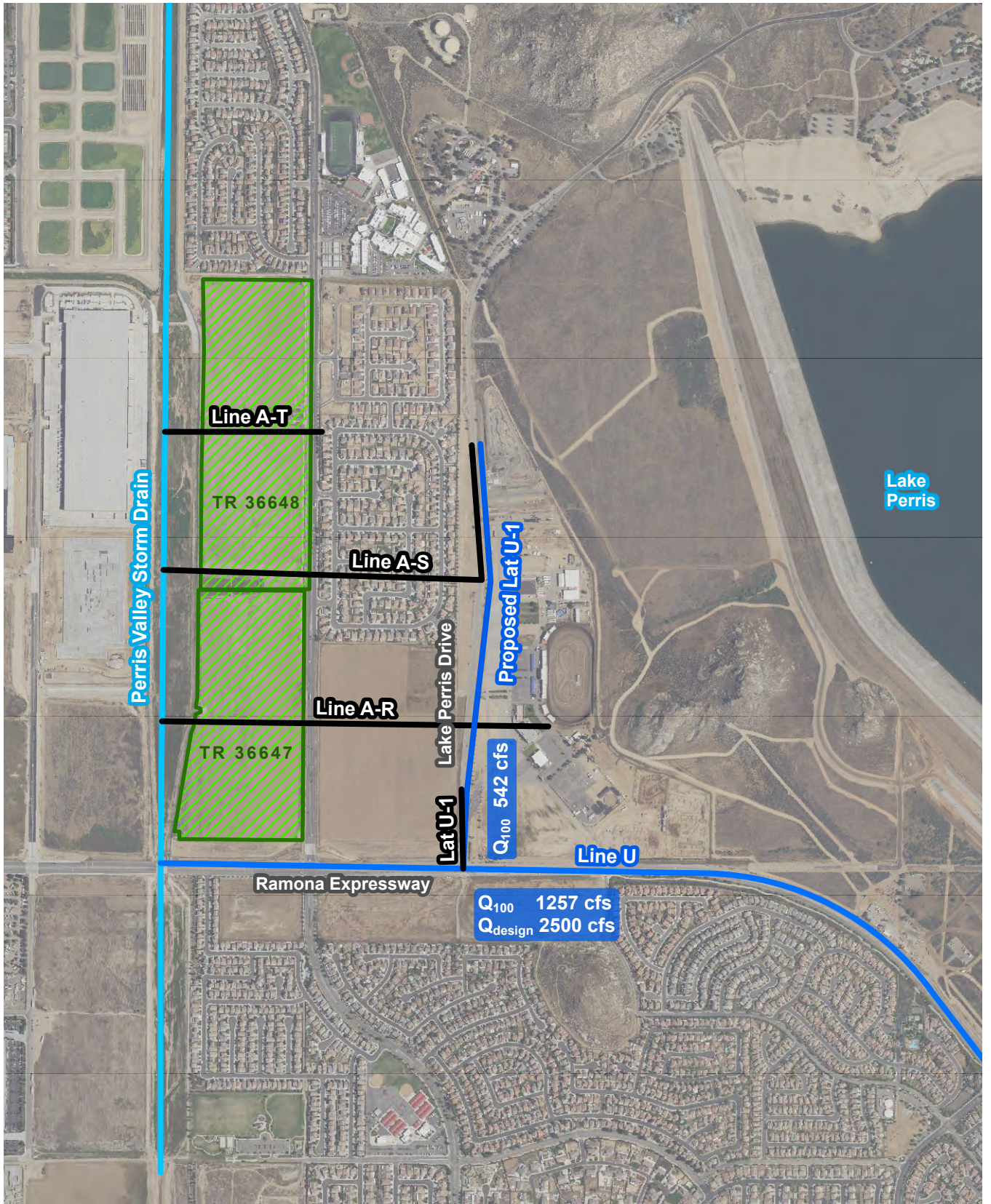
Expressway is 984 acres. A synthetic unit hydrograph calculation was prepared to determine the peak flow rate for Line U at this location. The 100-Year 3-Hour storm event produced a peak flow rate of **1257 cfs** for this tributary area. This is a greater flow rate than the 882 cfs shown on the PVMDP. It should be noted that the California Department of Water Resources (DWR) has current plans to construct an emergency outlet for Lake Perris along the Line U alignment. The DWR facility will be sized to convey approximately 2,500 cfs from Lake Perris to the PVSD. The increased flow rate for Line U caused by the redirection of offsite flows will be well within the flow capacity of the future DWR Line U facility.

A map summarizing some of the key information in this memorandum is included as Exhibit 1: Line U Proposed Changes.

## **Attachments**

Attachment 1	Hydrologic Calculations: Rational Method
Attachment 2	Hydrologic Calculations: Synthetic Unit Hydrograph Method
Attachment 3	Hydrologic Maps
Attachment 4	Perris Valley Master Drainage Plan Map

C:\2013\13-01159\GIS\Pro\13-01159.aprx Map created 02 Aug 2018



Source: Riverside County 2016

Exhibit 1: Line U Proposed Changes



0 1,000 2,000 3,000  
US Feet



# Attachment 1

## Hydrologic Calculations: Rational Method

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1  
Rational Hydrology Study Date: 08/01/18 File: LateralU1.out

-----  
Lateral U1 Rational  
100yr  
WO 13-0159  
CS  
-----

\*\*\*\*\* Hydrology Study Control Information \*\*\*\*\*

English (in-lb) Units used in input data file  
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Program License Serial Number 4010  
-----

Rational Method Hydrology Program based on  
Riverside County Flood Control & Water Conservation District  
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)  
For the [ Perris Valley ] area used.  
10 year storm 10 minute intensity = 1.880(In/Hr)  
10 year storm 60 minute intensity = 0.780(In/Hr)  
100 year storm 10 minute intensity = 2.690(In/Hr)  
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 100.0  
Calculated rainfall intensity data:  
1 hour intensity = 1.120(In/Hr)  
Slope of intensity duration curve = 0.4900

++++  
Process from Point/Station 100.000 to Point/Station 101.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

-----  
Initial area flow distance = 900.000(Ft.)  
Top (of initial area) elevation = 2508.000(Ft.)  
Bottom (of initial area) elevation = 2336.000(Ft.)  
Difference in elevation = 172.000(Ft.)  
Slope = 0.19111 s(percent)= 19.11  
TC =  $k(0.530)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 11.213 min.  
Rainfall intensity = 2.548(In/Hr) for a 100.0 year storm  
UNDEVELOPED (poor cover) subarea  
Runoff Coefficient = 0.845  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 0.000  
Decimal fraction soil group D = 1.000  
RI index for soil(AMC 2) = 89.00  
Pervious area fraction = 1.000; Impervious fraction = 0.000  
Initial subarea runoff = 9.045(CFS)  
Total initial stream area = 4.200(Ac.)  
Pervious area fraction = 1.000

++++  
Process from Point/Station 101.000 to Point/Station 102.000  
\*\*\*\* NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

-----  
Top of natural channel elevation = 2336.000(Ft.)  
End of natural channel elevation = 2220.000(Ft.)  
Length of natural channel = 437.000(Ft.)  
Estimated mean flow rate at midpoint of channel = 15.937(CFS)

Natural mountain channel type used  
L.A. County flood control district formula for channel velocity:  
Velocity =  $5.48(q^{.33})(\text{slope}^{.492})$   
Velocity using mean channel flow = 5.95(Ft/s)

Correction to map slope used on extremely rugged channels with  
drops and waterfalls (Plate D-6.2)  
Normal channel slope = 0.2654  
Corrected/adjusted channel slope = 0.1843  
Travel time = 1.22 min. TC = 12.44 min.

Adding area flow to channel  
UNDEVELOPED (poor cover) subarea  
Runoff Coefficient = 0.843  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 0.000  
Decimal fraction soil group D = 1.000  
RI index for soil(AMC 2) = 89.00  
Pervious area fraction = 1.000; Impervious fraction = 0.000  
Rainfall intensity = 2.422(In/Hr) for a 100.0 year storm  
Subarea runoff = 13.059(CFS) for 6.400(Ac.)  
Total runoff = 22.105(CFS) Total area = 10.600(Ac.)

+++++  
Process from Point/Station 102.000 to Point/Station 103.000  
\*\*\*\* NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

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Top of natural channel elevation = 2220.000(Ft.)  
End of natural channel elevation = 2164.000(Ft.)  
Length of natural channel = 263.000(Ft.)  
Estimated mean flow rate at midpoint of channel = 34.512(CFS)

Natural mountain channel type used  
L.A. County flood control district formula for channel velocity:  
Velocity =  $5.48(q^{.33})(\text{slope}^{.492})$   
Velocity using mean channel flow = 7.27(Ft/s)

Correction to map slope used on extremely rugged channels with  
drops and waterfalls (Plate D-6.2)  
Normal channel slope = 0.2129  
Corrected/adjusted channel slope = 0.1652  
Travel time = 0.60 min. TC = 13.04 min.

Adding area flow to channel  
UNDEVELOPED (poor cover) subarea  
Runoff Coefficient = 0.841  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 0.000  
Decimal fraction soil group D = 1.000  
RI index for soil(AMC 2) = 89.00  
Pervious area fraction = 1.000; Impervious fraction = 0.000  
Rainfall intensity = 2.366(In/Hr) for a 100.0 year storm  
Subarea runoff = 23.690(CFS) for 11.900(Ac.)  
Total runoff = 45.794(CFS) Total area = 22.500(Ac.)

+++++  
Process from Point/Station 103.000 to Point/Station 104.000  
\*\*\*\* NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of natural channel elevation = 2164.000(Ft.)  
End of natural channel elevation = 2030.000(Ft.)  
Length of natural channel = 950.000(Ft.)  
Estimated mean flow rate at midpoint of channel = 70.218(CFS)

Natural mountain channel type used  
L.A. County flood control district formula for channel velocity:  
Velocity =  $5.48(q^{.33})(\text{slope}^{.492})$   
Velocity using mean channel flow = 8.13(Ft/s)

Correction to map slope used on extremely rugged channels with drops and waterfalls (Plate D-6.2)

Normal channel slope = 0.1411

Corrected/adjusted channel slope = 0.1287

Travel time = 1.95 min. TC = 14.99 min.

Adding area flow to channel

UNDEVELOPED (poor cover) subarea

Runoff Coefficient = 0.838

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 1.000

RI index for soil(AMC 2) = 89.00

Pervious area fraction = 1.000; Impervious fraction = 0.000

Rainfall intensity = 2.210(In/Hr) for a 100.0 year storm

Subarea runoff = 44.424(CFS) for 24.000(Ac.)

Total runoff = 90.218(CFS) Total area = 46.500(Ac.)

\*\*\*\*\*  
Process from Point/Station 104.000 to Point/Station 105.000  
\*\*\*\* NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of natural channel elevation = 2030.000(Ft.)

End of natural channel elevation = 1660.000(Ft.)

Length of natural channel = 2934.000(Ft.)

Estimated mean flow rate at midpoint of channel = 127.664(CFS)

Natural mountain channel type used

L.A. County flood control district formula for channel velocity:

Velocity =  $5.48(q^{.33})(\text{slope}^{.492})$

Velocity using mean channel flow = 9.50(Ft/s)

Correction to map slope used on extremely rugged channels with drops and waterfalls (Plate D-6.2)

Normal channel slope = 0.1261

Corrected/adjusted channel slope = 0.1183

Travel time = 5.15 min. TC = 20.14 min.

Adding area flow to channel

UNDEVELOPED (poor cover) subarea

Runoff Coefficient = 0.829

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 1.000

RI index for soil(AMC 2) = 89.00

Pervious area fraction = 1.000; Impervious fraction = 0.000

Rainfall intensity = 1.912(In/Hr) for a 100.0 year storm

Subarea runoff = 61.163(CFS) for 38.600(Ac.)

Total runoff = 151.381(CFS) Total area = 85.100(Ac.)

\*\*\*\*\*  
Process from Point/Station 105.000 to Point/Station 106.000  
\*\*\*\* NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of natural channel elevation = 1660.000(Ft.)

End of natural channel elevation = 1569.000(Ft.)

Length of natural channel = 1177.000(Ft.)

Estimated mean flow rate at midpoint of channel = 215.421(CFS)

Natural mountain channel type used

L.A. County flood control district formula for channel velocity:

Velocity =  $5.48(q^{.33})(\text{slope}^{.492})$

Velocity using mean channel flow = 9.16(Ft/s)

Correction to map slope used on extremely rugged channels with drops and waterfalls (Plate D-6.2)

Normal channel slope = 0.0773

Corrected/adjusted channel slope = 0.0773

Travel time = 2.14 min. TC = 22.28 min.

Adding area flow to channel  
UNDEVELOPED (poor cover) subarea  
Runoff Coefficient = 0.805  
Decimal fraction soil group A = 0.090  
Decimal fraction soil group B = 0.080  
Decimal fraction soil group C = 0.000  
Decimal fraction soil group D = 0.830  
RI index for soil(AMC 2) = 86.14  
Pervious area fraction = 1.000; Impervious fraction = 0.000  
Rainfall intensity = 1.820(In/Hr) for a 100.0 year storm  
Subarea runoff = 105.494(CFS) for 72.000(Ac.)  
Total runoff = 256.875(CFS) Total area = 157.100(Ac.)

+++++  
Process from Point/Station 106.000 to Point/Station 107.000  
\*\*\*\* NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of natural channel elevation = 1569.000(Ft.)  
End of natural channel elevation = 1507.000(Ft.)  
Length of natural channel = 1749.000(Ft.)  
Estimated mean flow rate at midpoint of channel = 327.757(CFS)

Natural valley channel type used  
L.A. County flood control district formula for channel velocity:  
Velocity(ft/s) = (7 + 8(q(English Units)<sup>0.352</sup>)(slope<sup>0.5</sup>)  
Velocity using mean channel flow = 12.89(Ft/s)

Correction to map slope used on extremely rugged channels with  
drops and waterfalls (Plate D-6.2)  
Normal channel slope = 0.0354  
Corrected/adjusted channel slope = 0.0354  
Travel time = 2.26 min. TC = 24.54 min.

Adding area flow to channel  
COMMERCIAL subarea type  
Runoff Coefficient = 0.866  
Decimal fraction soil group A = 0.030  
Decimal fraction soil group B = 0.950  
Decimal fraction soil group C = 0.000  
Decimal fraction soil group D = 0.020  
RI index for soil(AMC 2) = 55.66  
Pervious area fraction = 0.100; Impervious fraction = 0.900  
Rainfall intensity = 1.736(In/Hr) for a 100.0 year storm  
Subarea runoff = 130.294(CFS) for 86.700(Ac.)  
Total runoff = 387.169(CFS) Total area = 243.800(Ac.)

+++++  
Process from Point/Station 107.000 to Point/Station 108.000  
\*\*\*\* NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of natural channel elevation = 1507.000(Ft.)  
End of natural channel elevation = 1458.000(Ft.)  
Length of natural channel = 5341.000(Ft.)  
Estimated mean flow rate at midpoint of channel = 487.058(CFS)

Natural valley channel type used  
L.A. County flood control district formula for channel velocity:  
Velocity(ft/s) = (7 + 8(q(English Units)<sup>0.352</sup>)(slope<sup>0.5</sup>)  
Velocity using mean channel flow = 7.44(Ft/s)

Correction to map slope used on extremely rugged channels with  
drops and waterfalls (Plate D-6.2)  
Normal channel slope = 0.0092  
Corrected/adjusted channel slope = 0.0092  
Travel time = 11.97 min. TC = 36.51 min.

Adding area flow to channel  
COMMERCIAL subarea type  
Runoff Coefficient = 0.863  
Decimal fraction soil group A = 0.010  
Decimal fraction soil group B = 0.910

Decimal fraction soil group C = 0.080  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 56.80  
Pervious area fraction = 0.100; Impervious fraction = 0.900  
Rainfall intensity = 1.429(In/Hr) for a 100.0 year storm  
Subarea runoff = 155.041(CFS) for 125.800(Ac.)  
Total runoff = 542.211(CFS) Total area = 369.600(Ac.)  
End of computations, total study area = 369.60 (Ac.)  
The following figures may  
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction( $A_p$ ) = 0.483  
Area averaged RI index number = 69.7

## Attachment 2

### Hydrologic Calculations: Synthetic Unit Hydrograph Method

Unit Hydrograph Analysis

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Study date 07/31/18 File: A3100.out

+++++
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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 4010

-----
English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

-----
Line U Synthetic Unit Hydrograph
Subarea A
WO 13-0159
CS

-----
Drainage Area = 157.30(Ac.) = 0.246 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 984.50(Ac.) = 1.538 Sq. Mi.
Length along longest watercourse = 6661.00(Ft.)
Length along longest watercourse measured to centroid = 2945.00(Ft.)
Length along longest watercourse = 1.262 Mi.
Length along longest watercourse measured to centroid = 0.558 Mi.
Difference in elevation = 939.00(Ft.)
Slope along watercourse = 744.3207 Ft./Mi.
Average Manning's 'N' = 0.050
Lag time = 0.299 Hr.
Lag time = 17.93 Min.
25% of lag time = 4.48 Min.
40% of lag time = 7.17 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1] Rainfall(In)[2] Weighting[1\*2]
984.50 0.80 787.60

100 YEAR Area rainfall data:

Area(Ac.)[1] Rainfall(In)[2] Weighting[1\*2]
984.50 1.85 1821.33

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.800(In)
Area Averaged 100-Year Rainfall = 1.850(In)

Point rain (area averaged) = 1.850(In)
Areal adjustment factor = 99.57 %
Adjusted average point rain = 1.842(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
5.360 62.00 0.000
1.400 76.00 0.000
0.270 84.00 0.000
138.380 88.00 0.000
0.790 32.00 0.500
1.290 56.00 0.500
4.290 75.00 0.500

2.800	56.00	0.900
2.130	75.00	0.900
0.590	32.00	0.900

Total Area Entered = 157.30(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
62.0	62.0	0.448	0.000	0.448	0.034	0.015
76.0	76.0	0.291	0.000	0.291	0.009	0.003
84.0	84.0	0.198	0.000	0.198	0.002	0.000
88.0	88.0	0.153	0.000	0.153	0.880	0.134
32.0	32.0	0.742	0.500	0.408	0.005	0.002
56.0	56.0	0.511	0.500	0.281	0.008	0.002
75.0	75.0	0.303	0.500	0.167	0.027	0.005
56.0	56.0	0.511	0.900	0.097	0.018	0.002
75.0	75.0	0.303	0.900	0.058	0.014	0.001
32.0	32.0	0.742	0.900	0.141	0.004	0.001
						Sum (F) = 0.165

Area averaged mean soil loss (F) (In/Hr) = 0.165

Minimum soil loss rate ((In/Hr)) = 0.082

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

-----  
 Unit Hydrograph  
 FOOTHILL S-Curve  
 -----

Unit Hydrograph Data  
 -----

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	27.879	1.959
2	0.167	55.758	6.106
3	0.250	83.637	11.249
4	0.333	111.516	25.348
5	0.417	139.395	18.926
6	0.500	167.274	8.989
7	0.583	195.153	6.310
8	0.667	223.032	4.805
9	0.750	250.910	3.742
10	0.833	278.789	2.987
11	0.917	306.668	2.384
12	1.000	334.547	1.887
13	1.083	362.426	1.412
14	1.167	390.305	1.099
15	1.250	418.184	0.720
16	1.333	446.063	0.362
17	1.417	473.942	0.314
18	1.500	501.821	0.279
19	1.583	529.700	0.216
20	1.667	557.579	0.169
21	1.750	585.458	0.208
22	1.833	613.337	0.210
23	1.917	641.216	0.127
24	2.000	669.095	0.098
25	2.083	696.974	0.059
26	2.167	724.853	0.034
Sum = 100.000			Sum= 158.529

-----

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time	Pattern	Storm Rain	Loss rate(In./Hr)	Effective
(Hr.)	Percent	(In/Hr)	Max   Low	(In/Hr)
1	0.08	1.30	0.287 ( 0.259)	0.123
2	0.17	1.30	0.287 ( 0.259)	0.123
3	0.25	1.10	0.243 ( 0.219)	0.079
4	0.33	1.50	0.332 ( 0.298)	0.167
5	0.42	1.50	0.332 ( 0.298)	0.167
6	0.50	1.80	0.398 ( 0.358)	0.233
7	0.58	1.50	0.332 ( 0.298)	0.167
8	0.67	1.80	0.398 ( 0.358)	0.233



2+20	7.4572	86.28				VQ			
2+25	8.1437	99.68				VQ			
2+30	8.9459	116.48				V	Q		
2+35	9.8226	127.29				V	Q		
2+40	10.8860	154.41					V	Q	
2+45	12.0979	175.97						V	Q
2+50	13.3370	179.91						V	Q
2+55	14.4278	158.38						V	QV
3+ 0	15.2294	116.40					Q		V
3+ 5	15.8247	86.44				Q			V
3+10	16.3017	69.25							V
3+15	16.6556	51.39			Q				V
3+20	16.9149	37.66		Q					V
3+25	17.1133	28.80		Q					V
3+30	17.2658	22.14		Q					V
3+35	17.3817	16.84		Q					V
3+40	17.4674	12.44		Q					V
3+45	17.5295	9.02		Q					V
3+50	17.5740	6.46		Q					V
3+55	17.6073	4.84		Q					V
4+ 0	17.6338	3.84		Q					V
4+ 5	17.6548	3.05		Q					V
4+10	17.6721	2.51		Q					V
4+15	17.6869	2.15		Q					V
4+20	17.6993	1.80		Q					V
4+25	17.7084	1.33		Q					V
4+30	17.7148	0.93		Q					V
4+35	17.7191	0.62		Q					V
4+40	17.7217	0.37		Q					V
4+45	17.7229	0.17		Q					V
4+50	17.7234	0.08		Q					V
4+55	17.7236	0.04		Q					V
5+ 0	17.7237	0.01		Q					V
5+ 5	17.7237	0.00		Q					V

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1  
Study date 07/31/18 File: B3100.out

+++++

Riverside County Synthetic Unit Hydrology Method  
RCFC & WCD Manual date - April 1978

Program License Serial Number 4010

-----  
English (in-lb) Input Units Used  
English Rainfall Data (Inches) Input Values Used

English Units used in output format

-----  
Line U Synthetic Unit Hydrograph  
Subarea B  
WO 13-0159  
CS

-----  
Drainage Area = 827.20(Ac.) = 1.293 Sq. Mi.  
Drainage Area for Depth-Area Areal Adjustment = 984.50(Ac.) = 1.538 Sq. Mi.  
Length along longest watercourse = 7090.00(Ft.)  
Length along longest watercourse measured to centroid = 497.00(Ft.)  
Length along longest watercourse = 1.343 Mi.  
Length along longest watercourse measured to centroid = 0.094 Mi.  
Difference in elevation = 111.00(Ft.)  
Slope along watercourse = 82.6629 Ft./Mi.  
Average Manning's 'N' = 0.015  
Lag time = 0.071 Hr.  
Lag time = 4.25 Min.  
25% of lag time = 1.06 Min.  
40% of lag time = 1.70 Min.  
Unit time = 5.00 Min.  
Duration of storm = 3 Hour(s)  
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
984.50	0.80	787.60

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
984.50	1.85	1821.33

STORM EVENT (YEAR) = 100.00  
Area Averaged 2-Year Rainfall = 0.800(In)  
Area Averaged 100-Year Rainfall = 1.850(In)

Point rain (area averaged) = 1.850(In)  
Areal adjustment factor = 99.57 %  
Adjusted average point rain = 1.842(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.410	62.00	0.000
26.520	84.00	0.000
130.740	88.00	0.000
1.080	32.00	0.500
31.410	56.00	0.500
11.980	69.00	0.500
128.790	75.00	0.500

0.460	32.00	0.900
126.660	56.00	0.900
18.340	69.00	0.900
347.810	76.00	0.000

Total Area Entered = 827.20(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
62.0	62.0	0.448	0.000	0.448	0.004	0.002
84.0	84.0	0.198	0.000	0.198	0.032	0.006
88.0	88.0	0.153	0.000	0.153	0.158	0.024
32.0	32.0	0.742	0.500	0.408	0.001	0.001
56.0	56.0	0.511	0.500	0.281	0.038	0.011
69.0	69.0	0.373	0.500	0.205	0.014	0.003
75.0	75.0	0.303	0.500	0.167	0.156	0.026
32.0	32.0	0.742	0.900	0.141	0.001	0.000
56.0	56.0	0.511	0.900	0.097	0.153	0.015
69.0	69.0	0.373	0.900	0.071	0.022	0.002
76.0	76.0	0.291	0.000	0.291	0.420	0.122
						Sum (F) = 0.211

Area averaged mean soil loss (F) (In/Hr) = 0.211  
 Minimum soil loss rate ((In/Hr)) = 0.106  
 (for 24 hour storm duration)  
 Soil low loss rate (decimal) = 0.900

-----  
 Unit Hydrograph  
 VALLEY S-Curve  
 -----

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	117.529	24.479
2	0.167	235.059	48.784
3	0.250	352.588	13.531
4	0.333	470.117	6.151
5	0.417	587.646	3.436
6	0.500	705.176	2.014
7	0.583	822.705	1.605
		Sum = 100.000	Sum= 833.663

-----  
 The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time	Pattern	Storm Rain	Loss rate(In./Hr)		Effective
(Hr.)	Percent	(In/Hr)	Max	Low	(In/Hr)
1	0.08	1.30	0.287	( 0.211)	0.076
2	0.17	1.30	0.287	( 0.211)	0.076
3	0.25	1.10	0.243	( 0.211)	0.032
4	0.33	1.50	0.332	( 0.211)	0.120
5	0.42	1.50	0.332	( 0.211)	0.120
6	0.50	1.80	0.398	( 0.211)	0.186
7	0.58	1.50	0.332	( 0.211)	0.120
8	0.67	1.80	0.398	( 0.211)	0.186
9	0.75	1.80	0.398	( 0.211)	0.186
10	0.83	1.50	0.332	( 0.211)	0.120
11	0.92	1.60	0.354	( 0.211)	0.142
12	1.00	1.80	0.398	( 0.211)	0.186
13	1.08	2.20	0.486	( 0.211)	0.275
14	1.17	2.20	0.486	( 0.211)	0.275
15	1.25	2.20	0.486	( 0.211)	0.275
16	1.33	2.00	0.442	( 0.211)	0.231
17	1.42	2.60	0.575	( 0.211)	0.363
18	1.50	2.70	0.597	( 0.211)	0.385
19	1.58	2.40	0.531	( 0.211)	0.319
20	1.67	2.70	0.597	( 0.211)	0.385
21	1.75	3.30	0.729	( 0.211)	0.518
22	1.83	3.10	0.685	( 0.211)	0.474
23	1.92	2.90	0.641	( 0.211)	0.430
24	2.00	3.00	0.663	( 0.211)	0.452
25	2.08	3.10	0.685	( 0.211)	0.474



-----  
Line U Synthetic Unit Hydrograph  
Combine routed flows from A with flows from B  
WO 13-0159  
CS  
-----

Program License Serial Number 4010

-----  
\*\*\*\*\* HYDROGRAPH INFORMATION \*\*\*\*\*

From study/file name: A3100.rte  
\*\*\*\*\*HYDROGRAPH DATA\*\*\*\*\*  
Number of intervals = 61  
Time interval = 5.0 (Min.)  
Maximum/Peak flow rate = 179.914 (CFS)  
Total volume = 17.724 (Ac.Ft)  
Status of hydrographs being held in storage  
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5  
Peak (CFS) 0.000 0.000 0.000 0.000 0.000  
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000  
\*\*\*\*\*

+++++  
Process from Point/Station 106.000 to Point/Station 108.000  
\*\*\*\* STREAM ROUTING SCS CONVEX METHOD \*\*\*\*

-----  
HYDROGRAPH STREAM ROUTING DATA:  
Length of stream = 7090.00 (Ft.)  
Elevation difference = 111.00 (Ft.)  
Slope of channel = 0.015656 (Vert/Horiz)  
Channel type - Pipe

Pipe length = 7090.00(Ft.) Elevation difference = 111.00(Ft.)  
Manning's N = 0.013 No. of pipes = 1  
Pipe evaluation using mean flow rate of hydrograph  
Required pipe flow = 61.425(CFS)  
Nearest computed pipe diameter = 33.00(In.)  
Calculated individual pipe flow = 61.425(CFS)  
Normal flow depth in pipe = 25.13(In.)  
Flow top width inside pipe = 28.13(In.)  
Critical Depth = 2.51(Ft.)  
Pipe flow velocity = 12.65(Ft/s)  
Travel time through pipe = 9.34 min.

Pipe length = 7090.00(Ft.) Elevation difference = 111.00(Ft.)  
Manning's N = 0.013 No. of pipes = 1  
Pipe evaluation using maximum flow rate of hydrograph  
Required pipe flow = 179.914(CFS)  
Nearest computed pipe diameter = 48.00(In.)  
Calculated individual pipe flow = 179.914(CFS)  
Normal flow depth in pipe = 39.38(In.)  
Flow top width inside pipe = 36.86(In.)  
Critical Depth = 3.77(Ft.)  
Pipe flow velocity = 16.30(Ft/s)  
Travel time through pipe = 7.25 min.

\*\*\*\*\* SCS CONVEX CHANNEL ROUTING \*\*\*\*\*  
Convex method of stream routing data items:  
Using equation: Outflow =  
 $O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)$

where  $c^* = 1 - (1-c)^e$  and  $dt = c(\text{length})/\text{velocity}$   
 $c(v/v+1.7) = 0.9056$  Travel time = 7.25 (min.)  
 $dt*(\text{unit time interval}) = 5.00(\text{min.})$ ,  $e = 0.8412$   
 $dt(\text{routing time-step}) = 6.56(\text{min.})$ ,  $c^* = 0.8626$

Output hydrograph delayed by 1 unit time increments

+++++

PRINT OF STORM  
 Runoff Hydrograph

-----  
 Hydrograph in 5 Minute intervals (CFS)  
 -----

Time(h+m)	Out = O(CFS)	In = I	0	45.0	90.0	134.9	179.9
0+ 5	0.0000	0.38	0				
0+10	0.0784	1.57	0				
0+15	0.5842	3.62	0				
0+20	1.8572	8.41	OI				
0+25	4.3644	12.16	O I				
0+30	8.6234	13.92	O I				
0+35	12.0361	17.81	OI				
0+40	14.4594	21.52	OI				
0+45	18.1121	25.19	OI				
0+50	21.8042	26.62	OI				
0+55	25.0187	28.54	OI				
1+ 0	26.7961	30.10	OI				
1+ 5	28.6246	29.85	0				
1+10	29.8485	31.36	0				
1+15	30.1597	35.17	OI				
1+20	31.9773	40.08	OI				
1+25	35.7378	43.49	O I				
1+30	40.1869	45.87	O I				
1+35	43.5272	47.74	OI				
1+40	45.9302	52.66	OI				
1+45	48.5015	57.53	O I				
1+50	53.0889	59.94	O I				
1+55	57.4162	64.19	O I				
2+ 0	60.4679	70.78	O I				
2+ 5	65.0336	73.82	O I				
2+10	70.6139	74.95	OI				
2+15	73.6133	79.23	OI				
2+20	75.6468	86.28	O I				
2+25	80.1867	99.68	O I				
2+30	88.1972	116.48	O I				
2+35	101.5541	127.29	O I				
2+40	116.6493	154.41	O I				
2+45	131.4032	175.97	O I				
2+50	155.6787	179.91	O I				
2+55	173.9912	158.38	O I				
3+ 0	174.6763	116.40	O I				
3+ 5	151.9939	86.44	O I				
3+10	115.1304	69.25	O I				
3+15	86.8483	51.39	O I				
3+20	67.9995	37.66	O I				
3+25	50.8502	28.80	O I				
3+30	37.6475	22.14	O I				
3+35	28.6459	16.84	O I				
3+40	21.9456	12.44	O I				
3+45	16.6344	9.02	O I				
3+50	12.3144	6.46	O I				
3+55	8.9446	4.84	O I				
4+ 0	6.4663	3.84	O I				
4+ 5	4.8597	3.05	O I				
4+10	3.8151	2.51	O				
4+15	3.0439	2.15	O				
4+20	2.5118	1.80	O				
4+25	2.1262	1.33	O				
4+30	1.7477	0.93	O				
4+35	1.3081	0.62	O				
4+40	0.9187	0.37	O				
4+45	0.6110	0.17	O				
4+50	0.3610	0.08	O				
4+55	0.1800	0.04	O				

5+ 0	0.0819	0.01	0				
5+ 5	0.0379	0.00	0				
5+10	0.0144	0.00	0				
5+15	0.0024	0.00	0				

\*\*\*\*\*HYDROGRAPH DATA\*\*\*\*\*

Number of intervals = 63  
Time interval = 5.0 (Min.)  
Maximum/Peak flow rate = 174.676 (CFS)  
Total volume = 17.724 (Ac.Ft)  
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

+++++  
Process from Point/Station 106.000 to Point/Station 108.000  
\*\*\*\* ADD/COMBINE/RECOVER HYDROGRAPHS \*\*\*\*

\*\*\*\*\* HYDROGRAPH INFORMATION \*\*\*\*\*

From study/file name: B3100.rte

+++++

P R I N T O F S T O R M  
R u n o f f H y d r o g r a p h

-----  
Hydrograph in 5 Minute intervals (CFS)

-----  
Time(h+m) Add q(CFS) Tot. Q 0 314.1 628.3 942.4 1256.5

0+ 5	15.5036	15.50	Q				
0+10	46.4006	46.48	Q				
0+15	45.9437	46.53	Q				
0+20	49.9039	51.76	Q				
0+25	83.0680	87.43	Q				
0+30	105.5939	114.22	Q				
0+35	123.3232	135.36	qQ				
0+40	119.1549	133.61	qQ				
0+45	142.9503	161.06	qQ				
0+50	136.5760	158.38	qQ				
0+55	116.7224	141.74	qQ				
1+ 0	128.9330	155.73	Q				
1+ 5	164.2935	192.92	qQ				
1+10	205.3815	235.23	qQ				
1+15	217.1477	247.31	qQ				
1+20	213.4086	245.39	qQ				
1+25	226.0719	261.81	qQ				
1+30	281.6392	321.83	q Q				
1+35	290.9769	334.50	qQ				
1+40	285.5662	331.50	qQ				
1+45	336.3368	384.84	q Q				
1+50	387.6282	440.72	q Q				
1+55	379.2295	436.65	qQ				
2+ 0	368.6516	429.12	q Q				
2+ 5	378.9291	443.96	q Q				
2+10	439.6444	510.26	q Q				
2+15	578.0823	651.70	q Q				
2+20	610.2130	685.86	q Q				
2+25	657.0806	737.27	q Q				
2+30	955.7488	1043.95	q Q				
2+35	1116.1004	1217.65	q Q				
2+40	1139.8690	1256.52	q Q				
2+45	802.8056	934.21	q Q				
2+50	406.8157	562.49	q Q				
2+55	282.7710	456.76	q  Q				
3+ 0	188.4403	363.12	q Q				
3+ 5	82.4071	234.40	q Q				
3+10	34.9080	150.04	q Q				
3+15	12.2440	99.09	q Q				
3+20	6.0085	74.01	q Q				
3+25	2.7184	53.57	qQ				

3+30	0.1775	37.83	qQ				
3+35	0.0000	28.65	Q				
3+40	0.0000	21.95	Q				
3+45	0.0000	16.63	Q				
3+50	0.0000	12.31	Q				
3+55	0.0000	8.94	Q				
4+ 0	0.0000	6.47	Q				
4+ 5	0.0000	4.86	Q				
4+10	0.0000	3.82	Q				
4+15	0.0000	3.04	Q				
4+20	0.0000	2.51	Q				
4+25	0.0000	2.13	Q				
4+30	0.0000	1.75	Q				
4+35	0.0000	1.31	Q				
4+40	0.0000	0.92	Q				
4+45	0.0000	0.61	Q				
4+50	0.0000	0.36	Q				
4+55	0.0000	0.18	Q				
5+ 0	0.0000	0.08	Q				
5+ 5	0.0000	0.04	Q				
5+10	0.0000	0.01	Q				
5+15	0.0000	0.00	Q				

-----  
 \*\*\*\*\*HYDROGRAPH DATA\*\*\*\*\*

Number of intervals = 63  
 Time interval = 5.0 (Min.)  
 Maximum/Peak flow rate = 1256.518 (CFS)  
 Total volume = 101.507 (Ac.Ft)  
 Status of hydrographs being held in storage  
 Stream 1 Stream 2 Stream 3 Stream 4 Stream 5  
 Peak (CFS) 0.000 0.000 0.000 0.000 0.000  
 Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000

\*\*\*\*\*

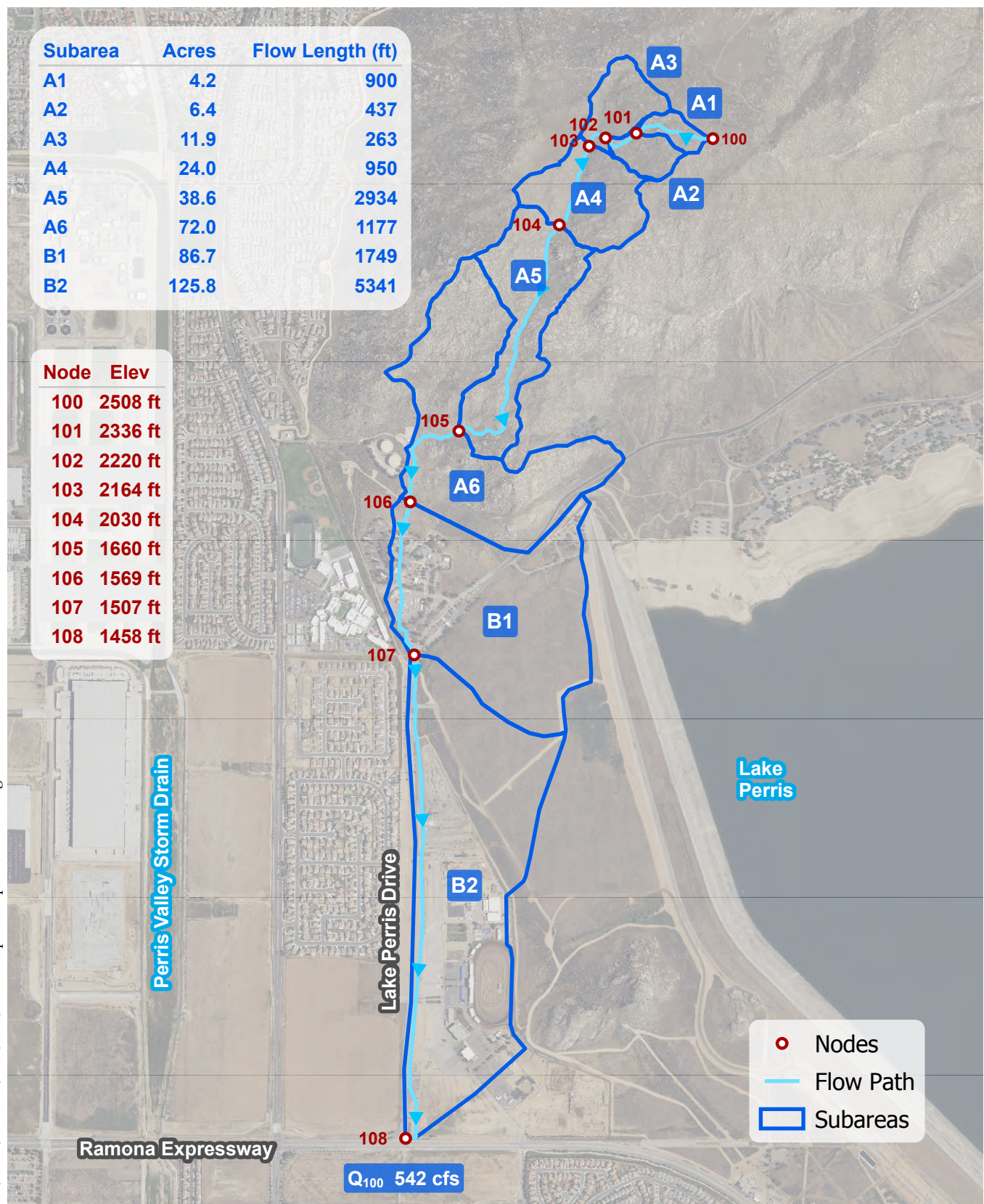
-----

# Attachment 3

## Hydrologic Maps

Subarea	Acres	Flow Length (ft)
A1	4.2	900
A2	6.4	437
A3	11.9	263
A4	24.0	950
A5	38.6	2934
A6	72.0	1177
B1	86.7	1749
B2	125.8	5341

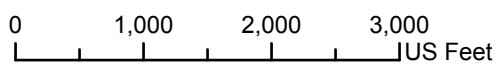
Node	Elev
100	2508 ft
101	2336 ft
102	2220 ft
103	2164 ft
104	2030 ft
105	1660 ft
106	1569 ft
107	1507 ft
108	1458 ft



C:\2013\13-0159\GIS\Pro\13-0159.aprx Map created 02 Aug 2018

Source: Riverside County 2016

**Rational Hydrology**  
Lateral U-1



C:\2013\13-01159\GIS\Pro\13-01159.aprx Map created 02 Aug 2018



- Nodes
- Centroids
- Flow Path
- Subareas

## Synthetic Unit Hydrograph Hydrology

Line U

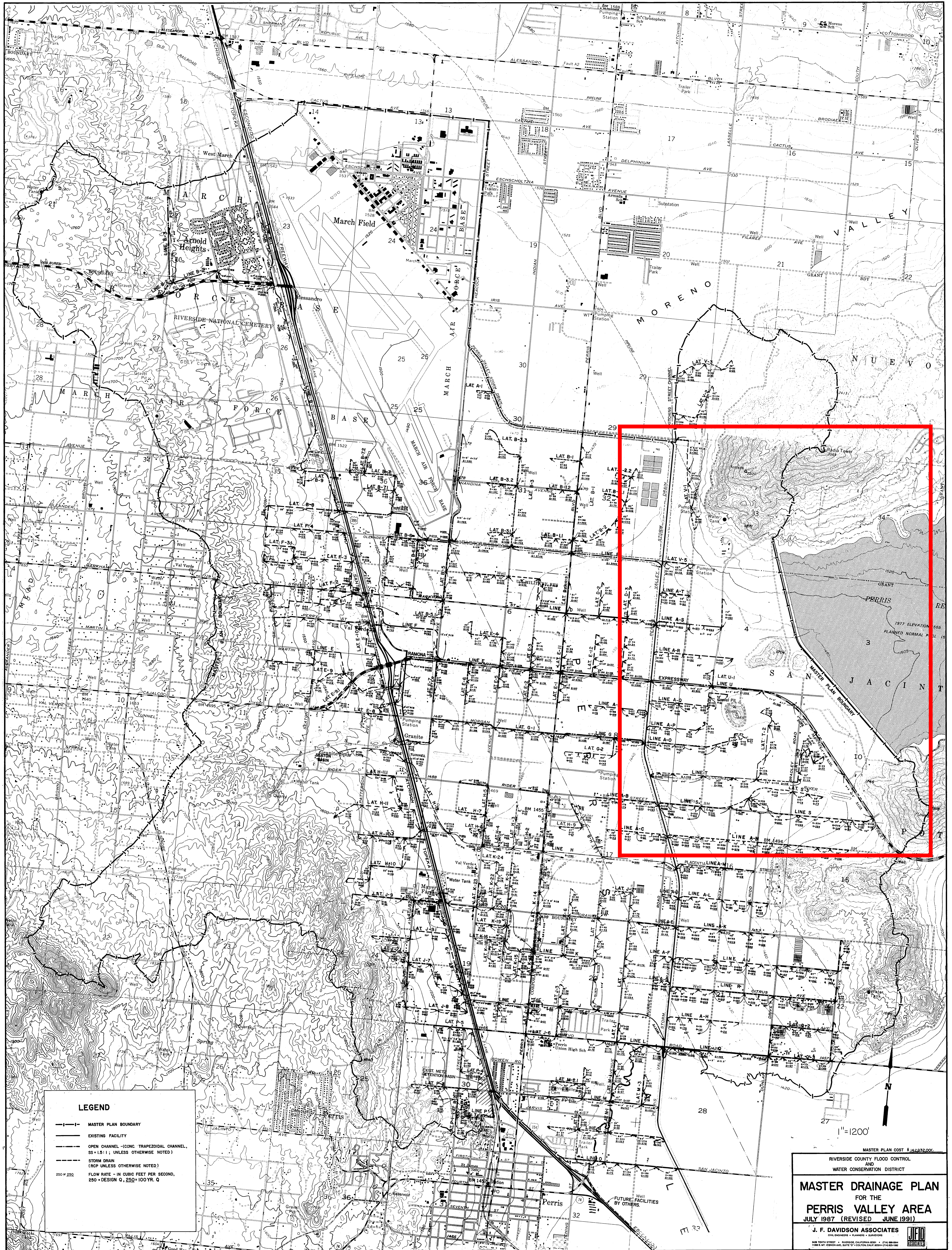


0 1,000 2,000 3,000  
JUS Feet



# Attachment 4

## Perris Valley Master Drainage Plan Map



**LEGEND**

- MASTER PLAN BOUNDARY
- EXISTING FACILITY
- OPEN CHANNEL (CONC. TRAPEZOIDAL CHANNEL, 50' x 1.5' ; UNLESS OTHERWISE NOTED)
- STORM DRAIN (CONC. UNLESS OTHERWISE NOTED)
- FLOW RATE - IN CUBIC FEET PER SECOND, 250' x 250' DESIGN Q, 250' x 100' YR. Q

1" = 1200'

MASTER PLAN COST \$1,428,320.00  
 RIVERSIDE COUNTY FLOOD CONTROL  
 AND  
 WATER CONSERVATION DISTRICT  
**MASTER DRAINAGE PLAN**  
 FOR THE  
**PERRIS VALLEY AREA**  
 JULY 1987 (REVISED JUNE 1991)  
 J. F. DAVIDSON ASSOCIATES  
 CIVIL ENGINEERS • PLANNERS • SURVEYORS  
 3000 TENTH STREET • RIVERSIDE, CALIFORNIA 92504 • (714) 948-8844  
 11085 W. VERNON AVE. SUITE 100 • COVINGTON, CALIF. 95926

*Appendix*

# B

## **PROPOSED CONDITION RATIONAL METHOD HYDROLOGY MAP**

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*Appendix*

**C**

**PROPOSED CONDITION RATIONAL  
METHOD HYDROLOGY CALCULATIONS**

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Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1  
Rational Hydrology Study Date: 03/19/21 File:100Upper.out

-----  
Stratford Ranch East  
100-Year Storm  
Proposed Conditon  
Upper Basin  
-----

\*\*\*\*\* Hydrology Study Control Information \*\*\*\*\*

English (in-lb) Units used in input data file  
-----

Program License Serial Number 6062  
-----

Rational Method Hydrology Program based on  
Riverside County Flood Control & Water Conservation District  
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.450(In.)  
100 year, 1 hour precipitation = 1.200(In.)

Storm event year = 100.0  
Calculated rainfall intensity data:  
1 hour intensity = 1.200(In/Hr)  
Slope of intensity duration curve = 0.5000

+++++  
Process from Point/Station 10.000 to Point/Station 11.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*  
-----

Initial area flow distance = 295.000(Ft.)  
Top (of initial area) elevation = 1460.200(Ft.)  
Bottom (of initial area) elevation = 1457.600(Ft.)  
Difference in elevation = 2.600(Ft.)  
Slope = 0.00881 s(percent)= 0.88  
TC = k(0.390)\*[(length^3)/(elevation change)]^0.2  
Initial area time of concentration = 9.772 min.  
Rainfall intensity = 2.974(In/Hr) for a 100.0 year storm  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.825  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Initial subarea runoff = 1.618(CFS)

Total initial stream area = 0.660(Ac.)  
Pervious area fraction = 0.500

\*\*\*\*\*  
Process from Point/Station 11.000 to Point/Station 12.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1457.600(Ft.)  
End of street segment elevation = 1455.000(Ft.)  
Length of street segment = 524.000(Ft.)  
Height of curb above gutter flowline = 6.0(In.)  
Width of half street (curb to crown) = 18.000(Ft.)  
Distance from crown to crossfall grade break = 10.000(Ft.)  
Slope from gutter to grade break (v/hz) = 0.020  
Slope from grade break to crown (v/hz) = 0.020  
Street flow is on [1] side(s) of the street  
Distance from curb to property line = 12.000(Ft.)  
Slope from curb to property line (v/hz) = 0.020  
Gutter width = 2.000(Ft.)  
Gutter hike from flowline = 2.000(In.)  
Manning's N in gutter = 0.0150  
Manning's N from gutter to grade break = 0.0150  
Manning's N from grade break to crown = 0.0150  
Estimated mean flow rate at midpoint of street = 3.420(CFS)  
Depth of flow = 0.389(Ft.), Average velocity = 1.851(Ft/s)  
Streetflow hydraulics at midpoint of street travel:  
Halfstreet flow width = 13.116(Ft.)  
Flow velocity = 1.85(Ft/s)  
Travel time = 4.72 min. TC = 14.49 min.  
Adding area flow to street  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.811  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Rainfall intensity = 2.442(In/Hr) for a 100.0 year storm  
Subarea runoff = 3.547(CFS) for 1.790(Ac.)  
Total runoff = 5.165(CFS) Total area = 2.450(Ac.)  
Street flow at end of street = 5.165(CFS)  
Half street flow at end of street = 5.165(CFS)  
Depth of flow = 0.437(Ft.), Average velocity = 2.044(Ft/s)  
Flow width (from curb towards crown)= 15.492(Ft.)

\*\*\*\*\*  
Process from Point/Station 12.000 to Point/Station 13.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1455.000(Ft.)  
End of street segment elevation = 1453.200(Ft.)  
Length of street segment = 297.000(Ft.)  
Height of curb above gutter flowline = 6.0(In.)  
Width of half street (curb to crown) = 18.000(Ft.)  
Distance from crown to crossfall grade break = 10.000(Ft.)  
Slope from gutter to grade break (v/hz) = 0.020  
Slope from grade break to crown (v/hz) = 0.020

Street flow is on [1] side(s) of the street  
 Distance from curb to property line = 12.000(Ft.)  
 Slope from curb to property line (v/hz) = 0.020  
 Gutter width = 2.000(Ft.)  
 Gutter hike from flowline = 2.000(In.)  
 Manning's N in gutter = 0.0150  
 Manning's N from gutter to grade break = 0.0150  
 Manning's N from grade break to crown = 0.0150  
 Estimated mean flow rate at midpoint of street = 6.452(CFS)  
 Depth of flow = 0.452(Ft.), Average velocity = 2.327(Ft/s)  
 Streetflow hydraulics at midpoint of street travel:  
 Halfstreet flow width = 16.266(Ft.)  
 Flow velocity = 2.33(Ft/s)  
 Travel time = 2.13 min. TC = 16.62 min.  
 Adding area flow to street  
 SINGLE FAMILY (1/4 Acre Lot)  
 Runoff Coefficient = 0.806  
 Decimal fraction soil group A = 0.000  
 Decimal fraction soil group B = 0.000  
 Decimal fraction soil group C = 1.000  
 Decimal fraction soil group D = 0.000  
 RI index for soil(AMC 2) = 69.00  
 Pervious area fraction = 0.500; Impervious fraction = 0.500  
 Rainfall intensity = 2.280(In/Hr) for a 100.0 year storm  
 Subarea runoff = 2.482(CFS) for 1.350(Ac.)  
 Total runoff = 7.647(CFS) Total area = 3.800(Ac.)  
 Street flow at end of street = 7.647(CFS)  
 Half street flow at end of street = 7.647(CFS)  
 Depth of flow = 0.475(Ft.), Average velocity = 2.425(Ft/s)  
 Flow width (from curb towards crown)= 17.397(Ft.)

++++++  
 Process from Point/Station 13.000 to Point/Station 14.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.450(Ft.)  
 Downstream point/station elevation = 1450.420(Ft.)  
 Pipe length = 27.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 7.647(CFS)  
 Nearest computed pipe diameter = 24.00(In.)  
 Calculated individual pipe flow = 7.647(CFS)  
 Normal flow depth in pipe = 19.97(In.)  
 Flow top width inside pipe = 17.94(In.)  
 Critical Depth = 11.79(In.)  
 Pipe flow velocity = 2.73(Ft/s)  
 Travel time through pipe = 0.16 min.  
 Time of concentration (TC) = 16.78 min.

++++++  
 Process from Point/Station 13.000 to Point/Station 14.000  
 \*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

---

The following data inside Main Stream is listed:  
 In Main Stream number: 1  
 Stream flow area = 3.800(Ac.)  
 Runoff from this stream = 7.647(CFS)  
 Time of concentration = 16.78 min.  
 Rainfall intensity = 2.269(In/Hr)

Program is now starting with Main Stream No. 2

+++++  
Process from Point/Station 20.000 to Point/Station 21.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

---

Initial area flow distance = 277.000(Ft.)  
Top (of initial area) elevation = 1459.700(Ft.)  
Bottom (of initial area) elevation = 1457.160(Ft.)  
Difference in elevation = 2.540(Ft.)  
Slope = 0.00917 s(percent)= 0.92  
TC =  $k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 9.453 min.  
Rainfall intensity = 3.023(In/Hr) for a 100.0 year storm  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.826  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Initial subarea runoff = 1.498(CFS)  
Total initial stream area = 0.600(Ac.)  
Pervious area fraction = 0.500

+++++  
Process from Point/Station 21.000 to Point/Station 22.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1457.160(Ft.)  
End of street segment elevation = 1455.000(Ft.)  
Length of street segment = 409.000(Ft.)  
Height of curb above gutter flowline = 6.0(In.)  
Width of half street (curb to crown) = 18.000(Ft.)  
Distance from crown to crossfall grade break = 10.000(Ft.)  
Slope from gutter to grade break (v/hz) = 0.020  
Slope from grade break to crown (v/hz) = 0.020  
Street flow is on [1] side(s) of the street  
Distance from curb to property line = 12.000(Ft.)  
Slope from curb to property line (v/hz) = 0.020  
Gutter width = 2.000(Ft.)  
Gutter hike from flowline = 2.000(In.)  
Manning's N in gutter = 0.0150  
Manning's N from gutter to grade break = 0.0150  
Manning's N from grade break to crown = 0.0150  
Estimated mean flow rate at midpoint of street = 2.779(CFS)  
Depth of flow = 0.364(Ft.), Average velocity = 1.805(Ft/s)  
Streetflow hydraulics at midpoint of street travel:  
Halfstreet flow width = 11.885(Ft.)  
Flow velocity = 1.81(Ft/s)  
Travel time = 3.78 min. TC = 13.23 min.  
Adding area flow to street  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.815  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000

Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Rainfall intensity = 2.556(In/Hr) for a 100.0 year storm  
Subarea runoff = 2.498(CFS) for 1.200(Ac.)  
Total runoff = 3.995(CFS) Total area = 1.800(Ac.)  
Street flow at end of street = 3.995(CFS)  
Half street flow at end of street = 3.995(CFS)  
Depth of flow = 0.403(Ft.), Average velocity = 1.968(Ft/s)  
Flow width (from curb towards crown)= 13.798(Ft.)

\*\*\*\*\*  
Process from Point/Station 22.000 to Point/Station 23.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1455.000(Ft.)  
End of street segment elevation = 1453.100(Ft.)  
Length of street segment = 196.000(Ft.)  
Height of curb above gutter flowline = 6.0(In.)  
Width of half street (curb to crown) = 18.000(Ft.)  
Distance from crown to crossfall grade break = 10.000(Ft.)  
Slope from gutter to grade break (v/hz) = 0.020  
Slope from grade break to crown (v/hz) = 0.020  
Street flow is on [1] side(s) of the street  
Distance from curb to property line = 12.000(Ft.)  
Slope from curb to property line (v/hz) = 0.020  
Gutter width = 2.000(Ft.)  
Gutter hike from flowline = 2.000(In.)  
Manning's N in gutter = 0.0150  
Manning's N from gutter to grade break = 0.0150  
Manning's N from grade break to crown = 0.0150  
Estimated mean flow rate at midpoint of street = 4.710(CFS)  
Depth of flow = 0.387(Ft.), Average velocity = 2.579(Ft/s)  
Streetflow hydraulics at midpoint of street travel:  
Halfstreet flow width = 13.037(Ft.)  
Flow velocity = 2.58(Ft/s)  
Travel time = 1.27 min. TC = 14.50 min.

Adding area flow to street  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.811  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Rainfall intensity = 2.441(In/Hr) for a 100.0 year storm  
Subarea runoff = 1.347(CFS) for 0.680(Ac.)  
Total runoff = 5.342(CFS) Total area = 2.480(Ac.)  
Street flow at end of street = 5.342(CFS)  
Half street flow at end of street = 5.342(CFS)  
Depth of flow = 0.401(Ft.), Average velocity = 2.658(Ft/s)  
Flow width (from curb towards crown)= 13.724(Ft.)

\*\*\*\*\*  
Process from Point/Station 23.000 to Point/Station 14.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.480(Ft.)  
 Downstream point/station elevation = 1450.420(Ft.)  
 Pipe length = 60.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 5.342(CFS)  
 Nearest computed pipe diameter = 21.00(In.)  
 Calculated individual pipe flow = 5.342(CFS)  
 Normal flow depth in pipe = 18.90(In.)  
 Flow top width inside pipe = 12.60(In.)  
 Critical Depth = 10.19(In.)  
 Pipe flow velocity = 2.34(Ft/s)  
 Travel time through pipe = 0.43 min.  
 Time of concentration (TC) = 14.92 min.

++++++  
 Process from Point/Station 23.000 to Point/Station 14.000  
 \*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

The following data inside Main Stream is listed:

In Main Stream number: 2  
 Stream flow area = 2.480(Ac.)  
 Runoff from this stream = 5.342(CFS)  
 Time of concentration = 14.92 min.  
 Rainfall intensity = 2.406(In/Hr)  
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
------------	-----------------	----------	----------------------------

1	7.647	16.78	2.269
2	5.342	14.92	2.406

Largest stream flow has longer time of concentration

$Q_p = 7.647 + \text{sum of}$   
 $Q_b \quad I_a/I_b$   
 $5.342 * 0.943 = 5.038$   
 $Q_p = 12.685$

Total of 2 main streams to confluence:

Flow rates before confluence point:

7.647      5.342

Area of streams before confluence:

3.800      2.480

Results of confluence:

Total flow rate = 12.685(CFS)  
 Time of concentration = 16.780 min.  
 Effective stream area after confluence = 6.280(Ac.)

++++++  
 Process from Point/Station 14.000 to Point/Station 15.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

Upstream point/station elevation = 1450.420(Ft.)  
 Downstream point/station elevation = 1450.230(Ft.)  
 Pipe length = 189.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 12.685(CFS)  
 Nearest computed pipe diameter = 30.00(In.)

Calculated individual pipe flow = 12.685(CFS)  
Normal flow depth in pipe = 23.95(In.)  
Flow top width inside pipe = 24.07(In.)  
Critical Depth = 14.37(In.)  
Pipe flow velocity = 3.02(Ft/s)  
Travel time through pipe = 1.04 min.  
Time of concentration (TC) = 17.82 min.

\*\*\*\*\*  
Process from Point/Station 14.000 to Point/Station 15.000  
\*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

---

The following data inside Main Stream is listed:

In Main Stream number: 1  
Stream flow area = 6.280(Ac.)  
Runoff from this stream = 12.685(CFS)  
Time of concentration = 17.82 min.  
Rainfall intensity = 2.202(In/Hr)  
Program is now starting with Main Stream No. 2

\*\*\*\*\*  
Process from Point/Station 30.000 to Point/Station 31.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

---

Initial area flow distance = 258.000(Ft.)  
Top (of initial area) elevation = 1457.300(Ft.)  
Bottom (of initial area) elevation = 1454.800(Ft.)  
Difference in elevation = 2.500(Ft.)  
Slope = 0.00969 s(percent)= 0.97  
TC =  $k(0.390)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$   
Initial area time of concentration = 9.088 min.  
Rainfall intensity = 3.083(In/Hr) for a 100.0 year storm  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.827  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Initial subarea runoff = 1.734(CFS)  
Total initial stream area = 0.680(Ac.)  
Pervious area fraction = 0.500

\*\*\*\*\*  
Process from Point/Station 31.000 to Point/Station 32.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1454.800(Ft.)  
End of street segment elevation = 1453.300(Ft.)  
Length of street segment = 301.000(Ft.)  
Height of curb above gutter flowline = 6.0(In.)  
Width of half street (curb to crown) = 18.000(Ft.)  
Distance from crown to crossfall grade break = 10.000(Ft.)  
Slope from gutter to grade break (v/hz) = 0.020  
Slope from grade break to crown (v/hz) = 0.020  
Street flow is on [1] side(s) of the street

Distance from curb to property line = 12.000(Ft.)  
 Slope from curb to property line (v/hz) = 0.020  
 Gutter width = 2.000(Ft.)  
 Gutter hike from flowline = 2.000(In.)  
 Manning's N in gutter = 0.0150  
 Manning's N from gutter to grade break = 0.0150  
 Manning's N from grade break to crown = 0.0150  
 Estimated mean flow rate at midpoint of street = 2.683(CFS)  
 Depth of flow = 0.364(Ft.), Average velocity = 1.751(Ft/s)  
 Streetflow hydraulics at midpoint of street travel:  
 Halfstreet flow width = 11.855(Ft.)  
 Flow velocity = 1.75(Ft/s)  
 Travel time = 2.86 min. TC = 11.95 min.  
 Adding area flow to street  
 SINGLE FAMILY (1/4 Acre Lot)  
 Runoff Coefficient = 0.818  
 Decimal fraction soil group A = 0.000  
 Decimal fraction soil group B = 0.000  
 Decimal fraction soil group C = 1.000  
 Decimal fraction soil group D = 0.000  
 RI index for soil(AMC 2) = 69.00  
 Pervious area fraction = 0.500; Impervious fraction = 0.500  
 Rainfall intensity = 2.689(In/Hr) for a 100.0 year storm  
 Subarea runoff = 1.825(CFS) for 0.830(Ac.)  
 Total runoff = 3.559(CFS) Total area = 1.510(Ac.)  
 Street flow at end of street = 3.559(CFS)  
 Half street flow at end of street = 3.559(CFS)  
 Depth of flow = 0.393(Ft.), Average velocity = 1.872(Ft/s)  
 Flow width (from curb towards crown)= 13.320(Ft.)

++++++  
 Process from Point/Station 32.000 to Point/Station 33.000  
 \*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1453.300(Ft.)  
 End of street segment elevation = 1453.000(Ft.)  
 Length of street segment = 74.000(Ft.)  
 Height of curb above gutter flowline = 6.0(In.)  
 Width of half street (curb to crown) = 18.000(Ft.)  
 Distance from crown to crossfall grade break = 10.000(Ft.)  
 Slope from gutter to grade break (v/hz) = 0.020  
 Slope from grade break to crown (v/hz) = 0.020  
 Street flow is on [1] side(s) of the street  
 Distance from curb to property line = 12.000(Ft.)  
 Slope from curb to property line (v/hz) = 0.020  
 Gutter width = 2.000(Ft.)  
 Gutter hike from flowline = 2.000(In.)  
 Manning's N in gutter = 0.0150  
 Manning's N from gutter to grade break = 0.0150  
 Manning's N from grade break to crown = 0.0150  
 Estimated mean flow rate at midpoint of street = 5.456(CFS)  
 Depth of flow = 0.456(Ft.), Average velocity = 1.919(Ft/s)  
 Streetflow hydraulics at midpoint of street travel:  
 Halfstreet flow width = 16.483(Ft.)  
 Flow velocity = 1.92(Ft/s)  
 Travel time = 0.64 min. TC = 12.60 min.  
 Adding area flow to street  
 SINGLE FAMILY (1/4 Acre Lot)  
 Runoff Coefficient = 0.816

Decimal fraction soil group A = 0.000  
 Decimal fraction soil group B = 0.000  
 Decimal fraction soil group C = 1.000  
 Decimal fraction soil group D = 0.000  
 RI index for soil(AMC 2) = 69.00  
 Pervious area fraction = 0.500; Impervious fraction = 0.500  
 Rainfall intensity = 2.619(In/Hr) for a 100.0 year storm  
 Subarea runoff = 3.698(CFS) for 1.730(Ac.)  
 Total runoff = 7.257(CFS) Total area = 3.240(Ac.)  
 Street flow at end of street = 7.257(CFS)  
 Half street flow at end of street = 7.257(CFS)  
 Depth of flow = 0.494(Ft.), Average velocity = 2.076(Ft/s)  
 Note: depth of flow exceeds top of street crown.  
 Flow width (from curb towards crown)= 18.000(Ft.)

++++++  
 Process from Point/Station 33.000 to Point/Station 15.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.270(Ft.)  
 Downstream point/station elevation = 1450.230(Ft.)  
 Pipe length = 35.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 7.257(CFS)  
 Nearest computed pipe diameter = 24.00(In.)  
 Calculated individual pipe flow = 7.257(CFS)  
 Normal flow depth in pipe = 18.66(In.)  
 Flow top width inside pipe = 19.97(In.)  
 Critical Depth = 11.48(In.)  
 Pipe flow velocity = 2.77(Ft/s)  
 Travel time through pipe = 0.21 min.  
 Time of concentration (TC) = 12.81 min.

++++++  
 Process from Point/Station 33.000 to Point/Station 15.000  
 \*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

---

The following data inside Main Stream is listed:

In Main Stream number: 2  
 Stream flow area = 3.240(Ac.)  
 Runoff from this stream = 7.257(CFS)  
 Time of concentration = 12.81 min.  
 Rainfall intensity = 2.597(In/Hr)  
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	12.685	17.82	2.202
2	7.257	12.81	2.597

Largest stream flow has longer time of concentration  
 $Q_p = 12.685 + \text{sum of } Q_b \cdot I_a/I_b$   
 $Q_p = 12.685 + 7.257 * 0.848 = 18.837$

Total of 2 main streams to confluence:  
 Flow rates before confluence point:

12.685            7.257  
Area of streams before confluence:  
6.280            3.240

Results of confluence:

Total flow rate =        18.837(CFS)  
Time of concentration =    17.823 min.  
Effective stream area after confluence =        9.520(Ac.)

+++++  
Process from Point/Station            15.000 to Point/Station            15.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.804  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Time of concentration = 17.82 min.  
Rainfall intensity = 2.202(In/Hr) for a 100.0 year storm  
Subarea runoff = 1.221(CFS) for 0.690(Ac.)  
Total runoff = 20.058(CFS)        Total area = 10.210(Ac.)

+++++  
Process from Point/Station            15.000 to Point/Station            16.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.230(Ft.)  
Downstream point/station elevation = 1450.000(Ft.)  
Pipe length = 229.00(Ft.)    Manning's N = 0.013  
No. of pipes = 1    Required pipe flow = 20.058(CFS)  
Nearest computed pipe diameter = 36.00(In.)  
Calculated individual pipe flow = 20.058(CFS)  
Normal flow depth in pipe = 27.98(In.)  
Flow top width inside pipe = 29.95(In.)  
Critical Depth = 17.24(In.)  
Pipe flow velocity = 3.40(Ft/s)  
Travel time through pipe = 1.12 min.  
Time of concentration (TC) = 18.95 min.

+++++  
Process from Point/Station            15.000 to Point/Station            16.000  
\*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

---

The following data inside Main Stream is listed:

In Main Stream number: 1  
Stream flow area = 10.210(Ac.)  
Runoff from this stream = 20.058(CFS)  
Time of concentration = 18.95 min.  
Rainfall intensity = 2.136(In/Hr)  
Program is now starting with Main Stream No. 2

+++++  
Process from Point/Station 40.000 to Point/Station 41.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

---

Initial area flow distance = 265.000(Ft.)  
Top (of initial area) elevation = 1455.800(Ft.)  
Bottom (of initial area) elevation = 1453.400(Ft.)  
Difference in elevation = 2.400(Ft.)  
Slope = 0.00906 s(percent)= 0.91  
TC =  $k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 9.310 min.  
Rainfall intensity = 3.046(In/Hr) for a 100.0 year storm  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.826  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Initial subarea runoff = 1.585(CFS)  
Total initial stream area = 0.630(Ac.)  
Pervious area fraction = 0.500

+++++  
Process from Point/Station 41.000 to Point/Station 42.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1453.400(Ft.)  
End of street segment elevation = 1452.900(Ft.)  
Length of street segment = 103.000(Ft.)  
Height of curb above gutter flowline = 6.0(In.)  
Width of half street (curb to crown) = 18.000(Ft.)  
Distance from crown to crossfall grade break = 10.000(Ft.)  
Slope from gutter to grade break (v/hz) = 0.020  
Slope from grade break to crown (v/hz) = 0.020  
Street flow is on [1] side(s) of the street  
Distance from curb to property line = 12.000(Ft.)  
Slope from curb to property line (v/hz) = 0.020  
Gutter width = 2.000(Ft.)  
Gutter hike from flowline = 2.000(In.)  
Manning's N in gutter = 0.0150  
Manning's N from gutter to grade break = 0.0150  
Manning's N from grade break to crown = 0.0150  
Estimated mean flow rate at midpoint of street = 2.453(CFS)  
Depth of flow = 0.356(Ft.), Average velocity = 1.698(Ft/s)  
Streetflow hydraulics at midpoint of street travel:  
Halfstreet flow width = 11.483(Ft.)  
Flow velocity = 1.70(Ft/s)  
Travel time = 1.01 min. TC = 10.32 min.  
Adding area flow to street  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.823  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500

Rainfall intensity = 2.893(In/Hr) for a 100.0 year storm  
 Subarea runoff = 1.643(CFS) for 0.690(Ac.)  
 Total runoff = 3.228(CFS) Total area = 1.320(Ac.)  
 Street flow at end of street = 3.228(CFS)  
 Half street flow at end of street = 3.228(CFS)  
 Depth of flow = 0.384(Ft.), Average velocity = 1.811(Ft/s)  
 Flow width (from curb towards crown)= 12.867(Ft.)

++++++  
 Process from Point/Station 42.000 to Point/Station 16.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.030(Ft.)  
 Downstream point/station elevation = 1450.000(Ft.)  
 Pipe length = 28.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 3.228(CFS)  
 Nearest computed pipe diameter = 18.00(In.)  
 Calculated individual pipe flow = 3.228(CFS)  
 Normal flow depth in pipe = 13.85(In.)  
 Flow top width inside pipe = 15.16(In.)  
 Critical Depth = 8.20(In.)  
 Pipe flow velocity = 2.21(Ft/s)  
 Travel time through pipe = 0.21 min.  
 Time of concentration (TC) = 10.53 min.

++++++  
 Process from Point/Station 42.000 to Point/Station 16.000  
 \*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

---

The following data inside Main Stream is listed:

In Main Stream number: 2  
 Stream flow area = 1.320(Ac.)  
 Runoff from this stream = 3.228(CFS)  
 Time of concentration = 10.53 min.  
 Rainfall intensity = 2.864(In/Hr)  
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
------------	-----------------	----------	----------------------------

1	20.058	18.95	2.136
2	3.228	10.53	2.864

Largest stream flow has longer time of concentration

$Q_p = 20.058 + \text{sum of}$   
 $Q_b \quad I_a/I_b$   
 $3.228 * 0.746 = 2.407$   
 $Q_p = 22.465$

Total of 2 main streams to confluence:

Flow rates before confluence point:  
 20.058 3.228  
 Area of streams before confluence:  
 10.210 1.320

Results of confluence:

Total flow rate = 22.465(CFS)

Time of concentration = 18.945 min.  
Effective stream area after confluence = 11.530(Ac.)

\*\*\*\*\*  
Process from Point/Station 16.000 to Point/Station 16.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.801  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Time of concentration = 18.95 min.  
Rainfall intensity = 2.136(In/Hr) for a 100.0 year storm  
Subarea runoff = 0.257(CFS) for 0.150(Ac.)  
Total runoff = 22.722(CFS) Total area = 11.680(Ac.)

\*\*\*\*\*  
Process from Point/Station 16.000 to Point/Station 17.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.000(Ft.)  
Downstream point/station elevation = 1449.740(Ft.)  
Pipe length = 265.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 22.722(CFS)  
Nearest computed pipe diameter = 39.00(In.)  
Calculated individual pipe flow = 22.722(CFS)  
Normal flow depth in pipe = 28.36(In.)  
Flow top width inside pipe = 34.74(In.)  
Critical Depth = 17.95(In.)  
Pipe flow velocity = 3.52(Ft/s)  
Travel time through pipe = 1.26 min.  
Time of concentration (TC) = 20.20 min.

\*\*\*\*\*  
Process from Point/Station 16.000 to Point/Station 17.000  
\*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

---

The following data inside Main Stream is listed:

In Main Stream number: 1  
Stream flow area = 11.680(Ac.)  
Runoff from this stream = 22.722(CFS)  
Time of concentration = 20.20 min.  
Rainfall intensity = 2.068(In/Hr)  
Program is now starting with Main Stream No. 2

\*\*\*\*\*  
Process from Point/Station 50.000 to Point/Station 51.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

---

Initial area flow distance = 518.000(Ft.)  
Top (of initial area) elevation = 1461.000(Ft.)  
Bottom (of initial area) elevation = 1457.700(Ft.)

Difference in elevation = 3.300(Ft.)  
 Slope = 0.00637 s(percent)= 0.64  
 TC =  $k(0.530)*[(length^3)/(elevation\ change)]^{0.2}$   
 Initial area time of concentration = 17.749 min.  
 Rainfall intensity = 2.206(In/Hr) for a 100.0 year storm  
 UNDEVELOPED (poor cover) subarea  
 Runoff Coefficient = 0.819  
 Decimal fraction soil group A = 0.000  
 Decimal fraction soil group B = 0.000  
 Decimal fraction soil group C = 1.000  
 Decimal fraction soil group D = 0.000  
 RI index for soil(AMC 2) = 86.00  
 Pervious area fraction = 1.000; Impervious fraction = 0.000  
 Initial subarea runoff = 2.567(CFS)  
 Total initial stream area = 1.420(Ac.)  
 Pervious area fraction = 1.000

++++++  
 Process from Point/Station 51.000 to Point/Station 52.000  
 \*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1457.700(Ft.)  
 End of street segment elevation = 1452.270(Ft.)  
 Length of street segment = 924.000(Ft.)  
 Height of curb above gutter flowline = 6.0(In.)  
 Width of half street (curb to crown) = 18.000(Ft.)  
 Distance from crown to crossfall grade break = 10.000(Ft.)  
 Slope from gutter to grade break (v/hz) = 0.020  
 Slope from grade break to crown (v/hz) = 0.020  
 Street flow is on [1] side(s) of the street  
 Distance from curb to property line = 12.000(Ft.)  
 Slope from curb to property line (v/hz) = 0.020  
 Gutter width = 2.000(Ft.)  
 Gutter hike from flowline = 2.000(In.)  
 Manning's N in gutter = 0.0150  
 Manning's N from gutter to grade break = 0.0150  
 Manning's N from grade break to crown = 0.0150  
 Estimated mean flow rate at midpoint of street = 4.633(CFS)  
 Depth of flow = 0.413(Ft.), Average velocity = 2.123(Ft/s)  
 Streetflow hydraulics at midpoint of street travel:  
 Halfstreet flow width = 14.336(Ft.)  
 Flow velocity = 2.12(Ft/s)  
 Travel time = 7.25 min. TC = 25.00 min.  
 Adding area flow to street  
 SINGLE FAMILY (1/4 Acre Lot)  
 Runoff Coefficient = 0.790  
 Decimal fraction soil group A = 0.000  
 Decimal fraction soil group B = 0.000  
 Decimal fraction soil group C = 1.000  
 Decimal fraction soil group D = 0.000  
 RI index for soil(AMC 2) = 69.00  
 Pervious area fraction = 0.500; Impervious fraction = 0.500  
 Rainfall intensity = 1.859(In/Hr) for a 100.0 year storm  
 Subarea runoff = 4.070(CFS) for 2.770(Ac.)  
 Total runoff = 6.637(CFS) Total area = 4.190(Ac.)  
 Street flow at end of street = 6.637(CFS)  
 Half street flow at end of street = 6.637(CFS)  
 Depth of flow = 0.458(Ft.), Average velocity = 2.316(Ft/s)  
 Flow width (from curb towards crown)= 16.550(Ft.)

\*\*\*\*\*  
Process from Point/Station 52.000 to Point/Station 53.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1449.810(Ft.)  
Downstream point/station elevation = 1449.780(Ft.)  
Pipe length = 28.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 6.637(CFS)  
Nearest computed pipe diameter = 24.00(In.)  
Calculated individual pipe flow = 6.637(CFS)  
Normal flow depth in pipe = 17.74(In.)  
Flow top width inside pipe = 21.07(In.)  
Critical Depth = 10.96(In.)  
Pipe flow velocity = 2.67(Ft/s)  
Travel time through pipe = 0.18 min.  
Time of concentration (TC) = 25.18 min.

\*\*\*\*\*  
Process from Point/Station 52.000 to Point/Station 53.000  
\*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

---

Along Main Stream number: 2 in normal stream number 1  
Stream flow area = 4.190(Ac.)  
Runoff from this stream = 6.637(CFS)  
Time of concentration = 25.18 min.  
Rainfall intensity = 1.852(In/Hr)

\*\*\*\*\*  
Process from Point/Station 60.000 to Point/Station 61.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

---

Initial area flow distance = 611.000(Ft.)  
Top (of initial area) elevation = 1462.000(Ft.)  
Bottom (of initial area) elevation = 1457.700(Ft.)  
Difference in elevation = 4.300(Ft.)  
Slope = 0.00704 s(percent)= 0.70  
TC =  $k(0.530)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$   
Initial area time of concentration = 18.587 min.  
Rainfall intensity = 2.156(In/Hr) for a 100.0 year storm  
UNDEVELOPED (poor cover) subarea  
Runoff Coefficient = 0.818  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 86.00  
Pervious area fraction = 1.000; Impervious fraction = 0.000  
Initial subarea runoff = 4.055(CFS)  
Total initial stream area = 2.300(Ac.)  
Pervious area fraction = 1.000

\*\*\*\*\*  
Process from Point/Station 61.000 to Point/Station 62.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1457.700(Ft.)  
 End of street segment elevation = 1452.270(Ft.)  
 Length of street segment = 1007.000(Ft.)  
 Height of curb above gutter flowline = 6.0(In.)  
 Width of half street (curb to crown) = 18.000(Ft.)  
 Distance from crown to crossfall grade break = 10.000(Ft.)  
 Slope from gutter to grade break (v/hz) = 0.020  
 Slope from grade break to crown (v/hz) = 0.020  
 Street flow is on [1] side(s) of the street  
 Distance from curb to property line = 12.000(Ft.)  
 Slope from curb to property line (v/hz) = 0.020  
 Gutter width = 2.000(Ft.)  
 Gutter hike from flowline = 2.000(In.)  
 Manning's N in gutter = 0.0150  
 Manning's N from gutter to grade break = 0.0150  
 Manning's N from grade break to crown = 0.0150  
 Estimated mean flow rate at midpoint of street = 6.907(CFS)  
 Depth of flow = 0.469(Ft.), Average velocity = 2.264(Ft/s)  
 Streetflow hydraulics at midpoint of street travel:  
 Halfstreet flow width = 17.102(Ft.)  
 Flow velocity = 2.26(Ft/s)  
 Travel time = 7.41 min. TC = 26.00 min.  
 Adding area flow to street  
 SINGLE FAMILY (1/4 Acre Lot)  
 Runoff Coefficient = 0.789  
 Decimal fraction soil group A = 0.000  
 Decimal fraction soil group B = 0.000  
 Decimal fraction soil group C = 1.000  
 Decimal fraction soil group D = 0.000  
 RI index for soil(AMC 2) = 69.00  
 Pervious area fraction = 0.500; Impervious fraction = 0.500  
 Rainfall intensity = 1.823(In/Hr) for a 100.0 year storm  
 Subarea runoff = 5.621(CFS) for 3.910(Ac.)  
 Total runoff = 9.676(CFS) Total area = 6.210(Ac.)  
 Street flow at end of street = 9.676(CFS)  
 Half street flow at end of street = 9.676(CFS)  
 Depth of flow = 0.514(Ft.), Average velocity = 2.499(Ft/s)  
 Warning: depth of flow exceeds top of curb  
 Note: depth of flow exceeds top of street crown.  
 Distance that curb overflow reaches into property = 0.72(Ft.)  
 Flow width (from curb towards crown)= 18.000(Ft.)

++++++  
 Process from Point/Station 62.000 to Point/Station 53.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1449.810(Ft.)  
 Downstream point/station elevation = 1449.780(Ft.)  
 Pipe length = 28.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 9.676(CFS)  
 Nearest computed pipe diameter = 27.00(In.)  
 Calculated individual pipe flow = 9.676(CFS)  
 Normal flow depth in pipe = 21.09(In.)  
 Flow top width inside pipe = 22.32(In.)  
 Critical Depth = 12.87(In.)  
 Pipe flow velocity = 2.90(Ft/s)  
 Travel time through pipe = 0.16 min.  
 Time of concentration (TC) = 26.16 min.

\*\*\*\*\*  
 Process from Point/Station 62.000 to Point/Station 53.000  
 \*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

---

Along Main Stream number: 2 in normal stream number 2  
 Stream flow area = 6.210(Ac.)  
 Runoff from this stream = 9.676(CFS)  
 Time of concentration = 26.16 min.  
 Rainfall intensity = 1.817(In/Hr)  
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
------------	-----------------	----------	----------------------------

1	6.637	25.18	1.852
2	9.676	26.16	1.817

Largest stream flow has longer time of concentration

Qp = 9.676 + sum of  

$$Qb \quad Ia/Ib$$

$$6.637 * 0.981 = 6.511$$
 Qp = 16.187

Total of 2 streams to confluence:  
 Flow rates before confluence point:  
 6.637 9.676  
 Area of streams before confluence:  
 4.190 6.210

Results of confluence:  
 Total flow rate = 16.187(CFS)  
 Time of concentration = 26.162 min.  
 Effective stream area after confluence = 10.400(Ac.)

\*\*\*\*\*  
 Process from Point/Station 53.000 to Point/Station 17.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1449.780(Ft.)  
 Downstream point/station elevation = 1449.740(Ft.)  
 Pipe length = 37.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 16.187(CFS)  
 Nearest computed pipe diameter = 33.00(In.)  
 Calculated individual pipe flow = 16.187(CFS)  
 Normal flow depth in pipe = 25.22(In.)  
 Flow top width inside pipe = 28.02(In.)  
 Critical Depth = 15.84(In.)  
 Pipe flow velocity = 3.33(Ft/s)  
 Travel time through pipe = 0.19 min.  
 Time of concentration (TC) = 26.35 min.

\*\*\*\*\*  
 Process from Point/Station 53.000 to Point/Station 17.000  
 \*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

---

The following data inside Main Stream is listed:  
 In Main Stream number: 2  
 Stream flow area = 10.400(Ac.)

Runoff from this stream = 16.187(CFS)  
 Time of concentration = 26.35 min.  
 Rainfall intensity = 1.811(In/Hr)  
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
------------	-----------------	----------	----------------------------

1	22.722	20.20	2.068
2	16.187	26.35	1.811

Largest stream flow has longer or shorter time of concentration

Qp = 22.722 + sum of  
 $Q_a \cdot T_b/T_a$   
 16.187 \* 0.767 = 12.411  
 Qp = 35.132

Total of 2 main streams to confluence:

Flow rates before confluence point:  
 22.722 16.187

Area of streams before confluence:  
 11.680 10.400

Results of confluence:

Total flow rate = 35.132(CFS)  
 Time of concentration = 20.201 min.  
 Effective stream area after confluence = 22.080(Ac.)

\*\*\*\*\*  
 Process from Point/Station 17.000 to Point/Station 18.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1449.740(Ft.)  
 Downstream point/station elevation = 1449.700(Ft.)  
 Pipe length = 40.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 35.132(CFS)  
 Nearest computed pipe diameter = 45.00(In.)  
 Calculated individual pipe flow = 35.132(CFS)  
 Normal flow depth in pipe = 33.98(In.)  
 Flow top width inside pipe = 38.70(In.)  
 Critical Depth = 21.59(In.)  
 Pipe flow velocity = 3.93(Ft/s)  
 Travel time through pipe = 0.17 min.  
 Time of concentration (TC) = 20.37 min.

\*\*\*\*\*  
 Process from Point/Station 17.000 to Point/Station 18.000  
 \*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

---

The following data inside Main Stream is listed:

In Main Stream number: 1  
 Stream flow area = 22.080(Ac.)  
 Runoff from this stream = 35.132(CFS)  
 Time of concentration = 20.37 min.  
 Rainfall intensity = 2.059(In/Hr)  
 Program is now starting with Main Stream No. 2

+++++  
Process from Point/Station           70.000 to Point/Station           71.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

---

Initial area flow distance = 324.000(Ft.)  
Top (of initial area) elevation = 1460.200(Ft.)  
Bottom (of initial area) elevation = 1457.510(Ft.)  
Difference in elevation = 2.690(Ft.)  
Slope = 0.00830 s(percent)= 0.83  
TC =  $k(0.390)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$   
Initial area time of concentration = 10.267 min.  
Rainfall intensity = 2.901(In/Hr) for a 100.0 year storm  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.823  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Initial subarea runoff = 1.719(CFS)  
Total initial stream area = 0.720(Ac.)  
Pervious area fraction = 0.500

+++++  
Process from Point/Station           71.000 to Point/Station           71.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

UNDEVELOPED (poor cover) subarea  
Runoff Coefficient = 0.837  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 86.00  
Pervious area fraction = 1.000; Impervious fraction = 0.000  
Time of concentration = 10.27 min.  
Rainfall intensity = 2.901(In/Hr) for a 100.0 year storm  
Subarea runoff = 3.134(CFS) for 1.290(Ac.)  
Total runoff = 4.852(CFS)      Total area = 2.010(Ac.)

+++++  
Process from Point/Station           71.000 to Point/Station           72.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1457.510(Ft.)  
End of street segment elevation = 1455.170(Ft.)  
Length of street segment = 550.000(Ft.)  
Height of curb above gutter flowline = 6.0(In.)  
Width of half street (curb to crown) = 18.000(Ft.)  
Distance from crown to crossfall grade break = 10.000(Ft.)  
Slope from gutter to grade break (v/hz) = 0.020  
Slope from grade break to crown (v/hz) = 0.020  
Street flow is on [1] side(s) of the street  
Distance from curb to property line = 12.000(Ft.)  
Slope from curb to property line (v/hz) = 0.020  
Gutter width = 2.000(Ft.)

Gutter hike from flowline = 2.000(In.)  
 Manning's N in gutter = 0.0150  
 Manning's N from gutter to grade break = 0.0150  
 Manning's N from grade break to crown = 0.0150  
 Estimated mean flow rate at midpoint of street = 6.666(CFS)  
 Depth of flow = 0.480(Ft.), Average velocity = 2.052(Ft/s)  
 Streetflow hydraulics at midpoint of street travel:  
 Halfstreet flow width = 17.670(Ft.)  
 Flow velocity = 2.05(Ft/s)  
 Travel time = 4.47 min. TC = 14.73 min.  
 Adding area flow to street  
 SINGLE FAMILY (1/4 Acre Lot)  
 Runoff Coefficient = 0.811  
 Decimal fraction soil group A = 0.000  
 Decimal fraction soil group B = 0.000  
 Decimal fraction soil group C = 1.000  
 Decimal fraction soil group D = 0.000  
 RI index for soil(AMC 2) = 69.00  
 Pervious area fraction = 0.500; Impervious fraction = 0.500  
 Rainfall intensity = 2.421(In/Hr) for a 100.0 year storm  
 Subarea runoff = 3.573(CFS) for 1.820(Ac.)  
 Total runoff = 8.426(CFS) Total area = 3.830(Ac.)  
 Street flow at end of street = 8.426(CFS)  
 Half street flow at end of street = 8.426(CFS)  
 Depth of flow = 0.511(Ft.), Average velocity = 2.209(Ft/s)  
 Warning: depth of flow exceeds top of curb  
 Note: depth of flow exceeds top of street crown.  
 Distance that curb overflow reaches into property = 0.57(Ft.)  
 Flow width (from curb towards crown)= 18.000(Ft.)

++++++  
 Process from Point/Station 72.000 to Point/Station 73.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.700(Ft.)  
 Downstream point/station elevation = 1450.180(Ft.)  
 Pipe length = 35.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 8.426(CFS)  
 Nearest computed pipe diameter = 18.00(In.)  
 Calculated individual pipe flow = 8.426(CFS)  
 Normal flow depth in pipe = 10.65(In.)  
 Flow top width inside pipe = 17.69(In.)  
 Critical Depth = 13.49(In.)  
 Pipe flow velocity = 7.73(Ft/s)  
 Travel time through pipe = 0.08 min.  
 Time of concentration (TC) = 14.81 min.

++++++  
 Process from Point/Station 72.000 to Point/Station 73.000  
 \*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

---

Along Main Stream number: 2 in normal stream number 1  
 Stream flow area = 3.830(Ac.)  
 Runoff from this stream = 8.426(CFS)  
 Time of concentration = 14.81 min.  
 Rainfall intensity = 2.415(In/Hr)

\*\*\*\*\*  
Process from Point/Station 80.000 to Point/Station 81.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

---

Initial area flow distance = 270.000(Ft.)  
Top (of initial area) elevation = 1461.000(Ft.)  
Bottom (of initial area) elevation = 1460.000(Ft.)  
Difference in elevation = 1.000(Ft.)  
Slope = 0.00370 s(percent)= 0.37  
TC =  $k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 11.217 min.  
Rainfall intensity = 2.775(In/Hr) for a 100.0 year storm  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.820  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Initial subarea runoff = 1.571(CFS)  
Total initial stream area = 0.690(Ac.)  
Pervious area fraction = 0.500

\*\*\*\*\*  
Process from Point/Station 81.000 to Point/Station 82.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1460.000(Ft.)  
End of street segment elevation = 1457.000(Ft.)  
Length of street segment = 297.000(Ft.)  
Height of curb above gutter flowline = 6.0(In.)  
Width of half street (curb to crown) = 18.000(Ft.)  
Distance from crown to crossfall grade break = 10.000(Ft.)  
Slope from gutter to grade break (v/hz) = 0.020  
Slope from grade break to crown (v/hz) = 0.020  
Street flow is on [1] side(s) of the street  
Distance from curb to property line = 12.000(Ft.)  
Slope from curb to property line (v/hz) = 0.020  
Gutter width = 2.000(Ft.)  
Gutter hike from flowline = 2.000(In.)  
Manning's N in gutter = 0.0150  
Manning's N from gutter to grade break = 0.0150  
Manning's N from grade break to crown = 0.0150  
Estimated mean flow rate at midpoint of street = 2.599(CFS)  
Depth of flow = 0.328(Ft.), Average velocity = 2.280(Ft/s)  
Streetflow hydraulics at midpoint of street travel:  
Halfstreet flow width = 10.066(Ft.)  
Flow velocity = 2.28(Ft/s)  
Travel time = 2.17 min. TC = 13.39 min.  
Adding area flow to street  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.814  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500

Rainfall intensity = 2.540(In/Hr) for a 100.0 year storm  
Subarea runoff = 2.006(CFS) for 0.970(Ac.)  
Total runoff = 3.577(CFS) Total area = 1.660(Ac.)  
Street flow at end of street = 3.577(CFS)  
Half street flow at end of street = 3.577(CFS)  
Depth of flow = 0.357(Ft.), Average velocity = 2.455(Ft/s)  
Flow width (from curb towards crown)= 11.534(Ft.)

\*\*\*\*\*  
Process from Point/Station 82.000 to Point/Station 83.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1457.000(Ft.)  
End of street segment elevation = 1455.170(Ft.)  
Length of street segment = 450.000(Ft.)  
Height of curb above gutter flowline = 6.0(In.)  
Width of half street (curb to crown) = 18.000(Ft.)  
Distance from crown to crossfall grade break = 10.000(Ft.)  
Slope from gutter to grade break (v/hz) = 0.020  
Slope from grade break to crown (v/hz) = 0.020  
Street flow is on [1] side(s) of the street  
Distance from curb to property line = 12.000(Ft.)  
Slope from curb to property line (v/hz) = 0.020  
Gutter width = 2.000(Ft.)  
Gutter hike from flowline = 2.000(In.)  
Manning's N in gutter = 0.0150  
Manning's N from gutter to grade break = 0.0150  
Manning's N from grade break to crown = 0.0150  
Estimated mean flow rate at midpoint of street = 5.767(CFS)  
Depth of flow = 0.463(Ft.), Average velocity = 1.947(Ft/s)  
Streetflow hydraulics at midpoint of street travel:  
Halfstreet flow width = 16.838(Ft.)  
Flow velocity = 1.95(Ft/s)  
Travel time = 3.85 min. TC = 17.24 min.  
Adding area flow to street  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.805  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Rainfall intensity = 2.239(In/Hr) for a 100.0 year storm  
Subarea runoff = 4.325(CFS) for 2.400(Ac.)  
Total runoff = 7.902(CFS) Total area = 4.060(Ac.)  
Street flow at end of street = 7.902(CFS)  
Half street flow at end of street = 7.902(CFS)  
Depth of flow = 0.505(Ft.), Average velocity = 2.139(Ft/s)  
Warning: depth of flow exceeds top of curb  
Note: depth of flow exceeds top of street crown.  
Distance that curb overflow reaches into property = 0.24(Ft.)  
Flow width (from curb towards crown)= 18.000(Ft.)

\*\*\*\*\*  
Process from Point/Station 83.000 to Point/Station 73.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.700(Ft.)  
 Downstream point/station elevation = 1450.180(Ft.)  
 Pipe length = 28.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 7.902(CFS)  
 Nearest computed pipe diameter = 15.00(In.)  
 Calculated individual pipe flow = 7.902(CFS)  
 Normal flow depth in pipe = 11.11(In.)  
 Flow top width inside pipe = 13.15(In.)  
 Critical Depth = 13.32(In.)  
 Pipe flow velocity = 8.12(Ft/s)  
 Travel time through pipe = 0.06 min.  
 Time of concentration (TC) = 17.30 min.

++++++  
 Process from Point/Station 83.000 to Point/Station 73.000  
 \*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

Along Main Stream number: 2 in normal stream number 2  
 Stream flow area = 4.060(Ac.)  
 Runoff from this stream = 7.902(CFS)  
 Time of concentration = 17.30 min.  
 Rainfall intensity = 2.235(In/Hr)  
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	8.426	14.81	2.415
2	7.902	17.30	2.235

Largest stream flow has longer or shorter time of concentration  
 $Q_p = 8.426 + \text{sum of } \frac{Q_a \cdot T_b}{T_a}$   
 $7.902 * \frac{0.856}{17.30} = 6.765$   
 $Q_p = 15.191$

Total of 2 streams to confluence:  
 Flow rates before confluence point:  
 8.426      7.902  
 Area of streams before confluence:  
 3.830      4.060  
 Results of confluence:  
 Total flow rate = 15.191(CFS)  
 Time of concentration = 14.810 min.  
 Effective stream area after confluence = 7.890(Ac.)

++++++  
 Process from Point/Station 73.000 to Point/Station 74.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

Upstream point/station elevation = 1450.180(Ft.)  
 Downstream point/station elevation = 1449.700(Ft.)  
 Pipe length = 480.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 15.191(CFS)  
 Nearest computed pipe diameter = 33.00(In.)  
 Calculated individual pipe flow = 15.191(CFS)  
 Normal flow depth in pipe = 24.66(In.)  
 Flow top width inside pipe = 28.69(In.)

Critical Depth = 15.31(In.)  
 Pipe flow velocity = 3.19(Ft/s)  
 Travel time through pipe = 2.51 min.  
 Time of concentration (TC) = 17.32 min.

++++  
 Process from Point/Station 73.000 to Point/Station 74.000  
 \*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

---

The following data inside Main Stream is listed:

In Main Stream number: 2  
 Stream flow area = 7.890(Ac.)  
 Runoff from this stream = 15.191(CFS)  
 Time of concentration = 17.32 min.  
 Rainfall intensity = 2.234(In/Hr)  
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
------------	-----------------	----------	----------------------------

1	35.132	20.37	2.059
2	15.191	17.32	2.234

Largest stream flow has longer time of concentration

Qp = 35.132 + sum of  
 Qb Ia/Ib  
 15.191 \* 0.922 = 14.007  
 Qp = 49.139

Total of 2 main streams to confluence:

Flow rates before confluence point:

35.132 15.191

Area of streams before confluence:

22.080 7.890

Results of confluence:

Total flow rate = 49.139(CFS)

Time of concentration = 20.371 min.

Effective stream area after confluence = 29.970(Ac.)

++++  
 Process from Point/Station 74.000 to Point/Station 74.000  
 \*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

UNDEVELOPED (poor cover) subarea

Runoff Coefficient = 0.814

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 1.000

Decimal fraction soil group D = 0.000

RI index for soil(AMC 2) = 86.00

Pervious area fraction = 1.000; Impervious fraction = 0.000

Time of concentration = 20.37 min.

Rainfall intensity = 2.059(In/Hr) for a 100.0 year storm

Subarea runoff = 1.090(CFS) for 0.650(Ac.)

Total runoff = 50.229(CFS) Total area = 30.620(Ac.)

End of computations, total study area = 30.62 (Ac.)

The following figures may  
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction( $A_p$ ) = 0.592

Area averaged RI index number = 72.1

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1  
Rational Hydrology Study Date: 03/19/21 File:100Lower.out

-----  
Stratford Ranch East  
100-Year Storm  
Proposed Condition  
Lower Basin Revised 3/19/21  
-----

\*\*\*\*\* Hydrology Study Control Information \*\*\*\*\*

English (in-lb) Units used in input data file  
-----

Program License Serial Number 6062  
-----

Rational Method Hydrology Program based on  
Riverside County Flood Control & Water Conservation District  
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.450(In.)  
100 year, 1 hour precipitation = 1.200(In.)

Storm event year = 100.0  
Calculated rainfall intensity data:  
1 hour intensity = 1.200(In/Hr)  
Slope of intensity duration curve = 0.5000

+++++  
Process from Point/Station 100.000 to Point/Station 101.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

-----  
Initial area flow distance = 250.000(Ft.)  
Top (of initial area) elevation = 1456.100(Ft.)  
Bottom (of initial area) elevation = 1453.000(Ft.)  
Difference in elevation = 3.100(Ft.)  
Slope = 0.01240 s(percent)= 1.24  
TC = k(0.390)\*[(length^3)/(elevation change)]^0.2  
Initial area time of concentration = 8.542 min.  
Rainfall intensity = 3.180(In/Hr) for a 100.0 year storm  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.829  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Initial subarea runoff = 1.265(CFS)

Total initial stream area = 0.480(Ac.)  
Pervious area fraction = 0.500

\*\*\*\*\*  
Process from Point/Station 101.000 to Point/Station 102.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.000(Ft.)  
Downstream point/station elevation = 1449.920(Ft.)  
Pipe length = 37.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 1.265(CFS)  
Nearest computed pipe diameter = 12.00(In.)  
Calculated individual pipe flow = 1.265(CFS)  
Normal flow depth in pipe = 7.85(In.)  
Flow top width inside pipe = 11.41(In.)  
Critical Depth = 5.69(In.)  
Pipe flow velocity = 2.32(Ft/s)  
Travel time through pipe = 0.27 min.  
Time of concentration (TC) = 8.81 min.

\*\*\*\*\*  
Process from Point/Station 102.000 to Point/Station 102.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.828  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Time of concentration = 8.81 min.  
Rainfall intensity = 3.132(In/Hr) for a 100.0 year storm  
Subarea runoff = 1.141(CFS) for 0.440(Ac.)  
Total runoff = 2.406(CFS) Total area = 0.920(Ac.)

\*\*\*\*\*  
Process from Point/Station 102.000 to Point/Station 103.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1449.920(Ft.)  
Downstream point/station elevation = 1449.690(Ft.)  
Pipe length = 233.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 2.406(CFS)  
Nearest computed pipe diameter = 18.00(In.)  
Calculated individual pipe flow = 2.406(CFS)  
Normal flow depth in pipe = 11.40(In.)  
Flow top width inside pipe = 17.35(In.)  
Critical Depth = 7.05(In.)  
Pipe flow velocity = 2.04(Ft/s)  
Travel time through pipe = 1.91 min.  
Time of concentration (TC) = 10.71 min.

\*\*\*\*\*  
Process from Point/Station 103.000 to Point/Station 103.000

\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.822  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Time of concentration = 10.71 min.  
Rainfall intensity = 2.840(In/Hr) for a 100.0 year storm  
Subarea runoff = 4.690(CFS) for 2.010(Ac.)  
Total runoff = 7.096(CFS) Total area = 2.930(Ac.)

++++  
Process from Point/Station 103.000 to Point/Station 104.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1449.690(Ft.)  
Downstream point/station elevation = 1449.450(Ft.)  
Pipe length = 247.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 7.096(CFS)  
Nearest computed pipe diameter = 24.00(In.)  
Calculated individual pipe flow = 7.096(CFS)  
Normal flow depth in pipe = 19.83(In.)  
Flow top width inside pipe = 18.19(In.)  
Critical Depth = 11.34(In.)  
Pipe flow velocity = 2.56(Ft/s)  
Travel time through pipe = 1.61 min.  
Time of concentration (TC) = 12.32 min.

++++  
Process from Point/Station 104.000 to Point/Station 104.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.817  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Time of concentration = 12.32 min.  
Rainfall intensity = 2.648(In/Hr) for a 100.0 year storm  
Subarea runoff = 6.879(CFS) for 3.180(Ac.)  
Total runoff = 13.975(CFS) Total area = 6.110(Ac.)

++++  
Process from Point/Station 104.000 to Point/Station 105.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1449.450(Ft.)  
Downstream point/station elevation = 1449.190(Ft.)  
Pipe length = 260.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 13.975(CFS)

Nearest computed pipe diameter = 33.00(In.)  
Calculated individual pipe flow = 13.975(CFS)  
Normal flow depth in pipe = 23.06(In.)  
Flow top width inside pipe = 30.28(In.)  
Critical Depth = 14.67(In.)  
Pipe flow velocity = 3.15(Ft/s)  
Travel time through pipe = 1.37 min.  
Time of concentration (TC) = 13.70 min.

\*\*\*\*\*  
Process from Point/Station 105.000 to Point/Station 105.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.813  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Time of concentration = 13.70 min.  
Rainfall intensity = 2.512(In/Hr) for a 100.0 year storm  
Subarea runoff = 7.272(CFS) for 3.560(Ac.)  
Total runoff = 21.247(CFS) Total area = 9.670(Ac.)

\*\*\*\*\*  
Process from Point/Station 105.000 to Point/Station 106.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1449.190(Ft.)  
Downstream point/station elevation = 1448.930(Ft.)  
Pipe length = 260.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 21.247(CFS)  
Nearest computed pipe diameter = 36.00(In.)  
Calculated individual pipe flow = 21.247(CFS)  
Normal flow depth in pipe = 29.77(In.)  
Flow top width inside pipe = 27.24(In.)  
Critical Depth = 17.77(In.)  
Pipe flow velocity = 3.40(Ft/s)  
Travel time through pipe = 1.27 min.  
Time of concentration (TC) = 14.97 min.

\*\*\*\*\*  
Process from Point/Station 106.000 to Point/Station 106.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.810  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Time of concentration = 14.97 min.  
Rainfall intensity = 2.402(In/Hr) for a 100.0 year storm

Subarea runoff = 9.634(CFS) for 4.950(Ac.)  
Total runoff = 30.881(CFS) Total area = 14.620(Ac.)

\*\*\*\*\*  
Process from Point/Station 106.000 to Point/Station 107.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1448.930(Ft.)  
Downstream point/station elevation = 1448.900(Ft.)  
Pipe length = 27.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 30.881(CFS)  
Nearest computed pipe diameter = 42.00(In.)  
Calculated individual pipe flow = 30.881(CFS)  
Normal flow depth in pipe = 31.78(In.)  
Flow top width inside pipe = 36.04(In.)  
Critical Depth = 20.61(In.)  
Pipe flow velocity = 3.96(Ft/s)  
Travel time through pipe = 0.11 min.  
Time of concentration (TC) = 15.09 min.

\*\*\*\*\*  
Process from Point/Station 100.000 to Point/Station 107.000  
\*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

---

The following data inside Main Stream is listed:

In Main Stream number: 1  
Stream flow area = 14.620(Ac.)  
Runoff from this stream = 30.881(CFS)  
Time of concentration = 15.09 min.  
Rainfall intensity = 2.393(In/Hr)  
Program is now starting with Main Stream No. 2

\*\*\*\*\*  
Process from Point/Station 200.000 to Point/Station 201.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

---

Initial area flow distance = 377.000(Ft.)  
Top (of initial area) elevation = 1458.500(Ft.)  
Bottom (of initial area) elevation = 1453.450(Ft.)  
Difference in elevation = 5.050(Ft.)  
Slope = 0.01340 s(percent)= 1.34  
TC =  $k(0.390)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$   
Initial area time of concentration = 9.913 min.  
Rainfall intensity = 2.952(In/Hr) for a 100.0 year storm  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.824  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Initial subarea runoff = 2.214(CFS)  
Total initial stream area = 0.910(Ac.)  
Pervious area fraction = 0.500

+++++  
Process from Point/Station 201.000 to Point/Station 201.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.824  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Time of concentration = 9.91 min.  
Rainfall intensity = 2.952(In/Hr) for a 100.0 year storm  
Subarea runoff = 1.971(CFS) for 0.810(Ac.)  
Total runoff = 4.185(CFS) Total area = 1.720(Ac.)

+++++  
Process from Point/Station 201.000 to Point/Station 202.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.500(Ft.)  
Downstream point/station elevation = 1450.350(Ft.)  
Pipe length = 37.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 4.185(CFS)  
Nearest computed pipe diameter = 18.00(In.)  
Calculated individual pipe flow = 4.185(CFS)  
Normal flow depth in pipe = 10.31(In.)  
Flow top width inside pipe = 17.81(In.)  
Critical Depth = 9.41(In.)  
Pipe flow velocity = 3.99(Ft/s)  
Travel time through pipe = 0.15 min.  
Time of concentration (TC) = 10.07 min.

+++++  
Process from Point/Station 200.000 to Point/Station 202.000  
\*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

---

Along Main Stream number: 2 in normal stream number 1  
Stream flow area = 1.720(Ac.)  
Runoff from this stream = 4.185(CFS)  
Time of concentration = 10.07 min.  
Rainfall intensity = 2.930(In/Hr)

+++++  
Process from Point/Station 210.000 to Point/Station 211.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

---

Initial area flow distance = 255.000(Ft.)  
Top (of initial area) elevation = 1458.000(Ft.)  
Bottom (of initial area) elevation = 1455.500(Ft.)  
Difference in elevation = 2.500(Ft.)  
Slope = 0.00980 s(percent) = 0.98  
TC =  $k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 9.024 min.  
Rainfall intensity = 3.094(In/Hr) for a 100.0 year storm  
SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.827  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Initial subarea runoff = 1.663(CFS)  
Total initial stream area = 0.650(Ac.)  
Pervious area fraction = 0.500

\*\*\*\*\*  
Process from Point/Station 211.000 to Point/Station 212.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1455.500(Ft.)  
End of street segment elevation = 1454.000(Ft.)  
Length of street segment = 342.000(Ft.)  
Height of curb above gutter flowline = 6.0(In.)  
Width of half street (curb to crown) = 18.000(Ft.)  
Distance from crown to crossfall grade break = 10.000(Ft.)  
Slope from gutter to grade break (v/hz) = 0.020  
Slope from grade break to crown (v/hz) = 0.020  
Street flow is on [1] side(s) of the street  
Distance from curb to property line = 12.000(Ft.)  
Slope from curb to property line (v/hz) = 0.020  
Gutter width = 2.000(Ft.)  
Gutter hike from flowline = 2.000(In.)  
Manning's N in gutter = 0.0150  
Manning's N from gutter to grade break = 0.0150  
Manning's N from grade break to crown = 0.0150  
Estimated mean flow rate at midpoint of street = 2.767(CFS)  
Depth of flow = 0.373(Ft.), Average velocity = 1.680(Ft/s)  
Streetflow hydraulics at midpoint of street travel:  
Halfstreet flow width = 12.330(Ft.)  
Flow velocity = 1.68(Ft/s)  
Travel time = 3.39 min. TC = 12.42 min.

Adding area flow to street  
SINGLE FAMILY (1/4 Acre Lot)  
Runoff Coefficient = 0.817  
Decimal fraction soil group A = 0.000  
Decimal fraction soil group B = 0.000  
Decimal fraction soil group C = 1.000  
Decimal fraction soil group D = 0.000  
RI index for soil(AMC 2) = 69.00  
Pervious area fraction = 0.500; Impervious fraction = 0.500  
Rainfall intensity = 2.638(In/Hr) for a 100.0 year storm  
Subarea runoff = 2.154(CFS) for 1.000(Ac.)  
Total runoff = 3.818(CFS) Total area = 1.650(Ac.)  
Street flow at end of street = 3.818(CFS)  
Half street flow at end of street = 3.818(CFS)  
Depth of flow = 0.408(Ft.), Average velocity = 1.814(Ft/s)  
Flow width (from curb towards crown)= 14.065(Ft.)

\*\*\*\*\*  
Process from Point/Station 212.000 to Point/Station 213.000  
\*\*\*\* STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION \*\*\*\*

---

Top of street segment elevation = 1454.000(Ft.)  
 End of street segment elevation = 1453.450(Ft.)  
 Length of street segment = 111.000(Ft.)  
 Height of curb above gutter flowline = 6.0(In.)  
 Width of half street (curb to crown) = 18.000(Ft.)  
 Distance from crown to crossfall grade break = 10.000(Ft.)  
 Slope from gutter to grade break (v/hz) = 0.020  
 Slope from grade break to crown (v/hz) = 0.020  
 Street flow is on [1] side(s) of the street  
 Distance from curb to property line = 12.000(Ft.)  
 Slope from curb to property line (v/hz) = 0.020  
 Gutter width = 2.000(Ft.)  
 Gutter hike from flowline = 2.000(In.)  
 Manning's N in gutter = 0.0150  
 Manning's N from gutter to grade break = 0.0150  
 Manning's N from grade break to crown = 0.0150  
 Estimated mean flow rate at midpoint of street = 5.639(CFS)  
 Depth of flow = 0.448(Ft.), Average velocity = 2.087(Ft/s)  
 Streetflow hydraulics at midpoint of street travel:  
 Halfstreet flow width = 16.048(Ft.)  
 Flow velocity = 2.09(Ft/s)  
 Travel time = 0.89 min. TC = 13.30 min.  
 Adding area flow to street  
 SINGLE FAMILY (1/4 Acre Lot)  
 Runoff Coefficient = 0.814  
 Decimal fraction soil group A = 0.000  
 Decimal fraction soil group B = 0.000  
 Decimal fraction soil group C = 1.000  
 Decimal fraction soil group D = 0.000  
 RI index for soil(AMC 2) = 69.00  
 Pervious area fraction = 0.500; Impervious fraction = 0.500  
 Rainfall intensity = 2.548(In/Hr) for a 100.0 year storm  
 Subarea runoff = 3.590(CFS) for 1.730(Ac.)  
 Total runoff = 7.408(CFS) Total area = 3.380(Ac.)  
 Street flow at end of street = 7.408(CFS)  
 Half street flow at end of street = 7.408(CFS)  
 Depth of flow = 0.484(Ft.), Average velocity = 2.230(Ft/s)  
 Flow width (from curb towards crown)= 17.875(Ft.)

++++++  
 Process from Point/Station 213.000 to Point/Station 202.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.500(Ft.)  
 Downstream point/station elevation = 1450.350(Ft.)  
 Pipe length = 30.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 7.408(CFS)  
 Nearest computed pipe diameter = 18.00(In.)  
 Calculated individual pipe flow = 7.408(CFS)  
 Normal flow depth in pipe = 14.72(In.)  
 Flow top width inside pipe = 13.90(In.)  
 Critical Depth = 12.64(In.)  
 Pipe flow velocity = 4.79(Ft/s)  
 Travel time through pipe = 0.10 min.  
 Time of concentration (TC) = 13.41 min.

++++++  
 Process from Point/Station 210.000 to Point/Station 202.000

\*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

---

Along Main Stream number: 2 in normal stream number 2  
 Stream flow area = 3.380(Ac.)  
 Runoff from this stream = 7.408(CFS)  
 Time of concentration = 13.41 min.  
 Rainfall intensity = 2.538(In/Hr)  
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
------------	-----------------	----------	----------------------------

1	4.185	10.07	2.930
2	7.408	13.41	2.538

Largest stream flow has longer time of concentration

Qp = 7.408 + sum of  

$$Qb \quad Ia/Ib$$

$$4.185 * 0.867 = 3.626$$
 Qp = 11.034

Total of 2 streams to confluence:  
 Flow rates before confluence point:  
 4.185          7.408  
 Area of streams before confluence:  
 1.720          3.380

Results of confluence:  
 Total flow rate = 11.034(CFS)  
 Time of concentration = 13.408 min.  
 Effective stream area after confluence = 5.100(Ac.)

\*\*\*\*\*  
 Process from Point/Station 202.000 to Point/Station 203.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (Program estimated size) \*\*\*\*

---

Upstream point/station elevation = 1450.350(Ft.)  
 Downstream point/station elevation = 1448.900(Ft.)  
 Pipe length = 410.00(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 11.034(CFS)  
 Nearest computed pipe diameter = 24.00(In.)  
 Calculated individual pipe flow = 11.034(CFS)  
 Normal flow depth in pipe = 16.55(In.)  
 Flow top width inside pipe = 22.21(In.)  
 Critical Depth = 14.31(In.)  
 Pipe flow velocity = 4.78(Ft/s)  
 Travel time through pipe = 1.43 min.  
 Time of concentration (TC) = 14.84 min.

\*\*\*\*\*  
 Process from Point/Station 200.000 to Point/Station 203.000  
 \*\*\*\* CONFLUENCE OF MAIN STREAMS \*\*\*\*

---

The following data inside Main Stream is listed:  
 In Main Stream number: 2  
 Stream flow area = 5.100(Ac.)  
 Runoff from this stream = 11.034(CFS)  
 Time of concentration = 14.84 min.  
 Rainfall intensity = 2.413(In/Hr)

Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
------------	-----------------	----------	----------------------------

1	30.881	15.09	2.393
2	11.034	14.84	2.413

Largest stream flow has longer time of concentration

Qp = 30.881 + sum of  
Qb Ia/Ib  
11.034 \* 0.992 = 10.943  
Qp = 41.825

Total of 2 main streams to confluence:

Flow rates before confluence point:

30.881 11.034

Area of streams before confluence:

14.620 5.100

Results of confluence:

Total flow rate = 41.825(CFS)

Time of concentration = 15.085 min.

Effective stream area after confluence = 19.720(Ac.)

\*\*\*\*\*  
Process from Point/Station 203.000 to Point/Station 203.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

UNDEVELOPED (poor cover) subarea

Runoff Coefficient = 0.825

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 1.000

Decimal fraction soil group D = 0.000

RI index for soil(AMC 2) = 86.00

Pervious area fraction = 1.000; Impervious fraction = 0.000

Time of concentration = 15.09 min.

Rainfall intensity = 2.393(In/Hr) for a 100.0 year storm

Subarea runoff = 1.224(CFS) for 0.620(Ac.)

Total runoff = 43.049(CFS) Total area = 20.340(Ac.)

End of computations, total study area = 20.34 (Ac.)

The following figures may

be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.515

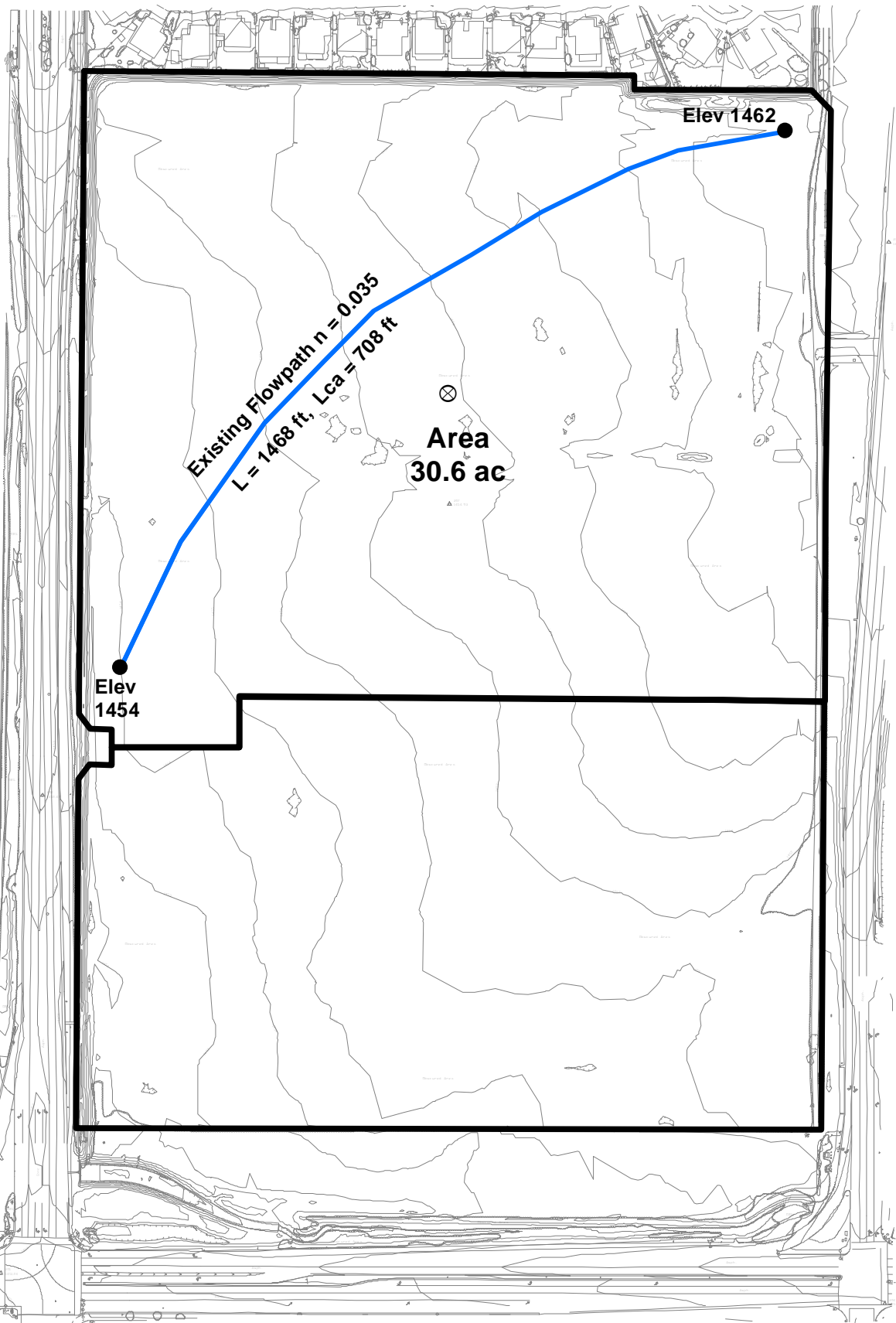
Area averaged RI index number = 69.5

*Appendix*

# D

## **EXISTING CONDITION UNIT HYDROGRAPH CALCULATIONS**

---

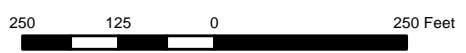


Elev 1454

Elev 1462

Existing Flowpath  $n = 0.035$   
 $L = 1468 \text{ ft}$ ,  $Lca = 708 \text{ ft}$

Area  
30.6 ac



Stratford Ranch  
Unit Hydrograph Map  
Existing Condition

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2004, Version 7.0  
Study date 06/14/21 File: E100242.out

+++++  
-----

Riverside County Synthetic Unit Hydrology Method  
RCFC & WCD Manual date - April 1978

Program License Serial Number 6062

-----  
English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

-----  
2-Yr 24-Hour  
Existing

-----  
Drainage Area = 30.60(Ac.) = 0.048 Sq. Mi.  
Drainage Area for Depth-Area Areal Adjustment = 30.60(Ac.) = 0.048  
Sq. Mi.  
Length along longest watercourse = 1468.00(Ft.)  
Length along longest watercourse measured to centroid = 708.00(Ft.)  
Length along longest watercourse = 0.278 Mi.  
Length along longest watercourse measured to centroid = 0.134 Mi.  
Difference in elevation = 8.00(Ft.)  
Slope along watercourse = 28.7738 Ft./Mi.  
Average Manning's 'N' = 0.035  
Lag time = 0.127 Hr.  
Lag time = 7.63 Min.  
25% of lag time = 1.91 Min.  
40% of lag time = 3.05 Min.  
Unit time = 5.00 Min.  
Duration of storm = 24 Hour(s)  
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	1.60	48.96

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	4.00	122.40

STORM EVENT (YEAR) = 2.00  
 Area Averaged 2-Year Rainfall = 1.600(In)  
 Area Averaged 100-Year Rainfall = 4.000(In)

Point rain (area averaged) = 1.600(In)  
 Areal adjustment factor = 99.99 %  
 Adjusted average point rain = 1.600(In)

Sub-Area Data:

Area(Ac.)                  Runoff Index          Impervious %  
 30.600                      86.00                      0.000  
 Total Area Entered =          30.60(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	71.6	0.343	0.000	0.343	1.000	0.343
						Sum (F) = 0.343

Area averaged mean soil loss (F) (In/Hr) = 0.343  
 Minimum soil loss rate ((In/Hr)) = 0.172  
 (for 24 hour storm duration)  
 Soil low loss rate (decimal) = 0.900

-----  
 U n i t   H y d r o g r a p h  
 VALLEY S-Curve  
 -----

Unit Hydrograph Data  
 -----

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	65.551	9.518
2	0.167	131.103	37.609
3	0.250	196.654	24.680
4	0.333	262.206	9.498
5	0.417	327.757	5.744
6	0.500	393.309	3.855
7	0.583	458.860	2.626
8	0.667	524.412	1.983
9	0.750	589.963	1.497
10	0.833	655.514	1.105
11	0.917	721.066	0.769
12	1.000	786.617	0.656
13	1.083	852.169	0.462
		Sum = 100.000	Sum= 30.839

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)	
			Max	Low		
1	0.08	0.07	0.013	0.608	0.012	0.00
2	0.17	0.07	0.013	0.606	0.012	0.00
3	0.25	0.07	0.013	0.604	0.012	0.00
4	0.33	0.10	0.019	0.601	0.017	0.00
5	0.42	0.10	0.019	0.599	0.017	0.00
6	0.50	0.10	0.019	0.597	0.017	0.00
7	0.58	0.10	0.019	0.594	0.017	0.00
8	0.67	0.10	0.019	0.592	0.017	0.00
9	0.75	0.10	0.019	0.590	0.017	0.00

10	0.83	0.13	0.026	0.587	0.023	0.00
11	0.92	0.13	0.026	0.585	0.023	0.00
12	1.00	0.13	0.026	0.583	0.023	0.00
13	1.08	0.10	0.019	0.580	0.017	0.00
14	1.17	0.10	0.019	0.578	0.017	0.00
15	1.25	0.10	0.019	0.576	0.017	0.00
16	1.33	0.10	0.019	0.573	0.017	0.00
17	1.42	0.10	0.019	0.571	0.017	0.00
18	1.50	0.10	0.019	0.569	0.017	0.00
19	1.58	0.10	0.019	0.567	0.017	0.00
20	1.67	0.10	0.019	0.564	0.017	0.00
21	1.75	0.10	0.019	0.562	0.017	0.00
22	1.83	0.13	0.026	0.560	0.023	0.00
23	1.92	0.13	0.026	0.558	0.023	0.00
24	2.00	0.13	0.026	0.555	0.023	0.00
25	2.08	0.13	0.026	0.553	0.023	0.00
26	2.17	0.13	0.026	0.551	0.023	0.00
27	2.25	0.13	0.026	0.549	0.023	0.00
28	2.33	0.13	0.026	0.546	0.023	0.00
29	2.42	0.13	0.026	0.544	0.023	0.00
30	2.50	0.13	0.026	0.542	0.023	0.00
31	2.58	0.17	0.032	0.540	0.029	0.00
32	2.67	0.17	0.032	0.537	0.029	0.00
33	2.75	0.17	0.032	0.535	0.029	0.00
34	2.83	0.17	0.032	0.533	0.029	0.00
35	2.92	0.17	0.032	0.531	0.029	0.00
36	3.00	0.17	0.032	0.529	0.029	0.00
37	3.08	0.17	0.032	0.526	0.029	0.00
38	3.17	0.17	0.032	0.524	0.029	0.00
39	3.25	0.17	0.032	0.522	0.029	0.00
40	3.33	0.17	0.032	0.520	0.029	0.00
41	3.42	0.17	0.032	0.518	0.029	0.00
42	3.50	0.17	0.032	0.516	0.029	0.00
43	3.58	0.17	0.032	0.513	0.029	0.00
44	3.67	0.17	0.032	0.511	0.029	0.00
45	3.75	0.17	0.032	0.509	0.029	0.00
46	3.83	0.20	0.038	0.507	0.035	0.00
47	3.92	0.20	0.038	0.505	0.035	0.00
48	4.00	0.20	0.038	0.503	0.035	0.00
49	4.08	0.20	0.038	0.501	0.035	0.00
50	4.17	0.20	0.038	0.498	0.035	0.00
51	4.25	0.20	0.038	0.496	0.035	0.00
52	4.33	0.23	0.045	0.494	0.040	0.00
53	4.42	0.23	0.045	0.492	0.040	0.00
54	4.50	0.23	0.045	0.490	0.040	0.00
55	4.58	0.23	0.045	0.488	0.040	0.00
56	4.67	0.23	0.045	0.486	0.040	0.00
57	4.75	0.23	0.045	0.484	0.040	0.00
58	4.83	0.27	0.051	0.482	0.046	0.01
59	4.92	0.27	0.051	0.480	0.046	0.01
60	5.00	0.27	0.051	0.477	0.046	0.01
61	5.08	0.20	0.038	0.475	0.035	0.00
62	5.17	0.20	0.038	0.473	0.035	0.00
63	5.25	0.20	0.038	0.471	0.035	0.00
64	5.33	0.23	0.045	0.469	0.040	0.00
65	5.42	0.23	0.045	0.467	0.040	0.00
66	5.50	0.23	0.045	0.465	0.040	0.00
67	5.58	0.27	0.051	0.463	0.046	0.01
68	5.67	0.27	0.051	0.461	0.046	0.01
69	5.75	0.27	0.051	0.459	0.046	0.01

70	5.83	0.27	0.051	0.457	0.046	0.01
71	5.92	0.27	0.051	0.455	0.046	0.01
72	6.00	0.27	0.051	0.453	0.046	0.01
73	6.08	0.30	0.058	0.451	0.052	0.01
74	6.17	0.30	0.058	0.449	0.052	0.01
75	6.25	0.30	0.058	0.447	0.052	0.01
76	6.33	0.30	0.058	0.445	0.052	0.01
77	6.42	0.30	0.058	0.443	0.052	0.01
78	6.50	0.30	0.058	0.441	0.052	0.01
79	6.58	0.33	0.064	0.439	0.058	0.01
80	6.67	0.33	0.064	0.437	0.058	0.01
81	6.75	0.33	0.064	0.435	0.058	0.01
82	6.83	0.33	0.064	0.433	0.058	0.01
83	6.92	0.33	0.064	0.431	0.058	0.01
84	7.00	0.33	0.064	0.429	0.058	0.01
85	7.08	0.33	0.064	0.427	0.058	0.01
86	7.17	0.33	0.064	0.425	0.058	0.01
87	7.25	0.33	0.064	0.423	0.058	0.01
88	7.33	0.37	0.070	0.421	0.063	0.01
89	7.42	0.37	0.070	0.419	0.063	0.01
90	7.50	0.37	0.070	0.417	0.063	0.01
91	7.58	0.40	0.077	0.416	0.069	0.01
92	7.67	0.40	0.077	0.414	0.069	0.01
93	7.75	0.40	0.077	0.412	0.069	0.01
94	7.83	0.43	0.083	0.410	0.075	0.01
95	7.92	0.43	0.083	0.408	0.075	0.01
96	8.00	0.43	0.083	0.406	0.075	0.01
97	8.08	0.50	0.096	0.404	0.086	0.01
98	8.17	0.50	0.096	0.402	0.086	0.01
99	8.25	0.50	0.096	0.400	0.086	0.01
100	8.33	0.50	0.096	0.399	0.086	0.01
101	8.42	0.50	0.096	0.397	0.086	0.01
102	8.50	0.50	0.096	0.395	0.086	0.01
103	8.58	0.53	0.102	0.393	0.092	0.01
104	8.67	0.53	0.102	0.391	0.092	0.01
105	8.75	0.53	0.102	0.389	0.092	0.01
106	8.83	0.57	0.109	0.387	0.098	0.01
107	8.92	0.57	0.109	0.386	0.098	0.01
108	9.00	0.57	0.109	0.384	0.098	0.01
109	9.08	0.63	0.122	0.382	0.109	0.01
110	9.17	0.63	0.122	0.380	0.109	0.01
111	9.25	0.63	0.122	0.378	0.109	0.01
112	9.33	0.67	0.128	0.377	0.115	0.01
113	9.42	0.67	0.128	0.375	0.115	0.01
114	9.50	0.67	0.128	0.373	0.115	0.01
115	9.58	0.70	0.134	0.371	0.121	0.01
116	9.67	0.70	0.134	0.369	0.121	0.01
117	9.75	0.70	0.134	0.368	0.121	0.01
118	9.83	0.73	0.141	0.366	0.127	0.01
119	9.92	0.73	0.141	0.364	0.127	0.01
120	10.00	0.73	0.141	0.362	0.127	0.01
121	10.08	0.50	0.096	0.361	0.086	0.01
122	10.17	0.50	0.096	0.359	0.086	0.01
123	10.25	0.50	0.096	0.357	0.086	0.01
124	10.33	0.50	0.096	0.355	0.086	0.01
125	10.42	0.50	0.096	0.354	0.086	0.01
126	10.50	0.50	0.096	0.352	0.086	0.01
127	10.58	0.67	0.128	0.350	0.115	0.01
128	10.67	0.67	0.128	0.348	0.115	0.01
129	10.75	0.67	0.128	0.347	0.115	0.01

130	10.83	0.67	0.128	0.345	0.115	0.01
131	10.92	0.67	0.128	0.343	0.115	0.01
132	11.00	0.67	0.128	0.342	0.115	0.01
133	11.08	0.63	0.122	0.340	0.109	0.01
134	11.17	0.63	0.122	0.338	0.109	0.01
135	11.25	0.63	0.122	0.337	0.109	0.01
136	11.33	0.63	0.122	0.335	0.109	0.01
137	11.42	0.63	0.122	0.333	0.109	0.01
138	11.50	0.63	0.122	0.332	0.109	0.01
139	11.58	0.57	0.109	0.330	0.098	0.01
140	11.67	0.57	0.109	0.328	0.098	0.01
141	11.75	0.57	0.109	0.327	0.098	0.01
142	11.83	0.60	0.115	0.325	0.104	0.01
143	11.92	0.60	0.115	0.324	0.104	0.01
144	12.00	0.60	0.115	0.322	0.104	0.01
145	12.08	0.83	0.160	0.320	0.144	0.02
146	12.17	0.83	0.160	0.319	0.144	0.02
147	12.25	0.83	0.160	0.317	0.144	0.02
148	12.33	0.87	0.166	0.316	0.150	0.02
149	12.42	0.87	0.166	0.314	0.150	0.02
150	12.50	0.87	0.166	0.312	0.150	0.02
151	12.58	0.93	0.179	0.311	0.161	0.02
152	12.67	0.93	0.179	0.309	0.161	0.02
153	12.75	0.93	0.179	0.308	0.161	0.02
154	12.83	0.97	0.186	0.306	0.167	0.02
155	12.92	0.97	0.186	0.305	0.167	0.02
156	13.00	0.97	0.186	0.303	0.167	0.02
157	13.08	1.13	0.218	0.301	0.196	0.02
158	13.17	1.13	0.218	0.300	0.196	0.02
159	13.25	1.13	0.218	0.298	0.196	0.02
160	13.33	1.13	0.218	0.297	0.196	0.02
161	13.42	1.13	0.218	0.295	0.196	0.02
162	13.50	1.13	0.218	0.294	0.196	0.02
163	13.58	0.77	0.147	0.292	0.132	0.01
164	13.67	0.77	0.147	0.291	0.132	0.01
165	13.75	0.77	0.147	0.289	0.132	0.01
166	13.83	0.77	0.147	0.288	0.132	0.01
167	13.92	0.77	0.147	0.286	0.132	0.01
168	14.00	0.77	0.147	0.285	0.132	0.01
169	14.08	0.90	0.173	0.284	0.156	0.02
170	14.17	0.90	0.173	0.282	0.156	0.02
171	14.25	0.90	0.173	0.281	0.156	0.02
172	14.33	0.87	0.166	0.279	0.150	0.02
173	14.42	0.87	0.166	0.278	0.150	0.02
174	14.50	0.87	0.166	0.276	0.150	0.02
175	14.58	0.87	0.166	0.275	0.150	0.02
176	14.67	0.87	0.166	0.274	0.150	0.02
177	14.75	0.87	0.166	0.272	0.150	0.02
178	14.83	0.83	0.160	0.271	0.144	0.02
179	14.92	0.83	0.160	0.269	0.144	0.02
180	15.00	0.83	0.160	0.268	0.144	0.02
181	15.08	0.80	0.154	0.267	0.138	0.02
182	15.17	0.80	0.154	0.265	0.138	0.02
183	15.25	0.80	0.154	0.264	0.138	0.02
184	15.33	0.77	0.147	0.263	0.132	0.01
185	15.42	0.77	0.147	0.261	0.132	0.01
186	15.50	0.77	0.147	0.260	0.132	0.01
187	15.58	0.63	0.122	0.259	0.109	0.01
188	15.67	0.63	0.122	0.257	0.109	0.01
189	15.75	0.63	0.122	0.256	0.109	0.01

190	15.83	0.63	0.122	0.255	0.109	0.01
191	15.92	0.63	0.122	0.253	0.109	0.01
192	16.00	0.63	0.122	0.252	0.109	0.01
193	16.08	0.13	0.026	0.251	0.023	0.00
194	16.17	0.13	0.026	0.249	0.023	0.00
195	16.25	0.13	0.026	0.248	0.023	0.00
196	16.33	0.13	0.026	0.247	0.023	0.00
197	16.42	0.13	0.026	0.246	0.023	0.00
198	16.50	0.13	0.026	0.244	0.023	0.00
199	16.58	0.10	0.019	0.243	0.017	0.00
200	16.67	0.10	0.019	0.242	0.017	0.00
201	16.75	0.10	0.019	0.241	0.017	0.00
202	16.83	0.10	0.019	0.239	0.017	0.00
203	16.92	0.10	0.019	0.238	0.017	0.00
204	17.00	0.10	0.019	0.237	0.017	0.00
205	17.08	0.17	0.032	0.236	0.029	0.00
206	17.17	0.17	0.032	0.235	0.029	0.00
207	17.25	0.17	0.032	0.233	0.029	0.00
208	17.33	0.17	0.032	0.232	0.029	0.00
209	17.42	0.17	0.032	0.231	0.029	0.00
210	17.50	0.17	0.032	0.230	0.029	0.00
211	17.58	0.17	0.032	0.229	0.029	0.00
212	17.67	0.17	0.032	0.228	0.029	0.00
213	17.75	0.17	0.032	0.227	0.029	0.00
214	17.83	0.13	0.026	0.225	0.023	0.00
215	17.92	0.13	0.026	0.224	0.023	0.00
216	18.00	0.13	0.026	0.223	0.023	0.00
217	18.08	0.13	0.026	0.222	0.023	0.00
218	18.17	0.13	0.026	0.221	0.023	0.00
219	18.25	0.13	0.026	0.220	0.023	0.00
220	18.33	0.13	0.026	0.219	0.023	0.00
221	18.42	0.13	0.026	0.218	0.023	0.00
222	18.50	0.13	0.026	0.217	0.023	0.00
223	18.58	0.10	0.019	0.216	0.017	0.00
224	18.67	0.10	0.019	0.215	0.017	0.00
225	18.75	0.10	0.019	0.214	0.017	0.00
226	18.83	0.07	0.013	0.213	0.012	0.00
227	18.92	0.07	0.013	0.212	0.012	0.00
228	19.00	0.07	0.013	0.211	0.012	0.00
229	19.08	0.10	0.019	0.210	0.017	0.00
230	19.17	0.10	0.019	0.209	0.017	0.00
231	19.25	0.10	0.019	0.208	0.017	0.00
232	19.33	0.13	0.026	0.207	0.023	0.00
233	19.42	0.13	0.026	0.206	0.023	0.00
234	19.50	0.13	0.026	0.205	0.023	0.00
235	19.58	0.10	0.019	0.204	0.017	0.00
236	19.67	0.10	0.019	0.203	0.017	0.00
237	19.75	0.10	0.019	0.202	0.017	0.00
238	19.83	0.07	0.013	0.201	0.012	0.00
239	19.92	0.07	0.013	0.200	0.012	0.00
240	20.00	0.07	0.013	0.199	0.012	0.00
241	20.08	0.10	0.019	0.198	0.017	0.00
242	20.17	0.10	0.019	0.197	0.017	0.00
243	20.25	0.10	0.019	0.197	0.017	0.00
244	20.33	0.10	0.019	0.196	0.017	0.00
245	20.42	0.10	0.019	0.195	0.017	0.00
246	20.50	0.10	0.019	0.194	0.017	0.00
247	20.58	0.10	0.019	0.193	0.017	0.00
248	20.67	0.10	0.019	0.192	0.017	0.00
249	20.75	0.10	0.019	0.192	0.017	0.00

250	20.83	0.07	0.013	0.191	0.012	0.00
251	20.92	0.07	0.013	0.190	0.012	0.00
252	21.00	0.07	0.013	0.189	0.012	0.00
253	21.08	0.10	0.019	0.189	0.017	0.00
254	21.17	0.10	0.019	0.188	0.017	0.00
255	21.25	0.10	0.019	0.187	0.017	0.00
256	21.33	0.07	0.013	0.186	0.012	0.00
257	21.42	0.07	0.013	0.186	0.012	0.00
258	21.50	0.07	0.013	0.185	0.012	0.00
259	21.58	0.10	0.019	0.184	0.017	0.00
260	21.67	0.10	0.019	0.184	0.017	0.00
261	21.75	0.10	0.019	0.183	0.017	0.00
262	21.83	0.07	0.013	0.182	0.012	0.00
263	21.92	0.07	0.013	0.182	0.012	0.00
264	22.00	0.07	0.013	0.181	0.012	0.00
265	22.08	0.10	0.019	0.181	0.017	0.00
266	22.17	0.10	0.019	0.180	0.017	0.00
267	22.25	0.10	0.019	0.179	0.017	0.00
268	22.33	0.07	0.013	0.179	0.012	0.00
269	22.42	0.07	0.013	0.178	0.012	0.00
270	22.50	0.07	0.013	0.178	0.012	0.00
271	22.58	0.07	0.013	0.177	0.012	0.00
272	22.67	0.07	0.013	0.177	0.012	0.00
273	22.75	0.07	0.013	0.176	0.012	0.00
274	22.83	0.07	0.013	0.176	0.012	0.00
275	22.92	0.07	0.013	0.175	0.012	0.00
276	23.00	0.07	0.013	0.175	0.012	0.00
277	23.08	0.07	0.013	0.175	0.012	0.00
278	23.17	0.07	0.013	0.174	0.012	0.00
279	23.25	0.07	0.013	0.174	0.012	0.00
280	23.33	0.07	0.013	0.173	0.012	0.00
281	23.42	0.07	0.013	0.173	0.012	0.00
282	23.50	0.07	0.013	0.173	0.012	0.00
283	23.58	0.07	0.013	0.173	0.012	0.00
284	23.67	0.07	0.013	0.172	0.012	0.00
285	23.75	0.07	0.013	0.172	0.012	0.00
286	23.83	0.07	0.013	0.172	0.012	0.00
287	23.92	0.07	0.013	0.172	0.012	0.00
288	24.00	0.07	0.013	0.172	0.012	0.00

Sum = 100.0 Sum = 1.9

Flood volume = Effective rainfall 0.16(In)  
times area 30.6(Ac.)/[(In)/(Ft.)] = 0.4(Ac.Ft)  
Total soil loss = 1.44(In)  
Total soil loss = 3.672(Ac.Ft)  
Total rainfall = 1.60(In)  
Flood volume = 17771.4 Cubic Feet  
Total soil loss = 159942.8 Cubic Feet

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Peak flow rate of this hydrograph = 0.662(CFS)  
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24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))  
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Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				

0+10	0.0002	0.02	Q
0+15	0.0003	0.03	Q
0+20	0.0006	0.03	Q
0+25	0.0009	0.04	Q
0+30	0.0012	0.05	Q
0+35	0.0016	0.05	Q
0+40	0.0020	0.05	Q
0+45	0.0024	0.06	Q
0+50	0.0028	0.06	Q
0+55	0.0032	0.07	Q
1+ 0	0.0037	0.07	Q
1+ 5	0.0042	0.07	Q
1+10	0.0047	0.07	Q
1+15	0.0051	0.06	Q
1+20	0.0056	0.06	Q
1+25	0.0060	0.06	Q
1+30	0.0064	0.06	Q
1+35	0.0068	0.06	Q
1+40	0.0072	0.06	Q
1+45	0.0076	0.06	Q
1+50	0.0080	0.06	Q
1+55	0.0085	0.07	Q
2+ 0	0.0090	0.07	Q
2+ 5	0.0095	0.08	Q
2+10	0.0101	0.08	Q
2+15	0.0106	0.08	QV
2+20	0.0111	0.08	QV
2+25	0.0117	0.08	QV
2+30	0.0122	0.08	QV
2+35	0.0128	0.08	QV
2+40	0.0134	0.09	QV
2+45	0.0140	0.09	QV
2+50	0.0147	0.10	QV
2+55	0.0153	0.10	QV
3+ 0	0.0160	0.10	QV
3+ 5	0.0167	0.10	QV
3+10	0.0173	0.10	QV
3+15	0.0180	0.10	QV
3+20	0.0187	0.10	QV
3+25	0.0194	0.10	QV
3+30	0.0201	0.10	QV
3+35	0.0207	0.10	Q V
3+40	0.0214	0.10	Q V
3+45	0.0221	0.10	Q V
3+50	0.0228	0.10	Q V
3+55	0.0235	0.11	Q V
4+ 0	0.0243	0.11	Q V
4+ 5	0.0251	0.11	Q V
4+10	0.0259	0.12	Q V
4+15	0.0267	0.12	Q V
4+20	0.0275	0.12	Q V
4+25	0.0284	0.13	Q V
4+30	0.0293	0.13	Q V
4+35	0.0302	0.13	Q V
4+40	0.0312	0.14	Q V
4+45	0.0321	0.14	Q V
4+50	0.0331	0.14	Q V
4+55	0.0341	0.15	Q V
5+ 0	0.0351	0.15	Q V
5+ 5	0.0362	0.15	Q V

5+10	0.0371	0.14	Q	V			
5+15	0.0380	0.13	Q	V			
5+20	0.0388	0.13	Q	V			
5+25	0.0398	0.13	Q	V			
5+30	0.0407	0.14	Q	V			
5+35	0.0416	0.14	Q	V			
5+40	0.0427	0.15	Q	V			
5+45	0.0437	0.15	Q	V			
5+50	0.0448	0.15	Q	V			
5+55	0.0458	0.15	Q	V			
6+ 0	0.0469	0.16	Q	V			
6+ 5	0.0480	0.16	Q	V			
6+10	0.0491	0.17	Q	V			
6+15	0.0503	0.17	Q	V			
6+20	0.0515	0.17	Q	V			
6+25	0.0527	0.17	Q	V			
6+30	0.0539	0.18	Q	V			
6+35	0.0551	0.18	Q	V			
6+40	0.0564	0.19	Q	V			
6+45	0.0577	0.19	Q	V			
6+50	0.0591	0.19	Q	V			
6+55	0.0604	0.19	Q	V			
7+ 0	0.0618	0.20	Q	V			
7+ 5	0.0631	0.20	Q	V			
7+10	0.0645	0.20	Q	V			
7+15	0.0658	0.20	Q	V			
7+20	0.0672	0.20	Q	V			
7+25	0.0686	0.21	Q	V			
7+30	0.0701	0.21	Q	V			
7+35	0.0716	0.22	Q	V			
7+40	0.0731	0.22	Q	V			
7+45	0.0747	0.23	Q	V			
7+50	0.0763	0.23	Q	V			
7+55	0.0780	0.24	Q	V			
8+ 0	0.0797	0.25	Q	V			
8+ 5	0.0814	0.26	Q	V			
8+10	0.0833	0.27	Q	V			
8+15	0.0853	0.28	Q	V			
8+20	0.0872	0.29	Q	V			
8+25	0.0892	0.29	Q	V			
8+30	0.0912	0.29	Q	V			
8+35	0.0933	0.30	Q	V			
8+40	0.0954	0.30	Q	V			
8+45	0.0975	0.31	Q	V			
8+50	0.0997	0.31	Q	V			
8+55	0.1019	0.32	Q	V			
9+ 0	0.1041	0.33	Q	V			
9+ 5	0.1064	0.33	Q	V			
9+10	0.1088	0.35	Q	V			
9+15	0.1113	0.36	Q	V			
9+20	0.1139	0.37	Q	V			
9+25	0.1165	0.38	Q	V			
9+30	0.1191	0.39	Q	V			
9+35	0.1218	0.39	Q	V			
9+40	0.1246	0.40	Q	V			
9+45	0.1274	0.41	Q	V			
9+50	0.1302	0.41	Q	V			
9+55	0.1331	0.42	Q	V			
10+ 0	0.1360	0.43	Q	V			
10+ 5	0.1389	0.42	Q	V			

10+10	0.1414	0.37	Q	V			
10+15	0.1437	0.33	Q	V			
10+20	0.1459	0.32	Q	V			
10+25	0.1481	0.31	Q	V			
10+30	0.1502	0.31	Q	V			
10+35	0.1523	0.31	Q	V			
10+40	0.1547	0.35	Q	V			
10+45	0.1573	0.37	Q	V			
10+50	0.1599	0.38	Q	V			
10+55	0.1626	0.38	Q	V			
11+ 0	0.1652	0.39	Q	V			
11+ 5	0.1679	0.39	Q	V			
11+10	0.1705	0.38	Q	V			
11+15	0.1731	0.38	Q	V			
11+20	0.1757	0.38	Q	V			
11+25	0.1783	0.38	Q	V			
11+30	0.1809	0.38	Q	V			
11+35	0.1835	0.37	Q	V			
11+40	0.1859	0.36	Q	V			
11+45	0.1883	0.35	Q	V			
11+50	0.1907	0.35	Q	V			
11+55	0.1931	0.35	Q	V			
12+ 0	0.1955	0.35	Q	V			
12+ 5	0.1981	0.37	Q	V			
12+10	0.2010	0.42	Q	V			
12+15	0.2041	0.45	Q	V			
12+20	0.2073	0.47	Q	V			
12+25	0.2107	0.48	Q	V			
12+30	0.2141	0.49	Q	V			
12+35	0.2175	0.50	Q	V			
12+40	0.2211	0.52	Q	V			
12+45	0.2248	0.54	Q	V			
12+50	0.2286	0.54	Q	V			
12+55	0.2324	0.55	Q	V			
13+ 0	0.2363	0.56	Q	V			
13+ 5	0.2402	0.58	Q	V			
13+10	0.2445	0.61	Q	V			
13+15	0.2489	0.64	Q	V			
13+20	0.2534	0.65	Q	V			
13+25	0.2579	0.66	Q	V			
13+30	0.2624	0.66	Q	V			
13+35	0.2669	0.64	Q	V			
13+40	0.2708	0.56	Q	V			
13+45	0.2743	0.51	Q	V			
13+50	0.2777	0.49	Q	V			
13+55	0.2810	0.48	Q	V			
14+ 0	0.2843	0.47	Q	V			
14+ 5	0.2875	0.48	Q	V			
14+10	0.2910	0.50	Q	V			
14+15	0.2945	0.52	Q	V			
14+20	0.2981	0.52	Q	V			
14+25	0.3017	0.52	Q	V			
14+30	0.3052	0.51	Q	V			
14+35	0.3087	0.51	Q	V			
14+40	0.3123	0.51	Q	V			
14+45	0.3158	0.51	Q	V			
14+50	0.3193	0.51	Q	V			
14+55	0.3228	0.50	Q	V			
15+ 0	0.3262	0.50	Q	V			
15+ 5	0.3297	0.50	Q	V			

15+10	0.3330	0.49	Q	V
15+15	0.3363	0.48	Q	V
15+20	0.3396	0.48	Q	V
15+25	0.3428	0.47	Q	V
15+30	0.3460	0.46	Q	V
15+35	0.3491	0.45	Q	V
15+40	0.3520	0.42	Q	V
15+45	0.3548	0.40	Q	V
15+50	0.3575	0.39	Q	V
15+55	0.3601	0.39	Q	V
16+ 0	0.3628	0.38	Q	V
16+ 5	0.3652	0.35	Q	V
16+10	0.3669	0.24	Q	V
16+15	0.3680	0.16	Q	V
16+20	0.3689	0.14	Q	V
16+25	0.3697	0.12	Q	V
16+30	0.3705	0.11	Q	V
16+35	0.3711	0.10	Q	V
16+40	0.3717	0.08	Q	V
16+45	0.3722	0.07	Q	V
16+50	0.3727	0.07	Q	V
16+55	0.3731	0.07	Q	V
17+ 0	0.3736	0.06	Q	V
17+ 5	0.3740	0.06	Q	V
17+10	0.3745	0.08	Q	V
17+15	0.3752	0.09	Q	V
17+20	0.3758	0.09	Q	V
17+25	0.3764	0.09	Q	V
17+30	0.3771	0.10	Q	V
17+35	0.3777	0.10	Q	V
17+40	0.3784	0.10	Q	V
17+45	0.3791	0.10	Q	V
17+50	0.3798	0.10	Q	V
17+55	0.3804	0.09	Q	V
18+ 0	0.3809	0.08	Q	V
18+ 5	0.3815	0.08	Q	V
18+10	0.3821	0.08	Q	V
18+15	0.3826	0.08	Q	V
18+20	0.3832	0.08	Q	V
18+25	0.3837	0.08	Q	V
18+30	0.3843	0.08	Q	V
18+35	0.3848	0.08	Q	V
18+40	0.3853	0.07	Q	V
18+45	0.3857	0.06	Q	V
18+50	0.3862	0.06	Q	V
18+55	0.3865	0.05	Q	V
19+ 0	0.3868	0.05	Q	V
19+ 5	0.3872	0.05	Q	V
19+10	0.3875	0.05	Q	V
19+15	0.3879	0.06	Q	V
19+20	0.3883	0.06	Q	V
19+25	0.3888	0.07	Q	V
19+30	0.3893	0.07	Q	V
19+35	0.3898	0.07	Q	V
19+40	0.3902	0.07	Q	V
19+45	0.3907	0.06	Q	V
19+50	0.3911	0.06	Q	V
19+55	0.3914	0.05	Q	V
20+ 0	0.3917	0.05	Q	V
20+ 5	0.3921	0.05	Q	V

20+10	0.3924	0.05	Q	V
20+15	0.3928	0.06	Q	V
20+20	0.3932	0.06	Q	V
20+25	0.3936	0.06	Q	V
20+30	0.3940	0.06	Q	V
20+35	0.3944	0.06	Q	V
20+40	0.3948	0.06	Q	V
20+45	0.3952	0.06	Q	V
20+50	0.3956	0.06	Q	V
20+55	0.3959	0.05	Q	V
21+ 0	0.3963	0.04	Q	V
21+ 5	0.3966	0.05	Q	V
21+10	0.3969	0.05	Q	V
21+15	0.3973	0.06	Q	V
21+20	0.3977	0.05	Q	V
21+25	0.3980	0.05	Q	V
21+30	0.3983	0.04	Q	V
21+35	0.3986	0.04	Q	V
21+40	0.3990	0.05	Q	V
21+45	0.3993	0.05	Q	V
21+50	0.3997	0.05	Q	V
21+55	0.4001	0.05	Q	V
22+ 0	0.4004	0.04	Q	V
22+ 5	0.4007	0.04	Q	V
22+10	0.4010	0.05	Q	V
22+15	0.4014	0.05	Q	V
22+20	0.4018	0.05	Q	V
22+25	0.4021	0.05	Q	V
22+30	0.4024	0.04	Q	V
22+35	0.4027	0.04	Q	V
22+40	0.4030	0.04	Q	V
22+45	0.4033	0.04	Q	V
22+50	0.4035	0.04	Q	V
22+55	0.4038	0.04	Q	V
23+ 0	0.4041	0.04	Q	V
23+ 5	0.4044	0.04	Q	V
23+10	0.4046	0.04	Q	V
23+15	0.4049	0.04	Q	V
23+20	0.4052	0.04	Q	V
23+25	0.4054	0.04	Q	V
23+30	0.4057	0.04	Q	V
23+35	0.4060	0.04	Q	V
23+40	0.4063	0.04	Q	V
23+45	0.4065	0.04	Q	V
23+50	0.4068	0.04	Q	V
23+55	0.4071	0.04	Q	V
24+ 0	0.4074	0.04	Q	V
24+ 5	0.4076	0.04	Q	V
24+10	0.4077	0.02	Q	V
24+15	0.4078	0.01	Q	V
24+20	0.4079	0.01	Q	V
24+25	0.4079	0.01	Q	V
24+30	0.4079	0.00	Q	V
24+35	0.4079	0.00	Q	V
24+40	0.4080	0.00	Q	V
24+45	0.4080	0.00	Q	V
24+50	0.4080	0.00	Q	V
24+55	0.4080	0.00	Q	V
25+ 0	0.4080	0.00	Q	V

Unit Hydrograph Analysis

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Study date 06/14/21 File: E100245.out

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Riverside County Synthetic Unit Hydrology Method  
RCFC & WCD Manual date - April 1978

Program License Serial Number 6062

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English (in-lb) Input Units Used  
English Rainfall Data (Inches) Input Values Used  
  
English Units used in output format

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5-Tear 24-Hour  
Existing

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Drainage Area = 30.60(Ac.) = 0.048 Sq. Mi.  
Drainage Area for Depth-Area Areal Adjustment = 30.60(Ac.) = 0.048 Sq. Mi.  
Length along longest watercourse = 1468.00(Ft.)  
Length along longest watercourse measured to centroid = 708.00(Ft.)  
Length along longest watercourse = 0.278 Mi.  
Length along longest watercourse measured to centroid = 0.134 Mi.  
Difference in elevation = 8.00(Ft.)  
Slope along watercourse = 28.7738 Ft./Mi.  
Average Manning's 'N' = 0.035  
Lag time = 0.127 Hr.  
Lag time = 7.63 Min.  
25% of lag time = 1.91 Min.  
40% of lag time = 3.05 Min.  
Unit time = 5.00 Min.  
Duration of storm = 24 Hour(s)  
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	1.60	48.96

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	4.00	122.40

STORM EVENT (YEAR) = 5.00  
 Area Averaged 2-Year Rainfall = 1.600(In)  
 Area Averaged 100-Year Rainfall = 4.000(In)

Point rain (area averaged) = 2.162(In)  
 Areal adjustment factor = 99.99 %  
 Adjusted average point rain = 2.162(In)

Sub-Area Data:

Area(Ac.)                  Runoff Index          Impervious %  
 30.600                      86.00                      0.000  
 Total Area Entered = 30.60(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	71.6	0.343	0.000	0.343	1.000	0.343
						Sum (F) = 0.343

Area averaged mean soil loss (F) (In/Hr) = 0.343  
 Minimum soil loss rate ((In/Hr)) = 0.172  
 (for 24 hour storm duration)  
 Soil low loss rate (decimal) = 0.900

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 U n i t   H y d r o g r a p h  
 VALLEY S-Curve  
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Unit Hydrograph Data  
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Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	65.551	9.518
2	0.167	131.103	37.609
3	0.250	196.654	24.680
4	0.333	262.206	9.498
5	0.417	327.757	5.744
6	0.500	393.309	3.855
7	0.583	458.860	2.626
8	0.667	524.412	1.983
9	0.750	589.963	1.497
10	0.833	655.514	1.105
11	0.917	721.066	0.769
12	1.000	786.617	0.656
13	1.083	852.169	0.462
		Sum = 100.000	Sum= 30.839

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
			Max	Low	
1	0.08	0.07	0.608	0.016	0.00
2	0.17	0.07	0.606	0.016	0.00
3	0.25	0.07	0.604	0.016	0.00
4	0.33	0.10	0.601	0.023	0.00
5	0.42	0.10	0.599	0.023	0.00
6	0.50	0.10	0.597	0.023	0.00
7	0.58	0.10	0.594	0.023	0.00
8	0.67	0.10	0.592	0.023	0.00
9	0.75	0.10	0.590	0.023	0.00

10	0.83	0.13	0.035	0.587	0.031	0.00
11	0.92	0.13	0.035	0.585	0.031	0.00
12	1.00	0.13	0.035	0.583	0.031	0.00
13	1.08	0.10	0.026	0.580	0.023	0.00
14	1.17	0.10	0.026	0.578	0.023	0.00
15	1.25	0.10	0.026	0.576	0.023	0.00
16	1.33	0.10	0.026	0.573	0.023	0.00
17	1.42	0.10	0.026	0.571	0.023	0.00
18	1.50	0.10	0.026	0.569	0.023	0.00
19	1.58	0.10	0.026	0.567	0.023	0.00
20	1.67	0.10	0.026	0.564	0.023	0.00
21	1.75	0.10	0.026	0.562	0.023	0.00
22	1.83	0.13	0.035	0.560	0.031	0.00
23	1.92	0.13	0.035	0.558	0.031	0.00
24	2.00	0.13	0.035	0.555	0.031	0.00
25	2.08	0.13	0.035	0.553	0.031	0.00
26	2.17	0.13	0.035	0.551	0.031	0.00
27	2.25	0.13	0.035	0.549	0.031	0.00
28	2.33	0.13	0.035	0.546	0.031	0.00
29	2.42	0.13	0.035	0.544	0.031	0.00
30	2.50	0.13	0.035	0.542	0.031	0.00
31	2.58	0.17	0.043	0.540	0.039	0.00
32	2.67	0.17	0.043	0.537	0.039	0.00
33	2.75	0.17	0.043	0.535	0.039	0.00
34	2.83	0.17	0.043	0.533	0.039	0.00
35	2.92	0.17	0.043	0.531	0.039	0.00
36	3.00	0.17	0.043	0.529	0.039	0.00
37	3.08	0.17	0.043	0.526	0.039	0.00
38	3.17	0.17	0.043	0.524	0.039	0.00
39	3.25	0.17	0.043	0.522	0.039	0.00
40	3.33	0.17	0.043	0.520	0.039	0.00
41	3.42	0.17	0.043	0.518	0.039	0.00
42	3.50	0.17	0.043	0.516	0.039	0.00
43	3.58	0.17	0.043	0.513	0.039	0.00
44	3.67	0.17	0.043	0.511	0.039	0.00
45	3.75	0.17	0.043	0.509	0.039	0.00
46	3.83	0.20	0.052	0.507	0.047	0.01
47	3.92	0.20	0.052	0.505	0.047	0.01
48	4.00	0.20	0.052	0.503	0.047	0.01
49	4.08	0.20	0.052	0.501	0.047	0.01
50	4.17	0.20	0.052	0.498	0.047	0.01
51	4.25	0.20	0.052	0.496	0.047	0.01
52	4.33	0.23	0.061	0.494	0.054	0.01
53	4.42	0.23	0.061	0.492	0.054	0.01
54	4.50	0.23	0.061	0.490	0.054	0.01
55	4.58	0.23	0.061	0.488	0.054	0.01
56	4.67	0.23	0.061	0.486	0.054	0.01
57	4.75	0.23	0.061	0.484	0.054	0.01
58	4.83	0.27	0.069	0.482	0.062	0.01
59	4.92	0.27	0.069	0.480	0.062	0.01
60	5.00	0.27	0.069	0.477	0.062	0.01
61	5.08	0.20	0.052	0.475	0.047	0.01
62	5.17	0.20	0.052	0.473	0.047	0.01
63	5.25	0.20	0.052	0.471	0.047	0.01
64	5.33	0.23	0.061	0.469	0.054	0.01
65	5.42	0.23	0.061	0.467	0.054	0.01
66	5.50	0.23	0.061	0.465	0.054	0.01
67	5.58	0.27	0.069	0.463	0.062	0.01
68	5.67	0.27	0.069	0.461	0.062	0.01
69	5.75	0.27	0.069	0.459	0.062	0.01

70	5.83	0.27	0.069	0.457	0.062	0.01
71	5.92	0.27	0.069	0.455	0.062	0.01
72	6.00	0.27	0.069	0.453	0.062	0.01
73	6.08	0.30	0.078	0.451	0.070	0.01
74	6.17	0.30	0.078	0.449	0.070	0.01
75	6.25	0.30	0.078	0.447	0.070	0.01
76	6.33	0.30	0.078	0.445	0.070	0.01
77	6.42	0.30	0.078	0.443	0.070	0.01
78	6.50	0.30	0.078	0.441	0.070	0.01
79	6.58	0.33	0.086	0.439	0.078	0.01
80	6.67	0.33	0.086	0.437	0.078	0.01
81	6.75	0.33	0.086	0.435	0.078	0.01
82	6.83	0.33	0.086	0.433	0.078	0.01
83	6.92	0.33	0.086	0.431	0.078	0.01
84	7.00	0.33	0.086	0.429	0.078	0.01
85	7.08	0.33	0.086	0.427	0.078	0.01
86	7.17	0.33	0.086	0.425	0.078	0.01
87	7.25	0.33	0.086	0.423	0.078	0.01
88	7.33	0.37	0.095	0.421	0.086	0.01
89	7.42	0.37	0.095	0.419	0.086	0.01
90	7.50	0.37	0.095	0.417	0.086	0.01
91	7.58	0.40	0.104	0.416	0.093	0.01
92	7.67	0.40	0.104	0.414	0.093	0.01
93	7.75	0.40	0.104	0.412	0.093	0.01
94	7.83	0.43	0.112	0.410	0.101	0.01
95	7.92	0.43	0.112	0.408	0.101	0.01
96	8.00	0.43	0.112	0.406	0.101	0.01
97	8.08	0.50	0.130	0.404	0.117	0.01
98	8.17	0.50	0.130	0.402	0.117	0.01
99	8.25	0.50	0.130	0.400	0.117	0.01
100	8.33	0.50	0.130	0.399	0.117	0.01
101	8.42	0.50	0.130	0.397	0.117	0.01
102	8.50	0.50	0.130	0.395	0.117	0.01
103	8.58	0.53	0.138	0.393	0.125	0.01
104	8.67	0.53	0.138	0.391	0.125	0.01
105	8.75	0.53	0.138	0.389	0.125	0.01
106	8.83	0.57	0.147	0.387	0.132	0.01
107	8.92	0.57	0.147	0.386	0.132	0.01
108	9.00	0.57	0.147	0.384	0.132	0.01
109	9.08	0.63	0.164	0.382	0.148	0.02
110	9.17	0.63	0.164	0.380	0.148	0.02
111	9.25	0.63	0.164	0.378	0.148	0.02
112	9.33	0.67	0.173	0.377	0.156	0.02
113	9.42	0.67	0.173	0.375	0.156	0.02
114	9.50	0.67	0.173	0.373	0.156	0.02
115	9.58	0.70	0.182	0.371	0.163	0.02
116	9.67	0.70	0.182	0.369	0.163	0.02
117	9.75	0.70	0.182	0.368	0.163	0.02
118	9.83	0.73	0.190	0.366	0.171	0.02
119	9.92	0.73	0.190	0.364	0.171	0.02
120	10.00	0.73	0.190	0.362	0.171	0.02
121	10.08	0.50	0.130	0.361	0.117	0.01
122	10.17	0.50	0.130	0.359	0.117	0.01
123	10.25	0.50	0.130	0.357	0.117	0.01
124	10.33	0.50	0.130	0.355	0.117	0.01
125	10.42	0.50	0.130	0.354	0.117	0.01
126	10.50	0.50	0.130	0.352	0.117	0.01
127	10.58	0.67	0.173	0.350	0.156	0.02
128	10.67	0.67	0.173	0.348	0.156	0.02
129	10.75	0.67	0.173	0.347	0.156	0.02

130	10.83	0.67	0.173	0.345	0.156	0.02
131	10.92	0.67	0.173	0.343	0.156	0.02
132	11.00	0.67	0.173	0.342	0.156	0.02
133	11.08	0.63	0.164	0.340	0.148	0.02
134	11.17	0.63	0.164	0.338	0.148	0.02
135	11.25	0.63	0.164	0.337	0.148	0.02
136	11.33	0.63	0.164	0.335	0.148	0.02
137	11.42	0.63	0.164	0.333	0.148	0.02
138	11.50	0.63	0.164	0.332	0.148	0.02
139	11.58	0.57	0.147	0.330	0.132	0.01
140	11.67	0.57	0.147	0.328	0.132	0.01
141	11.75	0.57	0.147	0.327	0.132	0.01
142	11.83	0.60	0.156	0.325	0.140	0.02
143	11.92	0.60	0.156	0.324	0.140	0.02
144	12.00	0.60	0.156	0.322	0.140	0.02
145	12.08	0.83	0.216	0.320	0.195	0.02
146	12.17	0.83	0.216	0.319	0.195	0.02
147	12.25	0.83	0.216	0.317	0.195	0.02
148	12.33	0.87	0.225	0.316	0.202	0.02
149	12.42	0.87	0.225	0.314	0.202	0.02
150	12.50	0.87	0.225	0.312	0.202	0.02
151	12.58	0.93	0.242	0.311	0.218	0.02
152	12.67	0.93	0.242	0.309	0.218	0.02
153	12.75	0.93	0.242	0.308	0.218	0.02
154	12.83	0.97	0.251	0.306	0.226	0.03
155	12.92	0.97	0.251	0.305	0.226	0.03
156	13.00	0.97	0.251	0.303	0.226	0.03
157	13.08	1.13	0.294	0.301	0.265	0.03
158	13.17	1.13	0.294	0.300	0.265	0.03
159	13.25	1.13	0.294	0.298	0.265	0.03
160	13.33	1.13	0.294	0.297	0.265	0.03
161	13.42	1.13	0.294	0.295	0.265	0.03
162	13.50	1.13	0.294	0.294	---	0.00
163	13.58	0.77	0.199	0.292	0.179	0.02
164	13.67	0.77	0.199	0.291	0.179	0.02
165	13.75	0.77	0.199	0.289	0.179	0.02
166	13.83	0.77	0.199	0.288	0.179	0.02
167	13.92	0.77	0.199	0.286	0.179	0.02
168	14.00	0.77	0.199	0.285	0.179	0.02
169	14.08	0.90	0.233	0.284	0.210	0.02
170	14.17	0.90	0.233	0.282	0.210	0.02
171	14.25	0.90	0.233	0.281	0.210	0.02
172	14.33	0.87	0.225	0.279	0.202	0.02
173	14.42	0.87	0.225	0.278	0.202	0.02
174	14.50	0.87	0.225	0.276	0.202	0.02
175	14.58	0.87	0.225	0.275	0.202	0.02
176	14.67	0.87	0.225	0.274	0.202	0.02
177	14.75	0.87	0.225	0.272	0.202	0.02
178	14.83	0.83	0.216	0.271	0.195	0.02
179	14.92	0.83	0.216	0.269	0.195	0.02
180	15.00	0.83	0.216	0.268	0.195	0.02
181	15.08	0.80	0.208	0.267	0.187	0.02
182	15.17	0.80	0.208	0.265	0.187	0.02
183	15.25	0.80	0.208	0.264	0.187	0.02
184	15.33	0.77	0.199	0.263	0.179	0.02
185	15.42	0.77	0.199	0.261	0.179	0.02
186	15.50	0.77	0.199	0.260	0.179	0.02
187	15.58	0.63	0.164	0.259	0.148	0.02
188	15.67	0.63	0.164	0.257	0.148	0.02
189	15.75	0.63	0.164	0.256	0.148	0.02

190	15.83	0.63	0.164	0.255	0.148	0.02
191	15.92	0.63	0.164	0.253	0.148	0.02
192	16.00	0.63	0.164	0.252	0.148	0.02
193	16.08	0.13	0.035	0.251	0.031	0.00
194	16.17	0.13	0.035	0.249	0.031	0.00
195	16.25	0.13	0.035	0.248	0.031	0.00
196	16.33	0.13	0.035	0.247	0.031	0.00
197	16.42	0.13	0.035	0.246	0.031	0.00
198	16.50	0.13	0.035	0.244	0.031	0.00
199	16.58	0.10	0.026	0.243	0.023	0.00
200	16.67	0.10	0.026	0.242	0.023	0.00
201	16.75	0.10	0.026	0.241	0.023	0.00
202	16.83	0.10	0.026	0.239	0.023	0.00
203	16.92	0.10	0.026	0.238	0.023	0.00
204	17.00	0.10	0.026	0.237	0.023	0.00
205	17.08	0.17	0.043	0.236	0.039	0.00
206	17.17	0.17	0.043	0.235	0.039	0.00
207	17.25	0.17	0.043	0.233	0.039	0.00
208	17.33	0.17	0.043	0.232	0.039	0.00
209	17.42	0.17	0.043	0.231	0.039	0.00
210	17.50	0.17	0.043	0.230	0.039	0.00
211	17.58	0.17	0.043	0.229	0.039	0.00
212	17.67	0.17	0.043	0.228	0.039	0.00
213	17.75	0.17	0.043	0.227	0.039	0.00
214	17.83	0.13	0.035	0.225	0.031	0.00
215	17.92	0.13	0.035	0.224	0.031	0.00
216	18.00	0.13	0.035	0.223	0.031	0.00
217	18.08	0.13	0.035	0.222	0.031	0.00
218	18.17	0.13	0.035	0.221	0.031	0.00
219	18.25	0.13	0.035	0.220	0.031	0.00
220	18.33	0.13	0.035	0.219	0.031	0.00
221	18.42	0.13	0.035	0.218	0.031	0.00
222	18.50	0.13	0.035	0.217	0.031	0.00
223	18.58	0.10	0.026	0.216	0.023	0.00
224	18.67	0.10	0.026	0.215	0.023	0.00
225	18.75	0.10	0.026	0.214	0.023	0.00
226	18.83	0.07	0.017	0.213	0.016	0.00
227	18.92	0.07	0.017	0.212	0.016	0.00
228	19.00	0.07	0.017	0.211	0.016	0.00
229	19.08	0.10	0.026	0.210	0.023	0.00
230	19.17	0.10	0.026	0.209	0.023	0.00
231	19.25	0.10	0.026	0.208	0.023	0.00
232	19.33	0.13	0.035	0.207	0.031	0.00
233	19.42	0.13	0.035	0.206	0.031	0.00
234	19.50	0.13	0.035	0.205	0.031	0.00
235	19.58	0.10	0.026	0.204	0.023	0.00
236	19.67	0.10	0.026	0.203	0.023	0.00
237	19.75	0.10	0.026	0.202	0.023	0.00
238	19.83	0.07	0.017	0.201	0.016	0.00
239	19.92	0.07	0.017	0.200	0.016	0.00
240	20.00	0.07	0.017	0.199	0.016	0.00
241	20.08	0.10	0.026	0.198	0.023	0.00
242	20.17	0.10	0.026	0.197	0.023	0.00
243	20.25	0.10	0.026	0.197	0.023	0.00
244	20.33	0.10	0.026	0.196	0.023	0.00
245	20.42	0.10	0.026	0.195	0.023	0.00
246	20.50	0.10	0.026	0.194	0.023	0.00
247	20.58	0.10	0.026	0.193	0.023	0.00
248	20.67	0.10	0.026	0.192	0.023	0.00
249	20.75	0.10	0.026	0.192	0.023	0.00

250	20.83	0.07	0.017	0.191	0.016	0.00
251	20.92	0.07	0.017	0.190	0.016	0.00
252	21.00	0.07	0.017	0.189	0.016	0.00
253	21.08	0.10	0.026	0.189	0.023	0.00
254	21.17	0.10	0.026	0.188	0.023	0.00
255	21.25	0.10	0.026	0.187	0.023	0.00
256	21.33	0.07	0.017	0.186	0.016	0.00
257	21.42	0.07	0.017	0.186	0.016	0.00
258	21.50	0.07	0.017	0.185	0.016	0.00
259	21.58	0.10	0.026	0.184	0.023	0.00
260	21.67	0.10	0.026	0.184	0.023	0.00
261	21.75	0.10	0.026	0.183	0.023	0.00
262	21.83	0.07	0.017	0.182	0.016	0.00
263	21.92	0.07	0.017	0.182	0.016	0.00
264	22.00	0.07	0.017	0.181	0.016	0.00
265	22.08	0.10	0.026	0.181	0.023	0.00
266	22.17	0.10	0.026	0.180	0.023	0.00
267	22.25	0.10	0.026	0.179	0.023	0.00
268	22.33	0.07	0.017	0.179	0.016	0.00
269	22.42	0.07	0.017	0.178	0.016	0.00
270	22.50	0.07	0.017	0.178	0.016	0.00
271	22.58	0.07	0.017	0.177	0.016	0.00
272	22.67	0.07	0.017	0.177	0.016	0.00
273	22.75	0.07	0.017	0.176	0.016	0.00
274	22.83	0.07	0.017	0.176	0.016	0.00
275	22.92	0.07	0.017	0.175	0.016	0.00
276	23.00	0.07	0.017	0.175	0.016	0.00
277	23.08	0.07	0.017	0.175	0.016	0.00
278	23.17	0.07	0.017	0.174	0.016	0.00
279	23.25	0.07	0.017	0.174	0.016	0.00
280	23.33	0.07	0.017	0.173	0.016	0.00
281	23.42	0.07	0.017	0.173	0.016	0.00
282	23.50	0.07	0.017	0.173	0.016	0.00
283	23.58	0.07	0.017	0.173	0.016	0.00
284	23.67	0.07	0.017	0.172	0.016	0.00
285	23.75	0.07	0.017	0.172	0.016	0.00
286	23.83	0.07	0.017	0.172	0.016	0.00
287	23.92	0.07	0.017	0.172	0.016	0.00
288	24.00	0.07	0.017	0.172	0.016	0.00

Sum = 100.0 Sum = 2.6

Flood volume = Effective rainfall 0.21(In)  
times area 30.6(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)  
Total soil loss = 1.95(In)  
Total soil loss = 4.968(Ac.Ft)  
Total rainfall = 2.16(In)  
Flood volume = 23744.3 Cubic Feet  
Total soil loss = 216407.3 Cubic Feet

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Peak flow rate of this hydrograph = 0.888(CFS)  
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24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))  
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Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.01	Q				

0+10	0.0002	0.03	Q
0+15	0.0005	0.04	Q
0+20	0.0008	0.05	Q
0+25	0.0012	0.06	Q
0+30	0.0017	0.07	Q
0+35	0.0022	0.07	Q
0+40	0.0027	0.07	Q
0+45	0.0032	0.08	Q
0+50	0.0037	0.08	Q
0+55	0.0044	0.09	Q
1+ 0	0.0050	0.10	Q
1+ 5	0.0057	0.10	Q
1+10	0.0063	0.09	Q
1+15	0.0069	0.09	Q
1+20	0.0075	0.08	Q
1+25	0.0081	0.08	Q
1+30	0.0086	0.08	Q
1+35	0.0092	0.08	Q
1+40	0.0097	0.08	Q
1+45	0.0103	0.08	Q
1+50	0.0109	0.08	Q
1+55	0.0115	0.09	Q
2+ 0	0.0122	0.10	Q
2+ 5	0.0129	0.10	Q
2+10	0.0136	0.10	Q
2+15	0.0143	0.10	QV
2+20	0.0151	0.11	QV
2+25	0.0158	0.11	QV
2+30	0.0165	0.11	QV
2+35	0.0173	0.11	QV
2+40	0.0181	0.12	QV
2+45	0.0189	0.13	QV
2+50	0.0198	0.13	QV
2+55	0.0207	0.13	QV
3+ 0	0.0216	0.13	QV
3+ 5	0.0225	0.13	QV
3+10	0.0234	0.13	QV
3+15	0.0244	0.13	QV
3+20	0.0253	0.13	QV
3+25	0.0262	0.13	QV
3+30	0.0271	0.13	QV
3+35	0.0280	0.13	Q V
3+40	0.0289	0.13	Q V
3+45	0.0299	0.13	Q V
3+50	0.0308	0.14	Q V
3+55	0.0318	0.15	Q V
4+ 0	0.0329	0.15	Q V
4+ 5	0.0339	0.16	Q V
4+10	0.0350	0.16	Q V
4+15	0.0361	0.16	Q V
4+20	0.0372	0.16	Q V
4+25	0.0384	0.17	Q V
4+30	0.0396	0.18	Q V
4+35	0.0409	0.18	Q V
4+40	0.0421	0.18	Q V
4+45	0.0434	0.18	Q V
4+50	0.0447	0.19	Q V
4+55	0.0460	0.20	Q V
5+ 0	0.0475	0.21	Q V
5+ 5	0.0489	0.20	Q V

5+10	0.0501	0.18	Q	V
5+15	0.0513	0.17	Q	V
5+20	0.0525	0.17	Q	V
5+25	0.0537	0.18	Q	V
5+30	0.0550	0.18	Q	V
5+35	0.0563	0.19	Q	V
5+40	0.0576	0.20	Q	V
5+45	0.0590	0.20	Q	V
5+50	0.0605	0.21	Q	V
5+55	0.0619	0.21	Q	V
6+ 0	0.0634	0.21	Q	V
6+ 5	0.0648	0.21	Q	V
6+10	0.0664	0.22	Q	V
6+15	0.0680	0.23	Q	V
6+20	0.0696	0.23	Q	V
6+25	0.0712	0.24	Q	V
6+30	0.0729	0.24	Q	V
6+35	0.0745	0.24	Q	V
6+40	0.0763	0.25	Q	V
6+45	0.0780	0.26	Q	V
6+50	0.0798	0.26	Q	V
6+55	0.0816	0.26	Q	V
7+ 0	0.0835	0.26	Q	V
7+ 5	0.0853	0.27	Q	V
7+10	0.0871	0.27	Q	V
7+15	0.0890	0.27	Q	V
7+20	0.0908	0.27	Q	V
7+25	0.0927	0.28	Q	V
7+30	0.0947	0.29	Q	V
7+35	0.0967	0.29	Q	V
7+40	0.0988	0.30	Q	V
7+45	0.1009	0.31	Q	V
7+50	0.1031	0.32	Q	V
7+55	0.1054	0.33	Q	V
8+ 0	0.1077	0.34	Q	V
8+ 5	0.1101	0.34	Q	V
8+10	0.1126	0.37	Q	V
8+15	0.1152	0.38	Q	V
8+20	0.1179	0.39	Q	V
8+25	0.1206	0.39	Q	V
8+30	0.1233	0.39	Q	V
8+35	0.1260	0.40	Q	V
8+40	0.1289	0.41	Q	V
8+45	0.1317	0.42	Q	V
8+50	0.1347	0.42	Q	V
8+55	0.1377	0.44	Q	V
9+ 0	0.1407	0.44	Q	V
9+ 5	0.1438	0.45	Q	V
9+10	0.1471	0.47	Q	V
9+15	0.1505	0.49	Q	V
9+20	0.1539	0.50	Q	V
9+25	0.1574	0.51	Q	V
9+30	0.1610	0.52	Q	V
9+35	0.1646	0.53	Q	V
9+40	0.1683	0.54	Q	V
9+45	0.1721	0.55	Q	V
9+50	0.1759	0.56	Q	V
9+55	0.1799	0.57	Q	V
10+ 0	0.1838	0.58	Q	V
10+ 5	0.1877	0.56	Q	V

10+10	0.1911	0.49	Q	V			
10+15	0.1942	0.45	Q	V			
10+20	0.1972	0.43	Q	V			
10+25	0.2001	0.42	Q	V			
10+30	0.2029	0.42	Q	V			
10+35	0.2059	0.42	Q	V			
10+40	0.2091	0.47	Q	V			
10+45	0.2126	0.50	Q	V			
10+50	0.2161	0.51	Q	V			
10+55	0.2197	0.52	Q	V			
11+ 0	0.2233	0.52	Q	V			
11+ 5	0.2269	0.52	Q	V			
11+10	0.2304	0.52	Q	V			
11+15	0.2339	0.51	Q	V			
11+20	0.2374	0.51	Q	V			
11+25	0.2409	0.51	Q	V			
11+30	0.2444	0.51	Q	V			
11+35	0.2479	0.50	Q	V			
11+40	0.2512	0.48	Q	V			
11+45	0.2545	0.47	Q	V			
11+50	0.2577	0.47	Q	V			
11+55	0.2610	0.47	Q	V			
12+ 0	0.2642	0.48	Q	V			
12+ 5	0.2677	0.50	Q	V			
12+10	0.2716	0.57	Q	V			
12+15	0.2758	0.61	Q	V			
12+20	0.2802	0.63	Q	V			
12+25	0.2847	0.65	Q	V			
12+30	0.2893	0.67	Q	V			
12+35	0.2940	0.68	Q	V			
12+40	0.2988	0.71	Q	V			
12+45	0.3038	0.72	Q	V			
12+50	0.3089	0.73	Q	V			
12+55	0.3140	0.75	Q	V			
13+ 0	0.3193	0.76	Q	V			
13+ 5	0.3246	0.78	Q	V			
13+10	0.3303	0.83	Q	V			
13+15	0.3363	0.87	Q	V			
13+20	0.3424	0.88	Q	V			
13+25	0.3485	0.89	Q	V			
13+30	0.3540	0.81	Q	V			
13+35	0.3577	0.53	Q	V			
13+40	0.3614	0.54	Q	V			
13+45	0.3656	0.61	Q	V			
13+50	0.3698	0.61	Q	V			
13+55	0.3741	0.62	Q	V			
14+ 0	0.3783	0.62	Q	V			
14+ 5	0.3826	0.62	Q	V			
14+10	0.3872	0.66	Q	V			
14+15	0.3919	0.69	Q	V			
14+20	0.3967	0.70	Q	V			
14+25	0.4015	0.69	Q	V			
14+30	0.4062	0.69	Q	V			
14+35	0.4110	0.69	Q	V			
14+40	0.4158	0.69	Q	V			
14+45	0.4205	0.69	Q	V			
14+50	0.4253	0.69	Q	V			
14+55	0.4300	0.68	Q	V			
15+ 0	0.4346	0.67	Q	V			
15+ 5	0.4393	0.67	Q	V			

15+10	0.4438	0.66	Q	V
15+15	0.4483	0.65	Q	V
15+20	0.4527	0.64	Q	V
15+25	0.4571	0.63	Q	V
15+30	0.4614	0.62	Q	V
15+35	0.4656	0.61	Q	V
15+40	0.4695	0.57	Q	V
15+45	0.4732	0.54	Q	V
15+50	0.4769	0.53	Q	V
15+55	0.4804	0.52	Q	V
16+ 0	0.4840	0.52	Q	V
16+ 5	0.4873	0.48	Q	V
16+10	0.4895	0.32	Q	V
16+15	0.4911	0.22	Q	V
16+20	0.4923	0.18	Q	V
16+25	0.4934	0.16	Q	V
16+30	0.4944	0.14	Q	V
16+35	0.4953	0.13	Q	V
16+40	0.4961	0.11	Q	V
16+45	0.4968	0.10	Q	V
16+50	0.4974	0.09	Q	V
16+55	0.4980	0.09	Q	V
17+ 0	0.4986	0.08	Q	V
17+ 5	0.4992	0.09	Q	V
17+10	0.4999	0.11	Q	V
17+15	0.5007	0.12	Q	V
17+20	0.5016	0.12	Q	V
17+25	0.5025	0.13	Q	V
17+30	0.5034	0.13	Q	V
17+35	0.5042	0.13	Q	V
17+40	0.5052	0.13	Q	V
17+45	0.5061	0.13	Q	V
17+50	0.5070	0.13	Q	V
17+55	0.5078	0.12	Q	V
18+ 0	0.5086	0.11	Q	V
18+ 5	0.5093	0.11	Q	V
18+10	0.5101	0.11	Q	V
18+15	0.5108	0.11	Q	V
18+20	0.5116	0.11	Q	V
18+25	0.5123	0.11	Q	V
18+30	0.5131	0.11	Q	V
18+35	0.5138	0.10	Q	V
18+40	0.5144	0.09	Q	V
18+45	0.5151	0.09	Q	V
18+50	0.5156	0.08	Q	V
18+55	0.5161	0.07	Q	V
19+ 0	0.5165	0.06	Q	V
19+ 5	0.5170	0.06	Q	V
19+10	0.5175	0.07	Q	V
19+15	0.5180	0.08	Q	V
19+20	0.5185	0.08	Q	V
19+25	0.5192	0.09	Q	V
19+30	0.5198	0.10	Q	V
19+35	0.5205	0.10	Q	V
19+40	0.5211	0.09	Q	V
19+45	0.5217	0.08	Q	V
19+50	0.5223	0.08	Q	V
19+55	0.5227	0.07	Q	V
20+ 0	0.5232	0.06	Q	V
20+ 5	0.5236	0.06	Q	V

20+10	0.5241	0.07	Q	V
20+15	0.5246	0.08	Q	V
20+20	0.5251	0.08	Q	V
20+25	0.5257	0.08	Q	V
20+30	0.5262	0.08	Q	V
20+35	0.5268	0.08	Q	V
20+40	0.5273	0.08	Q	V
20+45	0.5278	0.08	Q	V
20+50	0.5284	0.08	Q	V
20+55	0.5288	0.07	Q	V
21+ 0	0.5293	0.06	Q	V
21+ 5	0.5297	0.06	Q	V
21+10	0.5302	0.07	Q	V
21+15	0.5307	0.07	Q	V
21+20	0.5312	0.07	Q	V
21+25	0.5316	0.07	Q	V
21+30	0.5320	0.06	Q	V
21+35	0.5325	0.06	Q	V
21+40	0.5329	0.07	Q	V
21+45	0.5334	0.07	Q	V
21+50	0.5339	0.07	Q	V
21+55	0.5344	0.06	Q	V
22+ 0	0.5348	0.06	Q	V
22+ 5	0.5352	0.06	Q	V
22+10	0.5357	0.07	Q	V
22+15	0.5362	0.07	Q	V
22+20	0.5367	0.07	Q	V
22+25	0.5371	0.06	Q	V
22+30	0.5376	0.06	Q	V
22+35	0.5379	0.06	Q	V
22+40	0.5383	0.06	Q	V
22+45	0.5387	0.06	Q	V
22+50	0.5391	0.05	Q	V
22+55	0.5395	0.05	Q	V
23+ 0	0.5398	0.05	Q	V
23+ 5	0.5402	0.05	Q	V
23+10	0.5406	0.05	Q	V
23+15	0.5409	0.05	Q	V
23+20	0.5413	0.05	Q	V
23+25	0.5417	0.05	Q	V
23+30	0.5420	0.05	Q	V
23+35	0.5424	0.05	Q	V
23+40	0.5428	0.05	Q	V
23+45	0.5431	0.05	Q	V
23+50	0.5435	0.05	Q	V
23+55	0.5439	0.05	Q	V
24+ 0	0.5443	0.05	Q	V
24+ 5	0.5446	0.05	Q	V
24+10	0.5448	0.03	Q	V
24+15	0.5449	0.02	Q	V
24+20	0.5449	0.01	Q	V
24+25	0.5450	0.01	Q	V
24+30	0.5450	0.00	Q	V
24+35	0.5451	0.00	Q	V
24+40	0.5451	0.00	Q	V
24+45	0.5451	0.00	Q	V
24+50	0.5451	0.00	Q	V
24+55	0.5451	0.00	Q	V
25+ 0	0.5451	0.00	Q	V

Unit Hydrograph Analysis

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Study date 06/14/21 File: E1002410.out

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Riverside County Synthetic Unit Hydrology Method  
RCFC & WCD Manual date - April 1978

Program License Serial Number 6062

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English (in-lb) Input Units Used  
English Rainfall Data (Inches) Input Values Used  
  
English Units used in output format

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10-Year 24-Hour  
Existing

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Drainage Area = 30.60(Ac.) = 0.048 Sq. Mi.  
Drainage Area for Depth-Area Areal Adjustment = 30.60(Ac.) = 0.048 Sq. Mi.  
Length along longest watercourse = 1468.00(Ft.)  
Length along longest watercourse measured to centroid = 708.00(Ft.)  
Length along longest watercourse = 0.278 Mi.  
Length along longest watercourse measured to centroid = 0.134 Mi.  
Difference in elevation = 8.00(Ft.)  
Slope along watercourse = 28.7738 Ft./Mi.  
Average Manning's 'N' = 0.035  
Lag time = 0.127 Hr.  
Lag time = 7.63 Min.  
25% of lag time = 1.91 Min.  
40% of lag time = 3.05 Min.  
Unit time = 5.00 Min.  
Duration of storm = 24 Hour(s)  
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	1.60	48.96

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	4.00	122.40

STORM EVENT (YEAR) = 10.00  
 Area Averaged 2-Year Rainfall = 1.600(In)  
 Area Averaged 100-Year Rainfall = 4.000(In)

Point rain (area averaged) = 2.587(In)  
 Areal adjustment factor = 99.99 %  
 Adjusted average point rain = 2.587(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
30.600	86.00	0.000
Total Area Entered = 30.60(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	86.0	0.176	0.000	0.176	1.000	0.176
						Sum (F) = 0.176

Area averaged mean soil loss (F) (In/Hr) = 0.176  
 Minimum soil loss rate ((In/Hr)) = 0.088  
 (for 24 hour storm duration)  
 Soil low loss rate (decimal) = 0.900

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 U n i t H y d r o g r a p h  
 VALLEY S-Curve  
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Unit Hydrograph Data  
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Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	65.551	9.518
2	0.167	131.103	37.609
3	0.250	196.654	24.680
4	0.333	262.206	9.498
5	0.417	327.757	5.744
6	0.500	393.309	3.855
7	0.583	458.860	2.626
8	0.667	524.412	1.983
9	0.750	589.963	1.497
10	0.833	655.514	1.105
11	0.917	721.066	0.769
12	1.000	786.617	0.656
13	1.083	852.169	0.462
Sum = 100.000			Sum= 30.839

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)	
			Max	Low		
1	0.08	0.07	0.021	0.311	0.019	0.00
2	0.17	0.07	0.021	0.310	0.019	0.00
3	0.25	0.07	0.021	0.309	0.019	0.00
4	0.33	0.10	0.031	0.308	0.028	0.00
5	0.42	0.10	0.031	0.306	0.028	0.00
6	0.50	0.10	0.031	0.305	0.028	0.00
7	0.58	0.10	0.031	0.304	0.028	0.00
8	0.67	0.10	0.031	0.303	0.028	0.00
9	0.75	0.10	0.031	0.302	0.028	0.00

10	0.83	0.13	0.041	0.301	0.037	0.00
11	0.92	0.13	0.041	0.299	0.037	0.00
12	1.00	0.13	0.041	0.298	0.037	0.00
13	1.08	0.10	0.031	0.297	0.028	0.00
14	1.17	0.10	0.031	0.296	0.028	0.00
15	1.25	0.10	0.031	0.295	0.028	0.00
16	1.33	0.10	0.031	0.293	0.028	0.00
17	1.42	0.10	0.031	0.292	0.028	0.00
18	1.50	0.10	0.031	0.291	0.028	0.00
19	1.58	0.10	0.031	0.290	0.028	0.00
20	1.67	0.10	0.031	0.289	0.028	0.00
21	1.75	0.10	0.031	0.288	0.028	0.00
22	1.83	0.13	0.041	0.287	0.037	0.00
23	1.92	0.13	0.041	0.285	0.037	0.00
24	2.00	0.13	0.041	0.284	0.037	0.00
25	2.08	0.13	0.041	0.283	0.037	0.00
26	2.17	0.13	0.041	0.282	0.037	0.00
27	2.25	0.13	0.041	0.281	0.037	0.00
28	2.33	0.13	0.041	0.280	0.037	0.00
29	2.42	0.13	0.041	0.278	0.037	0.00
30	2.50	0.13	0.041	0.277	0.037	0.00
31	2.58	0.17	0.052	0.276	0.047	0.01
32	2.67	0.17	0.052	0.275	0.047	0.01
33	2.75	0.17	0.052	0.274	0.047	0.01
34	2.83	0.17	0.052	0.273	0.047	0.01
35	2.92	0.17	0.052	0.272	0.047	0.01
36	3.00	0.17	0.052	0.271	0.047	0.01
37	3.08	0.17	0.052	0.269	0.047	0.01
38	3.17	0.17	0.052	0.268	0.047	0.01
39	3.25	0.17	0.052	0.267	0.047	0.01
40	3.33	0.17	0.052	0.266	0.047	0.01
41	3.42	0.17	0.052	0.265	0.047	0.01
42	3.50	0.17	0.052	0.264	0.047	0.01
43	3.58	0.17	0.052	0.263	0.047	0.01
44	3.67	0.17	0.052	0.262	0.047	0.01
45	3.75	0.17	0.052	0.261	0.047	0.01
46	3.83	0.20	0.062	0.259	0.056	0.01
47	3.92	0.20	0.062	0.258	0.056	0.01
48	4.00	0.20	0.062	0.257	0.056	0.01
49	4.08	0.20	0.062	0.256	0.056	0.01
50	4.17	0.20	0.062	0.255	0.056	0.01
51	4.25	0.20	0.062	0.254	0.056	0.01
52	4.33	0.23	0.072	0.253	0.065	0.01
53	4.42	0.23	0.072	0.252	0.065	0.01
54	4.50	0.23	0.072	0.251	0.065	0.01
55	4.58	0.23	0.072	0.250	0.065	0.01
56	4.67	0.23	0.072	0.249	0.065	0.01
57	4.75	0.23	0.072	0.248	0.065	0.01
58	4.83	0.27	0.083	0.246	0.075	0.01
59	4.92	0.27	0.083	0.245	0.075	0.01
60	5.00	0.27	0.083	0.244	0.075	0.01
61	5.08	0.20	0.062	0.243	0.056	0.01
62	5.17	0.20	0.062	0.242	0.056	0.01
63	5.25	0.20	0.062	0.241	0.056	0.01
64	5.33	0.23	0.072	0.240	0.065	0.01
65	5.42	0.23	0.072	0.239	0.065	0.01
66	5.50	0.23	0.072	0.238	0.065	0.01
67	5.58	0.27	0.083	0.237	0.075	0.01
68	5.67	0.27	0.083	0.236	0.075	0.01
69	5.75	0.27	0.083	0.235	0.075	0.01

70	5.83	0.27	0.083	0.234	0.075	0.01
71	5.92	0.27	0.083	0.233	0.075	0.01
72	6.00	0.27	0.083	0.232	0.075	0.01
73	6.08	0.30	0.093	0.231	0.084	0.01
74	6.17	0.30	0.093	0.230	0.084	0.01
75	6.25	0.30	0.093	0.229	0.084	0.01
76	6.33	0.30	0.093	0.228	0.084	0.01
77	6.42	0.30	0.093	0.227	0.084	0.01
78	6.50	0.30	0.093	0.226	0.084	0.01
79	6.58	0.33	0.103	0.225	0.093	0.01
80	6.67	0.33	0.103	0.224	0.093	0.01
81	6.75	0.33	0.103	0.223	0.093	0.01
82	6.83	0.33	0.103	0.222	0.093	0.01
83	6.92	0.33	0.103	0.221	0.093	0.01
84	7.00	0.33	0.103	0.220	0.093	0.01
85	7.08	0.33	0.103	0.219	0.093	0.01
86	7.17	0.33	0.103	0.218	0.093	0.01
87	7.25	0.33	0.103	0.217	0.093	0.01
88	7.33	0.37	0.114	0.216	0.102	0.01
89	7.42	0.37	0.114	0.215	0.102	0.01
90	7.50	0.37	0.114	0.214	0.102	0.01
91	7.58	0.40	0.124	0.213	0.112	0.01
92	7.67	0.40	0.124	0.212	0.112	0.01
93	7.75	0.40	0.124	0.211	0.112	0.01
94	7.83	0.43	0.135	0.210	0.121	0.01
95	7.92	0.43	0.135	0.209	0.121	0.01
96	8.00	0.43	0.135	0.208	0.121	0.01
97	8.08	0.50	0.155	0.207	0.140	0.02
98	8.17	0.50	0.155	0.206	0.140	0.02
99	8.25	0.50	0.155	0.205	0.140	0.02
100	8.33	0.50	0.155	0.204	0.140	0.02
101	8.42	0.50	0.155	0.203	0.140	0.02
102	8.50	0.50	0.155	0.202	0.140	0.02
103	8.58	0.53	0.166	0.201	0.149	0.02
104	8.67	0.53	0.166	0.200	0.149	0.02
105	8.75	0.53	0.166	0.199	0.149	0.02
106	8.83	0.57	0.176	0.198	0.158	0.02
107	8.92	0.57	0.176	0.197	0.158	0.02
108	9.00	0.57	0.176	0.196	0.158	0.02
109	9.08	0.63	0.197	0.195	---	0.00
110	9.17	0.63	0.197	0.195	---	0.00
111	9.25	0.63	0.197	0.194	---	0.00
112	9.33	0.67	0.207	0.193	---	0.01
113	9.42	0.67	0.207	0.192	---	0.02
114	9.50	0.67	0.207	0.191	---	0.02
115	9.58	0.70	0.217	0.190	---	0.03
116	9.67	0.70	0.217	0.189	---	0.03
117	9.75	0.70	0.217	0.188	---	0.03
118	9.83	0.73	0.228	0.187	---	0.04
119	9.92	0.73	0.228	0.186	---	0.04
120	10.00	0.73	0.228	0.185	---	0.04
121	10.08	0.50	0.155	0.185	0.140	0.02
122	10.17	0.50	0.155	0.184	0.140	0.02
123	10.25	0.50	0.155	0.183	0.140	0.02
124	10.33	0.50	0.155	0.182	0.140	0.02
125	10.42	0.50	0.155	0.181	0.140	0.02
126	10.50	0.50	0.155	0.180	0.140	0.02
127	10.58	0.67	0.207	0.179	---	0.03
128	10.67	0.67	0.207	0.178	---	0.03
129	10.75	0.67	0.207	0.177	---	0.03

130	10.83	0.67	0.207	0.177	---	0.03
131	10.92	0.67	0.207	0.176	---	0.03
132	11.00	0.67	0.207	0.175	---	0.03
133	11.08	0.63	0.197	0.174	---	0.02
134	11.17	0.63	0.197	0.173	---	0.02
135	11.25	0.63	0.197	0.172	---	0.02
136	11.33	0.63	0.197	0.171	---	0.03
137	11.42	0.63	0.197	0.171	---	0.03
138	11.50	0.63	0.197	0.170	---	0.03
139	11.58	0.57	0.176	0.169	---	0.01
140	11.67	0.57	0.176	0.168	---	0.01
141	11.75	0.57	0.176	0.167	---	0.01
142	11.83	0.60	0.186	0.166	---	0.02
143	11.92	0.60	0.186	0.166	---	0.02
144	12.00	0.60	0.186	0.165	---	0.02
145	12.08	0.83	0.259	0.164	---	0.09
146	12.17	0.83	0.259	0.163	---	0.10
147	12.25	0.83	0.259	0.162	---	0.10
148	12.33	0.87	0.269	0.161	---	0.11
149	12.42	0.87	0.269	0.161	---	0.11
150	12.50	0.87	0.269	0.160	---	0.11
151	12.58	0.93	0.290	0.159	---	0.13
152	12.67	0.93	0.290	0.158	---	0.13
153	12.75	0.93	0.290	0.157	---	0.13
154	12.83	0.97	0.300	0.157	---	0.14
155	12.92	0.97	0.300	0.156	---	0.14
156	13.00	0.97	0.300	0.155	---	0.15
157	13.08	1.13	0.352	0.154	---	0.20
158	13.17	1.13	0.352	0.154	---	0.20
159	13.25	1.13	0.352	0.153	---	0.20
160	13.33	1.13	0.352	0.152	---	0.20
161	13.42	1.13	0.352	0.151	---	0.20
162	13.50	1.13	0.352	0.150	---	0.20
163	13.58	0.77	0.238	0.150	---	0.09
164	13.67	0.77	0.238	0.149	---	0.09
165	13.75	0.77	0.238	0.148	---	0.09
166	13.83	0.77	0.238	0.147	---	0.09
167	13.92	0.77	0.238	0.147	---	0.09
168	14.00	0.77	0.238	0.146	---	0.09
169	14.08	0.90	0.279	0.145	---	0.13
170	14.17	0.90	0.279	0.144	---	0.14
171	14.25	0.90	0.279	0.144	---	0.14
172	14.33	0.87	0.269	0.143	---	0.13
173	14.42	0.87	0.269	0.142	---	0.13
174	14.50	0.87	0.269	0.141	---	0.13
175	14.58	0.87	0.269	0.141	---	0.13
176	14.67	0.87	0.269	0.140	---	0.13
177	14.75	0.87	0.269	0.139	---	0.13
178	14.83	0.83	0.259	0.139	---	0.12
179	14.92	0.83	0.259	0.138	---	0.12
180	15.00	0.83	0.259	0.137	---	0.12
181	15.08	0.80	0.248	0.136	---	0.11
182	15.17	0.80	0.248	0.136	---	0.11
183	15.25	0.80	0.248	0.135	---	0.11
184	15.33	0.77	0.238	0.134	---	0.10
185	15.42	0.77	0.238	0.134	---	0.10
186	15.50	0.77	0.238	0.133	---	0.11
187	15.58	0.63	0.197	0.132	---	0.06
188	15.67	0.63	0.197	0.132	---	0.07
189	15.75	0.63	0.197	0.131	---	0.07

190	15.83	0.63	0.197	0.130	---	0.07
191	15.92	0.63	0.197	0.130	---	0.07
192	16.00	0.63	0.197	0.129	---	0.07
193	16.08	0.13	0.041	0.128	0.037	0.00
194	16.17	0.13	0.041	0.128	0.037	0.00
195	16.25	0.13	0.041	0.127	0.037	0.00
196	16.33	0.13	0.041	0.126	0.037	0.00
197	16.42	0.13	0.041	0.126	0.037	0.00
198	16.50	0.13	0.041	0.125	0.037	0.00
199	16.58	0.10	0.031	0.124	0.028	0.00
200	16.67	0.10	0.031	0.124	0.028	0.00
201	16.75	0.10	0.031	0.123	0.028	0.00
202	16.83	0.10	0.031	0.123	0.028	0.00
203	16.92	0.10	0.031	0.122	0.028	0.00
204	17.00	0.10	0.031	0.121	0.028	0.00
205	17.08	0.17	0.052	0.121	0.047	0.01
206	17.17	0.17	0.052	0.120	0.047	0.01
207	17.25	0.17	0.052	0.119	0.047	0.01
208	17.33	0.17	0.052	0.119	0.047	0.01
209	17.42	0.17	0.052	0.118	0.047	0.01
210	17.50	0.17	0.052	0.118	0.047	0.01
211	17.58	0.17	0.052	0.117	0.047	0.01
212	17.67	0.17	0.052	0.117	0.047	0.01
213	17.75	0.17	0.052	0.116	0.047	0.01
214	17.83	0.13	0.041	0.115	0.037	0.00
215	17.92	0.13	0.041	0.115	0.037	0.00
216	18.00	0.13	0.041	0.114	0.037	0.00
217	18.08	0.13	0.041	0.114	0.037	0.00
218	18.17	0.13	0.041	0.113	0.037	0.00
219	18.25	0.13	0.041	0.113	0.037	0.00
220	18.33	0.13	0.041	0.112	0.037	0.00
221	18.42	0.13	0.041	0.111	0.037	0.00
222	18.50	0.13	0.041	0.111	0.037	0.00
223	18.58	0.10	0.031	0.110	0.028	0.00
224	18.67	0.10	0.031	0.110	0.028	0.00
225	18.75	0.10	0.031	0.109	0.028	0.00
226	18.83	0.07	0.021	0.109	0.019	0.00
227	18.92	0.07	0.021	0.108	0.019	0.00
228	19.00	0.07	0.021	0.108	0.019	0.00
229	19.08	0.10	0.031	0.107	0.028	0.00
230	19.17	0.10	0.031	0.107	0.028	0.00
231	19.25	0.10	0.031	0.106	0.028	0.00
232	19.33	0.13	0.041	0.106	0.037	0.00
233	19.42	0.13	0.041	0.105	0.037	0.00
234	19.50	0.13	0.041	0.105	0.037	0.00
235	19.58	0.10	0.031	0.104	0.028	0.00
236	19.67	0.10	0.031	0.104	0.028	0.00
237	19.75	0.10	0.031	0.103	0.028	0.00
238	19.83	0.07	0.021	0.103	0.019	0.00
239	19.92	0.07	0.021	0.102	0.019	0.00
240	20.00	0.07	0.021	0.102	0.019	0.00
241	20.08	0.10	0.031	0.102	0.028	0.00
242	20.17	0.10	0.031	0.101	0.028	0.00
243	20.25	0.10	0.031	0.101	0.028	0.00
244	20.33	0.10	0.031	0.100	0.028	0.00
245	20.42	0.10	0.031	0.100	0.028	0.00
246	20.50	0.10	0.031	0.099	0.028	0.00
247	20.58	0.10	0.031	0.099	0.028	0.00
248	20.67	0.10	0.031	0.099	0.028	0.00
249	20.75	0.10	0.031	0.098	0.028	0.00

250	20.83	0.07	0.021	0.098	0.019	0.00
251	20.92	0.07	0.021	0.097	0.019	0.00
252	21.00	0.07	0.021	0.097	0.019	0.00
253	21.08	0.10	0.031	0.097	0.028	0.00
254	21.17	0.10	0.031	0.096	0.028	0.00
255	21.25	0.10	0.031	0.096	0.028	0.00
256	21.33	0.07	0.021	0.095	0.019	0.00
257	21.42	0.07	0.021	0.095	0.019	0.00
258	21.50	0.07	0.021	0.095	0.019	0.00
259	21.58	0.10	0.031	0.094	0.028	0.00
260	21.67	0.10	0.031	0.094	0.028	0.00
261	21.75	0.10	0.031	0.094	0.028	0.00
262	21.83	0.07	0.021	0.093	0.019	0.00
263	21.92	0.07	0.021	0.093	0.019	0.00
264	22.00	0.07	0.021	0.093	0.019	0.00
265	22.08	0.10	0.031	0.092	0.028	0.00
266	22.17	0.10	0.031	0.092	0.028	0.00
267	22.25	0.10	0.031	0.092	0.028	0.00
268	22.33	0.07	0.021	0.092	0.019	0.00
269	22.42	0.07	0.021	0.091	0.019	0.00
270	22.50	0.07	0.021	0.091	0.019	0.00
271	22.58	0.07	0.021	0.091	0.019	0.00
272	22.67	0.07	0.021	0.090	0.019	0.00
273	22.75	0.07	0.021	0.090	0.019	0.00
274	22.83	0.07	0.021	0.090	0.019	0.00
275	22.92	0.07	0.021	0.090	0.019	0.00
276	23.00	0.07	0.021	0.090	0.019	0.00
277	23.08	0.07	0.021	0.089	0.019	0.00
278	23.17	0.07	0.021	0.089	0.019	0.00
279	23.25	0.07	0.021	0.089	0.019	0.00
280	23.33	0.07	0.021	0.089	0.019	0.00
281	23.42	0.07	0.021	0.089	0.019	0.00
282	23.50	0.07	0.021	0.088	0.019	0.00
283	23.58	0.07	0.021	0.088	0.019	0.00
284	23.67	0.07	0.021	0.088	0.019	0.00
285	23.75	0.07	0.021	0.088	0.019	0.00
286	23.83	0.07	0.021	0.088	0.019	0.00
287	23.92	0.07	0.021	0.088	0.019	0.00
288	24.00	0.07	0.021	0.088	0.019	0.00

Sum = 100.0 Sum = 7.7

Flood volume = Effective rainfall 0.64(In)  
times area 30.6(Ac.)/[(In)/(Ft.)] = 1.6(Ac.Ft)  
Total soil loss = 1.95(In)  
Total soil loss = 4.970(Ac.Ft)  
Total rainfall = 2.59(In)  
Flood volume = 70892.3 Cubic Feet  
Total soil loss = 216491.5 Cubic Feet

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Peak flow rate of this hydrograph = 6.003(CFS)  
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24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))  
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Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.01	Q				

0+10	0.0002	0.03	Q
0+15	0.0006	0.05	Q
0+20	0.0009	0.05	Q
0+25	0.0014	0.07	Q
0+30	0.0020	0.08	Q
0+35	0.0026	0.09	Q
0+40	0.0032	0.09	Q
0+45	0.0038	0.09	Q
0+50	0.0045	0.10	Q
0+55	0.0052	0.11	Q
1+ 0	0.0060	0.12	Q
1+ 5	0.0068	0.12	Q
1+10	0.0076	0.11	Q
1+15	0.0083	0.10	Q
1+20	0.0090	0.10	Q
1+25	0.0097	0.10	Q
1+30	0.0103	0.10	Q
1+35	0.0110	0.10	Q
1+40	0.0117	0.10	Q
1+45	0.0123	0.10	Q
1+50	0.0130	0.10	Q
1+55	0.0138	0.11	Q
2+ 0	0.0146	0.12	Q
2+ 5	0.0154	0.12	Q
2+10	0.0163	0.12	Q
2+15	0.0172	0.12	Q
2+20	0.0180	0.13	Q
2+25	0.0189	0.13	Q
2+30	0.0198	0.13	Q
2+35	0.0207	0.13	Q
2+40	0.0216	0.14	Q
2+45	0.0227	0.15	Q
2+50	0.0237	0.15	Q
2+55	0.0248	0.16	Q
3+ 0	0.0259	0.16	Q
3+ 5	0.0270	0.16	Q
3+10	0.0281	0.16	Q
3+15	0.0291	0.16	Q
3+20	0.0302	0.16	Q
3+25	0.0313	0.16	Q
3+30	0.0324	0.16	Q
3+35	0.0335	0.16	Q
3+40	0.0346	0.16	Q
3+45	0.0357	0.16	Q
3+50	0.0369	0.16	Q
3+55	0.0381	0.17	Q
4+ 0	0.0393	0.18	Q
4+ 5	0.0406	0.19	Q
4+10	0.0419	0.19	QV
4+15	0.0432	0.19	QV
4+20	0.0445	0.19	QV
4+25	0.0459	0.21	QV
4+30	0.0474	0.21	QV
4+35	0.0489	0.22	QV
4+40	0.0504	0.22	QV
4+45	0.0519	0.22	QV
4+50	0.0535	0.22	QV
4+55	0.0551	0.24	QV
5+ 0	0.0568	0.25	QV
5+ 5	0.0585	0.24	QV

5+10	0.0600	0.22	QV
5+15	0.0614	0.21	QV
5+20	0.0628	0.20	QV
5+25	0.0643	0.21	QV
5+30	0.0658	0.22	QV
5+35	0.0673	0.22	QV
5+40	0.0690	0.24	QV
5+45	0.0707	0.25	QV
5+50	0.0724	0.25	QV
5+55	0.0741	0.25	Q
6+ 0	0.0758	0.25	Q
6+ 5	0.0776	0.26	Q
6+10	0.0794	0.27	Q
6+15	0.0814	0.28	Q
6+20	0.0833	0.28	QV
6+25	0.0852	0.28	QV
6+30	0.0872	0.28	QV
6+35	0.0892	0.29	QV
6+40	0.0913	0.30	QV
6+45	0.0934	0.31	QV
6+50	0.0955	0.31	QV
6+55	0.0977	0.31	QV
7+ 0	0.0999	0.32	QV
7+ 5	0.1021	0.32	QV
7+10	0.1043	0.32	QV
7+15	0.1065	0.32	QV
7+20	0.1087	0.32	QV
7+25	0.1110	0.33	QV
7+30	0.1133	0.34	QV
7+35	0.1157	0.35	QV
7+40	0.1182	0.36	QV
7+45	0.1208	0.37	QV
7+50	0.1234	0.38	Q V
7+55	0.1261	0.39	Q V
8+ 0	0.1289	0.40	Q V
8+ 5	0.1317	0.41	Q V
8+10	0.1347	0.44	Q V
8+15	0.1379	0.46	Q V
8+20	0.1411	0.46	Q V
8+25	0.1443	0.47	Q V
8+30	0.1475	0.47	Q V
8+35	0.1508	0.48	Q V
8+40	0.1542	0.49	Q V
8+45	0.1577	0.50	Q V
8+50	0.1611	0.51	QV
8+55	0.1647	0.52	Q V
9+ 0	0.1684	0.53	Q V
9+ 5	0.1717	0.49	Q V
9+10	0.1738	0.30	Q V
9+15	0.1751	0.19	Q V
9+20	0.1765	0.19	Q V
9+25	0.1786	0.31	Q V
9+30	0.1813	0.39	Q V
9+35	0.1845	0.47	Q V
9+40	0.1888	0.62	Q V
9+45	0.1939	0.73	Q V
9+50	0.1996	0.82	QV
9+55	0.2064	0.99	Q V
10+ 0	0.2141	1.11	QV
10+ 5	0.2216	1.10	QV

10+10	0.2274	0.83	Q	V				
10+15	0.2319	0.66	Q	V				
10+20	0.2360	0.60	Q	V				
10+25	0.2398	0.56	Q	V				
10+30	0.2435	0.54	Q	V				
10+35	0.2474	0.56	Q	V				
10+40	0.2521	0.69	Q	V				
10+45	0.2576	0.79	Q	V				
10+50	0.2633	0.84	Q	V				
10+55	0.2693	0.87	Q	V				
11+ 0	0.2756	0.91	Q	V				
11+ 5	0.2818	0.91	Q	V				
11+10	0.2875	0.82	Q	V				
11+15	0.2928	0.77	Q	V				
11+20	0.2981	0.77	Q	V				
11+25	0.3034	0.78	Q	V				
11+30	0.3089	0.80	Q	V				
11+35	0.3141	0.76	Q	V				
11+40	0.3178	0.53	Q	V				
11+45	0.3205	0.40	Q	V				
11+50	0.3232	0.39	Q	V				
11+55	0.3267	0.50	Q	V				
12+ 0	0.3306	0.58	Q	V				
12+ 5	0.3363	0.83	Q	V				
12+10	0.3480	1.70	Q	V				
12+15	0.3637	2.28		VQ				
12+20	0.3812	2.55		VQ				
12+25	0.4007	2.82		V Q				
12+30	0.4214	3.01		V Q				
12+35	0.4434	3.19		V Q				
12+40	0.4676	3.52		V Q				
12+45	0.4934	3.75		V Q				
12+50	0.5203	3.90		V Q				
12+55	0.5485	4.10		V Q				
13+ 0	0.5778	4.25		V Q				
13+ 5	0.6087	4.49		V Q				
13+10	0.6442	5.15		V	Q			
13+15	0.6827	5.59		V	Q	Q		
13+20	0.7225	5.78		V	Q	Q		
13+25	0.7632	5.91		V	Q	Q		
13+30	0.8045	6.00		V	Q	Q		
13+35	0.8441	5.74		V	Q			
13+40	0.8749	4.48		Q	V			
13+45	0.9001	3.66		Q	V			
13+50	0.9233	3.37		Q	V			
13+55	0.9454	3.20		Q	V			
14+ 0	0.9667	3.10		Q	V			
14+ 5	0.9885	3.16		Q	V			
14+10	1.0133	3.60		Q	V			
14+15	1.0400	3.88		Q	V			
14+20	1.0673	3.96		Q	V			
14+25	1.0942	3.91		Q	V			
14+30	1.1209	3.88		Q	V			
14+35	1.1476	3.89		Q	V			
14+40	1.1746	3.92		Q	V			
14+45	1.2018	3.94		Q	V			
14+50	1.2289	3.94		Q	V			V
14+55	1.2554	3.85		Q	V			V
15+ 0	1.2815	3.79		Q	V			V
15+ 5	1.3074	3.76		Q	V			V

15+10	1.3325	3.64				V
15+15	1.3570	3.57				V
15+20	1.3813	3.52				V
15+25	1.4047	3.40				V
15+30	1.4275	3.32				V
15+35	1.4494	3.18				V
15+40	1.4680	2.69				V
15+45	1.4843	2.38				V
15+50	1.4999	2.26				V
15+55	1.5151	2.20				V
16+ 0	1.5300	2.17				V
16+ 5	1.5435	1.96				V
16+10	1.5519	1.21		Q		V
16+15	1.5567	0.71		Q		V
16+20	1.5603	0.51		Q		V
16+25	1.5629	0.39		Q		V
16+30	1.5651	0.31		Q		V
16+35	1.5668	0.25	Q			V
16+40	1.5682	0.20	Q			V
16+45	1.5693	0.16	Q			V
16+50	1.5702	0.14	Q			V
16+55	1.5711	0.12	Q			V
17+ 0	1.5718	0.11	Q			V
17+ 5	1.5725	0.10	Q			V
17+10	1.5734	0.13	Q			V
17+15	1.5744	0.14	Q			V
17+20	1.5754	0.15	Q			V
17+25	1.5765	0.15	Q			V
17+30	1.5775	0.15	Q			V
17+35	1.5786	0.16	Q			V
17+40	1.5797	0.16	Q			V
17+45	1.5807	0.16	Q			V
17+50	1.5818	0.16	Q			V
17+55	1.5828	0.14	Q			V
18+ 0	1.5838	0.14	Q			V
18+ 5	1.5847	0.13	Q			V
18+10	1.5856	0.13	Q			V
18+15	1.5865	0.13	Q			V
18+20	1.5874	0.13	Q			V
18+25	1.5883	0.13	Q			V
18+30	1.5891	0.13	Q			V
18+35	1.5900	0.13	Q			V
18+40	1.5908	0.11	Q			V
18+45	1.5915	0.10	Q			V
18+50	1.5922	0.10	Q			V
18+55	1.5928	0.08	Q			V
19+ 0	1.5933	0.08	Q			V
19+ 5	1.5938	0.07	Q			V
19+10	1.5944	0.08	Q			V
19+15	1.5950	0.09	Q			V
19+20	1.5957	0.10	Q			V
19+25	1.5964	0.11	Q			V
19+30	1.5972	0.12	Q			V
19+35	1.5980	0.12	Q			V
19+40	1.5988	0.11	Q			V
19+45	1.5995	0.10	Q			V
19+50	1.6001	0.10	Q			V
19+55	1.6007	0.08	Q			V
20+ 0	1.6012	0.07	Q			V
20+ 5	1.6017	0.07	Q			V

20+10	1.6023	0.08	Q			V
20+15	1.6029	0.09	Q			V
20+20	1.6036	0.09	Q			V
20+25	1.6042	0.09	Q			V
20+30	1.6049	0.09	Q			V
20+35	1.6055	0.09	Q			V
20+40	1.6062	0.09	Q			V
20+45	1.6068	0.09	Q			V
20+50	1.6075	0.09	Q			V
20+55	1.6080	0.08	Q			V
21+ 0	1.6085	0.07	Q			V
21+ 5	1.6090	0.07	Q			V
21+10	1.6096	0.08	Q			V
21+15	1.6102	0.09	Q			V
21+20	1.6108	0.09	Q			V
21+25	1.6114	0.08	Q			V
21+30	1.6118	0.07	Q			V
21+35	1.6123	0.07	Q			V
21+40	1.6129	0.08	Q			V
21+45	1.6135	0.09	Q			V
21+50	1.6141	0.09	Q			V
21+55	1.6147	0.08	Q			V
22+ 0	1.6151	0.07	Q			V
22+ 5	1.6156	0.07	Q			V
22+10	1.6162	0.08	Q			V
22+15	1.6168	0.09	Q			V
22+20	1.6174	0.09	Q			V
22+25	1.6180	0.08	Q			V
22+30	1.6184	0.07	Q			V
22+35	1.6189	0.07	Q			V
22+40	1.6194	0.07	Q			V
22+45	1.6198	0.07	Q			V
22+50	1.6203	0.07	Q			V
22+55	1.6207	0.06	Q			V
23+ 0	1.6212	0.06	Q			V
23+ 5	1.6216	0.06	Q			V
23+10	1.6221	0.06	Q			V
23+15	1.6225	0.06	Q			V
23+20	1.6229	0.06	Q			V
23+25	1.6234	0.06	Q			V
23+30	1.6238	0.06	Q			V
23+35	1.6243	0.06	Q			V
23+40	1.6247	0.06	Q			V
23+45	1.6251	0.06	Q			V
23+50	1.6256	0.06	Q			V
23+55	1.6260	0.06	Q			V
24+ 0	1.6265	0.06	Q			V
24+ 5	1.6268	0.06	Q			V
24+10	1.6271	0.03	Q			V
24+15	1.6272	0.02	Q			V
24+20	1.6273	0.01	Q			V
24+25	1.6273	0.01	Q			V
24+30	1.6274	0.01	Q			V
24+35	1.6274	0.00	Q			V
24+40	1.6274	0.00	Q			V
24+45	1.6274	0.00	Q			V
24+50	1.6275	0.00	Q			V
24+55	1.6275	0.00	Q			V
25+ 0	1.6275	0.00	Q			V



Unit Hydrograph Analysis

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Study date 06/14/21 File: E10024100.out

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Riverside County Synthetic Unit Hydrology Method  
RCFC & WCD Manual date - April 1978

Program License Serial Number 6062

-----  
English (in-lb) Input Units Used  
English Rainfall Data (Inches) Input Values Used  
  
English Units used in output format

-----  
10-Year 24-Hour  
Existing

-----  
Drainage Area = 30.60(Ac.) = 0.048 Sq. Mi.  
Drainage Area for Depth-Area Areal Adjustment = 30.60(Ac.) = 0.048  
Sq. Mi.  
Length along longest watercourse = 1687.00(Ft.)  
Length along longest watercourse measured to centroid = 987.00(Ft.)  
Length along longest watercourse = 0.320 Mi.  
Length along longest watercourse measured to centroid = 0.187 Mi.  
Difference in elevation = 8.00(Ft.)  
Slope along watercourse = 25.0385 Ft./Mi.  
Average Manning's 'N' = 0.035  
Lag time = 0.156 Hr.  
Lag time = 9.37 Min.  
25% of lag time = 2.34 Min.  
40% of lag time = 3.75 Min.  
Unit time = 5.00 Min.  
Duration of storm = 24 Hour(s)  
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	1.60	48.96

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	4.00	122.40

STORM EVENT (YEAR) = 100.00  
 Area Averaged 2-Year Rainfall = 1.600(In)  
 Area Averaged 100-Year Rainfall = 4.000(In)

Point rain (area averaged) = 4.000(In)  
 Areal adjustment factor = 99.99 %  
 Adjusted average point rain = 4.000(In)

Sub-Area Data:

Area(Ac.)                  Runoff Index          Impervious %  
 30.600                      86.00                      0.000  
 Total Area Entered =          30.60(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	86.0	0.176	0.000	0.176	1.000	0.176
						Sum (F) = 0.176

Area averaged mean soil loss (F) (In/Hr) = 0.176  
 Minimum soil loss rate ((In/Hr)) = 0.088  
 (for 24 hour storm duration)  
 Soil low loss rate (decimal) = 0.900

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 U n i t   H y d r o g r a p h  
 VALLEY S-Curve  
 -----

Unit Hydrograph Data  
 -----

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	53.374	6.785
2	0.167	106.749	28.949
3	0.250	160.123	28.360
4	0.333	213.497	11.853
5	0.417	266.872	6.515
6	0.500	320.246	4.519
7	0.583	373.621	3.252
8	0.667	426.995	2.399
9	0.750	480.369	1.769
10	0.833	533.744	1.526
11	0.917	587.118	1.151
12	1.000	640.492	0.909
13	1.083	693.867	0.681
14	1.167	747.241	0.537
15	1.250	800.615	0.794
		Sum = 100.000	Sum= 30.839

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
			Max	Low	
1	0.08	0.07	0.311	0.029	0.00
2	0.17	0.07	0.310	0.029	0.00
3	0.25	0.07	0.309	0.029	0.00
4	0.33	0.10	0.308	0.043	0.00
5	0.42	0.10	0.306	0.043	0.00
6	0.50	0.10	0.305	0.043	0.00
7	0.58	0.10	0.304	0.043	0.00

8	0.67	0.10	0.048	0.303	0.043	0.00
9	0.75	0.10	0.048	0.302	0.043	0.00
10	0.83	0.13	0.064	0.301	0.058	0.01
11	0.92	0.13	0.064	0.299	0.058	0.01
12	1.00	0.13	0.064	0.298	0.058	0.01
13	1.08	0.10	0.048	0.297	0.043	0.00
14	1.17	0.10	0.048	0.296	0.043	0.00
15	1.25	0.10	0.048	0.295	0.043	0.00
16	1.33	0.10	0.048	0.293	0.043	0.00
17	1.42	0.10	0.048	0.292	0.043	0.00
18	1.50	0.10	0.048	0.291	0.043	0.00
19	1.58	0.10	0.048	0.290	0.043	0.00
20	1.67	0.10	0.048	0.289	0.043	0.00
21	1.75	0.10	0.048	0.288	0.043	0.00
22	1.83	0.13	0.064	0.287	0.058	0.01
23	1.92	0.13	0.064	0.285	0.058	0.01
24	2.00	0.13	0.064	0.284	0.058	0.01
25	2.08	0.13	0.064	0.283	0.058	0.01
26	2.17	0.13	0.064	0.282	0.058	0.01
27	2.25	0.13	0.064	0.281	0.058	0.01
28	2.33	0.13	0.064	0.280	0.058	0.01
29	2.42	0.13	0.064	0.278	0.058	0.01
30	2.50	0.13	0.064	0.277	0.058	0.01
31	2.58	0.17	0.080	0.276	0.072	0.01
32	2.67	0.17	0.080	0.275	0.072	0.01
33	2.75	0.17	0.080	0.274	0.072	0.01
34	2.83	0.17	0.080	0.273	0.072	0.01
35	2.92	0.17	0.080	0.272	0.072	0.01
36	3.00	0.17	0.080	0.271	0.072	0.01
37	3.08	0.17	0.080	0.269	0.072	0.01
38	3.17	0.17	0.080	0.268	0.072	0.01
39	3.25	0.17	0.080	0.267	0.072	0.01
40	3.33	0.17	0.080	0.266	0.072	0.01
41	3.42	0.17	0.080	0.265	0.072	0.01
42	3.50	0.17	0.080	0.264	0.072	0.01
43	3.58	0.17	0.080	0.263	0.072	0.01
44	3.67	0.17	0.080	0.262	0.072	0.01
45	3.75	0.17	0.080	0.261	0.072	0.01
46	3.83	0.20	0.096	0.259	0.086	0.01
47	3.92	0.20	0.096	0.258	0.086	0.01
48	4.00	0.20	0.096	0.257	0.086	0.01
49	4.08	0.20	0.096	0.256	0.086	0.01
50	4.17	0.20	0.096	0.255	0.086	0.01
51	4.25	0.20	0.096	0.254	0.086	0.01
52	4.33	0.23	0.112	0.253	0.101	0.01
53	4.42	0.23	0.112	0.252	0.101	0.01
54	4.50	0.23	0.112	0.251	0.101	0.01
55	4.58	0.23	0.112	0.250	0.101	0.01
56	4.67	0.23	0.112	0.249	0.101	0.01
57	4.75	0.23	0.112	0.248	0.101	0.01
58	4.83	0.27	0.128	0.246	0.115	0.01
59	4.92	0.27	0.128	0.245	0.115	0.01
60	5.00	0.27	0.128	0.244	0.115	0.01
61	5.08	0.20	0.096	0.243	0.086	0.01
62	5.17	0.20	0.096	0.242	0.086	0.01
63	5.25	0.20	0.096	0.241	0.086	0.01
64	5.33	0.23	0.112	0.240	0.101	0.01
65	5.42	0.23	0.112	0.239	0.101	0.01
66	5.50	0.23	0.112	0.238	0.101	0.01
67	5.58	0.27	0.128	0.237	0.115	0.01

68	5.67	0.27	0.128	0.236	0.115	0.01
69	5.75	0.27	0.128	0.235	0.115	0.01
70	5.83	0.27	0.128	0.234	0.115	0.01
71	5.92	0.27	0.128	0.233	0.115	0.01
72	6.00	0.27	0.128	0.232	0.115	0.01
73	6.08	0.30	0.144	0.231	0.130	0.01
74	6.17	0.30	0.144	0.230	0.130	0.01
75	6.25	0.30	0.144	0.229	0.130	0.01
76	6.33	0.30	0.144	0.228	0.130	0.01
77	6.42	0.30	0.144	0.227	0.130	0.01
78	6.50	0.30	0.144	0.226	0.130	0.01
79	6.58	0.33	0.160	0.225	0.144	0.02
80	6.67	0.33	0.160	0.224	0.144	0.02
81	6.75	0.33	0.160	0.223	0.144	0.02
82	6.83	0.33	0.160	0.222	0.144	0.02
83	6.92	0.33	0.160	0.221	0.144	0.02
84	7.00	0.33	0.160	0.220	0.144	0.02
85	7.08	0.33	0.160	0.219	0.144	0.02
86	7.17	0.33	0.160	0.218	0.144	0.02
87	7.25	0.33	0.160	0.217	0.144	0.02
88	7.33	0.37	0.176	0.216	0.158	0.02
89	7.42	0.37	0.176	0.215	0.158	0.02
90	7.50	0.37	0.176	0.214	0.158	0.02
91	7.58	0.40	0.192	0.213	0.173	0.02
92	7.67	0.40	0.192	0.212	0.173	0.02
93	7.75	0.40	0.192	0.211	0.173	0.02
94	7.83	0.43	0.208	0.210	0.187	0.02
95	7.92	0.43	0.208	0.209	0.187	0.02
96	8.00	0.43	0.208	0.208	---	0.00
97	8.08	0.50	0.240	0.207	---	0.03
98	8.17	0.50	0.240	0.206	---	0.03
99	8.25	0.50	0.240	0.205	---	0.04
100	8.33	0.50	0.240	0.204	---	0.04
101	8.42	0.50	0.240	0.203	---	0.04
102	8.50	0.50	0.240	0.202	---	0.04
103	8.58	0.53	0.256	0.201	---	0.05
104	8.67	0.53	0.256	0.200	---	0.06
105	8.75	0.53	0.256	0.199	---	0.06
106	8.83	0.57	0.272	0.198	---	0.07
107	8.92	0.57	0.272	0.197	---	0.07
108	9.00	0.57	0.272	0.196	---	0.08
109	9.08	0.63	0.304	0.195	---	0.11
110	9.17	0.63	0.304	0.195	---	0.11
111	9.25	0.63	0.304	0.194	---	0.11
112	9.33	0.67	0.320	0.193	---	0.13
113	9.42	0.67	0.320	0.192	---	0.13
114	9.50	0.67	0.320	0.191	---	0.13
115	9.58	0.70	0.336	0.190	---	0.15
116	9.67	0.70	0.336	0.189	---	0.15
117	9.75	0.70	0.336	0.188	---	0.15
118	9.83	0.73	0.352	0.187	---	0.16
119	9.92	0.73	0.352	0.186	---	0.17
120	10.00	0.73	0.352	0.185	---	0.17
121	10.08	0.50	0.240	0.185	---	0.06
122	10.17	0.50	0.240	0.184	---	0.06
123	10.25	0.50	0.240	0.183	---	0.06
124	10.33	0.50	0.240	0.182	---	0.06
125	10.42	0.50	0.240	0.181	---	0.06
126	10.50	0.50	0.240	0.180	---	0.06
127	10.58	0.67	0.320	0.179	---	0.14

128	10.67	0.67	0.320	0.178	---	0.14
129	10.75	0.67	0.320	0.177	---	0.14
130	10.83	0.67	0.320	0.177	---	0.14
131	10.92	0.67	0.320	0.176	---	0.14
132	11.00	0.67	0.320	0.175	---	0.15
133	11.08	0.63	0.304	0.174	---	0.13
134	11.17	0.63	0.304	0.173	---	0.13
135	11.25	0.63	0.304	0.172	---	0.13
136	11.33	0.63	0.304	0.171	---	0.13
137	11.42	0.63	0.304	0.171	---	0.13
138	11.50	0.63	0.304	0.170	---	0.13
139	11.58	0.57	0.272	0.169	---	0.10
140	11.67	0.57	0.272	0.168	---	0.10
141	11.75	0.57	0.272	0.167	---	0.10
142	11.83	0.60	0.288	0.166	---	0.12
143	11.92	0.60	0.288	0.166	---	0.12
144	12.00	0.60	0.288	0.165	---	0.12
145	12.08	0.83	0.400	0.164	---	0.24
146	12.17	0.83	0.400	0.163	---	0.24
147	12.25	0.83	0.400	0.162	---	0.24
148	12.33	0.87	0.416	0.161	---	0.25
149	12.42	0.87	0.416	0.161	---	0.26
150	12.50	0.87	0.416	0.160	---	0.26
151	12.58	0.93	0.448	0.159	---	0.29
152	12.67	0.93	0.448	0.158	---	0.29
153	12.75	0.93	0.448	0.157	---	0.29
154	12.83	0.97	0.464	0.157	---	0.31
155	12.92	0.97	0.464	0.156	---	0.31
156	13.00	0.97	0.464	0.155	---	0.31
157	13.08	1.13	0.544	0.154	---	0.39
158	13.17	1.13	0.544	0.154	---	0.39
159	13.25	1.13	0.544	0.153	---	0.39
160	13.33	1.13	0.544	0.152	---	0.39
161	13.42	1.13	0.544	0.151	---	0.39
162	13.50	1.13	0.544	0.150	---	0.39
163	13.58	0.77	0.368	0.150	---	0.22
164	13.67	0.77	0.368	0.149	---	0.22
165	13.75	0.77	0.368	0.148	---	0.22
166	13.83	0.77	0.368	0.147	---	0.22
167	13.92	0.77	0.368	0.147	---	0.22
168	14.00	0.77	0.368	0.146	---	0.22
169	14.08	0.90	0.432	0.145	---	0.29
170	14.17	0.90	0.432	0.144	---	0.29
171	14.25	0.90	0.432	0.144	---	0.29
172	14.33	0.87	0.416	0.143	---	0.27
173	14.42	0.87	0.416	0.142	---	0.27
174	14.50	0.87	0.416	0.141	---	0.27
175	14.58	0.87	0.416	0.141	---	0.28
176	14.67	0.87	0.416	0.140	---	0.28
177	14.75	0.87	0.416	0.139	---	0.28
178	14.83	0.83	0.400	0.139	---	0.26
179	14.92	0.83	0.400	0.138	---	0.26
180	15.00	0.83	0.400	0.137	---	0.26
181	15.08	0.80	0.384	0.136	---	0.25
182	15.17	0.80	0.384	0.136	---	0.25
183	15.25	0.80	0.384	0.135	---	0.25
184	15.33	0.77	0.368	0.134	---	0.23
185	15.42	0.77	0.368	0.134	---	0.23
186	15.50	0.77	0.368	0.133	---	0.23
187	15.58	0.63	0.304	0.132	---	0.17

188	15.67	0.63	0.304	0.132	---	0.17
189	15.75	0.63	0.304	0.131	---	0.17
190	15.83	0.63	0.304	0.130	---	0.17
191	15.92	0.63	0.304	0.130	---	0.17
192	16.00	0.63	0.304	0.129	---	0.18
193	16.08	0.13	0.064	0.128	0.058	0.01
194	16.17	0.13	0.064	0.128	0.058	0.01
195	16.25	0.13	0.064	0.127	0.058	0.01
196	16.33	0.13	0.064	0.126	0.058	0.01
197	16.42	0.13	0.064	0.126	0.058	0.01
198	16.50	0.13	0.064	0.125	0.058	0.01
199	16.58	0.10	0.048	0.124	0.043	0.00
200	16.67	0.10	0.048	0.124	0.043	0.00
201	16.75	0.10	0.048	0.123	0.043	0.00
202	16.83	0.10	0.048	0.123	0.043	0.00
203	16.92	0.10	0.048	0.122	0.043	0.00
204	17.00	0.10	0.048	0.121	0.043	0.00
205	17.08	0.17	0.080	0.121	0.072	0.01
206	17.17	0.17	0.080	0.120	0.072	0.01
207	17.25	0.17	0.080	0.119	0.072	0.01
208	17.33	0.17	0.080	0.119	0.072	0.01
209	17.42	0.17	0.080	0.118	0.072	0.01
210	17.50	0.17	0.080	0.118	0.072	0.01
211	17.58	0.17	0.080	0.117	0.072	0.01
212	17.67	0.17	0.080	0.117	0.072	0.01
213	17.75	0.17	0.080	0.116	0.072	0.01
214	17.83	0.13	0.064	0.115	0.058	0.01
215	17.92	0.13	0.064	0.115	0.058	0.01
216	18.00	0.13	0.064	0.114	0.058	0.01
217	18.08	0.13	0.064	0.114	0.058	0.01
218	18.17	0.13	0.064	0.113	0.058	0.01
219	18.25	0.13	0.064	0.113	0.058	0.01
220	18.33	0.13	0.064	0.112	0.058	0.01
221	18.42	0.13	0.064	0.111	0.058	0.01
222	18.50	0.13	0.064	0.111	0.058	0.01
223	18.58	0.10	0.048	0.110	0.043	0.00
224	18.67	0.10	0.048	0.110	0.043	0.00
225	18.75	0.10	0.048	0.109	0.043	0.00
226	18.83	0.07	0.032	0.109	0.029	0.00
227	18.92	0.07	0.032	0.108	0.029	0.00
228	19.00	0.07	0.032	0.108	0.029	0.00
229	19.08	0.10	0.048	0.107	0.043	0.00
230	19.17	0.10	0.048	0.107	0.043	0.00
231	19.25	0.10	0.048	0.106	0.043	0.00
232	19.33	0.13	0.064	0.106	0.058	0.01
233	19.42	0.13	0.064	0.105	0.058	0.01
234	19.50	0.13	0.064	0.105	0.058	0.01
235	19.58	0.10	0.048	0.104	0.043	0.00
236	19.67	0.10	0.048	0.104	0.043	0.00
237	19.75	0.10	0.048	0.103	0.043	0.00
238	19.83	0.07	0.032	0.103	0.029	0.00
239	19.92	0.07	0.032	0.102	0.029	0.00
240	20.00	0.07	0.032	0.102	0.029	0.00
241	20.08	0.10	0.048	0.102	0.043	0.00
242	20.17	0.10	0.048	0.101	0.043	0.00
243	20.25	0.10	0.048	0.101	0.043	0.00
244	20.33	0.10	0.048	0.100	0.043	0.00
245	20.42	0.10	0.048	0.100	0.043	0.00
246	20.50	0.10	0.048	0.099	0.043	0.00
247	20.58	0.10	0.048	0.099	0.043	0.00



0+ 5	0.0000	0.01	Q
0+10	0.0003	0.04	Q
0+15	0.0007	0.06	Q
0+20	0.0013	0.08	Q
0+25	0.0019	0.10	Q
0+30	0.0028	0.12	Q
0+35	0.0036	0.13	Q
0+40	0.0045	0.13	Q
0+45	0.0055	0.14	Q
0+50	0.0065	0.14	Q
0+55	0.0076	0.16	Q
1+ 0	0.0088	0.17	Q
1+ 5	0.0100	0.18	Q
1+10	0.0112	0.17	Q
1+15	0.0122	0.16	Q
1+20	0.0133	0.15	Q
1+25	0.0144	0.15	Q
1+30	0.0154	0.15	Q
1+35	0.0164	0.15	Q
1+40	0.0175	0.15	Q
1+45	0.0185	0.15	Q
1+50	0.0196	0.15	Q
1+55	0.0207	0.17	Q
2+ 0	0.0220	0.18	Q
2+ 5	0.0232	0.19	Q
2+10	0.0245	0.19	Q
2+15	0.0259	0.19	Q
2+20	0.0272	0.19	Q
2+25	0.0285	0.19	Q
2+30	0.0299	0.19	Q
2+35	0.0312	0.20	Q
2+40	0.0327	0.21	Q
2+45	0.0343	0.23	Q
2+50	0.0359	0.23	Q
2+55	0.0375	0.24	Q
3+ 0	0.0392	0.24	Q
3+ 5	0.0408	0.24	Q
3+10	0.0425	0.24	Q
3+15	0.0442	0.24	Q
3+20	0.0459	0.24	Q
3+25	0.0476	0.25	Q
3+30	0.0493	0.25	Q
3+35	0.0510	0.25	Q
3+40	0.0527	0.25	Q
3+45	0.0544	0.25	Q
3+50	0.0561	0.25	Q
3+55	0.0579	0.26	Q
4+ 0	0.0598	0.28	Q
4+ 5	0.0618	0.28	Q
4+10	0.0638	0.29	Q
4+15	0.0658	0.29	Q
4+20	0.0678	0.29	Q
4+25	0.0699	0.31	Q
4+30	0.0722	0.33	Q
4+35	0.0745	0.33	Q
4+40	0.0768	0.34	Q
4+45	0.0791	0.34	Q
4+50	0.0815	0.34	Q
4+55	0.0839	0.36	Q

5+ 0	0.0865	0.37	Q
5+ 5	0.0891	0.37	Q
5+10	0.0915	0.35	Q
5+15	0.0937	0.32	Q
5+20	0.0959	0.32	Q
5+25	0.0982	0.33	Q
5+30	0.1005	0.34	Q
5+35	0.1029	0.34	QV
5+40	0.1053	0.36	QV
5+45	0.1079	0.38	QV
5+50	0.1106	0.38	QV
5+55	0.1132	0.39	QV
6+ 0	0.1159	0.39	QV
6+ 5	0.1186	0.39	QV
6+10	0.1214	0.41	QV
6+15	0.1243	0.42	QV
6+20	0.1273	0.43	QV
6+25	0.1303	0.43	QV
6+30	0.1333	0.44	QV
6+35	0.1363	0.44	QV
6+40	0.1395	0.46	QV
6+45	0.1427	0.47	QV
6+50	0.1460	0.48	QV
6+55	0.1494	0.48	QV
7+ 0	0.1527	0.49	QV
7+ 5	0.1561	0.49	QV
7+10	0.1594	0.49	QV
7+15	0.1628	0.49	QV
7+20	0.1662	0.49	QV
7+25	0.1697	0.51	Q
7+30	0.1734	0.52	Q
7+35	0.1770	0.53	Q
7+40	0.1808	0.55	Q
7+45	0.1847	0.57	Q
7+50	0.1887	0.58	Q
7+55	0.1928	0.60	Q
8+ 0	0.1968	0.57	Q
8+ 5	0.2000	0.46	QV
8+10	0.2040	0.59	QV
8+15	0.2096	0.81	QV
8+20	0.2159	0.91	QV
8+25	0.2226	0.98	QV
8+30	0.2297	1.03	Q
8+35	0.2373	1.10	Q
8+40	0.2462	1.29	Q
8+45	0.2563	1.46	Q
8+50	0.2672	1.59	VQ
8+55	0.2796	1.80	VQ
9+ 0	0.2934	2.00	VQ
9+ 5	0.3083	2.17	VQ
9+10	0.3258	2.53	V Q
9+15	0.3456	2.88	V Q
9+20	0.3668	3.08	V Q
9+25	0.3898	3.33	V Q
9+30	0.4143	3.56	V Q
9+35	0.4399	3.72	V Q
9+40	0.4672	3.96	V Q
9+45	0.4959	4.18	V Q
9+50	0.5258	4.33	V Q
9+55	0.5572	4.56	V Q

10+ 0	0.5900	4.77	V	Q					
10+ 5	0.6221	4.65	V	Q					
10+10	0.6478	3.74	VQ						
10+15	0.6673	2.83	QV						
10+20	0.6843	2.47	Q	V					
10+25	0.7001	2.29	Q	V					
10+30	0.7151	2.18	Q	V					
10+35	0.7308	2.28	Q	V					
10+40	0.7511	2.94	Q	V					
10+45	0.7760	3.62	Q						
10+50	0.8028	3.89	Q						
10+55	0.8306	4.04	Q						
11+ 0	0.8592	4.15	Q						
11+ 5	0.8881	4.20	Q						
11+10	0.9165	4.12	QV						
11+15	0.9442	4.03	QV						
11+20	0.9720	4.03	QV						
11+25	0.9999	4.06	QV						
11+30	1.0280	4.08	Q	V					
11+35	1.0559	4.04	Q	V					
11+40	1.0819	3.78	Q	V					
11+45	1.1063	3.54	Q	V					
11+50	1.1303	3.48	Q	V					
11+55	1.1549	3.57	Q	V					
12+ 0	1.1803	3.69	Q	V					
12+ 5	1.2077	3.97	Q	V					
12+10	1.2422	5.01	Q	V					
12+15	1.2836	6.01	Q						
12+20	1.3282	6.48	QV						
12+25	1.3756	6.88	Q						
12+30	1.4251	7.20	Q						
12+35	1.4765	7.46	Q						
12+40	1.5308	7.89	Q						
12+45	1.5878	8.27	VQ						
12+50	1.6465	8.52	VQ						
12+55	1.7071	8.81	VQ						
13+ 0	1.7695	9.06	VQ						
13+ 5	1.8341	9.37	Q						
13+10	1.9043	10.19	V	Q					
13+15	1.9799	10.99	V	Q					
13+20	2.0580	11.34	V	Q					
13+25	2.1376	11.55	V	Q					
13+30	2.2182	11.71	V	Q					
13+35	2.2971	11.46	Q						
13+40	2.3658	9.98	Q						
13+45	2.4245	8.52	Q						
13+50	2.4792	7.94	Q						
13+55	2.5318	7.64	Q						
14+ 0	2.5831	7.44	Q						
14+ 5	2.6343	7.44	Q						
14+10	2.6889	7.92	Q						
14+15	2.7469	8.43	Q						
14+20	2.8059	8.57	Q						
14+25	2.8645	8.51	Q						
14+30	2.9226	8.44	Q						
14+35	2.9807	8.43	Q						
14+40	3.0388	8.44	Q						
14+45	3.0968	8.43	Q						
14+50	3.1549	8.43	Q						
14+55	3.2122	8.32	Q						

15+ 0	3.2688	8.21				V
15+ 5	3.3249	8.15				V
15+10	3.3800	8.00				V
15+15	3.4342	7.87				V
15+20	3.4878	7.78				V
15+25	3.5402	7.61				V
15+30	3.5916	7.46				V
15+35	3.6416	7.26				V
15+40	3.6875	6.66				V
15+45	3.7295	6.09				V
15+50	3.7698	5.85				V
15+55	3.8092	5.72				V
16+ 0	3.8480	5.64				V
16+ 5	3.8840	5.23				V
16+10	3.9093	3.68				V
16+15	3.9243	2.17				V
16+20	3.9348	1.52				V
16+25	3.9428	1.16				V
16+30	3.9490	0.91				V
16+35	3.9540	0.72				V
16+40	3.9580	0.58				V
16+45	3.9611	0.45				V
16+50	3.9636	0.37				V
16+55	3.9658	0.31				V
17+ 0	3.9675	0.26				V
17+ 5	3.9691	0.23				V
17+10	3.9707	0.23				V
17+15	3.9722	0.21				V
17+20	3.9737	0.23				V
17+25	3.9753	0.23				V
17+30	3.9769	0.23				V
17+35	3.9786	0.24				V
17+40	3.9802	0.24				V
17+45	3.9819	0.24				V
17+50	3.9835	0.24				V
17+55	3.9851	0.23				V
18+ 0	3.9865	0.21				V
18+ 5	3.9880	0.21				V
18+10	3.9894	0.21				V
18+15	3.9908	0.20				V
18+20	3.9922	0.20				V
18+25	3.9936	0.20				V
18+30	3.9950	0.20				V
18+35	3.9963	0.20				V
18+40	3.9976	0.18				V
18+45	3.9987	0.17				V
18+50	3.9998	0.16				V
18+55	4.0007	0.14				V
19+ 0	4.0016	0.12				V
19+ 5	4.0024	0.12				V
19+10	4.0033	0.13				V
19+15	4.0043	0.14				V
19+20	4.0053	0.15				V
19+25	4.0064	0.16				V
19+30	4.0076	0.18				V
19+35	4.0088	0.18				V
19+40	4.0100	0.17				V
19+45	4.0111	0.16				V
19+50	4.0121	0.15				V
19+55	4.0131	0.13				V

20+ 0	4.0139	0.12	Q	V
20+ 5	4.0147	0.12	Q	V
20+10	4.0156	0.13	Q	V
20+15	4.0165	0.14	Q	V
20+20	4.0175	0.14	Q	V
20+25	4.0185	0.14	Q	V
20+30	4.0195	0.15	Q	V
20+35	4.0205	0.15	Q	V
20+40	4.0215	0.15	Q	V
20+45	4.0225	0.15	Q	V
20+50	4.0235	0.14	Q	V
20+55	4.0244	0.13	Q	V
21+ 0	4.0252	0.12	Q	V
21+ 5	4.0260	0.11	Q	V
21+10	4.0268	0.12	Q	V
21+15	4.0278	0.14	Q	V
21+20	4.0287	0.14	Q	V
21+25	4.0296	0.13	Q	V
21+30	4.0303	0.11	Q	V
21+35	4.0311	0.11	Q	V
21+40	4.0320	0.12	Q	V
21+45	4.0329	0.14	Q	V
21+50	4.0338	0.14	Q	V
21+55	4.0347	0.12	Q	V
22+ 0	4.0355	0.11	Q	V
22+ 5	4.0362	0.11	Q	V
22+10	4.0371	0.12	Q	V
22+15	4.0380	0.14	Q	V
22+20	4.0389	0.14	Q	V
22+25	4.0398	0.12	Q	V
22+30	4.0406	0.11	Q	V
22+35	4.0413	0.11	Q	V
22+40	4.0420	0.10	Q	V
22+45	4.0427	0.10	Q	V
22+50	4.0434	0.10	Q	V
22+55	4.0441	0.10	Q	V
23+ 0	4.0448	0.10	Q	V
23+ 5	4.0455	0.10	Q	V
23+10	4.0462	0.10	Q	V
23+15	4.0469	0.10	Q	V
23+20	4.0476	0.10	Q	V
23+25	4.0482	0.10	Q	V
23+30	4.0489	0.10	Q	V
23+35	4.0496	0.10	Q	V
23+40	4.0503	0.10	Q	V
23+45	4.0510	0.10	Q	V
23+50	4.0516	0.10	Q	V
23+55	4.0523	0.10	Q	V
24+ 0	4.0530	0.10	Q	V
24+ 5	4.0536	0.09	Q	V
24+10	4.0541	0.06	Q	V
24+15	4.0543	0.04	Q	V
24+20	4.0545	0.02	Q	V
24+25	4.0546	0.02	Q	V
24+30	4.0547	0.01	Q	V
24+35	4.0548	0.01	Q	V
24+40	4.0548	0.01	Q	V
24+45	4.0548	0.01	Q	V
24+50	4.0549	0.00	Q	V
24+55	4.0549	0.00	Q	V

25+ 0	4.0549	0.00	Q				v
25+ 5	4.0549	0.00	Q				v
25+10	4.0549	0.00	Q				v

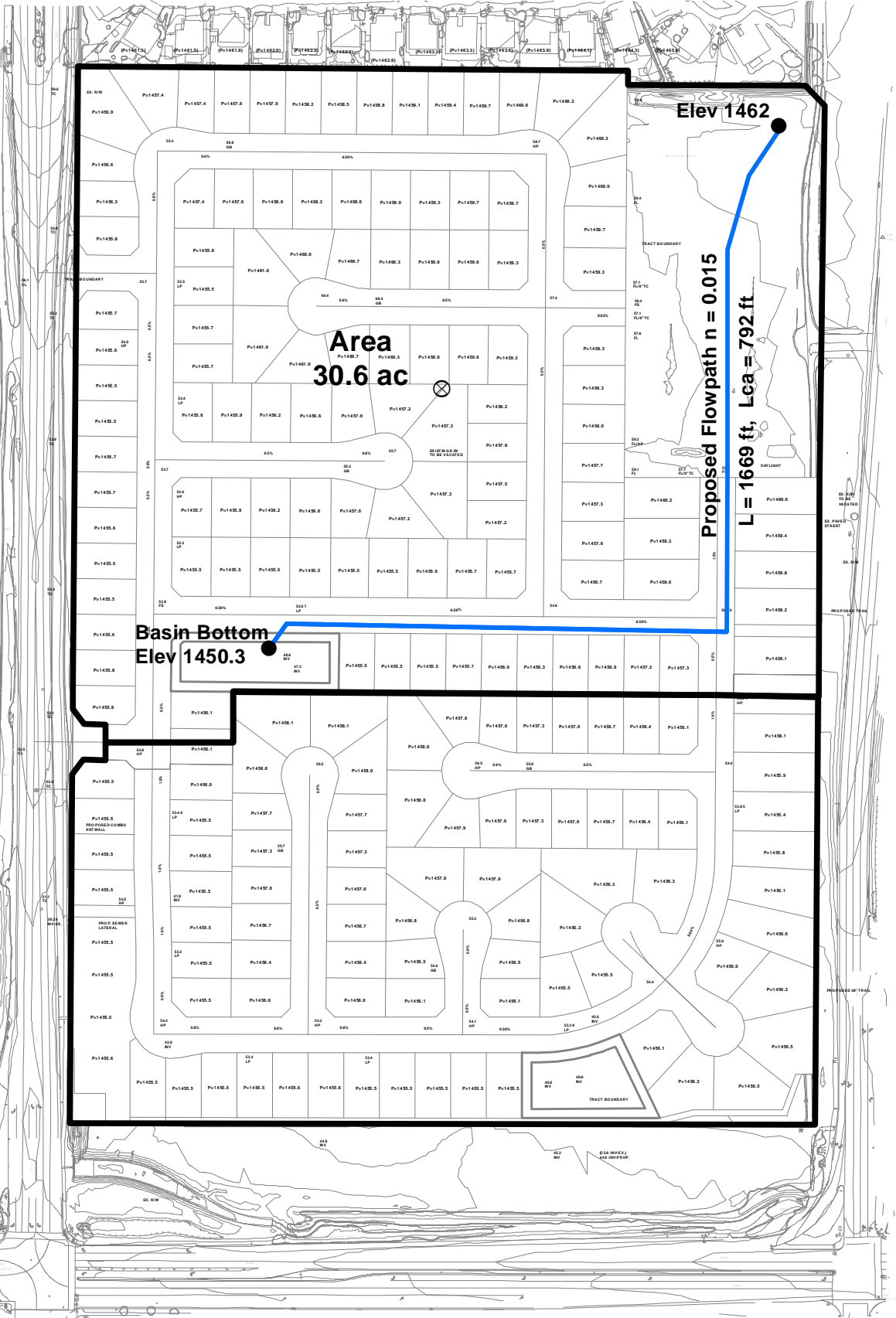
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*Appendix*

**E**

**PROPOSED CONDITION  
UNIT HYDROGRAPH CALCULATIONS**

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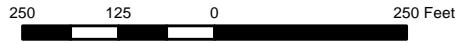


Elev 1462

Area  
30.6 ac

Proposed Flowpath  $n = 0.015$   
 $L = 1669 \text{ ft}$ ,  $L_{ca} = 792 \text{ ft}$

Basin Bottom  
Elev 1450.3



Stratford Ranch  
Unit Hydrograph Map  
Proposed Condition

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2004, Version 7.0  
Study date 06/14/21 File: P100242.out

+++++  
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Riverside County Synthetic Unit Hydrology Method  
RCFC & WCD Manual date - April 1978

Program License Serial Number 6062

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English (in-lb) Input Units Used  
English Rainfall Data (Inches) Input Values Used  
  
English Units used in output format

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2-Year 24-Hour Storm  
Proposed

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Drainage Area = 30.60(Ac.) = 0.048 Sq. Mi.  
Drainage Area for Depth-Area Areal Adjustment = 30.60(Ac.) = 0.048 Sq. Mi.  
Length along longest watercourse = 1669.00(Ft.)  
Length along longest watercourse measured to centroid = 792.00(Ft.)  
Length along longest watercourse = 0.316 Mi.  
Length along longest watercourse measured to centroid = 0.150 Mi.  
Difference in elevation = 11.70(Ft.)  
Slope along watercourse = 37.0138 Ft./Mi.  
Average Manning's 'N' = 0.015  
Lag time = 0.057 Hr.  
Lag time = 3.41 Min.  
25% of lag time = 0.85 Min.  
40% of lag time = 1.37 Min.  
Unit time = 5.00 Min.  
Duration of storm = 24 Hour(s)  
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	1.60	48.96

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	4.00	122.40

STORM EVENT (YEAR) = 2.00  
 Area Averaged 2-Year Rainfall = 1.600(In)  
 Area Averaged 100-Year Rainfall = 4.000(In)

Point rain (area averaged) = 1.600(In)  
 Areal adjustment factor = 99.99 %  
 Adjusted average point rain = 1.600(In)

Sub-Area Data:

Area(Ac.)                  Runoff Index          Impervious %  
 30.600                      69.00                      0.500  
 Total Area Entered = 30.60(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	49.8	0.574	0.500	0.316	1.000	0.316
						Sum (F) = 0.316

Area averaged mean soil loss (F) (In/Hr) = 0.316  
 Minimum soil loss rate ((In/Hr)) = 0.158  
 (for 24 hour storm duration)  
 Soil low loss rate (decimal) = 0.500

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 U n i t   H y d r o g r a p h  
 VALLEY S-Curve  
 -----

Unit Hydrograph Data  
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Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	146.439	9.962
2	0.167	292.879	14.577
3	0.250	439.318	3.514
4	0.333	585.758	1.540
5	0.417	732.197	0.794
6	0.500	878.637	0.453
		Sum = 100.000	Sum= 30.839

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)	
			Max	Low		
1	0.08	0.07	0.013	0.560	0.006	0.01
2	0.17	0.07	0.013	0.557	0.006	0.01
3	0.25	0.07	0.013	0.555	0.006	0.01
4	0.33	0.10	0.019	0.553	0.010	0.01
5	0.42	0.10	0.019	0.551	0.010	0.01
6	0.50	0.10	0.019	0.549	0.010	0.01
7	0.58	0.10	0.019	0.547	0.010	0.01
8	0.67	0.10	0.019	0.545	0.010	0.01
9	0.75	0.10	0.019	0.542	0.010	0.01
10	0.83	0.13	0.026	0.540	0.013	0.01
11	0.92	0.13	0.026	0.538	0.013	0.01
12	1.00	0.13	0.026	0.536	0.013	0.01
13	1.08	0.10	0.019	0.534	0.010	0.01
14	1.17	0.10	0.019	0.532	0.010	0.01
15	1.25	0.10	0.019	0.530	0.010	0.01
16	1.33	0.10	0.019	0.528	0.010	0.01

17	1.42	0.10	0.019	0.525	0.010	0.01
18	1.50	0.10	0.019	0.523	0.010	0.01
19	1.58	0.10	0.019	0.521	0.010	0.01
20	1.67	0.10	0.019	0.519	0.010	0.01
21	1.75	0.10	0.019	0.517	0.010	0.01
22	1.83	0.13	0.026	0.515	0.013	0.01
23	1.92	0.13	0.026	0.513	0.013	0.01
24	2.00	0.13	0.026	0.511	0.013	0.01
25	2.08	0.13	0.026	0.509	0.013	0.01
26	2.17	0.13	0.026	0.507	0.013	0.01
27	2.25	0.13	0.026	0.505	0.013	0.01
28	2.33	0.13	0.026	0.503	0.013	0.01
29	2.42	0.13	0.026	0.501	0.013	0.01
30	2.50	0.13	0.026	0.499	0.013	0.01
31	2.58	0.17	0.032	0.497	0.016	0.02
32	2.67	0.17	0.032	0.494	0.016	0.02
33	2.75	0.17	0.032	0.492	0.016	0.02
34	2.83	0.17	0.032	0.490	0.016	0.02
35	2.92	0.17	0.032	0.488	0.016	0.02
36	3.00	0.17	0.032	0.486	0.016	0.02
37	3.08	0.17	0.032	0.484	0.016	0.02
38	3.17	0.17	0.032	0.482	0.016	0.02
39	3.25	0.17	0.032	0.480	0.016	0.02
40	3.33	0.17	0.032	0.478	0.016	0.02
41	3.42	0.17	0.032	0.476	0.016	0.02
42	3.50	0.17	0.032	0.474	0.016	0.02
43	3.58	0.17	0.032	0.472	0.016	0.02
44	3.67	0.17	0.032	0.470	0.016	0.02
45	3.75	0.17	0.032	0.468	0.016	0.02
46	3.83	0.20	0.038	0.466	0.019	0.02
47	3.92	0.20	0.038	0.464	0.019	0.02
48	4.00	0.20	0.038	0.463	0.019	0.02
49	4.08	0.20	0.038	0.461	0.019	0.02
50	4.17	0.20	0.038	0.459	0.019	0.02
51	4.25	0.20	0.038	0.457	0.019	0.02
52	4.33	0.23	0.045	0.455	0.022	0.02
53	4.42	0.23	0.045	0.453	0.022	0.02
54	4.50	0.23	0.045	0.451	0.022	0.02
55	4.58	0.23	0.045	0.449	0.022	0.02
56	4.67	0.23	0.045	0.447	0.022	0.02
57	4.75	0.23	0.045	0.445	0.022	0.02
58	4.83	0.27	0.051	0.443	0.026	0.03
59	4.92	0.27	0.051	0.441	0.026	0.03
60	5.00	0.27	0.051	0.439	0.026	0.03
61	5.08	0.20	0.038	0.437	0.019	0.02
62	5.17	0.20	0.038	0.435	0.019	0.02
63	5.25	0.20	0.038	0.434	0.019	0.02
64	5.33	0.23	0.045	0.432	0.022	0.02
65	5.42	0.23	0.045	0.430	0.022	0.02
66	5.50	0.23	0.045	0.428	0.022	0.02
67	5.58	0.27	0.051	0.426	0.026	0.03
68	5.67	0.27	0.051	0.424	0.026	0.03
69	5.75	0.27	0.051	0.422	0.026	0.03
70	5.83	0.27	0.051	0.420	0.026	0.03
71	5.92	0.27	0.051	0.419	0.026	0.03
72	6.00	0.27	0.051	0.417	0.026	0.03
73	6.08	0.30	0.058	0.415	0.029	0.03
74	6.17	0.30	0.058	0.413	0.029	0.03
75	6.25	0.30	0.058	0.411	0.029	0.03
76	6.33	0.30	0.058	0.409	0.029	0.03

77	6.42	0.30	0.058	0.407	0.029	0.03
78	6.50	0.30	0.058	0.406	0.029	0.03
79	6.58	0.33	0.064	0.404	0.032	0.03
80	6.67	0.33	0.064	0.402	0.032	0.03
81	6.75	0.33	0.064	0.400	0.032	0.03
82	6.83	0.33	0.064	0.398	0.032	0.03
83	6.92	0.33	0.064	0.397	0.032	0.03
84	7.00	0.33	0.064	0.395	0.032	0.03
85	7.08	0.33	0.064	0.393	0.032	0.03
86	7.17	0.33	0.064	0.391	0.032	0.03
87	7.25	0.33	0.064	0.389	0.032	0.03
88	7.33	0.37	0.070	0.388	0.035	0.04
89	7.42	0.37	0.070	0.386	0.035	0.04
90	7.50	0.37	0.070	0.384	0.035	0.04
91	7.58	0.40	0.077	0.382	0.038	0.04
92	7.67	0.40	0.077	0.381	0.038	0.04
93	7.75	0.40	0.077	0.379	0.038	0.04
94	7.83	0.43	0.083	0.377	0.042	0.04
95	7.92	0.43	0.083	0.375	0.042	0.04
96	8.00	0.43	0.083	0.374	0.042	0.04
97	8.08	0.50	0.096	0.372	0.048	0.05
98	8.17	0.50	0.096	0.370	0.048	0.05
99	8.25	0.50	0.096	0.368	0.048	0.05
100	8.33	0.50	0.096	0.367	0.048	0.05
101	8.42	0.50	0.096	0.365	0.048	0.05
102	8.50	0.50	0.096	0.363	0.048	0.05
103	8.58	0.53	0.102	0.362	0.051	0.05
104	8.67	0.53	0.102	0.360	0.051	0.05
105	8.75	0.53	0.102	0.358	0.051	0.05
106	8.83	0.57	0.109	0.356	0.054	0.05
107	8.92	0.57	0.109	0.355	0.054	0.05
108	9.00	0.57	0.109	0.353	0.054	0.05
109	9.08	0.63	0.122	0.351	0.061	0.06
110	9.17	0.63	0.122	0.350	0.061	0.06
111	9.25	0.63	0.122	0.348	0.061	0.06
112	9.33	0.67	0.128	0.346	0.064	0.06
113	9.42	0.67	0.128	0.345	0.064	0.06
114	9.50	0.67	0.128	0.343	0.064	0.06
115	9.58	0.70	0.134	0.341	0.067	0.07
116	9.67	0.70	0.134	0.340	0.067	0.07
117	9.75	0.70	0.134	0.338	0.067	0.07
118	9.83	0.73	0.141	0.337	0.070	0.07
119	9.92	0.73	0.141	0.335	0.070	0.07
120	10.00	0.73	0.141	0.333	0.070	0.07
121	10.08	0.50	0.096	0.332	0.048	0.05
122	10.17	0.50	0.096	0.330	0.048	0.05
123	10.25	0.50	0.096	0.329	0.048	0.05
124	10.33	0.50	0.096	0.327	0.048	0.05
125	10.42	0.50	0.096	0.325	0.048	0.05
126	10.50	0.50	0.096	0.324	0.048	0.05
127	10.58	0.67	0.128	0.322	0.064	0.06
128	10.67	0.67	0.128	0.321	0.064	0.06
129	10.75	0.67	0.128	0.319	0.064	0.06
130	10.83	0.67	0.128	0.317	0.064	0.06
131	10.92	0.67	0.128	0.316	0.064	0.06
132	11.00	0.67	0.128	0.314	0.064	0.06
133	11.08	0.63	0.122	0.313	0.061	0.06
134	11.17	0.63	0.122	0.311	0.061	0.06
135	11.25	0.63	0.122	0.310	0.061	0.06
136	11.33	0.63	0.122	0.308	0.061	0.06

137	11.42	0.63	0.122	0.307	0.061	0.06
138	11.50	0.63	0.122	0.305	0.061	0.06
139	11.58	0.57	0.109	0.304	0.054	0.05
140	11.67	0.57	0.109	0.302	0.054	0.05
141	11.75	0.57	0.109	0.301	0.054	0.05
142	11.83	0.60	0.115	0.299	0.058	0.06
143	11.92	0.60	0.115	0.298	0.058	0.06
144	12.00	0.60	0.115	0.296	0.058	0.06
145	12.08	0.83	0.160	0.295	0.080	0.08
146	12.17	0.83	0.160	0.293	0.080	0.08
147	12.25	0.83	0.160	0.292	0.080	0.08
148	12.33	0.87	0.166	0.290	0.083	0.08
149	12.42	0.87	0.166	0.289	0.083	0.08
150	12.50	0.87	0.166	0.287	0.083	0.08
151	12.58	0.93	0.179	0.286	0.090	0.09
152	12.67	0.93	0.179	0.284	0.090	0.09
153	12.75	0.93	0.179	0.283	0.090	0.09
154	12.83	0.97	0.186	0.282	0.093	0.09
155	12.92	0.97	0.186	0.280	0.093	0.09
156	13.00	0.97	0.186	0.279	0.093	0.09
157	13.08	1.13	0.218	0.277	0.109	0.11
158	13.17	1.13	0.218	0.276	0.109	0.11
159	13.25	1.13	0.218	0.275	0.109	0.11
160	13.33	1.13	0.218	0.273	0.109	0.11
161	13.42	1.13	0.218	0.272	0.109	0.11
162	13.50	1.13	0.218	0.270	0.109	0.11
163	13.58	0.77	0.147	0.269	0.074	0.07
164	13.67	0.77	0.147	0.268	0.074	0.07
165	13.75	0.77	0.147	0.266	0.074	0.07
166	13.83	0.77	0.147	0.265	0.074	0.07
167	13.92	0.77	0.147	0.264	0.074	0.07
168	14.00	0.77	0.147	0.262	0.074	0.07
169	14.08	0.90	0.173	0.261	0.086	0.09
170	14.17	0.90	0.173	0.260	0.086	0.09
171	14.25	0.90	0.173	0.258	0.086	0.09
172	14.33	0.87	0.166	0.257	0.083	0.08
173	14.42	0.87	0.166	0.256	0.083	0.08
174	14.50	0.87	0.166	0.254	0.083	0.08
175	14.58	0.87	0.166	0.253	0.083	0.08
176	14.67	0.87	0.166	0.252	0.083	0.08
177	14.75	0.87	0.166	0.250	0.083	0.08
178	14.83	0.83	0.160	0.249	0.080	0.08
179	14.92	0.83	0.160	0.248	0.080	0.08
180	15.00	0.83	0.160	0.247	0.080	0.08
181	15.08	0.80	0.154	0.245	0.077	0.08
182	15.17	0.80	0.154	0.244	0.077	0.08
183	15.25	0.80	0.154	0.243	0.077	0.08
184	15.33	0.77	0.147	0.242	0.074	0.07
185	15.42	0.77	0.147	0.240	0.074	0.07
186	15.50	0.77	0.147	0.239	0.074	0.07
187	15.58	0.63	0.122	0.238	0.061	0.06
188	15.67	0.63	0.122	0.237	0.061	0.06
189	15.75	0.63	0.122	0.235	0.061	0.06
190	15.83	0.63	0.122	0.234	0.061	0.06
191	15.92	0.63	0.122	0.233	0.061	0.06
192	16.00	0.63	0.122	0.232	0.061	0.06
193	16.08	0.13	0.026	0.231	0.013	0.01
194	16.17	0.13	0.026	0.229	0.013	0.01
195	16.25	0.13	0.026	0.228	0.013	0.01
196	16.33	0.13	0.026	0.227	0.013	0.01

197	16.42	0.13	0.026	0.226	0.013	0.01
198	16.50	0.13	0.026	0.225	0.013	0.01
199	16.58	0.10	0.019	0.224	0.010	0.01
200	16.67	0.10	0.019	0.223	0.010	0.01
201	16.75	0.10	0.019	0.221	0.010	0.01
202	16.83	0.10	0.019	0.220	0.010	0.01
203	16.92	0.10	0.019	0.219	0.010	0.01
204	17.00	0.10	0.019	0.218	0.010	0.01
205	17.08	0.17	0.032	0.217	0.016	0.02
206	17.17	0.17	0.032	0.216	0.016	0.02
207	17.25	0.17	0.032	0.215	0.016	0.02
208	17.33	0.17	0.032	0.214	0.016	0.02
209	17.42	0.17	0.032	0.213	0.016	0.02
210	17.50	0.17	0.032	0.212	0.016	0.02
211	17.58	0.17	0.032	0.211	0.016	0.02
212	17.67	0.17	0.032	0.209	0.016	0.02
213	17.75	0.17	0.032	0.208	0.016	0.02
214	17.83	0.13	0.026	0.207	0.013	0.01
215	17.92	0.13	0.026	0.206	0.013	0.01
216	18.00	0.13	0.026	0.205	0.013	0.01
217	18.08	0.13	0.026	0.204	0.013	0.01
218	18.17	0.13	0.026	0.203	0.013	0.01
219	18.25	0.13	0.026	0.202	0.013	0.01
220	18.33	0.13	0.026	0.201	0.013	0.01
221	18.42	0.13	0.026	0.200	0.013	0.01
222	18.50	0.13	0.026	0.199	0.013	0.01
223	18.58	0.10	0.019	0.198	0.010	0.01
224	18.67	0.10	0.019	0.197	0.010	0.01
225	18.75	0.10	0.019	0.197	0.010	0.01
226	18.83	0.07	0.013	0.196	0.006	0.01
227	18.92	0.07	0.013	0.195	0.006	0.01
228	19.00	0.07	0.013	0.194	0.006	0.01
229	19.08	0.10	0.019	0.193	0.010	0.01
230	19.17	0.10	0.019	0.192	0.010	0.01
231	19.25	0.10	0.019	0.191	0.010	0.01
232	19.33	0.13	0.026	0.190	0.013	0.01
233	19.42	0.13	0.026	0.189	0.013	0.01
234	19.50	0.13	0.026	0.188	0.013	0.01
235	19.58	0.10	0.019	0.187	0.010	0.01
236	19.67	0.10	0.019	0.187	0.010	0.01
237	19.75	0.10	0.019	0.186	0.010	0.01
238	19.83	0.07	0.013	0.185	0.006	0.01
239	19.92	0.07	0.013	0.184	0.006	0.01
240	20.00	0.07	0.013	0.183	0.006	0.01
241	20.08	0.10	0.019	0.182	0.010	0.01
242	20.17	0.10	0.019	0.182	0.010	0.01
243	20.25	0.10	0.019	0.181	0.010	0.01
244	20.33	0.10	0.019	0.180	0.010	0.01
245	20.42	0.10	0.019	0.179	0.010	0.01
246	20.50	0.10	0.019	0.179	0.010	0.01
247	20.58	0.10	0.019	0.178	0.010	0.01
248	20.67	0.10	0.019	0.177	0.010	0.01
249	20.75	0.10	0.019	0.176	0.010	0.01
250	20.83	0.07	0.013	0.176	0.006	0.01
251	20.92	0.07	0.013	0.175	0.006	0.01
252	21.00	0.07	0.013	0.174	0.006	0.01
253	21.08	0.10	0.019	0.174	0.010	0.01
254	21.17	0.10	0.019	0.173	0.010	0.01
255	21.25	0.10	0.019	0.172	0.010	0.01
256	21.33	0.07	0.013	0.172	0.006	0.01

257	21.42	0.07	0.013	0.171	0.006	0.01
258	21.50	0.07	0.013	0.170	0.006	0.01
259	21.58	0.10	0.019	0.170	0.010	0.01
260	21.67	0.10	0.019	0.169	0.010	0.01
261	21.75	0.10	0.019	0.168	0.010	0.01
262	21.83	0.07	0.013	0.168	0.006	0.01
263	21.92	0.07	0.013	0.167	0.006	0.01
264	22.00	0.07	0.013	0.167	0.006	0.01
265	22.08	0.10	0.019	0.166	0.010	0.01
266	22.17	0.10	0.019	0.166	0.010	0.01
267	22.25	0.10	0.019	0.165	0.010	0.01
268	22.33	0.07	0.013	0.165	0.006	0.01
269	22.42	0.07	0.013	0.164	0.006	0.01
270	22.50	0.07	0.013	0.164	0.006	0.01
271	22.58	0.07	0.013	0.163	0.006	0.01
272	22.67	0.07	0.013	0.163	0.006	0.01
273	22.75	0.07	0.013	0.162	0.006	0.01
274	22.83	0.07	0.013	0.162	0.006	0.01
275	22.92	0.07	0.013	0.161	0.006	0.01
276	23.00	0.07	0.013	0.161	0.006	0.01
277	23.08	0.07	0.013	0.161	0.006	0.01
278	23.17	0.07	0.013	0.160	0.006	0.01
279	23.25	0.07	0.013	0.160	0.006	0.01
280	23.33	0.07	0.013	0.160	0.006	0.01
281	23.42	0.07	0.013	0.159	0.006	0.01
282	23.50	0.07	0.013	0.159	0.006	0.01
283	23.58	0.07	0.013	0.159	0.006	0.01
284	23.67	0.07	0.013	0.158	0.006	0.01
285	23.75	0.07	0.013	0.158	0.006	0.01
286	23.83	0.07	0.013	0.158	0.006	0.01
287	23.92	0.07	0.013	0.158	0.006	0.01
288	24.00	0.07	0.013	0.158	0.006	0.01

Sum = 100.0 Sum = 9.6

Flood volume = Effective rainfall 0.80(In)  
times area 30.6(Ac.)/[(In)/(Ft.)] = 2.0(Ac.Ft)  
Total soil loss = 0.80(In)  
Total soil loss = 2.040(Ac.Ft)  
Total rainfall = 1.60(In)  
Flood volume = 88857.1 Cubic Feet  
Total soil loss = 88857.1 Cubic Feet

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Peak flow rate of this hydrograph = 3.357(CFS)  
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24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))  
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Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0004	0.06	Q				
0+10	0.0015	0.16	Q				
0+15	0.0028	0.18	Q				
0+20	0.0043	0.22	Q				
0+25	0.0062	0.27	VQ				
0+30	0.0081	0.29	VQ				
0+35	0.0102	0.29	VQ				
0+40	0.0122	0.29	VQ				

0+45	0.0142	0.30	VQ
0+50	0.0165	0.33	VQ
0+55	0.0191	0.37	VQ
1+ 0	0.0217	0.39	VQ
1+ 5	0.0242	0.36	VQ
1+10	0.0264	0.31	VQ
1+15	0.0285	0.31	VQ
1+20	0.0305	0.30	VQ
1+25	0.0326	0.30	VQ
1+30	0.0346	0.30	VQ
1+35	0.0367	0.30	VQ
1+40	0.0387	0.30	VQ
1+45	0.0407	0.30	VQ
1+50	0.0430	0.33	VQ
1+55	0.0456	0.37	VQ
2+ 0	0.0482	0.39	VQ
2+ 5	0.0509	0.39	VQ
2+10	0.0536	0.39	Q
2+15	0.0564	0.39	Q
2+20	0.0591	0.39	Q
2+25	0.0618	0.39	Q
2+30	0.0645	0.39	Q
2+35	0.0675	0.43	Q
2+40	0.0707	0.47	Q
2+45	0.0741	0.48	Q
2+50	0.0774	0.49	Q
2+55	0.0808	0.49	Q
3+ 0	0.0842	0.49	Q
3+ 5	0.0876	0.49	Q
3+10	0.0910	0.49	Q
3+15	0.0944	0.49	Q
3+20	0.0978	0.49	Q
3+25	0.1012	0.49	Q
3+30	0.1046	0.49	QV
3+35	0.1080	0.49	QV
3+40	0.1114	0.49	QV
3+45	0.1148	0.49	QV
3+50	0.1184	0.53	Q
3+55	0.1224	0.57	Q
4+ 0	0.1264	0.58	Q
4+ 5	0.1305	0.59	Q
4+10	0.1345	0.59	Q
4+15	0.1386	0.59	Q
4+20	0.1429	0.62	Q
4+25	0.1475	0.67	Q
4+30	0.1522	0.68	Q
4+35	0.1570	0.69	QV
4+40	0.1617	0.69	QV
4+45	0.1665	0.69	QV
4+50	0.1714	0.72	QV
4+55	0.1767	0.77	Q
5+ 0	0.1821	0.78	Q
5+ 5	0.1871	0.72	QV
5+10	0.1914	0.63	QV
5+15	0.1956	0.61	QV
5+20	0.2000	0.63	QV
5+25	0.2046	0.67	Q V
5+30	0.2093	0.68	Q V
5+35	0.2143	0.72	Q V
5+40	0.2196	0.77	QV

5+45	0.2250	0.78	QV			
5+50	0.2304	0.79	QV			
5+55	0.2358	0.79	QV			
6+ 0	0.2412	0.79	QV			
6+ 5	0.2469	0.82	QV			
6+10	0.2529	0.87	QV			
6+15	0.2589	0.88	Q V			
6+20	0.2650	0.88	Q V			
6+25	0.2711	0.89	Q V			
6+30	0.2773	0.89	Q V			
6+35	0.2836	0.92	Q V			
6+40	0.2903	0.97	Q V			
6+45	0.2970	0.98	Q V			
6+50	0.3038	0.98	Q V			
6+55	0.3106	0.99	Q V			
7+ 0	0.3174	0.99	Q V			
7+ 5	0.3242	0.99	Q V			
7+10	0.3310	0.99	Q V			
7+15	0.3378	0.99	Q V			
7+20	0.3448	1.02	Q V			
7+25	0.3521	1.07	Q V			
7+30	0.3595	1.08	Q V			
7+35	0.3672	1.11	Q V			
7+40	0.3752	1.16	Q V			
7+45	0.3833	1.18	Q V			
7+50	0.3917	1.21	Q V			
7+55	0.4004	1.26	Q V			
8+ 0	0.4091	1.27	Q V			
8+ 5	0.4184	1.34	Q V			
8+10	0.4283	1.44	Q V			
8+15	0.4384	1.46	Q V			
8+20	0.4485	1.47	Q V			
8+25	0.4587	1.48	Q V			
8+30	0.4689	1.48	Q V			
8+35	0.4793	1.51	Q V			
8+40	0.4901	1.56	Q V			
8+45	0.5009	1.57	Q V			
8+50	0.5119	1.61	Q V			
8+55	0.5234	1.66	Q V			
9+ 0	0.5349	1.67	Q V			
9+ 5	0.5468	1.74	Q V			
9+10	0.5595	1.83	Q V			
9+15	0.5723	1.86	Q V			
9+20	0.5853	1.90	Q V			
9+25	0.5988	1.95	Q V			
9+30	0.6123	1.97	Q V			
9+35	0.6261	2.00	Q V			
9+40	0.6402	2.05	Q V			
9+45	0.6545	2.06	Q V			
9+50	0.6689	2.10	Q V			
9+55	0.6837	2.15	Q V			
10+ 0	0.6986	2.16	Q V			
10+ 5	0.7120	1.94	Q V			
10+10	0.7232	1.62	Q V			
10+15	0.7338	1.54	Q V			
10+20	0.7442	1.51	Q V			
10+25	0.7545	1.49	Q V			
10+30	0.7647	1.48	Q V			
10+35	0.7760	1.64	Q V			
10+40	0.7889	1.87	Q V			

10+45	0.8022	1.93	Q	V		
10+50	0.8156	1.95	Q	V		
10+55	0.8292	1.97	Q	V		
11+ 0	0.8428	1.97	Q	V		
11+ 5	0.8562	1.94	Q	V		
11+10	0.8692	1.90	Q	V		
11+15	0.8822	1.88	Q	V		
11+20	0.8952	1.88	Q	V		
11+25	0.9081	1.88	Q	V		
11+30	0.9210	1.88	Q	V		
11+35	0.9335	1.81	Q	V		
11+40	0.9453	1.72	Q	V		
11+45	0.9570	1.70	Q	V		
11+50	0.9688	1.72	Q	V		
11+55	0.9810	1.76	Q	V		
12+ 0	0.9931	1.77	Q	V		
12+ 5	1.0069	2.00	Q	V		
12+10	1.0229	2.33	Q	V		
12+15	1.0395	2.41	Q	V		
12+20	1.0565	2.47	Q	V		
12+25	1.0740	2.54	Q	V		
12+30	1.0916	2.56	Q	V		
12+35	1.1097	2.63	Q	V		
12+40	1.1284	2.72	Q	V		
12+45	1.1473	2.75	Q	V		
12+50	1.1665	2.79	Q	V		
12+55	1.1861	2.84	Q	V		
13+ 0	1.2058	2.85	Q	V		
13+ 5	1.2265	3.02	Q	V		
13+10	1.2490	3.25	Q	V		
13+15	1.2718	3.31	Q	V		
13+20	1.2948	3.34	Q	V		
13+25	1.3178	3.35	Q	V		
13+30	1.3409	3.36	Q	V		
13+35	1.3616	3.01	Q	V		
13+40	1.3788	2.49	Q	V		
13+45	1.3951	2.37	Q	V		
13+50	1.4111	2.31	Q	V		
13+55	1.4268	2.29	Q	V		
14+ 0	1.4425	2.27	Q	V		
14+ 5	1.4590	2.40	Q	V		
14+10	1.4768	2.59	Q	V		
14+15	1.4949	2.63	Q	V		
14+20	1.5129	2.62	Q	V		
14+25	1.5307	2.58	Q	V		
14+30	1.5484	2.58	Q	V		
14+35	1.5661	2.57	Q	V		
14+40	1.5838	2.57	Q	V		
14+45	1.6015	2.57	Q	V		
14+50	1.6190	2.54	Q	V		
14+55	1.6361	2.49	Q	V		
15+ 0	1.6532	2.48	Q	V		
15+ 5	1.6700	2.44	Q	V		
15+10	1.6864	2.39	Q	V		
15+15	1.7028	2.38	Q	V		
15+20	1.7190	2.34	Q	V		
15+25	1.7347	2.29	Q	V		
15+30	1.7504	2.28	Q	V		
15+35	1.7652	2.15	Q	V		
15+40	1.7787	1.96	Q	V		

15+45	1.7919	1.91		Q		V
15+50	1.8049	1.89		Q		V
15+55	1.8179	1.88		Q		V
16+ 0	1.8308	1.88		Q		V
16+ 5	1.8404	1.40		Q		V
16+10	1.8452	0.70	Q			V
16+15	1.8489	0.53	Q			V
16+20	1.8520	0.45	Q			V
16+25	1.8549	0.42	Q			V
16+30	1.8576	0.39	Q			V
16+35	1.8601	0.36	Q			V
16+40	1.8623	0.32	Q			V
16+45	1.8644	0.31	Q			V
16+50	1.8664	0.30	Q			V
16+55	1.8685	0.30	Q			V
17+ 0	1.8705	0.30	Q			V
17+ 5	1.8730	0.36	Q			V
17+10	1.8761	0.45	Q			V
17+15	1.8794	0.48	Q			V
17+20	1.8827	0.49	Q			V
17+25	1.8861	0.49	Q			V
17+30	1.8895	0.49	Q			V
17+35	1.8929	0.49	Q			V
17+40	1.8963	0.49	Q			V
17+45	1.8997	0.49	Q			V
17+50	1.9029	0.46	Q			V
17+55	1.9058	0.42	Q			V
18+ 0	1.9085	0.40	Q			V
18+ 5	1.9113	0.40	Q			V
18+10	1.9140	0.40	Q			V
18+15	1.9167	0.39	Q			V
18+20	1.9195	0.39	Q			V
18+25	1.9222	0.39	Q			V
18+30	1.9249	0.39	Q			V
18+35	1.9274	0.36	Q			V
18+40	1.9296	0.32	Q			V
18+45	1.9317	0.31	Q			V
18+50	1.9335	0.27	Q			V
18+55	1.9350	0.22	Q			V
19+ 0	1.9365	0.21	Q			V
19+ 5	1.9381	0.23	Q			V
19+10	1.9400	0.28	Q			V
19+15	1.9419	0.29	Q			V
19+20	1.9442	0.32	Q			V
19+25	1.9467	0.37	Q			V
19+30	1.9494	0.39	Q			V
19+35	1.9519	0.36	Q			V
19+40	1.9540	0.31	Q			V
19+45	1.9562	0.31	Q			V
19+50	1.9580	0.27	Q			V
19+55	1.9595	0.22	Q			V
20+ 0	1.9609	0.21	Q			V
20+ 5	1.9625	0.23	Q			V
20+10	1.9644	0.28	Q			V
20+15	1.9664	0.29	Q			V
20+20	1.9684	0.29	Q			V
20+25	1.9705	0.29	Q			V
20+30	1.9725	0.30	Q			V
20+35	1.9745	0.30	Q			V
20+40	1.9766	0.30	Q			V

20+45	1.9786	0.30	Q	V
20+50	1.9804	0.26	Q	V
20+55	1.9819	0.22	Q	V
21+ 0	1.9834	0.21	Q	V
21+ 5	1.9850	0.23	Q	V
21+10	1.9869	0.28	Q	V
21+15	1.9889	0.29	Q	V
21+20	1.9907	0.26	Q	V
21+25	1.9921	0.22	Q	V
21+30	1.9936	0.21	Q	V
21+35	1.9952	0.23	Q	V
21+40	1.9971	0.28	Q	V
21+45	1.9991	0.29	Q	V
21+50	2.0009	0.26	Q	V
21+55	2.0023	0.22	Q	V
22+ 0	2.0038	0.21	Q	V
22+ 5	2.0054	0.23	Q	V
22+10	2.0073	0.28	Q	V
22+15	2.0093	0.29	Q	V
22+20	2.0111	0.26	Q	V
22+25	2.0125	0.22	Q	V
22+30	2.0140	0.21	Q	V
22+35	2.0154	0.20	Q	V
22+40	2.0167	0.20	Q	V
22+45	2.0181	0.20	Q	V
22+50	2.0194	0.20	Q	V
22+55	2.0208	0.20	Q	V
23+ 0	2.0222	0.20	Q	V
23+ 5	2.0235	0.20	Q	V
23+10	2.0249	0.20	Q	V
23+15	2.0262	0.20	Q	V
23+20	2.0276	0.20	Q	V
23+25	2.0290	0.20	Q	V
23+30	2.0303	0.20	Q	V
23+35	2.0317	0.20	Q	V
23+40	2.0330	0.20	Q	V
23+45	2.0344	0.20	Q	V
23+50	2.0358	0.20	Q	V
23+55	2.0371	0.20	Q	V
24+ 0	2.0385	0.20	Q	V
24+ 5	2.0394	0.13	Q	V
24+10	2.0397	0.04	Q	V
24+15	2.0398	0.02	Q	V
24+20	2.0399	0.01	Q	V
24+25	2.0399	0.00	Q	V

Unit Hydrograph Analysis

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Study date 06/14/21 File: P100245.out

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Riverside County Synthetic Unit Hydrology Method  
RCFC & WCD Manual date - April 1978

Program License Serial Number 6062

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English (in-lb) Input Units Used  
English Rainfall Data (Inches) Input Values Used  
  
English Units used in output format

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5-Year 24-Hour Storm  
Proposed

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Drainage Area = 30.60(Ac.) = 0.048 Sq. Mi.  
Drainage Area for Depth-Area Areal Adjustment = 30.60(Ac.) = 0.048 Sq. Mi.  
Length along longest watercourse = 1669.00(Ft.)  
Length along longest watercourse measured to centroid = 792.00(Ft.)  
Length along longest watercourse = 0.316 Mi.  
Length along longest watercourse measured to centroid = 0.150 Mi.  
Difference in elevation = 11.70(Ft.)  
Slope along watercourse = 37.0138 Ft./Mi.  
Average Manning's 'N' = 0.015  
Lag time = 0.057 Hr.  
Lag time = 3.41 Min.  
25% of lag time = 0.85 Min.  
40% of lag time = 1.37 Min.  
Unit time = 5.00 Min.  
Duration of storm = 24 Hour(s)  
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	1.60	48.96

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	4.00	122.40

STORM EVENT (YEAR) = 5.00  
 Area Averaged 2-Year Rainfall = 1.600(In)  
 Area Averaged 100-Year Rainfall = 4.000(In)

Point rain (area averaged) = 2.162(In)  
 Areal adjustment factor = 99.99 %  
 Adjusted average point rain = 2.162(In)

Sub-Area Data:

Area(Ac.)                  Runoff Index          Impervious %  
 30.600                      69.00                      0.500  
 Total Area Entered =          30.60(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	49.8	0.574	0.500	0.316	1.000	0.316
						Sum (F) = 0.316

Area averaged mean soil loss (F) (In/Hr) = 0.316  
 Minimum soil loss rate ((In/Hr)) = 0.158  
 (for 24 hour storm duration)  
 Soil low loss rate (decimal) = 0.500

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 U n i t   H y d r o g r a p h  
 VALLEY S-Curve  
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Unit Hydrograph Data  
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Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	146.439	9.962
2	0.167	292.879	14.577
3	0.250	439.318	3.514
4	0.333	585.758	1.540
5	0.417	732.197	0.794
6	0.500	878.637	0.453
		Sum = 100.000	Sum= 30.839

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Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
			Max	Low	
1	0.08	0.017	0.560	0.009	0.01
2	0.17	0.017	0.557	0.009	0.01
3	0.25	0.017	0.555	0.009	0.01
4	0.33	0.026	0.553	0.013	0.01
5	0.42	0.026	0.551	0.013	0.01
6	0.50	0.026	0.549	0.013	0.01
7	0.58	0.026	0.547	0.013	0.01
8	0.67	0.026	0.545	0.013	0.01
9	0.75	0.026	0.542	0.013	0.01
10	0.83	0.035	0.540	0.017	0.02
11	0.92	0.035	0.538	0.017	0.02
12	1.00	0.035	0.536	0.017	0.02
13	1.08	0.026	0.534	0.013	0.01
14	1.17	0.026	0.532	0.013	0.01
15	1.25	0.026	0.530	0.013	0.01
16	1.33	0.026	0.528	0.013	0.01

17	1.42	0.10	0.026	0.525	0.013	0.01
18	1.50	0.10	0.026	0.523	0.013	0.01
19	1.58	0.10	0.026	0.521	0.013	0.01
20	1.67	0.10	0.026	0.519	0.013	0.01
21	1.75	0.10	0.026	0.517	0.013	0.01
22	1.83	0.13	0.035	0.515	0.017	0.02
23	1.92	0.13	0.035	0.513	0.017	0.02
24	2.00	0.13	0.035	0.511	0.017	0.02
25	2.08	0.13	0.035	0.509	0.017	0.02
26	2.17	0.13	0.035	0.507	0.017	0.02
27	2.25	0.13	0.035	0.505	0.017	0.02
28	2.33	0.13	0.035	0.503	0.017	0.02
29	2.42	0.13	0.035	0.501	0.017	0.02
30	2.50	0.13	0.035	0.499	0.017	0.02
31	2.58	0.17	0.043	0.497	0.022	0.02
32	2.67	0.17	0.043	0.494	0.022	0.02
33	2.75	0.17	0.043	0.492	0.022	0.02
34	2.83	0.17	0.043	0.490	0.022	0.02
35	2.92	0.17	0.043	0.488	0.022	0.02
36	3.00	0.17	0.043	0.486	0.022	0.02
37	3.08	0.17	0.043	0.484	0.022	0.02
38	3.17	0.17	0.043	0.482	0.022	0.02
39	3.25	0.17	0.043	0.480	0.022	0.02
40	3.33	0.17	0.043	0.478	0.022	0.02
41	3.42	0.17	0.043	0.476	0.022	0.02
42	3.50	0.17	0.043	0.474	0.022	0.02
43	3.58	0.17	0.043	0.472	0.022	0.02
44	3.67	0.17	0.043	0.470	0.022	0.02
45	3.75	0.17	0.043	0.468	0.022	0.02
46	3.83	0.20	0.052	0.466	0.026	0.03
47	3.92	0.20	0.052	0.464	0.026	0.03
48	4.00	0.20	0.052	0.463	0.026	0.03
49	4.08	0.20	0.052	0.461	0.026	0.03
50	4.17	0.20	0.052	0.459	0.026	0.03
51	4.25	0.20	0.052	0.457	0.026	0.03
52	4.33	0.23	0.061	0.455	0.030	0.03
53	4.42	0.23	0.061	0.453	0.030	0.03
54	4.50	0.23	0.061	0.451	0.030	0.03
55	4.58	0.23	0.061	0.449	0.030	0.03
56	4.67	0.23	0.061	0.447	0.030	0.03
57	4.75	0.23	0.061	0.445	0.030	0.03
58	4.83	0.27	0.069	0.443	0.035	0.03
59	4.92	0.27	0.069	0.441	0.035	0.03
60	5.00	0.27	0.069	0.439	0.035	0.03
61	5.08	0.20	0.052	0.437	0.026	0.03
62	5.17	0.20	0.052	0.435	0.026	0.03
63	5.25	0.20	0.052	0.434	0.026	0.03
64	5.33	0.23	0.061	0.432	0.030	0.03
65	5.42	0.23	0.061	0.430	0.030	0.03
66	5.50	0.23	0.061	0.428	0.030	0.03
67	5.58	0.27	0.069	0.426	0.035	0.03
68	5.67	0.27	0.069	0.424	0.035	0.03
69	5.75	0.27	0.069	0.422	0.035	0.03
70	5.83	0.27	0.069	0.420	0.035	0.03
71	5.92	0.27	0.069	0.419	0.035	0.03
72	6.00	0.27	0.069	0.417	0.035	0.03
73	6.08	0.30	0.078	0.415	0.039	0.04
74	6.17	0.30	0.078	0.413	0.039	0.04
75	6.25	0.30	0.078	0.411	0.039	0.04
76	6.33	0.30	0.078	0.409	0.039	0.04

77	6.42	0.30	0.078	0.407	0.039	0.04
78	6.50	0.30	0.078	0.406	0.039	0.04
79	6.58	0.33	0.086	0.404	0.043	0.04
80	6.67	0.33	0.086	0.402	0.043	0.04
81	6.75	0.33	0.086	0.400	0.043	0.04
82	6.83	0.33	0.086	0.398	0.043	0.04
83	6.92	0.33	0.086	0.397	0.043	0.04
84	7.00	0.33	0.086	0.395	0.043	0.04
85	7.08	0.33	0.086	0.393	0.043	0.04
86	7.17	0.33	0.086	0.391	0.043	0.04
87	7.25	0.33	0.086	0.389	0.043	0.04
88	7.33	0.37	0.095	0.388	0.048	0.05
89	7.42	0.37	0.095	0.386	0.048	0.05
90	7.50	0.37	0.095	0.384	0.048	0.05
91	7.58	0.40	0.104	0.382	0.052	0.05
92	7.67	0.40	0.104	0.381	0.052	0.05
93	7.75	0.40	0.104	0.379	0.052	0.05
94	7.83	0.43	0.112	0.377	0.056	0.06
95	7.92	0.43	0.112	0.375	0.056	0.06
96	8.00	0.43	0.112	0.374	0.056	0.06
97	8.08	0.50	0.130	0.372	0.065	0.06
98	8.17	0.50	0.130	0.370	0.065	0.06
99	8.25	0.50	0.130	0.368	0.065	0.06
100	8.33	0.50	0.130	0.367	0.065	0.06
101	8.42	0.50	0.130	0.365	0.065	0.06
102	8.50	0.50	0.130	0.363	0.065	0.06
103	8.58	0.53	0.138	0.362	0.069	0.07
104	8.67	0.53	0.138	0.360	0.069	0.07
105	8.75	0.53	0.138	0.358	0.069	0.07
106	8.83	0.57	0.147	0.356	0.074	0.07
107	8.92	0.57	0.147	0.355	0.074	0.07
108	9.00	0.57	0.147	0.353	0.074	0.07
109	9.08	0.63	0.164	0.351	0.082	0.08
110	9.17	0.63	0.164	0.350	0.082	0.08
111	9.25	0.63	0.164	0.348	0.082	0.08
112	9.33	0.67	0.173	0.346	0.086	0.09
113	9.42	0.67	0.173	0.345	0.086	0.09
114	9.50	0.67	0.173	0.343	0.086	0.09
115	9.58	0.70	0.182	0.341	0.091	0.09
116	9.67	0.70	0.182	0.340	0.091	0.09
117	9.75	0.70	0.182	0.338	0.091	0.09
118	9.83	0.73	0.190	0.337	0.095	0.10
119	9.92	0.73	0.190	0.335	0.095	0.10
120	10.00	0.73	0.190	0.333	0.095	0.10
121	10.08	0.50	0.130	0.332	0.065	0.06
122	10.17	0.50	0.130	0.330	0.065	0.06
123	10.25	0.50	0.130	0.329	0.065	0.06
124	10.33	0.50	0.130	0.327	0.065	0.06
125	10.42	0.50	0.130	0.325	0.065	0.06
126	10.50	0.50	0.130	0.324	0.065	0.06
127	10.58	0.67	0.173	0.322	0.086	0.09
128	10.67	0.67	0.173	0.321	0.086	0.09
129	10.75	0.67	0.173	0.319	0.086	0.09
130	10.83	0.67	0.173	0.317	0.086	0.09
131	10.92	0.67	0.173	0.316	0.086	0.09
132	11.00	0.67	0.173	0.314	0.086	0.09
133	11.08	0.63	0.164	0.313	0.082	0.08
134	11.17	0.63	0.164	0.311	0.082	0.08
135	11.25	0.63	0.164	0.310	0.082	0.08
136	11.33	0.63	0.164	0.308	0.082	0.08

137	11.42	0.63	0.164	0.307	0.082	0.08
138	11.50	0.63	0.164	0.305	0.082	0.08
139	11.58	0.57	0.147	0.304	0.074	0.07
140	11.67	0.57	0.147	0.302	0.074	0.07
141	11.75	0.57	0.147	0.301	0.074	0.07
142	11.83	0.60	0.156	0.299	0.078	0.08
143	11.92	0.60	0.156	0.298	0.078	0.08
144	12.00	0.60	0.156	0.296	0.078	0.08
145	12.08	0.83	0.216	0.295	0.108	0.11
146	12.17	0.83	0.216	0.293	0.108	0.11
147	12.25	0.83	0.216	0.292	0.108	0.11
148	12.33	0.87	0.225	0.290	0.112	0.11
149	12.42	0.87	0.225	0.289	0.112	0.11
150	12.50	0.87	0.225	0.287	0.112	0.11
151	12.58	0.93	0.242	0.286	0.121	0.12
152	12.67	0.93	0.242	0.284	0.121	0.12
153	12.75	0.93	0.242	0.283	0.121	0.12
154	12.83	0.97	0.251	0.282	0.125	0.13
155	12.92	0.97	0.251	0.280	0.125	0.13
156	13.00	0.97	0.251	0.279	0.125	0.13
157	13.08	1.13	0.294	0.277	---	0.02
158	13.17	1.13	0.294	0.276	---	0.02
159	13.25	1.13	0.294	0.275	---	0.02
160	13.33	1.13	0.294	0.273	---	0.02
161	13.42	1.13	0.294	0.272	---	0.02
162	13.50	1.13	0.294	0.270	---	0.02
163	13.58	0.77	0.199	0.269	0.099	0.10
164	13.67	0.77	0.199	0.268	0.099	0.10
165	13.75	0.77	0.199	0.266	0.099	0.10
166	13.83	0.77	0.199	0.265	0.099	0.10
167	13.92	0.77	0.199	0.264	0.099	0.10
168	14.00	0.77	0.199	0.262	0.099	0.10
169	14.08	0.90	0.233	0.261	0.117	0.12
170	14.17	0.90	0.233	0.260	0.117	0.12
171	14.25	0.90	0.233	0.258	0.117	0.12
172	14.33	0.87	0.225	0.257	0.112	0.11
173	14.42	0.87	0.225	0.256	0.112	0.11
174	14.50	0.87	0.225	0.254	0.112	0.11
175	14.58	0.87	0.225	0.253	0.112	0.11
176	14.67	0.87	0.225	0.252	0.112	0.11
177	14.75	0.87	0.225	0.250	0.112	0.11
178	14.83	0.83	0.216	0.249	0.108	0.11
179	14.92	0.83	0.216	0.248	0.108	0.11
180	15.00	0.83	0.216	0.247	0.108	0.11
181	15.08	0.80	0.208	0.245	0.104	0.10
182	15.17	0.80	0.208	0.244	0.104	0.10
183	15.25	0.80	0.208	0.243	0.104	0.10
184	15.33	0.77	0.199	0.242	0.099	0.10
185	15.42	0.77	0.199	0.240	0.099	0.10
186	15.50	0.77	0.199	0.239	0.099	0.10
187	15.58	0.63	0.164	0.238	0.082	0.08
188	15.67	0.63	0.164	0.237	0.082	0.08
189	15.75	0.63	0.164	0.235	0.082	0.08
190	15.83	0.63	0.164	0.234	0.082	0.08
191	15.92	0.63	0.164	0.233	0.082	0.08
192	16.00	0.63	0.164	0.232	0.082	0.08
193	16.08	0.13	0.035	0.231	0.017	0.02
194	16.17	0.13	0.035	0.229	0.017	0.02
195	16.25	0.13	0.035	0.228	0.017	0.02
196	16.33	0.13	0.035	0.227	0.017	0.02

197	16.42	0.13	0.035	0.226	0.017	0.02
198	16.50	0.13	0.035	0.225	0.017	0.02
199	16.58	0.10	0.026	0.224	0.013	0.01
200	16.67	0.10	0.026	0.223	0.013	0.01
201	16.75	0.10	0.026	0.221	0.013	0.01
202	16.83	0.10	0.026	0.220	0.013	0.01
203	16.92	0.10	0.026	0.219	0.013	0.01
204	17.00	0.10	0.026	0.218	0.013	0.01
205	17.08	0.17	0.043	0.217	0.022	0.02
206	17.17	0.17	0.043	0.216	0.022	0.02
207	17.25	0.17	0.043	0.215	0.022	0.02
208	17.33	0.17	0.043	0.214	0.022	0.02
209	17.42	0.17	0.043	0.213	0.022	0.02
210	17.50	0.17	0.043	0.212	0.022	0.02
211	17.58	0.17	0.043	0.211	0.022	0.02
212	17.67	0.17	0.043	0.209	0.022	0.02
213	17.75	0.17	0.043	0.208	0.022	0.02
214	17.83	0.13	0.035	0.207	0.017	0.02
215	17.92	0.13	0.035	0.206	0.017	0.02
216	18.00	0.13	0.035	0.205	0.017	0.02
217	18.08	0.13	0.035	0.204	0.017	0.02
218	18.17	0.13	0.035	0.203	0.017	0.02
219	18.25	0.13	0.035	0.202	0.017	0.02
220	18.33	0.13	0.035	0.201	0.017	0.02
221	18.42	0.13	0.035	0.200	0.017	0.02
222	18.50	0.13	0.035	0.199	0.017	0.02
223	18.58	0.10	0.026	0.198	0.013	0.01
224	18.67	0.10	0.026	0.197	0.013	0.01
225	18.75	0.10	0.026	0.197	0.013	0.01
226	18.83	0.07	0.017	0.196	0.009	0.01
227	18.92	0.07	0.017	0.195	0.009	0.01
228	19.00	0.07	0.017	0.194	0.009	0.01
229	19.08	0.10	0.026	0.193	0.013	0.01
230	19.17	0.10	0.026	0.192	0.013	0.01
231	19.25	0.10	0.026	0.191	0.013	0.01
232	19.33	0.13	0.035	0.190	0.017	0.02
233	19.42	0.13	0.035	0.189	0.017	0.02
234	19.50	0.13	0.035	0.188	0.017	0.02
235	19.58	0.10	0.026	0.187	0.013	0.01
236	19.67	0.10	0.026	0.187	0.013	0.01
237	19.75	0.10	0.026	0.186	0.013	0.01
238	19.83	0.07	0.017	0.185	0.009	0.01
239	19.92	0.07	0.017	0.184	0.009	0.01
240	20.00	0.07	0.017	0.183	0.009	0.01
241	20.08	0.10	0.026	0.182	0.013	0.01
242	20.17	0.10	0.026	0.182	0.013	0.01
243	20.25	0.10	0.026	0.181	0.013	0.01
244	20.33	0.10	0.026	0.180	0.013	0.01
245	20.42	0.10	0.026	0.179	0.013	0.01
246	20.50	0.10	0.026	0.179	0.013	0.01
247	20.58	0.10	0.026	0.178	0.013	0.01
248	20.67	0.10	0.026	0.177	0.013	0.01
249	20.75	0.10	0.026	0.176	0.013	0.01
250	20.83	0.07	0.017	0.176	0.009	0.01
251	20.92	0.07	0.017	0.175	0.009	0.01
252	21.00	0.07	0.017	0.174	0.009	0.01
253	21.08	0.10	0.026	0.174	0.013	0.01
254	21.17	0.10	0.026	0.173	0.013	0.01
255	21.25	0.10	0.026	0.172	0.013	0.01
256	21.33	0.07	0.017	0.172	0.009	0.01

257	21.42	0.07	0.017	0.171	0.009	0.01
258	21.50	0.07	0.017	0.170	0.009	0.01
259	21.58	0.10	0.026	0.170	0.013	0.01
260	21.67	0.10	0.026	0.169	0.013	0.01
261	21.75	0.10	0.026	0.168	0.013	0.01
262	21.83	0.07	0.017	0.168	0.009	0.01
263	21.92	0.07	0.017	0.167	0.009	0.01
264	22.00	0.07	0.017	0.167	0.009	0.01
265	22.08	0.10	0.026	0.166	0.013	0.01
266	22.17	0.10	0.026	0.166	0.013	0.01
267	22.25	0.10	0.026	0.165	0.013	0.01
268	22.33	0.07	0.017	0.165	0.009	0.01
269	22.42	0.07	0.017	0.164	0.009	0.01
270	22.50	0.07	0.017	0.164	0.009	0.01
271	22.58	0.07	0.017	0.163	0.009	0.01
272	22.67	0.07	0.017	0.163	0.009	0.01
273	22.75	0.07	0.017	0.162	0.009	0.01
274	22.83	0.07	0.017	0.162	0.009	0.01
275	22.92	0.07	0.017	0.161	0.009	0.01
276	23.00	0.07	0.017	0.161	0.009	0.01
277	23.08	0.07	0.017	0.161	0.009	0.01
278	23.17	0.07	0.017	0.160	0.009	0.01
279	23.25	0.07	0.017	0.160	0.009	0.01
280	23.33	0.07	0.017	0.160	0.009	0.01
281	23.42	0.07	0.017	0.159	0.009	0.01
282	23.50	0.07	0.017	0.159	0.009	0.01
283	23.58	0.07	0.017	0.159	0.009	0.01
284	23.67	0.07	0.017	0.158	0.009	0.01
285	23.75	0.07	0.017	0.158	0.009	0.01
286	23.83	0.07	0.017	0.158	0.009	0.01
287	23.92	0.07	0.017	0.158	0.009	0.01
288	24.00	0.07	0.017	0.158	0.009	0.01

Sum = 100.0 Sum = 12.2

Flood volume = Effective rainfall 1.02(In)  
times area 30.6(Ac.)/[(In)/(Ft.)] = 2.6(Ac.Ft)  
Total soil loss = 1.14(In)  
Total soil loss = 2.918(Ac.Ft)  
Total rainfall = 2.16(In)  
Flood volume = 113031.1 Cubic Feet  
Total soil loss = 127120.6 Cubic Feet

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Peak flow rate of this hydrograph = 3.857(CFS)  
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24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))  
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Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0006	0.09	Q				
0+10	0.0021	0.21	Q				
0+15	0.0037	0.24	Q				
0+20	0.0058	0.30	VQ				
0+25	0.0083	0.37	VQ				
0+30	0.0110	0.39	VQ				
0+35	0.0137	0.39	VQ				
0+40	0.0165	0.40	VQ				

0+45	0.0192	0.40	VQ
0+50	0.0223	0.44	VQ
0+55	0.0258	0.51	V Q
1+ 0	0.0294	0.52	V Q
1+ 5	0.0327	0.49	VQ
1+10	0.0356	0.43	VQ
1+15	0.0385	0.41	VQ
1+20	0.0413	0.41	VQ
1+25	0.0440	0.40	VQ
1+30	0.0468	0.40	VQ
1+35	0.0495	0.40	VQ
1+40	0.0523	0.40	VQ
1+45	0.0551	0.40	VQ
1+50	0.0581	0.44	VQ
1+55	0.0616	0.51	V Q
2+ 0	0.0652	0.52	VQ
2+ 5	0.0688	0.53	VQ
2+10	0.0725	0.53	VQ
2+15	0.0762	0.53	VQ
2+20	0.0798	0.53	VQ
2+25	0.0835	0.53	VQ
2+30	0.0872	0.53	VQ
2+35	0.0912	0.58	VQ
2+40	0.0956	0.64	VQ
2+45	0.1001	0.66	VQ
2+50	0.1046	0.66	VQ
2+55	0.1092	0.67	VQ
3+ 0	0.1138	0.67	VQ
3+ 5	0.1184	0.67	VQ
3+10	0.1230	0.67	VQ
3+15	0.1276	0.67	VQ
3+20	0.1322	0.67	Q
3+25	0.1368	0.67	Q
3+30	0.1414	0.67	Q
3+35	0.1460	0.67	Q
3+40	0.1506	0.67	Q
3+45	0.1552	0.67	Q
3+50	0.1601	0.71	Q
3+55	0.1654	0.77	VQ
4+ 0	0.1708	0.79	VQ
4+ 5	0.1763	0.80	VQ
4+10	0.1818	0.80	VQ
4+15	0.1873	0.80	VQ
4+20	0.1931	0.84	VQ
4+25	0.1994	0.91	Q
4+30	0.2057	0.92	Q
4+35	0.2121	0.93	Q
4+40	0.2185	0.93	Q
4+45	0.2249	0.93	Q
4+50	0.2317	0.98	Q
4+55	0.2388	1.04	VQ
5+ 0	0.2461	1.06	VQ
5+ 5	0.2528	0.98	Q
5+10	0.2587	0.85	Q
5+15	0.2644	0.82	QV
5+20	0.2703	0.85	QV
5+25	0.2765	0.91	QV
5+30	0.2829	0.92	QV
5+35	0.2896	0.97	QV
5+40	0.2967	1.04	Q

5+45	0.3040	1.06	Q			
5+50	0.3113	1.06	Q			
5+55	0.3186	1.07	Q			
6+ 0	0.3260	1.07	QV			
6+ 5	0.3336	1.11	QV			
6+10	0.3417	1.17	QV			
6+15	0.3499	1.19	QV			
6+20	0.3581	1.20	QV			
6+25	0.3664	1.20	QV			
6+30	0.3747	1.20	QV			
6+35	0.3832	1.24	QV			
6+40	0.3922	1.31	QV			
6+45	0.4013	1.32	QV			
6+50	0.4105	1.33	QV			
6+55	0.4197	1.33	QV			
7+ 0	0.4289	1.33	QV			
7+ 5	0.4380	1.33	QV			
7+10	0.4472	1.33	QV			
7+15	0.4564	1.33	Q V			
7+20	0.4659	1.38	Q V			
7+25	0.4758	1.44	Q V			
7+30	0.4859	1.46	Q V			
7+35	0.4962	1.51	QV			
7+40	0.5070	1.57	QV			
7+45	0.5180	1.59	QV			
7+50	0.5293	1.64	Q V			
7+55	0.5410	1.71	Q V			
8+ 0	0.5529	1.72	Q V			
8+ 5	0.5654	1.82	QV			
8+10	0.5788	1.94	QV			
8+15	0.5924	1.98	Q V			
8+20	0.6061	1.99	Q V			
8+25	0.6199	2.00	Q V			
8+30	0.6336	2.00	QV			
8+35	0.6477	2.04	QV			
8+40	0.6622	2.11	Q V			
8+45	0.6769	2.12	Q V			
8+50	0.6918	2.17	Q V			
8+55	0.7072	2.24	Q V			
9+ 0	0.7228	2.26	Q V			
9+ 5	0.7389	2.35	Q V			
9+10	0.7560	2.48	Q V			
9+15	0.7733	2.51	QV			
9+20	0.7910	2.57	Q V			
9+25	0.8092	2.64	Q V			
9+30	0.8274	2.66	Q V			
9+35	0.8461	2.71	Q V			
9+40	0.8652	2.77	Q V			
9+45	0.8844	2.79	Q V			
9+50	0.9039	2.84	Q V			
9+55	0.9240	2.91	Q V			
10+ 0	0.9441	2.92	Q V			
10+ 5	0.9622	2.63	Q V			
10+10	0.9773	2.19	Q V			
10+15	0.9916	2.09	Q V			
10+20	1.0057	2.04	Q V			
10+25	1.0196	2.01	Q V			
10+30	1.0333	2.00	Q V			
10+35	1.0486	2.22	Q V			
10+40	1.0660	2.53	Q V			

10+45	1.0840	2.61		Q	V		
10+50	1.1022	2.64		Q	V		
10+55	1.1205	2.66		Q	V		
11+ 0	1.1389	2.67		Q	V		
11+ 5	1.1570	2.63		Q	V		
11+10	1.1746	2.56		Q	V		
11+15	1.1922	2.55		Q	V		
11+20	1.2097	2.54		Q	V		
11+25	1.2271	2.54		Q	V		
11+30	1.2446	2.53		Q	V		
11+35	1.2614	2.45		Q	V		
11+40	1.2774	2.32		Q	V		
11+45	1.2932	2.29		Q	V		
11+50	1.3092	2.32		Q	V		
11+55	1.3256	2.38		Q	V		
12+ 0	1.3421	2.39		Q	V		
12+ 5	1.3606	2.70		Q	V		
12+10	1.3823	3.14		Q	V		
12+15	1.4047	3.25		Q	V		
12+20	1.4277	3.34		Q	V		
12+25	1.4513	3.43		Q	V		
12+30	1.4751	3.46		Q	V		
12+35	1.4995	3.55		Q	V		
12+40	1.5249	3.68		Q	V		
12+45	1.5504	3.71		Q	V		
12+50	1.5764	3.77		Q	V		
12+55	1.6028	3.84		Q	V		
13+ 0	1.6294	3.86		Q	V		
13+ 5	1.6485	2.78		Q	V		
13+10	1.6569	1.21		Q	V		
13+15	1.6628	0.87		Q	V		
13+20	1.6679	0.74	Q	Q	V		
13+25	1.6727	0.69	Q	Q	V		
13+30	1.6774	0.69	Q	Q	V		
13+35	1.6875	1.47		Q	V		
13+40	1.7053	2.58		Q	V		
13+45	1.7250	2.85		Q	V		
13+50	1.7455	2.97		Q	V		
13+55	1.7664	3.03		Q	V		
14+ 0	1.7875	3.07		Q	V		
14+ 5	1.8098	3.24		Q	V		
14+10	1.8339	3.49		Q	V		
14+15	1.8584	3.55		Q	V		
14+20	1.8827	3.54		Q	V		
14+25	1.9068	3.49		Q	V		
14+30	1.9307	3.48		Q	V		
14+35	1.9547	3.47		Q	V		
14+40	1.9786	3.47		Q	V		
14+45	2.0025	3.47		Q	V		
14+50	2.0260	3.43		Q	V		
14+55	2.0492	3.36		Q	V		
15+ 0	2.0723	3.35		Q	V		
15+ 5	2.0950	3.30		Q	V		
15+10	2.1172	3.23		Q	V		
15+15	2.1394	3.21		Q	V		
15+20	2.1612	3.16		Q	V		
15+25	2.1825	3.10		Q	V		
15+30	2.2037	3.08		Q	V		
15+35	2.2237	2.90		Q	V		
15+40	2.2419	2.65		Q	V		

15+45	2.2597	2.58		Q		V
15+50	2.2773	2.56		Q		V
15+55	2.2948	2.54		Q		V
16+ 0	2.3123	2.53		Q		V
16+ 5	2.3253	1.89		Q		V
16+10	2.3318	0.94	Q			V
16+15	2.3367	0.71	Q			V
16+20	2.3409	0.61	Q			V
16+25	2.3448	0.56	Q			V
16+30	2.3485	0.53	Q			V
16+35	2.3519	0.49	Q			V
16+40	2.3548	0.43	Q			V
16+45	2.3576	0.41	Q			V
16+50	2.3604	0.41	Q			V
16+55	2.3632	0.40	Q			V
17+ 0	2.3660	0.40	Q			V
17+ 5	2.3693	0.49	Q			V
17+10	2.3735	0.61	Q			V
17+15	2.3780	0.64	Q			V
17+20	2.3825	0.66	Q			V
17+25	2.3871	0.66	Q			V
17+30	2.3916	0.67	Q			V
17+35	2.3962	0.67	Q			V
17+40	2.4008	0.67	Q			V
17+45	2.4054	0.67	Q			V
17+50	2.4097	0.62	Q			V
17+55	2.4136	0.56	Q			V
18+ 0	2.4173	0.55	Q			V
18+ 5	2.4211	0.54	Q			V
18+10	2.4248	0.54	Q			V
18+15	2.4284	0.53	Q			V
18+20	2.4321	0.53	Q			V
18+25	2.4358	0.53	Q			V
18+30	2.4395	0.53	Q			V
18+35	2.4428	0.49	Q			V
18+40	2.4458	0.43	Q			V
18+45	2.4486	0.41	Q			V
18+50	2.4511	0.36	Q			V
18+55	2.4532	0.30	Q			V
19+ 0	2.4551	0.28	Q			V
19+ 5	2.4572	0.32	Q			V
19+10	2.4598	0.37	Q			V
19+15	2.4625	0.39	Q			V
19+20	2.4655	0.44	Q			V
19+25	2.4690	0.50	Q			V
19+30	2.4726	0.52	Q			V
19+35	2.4759	0.49	Q			V
19+40	2.4789	0.43	Q			V
19+45	2.4817	0.41	Q			V
19+50	2.4842	0.36	Q			V
19+55	2.4862	0.30	Q			V
20+ 0	2.4881	0.28	Q			V
20+ 5	2.4903	0.32	Q			V
20+10	2.4929	0.37	Q			V
20+15	2.4956	0.39	Q			V
20+20	2.4983	0.39	Q			V
20+25	2.5010	0.40	Q			V
20+30	2.5038	0.40	Q			V
20+35	2.5066	0.40	Q			V
20+40	2.5093	0.40	Q			V

20+45	2.5121	0.40	Q	V
20+50	2.5145	0.36	Q	V
20+55	2.5166	0.29	Q	V
21+ 0	2.5185	0.28	Q	V
21+ 5	2.5206	0.32	Q	V
21+10	2.5232	0.37	Q	V
21+15	2.5259	0.39	Q	V
21+20	2.5283	0.35	Q	V
21+25	2.5303	0.29	Q	V
21+30	2.5323	0.28	Q	V
21+35	2.5344	0.32	Q	V
21+40	2.5370	0.37	Q	V
21+45	2.5397	0.39	Q	V
21+50	2.5421	0.35	Q	V
21+55	2.5441	0.29	Q	V
22+ 0	2.5460	0.28	Q	V
22+ 5	2.5482	0.32	Q	V
22+10	2.5508	0.37	Q	V
22+15	2.5535	0.39	Q	V
22+20	2.5559	0.35	Q	V
22+25	2.5579	0.29	Q	V
22+30	2.5598	0.28	Q	V
22+35	2.5617	0.27	Q	V
22+40	2.5635	0.27	Q	V
22+45	2.5654	0.27	Q	V
22+50	2.5672	0.27	Q	V
22+55	2.5691	0.27	Q	V
23+ 0	2.5709	0.27	Q	V
23+ 5	2.5727	0.27	Q	V
23+10	2.5746	0.27	Q	V
23+15	2.5764	0.27	Q	V
23+20	2.5782	0.27	Q	V
23+25	2.5801	0.27	Q	V
23+30	2.5819	0.27	Q	V
23+35	2.5838	0.27	Q	V
23+40	2.5856	0.27	Q	V
23+45	2.5874	0.27	Q	V
23+50	2.5893	0.27	Q	V
23+55	2.5911	0.27	Q	V
24+ 0	2.5929	0.27	Q	V
24+ 5	2.5942	0.18	Q	V
24+10	2.5946	0.05	Q	V
24+15	2.5947	0.02	Q	V
24+20	2.5948	0.01	Q	V
24+25	2.5948	0.00	Q	V

Unit Hydrograph Analysis

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Study date 06/14/21 File: P1002410.out

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Riverside County Synthetic Unit Hydrology Method  
RCFC & WCD Manual date - April 1978

Program License Serial Number 6062

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English (in-lb) Input Units Used  
English Rainfall Data (Inches) Input Values Used  
  
English Units used in output format

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10-Year 24-Hour Storm  
Proposed

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Drainage Area = 30.60(Ac.) = 0.048 Sq. Mi.  
Drainage Area for Depth-Area Areal Adjustment = 30.60(Ac.) = 0.048 Sq. Mi.  
Length along longest watercourse = 1669.00(Ft.)  
Length along longest watercourse measured to centroid = 792.00(Ft.)  
Length along longest watercourse = 0.316 Mi.  
Length along longest watercourse measured to centroid = 0.150 Mi.  
Difference in elevation = 11.70(Ft.)  
Slope along watercourse = 37.0138 Ft./Mi.  
Average Manning's 'N' = 0.015  
Lag time = 0.057 Hr.  
Lag time = 3.41 Min.  
25% of lag time = 0.85 Min.  
40% of lag time = 1.37 Min.  
Unit time = 5.00 Min.  
Duration of storm = 24 Hour(s)  
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	1.60	48.96

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	4.00	122.40

STORM EVENT (YEAR) = 10.00  
 Area Averaged 2-Year Rainfall = 1.600(In)  
 Area Averaged 100-Year Rainfall = 4.000(In)

Point rain (area averaged) = 2.587(In)  
 Areal adjustment factor = 99.99 %  
 Adjusted average point rain = 2.587(In)

Sub-Area Data:

Area(Ac.)                  Runoff Index      Impervious %  
 30.600                      69.00              0.500  
 Total Area Entered =      30.60(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	69.0	0.373	0.500	0.205	1.000	0.205
						Sum (F) = 0.205

Area averaged mean soil loss (F) (In/Hr) = 0.205  
 Minimum soil loss rate ((In/Hr)) = 0.103  
 (for 24 hour storm duration)  
 Soil low loss rate (decimal) = 0.500

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 U n i t   H y d r o g r a p h  
 VALLEY S-Curve  
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Unit Hydrograph Data  
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Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	146.439	9.962
2	0.167	292.879	14.577
3	0.250	439.318	3.514
4	0.333	585.758	1.540
5	0.417	732.197	0.794
6	0.500	878.637	0.453
		Sum = 100.000	Sum= 30.839

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
			Max	Low	
1	0.08	0.07	0.363	0.010	0.01
2	0.17	0.07	0.362	0.010	0.01
3	0.25	0.07	0.361	0.010	0.01
4	0.33	0.10	0.359	0.016	0.02
5	0.42	0.10	0.358	0.016	0.02
6	0.50	0.10	0.356	0.016	0.02
7	0.58	0.10	0.355	0.016	0.02
8	0.67	0.10	0.354	0.016	0.02
9	0.75	0.10	0.352	0.016	0.02
10	0.83	0.13	0.351	0.021	0.02
11	0.92	0.13	0.350	0.021	0.02
12	1.00	0.13	0.348	0.021	0.02
13	1.08	0.10	0.347	0.016	0.02
14	1.17	0.10	0.345	0.016	0.02
15	1.25	0.10	0.344	0.016	0.02
16	1.33	0.10	0.343	0.016	0.02

17	1.42	0.10	0.031	0.341	0.016	0.02
18	1.50	0.10	0.031	0.340	0.016	0.02
19	1.58	0.10	0.031	0.339	0.016	0.02
20	1.67	0.10	0.031	0.337	0.016	0.02
21	1.75	0.10	0.031	0.336	0.016	0.02
22	1.83	0.13	0.041	0.335	0.021	0.02
23	1.92	0.13	0.041	0.333	0.021	0.02
24	2.00	0.13	0.041	0.332	0.021	0.02
25	2.08	0.13	0.041	0.330	0.021	0.02
26	2.17	0.13	0.041	0.329	0.021	0.02
27	2.25	0.13	0.041	0.328	0.021	0.02
28	2.33	0.13	0.041	0.326	0.021	0.02
29	2.42	0.13	0.041	0.325	0.021	0.02
30	2.50	0.13	0.041	0.324	0.021	0.02
31	2.58	0.17	0.052	0.323	0.026	0.03
32	2.67	0.17	0.052	0.321	0.026	0.03
33	2.75	0.17	0.052	0.320	0.026	0.03
34	2.83	0.17	0.052	0.319	0.026	0.03
35	2.92	0.17	0.052	0.317	0.026	0.03
36	3.00	0.17	0.052	0.316	0.026	0.03
37	3.08	0.17	0.052	0.315	0.026	0.03
38	3.17	0.17	0.052	0.313	0.026	0.03
39	3.25	0.17	0.052	0.312	0.026	0.03
40	3.33	0.17	0.052	0.311	0.026	0.03
41	3.42	0.17	0.052	0.309	0.026	0.03
42	3.50	0.17	0.052	0.308	0.026	0.03
43	3.58	0.17	0.052	0.307	0.026	0.03
44	3.67	0.17	0.052	0.306	0.026	0.03
45	3.75	0.17	0.052	0.304	0.026	0.03
46	3.83	0.20	0.062	0.303	0.031	0.03
47	3.92	0.20	0.062	0.302	0.031	0.03
48	4.00	0.20	0.062	0.300	0.031	0.03
49	4.08	0.20	0.062	0.299	0.031	0.03
50	4.17	0.20	0.062	0.298	0.031	0.03
51	4.25	0.20	0.062	0.297	0.031	0.03
52	4.33	0.23	0.072	0.295	0.036	0.04
53	4.42	0.23	0.072	0.294	0.036	0.04
54	4.50	0.23	0.072	0.293	0.036	0.04
55	4.58	0.23	0.072	0.292	0.036	0.04
56	4.67	0.23	0.072	0.290	0.036	0.04
57	4.75	0.23	0.072	0.289	0.036	0.04
58	4.83	0.27	0.083	0.288	0.041	0.04
59	4.92	0.27	0.083	0.287	0.041	0.04
60	5.00	0.27	0.083	0.285	0.041	0.04
61	5.08	0.20	0.062	0.284	0.031	0.03
62	5.17	0.20	0.062	0.283	0.031	0.03
63	5.25	0.20	0.062	0.282	0.031	0.03
64	5.33	0.23	0.072	0.280	0.036	0.04
65	5.42	0.23	0.072	0.279	0.036	0.04
66	5.50	0.23	0.072	0.278	0.036	0.04
67	5.58	0.27	0.083	0.277	0.041	0.04
68	5.67	0.27	0.083	0.275	0.041	0.04
69	5.75	0.27	0.083	0.274	0.041	0.04
70	5.83	0.27	0.083	0.273	0.041	0.04
71	5.92	0.27	0.083	0.272	0.041	0.04
72	6.00	0.27	0.083	0.271	0.041	0.04
73	6.08	0.30	0.093	0.269	0.047	0.05
74	6.17	0.30	0.093	0.268	0.047	0.05
75	6.25	0.30	0.093	0.267	0.047	0.05
76	6.33	0.30	0.093	0.266	0.047	0.05

77	6.42	0.30	0.093	0.265	0.047	0.05
78	6.50	0.30	0.093	0.263	0.047	0.05
79	6.58	0.33	0.103	0.262	0.052	0.05
80	6.67	0.33	0.103	0.261	0.052	0.05
81	6.75	0.33	0.103	0.260	0.052	0.05
82	6.83	0.33	0.103	0.259	0.052	0.05
83	6.92	0.33	0.103	0.258	0.052	0.05
84	7.00	0.33	0.103	0.256	0.052	0.05
85	7.08	0.33	0.103	0.255	0.052	0.05
86	7.17	0.33	0.103	0.254	0.052	0.05
87	7.25	0.33	0.103	0.253	0.052	0.05
88	7.33	0.37	0.114	0.252	0.057	0.06
89	7.42	0.37	0.114	0.251	0.057	0.06
90	7.50	0.37	0.114	0.249	0.057	0.06
91	7.58	0.40	0.124	0.248	0.062	0.06
92	7.67	0.40	0.124	0.247	0.062	0.06
93	7.75	0.40	0.124	0.246	0.062	0.06
94	7.83	0.43	0.135	0.245	0.067	0.07
95	7.92	0.43	0.135	0.244	0.067	0.07
96	8.00	0.43	0.135	0.243	0.067	0.07
97	8.08	0.50	0.155	0.242	0.078	0.08
98	8.17	0.50	0.155	0.240	0.078	0.08
99	8.25	0.50	0.155	0.239	0.078	0.08
100	8.33	0.50	0.155	0.238	0.078	0.08
101	8.42	0.50	0.155	0.237	0.078	0.08
102	8.50	0.50	0.155	0.236	0.078	0.08
103	8.58	0.53	0.166	0.235	0.083	0.08
104	8.67	0.53	0.166	0.234	0.083	0.08
105	8.75	0.53	0.166	0.233	0.083	0.08
106	8.83	0.57	0.176	0.232	0.088	0.09
107	8.92	0.57	0.176	0.230	0.088	0.09
108	9.00	0.57	0.176	0.229	0.088	0.09
109	9.08	0.63	0.197	0.228	0.098	0.10
110	9.17	0.63	0.197	0.227	0.098	0.10
111	9.25	0.63	0.197	0.226	0.098	0.10
112	9.33	0.67	0.207	0.225	0.103	0.10
113	9.42	0.67	0.207	0.224	0.103	0.10
114	9.50	0.67	0.207	0.223	0.103	0.10
115	9.58	0.70	0.217	0.222	0.109	0.11
116	9.67	0.70	0.217	0.221	0.109	0.11
117	9.75	0.70	0.217	0.220	0.109	0.11
118	9.83	0.73	0.228	0.219	---	0.01
119	9.92	0.73	0.228	0.218	---	0.01
120	10.00	0.73	0.228	0.217	---	0.01
121	10.08	0.50	0.155	0.215	0.078	0.08
122	10.17	0.50	0.155	0.214	0.078	0.08
123	10.25	0.50	0.155	0.213	0.078	0.08
124	10.33	0.50	0.155	0.212	0.078	0.08
125	10.42	0.50	0.155	0.211	0.078	0.08
126	10.50	0.50	0.155	0.210	0.078	0.08
127	10.58	0.67	0.207	0.209	0.103	0.10
128	10.67	0.67	0.207	0.208	0.103	0.10
129	10.75	0.67	0.207	0.207	0.103	0.10
130	10.83	0.67	0.207	0.206	---	0.00
131	10.92	0.67	0.207	0.205	---	0.00
132	11.00	0.67	0.207	0.204	---	0.00
133	11.08	0.63	0.197	0.203	0.098	0.10
134	11.17	0.63	0.197	0.202	0.098	0.10
135	11.25	0.63	0.197	0.201	0.098	0.10
136	11.33	0.63	0.197	0.200	0.098	0.10

137	11.42	0.63	0.197	0.199	0.098	0.10
138	11.50	0.63	0.197	0.198	0.098	0.10
139	11.58	0.57	0.176	0.197	0.088	0.09
140	11.67	0.57	0.176	0.196	0.088	0.09
141	11.75	0.57	0.176	0.195	0.088	0.09
142	11.83	0.60	0.186	0.194	0.093	0.09
143	11.92	0.60	0.186	0.193	0.093	0.09
144	12.00	0.60	0.186	0.192	0.093	0.09
145	12.08	0.83	0.259	0.191	---	0.07
146	12.17	0.83	0.259	0.190	---	0.07
147	12.25	0.83	0.259	0.189	---	0.07
148	12.33	0.87	0.269	0.189	---	0.08
149	12.42	0.87	0.269	0.188	---	0.08
150	12.50	0.87	0.269	0.187	---	0.08
151	12.58	0.93	0.290	0.186	---	0.10
152	12.67	0.93	0.290	0.185	---	0.10
153	12.75	0.93	0.290	0.184	---	0.11
154	12.83	0.97	0.300	0.183	---	0.12
155	12.92	0.97	0.300	0.182	---	0.12
156	13.00	0.97	0.300	0.181	---	0.12
157	13.08	1.13	0.352	0.180	---	0.17
158	13.17	1.13	0.352	0.179	---	0.17
159	13.25	1.13	0.352	0.178	---	0.17
160	13.33	1.13	0.352	0.177	---	0.17
161	13.42	1.13	0.352	0.177	---	0.18
162	13.50	1.13	0.352	0.176	---	0.18
163	13.58	0.77	0.238	0.175	---	0.06
164	13.67	0.77	0.238	0.174	---	0.06
165	13.75	0.77	0.238	0.173	---	0.07
166	13.83	0.77	0.238	0.172	---	0.07
167	13.92	0.77	0.238	0.171	---	0.07
168	14.00	0.77	0.238	0.170	---	0.07
169	14.08	0.90	0.279	0.169	---	0.11
170	14.17	0.90	0.279	0.169	---	0.11
171	14.25	0.90	0.279	0.168	---	0.11
172	14.33	0.87	0.269	0.167	---	0.10
173	14.42	0.87	0.269	0.166	---	0.10
174	14.50	0.87	0.269	0.165	---	0.10
175	14.58	0.87	0.269	0.164	---	0.10
176	14.67	0.87	0.269	0.163	---	0.11
177	14.75	0.87	0.269	0.163	---	0.11
178	14.83	0.83	0.259	0.162	---	0.10
179	14.92	0.83	0.259	0.161	---	0.10
180	15.00	0.83	0.259	0.160	---	0.10
181	15.08	0.80	0.248	0.159	---	0.09
182	15.17	0.80	0.248	0.159	---	0.09
183	15.25	0.80	0.248	0.158	---	0.09
184	15.33	0.77	0.238	0.157	---	0.08
185	15.42	0.77	0.238	0.156	---	0.08
186	15.50	0.77	0.238	0.155	---	0.08
187	15.58	0.63	0.197	0.154	---	0.04
188	15.67	0.63	0.197	0.154	---	0.04
189	15.75	0.63	0.197	0.153	---	0.04
190	15.83	0.63	0.197	0.152	---	0.04
191	15.92	0.63	0.197	0.151	---	0.05
192	16.00	0.63	0.197	0.151	---	0.05
193	16.08	0.13	0.041	0.150	0.021	0.02
194	16.17	0.13	0.041	0.149	0.021	0.02
195	16.25	0.13	0.041	0.148	0.021	0.02
196	16.33	0.13	0.041	0.148	0.021	0.02

197	16.42	0.13	0.041	0.147	0.021	0.02
198	16.50	0.13	0.041	0.146	0.021	0.02
199	16.58	0.10	0.031	0.145	0.016	0.02
200	16.67	0.10	0.031	0.145	0.016	0.02
201	16.75	0.10	0.031	0.144	0.016	0.02
202	16.83	0.10	0.031	0.143	0.016	0.02
203	16.92	0.10	0.031	0.142	0.016	0.02
204	17.00	0.10	0.031	0.142	0.016	0.02
205	17.08	0.17	0.052	0.141	0.026	0.03
206	17.17	0.17	0.052	0.140	0.026	0.03
207	17.25	0.17	0.052	0.140	0.026	0.03
208	17.33	0.17	0.052	0.139	0.026	0.03
209	17.42	0.17	0.052	0.138	0.026	0.03
210	17.50	0.17	0.052	0.137	0.026	0.03
211	17.58	0.17	0.052	0.137	0.026	0.03
212	17.67	0.17	0.052	0.136	0.026	0.03
213	17.75	0.17	0.052	0.135	0.026	0.03
214	17.83	0.13	0.041	0.135	0.021	0.02
215	17.92	0.13	0.041	0.134	0.021	0.02
216	18.00	0.13	0.041	0.133	0.021	0.02
217	18.08	0.13	0.041	0.133	0.021	0.02
218	18.17	0.13	0.041	0.132	0.021	0.02
219	18.25	0.13	0.041	0.131	0.021	0.02
220	18.33	0.13	0.041	0.131	0.021	0.02
221	18.42	0.13	0.041	0.130	0.021	0.02
222	18.50	0.13	0.041	0.130	0.021	0.02
223	18.58	0.10	0.031	0.129	0.016	0.02
224	18.67	0.10	0.031	0.128	0.016	0.02
225	18.75	0.10	0.031	0.128	0.016	0.02
226	18.83	0.07	0.021	0.127	0.010	0.01
227	18.92	0.07	0.021	0.126	0.010	0.01
228	19.00	0.07	0.021	0.126	0.010	0.01
229	19.08	0.10	0.031	0.125	0.016	0.02
230	19.17	0.10	0.031	0.125	0.016	0.02
231	19.25	0.10	0.031	0.124	0.016	0.02
232	19.33	0.13	0.041	0.123	0.021	0.02
233	19.42	0.13	0.041	0.123	0.021	0.02
234	19.50	0.13	0.041	0.122	0.021	0.02
235	19.58	0.10	0.031	0.122	0.016	0.02
236	19.67	0.10	0.031	0.121	0.016	0.02
237	19.75	0.10	0.031	0.121	0.016	0.02
238	19.83	0.07	0.021	0.120	0.010	0.01
239	19.92	0.07	0.021	0.120	0.010	0.01
240	20.00	0.07	0.021	0.119	0.010	0.01
241	20.08	0.10	0.031	0.119	0.016	0.02
242	20.17	0.10	0.031	0.118	0.016	0.02
243	20.25	0.10	0.031	0.118	0.016	0.02
244	20.33	0.10	0.031	0.117	0.016	0.02
245	20.42	0.10	0.031	0.116	0.016	0.02
246	20.50	0.10	0.031	0.116	0.016	0.02
247	20.58	0.10	0.031	0.116	0.016	0.02
248	20.67	0.10	0.031	0.115	0.016	0.02
249	20.75	0.10	0.031	0.115	0.016	0.02
250	20.83	0.07	0.021	0.114	0.010	0.01
251	20.92	0.07	0.021	0.114	0.010	0.01
252	21.00	0.07	0.021	0.113	0.010	0.01
253	21.08	0.10	0.031	0.113	0.016	0.02
254	21.17	0.10	0.031	0.112	0.016	0.02
255	21.25	0.10	0.031	0.112	0.016	0.02
256	21.33	0.07	0.021	0.111	0.010	0.01

257	21.42	0.07	0.021	0.111	0.010	0.01
258	21.50	0.07	0.021	0.111	0.010	0.01
259	21.58	0.10	0.031	0.110	0.016	0.02
260	21.67	0.10	0.031	0.110	0.016	0.02
261	21.75	0.10	0.031	0.109	0.016	0.02
262	21.83	0.07	0.021	0.109	0.010	0.01
263	21.92	0.07	0.021	0.109	0.010	0.01
264	22.00	0.07	0.021	0.108	0.010	0.01
265	22.08	0.10	0.031	0.108	0.016	0.02
266	22.17	0.10	0.031	0.108	0.016	0.02
267	22.25	0.10	0.031	0.107	0.016	0.02
268	22.33	0.07	0.021	0.107	0.010	0.01
269	22.42	0.07	0.021	0.107	0.010	0.01
270	22.50	0.07	0.021	0.106	0.010	0.01
271	22.58	0.07	0.021	0.106	0.010	0.01
272	22.67	0.07	0.021	0.106	0.010	0.01
273	22.75	0.07	0.021	0.105	0.010	0.01
274	22.83	0.07	0.021	0.105	0.010	0.01
275	22.92	0.07	0.021	0.105	0.010	0.01
276	23.00	0.07	0.021	0.105	0.010	0.01
277	23.08	0.07	0.021	0.104	0.010	0.01
278	23.17	0.07	0.021	0.104	0.010	0.01
279	23.25	0.07	0.021	0.104	0.010	0.01
280	23.33	0.07	0.021	0.104	0.010	0.01
281	23.42	0.07	0.021	0.103	0.010	0.01
282	23.50	0.07	0.021	0.103	0.010	0.01
283	23.58	0.07	0.021	0.103	0.010	0.01
284	23.67	0.07	0.021	0.103	0.010	0.01
285	23.75	0.07	0.021	0.103	0.010	0.01
286	23.83	0.07	0.021	0.103	0.010	0.01
287	23.92	0.07	0.021	0.103	0.010	0.01
288	24.00	0.07	0.021	0.103	0.010	0.01

Sum = 100.0 Sum = 13.1

Flood volume = Effective rainfall 1.09(In)  
times area 30.6(Ac.)/[(In)/(Ft.)] = 2.8(Ac.Ft)  
Total soil loss = 1.49(In)  
Total soil loss = 3.811(Ac.Ft)  
Total rainfall = 2.59(In)  
Flood volume = 121393.3 Cubic Feet  
Total soil loss = 165990.4 Cubic Feet

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Peak flow rate of this hydrograph = 5.409(CFS)  
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24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))  
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Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0007	0.10	Q				
0+10	0.0025	0.25	VQ				
0+15	0.0045	0.29	VQ				
0+20	0.0069	0.36	VQ				
0+25	0.0100	0.44	VQ				
0+30	0.0132	0.46	VQ				
0+35	0.0164	0.47	VQ				
0+40	0.0197	0.48	VQ				

0+45	0.0230	0.48	VQ
0+50	0.0267	0.53	V Q
0+55	0.0308	0.61	V Q
1+ 0	0.0351	0.62	V Q
1+ 5	0.0391	0.58	V Q
1+10	0.0426	0.51	V Q
1+15	0.0460	0.49	VQ
1+20	0.0494	0.49	VQ
1+25	0.0527	0.48	VQ
1+30	0.0560	0.48	VQ
1+35	0.0593	0.48	VQ
1+40	0.0626	0.48	VQ
1+45	0.0659	0.48	VQ
1+50	0.0695	0.53	V Q
1+55	0.0737	0.61	VQ
2+ 0	0.0780	0.62	VQ
2+ 5	0.0824	0.63	VQ
2+10	0.0867	0.64	VQ
2+15	0.0911	0.64	VQ
2+20	0.0955	0.64	VQ
2+25	0.0999	0.64	VQ
2+30	0.1043	0.64	VQ
2+35	0.1091	0.69	VQ
2+40	0.1144	0.77	V Q
2+45	0.1198	0.78	V Q
2+50	0.1252	0.79	V Q
2+55	0.1307	0.80	V Q
3+ 0	0.1362	0.80	V Q
3+ 5	0.1417	0.80	VQ
3+10	0.1472	0.80	VQ
3+15	0.1527	0.80	VQ
3+20	0.1582	0.80	VQ
3+25	0.1637	0.80	VQ
3+30	0.1692	0.80	VQ
3+35	0.1747	0.80	VQ
3+40	0.1802	0.80	VQ
3+45	0.1857	0.80	VQ
3+50	0.1915	0.85	VQ
3+55	0.1979	0.93	VQ
4+ 0	0.2044	0.94	VQ
4+ 5	0.2110	0.95	Q
4+10	0.2175	0.96	Q
4+15	0.2241	0.96	Q
4+20	0.2311	1.01	VQ
4+25	0.2386	1.08	VQ
4+30	0.2462	1.10	VQ
4+35	0.2538	1.11	VQ
4+40	0.2615	1.12	VQ
4+45	0.2692	1.12	VQ
4+50	0.2772	1.17	VQ
4+55	0.2858	1.24	Q
5+ 0	0.2945	1.26	VQ
5+ 5	0.3026	1.17	Q
5+10	0.3096	1.02	Q
5+15	0.3164	0.99	QV
5+20	0.3234	1.02	Q
5+25	0.3309	1.09	Q
5+30	0.3385	1.10	Q
5+35	0.3465	1.16	Q
5+40	0.3551	1.24	QV

5+45	0.3638	1.26	Q			
5+50	0.3725	1.27	Q			
5+55	0.3813	1.27	Q			
6+ 0	0.3901	1.28	Q			
6+ 5	0.3993	1.33	Q			
6+10	0.4089	1.40	Q			
6+15	0.4187	1.42	QV			
6+20	0.4286	1.43	QV			
6+25	0.4385	1.43	QV			
6+30	0.4484	1.44	QV			
6+35	0.4586	1.49	QV			
6+40	0.4694	1.56	Q			
6+45	0.4803	1.58	Q			
6+50	0.4912	1.59	QV			
6+55	0.5022	1.59	QV			
7+ 0	0.5132	1.60	QV			
7+ 5	0.5242	1.60	QV			
7+10	0.5352	1.60	QV			
7+15	0.5462	1.60	QV			
7+20	0.5575	1.65	Q V			
7+25	0.5694	1.72	Q V			
7+30	0.5814	1.74	Q V			
7+35	0.5938	1.80	QV			
7+40	0.6068	1.88	QV			
7+45	0.6199	1.90	QV			
7+50	0.6334	1.96	Q V			
7+55	0.6474	2.04	QV			
8+ 0	0.6616	2.06	QV			
8+ 5	0.6766	2.17	QV			
8+10	0.6926	2.33	Q			
8+15	0.7089	2.37	QV			
8+20	0.7253	2.38	QV			
8+25	0.7418	2.39	QV			
8+30	0.7583	2.39	QV			
8+35	0.7751	2.45	Q V			
8+40	0.7925	2.52	QV			
8+45	0.8100	2.54	QV			
8+50	0.8279	2.60	QV			
8+55	0.8463	2.68	Q V			
9+ 0	0.8649	2.70	Q V			
9+ 5	0.8843	2.81	QV			
9+10	0.9047	2.97	QV			
9+15	0.9254	3.00	QV			
9+20	0.9466	3.07	QV			
9+25	0.9683	3.16	QV			
9+30	0.9902	3.18	Q V			
9+35	1.0125	3.24	Q V			
9+40	1.0353	3.32	QV			
9+45	1.0583	3.34	Q V			
9+50	1.0745	2.35	Q		V	
9+55	1.0808	0.92	Q		V	
10+ 0	1.0849	0.59	Q		V	
10+ 5	1.0927	1.12	Q		V	
10+10	1.1065	2.02	Q		V	
10+15	1.1217	2.21	Q		V	
10+20	1.1377	2.31	Q		V	
10+25	1.1540	2.36	Q		V	
10+30	1.1704	2.39	Q		V	
10+35	1.1887	2.65	Q		V	
10+40	1.2096	3.03	Q	Q	V	



15+45	2.4313	1.44	Q	V
15+50	2.4410	1.40	Q	V
15+55	2.4506	1.39	Q	V
16+ 0	2.4602	1.40	Q	V
16+ 5	2.4682	1.16	Q	V
16+10	2.4736	0.80	Q	V
16+15	2.4785	0.71	Q	V
16+20	2.4831	0.67	Q	V
16+25	2.4876	0.65	Q	V
16+30	2.4920	0.64	Q	V
16+35	2.4960	0.59	Q	V
16+40	2.4996	0.51	Q	V
16+45	2.5030	0.49	Q	V
16+50	2.5063	0.49	Q	V
16+55	2.5096	0.48	Q	V
17+ 0	2.5129	0.48	Q	V
17+ 5	2.5169	0.58	Q	V
17+10	2.5220	0.73	Q	V
17+15	2.5273	0.77	Q	V
17+20	2.5327	0.79	Q	V
17+25	2.5382	0.79	Q	V
17+30	2.5437	0.80	Q	V
17+35	2.5492	0.80	Q	V
17+40	2.5547	0.80	Q	V
17+45	2.5601	0.80	Q	V
17+50	2.5653	0.75	Q	V
17+55	2.5699	0.67	Q	V
18+ 0	2.5744	0.65	Q	V
18+ 5	2.5789	0.65	Q	V
18+10	2.5833	0.64	Q	V
18+15	2.5877	0.64	Q	V
18+20	2.5921	0.64	Q	V
18+25	2.5965	0.64	Q	V
18+30	2.6009	0.64	Q	V
18+35	2.6049	0.59	Q	V
18+40	2.6084	0.51	Q	V
18+45	2.6118	0.49	Q	V
18+50	2.6148	0.43	Q	V
18+55	2.6173	0.35	Q	V
19+ 0	2.6196	0.33	Q	V
19+ 5	2.6222	0.38	Q	V
19+10	2.6252	0.45	Q	V
19+15	2.6284	0.46	Q	V
19+20	2.6321	0.52	Q	V
19+25	2.6362	0.60	Q	V
19+30	2.6405	0.62	Q	V
19+35	2.6445	0.58	Q	V
19+40	2.6480	0.51	Q	V
19+45	2.6514	0.49	Q	V
19+50	2.6544	0.43	Q	V
19+55	2.6568	0.35	Q	V
20+ 0	2.6591	0.33	Q	V
20+ 5	2.6617	0.38	Q	V
20+10	2.6648	0.45	Q	V
20+15	2.6680	0.46	Q	V
20+20	2.6713	0.47	Q	V
20+25	2.6746	0.48	Q	V
20+30	2.6779	0.48	Q	V
20+35	2.6812	0.48	Q	V
20+40	2.6845	0.48	Q	V

20+45	2.6878	0.48	Q			V
20+50	2.6907	0.43	Q			V
20+55	2.6931	0.35	Q			V
21+ 0	2.6954	0.33	Q			V
21+ 5	2.6980	0.38	Q			V
21+10	2.7011	0.45	Q			V
21+15	2.7043	0.46	Q			V
21+20	2.7072	0.42	Q			V
21+25	2.7096	0.35	Q			V
21+30	2.7119	0.33	Q			V
21+35	2.7145	0.38	Q			V
21+40	2.7176	0.45	Q			V
21+45	2.7208	0.46	Q			V
21+50	2.7237	0.42	Q			V
21+55	2.7261	0.35	Q			V
22+ 0	2.7284	0.33	Q			V
22+ 5	2.7310	0.38	Q			V
22+10	2.7341	0.45	Q			V
22+15	2.7373	0.46	Q			V
22+20	2.7402	0.42	Q			V
22+25	2.7426	0.35	Q			V
22+30	2.7449	0.33	Q			V
22+35	2.7471	0.33	Q			V
22+40	2.7494	0.32	Q			V
22+45	2.7516	0.32	Q			V
22+50	2.7538	0.32	Q			V
22+55	2.7560	0.32	Q			V
23+ 0	2.7582	0.32	Q			V
23+ 5	2.7604	0.32	Q			V
23+10	2.7626	0.32	Q			V
23+15	2.7648	0.32	Q			V
23+20	2.7670	0.32	Q			V
23+25	2.7692	0.32	Q			V
23+30	2.7714	0.32	Q			V
23+35	2.7736	0.32	Q			V
23+40	2.7758	0.32	Q			V
23+45	2.7780	0.32	Q			V
23+50	2.7802	0.32	Q			V
23+55	2.7823	0.32	Q			V
24+ 0	2.7845	0.32	Q			V
24+ 5	2.7860	0.22	Q			V
24+10	2.7865	0.07	Q			V
24+15	2.7867	0.03	Q			V
24+20	2.7868	0.01	Q			V
24+25	2.7868	0.00	Q			V

Unit Hydrograph Analysis

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Study date 06/14/21 File: P10024100.out

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Riverside County Synthetic Unit Hydrology Method  
RCFC & WCD Manual date - April 1978

Program License Serial Number 6062

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English (in-lb) Input Units Used  
English Rainfall Data (Inches) Input Values Used  
  
English Units used in output format

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2-Year 24-Hour Storm  
100-Year 24-Hour Storm  
Proposed

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Drainage Area = 30.60(Ac.) = 0.048 Sq. Mi.  
Drainage Area for Depth-Area Areal Adjustment = 30.60(Ac.) = 0.048 Sq. Mi.  
Length along longest watercourse = 1441.00(Ft.)  
Length along longest watercourse measured to centroid = 904.00(Ft.)  
Length along longest watercourse = 0.273 Mi.  
Length along longest watercourse measured to centroid = 0.171 Mi.  
Difference in elevation = 14.50(Ft.)  
Slope along watercourse = 53.1298 Ft./Mi.  
Average Manning's 'N' = 0.015  
Lag time = 0.053 Hr.  
Lag time = 3.17 Min.  
25% of lag time = 0.79 Min.  
40% of lag time = 1.27 Min.  
Unit time = 5.00 Min.  
Duration of storm = 24 Hour(s)  
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	1.60	48.96

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.60	4.00	122.40

STORM EVENT (YEAR) = 100.00  
 Area Averaged 2-Year Rainfall = 1.600(In)  
 Area Averaged 100-Year Rainfall = 4.000(In)

Point rain (area averaged) = 4.000(In)  
 Areal adjustment factor = 99.99 %  
 Adjusted average point rain = 4.000(In)

Sub-Area Data:

Area(Ac.)                  Runoff Index          Impervious %  
 30.600                      69.00                      0.500  
 Total Area Entered =          30.60(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	69.0	0.373	0.500	0.205	1.000	0.205
						Sum (F) = 0.205

Area averaged mean soil loss (F) (In/Hr) = 0.205  
 Minimum soil loss rate ((In/Hr)) = 0.103  
 (for 24 hour storm duration)  
 Soil low loss rate (decimal) = 0.500

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 U n i t   H y d r o g r a p h  
 VALLEY S-Curve  
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Unit Hydrograph Data  
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Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	157.723	10.791
2	0.167	315.447	14.321
3	0.250	473.170	3.316
4	0.333	630.893	1.434
5	0.417	788.617	0.697
6	0.500	946.340	0.280
		Sum = 100.000	Sum= 30.839

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
			Max	Low	
1	0.08	0.07	0.363	0.016	0.02
2	0.17	0.07	0.362	0.016	0.02
3	0.25	0.07	0.361	0.016	0.02
4	0.33	0.10	0.359	0.024	0.02
5	0.42	0.10	0.358	0.024	0.02
6	0.50	0.10	0.356	0.024	0.02
7	0.58	0.10	0.355	0.024	0.02
8	0.67	0.10	0.354	0.024	0.02
9	0.75	0.10	0.352	0.024	0.02
10	0.83	0.13	0.351	0.032	0.03
11	0.92	0.13	0.350	0.032	0.03
12	1.00	0.13	0.348	0.032	0.03
13	1.08	0.10	0.347	0.024	0.02
14	1.17	0.10	0.345	0.024	0.02
15	1.25	0.10	0.344	0.024	0.02
16	1.33	0.10	0.343	0.024	0.02

17	1.42	0.10	0.048	0.341	0.024	0.02
18	1.50	0.10	0.048	0.340	0.024	0.02
19	1.58	0.10	0.048	0.339	0.024	0.02
20	1.67	0.10	0.048	0.337	0.024	0.02
21	1.75	0.10	0.048	0.336	0.024	0.02
22	1.83	0.13	0.064	0.335	0.032	0.03
23	1.92	0.13	0.064	0.333	0.032	0.03
24	2.00	0.13	0.064	0.332	0.032	0.03
25	2.08	0.13	0.064	0.330	0.032	0.03
26	2.17	0.13	0.064	0.329	0.032	0.03
27	2.25	0.13	0.064	0.328	0.032	0.03
28	2.33	0.13	0.064	0.326	0.032	0.03
29	2.42	0.13	0.064	0.325	0.032	0.03
30	2.50	0.13	0.064	0.324	0.032	0.03
31	2.58	0.17	0.080	0.323	0.040	0.04
32	2.67	0.17	0.080	0.321	0.040	0.04
33	2.75	0.17	0.080	0.320	0.040	0.04
34	2.83	0.17	0.080	0.319	0.040	0.04
35	2.92	0.17	0.080	0.317	0.040	0.04
36	3.00	0.17	0.080	0.316	0.040	0.04
37	3.08	0.17	0.080	0.315	0.040	0.04
38	3.17	0.17	0.080	0.313	0.040	0.04
39	3.25	0.17	0.080	0.312	0.040	0.04
40	3.33	0.17	0.080	0.311	0.040	0.04
41	3.42	0.17	0.080	0.309	0.040	0.04
42	3.50	0.17	0.080	0.308	0.040	0.04
43	3.58	0.17	0.080	0.307	0.040	0.04
44	3.67	0.17	0.080	0.306	0.040	0.04
45	3.75	0.17	0.080	0.304	0.040	0.04
46	3.83	0.20	0.096	0.303	0.048	0.05
47	3.92	0.20	0.096	0.302	0.048	0.05
48	4.00	0.20	0.096	0.300	0.048	0.05
49	4.08	0.20	0.096	0.299	0.048	0.05
50	4.17	0.20	0.096	0.298	0.048	0.05
51	4.25	0.20	0.096	0.297	0.048	0.05
52	4.33	0.23	0.112	0.295	0.056	0.06
53	4.42	0.23	0.112	0.294	0.056	0.06
54	4.50	0.23	0.112	0.293	0.056	0.06
55	4.58	0.23	0.112	0.292	0.056	0.06
56	4.67	0.23	0.112	0.290	0.056	0.06
57	4.75	0.23	0.112	0.289	0.056	0.06
58	4.83	0.27	0.128	0.288	0.064	0.06
59	4.92	0.27	0.128	0.287	0.064	0.06
60	5.00	0.27	0.128	0.285	0.064	0.06
61	5.08	0.20	0.096	0.284	0.048	0.05
62	5.17	0.20	0.096	0.283	0.048	0.05
63	5.25	0.20	0.096	0.282	0.048	0.05
64	5.33	0.23	0.112	0.280	0.056	0.06
65	5.42	0.23	0.112	0.279	0.056	0.06
66	5.50	0.23	0.112	0.278	0.056	0.06
67	5.58	0.27	0.128	0.277	0.064	0.06
68	5.67	0.27	0.128	0.275	0.064	0.06
69	5.75	0.27	0.128	0.274	0.064	0.06
70	5.83	0.27	0.128	0.273	0.064	0.06
71	5.92	0.27	0.128	0.272	0.064	0.06
72	6.00	0.27	0.128	0.271	0.064	0.06
73	6.08	0.30	0.144	0.269	0.072	0.07
74	6.17	0.30	0.144	0.268	0.072	0.07
75	6.25	0.30	0.144	0.267	0.072	0.07
76	6.33	0.30	0.144	0.266	0.072	0.07

77	6.42	0.30	0.144	0.265	0.072	0.07
78	6.50	0.30	0.144	0.263	0.072	0.07
79	6.58	0.33	0.160	0.262	0.080	0.08
80	6.67	0.33	0.160	0.261	0.080	0.08
81	6.75	0.33	0.160	0.260	0.080	0.08
82	6.83	0.33	0.160	0.259	0.080	0.08
83	6.92	0.33	0.160	0.258	0.080	0.08
84	7.00	0.33	0.160	0.256	0.080	0.08
85	7.08	0.33	0.160	0.255	0.080	0.08
86	7.17	0.33	0.160	0.254	0.080	0.08
87	7.25	0.33	0.160	0.253	0.080	0.08
88	7.33	0.37	0.176	0.252	0.088	0.09
89	7.42	0.37	0.176	0.251	0.088	0.09
90	7.50	0.37	0.176	0.249	0.088	0.09
91	7.58	0.40	0.192	0.248	0.096	0.10
92	7.67	0.40	0.192	0.247	0.096	0.10
93	7.75	0.40	0.192	0.246	0.096	0.10
94	7.83	0.43	0.208	0.245	0.104	0.10
95	7.92	0.43	0.208	0.244	0.104	0.10
96	8.00	0.43	0.208	0.243	0.104	0.10
97	8.08	0.50	0.240	0.242	0.120	0.12
98	8.17	0.50	0.240	0.240	0.120	0.12
99	8.25	0.50	0.240	0.239	---	0.00
100	8.33	0.50	0.240	0.238	---	0.00
101	8.42	0.50	0.240	0.237	---	0.00
102	8.50	0.50	0.240	0.236	---	0.00
103	8.58	0.53	0.256	0.235	---	0.02
104	8.67	0.53	0.256	0.234	---	0.02
105	8.75	0.53	0.256	0.233	---	0.02
106	8.83	0.57	0.272	0.232	---	0.04
107	8.92	0.57	0.272	0.230	---	0.04
108	9.00	0.57	0.272	0.229	---	0.04
109	9.08	0.63	0.304	0.228	---	0.08
110	9.17	0.63	0.304	0.227	---	0.08
111	9.25	0.63	0.304	0.226	---	0.08
112	9.33	0.67	0.320	0.225	---	0.09
113	9.42	0.67	0.320	0.224	---	0.10
114	9.50	0.67	0.320	0.223	---	0.10
115	9.58	0.70	0.336	0.222	---	0.11
116	9.67	0.70	0.336	0.221	---	0.12
117	9.75	0.70	0.336	0.220	---	0.12
118	9.83	0.73	0.352	0.219	---	0.13
119	9.92	0.73	0.352	0.218	---	0.13
120	10.00	0.73	0.352	0.217	---	0.14
121	10.08	0.50	0.240	0.215	---	0.02
122	10.17	0.50	0.240	0.214	---	0.03
123	10.25	0.50	0.240	0.213	---	0.03
124	10.33	0.50	0.240	0.212	---	0.03
125	10.42	0.50	0.240	0.211	---	0.03
126	10.50	0.50	0.240	0.210	---	0.03
127	10.58	0.67	0.320	0.209	---	0.11
128	10.67	0.67	0.320	0.208	---	0.11
129	10.75	0.67	0.320	0.207	---	0.11
130	10.83	0.67	0.320	0.206	---	0.11
131	10.92	0.67	0.320	0.205	---	0.11
132	11.00	0.67	0.320	0.204	---	0.12
133	11.08	0.63	0.304	0.203	---	0.10
134	11.17	0.63	0.304	0.202	---	0.10
135	11.25	0.63	0.304	0.201	---	0.10
136	11.33	0.63	0.304	0.200	---	0.10

137	11.42	0.63	0.304	0.199	---	0.10
138	11.50	0.63	0.304	0.198	---	0.11
139	11.58	0.57	0.272	0.197	---	0.07
140	11.67	0.57	0.272	0.196	---	0.08
141	11.75	0.57	0.272	0.195	---	0.08
142	11.83	0.60	0.288	0.194	---	0.09
143	11.92	0.60	0.288	0.193	---	0.09
144	12.00	0.60	0.288	0.192	---	0.10
145	12.08	0.83	0.400	0.191	---	0.21
146	12.17	0.83	0.400	0.190	---	0.21
147	12.25	0.83	0.400	0.189	---	0.21
148	12.33	0.87	0.416	0.189	---	0.23
149	12.42	0.87	0.416	0.188	---	0.23
150	12.50	0.87	0.416	0.187	---	0.23
151	12.58	0.93	0.448	0.186	---	0.26
152	12.67	0.93	0.448	0.185	---	0.26
153	12.75	0.93	0.448	0.184	---	0.26
154	12.83	0.97	0.464	0.183	---	0.28
155	12.92	0.97	0.464	0.182	---	0.28
156	13.00	0.97	0.464	0.181	---	0.28
157	13.08	1.13	0.544	0.180	---	0.36
158	13.17	1.13	0.544	0.179	---	0.36
159	13.25	1.13	0.544	0.178	---	0.37
160	13.33	1.13	0.544	0.177	---	0.37
161	13.42	1.13	0.544	0.177	---	0.37
162	13.50	1.13	0.544	0.176	---	0.37
163	13.58	0.77	0.368	0.175	---	0.19
164	13.67	0.77	0.368	0.174	---	0.19
165	13.75	0.77	0.368	0.173	---	0.20
166	13.83	0.77	0.368	0.172	---	0.20
167	13.92	0.77	0.368	0.171	---	0.20
168	14.00	0.77	0.368	0.170	---	0.20
169	14.08	0.90	0.432	0.169	---	0.26
170	14.17	0.90	0.432	0.169	---	0.26
171	14.25	0.90	0.432	0.168	---	0.26
172	14.33	0.87	0.416	0.167	---	0.25
173	14.42	0.87	0.416	0.166	---	0.25
174	14.50	0.87	0.416	0.165	---	0.25
175	14.58	0.87	0.416	0.164	---	0.25
176	14.67	0.87	0.416	0.163	---	0.25
177	14.75	0.87	0.416	0.163	---	0.25
178	14.83	0.83	0.400	0.162	---	0.24
179	14.92	0.83	0.400	0.161	---	0.24
180	15.00	0.83	0.400	0.160	---	0.24
181	15.08	0.80	0.384	0.159	---	0.22
182	15.17	0.80	0.384	0.159	---	0.23
183	15.25	0.80	0.384	0.158	---	0.23
184	15.33	0.77	0.368	0.157	---	0.21
185	15.42	0.77	0.368	0.156	---	0.21
186	15.50	0.77	0.368	0.155	---	0.21
187	15.58	0.63	0.304	0.154	---	0.15
188	15.67	0.63	0.304	0.154	---	0.15
189	15.75	0.63	0.304	0.153	---	0.15
190	15.83	0.63	0.304	0.152	---	0.15
191	15.92	0.63	0.304	0.151	---	0.15
192	16.00	0.63	0.304	0.151	---	0.15
193	16.08	0.13	0.064	0.150	0.032	0.03
194	16.17	0.13	0.064	0.149	0.032	0.03
195	16.25	0.13	0.064	0.148	0.032	0.03
196	16.33	0.13	0.064	0.148	0.032	0.03

197	16.42	0.13	0.064	0.147	0.032	0.03
198	16.50	0.13	0.064	0.146	0.032	0.03
199	16.58	0.10	0.048	0.145	0.024	0.02
200	16.67	0.10	0.048	0.145	0.024	0.02
201	16.75	0.10	0.048	0.144	0.024	0.02
202	16.83	0.10	0.048	0.143	0.024	0.02
203	16.92	0.10	0.048	0.142	0.024	0.02
204	17.00	0.10	0.048	0.142	0.024	0.02
205	17.08	0.17	0.080	0.141	0.040	0.04
206	17.17	0.17	0.080	0.140	0.040	0.04
207	17.25	0.17	0.080	0.140	0.040	0.04
208	17.33	0.17	0.080	0.139	0.040	0.04
209	17.42	0.17	0.080	0.138	0.040	0.04
210	17.50	0.17	0.080	0.137	0.040	0.04
211	17.58	0.17	0.080	0.137	0.040	0.04
212	17.67	0.17	0.080	0.136	0.040	0.04
213	17.75	0.17	0.080	0.135	0.040	0.04
214	17.83	0.13	0.064	0.135	0.032	0.03
215	17.92	0.13	0.064	0.134	0.032	0.03
216	18.00	0.13	0.064	0.133	0.032	0.03
217	18.08	0.13	0.064	0.133	0.032	0.03
218	18.17	0.13	0.064	0.132	0.032	0.03
219	18.25	0.13	0.064	0.131	0.032	0.03
220	18.33	0.13	0.064	0.131	0.032	0.03
221	18.42	0.13	0.064	0.130	0.032	0.03
222	18.50	0.13	0.064	0.130	0.032	0.03
223	18.58	0.10	0.048	0.129	0.024	0.02
224	18.67	0.10	0.048	0.128	0.024	0.02
225	18.75	0.10	0.048	0.128	0.024	0.02
226	18.83	0.07	0.032	0.127	0.016	0.02
227	18.92	0.07	0.032	0.126	0.016	0.02
228	19.00	0.07	0.032	0.126	0.016	0.02
229	19.08	0.10	0.048	0.125	0.024	0.02
230	19.17	0.10	0.048	0.125	0.024	0.02
231	19.25	0.10	0.048	0.124	0.024	0.02
232	19.33	0.13	0.064	0.123	0.032	0.03
233	19.42	0.13	0.064	0.123	0.032	0.03
234	19.50	0.13	0.064	0.122	0.032	0.03
235	19.58	0.10	0.048	0.122	0.024	0.02
236	19.67	0.10	0.048	0.121	0.024	0.02
237	19.75	0.10	0.048	0.121	0.024	0.02
238	19.83	0.07	0.032	0.120	0.016	0.02
239	19.92	0.07	0.032	0.120	0.016	0.02
240	20.00	0.07	0.032	0.119	0.016	0.02
241	20.08	0.10	0.048	0.119	0.024	0.02
242	20.17	0.10	0.048	0.118	0.024	0.02
243	20.25	0.10	0.048	0.118	0.024	0.02
244	20.33	0.10	0.048	0.117	0.024	0.02
245	20.42	0.10	0.048	0.116	0.024	0.02
246	20.50	0.10	0.048	0.116	0.024	0.02
247	20.58	0.10	0.048	0.116	0.024	0.02
248	20.67	0.10	0.048	0.115	0.024	0.02
249	20.75	0.10	0.048	0.115	0.024	0.02
250	20.83	0.07	0.032	0.114	0.016	0.02
251	20.92	0.07	0.032	0.114	0.016	0.02
252	21.00	0.07	0.032	0.113	0.016	0.02
253	21.08	0.10	0.048	0.113	0.024	0.02
254	21.17	0.10	0.048	0.112	0.024	0.02
255	21.25	0.10	0.048	0.112	0.024	0.02
256	21.33	0.07	0.032	0.111	0.016	0.02

257	21.42	0.07	0.032	0.111	0.016	0.02
258	21.50	0.07	0.032	0.111	0.016	0.02
259	21.58	0.10	0.048	0.110	0.024	0.02
260	21.67	0.10	0.048	0.110	0.024	0.02
261	21.75	0.10	0.048	0.109	0.024	0.02
262	21.83	0.07	0.032	0.109	0.016	0.02
263	21.92	0.07	0.032	0.109	0.016	0.02
264	22.00	0.07	0.032	0.108	0.016	0.02
265	22.08	0.10	0.048	0.108	0.024	0.02
266	22.17	0.10	0.048	0.108	0.024	0.02
267	22.25	0.10	0.048	0.107	0.024	0.02
268	22.33	0.07	0.032	0.107	0.016	0.02
269	22.42	0.07	0.032	0.107	0.016	0.02
270	22.50	0.07	0.032	0.106	0.016	0.02
271	22.58	0.07	0.032	0.106	0.016	0.02
272	22.67	0.07	0.032	0.106	0.016	0.02
273	22.75	0.07	0.032	0.105	0.016	0.02
274	22.83	0.07	0.032	0.105	0.016	0.02
275	22.92	0.07	0.032	0.105	0.016	0.02
276	23.00	0.07	0.032	0.105	0.016	0.02
277	23.08	0.07	0.032	0.104	0.016	0.02
278	23.17	0.07	0.032	0.104	0.016	0.02
279	23.25	0.07	0.032	0.104	0.016	0.02
280	23.33	0.07	0.032	0.104	0.016	0.02
281	23.42	0.07	0.032	0.103	0.016	0.02
282	23.50	0.07	0.032	0.103	0.016	0.02
283	23.58	0.07	0.032	0.103	0.016	0.02
284	23.67	0.07	0.032	0.103	0.016	0.02
285	23.75	0.07	0.032	0.103	0.016	0.02
286	23.83	0.07	0.032	0.103	0.016	0.02
287	23.92	0.07	0.032	0.103	0.016	0.02
288	24.00	0.07	0.032	0.103	0.016	0.02

Sum = 100.0 Sum = 22.5

Flood volume = Effective rainfall 1.87(In)  
times area 30.6(Ac.)/[(In)/(Ft.)] = 4.8(Ac.Ft)  
Total soil loss = 2.13(In)  
Total soil loss = 5.427(Ac.Ft)  
Total rainfall = 4.00(In)  
Flood volume = 207892.3 Cubic Feet  
Total soil loss = 236393.1 Cubic Feet

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Peak flow rate of this hydrograph = 11.339(CFS)  
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24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))  
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Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0012	0.17	Q				
0+10	0.0040	0.40	Q				
0+15	0.0071	0.46	Q				
0+20	0.0110	0.56	VQ				
0+25	0.0157	0.69	VQ				
0+30	0.0207	0.72	VQ				
0+35	0.0257	0.73	VQ				
0+40	0.0308	0.74	VQ				

0+45	0.0359	0.74	VQ
0+50	0.0416	0.83	VQ
0+55	0.0481	0.94	VQ
1+ 0	0.0548	0.97	VQ
1+ 5	0.0609	0.89	VQ
1+10	0.0663	0.78	VQ
1+15	0.0716	0.76	VQ
1+20	0.0767	0.75	VQ
1+25	0.0818	0.74	VQ
1+30	0.0869	0.74	VQ
1+35	0.0920	0.74	VQ
1+40	0.0971	0.74	VQ
1+45	0.1022	0.74	VQ
1+50	0.1079	0.83	VQ
1+55	0.1144	0.94	VQ
2+ 0	0.1211	0.97	Q
2+ 5	0.1278	0.98	Q
2+10	0.1346	0.99	Q
2+15	0.1414	0.99	Q
2+20	0.1482	0.99	Q
2+25	0.1550	0.99	Q
2+30	0.1618	0.99	Q
2+35	0.1692	1.07	VQ
2+40	0.1774	1.19	VQ
2+45	0.1857	1.21	VQ
2+50	0.1942	1.23	VQ
2+55	0.2027	1.23	VQ
3+ 0	0.2112	1.23	VQ
3+ 5	0.2197	1.23	VQ
3+10	0.2282	1.23	VQ
3+15	0.2367	1.23	VQ
3+20	0.2452	1.23	Q
3+25	0.2537	1.23	Q
3+30	0.2622	1.23	Q
3+35	0.2707	1.23	Q
3+40	0.2792	1.23	Q
3+45	0.2877	1.23	Q
3+50	0.2968	1.32	Q
3+55	0.3066	1.44	Q
4+ 0	0.3167	1.46	Q
4+ 5	0.3269	1.47	Q
4+10	0.3370	1.48	Q
4+15	0.3472	1.48	Q
4+20	0.3580	1.57	Q
4+25	0.3696	1.68	Q
4+30	0.3814	1.71	Q
4+35	0.3932	1.72	Q
4+40	0.4051	1.73	Q
4+45	0.4170	1.73	Q
4+50	0.4295	1.81	Q
4+55	0.4428	1.93	Q
5+ 0	0.4563	1.96	Q
5+ 5	0.4686	1.79	Q
5+10	0.4794	1.57	QV
5+15	0.4899	1.52	QV
5+20	0.5008	1.58	QV
5+25	0.5124	1.69	QV
5+30	0.5242	1.71	QV
5+35	0.5366	1.81	QV
5+40	0.5499	1.93	QV

5+45	0.5634	1.96		QV			
5+50	0.5769	1.97		QV			
5+55	0.5905	1.97		QV			
6+ 0	0.6041	1.97		Q V			
6+ 5	0.6183	2.06		QV			
6+10	0.6333	2.18		QV			
6+15	0.6484	2.20		QV			
6+20	0.6637	2.21		QV			
6+25	0.6790	2.22		QV			
6+30	0.6943	2.22		QV			
6+35	0.7101	2.31		QV			
6+40	0.7268	2.42		Q V			
6+45	0.7437	2.45		Q V			
6+50	0.7606	2.46		Q V			
6+55	0.7776	2.47		Q V			
7+ 0	0.7946	2.47		Q V			
7+ 5	0.8116	2.47		Q V			
7+10	0.8286	2.47		Q V			
7+15	0.8456	2.47		Q V			
7+20	0.8632	2.55		Q V			
7+25	0.8816	2.67		Q V			
7+30	0.9002	2.70		Q V			
7+35	0.9194	2.79		Q V			
7+40	0.9395	2.91		Q V			
7+45	0.9597	2.94		Q V			
7+50	0.9807	3.04		Q V			
7+55	1.0024	3.16		Q V			
8+ 0	1.0244	3.19		Q V			
8+ 5	1.0476	3.37		Q V			
8+10	1.0725	3.61		QV			
8+15	1.0889	2.38		Q		V	
8+20	1.0937	0.70	Q			V	
8+25	1.0961	0.34	Q			V	
8+30	1.0975	0.21	Q			V	
8+35	1.0998	0.33	Q			V	
8+40	1.1037	0.56	Q			V	
8+45	1.1081	0.65	Q			V	
8+50	1.1142	0.88	Q			V	
8+55	1.1221	1.15	Q			V	
9+ 0	1.1307	1.24	Q			V	
9+ 5	1.1421	1.65	Q			V	
9+10	1.1569	2.15	Q			V	
9+15	1.1727	2.29	Q			V	
9+20	1.1902	2.55	Q			V	
9+25	1.2097	2.83	Q			V	
9+30	1.2298	2.93	Q			V	
9+35	1.2516	3.15	Q			V	
9+40	1.2752	3.43	Q			V	
9+45	1.2994	3.52	Q			V	
9+50	1.3252	3.75	Q			V	
9+55	1.3529	4.02	Q			V	
10+ 0	1.3812	4.11	Q			V	
10+ 5	1.4016	2.96	Q			V	
10+10	1.4112	1.39	Q			V	
10+15	1.4185	1.06	Q			V	
10+20	1.4249	0.93	Q			V	
10+25	1.4310	0.89	Q			V	
10+30	1.4371	0.89	Q			V	
10+35	1.4494	1.78	Q			V	
10+40	1.4697	2.96	Q			V	

10+45	1.4922	3.26	Q	V		
10+50	1.5156	3.40	Q	V		
10+55	1.5396	3.49	Q	V		
11+ 0	1.5640	3.54	Q	V		
11+ 5	1.5875	3.40	Q	V		
11+10	1.6095	3.20	Q	V		
11+15	1.6314	3.18	Q	V		
11+20	1.6534	3.19	Q	V		
11+25	1.6755	3.21	Q	V		
11+30	1.6978	3.23	Q	V		
11+35	1.7179	2.92	Q	V		
11+40	1.7350	2.49	Q	V		
11+45	1.7517	2.42	Q	V		
11+50	1.7694	2.57	Q	V		
11+55	1.7887	2.81	Q	V		
12+ 0	1.8086	2.88	Q	V		
12+ 5	1.8371	4.15	Q	V		
12+10	1.8770	5.79	Q	V		
12+15	1.9197	6.20	Q	V		
12+20	1.9648	6.56	Q	V		
12+25	2.0123	6.90	Q	V		
12+30	2.0606	7.01	Q	V		
12+35	2.1116	7.41	Q	V		
12+40	2.1661	7.91	Q	V		
12+45	2.2215	8.05	Q	V		
12+50	2.2786	8.29	Q	V		
12+55	2.3376	8.57	Q	V		
13+ 0	2.3973	8.66	Q	V		
13+ 5	2.4633	9.58	Q	V		
13+10	2.5374	10.76	Q	V		
13+15	2.6136	11.06	Q	V		
13+20	2.6908	11.20	Q	V		
13+25	2.7685	11.29	Q	V		
13+30	2.8466	11.34	Q	V		
13+35	2.9118	9.47	Q	V		
13+40	2.9598	6.97	Q	V		
13+45	3.0040	6.42	Q	V		
13+50	3.0466	6.19	Q	V		
13+55	3.0886	6.10	Q	V		
14+ 0	3.1304	6.07	Q	V		
14+ 5	3.1772	6.79	Q	V		
14+10	3.2305	7.73	Q	V		
14+15	3.2854	7.97	Q	V		
14+20	3.3399	7.92	Q	V		
14+25	3.3934	7.76	Q	V		
14+30	3.4468	7.75	Q	V		
14+35	3.5002	7.76	Q	V		
14+40	3.5537	7.77	Q	V		
14+45	3.6074	7.79	Q	V		
14+50	3.6600	7.65	Q	V		
14+55	3.7113	7.44	Q	V		
15+ 0	3.7623	7.41	Q	V		
15+ 5	3.8122	7.24	Q	V		
15+10	3.8606	7.03	Q	V		
15+15	3.9088	7.00	Q	V		
15+20	3.9558	6.83	Q	V		
15+25	4.0014	6.61	Q	V		
15+30	4.0467	6.58	Q	V		
15+35	4.0872	5.89	Q	V		
15+40	4.1215	4.98	Q	V		

15+45	4.1546	4.79		Q		V
15+50	4.1871	4.73		Q		V
15+55	4.2195	4.70		Q		V
16+ 0	4.2519	4.71		Q		V
16+ 5	4.2755	3.42		Q		V
16+10	4.2870	1.68	Q			V
16+15	4.2958	1.28	Q			V
16+20	4.3035	1.11	Q			V
16+25	4.3105	1.02	Q			V
16+30	4.3173	0.99	Q			V
16+35	4.3235	0.90	Q			V
16+40	4.3289	0.79	Q			V
16+45	4.3341	0.76	Q			V
16+50	4.3393	0.75	Q			V
16+55	4.3444	0.74	Q			V
17+ 0	4.3495	0.74	Q			V
17+ 5	4.3558	0.91	Q			V
17+10	4.3637	1.14	Q			V
17+15	4.3719	1.20	Q			V
17+20	4.3803	1.22	Q			V
17+25	4.3888	1.23	Q			V
17+30	4.3973	1.23	Q			V
17+35	4.4058	1.23	Q			V
17+40	4.4143	1.23	Q			V
17+45	4.4228	1.23	Q			V
17+50	4.4307	1.15	Q			V
17+55	4.4378	1.03	Q			V
18+ 0	4.4447	1.01	Q			V
18+ 5	4.4516	1.00	Q			V
18+10	4.4584	0.99	Q			V
18+15	4.4652	0.99	Q			V
18+20	4.4720	0.99	Q			V
18+25	4.4788	0.99	Q			V
18+30	4.4856	0.99	Q			V
18+35	4.4918	0.90	Q			V
18+40	4.4972	0.79	Q			V
18+45	4.5024	0.76	Q			V
18+50	4.5070	0.66	Q			V
18+55	4.5107	0.54	Q			V
19+ 0	4.5143	0.51	Q			V
19+ 5	4.5183	0.59	Q			V
19+10	4.5231	0.70	Q			V
19+15	4.5281	0.72	Q			V
19+20	4.5337	0.82	Q			V
19+25	4.5402	0.94	Q			V
19+30	4.5468	0.97	Q			V
19+35	4.5530	0.89	Q			V
19+40	4.5584	0.78	Q			V
19+45	4.5636	0.76	Q			V
19+50	4.5682	0.66	Q			V
19+55	4.5719	0.54	Q			V
20+ 0	4.5754	0.51	Q			V
20+ 5	4.5795	0.59	Q			V
20+10	4.5843	0.70	Q			V
20+15	4.5893	0.72	Q			V
20+20	4.5943	0.73	Q			V
20+25	4.5994	0.74	Q			V
20+30	4.6045	0.74	Q			V
20+35	4.6096	0.74	Q			V
20+40	4.6147	0.74	Q			V

20+45	4.6198	0.74	Q	V
20+50	4.6243	0.65	Q	V
20+55	4.6280	0.54	Q	V
21+ 0	4.6315	0.51	Q	V
21+ 5	4.6356	0.59	Q	V
21+10	4.6404	0.70	Q	V
21+15	4.6454	0.72	Q	V
21+20	4.6498	0.65	Q	V
21+25	4.6535	0.54	Q	V
21+30	4.6570	0.51	Q	V
21+35	4.6611	0.59	Q	V
21+40	4.6659	0.70	Q	V
21+45	4.6709	0.72	Q	V
21+50	4.6753	0.65	Q	V
21+55	4.6790	0.54	Q	V
22+ 0	4.6825	0.51	Q	V
22+ 5	4.6866	0.59	Q	V
22+10	4.6914	0.70	Q	V
22+15	4.6964	0.72	Q	V
22+20	4.7008	0.65	Q	V
22+25	4.7045	0.54	Q	V
22+30	4.7080	0.51	Q	V
22+35	4.7115	0.50	Q	V
22+40	4.7149	0.50	Q	V
22+45	4.7183	0.49	Q	V
22+50	4.7217	0.49	Q	V
22+55	4.7251	0.49	Q	V
23+ 0	4.7285	0.49	Q	V
23+ 5	4.7319	0.49	Q	V
23+10	4.7353	0.49	Q	V
23+15	4.7387	0.49	Q	V
23+20	4.7421	0.49	Q	V
23+25	4.7455	0.49	Q	V
23+30	4.7489	0.49	Q	V
23+35	4.7523	0.49	Q	V
23+40	4.7557	0.49	Q	V
23+45	4.7591	0.49	Q	V
23+50	4.7625	0.49	Q	V
23+55	4.7659	0.49	Q	V
24+ 0	4.7693	0.49	Q	V
24+ 5	4.7715	0.32	Q	V
24+10	4.7721	0.09	Q	V
24+15	4.7724	0.04	Q	V
24+20	4.7725	0.02	Q	V
24+25	4.7726	0.00	Q	V

*Appendix*

**F**

# **DETENTION BASIN ANALYSIS**

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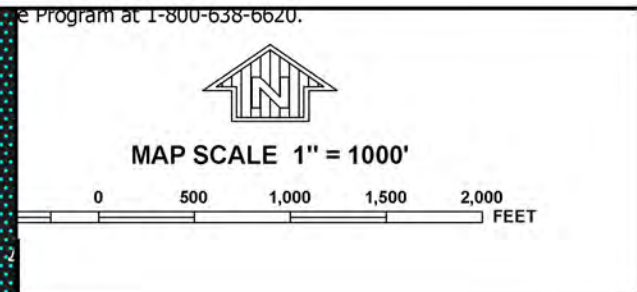
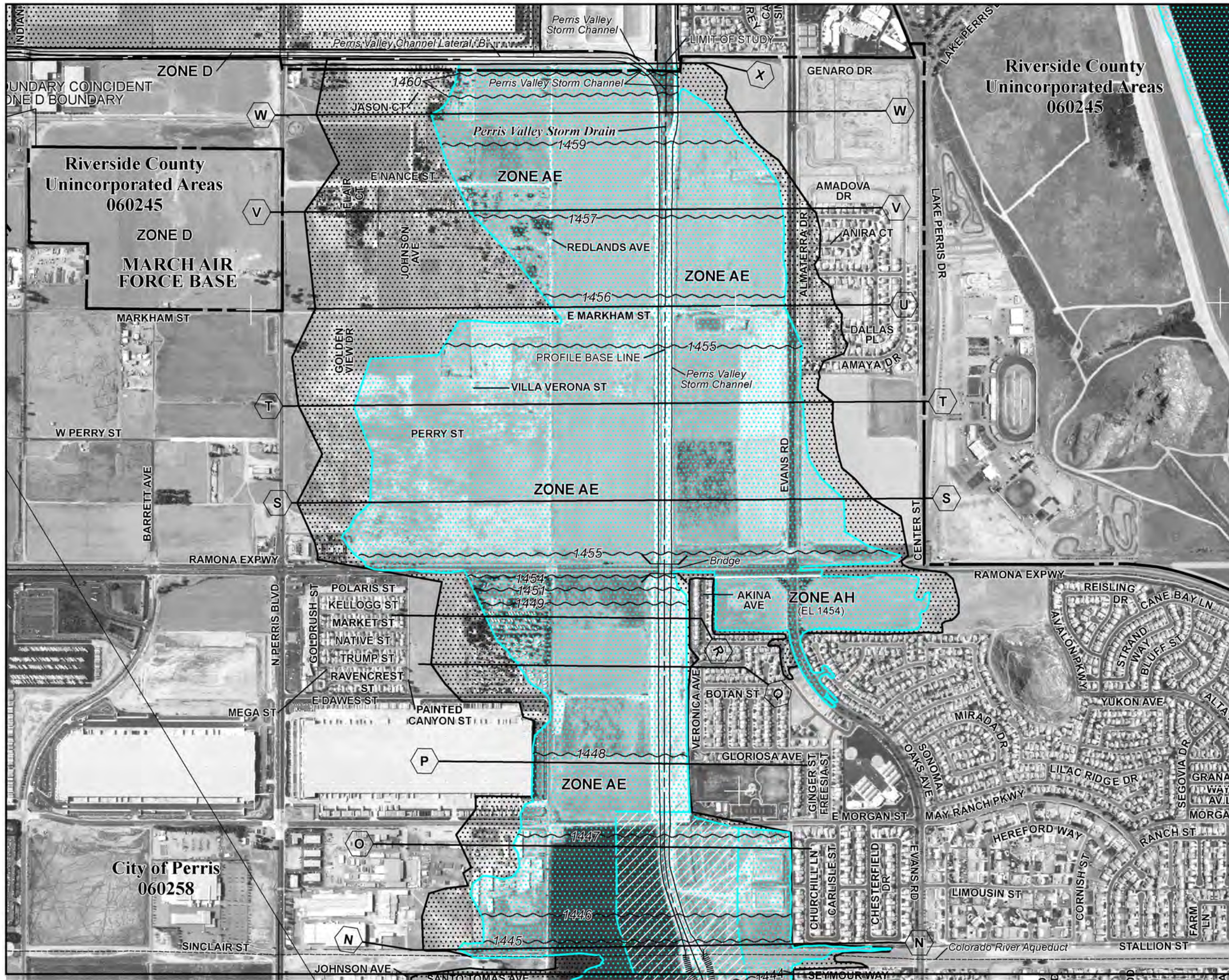
To be prepared in Final Hydrology &  
Hydraulics Report

*Appendix*

**G**

**FEMA FIRM Panel No. 06065C1430H**

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Riverside County  
Unincorporated Areas  
060245

**NFIP** PANEL 1430H

**FIRM**  
FLOOD INSURANCE RATE MAP  
RIVERSIDE COUNTY,  
CALIFORNIA  
AND INCORPORATED AREAS

PANEL 1430 OF 3805  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MORENO VALLEY CITY OF	065074	1430	H
PERRIS, CITY OF	060258	1430	H
RIVERSIDE COUNTY UNINCORPORATED AREAS	060245	1430	H

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

**MAP NUMBER**  
06065C1430H

**MAP REVISED**  
AUGUST 18, 2014

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

*Appendix*

**H**

# **CATCH BASIN SIZING AND STREET FLOW CAPACITY CALCULATIONS**

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To be prepared in Final Hydrology &  
Hydraulics Report

*Appendix*

**J**

**STORM DRAIN HYDRAULICS WSPG FILES**

T1 Strafford Ranch

0

T2 Lower WQMP Basin Outlet Storm Drain

T3 L.Johnson\March 09, 2021 \Rev 3/24/21

SO 0100.0001443.900 1 1447.000

R 0900.0001445.700 1 .013 .000

.000 0

WE 0900.0001445.700 10 .200

SH 0900.0001445.700 10 1445.700

CD 1 4 1 .000 3.500 .000 .000 .000 .00

CD 10 3 0 .000 8.000 14.000 .000 .000 .00

Q 49.700 .0



T1 Strafford Ranch

0

T2 Lower WQMP Basin Outlet Storm Drain, Q100 Flow Rate

T3 L.Johnson\March 09, 2021/ Rev 3/23/21

SO 0100.0001444.600 1 1447.000

R 0151.6001445.320 1 .013 .000

.000 0

WE 0151.6001445.320 10 .200

SH 0151.6001445.320 10 1445.320

CD 1 4 1 .000 3.000 .000 .000 .000 .00

CD 10 3 0 .000 8.000 14.000 .000 .000 .00

Q 43.000 .0



