HYDROLOGY & HYDRAULICS REPORT

VA BAKERSFIELD COMMUNITY BASED OUTPATIENT CLINIC

KNUDSEN DR. & OLIVE DRIVE
BAKERSFIELD, CA 93308
APN: 365-020-30
PROJECT NO: VA -101F-12-20010

PREPARED FOR:

SASD Development Group, LLC
4895 Pacific Highway
San Diego, CA 92110
Contact: Steve Doctor
(619) 787-6270

PREPARED BY:

EA ENGINEERS, INC.
20505 E. VALLEY BLVD., SUITE 110
WALNUT, CA 91789
(909) 598-5045

ORIGINAL DATE: *June 11th, 2020*

I hereby declare that I am the engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions code, and that the design is consistent with current standards.

6/11/20

GIL EVANGELISTA
R.C.E. NO. 32512
EXPIRES 6/30/21

DATE

TABLE OF CONTENTS

DESCRIPTIONS ***PAGE***

COVER SHEET 1
TABLE OF CONTENTS 2
1.0 INTRODUCTION 3
2.0 LOCATION 3
3.0 METHODOLOGY 3
4.0 HYDRAULIC CALCULATIONS 4-5
5.0 CONCLUSION 5
6.0 REFERENCES 7
7.0 DECLARATION OF RESPONSIBLE CHARGE 8
8.0 ATTACHMENTS 9

ATTACHMENT 1: STANDARD EXCERPTS

ATTACHMENT 2: EXISTING CONDITIONS CALCULATIONS

ATTACHMENT 3: PROPOSED CONDITIONS CALCULATIONS

ATTACHMENT 4: EXHIBITS

ATTACHMENT 5: FEMA DETERMINATION

ATTACHMENT 6: SOILS REPORT

1.0 INTRODUCTION

The purpose of this report is to calculate the pre-development and post development hydrology conditions for the proposed site located at the southeasterly portion of the intersection located at Olive Dr. and Knudsen Dr. as part of MB 6422, pg. 563. This report will quantify the impact of the proposed commercial development on the project. The report will quantify the increase in flow rates in the 10 yr.–24 hr storm and 100 yr.-24 hr storm events. The calculations provided in this report have been created using Division Four "Standards for Drainage" of the City of Bakersfield *Subdivision and Engineering Design Manual*, dated July 1989; hereinafter referred to as "Design Manual." This study will also use Civil Design software to compile hydrology calculations computations.

2.0 LOCATION

The proposed improvements are located at the southeasterly portion of the intersection located at Olive Dr. and Knudsen Dr. as part of MB 6422, pg. 563. The proposed development includes a multi-story single building hospital with parking, curb, gutter and landscaping. The property will be bounded by Knudsen Drive to the west, an existing commercial property along the northerly property line and Landco Drive to the immediate east. The site is also bound by a proposed Street "A" to the immediate south. The site naturally drains to the south west to an existing drainage basin with nuisance flows draining to the south east of the site.

3.0 METHODOLOGY

This report will compare the existing and proposed 100 yr. 24 hr. storm values and also compare the 10 yr. 24 hr. storm values. The report will quantify the increase in flow rates in the 10 yr.–24 hr storm and 100 yr.-24 hr storm events. The calculations provided in this report have been created using Division Four "Standards for Drainage" of the City of Bakersfield *Subdivision and Engineering Design Manual*, dated July 1989; hereinafter referred to as "Design Manual." This study will also use Civil Design software to compile hydrology calculations computations.

4.0 EXISTING CONDITIONS CALCULATIONS

The project site has been evaluated using the design manual to determine the 10-Year and 100- Year Design Storm Event Peak Discharge Rates. Certain tables and figures from the Standards are referenced in this report and have been included in Attachment 1: Standards Excerpts. The existing conditions calculations are provided in Attachment 2 for reference. The hydrology exhibits are provided for reference in Attachment 4. A summary of the existing conditions are as follows:

EXISTING CONDITION SUMMARY 10-YEAR – 24 HR STORM EVENT					
DMA	***AREA (ACRES)***	***TIME OF CONC. (TC)***	***INTENSITY (IN/HR)***	***TOTAL DISCHARGE (CFS)***	***VOLUME (Cubic Ft.)***
X-1	6.92	10	0.81	2.38	-
Sub-Total:	6.92	10	0.81	2.38	-

EXISTING CONDITION SUMMARY 100-YEAR – 24 HR STORM EVENT					
DMA	***AREA (ACRES)***	***TIME OF CONC. (TC)***	***INTENSITY (IN/HR)***	***TOTAL DISCHARGE (CFS)***	***VOLUME (Cubic Ft.)***
X-1	6.92	10	1.71	4.3	22,215.60
Sub-Total:	6.92	10	1.71	4.3	22,215.60

5.0 PROPOSED CONDITIONS CALCULATIONS

The project site has been evaluated using the Rational Method from *Division Four, "Standards for Drainage" of the City of Bakersfield Subdivision and Engineering Design Manual, dated July 1989; hereinafter referred to as "Design Manual." Certain* tables and figures from the Standards are referenced in this report and have been included in Attachment 1: Standards Excerpts. The proposed conditions calculations are provided in Attachment 3 for reference. The hydrology exhibits are provided for reference in Attachment 4. A summary of the existing conditions are as follows:

PROPOSED CONDITION SUMMARY 10-YEAR-24 HR STORM EVENT					
DMA	***AREA (ACRES)***	***TIME OF CONC. (TC)***	***INTENSITY (IN/HR)***	***TOTAL DISCHARGE (CFS)***	***VOLUME (Cubic Ft.)***
A-1	1.31	10	2.174	1.82	-
A-2	1.06	10	1.981	0.96	-
A-3	1.64	10	1.609	1.49	-
A-4	2.80	10	2.077	2.61	-
Total:	6.81	10	-	6.88	-

PROPOSED CONDITION SUMMARY 100-YEAR-24 HR STORM EVENT					
DMA	***AREA (ACRES)***	***TIME OF CONC. (TC)***	***INTENSITY (IN/HR)***	***TOTAL DISCHARGE (CFS)***	***VOLUME (Cubic Ft.)***
A-1	1.31	10	2.192	2.95	11,325.60
A-2	1.06	10	1.981	1.49	8,363.52
A-3	1.64	10	1.981	2.31	12,893.76
A-4	2.80	10	2.077	4.01	22,215.60
Total:	6.81	10	-	10.76	54,798.48

9.0 FEMA DETERMINATION

In order to access the impacts to existing flood control impacts, FEMA flood mapping was consulted, but the area is not listed and is assumed to be Area X. This means that there is no FEMA flooding risk associated with the project site or its proposed elements. An excerpt from the localized FEMA Flood Insurance Study mapping is provided for reference in Attachment 5.

10.0 CONCLUSION

The proposed project site will construct new structures, landscaping, and impervious surfaces on an existing ungraded lot. This will result in no increase in the peak discharge rates as a direct result of the construction of two drainage basins at the southeast and southwest corners of the site. Elements like the minimization of impervious areas and the dispersion of impervious areas to flatter permeable areas. An overall comparison is as follows:

10-YEAR - 24 HR - DESIGN STORM EVENT COMPARISON			
DATA	***EXISTING***	***PROPOSED***	***COMPARISON***
TIME OF CONCENTRATION (TC) MIN.	10	10	-
TOTAL DISCHARGE (cfs)	2.38	6.88	-
AREA (ACRES)	6.92	6.81	-

100-YEAR - 24 HR - DESIGN STORM EVENT COMPARISON			
DATA	***EXISTING***	***PROPOSED***	***COMPARISON***
TIME OF CONCENTRATION (TC) MIN.	10	10	N/A
TOTAL DISCHARGE (cfs)	4.3	10.76	+6.46
AREA (ACRES)	6.92	6.81	-0.11**
VOLUME	22,215.60	54798.48	+32,582.88*

*Volume to be stored onsite.

** Right of Way Dedication: 0.11 Acres.

100-YEAR - 24 HR – ONSITE VOLUME					
DMA	***BMP TYPE***	*100 YR FLOOD*	***S.F.***	***C.F.***	***VOLUME REQ.***
A1	BASIN	11,325.60	1525	862	BASIN
A2	BASIN	8,363.52	1194	913	BASIN
A3	BASIN	12,893.76	1253	975	BASIN
A4	BASIN	22,215.60	9675	30163	BASIN
TOTAL	--	54,798.48	13647	32,913	32,582.88*
Net Storage Onsite vs. Required:					**32,913 > 32,582.88*** √

*NET VOLUME FOR 100 YEAR – 24 HR STORM STORED ON-SITE
* SEE RATIONAL METHOD CIVIL DESIGN DATA AND HYDROCAD DATA IN APPENDIX.

BASIN DETAILS					
DMA	***BMP TYPE***	***S.F.***	***BOTTOM***	***OVERFLOW***	***OVERFLOW DESTINATION***
A1	BASIN	1525	862	426.0	BASIN 1
A2	BASIN	1194	425	426	BASIN 1
A3	BASIN	1253	427	428	BASIN 1
A4	BASIN	9675	30163	BASIN	PUBLIC SD

CATCH BASIN SUMMARY							
CB	*L*	*W*	*T*	*CFS (10 YR STORM)*	*CFS (100 YR STORM)*	*CAPACITY*	*DESTINATION*
1	8’	4’	8”	1.82	2.95	2.95	BASIN 1
2	7’	4’	8”	0.96	1.49	1.49	BASIN 4
3	7’	4’	8”	1.49	2.31	2.31	BASIN 4
4	12’	4’	8”	2.61	4.01	4.01	BASIN 4

LEGEND:
CB – CATCH BASIN
L- LENGTH
W- WIDTH
T-THROAT

In addition, the following statements apply to the project site:

Drainage Pattern Alteration Statement: The proposed project does not substantially alter the existing drainage pattern of the site or area. The site will maintain existing drainage patterns and will drain to the south by an onsite storm drain system. Flows will be collected in an onsite storm drain system and will overflow into a basin to the south.

Housing in a 100-Year Flood Hazard Statement: The project is not in a FEMA mapped flood hazard area per the appropriate FEMA mapping and as such, no hazards exist at this time.

Flooding Statement: The majority of the project is mapped FEMA area and is considered to be Zone X with no flooding on-site per FEMA plate 06065C2037G dated 8/28/2008.

Offsite Flows: The proposed project does not take on direct flows. The project site takes on nuisance flows with the majority of the flows continuing to the south east to the adjoining parcel.

11.0 REFERENCES

The following references were utilized in the creation of this hydrology report:

1. Brater & King, Handbook of Hydraulics, 6th ed.

2. Division Four, “Standards for Drainage” of the City of Bakersfield Subdivision and Engineering Design Manual, dated July 1989; hereinafter referred to as “Design Manual.”

3. Hydrology Software - Civil Design, 2014

12.0 DECLARATION OF RESPONSIBLE CHARGE

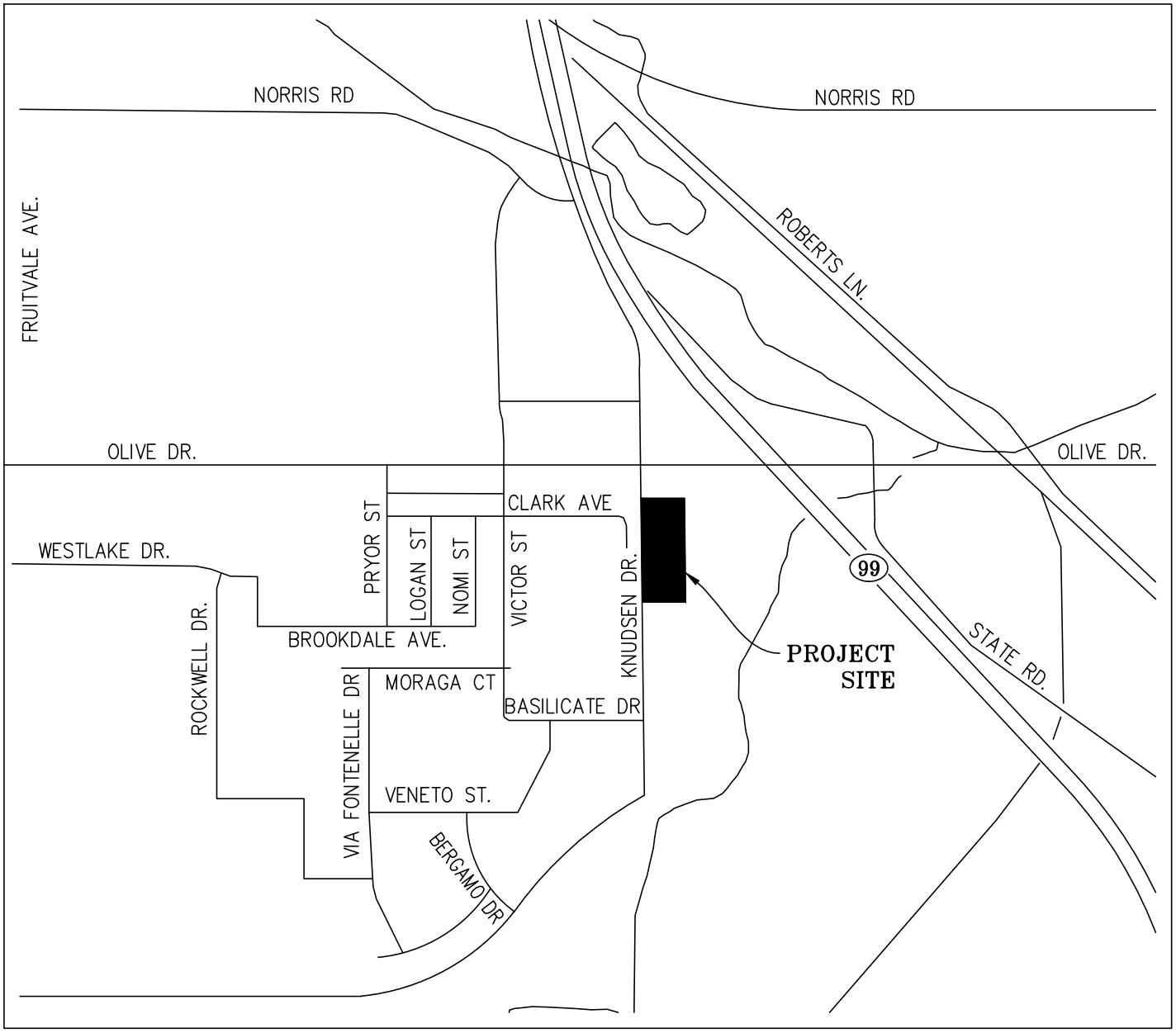
I hereby declare that I am the engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions code, and that the design is consistent with current standards.

6/11/20

GIL EVANGELISTA *DATE*
R.C.E. NO. 32512
EXPIRES 6/30/21

ATTACHMENT 1: STANDARDEXCERPTS

This attachment contains various excerpts, calculations, assumptions, procedures, and references in this study are done per Division four “Standards for Drainage” of the City of Bakersfield *Subdivision and Engineering Design Manual*, dated July 1989; hereinafter referred to as “Design Manual.” https://kernpublicworks.com/building-and-development/engineering/development-standards/division-four-standards-for-drainage/



VICINITY MAP

NOT TO SCALE

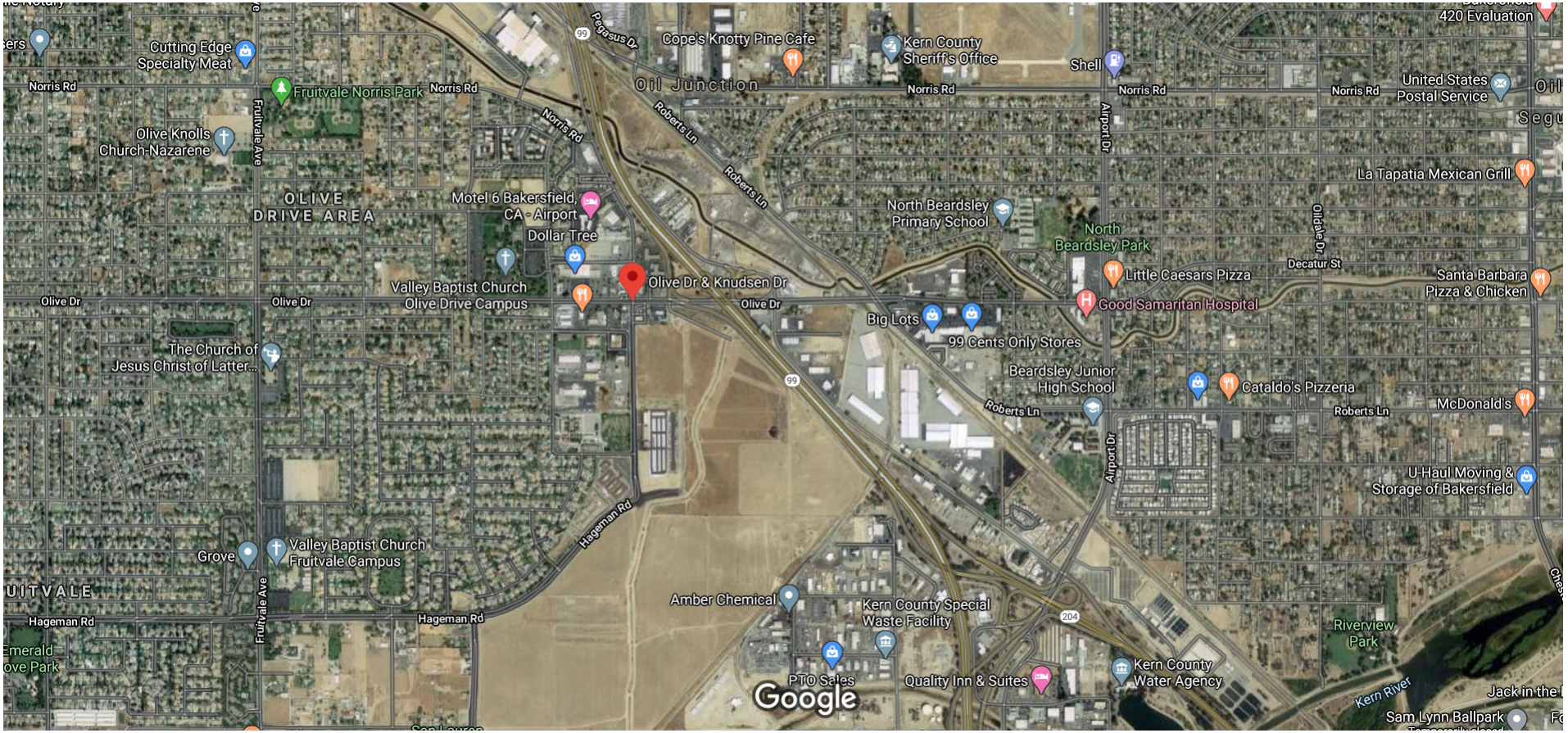
SITE ADDRESS

KNUDSEN & OLIVE DRIVE
BAKERSFIELD, CA 93308
APN: 365-020-30
PROJECT NO: VA -101F-12-20010

Google Maps

Olive Dr & Knudsen Dr

PROJECT LOCATION

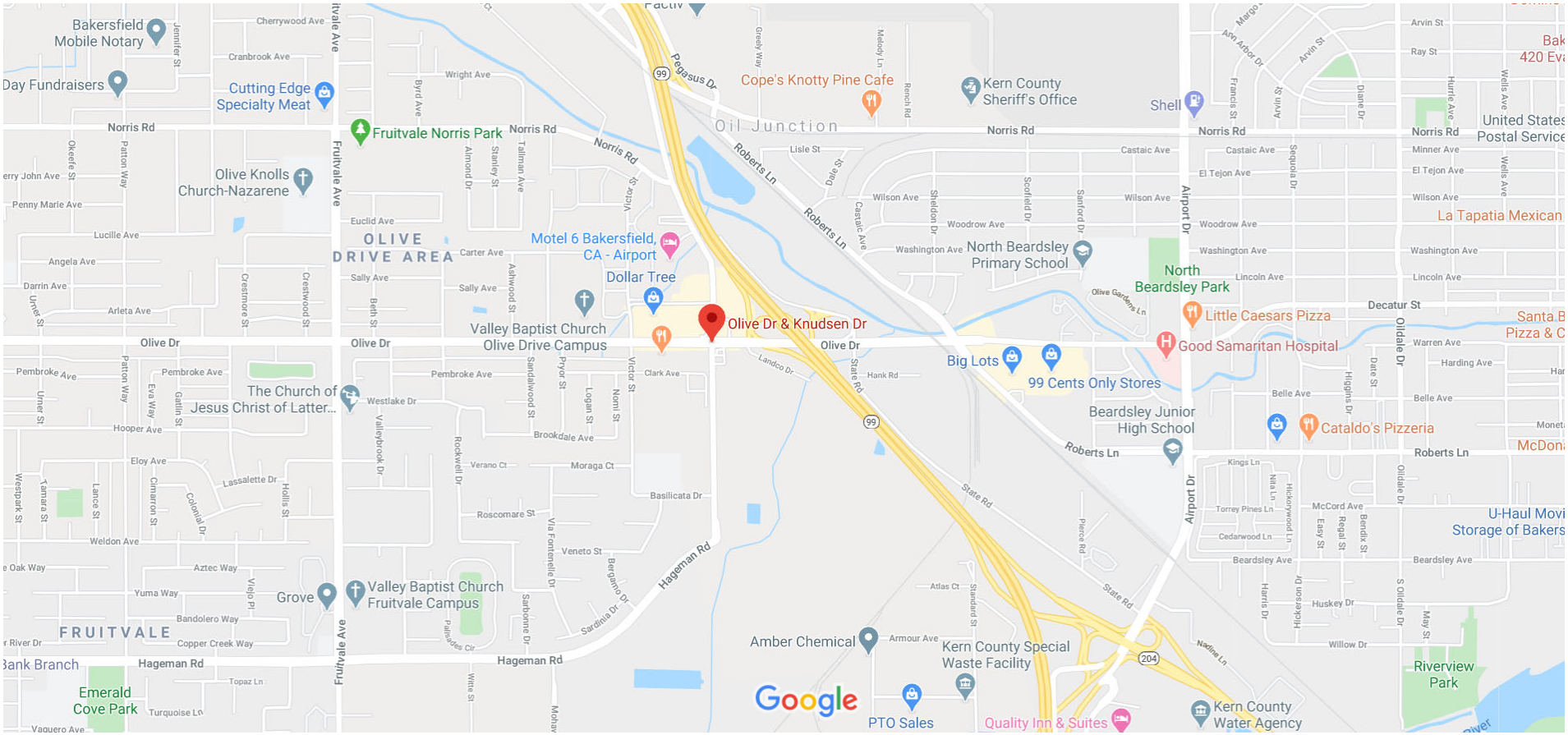


Imagery ©2020 Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency, Map data ©2020 1000 ft

Google Maps

Olive Dr & Knudsen Dr

VICINITY MAP



NOAA Atlas 14, Volume 6, Version 2
Location name: Bakersfield, California, USA*
Latitude: 35.4076°, Longitude: -119.0547°
Elevation: 431.91 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.078** (0.064-0.095)	**0.098** (0.081-0.121)	**0.129** (0.105-0.159)	**0.156** (0.127-0.194)	**0.197** (0.155-0.253)	**0.232** (0.179-0.305)	**0.272** (0.204-0.365)	**0.316** (0.231-0.437)	**0.437** (0.307-0.628)	**0.605** (0.410-0.900)
10-min	**0.111** (0.092-0.137)	**0.141** (0.116-0.173)	**0.184** (0.151-0.227)	**0.223** (0.182-0.278)	**0.283** (0.222-0.363)	**0.333** (0.257-0.437)	**0.390** (0.293-0.523)	**0.453** (0.332-0.626)	**0.626** (0.440-0.900)	**0.867** (0.588-1.29)
15-min	**0.135** (0.111-0.165)	**0.171** (0.140-0.210)	**0.223** (0.183-0.275)	**0.270** (0.220-0.336)	**0.342** (0.269-0.439)	**0.403** (0.311-0.528)	**0.471** (0.354-0.633)	**0.548** (0.401-0.757)	**0.757** (0.532-1.09)	**1.05** (0.711-1.56)
30-min	**0.184** (0.151-0.226)	**0.233** (0.191-0.286)	**0.305** (0.250-0.375)	**0.369** (0.300-0.458)	**0.467** (0.367-0.599)	**0.550** (0.424-0.721)	**0.643** (0.484-0.864)	**0.748** (0.548-1.03)	**1.03** (0.726-1.49)	**1.43** (0.971-2.13)
60-min	**0.259** (0.213-0.318)	**0.328** (0.270-0.403)	**0.429** (0.351-0.528)	**0.519** (0.422-0.645)	**0.657** (0.517-0.843)	**0.775** (0.597-1.01)	**0.906** (0.681-1.22)	**1.05** (0.771-1.46)	**1.46** (1.02-2.09)	**2.02** (1.37-3.00)
2-hr	**0.358** (0.294-0.439)	**0.450** (0.370-0.553)	**0.579** (0.474-0.713)	**0.690** (0.561-0.857)	**0.852** (0.670-1.09)	**0.985** (0.759-1.29)	**1.13** (0.848-1.51)	**1.28** (0.939-1.77)	**1.51** (1.06-2.17)	**2.04** (1.38-3.03)
3-hr	**0.421** (0.346-0.516)	**0.529** (0.435-0.651)	**0.680** (0.557-0.838)	**0.809** (0.658-1.00)	**0.993** (0.781-1.27)	**1.14** (0.881-1.50)	**1.30** (0.979-1.75)	**1.47** (1.08-2.03)	**1.72** (1.21-2.47)	**2.06** (1.40-3.06)
6-hr	**0.524** (0.431-0.643)	**0.664** (0.546-0.816)	**0.857** (0.702-1.06)	**1.02** (0.830-1.27)	**1.25** (0.986-1.61)	**1.44** (1.11-1.89)	**1.64** (1.23-2.20)	**1.85** (1.35-2.55)	**2.15** (1.51-3.09)	**2.39** (1.62-3.55)
12-hr	**0.610** (0.502-0.749)	**0.784** (0.645-0.964)	**1.03** (0.844-1.27)	**1.24** (1.01-1.54)	**1.55** (1.22-1.99)	**1.81** (1.39-2.37)	**2.08** (1.57-2.80)	**2.38** (1.74-3.29)	**2.82** (1.98-4.05)	**3.17** (2.15-4.72)
24-hr	**0.749** (0.681-0.839)	**0.971** (0.883-1.09)	**1.30** (1.17-1.46)	**1.58** (1.42-1.80)	**2.02** (1.75-2.38)	**2.39** (2.03-2.88)	**2.81** (2.32-3.46)	**3.27** (2.63-4.15)	**3.97** (3.05-5.26)	**4.56** (3.39-6.27)
2-day	**0.873** (0.795-0.979)	**1.13** (1.02-1.26)	**1.50** (1.36-1.69)	**1.85** (1.66-2.10)	**2.37** (2.06-2.79)	**2.83** (2.40-3.40)	**3.35** (2.77-4.12)	**3.94** (3.16-5.00)	**4.84** (3.73-6.42)	**5.64** (4.19-7.75)
3-day	**0.941** (0.856-1.06)	**1.21** (1.10-1.36)	**1.61** (1.46-1.81)	**1.97** (1.77-2.24)	**2.54** (2.20-2.98)	**3.03** (2.57-3.64)	**3.58** (2.96-4.41)	**4.21** (3.39-5.35)	**5.19** (4.00-6.88)	**6.05** (4.49-8.32)
4-day	**1.00** (0.914-1.13)	**1.29** (1.17-1.45)	**1.72** (1.56-1.93)	**2.10** (1.89-2.38)	**2.68** (2.33-3.15)	**3.18** (2.70-3.83)	**3.75** (3.10-4.62)	**4.39** (3.53-5.57)	**5.36** (4.12-7.10)	**6.20** (4.61-8.52)
7-day	**1.14** (1.03-1.27)	**1.47** (1.33-1.65)	**1.94** (1.76-2.19)	**2.36** (2.12-2.68)	**2.96** (2.57-3.49)	**3.47** (2.95-4.17)	**4.01** (3.32-4.95)	**4.61** (3.71-5.86)	**5.49** (4.23-7.28)	**6.22** (4.62-8.55)
10-day	**1.24** (1.13-1.39)	**1.60** (1.46-1.80)	**2.11** (1.92-2.38)	**2.55** (2.29-2.90)	**3.18** (2.76-3.74)	**3.69** (3.14-4.44)	**4.23** (3.50-5.22)	**4.81** (3.87-6.11)	**5.64** (4.34-7.48)	**6.32** (4.69-8.68)
20-day	**1.55** (1.41-1.74)	**2.03** (1.85-2.28)	**2.68** (2.43-3.02)	**3.23** (2.90-3.66)	**3.99** (3.46-4.69)	**4.59** (3.90-5.52)	**5.22** (4.32-6.43)	**5.87** (4.72-7.45)	**6.77** (5.21-8.97)	**7.47** (5.55-10.3)
30-day	**1.83** (1.66-2.05)	**2.39** (2.17-2.69)	**3.16** (2.87-3.56)	**3.81** (3.42-4.32)	**4.71** (4.09-5.54)	**5.42** (4.60-6.51)	**6.14** (5.08-7.57)	**6.90** (5.55-8.76)	**7.93** (6.11-10.5)	**8.74** (6.49-12.0)
45-day	**2.24** (2.04-2.52)	**2.94** (2.67-3.30)	**3.88** (3.52-4.37)	**4.67** (4.20-5.31)	**5.78** (5.02-6.79)	**6.65** (5.65-7.99)	**7.54** (6.24-9.30)	**8.47** (6.80-10.7)	**9.73** (7.49-12.9)	**10.7** (7.95-14.7)
60-day	**2.57** (2.34-2.89)	**3.36** (3.06-3.77)	**4.44** (4.02-4.99)	**5.34** (4.80-6.06)	**6.59** (5.72-7.75)	**7.59** (6.44-9.12)	**8.61** (7.12-10.6)	**9.66** (7.77-12.3)	**11.1** (8.55-14.7)	**12.2** (9.08-16.8)

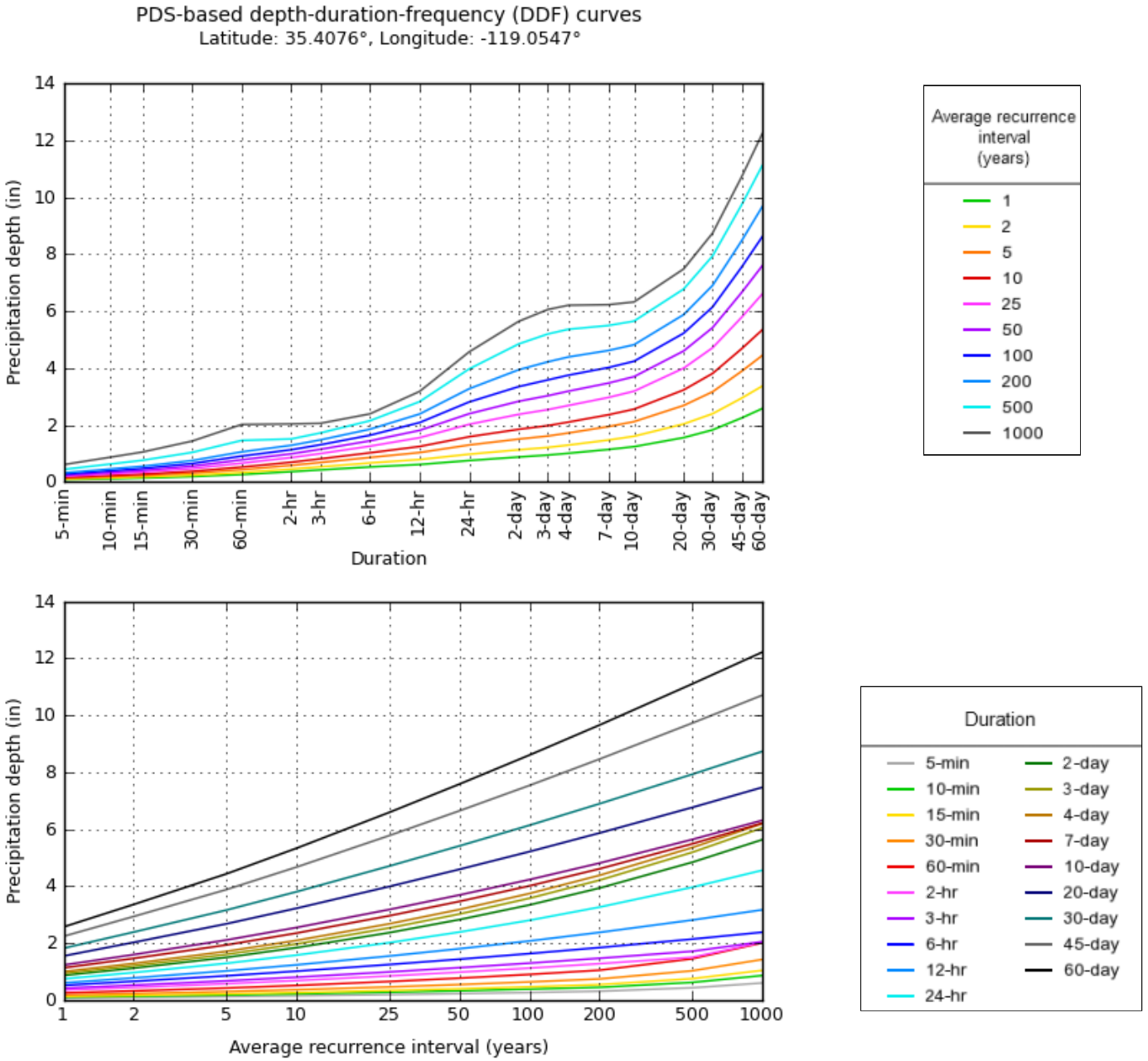
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



NOAA Atlas 14, Volume 6, Version 2

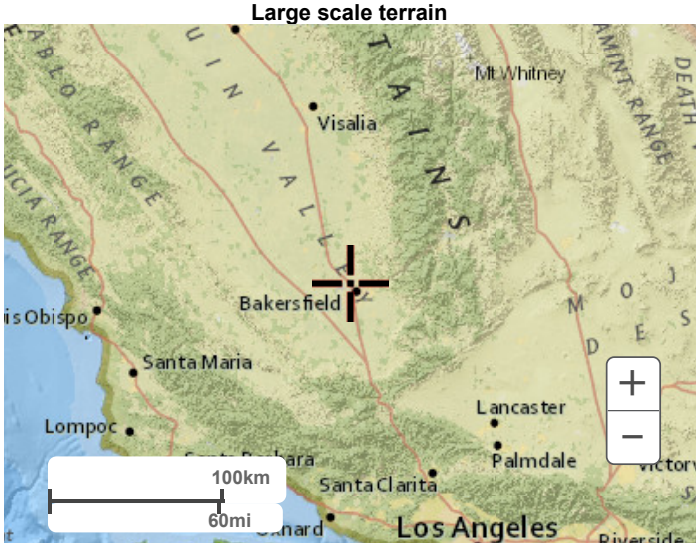
Created (GMT): Sat Jun 13 22:50:08 2020

Back to Top

Maps & aerials

Small scale terrain

Large scale terrain



Large scale map

Large scale aerial

Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

ATTACHMENT 2: EXISTING CONDITIONS CALCULATIONS

This attachment contains the existing conditions hydrology calculations. Please see the attached calculations.

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 2004-2014, Version 9.0

Study date 06/15/20

++

Kern County Synthetic Unit Hydrograph Hydrology Method
Manual date - 1992

Program License Serial Number 6394

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x1
10 yr -24 hr storm

Storm Event Year = 10

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.650

Zone Designation: San Joaquin Valley Latitude = 35.40

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
6.92	6	0.66
Rainfall data for year 2		
6.92	24	0.97
Rainfall data for year 100		
6.92	6	1.64
Rainfall data for year 100		
6.92	24	2.81

++
SAN JOAQUIN VALLEY area of study

Log-Log Rainfall Intensity Slope = 0.65

******** Area-averaged max loss rate, Fm ********

SCS curve Number	Area (Ac.)	Area Fraction	Fp (In/Hr)	Ap (dec.)	Fm (In/Hr)
86.0	6.92	1.000	0.272	0.900	0.245

Area-averaged adjusted loss rate Fm (In/Hr) = 0.245

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	S	Pervious Yield Fr
6.23	0.900	86.0	1.63	0.375
0.69	0.100	98.0	0.20	0.871

Area-averaged catchment yield fraction, Y = 0.425
Area-averaged low loss fraction, Yb = 0.575
Direct entry of lag time by user

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Watershed area = 6.92(Ac.)
Catchment Lag time = 0.160 hours
Unit interval = 20.000 minutes
Unit interval percentage of lag time = 208.3333
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.245(In/Hr)
Average low loss rate fraction (Yb) = 0.575 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.201(In)
Computed peak 30-minute rainfall = 0.376(In)
Specified peak 1-hour rainfall = 0.479(In)
Computed peak 3-hour rainfall = 0.746(In)
Specified peak 6-hour rainfall = 0.986(In)
Specified peak 24-hour rainfall = 1.726(In)

Rainfall depth area reduction factors:
Using a total area of 6.92(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.201(In)
30-minute factor = 1.000 Adjusted rainfall = 0.375(In)
1-hour factor = 1.000 Adjusted rainfall = 0.478(In)
3-hour factor = 1.000 Adjusted rainfall = 0.746(In)
6-hour factor = 1.000 Adjusted rainfall = 0.986(In)
24-hour factor = 1.000 Adjusted rainfall = 1.726(In)

U n i t H y d r o g r a p h

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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))

(K = 20.92 (CFS))

1	44.653	9.342
2	87.572	8.980
3	96.035	1.771
4	100.000	0.830

Rainfall values calculated at 5 minute intervals:

Peak Rainfall Unit Number	Intensity	Depth	Adjusted	Unit Rainfall (In)
1	2.41	0.20	0.20	0.201
2	1.53	0.26	0.26	0.055
3	1.18	0.29	0.29	0.039
4	0.98	0.33	0.33	0.031
5	0.85	0.35	0.35	0.026
6	0.75	0.38	0.38	0.023
7	0.68	0.40	0.40	0.021
8	0.62	0.42	0.42	0.019
9	0.58	0.43	0.43	0.017
10	0.54	0.45	0.45	0.016
11	0.51	0.46	0.46	0.015
12	0.48	0.48	0.48	0.014
13	0.46	0.49	0.49	0.016
14	0.44	0.51	0.51	0.015
15	0.42	0.52	0.52	0.014
16	0.40	0.54	0.54	0.014
17	0.39	0.55	0.55	0.013
18	0.38	0.56	0.56	0.013
19	0.36	0.58	0.58	0.012
20	0.35	0.59	0.59	0.012
21	0.34	0.60	0.60	0.012
22	0.33	0.61	0.61	0.011
23	0.32	0.62	0.62	0.011
24	0.32	0.63	0.63	0.011
25	0.31	0.64	0.64	0.011
26	0.30	0.65	0.65	0.010
27	0.30	0.66	0.66	0.010
28	0.29	0.67	0.67	0.010
29	0.28	0.68	0.68	0.010
30	0.28	0.69	0.69	0.009
31	0.27	0.70	0.70	0.009
32	0.27	0.71	0.71	0.009
33	0.26	0.72	0.72	0.009
34	0.26	0.73	0.73	0.009
35	0.25	0.74	0.74	0.009
36	0.25	0.75	0.75	0.008
37	0.24	0.75	0.75	0.008
38	0.24	0.76	0.76	0.008
39	0.24	0.77	0.77	0.008
40	0.23	0.78	0.78	0.008
41	0.23	0.79	0.79	0.008
42	0.23	0.79	0.79	0.008
43	0.22	0.80	0.80	0.008
44	0.22	0.81	0.81	0.007
45	0.22	0.82	0.82	0.007
46	0.21	0.82	0.82	0.007
47	0.21	0.83	0.83	0.007

48	0.21	0.84	0.84	0.007
49	0.21	0.84	0.84	0.007
50	0.20	0.85	0.85	0.007
51	0.20	0.86	0.86	0.007
52	0.20	0.87	0.87	0.007
53	0.20	0.87	0.87	0.007
54	0.20	0.88	0.88	0.007
55	0.19	0.88	0.88	0.007
56	0.19	0.89	0.89	0.006
57	0.19	0.90	0.90	0.006
58	0.19	0.90	0.90	0.006
59	0.19	0.91	0.91	0.006
60	0.18	0.92	0.92	0.006
61	0.18	0.92	0.92	0.006
62	0.18	0.93	0.93	0.006
63	0.18	0.93	0.93	0.006
64	0.18	0.94	0.94	0.006
65	0.17	0.95	0.95	0.006
66	0.17	0.95	0.95	0.006
67	0.17	0.96	0.96	0.006
68	0.17	0.96	0.96	0.006
69	0.17	0.97	0.97	0.006
70	0.17	0.98	0.98	0.006
71	0.17	0.98	0.98	0.006
72	0.16	0.99	0.99	0.006
73	0.16	0.99	0.99	0.006
74	0.16	1.00	1.00	0.005
75	0.16	1.00	1.00	0.005
76	0.16	1.01	1.01	0.005
77	0.16	1.01	1.01	0.005
78	0.16	1.02	1.02	0.005
79	0.16	1.02	1.02	0.005
80	0.15	1.03	1.03	0.005
81	0.15	1.03	1.03	0.005
82	0.15	1.04	1.04	0.005
83	0.15	1.04	1.04	0.005
84	0.15	1.05	1.05	0.005
85	0.15	1.05	1.05	0.005
86	0.15	1.06	1.06	0.005
87	0.15	1.06	1.06	0.005
88	0.15	1.07	1.07	0.005
89	0.14	1.07	1.07	0.005
90	0.14	1.08	1.08	0.005
91	0.14	1.08	1.08	0.005
92	0.14	1.09	1.09	0.005
93	0.14	1.09	1.09	0.005
94	0.14	1.10	1.10	0.005
95	0.14	1.10	1.10	0.005
96	0.14	1.11	1.11	0.005
97	0.14	1.11	1.11	0.005
98	0.14	1.12	1.12	0.005
99	0.14	1.12	1.12	0.005
100	0.14	1.13	1.13	0.005
101	0.13	1.13	1.13	0.005
102	0.13	1.14	1.14	0.005
103	0.13	1.14	1.14	0.004

104	0.13	1.14	1.14	0.004
105	0.13	1.15	1.15	0.004
106	0.13	1.15	1.15	0.004
107	0.13	1.16	1.16	0.004
108	0.13	1.16	1.16	0.004
109	0.13	1.17	1.17	0.004
110	0.13	1.17	1.17	0.004
111	0.13	1.17	1.17	0.004
112	0.13	1.18	1.18	0.004
113	0.13	1.18	1.18	0.004
114	0.12	1.19	1.19	0.004
115	0.12	1.19	1.19	0.004
116	0.12	1.20	1.20	0.004
117	0.12	1.20	1.20	0.004
118	0.12	1.20	1.20	0.004
119	0.12	1.21	1.21	0.004
120	0.12	1.21	1.21	0.004
121	0.12	1.22	1.22	0.004
122	0.12	1.22	1.22	0.004
123	0.12	1.22	1.22	0.004
124	0.12	1.23	1.23	0.004
125	0.12	1.23	1.23	0.004
126	0.12	1.24	1.24	0.004
127	0.12	1.24	1.24	0.004
128	0.12	1.24	1.24	0.004
129	0.12	1.25	1.25	0.004
130	0.12	1.25	1.25	0.004
131	0.12	1.26	1.26	0.004
132	0.11	1.26	1.26	0.004
133	0.11	1.26	1.26	0.004
134	0.11	1.27	1.27	0.004
135	0.11	1.27	1.27	0.004
136	0.11	1.28	1.28	0.004
137	0.11	1.28	1.28	0.004
138	0.11	1.28	1.28	0.004
139	0.11	1.29	1.29	0.004
140	0.11	1.29	1.29	0.004
141	0.11	1.29	1.29	0.004
142	0.11	1.30	1.30	0.004
143	0.11	1.30	1.30	0.004
144	0.11	1.30	1.30	0.004
145	0.11	1.31	1.31	0.004
146	0.11	1.31	1.31	0.004
147	0.11	1.32	1.32	0.004
148	0.11	1.32	1.32	0.004
149	0.11	1.32	1.32	0.004
150	0.11	1.33	1.33	0.004
151	0.11	1.33	1.33	0.004
152	0.11	1.33	1.33	0.004
153	0.10	1.34	1.34	0.004
154	0.10	1.34	1.34	0.004
155	0.10	1.34	1.34	0.004
156	0.10	1.35	1.35	0.003
157	0.10	1.35	1.35	0.003
158	0.10	1.35	1.35	0.003
159	0.10	1.36	1.36	0.003

160	0.10	1.36	1.36	0.003
161	0.10	1.37	1.37	0.003
162	0.10	1.37	1.37	0.003
163	0.10	1.37	1.37	0.003
164	0.10	1.38	1.38	0.003
165	0.10	1.38	1.38	0.003
166	0.10	1.38	1.38	0.003
167	0.10	1.39	1.39	0.003
168	0.10	1.39	1.39	0.003
169	0.10	1.39	1.39	0.003
170	0.10	1.40	1.40	0.003
171	0.10	1.40	1.40	0.003
172	0.10	1.40	1.40	0.003
173	0.10	1.41	1.41	0.003
174	0.10	1.41	1.41	0.003
175	0.10	1.41	1.41	0.003
176	0.10	1.41	1.41	0.003
177	0.10	1.42	1.42	0.003
178	0.10	1.42	1.42	0.003
179	0.10	1.42	1.42	0.003
180	0.10	1.43	1.43	0.003
181	0.09	1.43	1.43	0.003
182	0.09	1.43	1.43	0.003
183	0.09	1.44	1.44	0.003
184	0.09	1.44	1.44	0.003
185	0.09	1.44	1.44	0.003
186	0.09	1.45	1.45	0.003
187	0.09	1.45	1.45	0.003
188	0.09	1.45	1.45	0.003
189	0.09	1.46	1.46	0.003
190	0.09	1.46	1.46	0.003
191	0.09	1.46	1.46	0.003
192	0.09	1.47	1.47	0.003
193	0.09	1.47	1.47	0.003
194	0.09	1.47	1.47	0.003
195	0.09	1.47	1.47	0.003
196	0.09	1.48	1.48	0.003
197	0.09	1.48	1.48	0.003
198	0.09	1.48	1.48	0.003
199	0.09	1.49	1.49	0.003
200	0.09	1.49	1.49	0.003
201	0.09	1.49	1.49	0.003
202	0.09	1.50	1.50	0.003
203	0.09	1.50	1.50	0.003
204	0.09	1.50	1.50	0.003
205	0.09	1.50	1.50	0.003
206	0.09	1.51	1.51	0.003
207	0.09	1.51	1.51	0.003
208	0.09	1.51	1.51	0.003
209	0.09	1.52	1.52	0.003
210	0.09	1.52	1.52	0.003
211	0.09	1.52	1.52	0.003
212	0.09	1.53	1.53	0.003
213	0.09	1.53	1.53	0.003
214	0.09	1.53	1.53	0.003
215	0.09	1.53	1.53	0.003

216	0.09	1.54	1.54	0.003
217	0.09	1.54	1.54	0.003
218	0.08	1.54	1.54	0.003
219	0.08	1.55	1.55	0.003
220	0.08	1.55	1.55	0.003
221	0.08	1.55	1.55	0.003
222	0.08	1.55	1.55	0.003
223	0.08	1.56	1.56	0.003
224	0.08	1.56	1.56	0.003
225	0.08	1.56	1.56	0.003
226	0.08	1.57	1.57	0.003
227	0.08	1.57	1.57	0.003
228	0.08	1.57	1.57	0.003
229	0.08	1.57	1.57	0.003
230	0.08	1.58	1.58	0.003
231	0.08	1.58	1.58	0.003
232	0.08	1.58	1.58	0.003
233	0.08	1.58	1.58	0.003
234	0.08	1.59	1.59	0.003
235	0.08	1.59	1.59	0.003
236	0.08	1.59	1.59	0.003
237	0.08	1.60	1.60	0.003
238	0.08	1.60	1.60	0.003
239	0.08	1.60	1.60	0.003
240	0.08	1.60	1.60	0.003
241	0.08	1.61	1.61	0.003
242	0.08	1.61	1.61	0.003
243	0.08	1.61	1.61	0.003
244	0.08	1.61	1.61	0.003
245	0.08	1.62	1.62	0.003
246	0.08	1.62	1.62	0.003
247	0.08	1.62	1.62	0.003
248	0.08	1.63	1.63	0.003
249	0.08	1.63	1.63	0.003
250	0.08	1.63	1.63	0.003
251	0.08	1.63	1.63	0.003
252	0.08	1.64	1.64	0.003
253	0.08	1.64	1.64	0.003
254	0.08	1.64	1.64	0.003
255	0.08	1.64	1.64	0.003
256	0.08	1.65	1.65	0.003
257	0.08	1.65	1.65	0.003
258	0.08	1.65	1.65	0.003
259	0.08	1.65	1.65	0.003
260	0.08	1.66	1.66	0.003
261	0.08	1.66	1.66	0.003
262	0.08	1.66	1.66	0.003
263	0.08	1.66	1.66	0.003
264	0.08	1.67	1.67	0.003
265	0.08	1.67	1.67	0.003
266	0.08	1.67	1.67	0.003
267	0.08	1.67	1.67	0.003
268	0.08	1.68	1.68	0.003
269	0.07	1.68	1.68	0.003
270	0.07	1.68	1.68	0.003
271	0.07	1.68	1.68	0.003

272	0.07	1.69	1.69	0.003
273	0.07	1.69	1.69	0.003
274	0.07	1.69	1.69	0.002
275	0.07	1.69	1.69	0.002
276	0.07	1.70	1.70	0.002
277	0.07	1.70	1.70	0.002
278	0.07	1.70	1.70	0.002
279	0.07	1.70	1.70	0.002
280	0.07	1.71	1.71	0.002
281	0.07	1.71	1.71	0.002
282	0.07	1.71	1.71	0.002
283	0.07	1.71	1.71	0.002
284	0.07	1.72	1.72	0.002
285	0.07	1.72	1.72	0.002
286	0.07	1.72	1.72	0.002
287	0.07	1.72	1.72	0.002
288	0.07	1.73	1.73	0.002

Time = 24.00 Hours Total unit rainfall = 1.73(In)

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0097	0.0056	0.0041
2	0.0099	0.0057	0.0042
3	0.0100	0.0057	0.0042
4	0.0101	0.0058	0.0043
5	0.0103	0.0059	0.0044
6	0.0104	0.0060	0.0044
7	0.0105	0.0061	0.0045
8	0.0107	0.0062	0.0045
9	0.0109	0.0062	0.0046
10	0.0110	0.0063	0.0047
11	0.0112	0.0064	0.0048
12	0.0114	0.0065	0.0048
13	0.0116	0.0067	0.0049
14	0.0118	0.0068	0.0050
15	0.0120	0.0069	0.0051
16	0.0122	0.0070	0.0052
17	0.0124	0.0071	0.0053
18	0.0127	0.0073	0.0054
19	0.0129	0.0074	0.0055
20	0.0132	0.0076	0.0056
21	0.0135	0.0077	0.0057
22	0.0138	0.0079	0.0058
23	0.0141	0.0081	0.0060
24	0.0144	0.0083	0.0061
25	0.0148	0.0085	0.0063
26	0.0152	0.0087	0.0064
27	0.0156	0.0090	0.0066
28	0.0160	0.0092	0.0068
29	0.0165	0.0095	0.0070
30	0.0170	0.0098	0.0072
31	0.0176	0.0101	0.0075
32	0.0182	0.0105	0.0077
33	0.0189	0.0109	0.0080

34	0.0197	0.0113	0.0084
35	0.0205	0.0118	0.0087
36	0.0215	0.0124	0.0091
37	0.0226	0.0130	0.0096
38	0.0238	0.0137	0.0101
39	0.0253	0.0146	0.0107
40	0.0270	0.0155	0.0115
41	0.0291	0.0167	0.0124
42	0.0317	0.0182	0.0135
43	0.0350	0.0201	0.0149
44	0.0394	0.0226	0.0167
45	0.0456	0.0262	0.0194
46	0.0556	0.0320	0.0236
47	0.0660	0.0380	0.0280
48	0.1437	0.0816*	0.0621
49	0.2688	0.0816*	0.1872
50	0.0534	0.0307	0.0227
51	0.0383	0.0220	0.0163
52	0.0310	0.0179	0.0132
53	0.0266	0.0153	0.0113
54	0.0235	0.0135	0.0100
55	0.0213	0.0122	0.0090
56	0.0195	0.0112	0.0083
57	0.0181	0.0104	0.0077
58	0.0169	0.0097	0.0072
59	0.0159	0.0092	0.0068
60	0.0151	0.0087	0.0064
61	0.0143	0.0082	0.0061
62	0.0137	0.0079	0.0058
63	0.0131	0.0075	0.0056
64	0.0126	0.0072	0.0054
65	0.0121	0.0070	0.0052
66	0.0117	0.0067	0.0050
67	0.0113	0.0065	0.0048
68	0.0110	0.0063	0.0047
69	0.0107	0.0061	0.0045
70	0.0104	0.0060	0.0044
71	0.0101	0.0058	0.0043
72	0.0098	0.0056	0.0042
	1.7262	0.9188	0.8073

Total soil rain loss = 0.92(In)
Total effective rainfall = 0.81(In)
Peak flow rate in flood hydrograph = 2.38(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

Hydrograph in 20 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0

```
 0+20       0.0011      0.04  Q          |          |          |          |
 0+40       0.0032      0.08  Q          |          |          |          |
 1+ 0       0.0055      0.08  Q          |          |          |          |
 1+20       0.0079      0.09  Q          |          |          |          |
 1+40       0.0104      0.09  Q          |          |          |          |
 2+ 0       0.0129      0.09  QV         |          |          |          |
 2+20       0.0155      0.09  QV         |          |          |          |
 2+40       0.0181      0.09  QV         |          |          |          |
 3+ 0       0.0207      0.10  QV         |          |          |          |
 3+20       0.0234      0.10  Q V        |          |          |          |
 3+40       0.0261      0.10  Q V        |          |          |          |
 4+ 0       0.0289      0.10  Q V        |          |          |          |
 4+20       0.0317      0.10  Q V        |          |          |          |
 4+40       0.0345      0.10  Q V        |          |          |          |
 5+ 0       0.0374      0.11  Q  V       |          |          |          |
 5+20       0.0404      0.11  Q  V       |          |          |          |
 5+40       0.0434      0.11  Q  V       |          |          |          |
 6+ 0       0.0464      0.11  Q  V       |          |          |          |
 6+20       0.0495      0.11  Q   V      |          |          |          |
 6+40       0.0527      0.12  Q   V      |          |          |          |
 7+ 0       0.0560      0.12  Q   V      |          |          |          |
 7+20       0.0593      0.12  Q    V     |          |          |          |
 7+40       0.0627      0.12  Q    V     |          |          |          |
 8+ 0       0.0661      0.13  Q    V     |          |          |          |
 8+20       0.0697      0.13  Q    V     |          |          |          |
 8+40       0.0734      0.13  Q     V    |          |          |          |
 9+ 0       0.0771      0.14  Q     V    |          |          |          |
 9+20       0.0809      0.14  Q     V    |          |          |          |
 9+40       0.0849      0.14  Q      V   |          |          |          |
10+ 0       0.0890      0.15  Q      V   |          |          |          |
10+20       0.0932      0.15  Q       V  |          |          |          |
10+40       0.0976      0.16  Q       V  |          |          |          |
11+ 0       0.1021      0.16  Q       V  |          |          |          |
11+20       0.1068      0.17  Q        V |          |          |          |
11+40       0.1117      0.18  Q        V |          |          |          |
12+ 0       0.1168      0.19  Q         V          |          |          |
12+20       0.1221      0.19  Q         V          |          |          |
12+40       0.1277      0.20  Q         V          |          |          |
13+ 0       0.1337      0.22  Q         |V         |          |          |
13+20       0.1400      0.23  Q         | V        |          |          |
13+40       0.1468      0.25  Q         | V        |          |          |
14+ 0       0.1541      0.27  |Q         |  V       |          |          |
14+20       0.1621      0.29  |Q         |  V       |          |          |
14+40       0.1710      0.32  |Q         |   V      |          |          |
15+ 0       0.1812      0.37  |Q         |    V     |          |          |
15+20       0.1932      0.44  |Q         |     V    |          |          |
15+40       0.2076      0.52  | Q        |      V   |          |          |
16+ 0       0.2321      0.89  |  Q       |        V |          |          |
16+20       0.2976      2.38  |         Q|          |    V     |          |
16+40       0.3534      2.03  |        Q |          |          V          |
17+ 0       0.3737      0.74  | Q        |          |           V         |
17+20       0.3865      0.46  |Q         |          |          |  V       |
17+40       0.3940      0.27  |Q         |          |          |  V       |
18+ 0       0.4004      0.23  Q          |          |          |   V      |
18+20       0.4060      0.21  Q          |          |          |   V      |
18+40       0.4112      0.19  Q          |          |          |    V     |
```

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  19+ 0       0.4159      0.17  Q          |          |          |    V     |
  19+20       0.4202      0.16  Q          |          |          |     V    |
  19+40       0.4243      0.15  Q          |          |          |     V    |
  20+ 0       0.4281      0.14  Q          |          |          |     V    |
  20+20       0.4318      0.13  Q          |          |          |      V   |
  20+40       0.4353      0.13  Q          |          |          |      V   |
  21+ 0       0.4386      0.12  Q          |          |          |      V   |
  21+20       0.4418      0.12  Q          |          |          |      V   |
  21+40       0.4448      0.11  Q          |          |          |       V  |
  22+ 0       0.4478      0.11  Q          |          |          |       V  |
  22+20       0.4506      0.10  Q          |          |          |       V  |
  22+40       0.4534      0.10  Q          |          |          |       V  |
  23+ 0       0.4560      0.10  Q          |          |          |        V |
  23+20       0.4586      0.09  Q          |          |          |        V |
  23+40       0.4611      0.09  Q          |          |          |        V |
  24+ 0       0.4636      0.09  Q          |          |          |        V |
  24+20       0.4649      0.05  Q          |          |          |        V |
  24+40       0.4652      0.01  Q          |          |          |        V |
  25+ 0       0.4653      0.00  Q          |          |          |         V
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 2004-2014, Version 9.0

Study date 06/15/20

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Kern County Synthetic Unit Hydrograph Hydrology Method
Manual date - 1992

Program License Serial Number 6394

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x1
100 yr - 24 hr storm

Storm Event Year = 100

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.650

Zone Designation: San Joaquin Valley Latitude = 35.40

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
6.92	6	0.66
Rainfall data for year 2		
6.92	24	0.97
Rainfall data for year 100		
6.92	6	1.64
Rainfall data for year 100		
6.92	24	2.81

++
SAN JOAQUIN VALLEY area of study

Log-Log Rainfall Intensity Slope = 0.65

******** Area-averaged max loss rate, Fm ********

SCS curve Number	Area (Ac.)	Area Fraction	Fp (In/Hr)	Ap (dec.)	Fm (In/Hr)
86.0	6.92	1.000	0.272	0.900	0.245

Area-averaged adjusted loss rate Fm (In/Hr) = 0.245

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	S	Pervious Yield Fr
6.23	0.900	86.0	1.63	0.534
0.69	0.100	98.0	0.20	0.918

Area-averaged catchment yield fraction, Y = 0.573
Area-averaged low loss fraction, Yb = 0.427
Direct entry of lag time by user

++

Watershed area = 6.92(Ac.)
Catchment Lag time = 0.160 hours
Unit interval = 20.000 minutes
Unit interval percentage of lag time = 208.3333
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.245(In/Hr)
Average low loss rate fraction (Yb) = 0.427 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.298(In)
Computed peak 30-minute rainfall = 0.558(In)
Specified peak 1-hour rainfall = 0.712(In)
Computed peak 3-hour rainfall = 1.187(In)
Specified peak 6-hour rainfall = 1.640(In)
Specified peak 24-hour rainfall = 2.810(In)

Rainfall depth area reduction factors:
Using a total area of 6.92(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.298(In)
30-minute factor = 1.000 Adjusted rainfall = 0.558(In)
1-hour factor = 1.000 Adjusted rainfall = 0.712(In)
3-hour factor = 1.000 Adjusted rainfall = 1.187(In)
6-hour factor = 1.000 Adjusted rainfall = 1.640(In)
24-hour factor = 1.000 Adjusted rainfall = 2.810(In)

U n i t H y d r o g r a p h

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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))

(K = 20.92 (CFS))

1	44.653	9.342
2	87.572	8.980
3	96.035	1.771
4	100.000	0.830

Rainfall values calculated at 5 minute intervals:

Peak Rainfall Unit Number	Intensity	Depth	Adjusted	Unit Rainfall (In)
1	3.58	0.30	0.30	0.298
2	2.28	0.38	0.38	0.082
3	1.75	0.44	0.44	0.058
4	1.45	0.48	0.48	0.046
5	1.26	0.52	0.52	0.039
6	1.12	0.56	0.56	0.035
7	1.01	0.59	0.59	0.031
8	0.93	0.62	0.62	0.028
9	0.86	0.64	0.64	0.026
10	0.80	0.67	0.67	0.024
11	0.75	0.69	0.69	0.023
12	0.71	0.71	0.71	0.021
13	0.68	0.74	0.74	0.027
14	0.66	0.76	0.76	0.026
15	0.63	0.79	0.79	0.025
16	0.61	0.81	0.81	0.024
17	0.59	0.84	0.84	0.023
18	0.57	0.86	0.86	0.023
19	0.56	0.88	0.88	0.022
20	0.54	0.90	0.90	0.021
21	0.53	0.92	0.92	0.021
22	0.51	0.94	0.94	0.020
23	0.50	0.96	0.96	0.020
24	0.49	0.98	0.98	0.019
25	0.48	1.00	1.00	0.019
26	0.47	1.02	1.02	0.018
27	0.46	1.04	1.04	0.018
28	0.45	1.06	1.06	0.018
29	0.44	1.07	1.07	0.017
30	0.44	1.09	1.09	0.017
31	0.43	1.11	1.11	0.017
32	0.42	1.12	1.12	0.017
33	0.41	1.14	1.14	0.016
34	0.41	1.16	1.16	0.016
35	0.40	1.17	1.17	0.016
36	0.40	1.19	1.19	0.015
37	0.39	1.20	1.20	0.015
38	0.38	1.22	1.22	0.015
39	0.38	1.23	1.23	0.015
40	0.37	1.25	1.25	0.015
41	0.37	1.26	1.26	0.014
42	0.36	1.28	1.28	0.014
43	0.36	1.29	1.29	0.014
44	0.36	1.30	1.30	0.014
45	0.35	1.32	1.32	0.014
46	0.35	1.33	1.33	0.014
47	0.34	1.34	1.34	0.013

48	0.34	1.36	1.36	0.013
49	0.34	1.37	1.37	0.013
50	0.33	1.38	1.38	0.013
51	0.33	1.40	1.40	0.013
52	0.33	1.41	1.41	0.013
53	0.32	1.42	1.42	0.013
54	0.32	1.43	1.43	0.012
55	0.32	1.45	1.45	0.012
56	0.31	1.46	1.46	0.012
57	0.31	1.47	1.47	0.012
58	0.31	1.48	1.48	0.012
59	0.30	1.49	1.49	0.012
60	0.30	1.51	1.51	0.012
61	0.30	1.52	1.52	0.012
62	0.30	1.53	1.53	0.012
63	0.29	1.54	1.54	0.011
64	0.29	1.55	1.55	0.011
65	0.29	1.56	1.56	0.011
66	0.29	1.57	1.57	0.011
67	0.28	1.59	1.59	0.011
68	0.28	1.60	1.60	0.011
69	0.28	1.61	1.61	0.011
70	0.28	1.62	1.62	0.011
71	0.28	1.63	1.63	0.011
72	0.27	1.64	1.64	0.011
73	0.27	1.65	1.65	0.009
74	0.27	1.66	1.66	0.009
75	0.27	1.67	1.67	0.009
76	0.26	1.67	1.67	0.009
77	0.26	1.68	1.68	0.009
78	0.26	1.69	1.69	0.008
79	0.26	1.70	1.70	0.008
80	0.26	1.71	1.71	0.008
81	0.25	1.72	1.72	0.008
82	0.25	1.72	1.72	0.008
83	0.25	1.73	1.73	0.008
84	0.25	1.74	1.74	0.008
85	0.25	1.75	1.75	0.008
86	0.25	1.76	1.76	0.008
87	0.24	1.77	1.77	0.008
88	0.24	1.77	1.77	0.008
89	0.24	1.78	1.78	0.008
90	0.24	1.79	1.79	0.008
91	0.24	1.80	1.80	0.008
92	0.24	1.80	1.80	0.008
93	0.23	1.81	1.81	0.008
94	0.23	1.82	1.82	0.008
95	0.23	1.83	1.83	0.007
96	0.23	1.83	1.83	0.007
97	0.23	1.84	1.84	0.007
98	0.23	1.85	1.85	0.007
99	0.22	1.86	1.86	0.007
100	0.22	1.86	1.86	0.007
101	0.22	1.87	1.87	0.007
102	0.22	1.88	1.88	0.007
103	0.22	1.88	1.88	0.007

104	0.22	1.89	1.89	0.007
105	0.22	1.90	1.90	0.007
106	0.22	1.91	1.91	0.007
107	0.21	1.91	1.91	0.007
108	0.21	1.92	1.92	0.007
109	0.21	1.93	1.93	0.007
110	0.21	1.93	1.93	0.007
111	0.21	1.94	1.94	0.007
112	0.21	1.95	1.95	0.007
113	0.21	1.95	1.95	0.007
114	0.21	1.96	1.96	0.007
115	0.21	1.97	1.97	0.007
116	0.20	1.97	1.97	0.007
117	0.20	1.98	1.98	0.007
118	0.20	1.99	1.99	0.007
119	0.20	1.99	1.99	0.007
120	0.20	2.00	2.00	0.006
121	0.20	2.01	2.01	0.006
122	0.20	2.01	2.01	0.006
123	0.20	2.02	2.02	0.006
124	0.20	2.03	2.03	0.006
125	0.20	2.03	2.03	0.006
126	0.19	2.04	2.04	0.006
127	0.19	2.04	2.04	0.006
128	0.19	2.05	2.05	0.006
129	0.19	2.06	2.06	0.006
130	0.19	2.06	2.06	0.006
131	0.19	2.07	2.07	0.006
132	0.19	2.08	2.08	0.006
133	0.19	2.08	2.08	0.006
134	0.19	2.09	2.09	0.006
135	0.19	2.09	2.09	0.006
136	0.19	2.10	2.10	0.006
137	0.18	2.11	2.11	0.006
138	0.18	2.11	2.11	0.006
139	0.18	2.12	2.12	0.006
140	0.18	2.12	2.12	0.006
141	0.18	2.13	2.13	0.006
142	0.18	2.14	2.14	0.006
143	0.18	2.14	2.14	0.006
144	0.18	2.15	2.15	0.006
145	0.18	2.15	2.15	0.006
146	0.18	2.16	2.16	0.006
147	0.18	2.16	2.16	0.006
148	0.18	2.17	2.17	0.006
149	0.18	2.18	2.18	0.006
150	0.17	2.18	2.18	0.006
151	0.17	2.19	2.19	0.006
152	0.17	2.19	2.19	0.006
153	0.17	2.20	2.20	0.006
154	0.17	2.20	2.20	0.006
155	0.17	2.21	2.21	0.006
156	0.17	2.21	2.21	0.006
157	0.17	2.22	2.22	0.006
158	0.17	2.23	2.23	0.005
159	0.17	2.23	2.23	0.005

160	0.17	2.24	2.24	0.005
161	0.17	2.24	2.24	0.005
162	0.17	2.25	2.25	0.005
163	0.17	2.25	2.25	0.005
164	0.17	2.26	2.26	0.005
165	0.16	2.26	2.26	0.005
166	0.16	2.27	2.27	0.005
167	0.16	2.27	2.27	0.005
168	0.16	2.28	2.28	0.005
169	0.16	2.28	2.28	0.005
170	0.16	2.29	2.29	0.005
171	0.16	2.29	2.29	0.005
172	0.16	2.30	2.30	0.005
173	0.16	2.31	2.31	0.005
174	0.16	2.31	2.31	0.005
175	0.16	2.32	2.32	0.005
176	0.16	2.32	2.32	0.005
177	0.16	2.33	2.33	0.005
178	0.16	2.33	2.33	0.005
179	0.16	2.34	2.34	0.005
180	0.16	2.34	2.34	0.005
181	0.16	2.35	2.35	0.005
182	0.16	2.35	2.35	0.005
183	0.15	2.36	2.36	0.005
184	0.15	2.36	2.36	0.005
185	0.15	2.37	2.37	0.005
186	0.15	2.37	2.37	0.005
187	0.15	2.38	2.38	0.005
188	0.15	2.38	2.38	0.005
189	0.15	2.39	2.39	0.005
190	0.15	2.39	2.39	0.005
191	0.15	2.40	2.40	0.005
192	0.15	2.40	2.40	0.005
193	0.15	2.41	2.41	0.005
194	0.15	2.41	2.41	0.005
195	0.15	2.41	2.41	0.005
196	0.15	2.42	2.42	0.005
197	0.15	2.42	2.42	0.005
198	0.15	2.43	2.43	0.005
199	0.15	2.43	2.43	0.005
200	0.15	2.44	2.44	0.005
201	0.15	2.44	2.44	0.005
202	0.15	2.45	2.45	0.005
203	0.15	2.45	2.45	0.005
204	0.14	2.46	2.46	0.005
205	0.14	2.46	2.46	0.005
206	0.14	2.47	2.47	0.005
207	0.14	2.47	2.47	0.005
208	0.14	2.48	2.48	0.005
209	0.14	2.48	2.48	0.005
210	0.14	2.49	2.49	0.005
211	0.14	2.49	2.49	0.005
212	0.14	2.49	2.49	0.005
213	0.14	2.50	2.50	0.005
214	0.14	2.50	2.50	0.005
215	0.14	2.51	2.51	0.005

216	0.14	2.51	2.51	0.005
217	0.14	2.52	2.52	0.005
218	0.14	2.52	2.52	0.004
219	0.14	2.53	2.53	0.004
220	0.14	2.53	2.53	0.004
221	0.14	2.54	2.54	0.004
222	0.14	2.54	2.54	0.004
223	0.14	2.54	2.54	0.004
224	0.14	2.55	2.55	0.004
225	0.14	2.55	2.55	0.004
226	0.14	2.56	2.56	0.004
227	0.14	2.56	2.56	0.004
228	0.14	2.57	2.57	0.004
229	0.13	2.57	2.57	0.004
230	0.13	2.57	2.57	0.004
231	0.13	2.58	2.58	0.004
232	0.13	2.58	2.58	0.004
233	0.13	2.59	2.59	0.004
234	0.13	2.59	2.59	0.004
235	0.13	2.60	2.60	0.004
236	0.13	2.60	2.60	0.004
237	0.13	2.61	2.61	0.004
238	0.13	2.61	2.61	0.004
239	0.13	2.61	2.61	0.004
240	0.13	2.62	2.62	0.004
241	0.13	2.62	2.62	0.004
242	0.13	2.63	2.63	0.004
243	0.13	2.63	2.63	0.004
244	0.13	2.63	2.63	0.004
245	0.13	2.64	2.64	0.004
246	0.13	2.64	2.64	0.004
247	0.13	2.65	2.65	0.004
248	0.13	2.65	2.65	0.004
249	0.13	2.66	2.66	0.004
250	0.13	2.66	2.66	0.004
251	0.13	2.66	2.66	0.004
252	0.13	2.67	2.67	0.004
253	0.13	2.67	2.67	0.004
254	0.13	2.68	2.68	0.004
255	0.13	2.68	2.68	0.004
256	0.13	2.68	2.68	0.004
257	0.13	2.69	2.69	0.004
258	0.13	2.69	2.69	0.004
259	0.12	2.70	2.70	0.004
260	0.12	2.70	2.70	0.004
261	0.12	2.70	2.70	0.004
262	0.12	2.71	2.71	0.004
263	0.12	2.71	2.71	0.004
264	0.12	2.72	2.72	0.004
265	0.12	2.72	2.72	0.004
266	0.12	2.72	2.72	0.004
267	0.12	2.73	2.73	0.004
268	0.12	2.73	2.73	0.004
269	0.12	2.74	2.74	0.004
270	0.12	2.74	2.74	0.004
271	0.12	2.74	2.74	0.004

272	0.12	2.75	2.75	0.004
273	0.12	2.75	2.75	0.004
274	0.12	2.76	2.76	0.004
275	0.12	2.76	2.76	0.004
276	0.12	2.76	2.76	0.004
277	0.12	2.77	2.77	0.004
278	0.12	2.77	2.77	0.004
279	0.12	2.78	2.78	0.004
280	0.12	2.78	2.78	0.004
281	0.12	2.78	2.78	0.004
282	0.12	2.79	2.79	0.004
283	0.12	2.79	2.79	0.004
284	0.12	2.79	2.79	0.004
285	0.12	2.80	2.80	0.004
286	0.12	2.80	2.80	0.004
287	0.12	2.81	2.81	0.004
288	0.12	2.81	2.81	0.004

Time = 24.00 Hours Total unit rainfall = 2.81(In)

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0152	0.0065	0.0087
2	0.0154	0.0066	0.0088
3	0.0156	0.0067	0.0090
4	0.0159	0.0068	0.0091
5	0.0161	0.0069	0.0092
6	0.0163	0.0070	0.0093
7	0.0166	0.0071	0.0095
8	0.0168	0.0072	0.0096
9	0.0171	0.0073	0.0098
10	0.0173	0.0074	0.0099
11	0.0176	0.0075	0.0101
12	0.0179	0.0077	0.0102
13	0.0182	0.0078	0.0104
14	0.0185	0.0079	0.0106
15	0.0189	0.0081	0.0108
16	0.0192	0.0082	0.0110
17	0.0196	0.0084	0.0112
18	0.0200	0.0085	0.0114
19	0.0204	0.0087	0.0117
20	0.0208	0.0089	0.0119
21	0.0213	0.0091	0.0122
22	0.0218	0.0093	0.0125
23	0.0223	0.0095	0.0128
24	0.0228	0.0098	0.0131
25	0.0234	0.0100	0.0134
26	0.0240	0.0103	0.0138
27	0.0247	0.0106	0.0142
28	0.0254	0.0109	0.0146
29	0.0262	0.0112	0.0150
30	0.0271	0.0116	0.0155
31	0.0280	0.0120	0.0160
32	0.0290	0.0124	0.0166
33	0.0302	0.0129	0.0173

34	0.0314	0.0134	0.0180
35	0.0328	0.0140	0.0188
36	0.0344	0.0147	0.0197
37	0.0433	0.0185	0.0248
38	0.0454	0.0194	0.0260
39	0.0479	0.0205	0.0274
40	0.0508	0.0217	0.0291
41	0.0543	0.0232	0.0311
42	0.0585	0.0250	0.0335
43	0.0640	0.0273	0.0366
44	0.0711	0.0304	0.0407
45	0.0812	0.0347	0.0465
46	0.0969	0.0414	0.0555
47	0.0982	0.0420	0.0562
48	0.2137	0.0816*	0.1321
49	0.3997	0.0816*	0.3181
50	0.0933	0.0399	0.0534
51	0.0694	0.0297	0.0397
52	0.0575	0.0246	0.0329
53	0.0501	0.0214	0.0287
54	0.0449	0.0192	0.0257
55	0.0340	0.0145	0.0195
56	0.0311	0.0133	0.0178
57	0.0288	0.0123	0.0165
58	0.0269	0.0115	0.0154
59	0.0253	0.0108	0.0145
60	0.0239	0.0102	0.0137
61	0.0227	0.0097	0.0130
62	0.0216	0.0093	0.0124
63	0.0207	0.0089	0.0119
64	0.0199	0.0085	0.0114
65	0.0191	0.0082	0.0109
66	0.0184	0.0079	0.0106
67	0.0178	0.0076	0.0102
68	0.0173	0.0074	0.0099
69	0.0167	0.0072	0.0096
70	0.0163	0.0069	0.0093
71	0.0158	0.0068	0.0090
72	0.0154	0.0066	0.0088
	2.8100	1.1022	1.7078

Total soil rain loss = 1.10(In)
Total effective rainfall = 1.71(In)
Peak flow rate in flood hydrograph = 4.30(CFS)

++

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

Hydrograph in 20 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0

```
 0+20       0.0022      0.08  Q         |          |          |          |
 0+40       0.0067      0.16  Q         |          |          |          |
 1+ 0       0.0116      0.18  Q         |          |          |          |
 1+20       0.0168      0.19  Q         |          |          |          |
 1+40       0.0220      0.19  Q         |          |          |          |
 2+ 0       0.0274      0.19  QV        |          |          |          |
 2+20       0.0328      0.20  QV        |          |          |          |
 2+40       0.0383      0.20  QV        |          |          |          |
 3+ 0       0.0438      0.20  QV        |          |          |          |
 3+20       0.0495      0.21  Q V       |          |          |          |
 3+40       0.0552      0.21  Q V       |          |          |          |
 4+ 0       0.0611      0.21  Q V       |          |          |          |
 4+20       0.0670      0.22  Q V       |          |          |          |
 4+40       0.0730      0.22  Q V       |          |          |          |
 5+ 0       0.0792      0.22  Q  V      |          |          |          |
 5+20       0.0854      0.23  Q  V      |          |          |          |
 5+40       0.0918      0.23  Q  V      |          |          |          |
 6+ 0       0.0983      0.24  Q  V      |          |          |          |
 6+20       0.1049      0.24  Q   V     |          |          |          |
 6+40       0.1117      0.25  Q   V     |          |          |          |
 7+ 0       0.1186      0.25  |Q  V     |          |          |          |
 7+20       0.1257      0.26  |Q   V    |          |          |          |
 7+40       0.1329      0.26  |Q   V    |          |          |          |
 8+ 0       0.1403      0.27  |Q   V    |          |          |          |
 8+20       0.1479      0.28  |Q    V   |          |          |          |
 8+40       0.1557      0.28  |Q    V   |          |          |          |
 9+ 0       0.1637      0.29  |Q    V   |          |          |          |
 9+20       0.1719      0.30  |Q    V   |          |          |          |
 9+40       0.1804      0.31  |Q     V  |          |          |          |
10+ 0       0.1891      0.32  |Q     V  |          |          |          |
10+20       0.1982      0.33  |Q      V |          |          |          |
10+40       0.2075      0.34  |Q      V |          |          |          |
11+ 0       0.2172      0.35  |Q      V |          |          |          |
11+20       0.2273      0.37  |Q       V|          |          |          |
11+40       0.2378      0.38  |Q       V|          |          |          |
12+ 0       0.2488      0.40  |Q        V          |          |          |
12+20       0.2614      0.46  |Q        V          |          |          |
12+40       0.2756      0.52  | Q        V         |          |          |
13+ 0       0.2907      0.55  | Q       |V         |          |          |
13+20       0.3068      0.58  | Q       | V        |          |          |
13+40       0.3239      0.62  | Q       |  V       |          |          |
14+ 0       0.3423      0.67  | Q       |  V       |          |          |
14+20       0.3622      0.72  | Q       |   V      |          |          |
14+40       0.3840      0.79  |  Q      |    V     |          |          |
15+ 0       0.4086      0.89  |  Q      |     V    |          |          |
15+20       0.4372      1.04  |   Q     |      V   |          |          |
15+40       0.4686      1.14  |   Q     |        V|          |          |
16+ 0       0.5203      1.88  |      Q  |         V          |          |
16+20       0.6388      4.30  |         |      Q   |    V     |          |
16+40       0.7390      3.64  |         |   Q      |          V          |
17+ 0       0.7810      1.52  |     Q   |          |           V         |
17+20       0.8091      1.02  |   Q     |          |           | V       |
17+40       0.8278      0.68  | Q       |          |           |  V      |
18+ 0       0.8440      0.59  | Q       |          |           |   V     |
18+20       0.8576      0.49  |Q        |          |           |   V     |
18+40       0.8689      0.41  |Q        |          |           |    V    |
```

```
  19+ 0       0.8791      0.37  |Q        |         |         |    V    |
  19+20       0.8884      0.34  |Q        |         |         |     V   |
  19+40       0.8971      0.32  |Q        |         |         |     V   |
  20+ 0       0.9054      0.30  |Q        |         |         |     V   |
  20+20       0.9132      0.28  |Q        |         |         |      V  |
  20+40       0.9206      0.27  |Q        |         |         |      V  |
  21+ 0       0.9276      0.26  |Q        |         |         |      V  |
  21+20       0.9344      0.25  Q         |         |         |      V  |
  21+40       0.9409      0.24  Q         |         |         |       V |
  22+ 0       0.9471      0.23  Q         |         |         |       V |
  22+20       0.9532      0.22  Q         |         |         |       V |
  22+40       0.9590      0.21  Q         |         |         |       V |
  23+ 0       0.9646      0.21  Q         |         |         |        V|
  23+20       0.9701      0.20  Q         |         |         |        V|
  23+40       0.9754      0.19  Q         |         |         |        V|
  24+ 0       0.9806      0.19  Q         |         |         |        V|
  24+20       0.9835      0.10  Q         |         |         |        V|
  24+40       0.9841      0.02  Q         |         |         |        V|
  25+ 0       0.9843      0.01  Q         |         |         |        V|
-------------------------------------------------------------------------
```

ATTACHMENT 3: PROPOSED CONDITIONS CALCULATIONS

This attachment contains the proposed conditions hydrology calculations. Please see the attached calculations.

Kern County Rational Hydrology Program

(Hydrology Manual Dated 1992)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 2007-2014 Version 9.0
Rational Hydrology Study Date: 06/15/20 File: A1.out

A1
10 YR RATIONAL METHOD

Program License Serial Number 6394

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

ENGLISH UNITS USED FOR RAINFALL DATA

Rainfall map data:

Year Storm	Hour	Rainfall
2	6	0.750(In.)
2	24	1.100(In.)
100	6	1.600(In.)
100	24	2.250(In.)

Latitude in degrees = 35.40
SAN JOAQUIN VALLEY area of study
Y2 = 0.343, Y100 = 0.651 or Y100 = 0.652
Note: Larger value of Y100 = 0.652 used
Slope used for rainfall intensity curve b = 0.6500

Remaining year storm values:

1 Hour Rainfall -	Year Storm
0.343	2
0.420	5
0.470	10
0.536	25
0.596	50
0.652	100

24 Hour Rainfall -	Year Storm
1.100	2
1.384	5
1.572	10
1.817	25
2.040	50
2.250	100

Note: Computer estimated pipe sizes use 10 year storm flow rates
NOTE: ENGLISH (IN-LB) INPUT DATA UNITS USED
NOTE: ENGLISH (IN-LB) OUTPUT DATA UNITS USED

++

Process from Point 1.000 to Point 1.100
**** INITIAL AREA EVALUATION ****

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil AMC II = 86.00
Pervious (Ap) = 0.200 Loss rate, Fm = 0.054(In/Hr), Fp = 0.272(In/Hr)
Subarea (Ai) = 0.8000; Subarea Yield Fraction(Y) = 0.813
Initial subarea data:
Initial area flow distance = 425.000(Ft.)
Top (of initial area) elevation = 431.200(Ft.)
Bottom (of initial area) elevation = 427.500(Ft.)
Difference in elevation = 3.700(Ft.)
Slope = 0.00871 s(%)= 0.87
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.418 min.
Rainfall intensity = 2.174(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) = 2.083(CFS)
Subarea runoff = 2.498(CFS)
Total initial stream area = 1.310(Ac.)

******* DATA FOR OTHER YEAR STORMS *******

Year	Area (Ac)	TC (Min)	Intensity (In/Hr)	Fm Avg (In/Hr)	Y Avg (In/Hr)	Qmin (cfs)	Qcalc (cfs)	Qtot (cfs)
5	1.3	9.42	1.40	0.05	0.78	1.3	1.6	1.6
10	1.3	9.42	1.57	0.05	0.79	1.5	1.8	1.8
25	1.3	9.42	1.79	0.05	0.80	1.7	2.0	2.0
50	1.3	9.42	1.99	0.05	0.81	1.9	2.3	2.3

End of computations, total study area = 1.310 (Ac.)

Kern County Rational Hydrology Program

(Hydrology Manual Dated 1992)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 2007-2014 Version 9.0
Rational Hydrology Study Date: 06/15/20 File: A100.out

A1
100 YR RATIONAL METHOD

Program License Serial Number 6394

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

ENGLISH UNITS USED FOR RAINFALL DATA

Rainfall map data:

Year Storm	Hour	Rainfall
2	6	0.750(In.)
2	24	1.100(In.)
100	6	1.600(In.)
100	24	2.250(In.)

Latitude in degrees = 35.40
SAN JOAQUIN VALLEY area of study
Y2 = 0.343, Y100 = 0.651 or Y100 = 0.652
Note: Larger value of Y100 = 0.652 used
Slope used for rainfall intensity curve b = 0.6500

Remaining year storm values:

1 Hour Rainfall -	Year Storm
0.343	2
0.420	5
0.470	10
0.536	25
0.596	50
0.652	100

24 Hour Rainfall -	Year Storm
1.100	2
1.384	5
1.572	10
1.817	25
2.040	50
2.250	100

Note: Computer estimated pipe sizes use 100 year storm flow rates
NOTE: ENGLISH (IN-LB) INPUT DATA UNITS USED
NOTE: ENGLISH (IN-LB) OUTPUT DATA UNITS USED

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point        1.000 to Point        1.100
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil AMC II  = 86.00
Pervious (Ap) = 0.200 Loss rate, Fm = 0.054(In/Hr), Fp = 0.272(In/Hr)
Subarea (Ai) = 0.8000; Subarea Yield Fraction(Y) =     0.813
Initial subarea data:
Initial area flow distance =   425.000(Ft.)
Top (of initial area) elevation =   431.200(Ft.)
Bottom (of initial area) elevation =   427.250(Ft.)
Difference in elevation =     3.950(Ft.)
Slope =    0.00929  s(%)=       0.93
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.295 min.
Rainfall intensity =      2.192(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   2.100(CFS)
Subarea runoff =      2.520(CFS)
Total initial stream area =        1.310(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    1.3    9.30     1.41      0.05   0.78     1.3   1.6   1.6
  10    1.3    9.30     1.58      0.05   0.79     1.5   1.8   1.8
  25    1.3    9.30     1.80      0.05   0.80     1.7   2.1   2.1
  50    1.3    9.30     2.00      0.05   0.81     1.9   2.3   2.3
------------------------------------------------------------------
End of computations, total study area =           1.310 (Ac.)
```

Kern County Rational Hydrology Program

(Hydrology Manual Dated 1992)

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Rational Hydrology Study Date: 06/15/20 File: B110R.out

A2
10 YR RATIONAL METHOD

Program License Serial Number 6394

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

ENGLISH UNITS USED FOR RAINFALL DATA

Rainfall map data:

Year Storm	Hour	Rainfall
2	6	0.750(In.)
2	24	1.100(In.)
100	6	1.600(In.)
100	24	2.250(In.)

Latitude in degrees = 35.40
SAN JOAQUIN VALLEY area of study
Y2 = 0.343, Y100 = 0.651 or Y100 = 0.652
Note: Larger value of Y100 = 0.652 used
Slope used for rainfall intensity curve b = 0.6500

Remaining year storm values:

1 Hour Rainfall -	Year Storm
0.343	2
0.420	5
0.470	10
0.536	25
0.596	50
0.652	100

24 Hour Rainfall -	Year Storm
1.100	2
1.384	5
1.572	10
1.817	25
2.040	50
2.250	100

Note: Computer estimated pipe sizes use 10 year storm flow rates
NOTE: ENGLISH (IN-LB) INPUT DATA UNITS USED
NOTE: ENGLISH (IN-LB) OUTPUT DATA UNITS USED

++
Process from Point 2.000 to Point 2.100
**** INITIAL AREA EVALUATION ****

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil AMC II = 86.00
Pervious (Ap) = 0.450 Loss rate, Fm = 0.122(In/Hr), Fp = 0.272(In/Hr)
Subarea (Ai) = 0.5500; Subarea Yield Fraction(Y) = 0.704
Initial subarea data:
Initial area flow distance = 393.000(Ft.)
Top (of initial area) elevation = 430.640(Ft.)
Bottom (of initial area) elevation = 427.400(Ft.)
Difference in elevation = 3.240(Ft.)
Slope = 0.00824 s(%)= 0.82
TC = k(0.382)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 10.865 min.
Rainfall intensity = 1.981(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) = 1.329(CFS)
Subarea runoff = 1.773(CFS)
Total initial stream area = 1.060(Ac.)

******* DATA FOR OTHER YEAR STORMS *******

Year	Area (Ac)	TC (Min)	Intensity (In/Hr)	Fm Avg (In/Hr)	Y Avg (In/Hr)	Qmin (cfs)	Qcalc (cfs)	Qtot (cfs)
5	1.1	10.86	1.27	0.12	0.63	0.8	1.1	1.1
10	1.1	10.86	1.43	0.12	0.65	0.9	1.2	1.2
25	1.1	10.86	1.63	0.12	0.67	1.0	1.4	1.4
50	1.1	10.86	1.81	0.12	0.69	1.2	1.6	1.6

End of computations, total study area = 1.060 (Ac.)

Kern County Rational Hydrology Program

(Hydrology Manual Dated 1992)

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Rational Hydrology Study Date: 06/15/20 File: A310R.out

A3
10 YR STORM - RATIONAL METHOD

Program License Serial Number 6394

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

ENGLISH UNITS USED FOR RAINFALL DATA

Rainfall map data:

Year Storm	Hour	Rainfall
2	6	0.750(In.)
2	24	1.100(In.)
100	6	1.600(In.)
100	24	2.250(In.)

Latitude in degrees = 35.40
SAN JOAQUIN VALLEY area of study
Y2 = 0.343, Y100 = 0.651 or Y100 = 0.652
Note: Larger value of Y100 = 0.652 used
Slope used for rainfall intensity curve b = 0.6500

Remaining year storm values:

1 Hour Rainfall -	Year Storm
0.343	2
0.420	5
0.470	10
0.536	25
0.596	50
0.652	100

24 Hour Rainfall -	Year Storm
1.100	2
1.384	5
1.572	10
1.817	25
2.040	50
2.250	100

Note: Computer estimated pipe sizes use 10 year storm flow rates
NOTE: ENGLISH (IN-LB) INPUT DATA UNITS USED
NOTE: ENGLISH (IN-LB) OUTPUT DATA UNITS USED

++

Process from Point 3.000 to Point 3.100
**** INITIAL AREA EVALUATION ****

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil AMC II = 86.00
Pervious (Ap) = 0.450 Loss rate, Fm = 0.122(In/Hr), Fp = 0.272(In/Hr)
Subarea (Ai) = 0.5500; Subarea Yield Fraction(Y) = 0.704
Initial subarea data:
Initial area flow distance = 529.000(Ft.)
Top (of initial area) elevation = 429.800(Ft.)
Bottom (of initial area) elevation = 428.200(Ft.)
Difference in elevation = 1.600(Ft.)
Slope = 0.00302 s(%)= 0.30
TC = k(0.382)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.954 min.
Rainfall intensity = 1.609(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) = 1.671(CFS)
Subarea runoff = 2.195(CFS)
Total initial stream area = 1.640(Ac.)

******* DATA FOR OTHER YEAR STORMS *******

Year	Area (Ac)	TC (Min)	Intensity (In/Hr)	Fm Avg (In/Hr)	Y Avg (In/Hr)	Qmin (cfs)	Qcalc (cfs)	Qtot (cfs)
5	1.6	14.95	1.04	0.12	0.63	1.0	1.3	1.3
10	1.6	14.95	1.16	0.12	0.65	1.1	1.5	1.5
25	1.6	14.95	1.32	0.12	0.67	1.3	1.8	1.8
50	1.6	14.95	1.47	0.12	0.69	1.5	2.0	2.0

End of computations, total study area = 1.640 (Ac.)

Kern County Rational Hydrology Program

(Hydrology Manual Dated 1992)

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Rational Hydrology Study Date: 06/15/20 File: A410.out

A4
10 YR - RATIONAL METHOD

Program License Serial Number 6394

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

ENGLISH UNITS USED FOR RAINFALL DATA

Rainfall map data:

Year Storm	Hour	Rainfall
2	6	0.750(In.)
2	24	1.100(In.)
100	6	1.600(In.)
100	24	2.250(In.)

Latitude in degrees = 35.40
SAN JOAQUIN VALLEY area of study
Y2 = 0.343, Y100 = 0.651 or Y100 = 0.652
Note: Larger value of Y100 = 0.652 used
Slope used for rainfall intensity curve b = 0.6500

Remaining year storm values:

1 Hour Rainfall -	Year Storm
0.343	2
0.420	5
0.470	10
0.536	25
0.596	50
0.652	100

24 Hour Rainfall -	Year Storm
1.100	2
1.384	5
1.572	10
1.817	25
2.040	50
2.250	100

Note: Computer estimated pipe sizes use 10 year storm flow rates
NOTE: ENGLISH (IN-LB) INPUT DATA UNITS USED
NOTE: ENGLISH (IN-LB) OUTPUT DATA UNITS USED

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point        4.000 to Point        4.100
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil AMC II  = 86.00
Pervious (Ap) = 0.350 Loss rate, Fm = 0.095(In/Hr), Fp = 0.272(In/Hr)
Subarea (Ai) = 0.6500; Subarea Yield Fraction(Y) =     0.747
Initial subarea data:
Initial area flow distance =   337.000(Ft.)
Top (of initial area) elevation =   427.600(Ft.)
Bottom (of initial area) elevation =   425.400(Ft.)
Difference in elevation =     2.200(Ft.)
Slope =    0.00653  s(%)=       0.65
TC = k(0.360)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.102 min.
Rainfall intensity =      2.077(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   3.910(CFS)
Subarea runoff =      4.993(CFS)
Total initial stream area =        2.800(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    2.8   10.10     1.34      0.10   0.69     2.3   3.1   3.1
  10    2.8   10.10     1.50      0.10   0.71     2.7   3.5   3.5
  25    2.8   10.10     1.71      0.10   0.72     3.1   4.1   4.1
  50    2.8   10.10     1.90      0.10   0.74     3.5   4.5   4.5
------------------------------------------------------------------
End of computations, total study area =          2.800 (Ac.)
```

Kern County Rational Hydrology Program

(Hydrology Manual Dated 1992)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 2007-2014 Version 9.0
Rational Hydrology Study Date: 06/15/20 File: A2100R.out

A2
100 YR STORM - RATIONAL METHOD

Program License Serial Number 6394

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

ENGLISH UNITS USED FOR RAINFALL DATA

Rainfall map data:

Year Storm	Hour	Rainfall
2	6	0.750(In.)
2	24	1.100(In.)
100	6	1.600(In.)
100	24	2.250(In.)

Latitude in degrees = 35.40
SAN JOAQUIN VALLEY area of study
Y2 = 0.343, Y100 = 0.651 or Y100 = 0.652
Note: Larger value of Y100 = 0.652 used
Slope used for rainfall intensity curve b = 0.6500

Remaining year storm values:

1 Hour Rainfall -	Year Storm
0.343	2
0.420	5
0.470	10
0.536	25
0.596	50
0.652	100

24 Hour Rainfall -	Year Storm
1.100	2
1.384	5
1.572	10
1.817	25
2.040	50
2.250	100

Note: Computer estimated pipe sizes use 100 year storm flow rates
NOTE: ENGLISH (IN-LB) INPUT DATA UNITS USED
NOTE: ENGLISH (IN-LB) OUTPUT DATA UNITS USED

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point        2.000 to Point        2.100
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil AMC II  = 86.00
Pervious (Ap) = 0.450 Loss rate, Fm = 0.122(In/Hr), Fp = 0.272(In/Hr)
Subarea (Ai) = 0.5500; Subarea Yield Fraction(Y) =     0.704
Initial subarea data:
Initial area flow distance =   393.000(Ft.)
Top (of initial area) elevation =   430.640(Ft.)
Bottom (of initial area) elevation =   427.400(Ft.)
Difference in elevation =     3.240(Ft.)
Slope =    0.00824  s(%)=       0.82
TC = k(0.382)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.865 min.
Rainfall intensity =      1.981(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   1.329(CFS)
Subarea runoff =      1.773(CFS)
Total initial stream area =        1.060(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    1.1   10.86     1.27      0.12   0.63     0.8   1.1   1.1
  10    1.1   10.86     1.43      0.12   0.65     0.9   1.2   1.2
  25    1.1   10.86     1.63      0.12   0.67     1.0   1.4   1.4
  50    1.1   10.86     1.81      0.12   0.69     1.2   1.6   1.6
------------------------------------------------------------------
End of computations, total study area =           1.060 (Ac.)
```

Kern County Rational Hydrology Program

(Hydrology Manual Dated 1992)

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Rational Hydrology Study Date: 06/15/20 File: A3100R.out

A3
100 YR STORM - RATIONAL METHOD

Program License Serial Number 6394

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

ENGLISH UNITS USED FOR RAINFALL DATA

Rainfall map data: Year Storm Hour Rainfall
2 6 0.750(In.)
2 24 1.100(In.)
100 6 1.600(In.)
100 24 2.250(In.)
Latitude in degrees = 35.40
SAN JOAQUIN VALLEY area of study
Y2 = 0.343, Y100 = 0.651 or Y100 = 0.652
Note: Larger value of Y100 = 0.652 used
Slope used for rainfall intensity curve b = 0.6500

Remaining year storm values:

1 Hour Rainfall - Year Storm
0.343 2
0.420 5
0.470 10
0.536 25
0.596 50
0.652 100

24 Hour Rainfall - Year Storm
1.100 2
1.384 5
1.572 10
1.817 25
2.040 50
2.250 100

Note: Computer estimated pipe sizes use 100 year storm flow rates
NOTE: ENGLISH (IN-LB) INPUT DATA UNITS USED

NOTE: ENGLISH (IN-LB) OUTPUT DATA UNITS USED

++
Process from Point 3.000 to Point 3.100
**** INITIAL AREA EVALUATION ****

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil AMC II = 86.00
Pervious (Ap) = 0.450 Loss rate, Fm = 0.122(In/Hr), Fp = 0.272(In/Hr)
Subarea (Ai) = 0.5500; Subarea Yield Fraction(Y) = 0.704
Initial subarea data:
Initial area flow distance = 529.000(Ft.)
Top (of initial area) elevation = 429.800(Ft.)
Bottom (of initial area) elevation = 428.200(Ft.)
Difference in elevation = 1.600(Ft.)
Slope = 0.00302 s(%)= 0.30
TC = k(0.382)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.954 min.
Rainfall intensity = 1.609(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) = 1.671(CFS)
Subarea runoff = 2.195(CFS)
Total initial stream area = 1.640(Ac.)

******* DATA FOR OTHER YEAR STORMS *******

Year	Area (Ac)	TC (Min)	Intensity (In/Hr)	Fm Avg (In/Hr)	Y Avg (In/Hr)	Qmin (cfs)	Qcalc (cfs)	Qtot (cfs)
5	1.6	14.95	1.04	0.12	0.63	1.0	1.3	1.3
10	1.6	14.95	1.16	0.12	0.65	1.1	1.5	1.5
25	1.6	14.95	1.32	0.12	0.67	1.3	1.8	1.8
50	1.6	14.95	1.47	0.12	0.69	1.5	2.0	2.0

End of computations, total study area = 1.640 (Ac.)

Kern County Rational Hydrology Program

(Hydrology Manual Dated 1992)

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Rational Hydrology Study Date: 06/15/20 File: A410.out

A4
100 YR - RATIONAL METHOD

Program License Serial Number 6394

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

ENGLISH UNITS USED FOR RAINFALL DATA

Rainfall map data:

Year Storm	Hour	Rainfall
2	6	0.750(In.)
2	24	1.100(In.)
100	6	1.600(In.)
100	24	2.250(In.)

Latitude in degrees = 35.40
SAN JOAQUIN VALLEY area of study
Y2 = 0.343, Y100 = 0.651 or Y100 = 0.652
Note: Larger value of Y100 = 0.652 used
Slope used for rainfall intensity curve b = 0.6500

Remaining year storm values:

1 Hour Rainfall -	Year Storm
0.343	2
0.420	5
0.470	10
0.536	25
0.596	50
0.652	100

24 Hour Rainfall -	Year Storm
1.100	2
1.384	5
1.572	10
1.817	25
2.040	50
2.250	100

Note: Computer estimated pipe sizes use 100 year storm flow rates
NOTE: ENGLISH (IN-LB) INPUT DATA UNITS USED
NOTE: ENGLISH (IN-LB) OUTPUT DATA UNITS USED

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point        4.000 to Point        4.100
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil AMC II  = 86.00
Pervious (Ap) = 0.350 Loss rate, Fm = 0.095(In/Hr), Fp = 0.272(In/Hr)
Subarea (Ai) = 0.6500; Subarea Yield Fraction(Y) =     0.747
Initial subarea data:
Initial area flow distance =   337.000(Ft.)
Top (of initial area) elevation =   427.600(Ft.)
Bottom (of initial area) elevation =   425.400(Ft.)
Difference in elevation =     2.200(Ft.)
Slope =    0.00653  s(%)=       0.65
TC = k(0.360)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.102 min.
Rainfall intensity =      2.077(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   3.910(CFS)
Subarea runoff =      4.993(CFS)
Total initial stream area =        2.800(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    2.8   10.10     1.34      0.10   0.69     2.3   3.1   3.1
  10    2.8   10.10     1.50      0.10   0.71     2.7   3.5   3.5
  25    2.8   10.10     1.71      0.10   0.72     3.1   4.1   4.1
  50    2.8   10.10     1.90      0.10   0.74     3.5   4.5   4.5
------------------------------------------------------------------
End of computations, total study area =           2.800 (Ac.)
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 06/15/20

++

Kern County Synthetic Unit Hydrograph Hydrology Method
Manual date - 1992

Program License Serial Number 6394

A1
10 YR - 24 HR STORM

Storm Event Year = 10

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.650

Zone Designation: Desert Region Latitude = 35.40

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
1.31	6	0.66
Rainfall data for year 2		
1.31	24	0.97
Rainfall data for year 100		
1.31	6	1.64
Rainfall data for year 100		
1.31	24	2.81

++
DESERT REGION area of study
Log-Log Rainfall Intensity Slope = 0.65

******** Area-averaged max loss rate, Fm ********

SCS curve Number	Area (Ac.)	Area Fraction	Fp (In/Hr)	Ap (dec.)	Fm (In/Hr)
86.0	1.31	1.000	0.272	0.200	0.054

Area-averaged adjusted loss rate Fm (In/Hr) = 0.054

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	S	Pervious Yield Fr
0.26	0.200	86.0	1.63	0.375
1.05	0.800	98.0	0.20	0.871

Area-averaged catchment yield fraction, Y = 0.772
Area-averaged low loss fraction, Yb = 0.228
Direct entry of lag time by user
++
Watershed area = 1.31(Ac.)
Catchment Lag time = 0.160 hours
Unit interval = 10.000 minutes
Unit interval percentage of lag time = 104.1667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.054(In/Hr)
Average low loss rate fraction (Yb) = 0.228 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.282(In)
Computed peak 30-minute rainfall = 0.528(In)
Specified peak 1-hour rainfall = 0.673(In)
Computed peak 3-hour rainfall = 0.932(In)
Specified peak 6-hour rainfall = 1.145(In)
Specified peak 24-hour rainfall = 1.726(In)

Rainfall depth area reduction factors:
Using a total area of 1.31(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.282(In)
30-minute factor = 1.000 Adjusted rainfall = 0.528(In)
1-hour factor = 1.000 Adjusted rainfall = 0.673(In)
3-hour factor = 1.000 Adjusted rainfall = 0.932(In)
6-hour factor = 1.000 Adjusted rainfall = 1.145(In)
24-hour factor = 1.000 Adjusted rainfall = 1.726(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 7.92 (CFS))	
1	18.421	1.459
2	81.273	4.979
3	98.453	1.361
4	100.000	0.123

Rainfall values calculated at 5 minute intervals:

Peak Rainfall Unit Number	Intensity	Depth	Adjusted	Unit Rainfall (In)
1	3.39	0.28	0.28	0.282
2	2.16	0.36	0.36	0.077
3	1.66	0.41	0.41	0.055
4	1.38	0.46	0.46	0.044
5	1.19	0.50	0.50	0.037
6	1.06	0.53	0.53	0.033
7	0.96	0.56	0.56	0.029
8	0.88	0.58	0.58	0.027
9	0.81	0.61	0.61	0.025
10	0.76	0.63	0.63	0.023
11	0.71	0.65	0.65	0.021
12	0.67	0.67	0.67	0.020
13	0.64	0.69	0.69	0.016
14	0.60	0.70	0.70	0.015
15	0.58	0.72	0.72	0.015
16	0.55	0.73	0.73	0.014
17	0.53	0.75	0.75	0.013
18	0.51	0.76	0.76	0.013
19	0.49	0.77	0.77	0.012
20	0.47	0.78	0.78	0.012
21	0.45	0.79	0.79	0.011
22	0.44	0.81	0.81	0.011
23	0.43	0.82	0.82	0.011
24	0.41	0.83	0.83	0.010
25	0.40	0.84	0.84	0.010
26	0.39	0.85	0.85	0.010
27	0.38	0.86	0.86	0.010
28	0.37	0.87	0.87	0.009
29	0.36	0.87	0.87	0.009
30	0.35	0.88	0.88	0.009
31	0.35	0.89	0.89	0.009
32	0.34	0.90	0.90	0.008
33	0.33	0.91	0.91	0.008
34	0.32	0.92	0.92	0.008
35	0.32	0.92	0.92	0.008
36	0.31	0.93	0.93	0.008
37	0.30	0.94	0.94	0.008
38	0.30	0.95	0.95	0.007
39	0.29	0.95	0.95	0.007
40	0.29	0.96	0.96	0.007
41	0.28	0.97	0.97	0.007
42	0.28	0.98	0.98	0.007
43	0.27	0.98	0.98	0.007
44	0.27	0.99	0.99	0.007
45	0.27	1.00	1.00	0.007
46	0.26	1.00	1.00	0.007
47	0.26	1.01	1.01	0.006
48	0.25	1.02	1.02	0.006
49	0.25	1.02	1.02	0.006
50	0.25	1.03	1.03	0.006
51	0.24	1.03	1.03	0.006
52	0.24	1.04	1.04	0.006
53	0.24	1.05	1.05	0.006
54	0.23	1.05	1.05	0.006
55	0.23	1.06	1.06	0.006
56	0.23	1.06	1.06	0.006

57	0.22	1.07	1.07	0.006
58	0.22	1.07	1.07	0.006
59	0.22	1.08	1.08	0.005
60	0.22	1.08	1.08	0.005
61	0.21	1.09	1.09	0.005
62	0.21	1.10	1.10	0.005
63	0.21	1.10	1.10	0.005
64	0.21	1.11	1.11	0.005
65	0.21	1.11	1.11	0.005
66	0.20	1.12	1.12	0.005
67	0.20	1.12	1.12	0.005
68	0.20	1.13	1.13	0.005
69	0.20	1.13	1.13	0.005
70	0.19	1.14	1.14	0.005
71	0.19	1.14	1.14	0.005
72	0.19	1.14	1.14	0.005
73	0.19	1.15	1.15	0.005
74	0.19	1.15	1.15	0.005
75	0.19	1.16	1.16	0.005
76	0.18	1.16	1.16	0.005
77	0.18	1.17	1.17	0.005
78	0.18	1.17	1.17	0.004
79	0.18	1.18	1.18	0.004
80	0.18	1.18	1.18	0.004
81	0.18	1.19	1.19	0.004
82	0.17	1.19	1.19	0.004
83	0.17	1.19	1.19	0.004
84	0.17	1.20	1.20	0.004
85	0.17	1.20	1.20	0.004
86	0.17	1.21	1.21	0.004
87	0.17	1.21	1.21	0.004
88	0.17	1.21	1.21	0.004
89	0.16	1.22	1.22	0.004
90	0.16	1.22	1.22	0.004
91	0.16	1.23	1.23	0.004
92	0.16	1.23	1.23	0.004
93	0.16	1.23	1.23	0.004
94	0.16	1.24	1.24	0.004
95	0.16	1.24	1.24	0.004
96	0.16	1.25	1.25	0.004
97	0.15	1.25	1.25	0.004
98	0.15	1.25	1.25	0.004
99	0.15	1.26	1.26	0.004
100	0.15	1.26	1.26	0.004
101	0.15	1.27	1.27	0.004
102	0.15	1.27	1.27	0.004
103	0.15	1.27	1.27	0.004
104	0.15	1.28	1.28	0.004
105	0.15	1.28	1.28	0.004
106	0.15	1.28	1.28	0.004
107	0.14	1.29	1.29	0.004
108	0.14	1.29	1.29	0.004
109	0.14	1.29	1.29	0.004
110	0.14	1.30	1.30	0.004
111	0.14	1.30	1.30	0.003
112	0.14	1.30	1.30	0.003
113	0.14	1.31	1.31	0.003
114	0.14	1.31	1.31	0.003
115	0.14	1.32	1.32	0.003

116	0.14	1.32	1.32	0.003
117	0.14	1.32	1.32	0.003
118	0.13	1.33	1.33	0.003
119	0.13	1.33	1.33	0.003
120	0.13	1.33	1.33	0.003
121	0.13	1.34	1.34	0.003
122	0.13	1.34	1.34	0.003
123	0.13	1.34	1.34	0.003
124	0.13	1.34	1.34	0.003
125	0.13	1.35	1.35	0.003
126	0.13	1.35	1.35	0.003
127	0.13	1.35	1.35	0.003
128	0.13	1.36	1.36	0.003
129	0.13	1.36	1.36	0.003
130	0.13	1.36	1.36	0.003
131	0.13	1.37	1.37	0.003
132	0.12	1.37	1.37	0.003
133	0.12	1.37	1.37	0.003
134	0.12	1.38	1.38	0.003
135	0.12	1.38	1.38	0.003
136	0.12	1.38	1.38	0.003
137	0.12	1.39	1.39	0.003
138	0.12	1.39	1.39	0.003
139	0.12	1.39	1.39	0.003
140	0.12	1.39	1.39	0.003
141	0.12	1.40	1.40	0.003
142	0.12	1.40	1.40	0.003
143	0.12	1.40	1.40	0.003
144	0.12	1.41	1.41	0.003
145	0.12	1.41	1.41	0.003
146	0.12	1.41	1.41	0.003
147	0.12	1.41	1.41	0.003
148	0.11	1.42	1.42	0.003
149	0.11	1.42	1.42	0.003
150	0.11	1.42	1.42	0.003
151	0.11	1.43	1.43	0.003
152	0.11	1.43	1.43	0.003
153	0.11	1.43	1.43	0.003
154	0.11	1.43	1.43	0.003
155	0.11	1.44	1.44	0.003
156	0.11	1.44	1.44	0.003
157	0.11	1.44	1.44	0.003
158	0.11	1.44	1.44	0.003
159	0.11	1.45	1.45	0.003
160	0.11	1.45	1.45	0.003
161	0.11	1.45	1.45	0.003
162	0.11	1.46	1.46	0.003
163	0.11	1.46	1.46	0.003
164	0.11	1.46	1.46	0.003
165	0.11	1.46	1.46	0.003
166	0.11	1.47	1.47	0.003
167	0.11	1.47	1.47	0.003
168	0.11	1.47	1.47	0.003
169	0.10	1.47	1.47	0.003
170	0.10	1.48	1.48	0.003
171	0.10	1.48	1.48	0.003
172	0.10	1.48	1.48	0.003
173	0.10	1.48	1.48	0.003
174	0.10	1.49	1.49	0.003

175	0.10	1.49	1.49	0.003
176	0.10	1.49	1.49	0.003
177	0.10	1.49	1.49	0.003
178	0.10	1.50	1.50	0.002
179	0.10	1.50	1.50	0.002
180	0.10	1.50	1.50	0.002
181	0.10	1.50	1.50	0.002
182	0.10	1.51	1.51	0.002
183	0.10	1.51	1.51	0.002
184	0.10	1.51	1.51	0.002
185	0.10	1.51	1.51	0.002
186	0.10	1.52	1.52	0.002
187	0.10	1.52	1.52	0.002
188	0.10	1.52	1.52	0.002
189	0.10	1.52	1.52	0.002
190	0.10	1.53	1.53	0.002
191	0.10	1.53	1.53	0.002
192	0.10	1.53	1.53	0.002
193	0.10	1.53	1.53	0.002
194	0.09	1.54	1.54	0.002
195	0.09	1.54	1.54	0.002
196	0.09	1.54	1.54	0.002
197	0.09	1.54	1.54	0.002
198	0.09	1.54	1.54	0.002
199	0.09	1.55	1.55	0.002
200	0.09	1.55	1.55	0.002
201	0.09	1.55	1.55	0.002
202	0.09	1.55	1.55	0.002
203	0.09	1.56	1.56	0.002
204	0.09	1.56	1.56	0.002
205	0.09	1.56	1.56	0.002
206	0.09	1.56	1.56	0.002
207	0.09	1.57	1.57	0.002
208	0.09	1.57	1.57	0.002
209	0.09	1.57	1.57	0.002
210	0.09	1.57	1.57	0.002
211	0.09	1.57	1.57	0.002
212	0.09	1.58	1.58	0.002
213	0.09	1.58	1.58	0.002
214	0.09	1.58	1.58	0.002
215	0.09	1.58	1.58	0.002
216	0.09	1.59	1.59	0.002
217	0.09	1.59	1.59	0.002
218	0.09	1.59	1.59	0.002
219	0.09	1.59	1.59	0.002
220	0.09	1.59	1.59	0.002
221	0.09	1.60	1.60	0.002
222	0.09	1.60	1.60	0.002
223	0.09	1.60	1.60	0.002
224	0.09	1.60	1.60	0.002
225	0.09	1.60	1.60	0.002
226	0.09	1.61	1.61	0.002
227	0.09	1.61	1.61	0.002
228	0.08	1.61	1.61	0.002
229	0.08	1.61	1.61	0.002
230	0.08	1.61	1.61	0.002
231	0.08	1.62	1.62	0.002
232	0.08	1.62	1.62	0.002
233	0.08	1.62	1.62	0.002

234	0.08	1.62	1.62	0.002
235	0.08	1.63	1.63	0.002
236	0.08	1.63	1.63	0.002
237	0.08	1.63	1.63	0.002
238	0.08	1.63	1.63	0.002
239	0.08	1.63	1.63	0.002
240	0.08	1.64	1.64	0.002
241	0.08	1.64	1.64	0.002
242	0.08	1.64	1.64	0.002
243	0.08	1.64	1.64	0.002
244	0.08	1.64	1.64	0.002
245	0.08	1.65	1.65	0.002
246	0.08	1.65	1.65	0.002
247	0.08	1.65	1.65	0.002
248	0.08	1.65	1.65	0.002
249	0.08	1.65	1.65	0.002
250	0.08	1.66	1.66	0.002
251	0.08	1.66	1.66	0.002
252	0.08	1.66	1.66	0.002
253	0.08	1.66	1.66	0.002
254	0.08	1.66	1.66	0.002
255	0.08	1.67	1.67	0.002
256	0.08	1.67	1.67	0.002
257	0.08	1.67	1.67	0.002
258	0.08	1.67	1.67	0.002
259	0.08	1.67	1.67	0.002
260	0.08	1.67	1.67	0.002
261	0.08	1.68	1.68	0.002
262	0.08	1.68	1.68	0.002
263	0.08	1.68	1.68	0.002
264	0.08	1.68	1.68	0.002
265	0.08	1.68	1.68	0.002
266	0.08	1.69	1.69	0.002
267	0.08	1.69	1.69	0.002
268	0.08	1.69	1.69	0.002
269	0.08	1.69	1.69	0.002
270	0.08	1.69	1.69	0.002
271	0.08	1.70	1.70	0.002
272	0.07	1.70	1.70	0.002
273	0.07	1.70	1.70	0.002
274	0.07	1.70	1.70	0.002
275	0.07	1.70	1.70	0.002
276	0.07	1.70	1.70	0.002
277	0.07	1.71	1.71	0.002
278	0.07	1.71	1.71	0.002
279	0.07	1.71	1.71	0.002
280	0.07	1.71	1.71	0.002
281	0.07	1.71	1.71	0.002
282	0.07	1.72	1.72	0.002
283	0.07	1.72	1.72	0.002
284	0.07	1.72	1.72	0.002
285	0.07	1.72	1.72	0.002
286	0.07	1.72	1.72	0.002
287	0.07	1.72	1.72	0.002
288	0.07	1.73	1.73	0.002

Time = 24.00 Hours Total unit rainfall = 1.73(In)

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0036	0.0008	0.0027
2	0.0036	0.0008	0.0028
3	0.0036	0.0008	0.0028
4	0.0036	0.0008	0.0028
5	0.0037	0.0008	0.0028
6	0.0037	0.0008	0.0029
7	0.0037	0.0009	0.0029
8	0.0038	0.0009	0.0029
9	0.0038	0.0009	0.0029
10	0.0038	0.0009	0.0029
11	0.0038	0.0009	0.0030
12	0.0039	0.0009	0.0030
13	0.0039	0.0009	0.0030
14	0.0039	0.0009	0.0030
15	0.0040	0.0009	0.0031
16	0.0040	0.0009	0.0031
17	0.0040	0.0009	0.0031
18	0.0041	0.0009	0.0032
19	0.0041	0.0009	0.0032
20	0.0042	0.0009	0.0032
21	0.0042	0.0010	0.0032
22	0.0042	0.0010	0.0033
23	0.0043	0.0010	0.0033
24	0.0043	0.0010	0.0033
25	0.0044	0.0010	0.0034
26	0.0044	0.0010	0.0034
27	0.0045	0.0010	0.0034
28	0.0045	0.0010	0.0035
29	0.0045	0.0010	0.0035
30	0.0046	0.0010	0.0035
31	0.0046	0.0011	0.0036
32	0.0047	0.0011	0.0036
33	0.0047	0.0011	0.0037
34	0.0048	0.0011	0.0037
35	0.0048	0.0011	0.0037
36	0.0049	0.0011	0.0038
37	0.0050	0.0011	0.0038
38	0.0050	0.0011	0.0039
39	0.0051	0.0012	0.0039
40	0.0051	0.0012	0.0040
41	0.0052	0.0012	0.0040
42	0.0053	0.0012	0.0041
43	0.0053	0.0012	0.0041
44	0.0054	0.0012	0.0042
45	0.0055	0.0013	0.0042
46	0.0056	0.0013	0.0043
47	0.0056	0.0013	0.0044
48	0.0057	0.0013	0.0044
49	0.0058	0.0013	0.0045
50	0.0059	0.0013	0.0046
51	0.0060	0.0014	0.0046
52	0.0061	0.0014	0.0047
53	0.0062	0.0014	0.0048
54	0.0063	0.0014	0.0048
55	0.0064	0.0015	0.0049
56	0.0065	0.0015	0.0050
57	0.0066	0.0015	0.0051

58	0.0067	0.0015	0.0052
59	0.0069	0.0016	0.0053
60	0.0070	0.0016	0.0054
61	0.0071	0.0016	0.0055
62	0.0073	0.0017	0.0056
63	0.0074	0.0017	0.0057
64	0.0076	0.0017	0.0059
65	0.0078	0.0018	0.0060
66	0.0079	0.0018	0.0061
67	0.0081	0.0019	0.0063
68	0.0083	0.0019	0.0064
69	0.0085	0.0019	0.0066
70	0.0087	0.0020	0.0068
71	0.0090	0.0021	0.0069
72	0.0092	0.0021	0.0071
73	0.0095	0.0022	0.0073
74	0.0098	0.0022	0.0076
75	0.0101	0.0023	0.0078
76	0.0105	0.0024	0.0081
77	0.0108	0.0025	0.0084
78	0.0112	0.0026	0.0087
79	0.0117	0.0027	0.0090
80	0.0122	0.0028	0.0094
81	0.0127	0.0029	0.0098
82	0.0133	0.0030	0.0103
83	0.0140	0.0032	0.0108
84	0.0148	0.0034	0.0114
85	0.0157	0.0036	0.0121
86	0.0167	0.0038	0.0129
87	0.0179	0.0041	0.0138
88	0.0193	0.0044	0.0149
89	0.0210	0.0048	0.0162
90	0.0232	0.0053	0.0179
91	0.0260	0.0059	0.0201
92	0.0299	0.0068	0.0230
93	0.0416	0.0091*	0.0326
94	0.0513	0.0091*	0.0422
95	0.0699	0.0091*	0.0608
96	0.1323	0.0091*	0.1232
97	0.3260	0.0091*	0.3170
98	0.0521	0.0091*	0.0431
99	0.0300	0.0069	0.0232
100	0.0233	0.0053	0.0180
101	0.0193	0.0044	0.0149
102	0.0167	0.0038	0.0129
103	0.0148	0.0034	0.0114
104	0.0133	0.0030	0.0103
105	0.0122	0.0028	0.0094
106	0.0112	0.0026	0.0087
107	0.0105	0.0024	0.0081
108	0.0098	0.0022	0.0076
109	0.0092	0.0021	0.0071
110	0.0087	0.0020	0.0068
111	0.0083	0.0019	0.0064
112	0.0079	0.0018	0.0061
113	0.0076	0.0017	0.0059
114	0.0073	0.0017	0.0056
115	0.0070	0.0016	0.0054
116	0.0067	0.0015	0.0052

117	0.0065	0.0015	0.0050
118	0.0063	0.0014	0.0049
119	0.0061	0.0014	0.0047
120	0.0059	0.0013	0.0046
121	0.0057	0.0013	0.0044
122	0.0056	0.0013	0.0043
123	0.0054	0.0012	0.0042
124	0.0053	0.0012	0.0041
125	0.0051	0.0012	0.0040
126	0.0050	0.0011	0.0039
127	0.0049	0.0011	0.0038
128	0.0048	0.0011	0.0037
129	0.0047	0.0011	0.0036
130	0.0046	0.0010	0.0035
131	0.0045	0.0010	0.0035
132	0.0044	0.0010	0.0034
133	0.0043	0.0010	0.0033
134	0.0042	0.0010	0.0033
135	0.0042	0.0009	0.0032
136	0.0041	0.0009	0.0032
137	0.0040	0.0009	0.0031
138	0.0039	0.0009	0.0030
139	0.0039	0.0009	0.0030
140	0.0038	0.0009	0.0029
141	0.0038	0.0009	0.0029
142	0.0037	0.0008	0.0029
143	0.0036	0.0008	0.0028
144	0.0036	0.0008	0.0028
	1.7262	0.2947	1.4315

Total soil rain loss = 0.29(In)
Total effective rainfall = 1.43(In)
Peak flow rate in flood hydrograph = 1.82(CFS)

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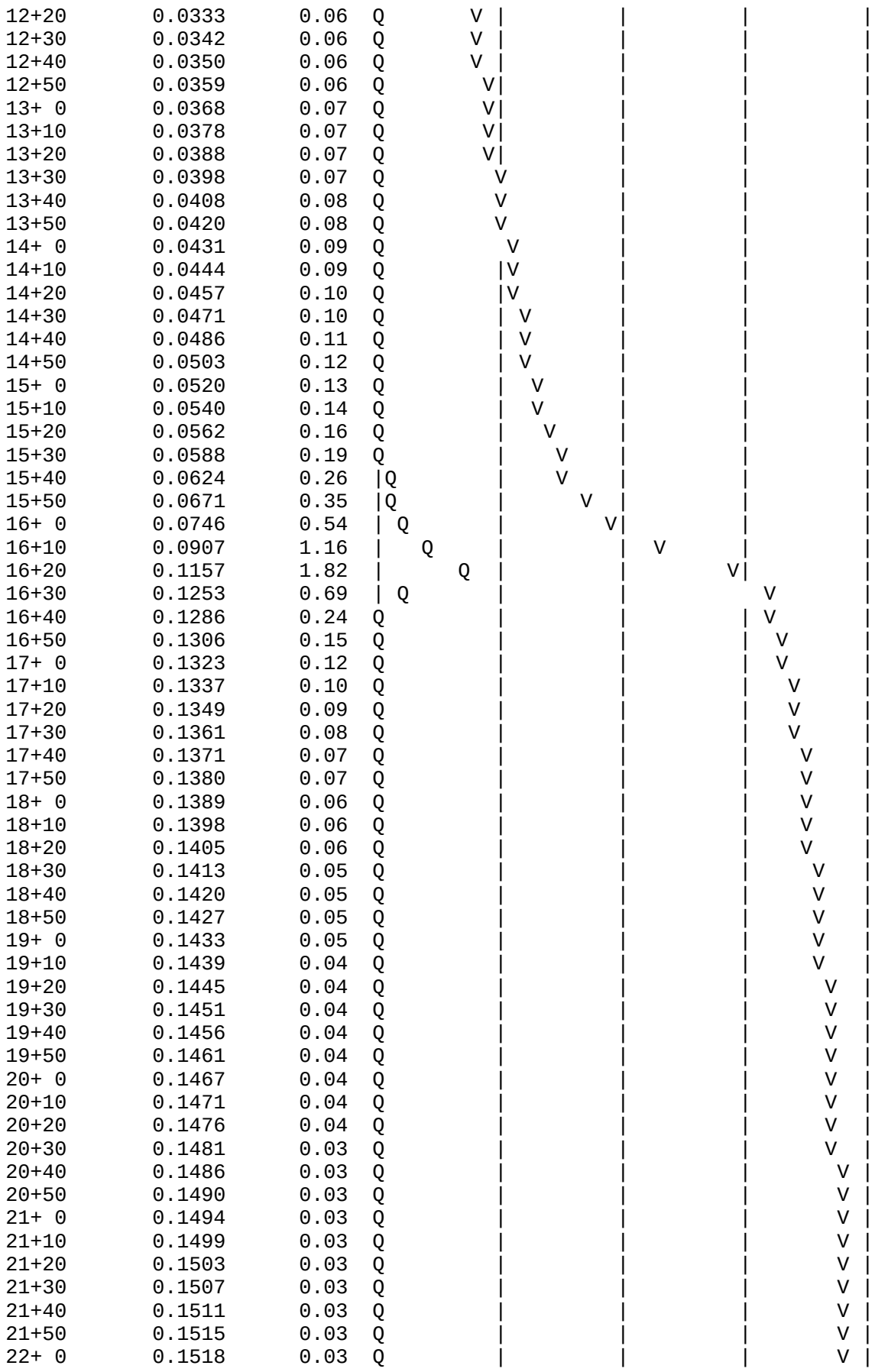
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 10 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+10	0.0001	0.00	Q				
0+20	0.0003	0.02	Q				
0+30	0.0006	0.02	Q				
0+40	0.0009	0.02	Q				
0+50	0.0012	0.02	Q				
1+ 0	0.0015	0.02	Q				
1+10	0.0018	0.02	Q				
1+20	0.0021	0.02	Q				
1+30	0.0025	0.02	Q				
1+40	0.0028	0.02	Q				
1+50	0.0031	0.02	Q				
2+ 0	0.0034	0.02	Q				
2+10	0.0037	0.02	Q				
2+20	0.0041	0.02	QV				

2+30	0.0044	0.02	QV	|	|	|	|
2+40	0.0047	0.02	QV	|	|	|	|
2+50	0.0051	0.02	QV	|	|	|	|
3+ 0	0.0054	0.02	QV	|	|	|	|
3+10	0.0058	0.02	QV	|	|	|	|
3+20	0.0061	0.03	QV	|	|	|	|
3+30	0.0065	0.03	QV	|	|	|	|
3+40	0.0068	0.03	QV	|	|	|	|
3+50	0.0072	0.03	QV	|	|	|	|
4+ 0	0.0075	0.03	QV	|	|	|	|
4+10	0.0079	0.03	Q V	|	|	|	|
4+20	0.0083	0.03	Q V	|	|	|	|
4+30	0.0086	0.03	Q V	|	|	|	|
4+40	0.0090	0.03	Q V	|	|	|	|
4+50	0.0094	0.03	Q V	|	|	|	|
5+ 0	0.0098	0.03	Q V	|	|	|	|
5+10	0.0102	0.03	Q V	|	|	|	|
5+20	0.0106	0.03	Q V	|	|	|	|
5+30	0.0109	0.03	Q V	|	|	|	|
5+40	0.0113	0.03	Q V	|	|	|	|
5+50	0.0117	0.03	Q V	|	|	|	|
6+ 0	0.0122	0.03	Q V	|	|	|	|
6+10	0.0126	0.03	Q V	|	|	|	|
6+20	0.0130	0.03	Q V	|	|	|	|
6+30	0.0134	0.03	Q V	|	|	|	|
6+40	0.0138	0.03	Q V	|	|	|	|
6+50	0.0143	0.03	Q V	|	|	|	|
7+ 0	0.0147	0.03	Q V	|	|	|	|
7+10	0.0152	0.03	Q V	|	|	|	|
7+20	0.0156	0.03	Q V	|	|	|	|
7+30	0.0161	0.03	Q V	|	|	|	|
7+40	0.0165	0.03	Q V	|	|	|	|
7+50	0.0170	0.03	Q V	|	|	|	|
8+ 0	0.0175	0.03	Q V	|	|	|	|
8+10	0.0179	0.04	Q V	|	|	|	|
8+20	0.0184	0.04	Q V	|	|	|	|
8+30	0.0189	0.04	Q V	|	|	|	|
8+40	0.0194	0.04	Q V	|	|	|	|
8+50	0.0200	0.04	Q V	|	|	|	|
9+ 0	0.0205	0.04	Q V	|	|	|	|
9+10	0.0210	0.04	Q V	|	|	|	|
9+20	0.0215	0.04	Q V	|	|	|	|
9+30	0.0221	0.04	Q V	|	|	|	|
9+40	0.0226	0.04	Q V	|	|	|	|
9+50	0.0232	0.04	Q V	|	|	|	|
10+ 0	0.0238	0.04	Q V	|	|	|	|
10+10	0.0244	0.04	Q V	|	|	|	|
10+20	0.0250	0.04	Q V	|	|	|	|
10+30	0.0256	0.04	Q V	|	|	|	|
10+40	0.0262	0.05	Q V	|	|	|	|
10+50	0.0269	0.05	Q V	|	|	|	|
11+ 0	0.0275	0.05	Q V	|	|	|	|
11+10	0.0282	0.05	Q V	|	|	|	|
11+20	0.0289	0.05	Q V	|	|	|	|
11+30	0.0296	0.05	Q V	|	|	|	|
11+40	0.0303	0.05	Q V	|	|	|	|
11+50	0.0310	0.05	Q V	|	|	|	|
12+ 0	0.0318	0.05	Q V	|	|	|	|
12+10	0.0325	0.06	Q V	|	|	|	|



```
   22+10       0.1522      0.03  Q          |          |          |        V |
   22+20       0.1526      0.03  Q          |          |          |         V|
   22+30       0.1529      0.03  Q          |          |          |         V|
   22+40       0.1533      0.03  Q          |          |          |         V|
   22+50       0.1536      0.02  Q          |          |          |         V|
   23+ 0       0.1540      0.02  Q          |          |          |         V|
   23+10       0.1543      0.02  Q          |          |          |         V|
   23+20       0.1546      0.02  Q          |          |          |         V|
   23+30       0.1549      0.02  Q          |          |          |         V|
   23+40       0.1553      0.02  Q          |          |          |         V|
   23+50       0.1556      0.02  Q          |          |          |         V|
   24+ 0       0.1559      0.02  Q          |          |          |         V|
   24+10       0.1561      0.02  Q          |          |          |         V|
   24+20       0.1562      0.00  Q          |          |          |         V|
   24+30       0.1562      0.00  Q          |          |          |          V
-------------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 2004-2014, Version 9.0

Study date 06/15/20

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Kern County Synthetic Unit Hydrograph Hydrology Method
Manual date - 1992

Program License Serial Number 6394

A2
10 YR STORM EVENT

Storm Event Year = 10

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.650

Zone Designation: San Joaquin Valley Latitude = 35.40

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
1.06	6	0.66
Rainfall data for year 2		
1.06	24	0.97
Rainfall data for year 100		
1.06	6	1.64
Rainfall data for year 100		
1.06	24	2.81

++
SAN JOAQUIN VALLEY area of study
Log-Log Rainfall Intensity Slope = 0.65

******** Area-averaged max loss rate, Fm ********

SCS curve Number	Area (Ac.)	Area Fraction	Fp (In/Hr)	Ap (dec.)	Fm (In/Hr)
86.0	1.06	1.000	0.272	0.450	0.122

Area-averaged adjusted loss rate Fm (In/Hr) = 0.122

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	S	Pervious Yield Fr
0.48	0.450	86.0	1.63	0.375
0.58	0.550	98.0	0.20	0.871

Area-averaged catchment yield fraction, Y = 0.648
Area-averaged low loss fraction, Yb = 0.352
Direct entry of lag time by user
++
Watershed area = 1.06(Ac.)
Catchment Lag time = 0.160 hours
Unit interval = 10.000 minutes
Unit interval percentage of lag time = 104.1667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.122(In/Hr)
Average low loss rate fraction (Yb) = 0.352 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.201(In)
Computed peak 30-minute rainfall = 0.376(In)
Specified peak 1-hour rainfall = 0.479(In)
Computed peak 3-hour rainfall = 0.746(In)
Specified peak 6-hour rainfall = 0.986(In)
Specified peak 24-hour rainfall = 1.726(In)

Rainfall depth area reduction factors:
Using a total area of 1.06(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.201(In)
30-minute factor = 1.000 Adjusted rainfall = 0.376(In)
1-hour factor = 1.000 Adjusted rainfall = 0.479(In)
3-hour factor = 1.000 Adjusted rainfall = 0.746(In)
6-hour factor = 1.000 Adjusted rainfall = 0.986(In)
24-hour factor = 1.000 Adjusted rainfall = 1.726(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 6.41 (CFS))	
1	18.421	1.181
2	81.273	4.029
3	98.453	1.101
4	100.000	0.099

Rainfall values calculated at 5 minute intervals:

Peak Rainfall Unit Number	Intensity	Depth	Adjusted	Unit Rainfall (In)
1	2.41	0.20	0.20	0.201
2	1.53	0.26	0.26	0.055
3	1.18	0.29	0.29	0.039
4	0.98	0.33	0.33	0.031
5	0.85	0.35	0.35	0.026
6	0.75	0.38	0.38	0.023
7	0.68	0.40	0.40	0.021
8	0.62	0.42	0.42	0.019
9	0.58	0.43	0.43	0.017
10	0.54	0.45	0.45	0.016
11	0.51	0.46	0.46	0.015
12	0.48	0.48	0.48	0.014
13	0.46	0.49	0.49	0.016
14	0.44	0.51	0.51	0.015
15	0.42	0.52	0.52	0.014
16	0.40	0.54	0.54	0.014
17	0.39	0.55	0.55	0.013
18	0.38	0.56	0.56	0.013
19	0.36	0.58	0.58	0.012
20	0.35	0.59	0.59	0.012
21	0.34	0.60	0.60	0.012
22	0.33	0.61	0.61	0.011
23	0.32	0.62	0.62	0.011
24	0.32	0.63	0.63	0.011
25	0.31	0.64	0.64	0.011
26	0.30	0.65	0.65	0.010
27	0.30	0.66	0.66	0.010
28	0.29	0.67	0.67	0.010
29	0.28	0.68	0.68	0.010
30	0.28	0.69	0.69	0.009
31	0.27	0.70	0.70	0.009
32	0.27	0.71	0.71	0.009
33	0.26	0.72	0.72	0.009
34	0.26	0.73	0.73	0.009
35	0.25	0.74	0.74	0.009
36	0.25	0.75	0.75	0.008
37	0.24	0.75	0.75	0.008
38	0.24	0.76	0.76	0.008
39	0.24	0.77	0.77	0.008
40	0.23	0.78	0.78	0.008
41	0.23	0.79	0.79	0.008
42	0.23	0.79	0.79	0.008
43	0.22	0.80	0.80	0.008
44	0.22	0.81	0.81	0.007
45	0.22	0.82	0.82	0.007
46	0.21	0.82	0.82	0.007
47	0.21	0.83	0.83	0.007
48	0.21	0.84	0.84	0.007
49	0.21	0.84	0.84	0.007
50	0.20	0.85	0.85	0.007
51	0.20	0.86	0.86	0.007
52	0.20	0.87	0.87	0.007
53	0.20	0.87	0.87	0.007
54	0.20	0.88	0.88	0.007
55	0.19	0.88	0.88	0.007
56	0.19	0.89	0.89	0.006

57	0.19	0.90	0.90	0.006
58	0.19	0.90	0.90	0.006
59	0.19	0.91	0.91	0.006
60	0.18	0.92	0.92	0.006
61	0.18	0.92	0.92	0.006
62	0.18	0.93	0.93	0.006
63	0.18	0.93	0.93	0.006
64	0.18	0.94	0.94	0.006
65	0.17	0.95	0.95	0.006
66	0.17	0.95	0.95	0.006
67	0.17	0.96	0.96	0.006
68	0.17	0.96	0.96	0.006
69	0.17	0.97	0.97	0.006
70	0.17	0.98	0.98	0.006
71	0.17	0.98	0.98	0.006
72	0.16	0.99	0.99	0.006
73	0.16	0.99	0.99	0.006
74	0.16	1.00	1.00	0.005
75	0.16	1.00	1.00	0.005
76	0.16	1.01	1.01	0.005
77	0.16	1.01	1.01	0.005
78	0.16	1.02	1.02	0.005
79	0.16	1.02	1.02	0.005
80	0.15	1.03	1.03	0.005
81	0.15	1.03	1.03	0.005
82	0.15	1.04	1.04	0.005
83	0.15	1.04	1.04	0.005
84	0.15	1.05	1.05	0.005
85	0.15	1.05	1.05	0.005
86	0.15	1.06	1.06	0.005
87	0.15	1.06	1.06	0.005
88	0.15	1.07	1.07	0.005
89	0.14	1.07	1.07	0.005
90	0.14	1.08	1.08	0.005
91	0.14	1.08	1.08	0.005
92	0.14	1.09	1.09	0.005
93	0.14	1.09	1.09	0.005
94	0.14	1.10	1.10	0.005
95	0.14	1.10	1.10	0.005
96	0.14	1.11	1.11	0.005
97	0.14	1.11	1.11	0.005
98	0.14	1.12	1.12	0.005
99	0.14	1.12	1.12	0.005
100	0.14	1.13	1.13	0.005
101	0.13	1.13	1.13	0.005
102	0.13	1.14	1.14	0.005
103	0.13	1.14	1.14	0.004
104	0.13	1.14	1.14	0.004
105	0.13	1.15	1.15	0.004
106	0.13	1.15	1.15	0.004
107	0.13	1.16	1.16	0.004
108	0.13	1.16	1.16	0.004
109	0.13	1.17	1.17	0.004
110	0.13	1.17	1.17	0.004
111	0.13	1.17	1.17	0.004
112	0.13	1.18	1.18	0.004
113	0.13	1.18	1.18	0.004
114	0.12	1.19	1.19	0.004
115	0.12	1.19	1.19	0.004

116	0.12	1.20	1.20	0.004
117	0.12	1.20	1.20	0.004
118	0.12	1.20	1.20	0.004
119	0.12	1.21	1.21	0.004
120	0.12	1.21	1.21	0.004
121	0.12	1.22	1.22	0.004
122	0.12	1.22	1.22	0.004
123	0.12	1.22	1.22	0.004
124	0.12	1.23	1.23	0.004
125	0.12	1.23	1.23	0.004
126	0.12	1.24	1.24	0.004
127	0.12	1.24	1.24	0.004
128	0.12	1.24	1.24	0.004
129	0.12	1.25	1.25	0.004
130	0.12	1.25	1.25	0.004
131	0.12	1.26	1.26	0.004
132	0.11	1.26	1.26	0.004
133	0.11	1.26	1.26	0.004
134	0.11	1.27	1.27	0.004
135	0.11	1.27	1.27	0.004
136	0.11	1.28	1.28	0.004
137	0.11	1.28	1.28	0.004
138	0.11	1.28	1.28	0.004
139	0.11	1.29	1.29	0.004
140	0.11	1.29	1.29	0.004
141	0.11	1.29	1.29	0.004
142	0.11	1.30	1.30	0.004
143	0.11	1.30	1.30	0.004
144	0.11	1.30	1.30	0.004
145	0.11	1.31	1.31	0.004
146	0.11	1.31	1.31	0.004
147	0.11	1.32	1.32	0.004
148	0.11	1.32	1.32	0.004
149	0.11	1.32	1.32	0.004
150	0.11	1.33	1.33	0.004
151	0.11	1.33	1.33	0.004
152	0.11	1.33	1.33	0.004
153	0.10	1.34	1.34	0.004
154	0.10	1.34	1.34	0.004
155	0.10	1.34	1.34	0.004
156	0.10	1.35	1.35	0.003
157	0.10	1.35	1.35	0.003
158	0.10	1.35	1.35	0.003
159	0.10	1.36	1.36	0.003
160	0.10	1.36	1.36	0.003
161	0.10	1.37	1.37	0.003
162	0.10	1.37	1.37	0.003
163	0.10	1.37	1.37	0.003
164	0.10	1.38	1.38	0.003
165	0.10	1.38	1.38	0.003
166	0.10	1.38	1.38	0.003
167	0.10	1.39	1.39	0.003
168	0.10	1.39	1.39	0.003
169	0.10	1.39	1.39	0.003
170	0.10	1.40	1.40	0.003
171	0.10	1.40	1.40	0.003
172	0.10	1.40	1.40	0.003
173	0.10	1.41	1.41	0.003
174	0.10	1.41	1.41	0.003

175	0.10	1.41	1.41	0.003
176	0.10	1.42	1.42	0.003
177	0.10	1.42	1.42	0.003
178	0.10	1.42	1.42	0.003
179	0.10	1.42	1.42	0.003
180	0.10	1.43	1.43	0.003
181	0.09	1.43	1.43	0.003
182	0.09	1.43	1.43	0.003
183	0.09	1.44	1.44	0.003
184	0.09	1.44	1.44	0.003
185	0.09	1.44	1.44	0.003
186	0.09	1.45	1.45	0.003
187	0.09	1.45	1.45	0.003
188	0.09	1.45	1.45	0.003
189	0.09	1.46	1.46	0.003
190	0.09	1.46	1.46	0.003
191	0.09	1.46	1.46	0.003
192	0.09	1.47	1.47	0.003
193	0.09	1.47	1.47	0.003
194	0.09	1.47	1.47	0.003
195	0.09	1.47	1.47	0.003
196	0.09	1.48	1.48	0.003
197	0.09	1.48	1.48	0.003
198	0.09	1.48	1.48	0.003
199	0.09	1.49	1.49	0.003
200	0.09	1.49	1.49	0.003
201	0.09	1.49	1.49	0.003
202	0.09	1.50	1.50	0.003
203	0.09	1.50	1.50	0.003
204	0.09	1.50	1.50	0.003
205	0.09	1.50	1.50	0.003
206	0.09	1.51	1.51	0.003
207	0.09	1.51	1.51	0.003
208	0.09	1.51	1.51	0.003
209	0.09	1.52	1.52	0.003
210	0.09	1.52	1.52	0.003
211	0.09	1.52	1.52	0.003
212	0.09	1.53	1.53	0.003
213	0.09	1.53	1.53	0.003
214	0.09	1.53	1.53	0.003
215	0.09	1.53	1.53	0.003
216	0.09	1.54	1.54	0.003
217	0.09	1.54	1.54	0.003
218	0.08	1.54	1.54	0.003
219	0.08	1.55	1.55	0.003
220	0.08	1.55	1.55	0.003
221	0.08	1.55	1.55	0.003
222	0.08	1.55	1.55	0.003
223	0.08	1.56	1.56	0.003
224	0.08	1.56	1.56	0.003
225	0.08	1.56	1.56	0.003
226	0.08	1.57	1.57	0.003
227	0.08	1.57	1.57	0.003
228	0.08	1.57	1.57	0.003
229	0.08	1.57	1.57	0.003
230	0.08	1.58	1.58	0.003
231	0.08	1.58	1.58	0.003
232	0.08	1.58	1.58	0.003
233	0.08	1.58	1.58	0.003

234	0.08	1.59	1.59	0.003
235	0.08	1.59	1.59	0.003
236	0.08	1.59	1.59	0.003
237	0.08	1.60	1.60	0.003
238	0.08	1.60	1.60	0.003
239	0.08	1.60	1.60	0.003
240	0.08	1.60	1.60	0.003
241	0.08	1.61	1.61	0.003
242	0.08	1.61	1.61	0.003
243	0.08	1.61	1.61	0.003
244	0.08	1.61	1.61	0.003
245	0.08	1.62	1.62	0.003
246	0.08	1.62	1.62	0.003
247	0.08	1.62	1.62	0.003
248	0.08	1.63	1.63	0.003
249	0.08	1.63	1.63	0.003
250	0.08	1.63	1.63	0.003
251	0.08	1.63	1.63	0.003
252	0.08	1.64	1.64	0.003
253	0.08	1.64	1.64	0.003
254	0.08	1.64	1.64	0.003
255	0.08	1.64	1.64	0.003
256	0.08	1.65	1.65	0.003
257	0.08	1.65	1.65	0.003
258	0.08	1.65	1.65	0.003
259	0.08	1.65	1.65	0.003
260	0.08	1.66	1.66	0.003
261	0.08	1.66	1.66	0.003
262	0.08	1.66	1.66	0.003
263	0.08	1.66	1.66	0.003
264	0.08	1.67	1.67	0.003
265	0.08	1.67	1.67	0.003
266	0.08	1.67	1.67	0.003
267	0.08	1.67	1.67	0.003
268	0.08	1.68	1.68	0.003
269	0.07	1.68	1.68	0.003
270	0.07	1.68	1.68	0.003
271	0.07	1.68	1.68	0.003
272	0.07	1.69	1.69	0.003
273	0.07	1.69	1.69	0.003
274	0.07	1.69	1.69	0.002
275	0.07	1.69	1.69	0.002
276	0.07	1.70	1.70	0.002
277	0.07	1.70	1.70	0.002
278	0.07	1.70	1.70	0.002
279	0.07	1.70	1.70	0.002
280	0.07	1.71	1.71	0.002
281	0.07	1.71	1.71	0.002
282	0.07	1.71	1.71	0.002
283	0.07	1.71	1.71	0.002
284	0.07	1.72	1.72	0.002
285	0.07	1.72	1.72	0.002
286	0.07	1.72	1.72	0.002
287	0.07	1.72	1.72	0.002
288	0.07	1.73	1.73	0.002

Time = 24.00 Hours Total unit rainfall = 1.73(In)

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0048	0.0017	0.0031
2	0.0049	0.0017	0.0032
3	0.0049	0.0017	0.0032
4	0.0049	0.0017	0.0032
5	0.0050	0.0018	0.0032
6	0.0050	0.0018	0.0032
7	0.0050	0.0018	0.0033
8	0.0051	0.0018	0.0033
9	0.0051	0.0018	0.0033
10	0.0051	0.0018	0.0033
11	0.0052	0.0018	0.0034
12	0.0052	0.0018	0.0034
13	0.0053	0.0018	0.0034
14	0.0053	0.0019	0.0034
15	0.0053	0.0019	0.0035
16	0.0054	0.0019	0.0035
17	0.0054	0.0019	0.0035
18	0.0054	0.0019	0.0035
19	0.0055	0.0019	0.0036
20	0.0055	0.0019	0.0036
21	0.0056	0.0020	0.0036
22	0.0056	0.0020	0.0036
23	0.0057	0.0020	0.0037
24	0.0057	0.0020	0.0037
25	0.0058	0.0020	0.0037
26	0.0058	0.0020	0.0038
27	0.0059	0.0021	0.0038
28	0.0059	0.0021	0.0038
29	0.0060	0.0021	0.0039
30	0.0060	0.0021	0.0039
31	0.0061	0.0021	0.0039
32	0.0061	0.0022	0.0040
33	0.0062	0.0022	0.0040
34	0.0062	0.0022	0.0040
35	0.0063	0.0022	0.0041
36	0.0064	0.0022	0.0041
37	0.0064	0.0023	0.0042
38	0.0065	0.0023	0.0042
39	0.0066	0.0023	0.0042
40	0.0066	0.0023	0.0043
41	0.0067	0.0024	0.0043
42	0.0068	0.0024	0.0044
43	0.0068	0.0024	0.0044
44	0.0069	0.0024	0.0045
45	0.0070	0.0025	0.0045
46	0.0071	0.0025	0.0046
47	0.0072	0.0025	0.0046
48	0.0073	0.0026	0.0047
49	0.0073	0.0026	0.0048
50	0.0074	0.0026	0.0048
51	0.0075	0.0027	0.0049
52	0.0076	0.0027	0.0049
53	0.0077	0.0027	0.0050
54	0.0078	0.0028	0.0051
55	0.0080	0.0028	0.0052
56	0.0081	0.0028	0.0052
57	0.0082	0.0029	0.0053

58	0.0083	0.0029	0.0054
59	0.0085	0.0030	0.0055
60	0.0086	0.0030	0.0056
61	0.0087	0.0031	0.0057
62	0.0089	0.0031	0.0058
63	0.0090	0.0032	0.0059
64	0.0092	0.0032	0.0060
65	0.0094	0.0033	0.0061
66	0.0096	0.0034	0.0062
67	0.0097	0.0034	0.0063
68	0.0099	0.0035	0.0064
69	0.0102	0.0036	0.0066
70	0.0104	0.0037	0.0067
71	0.0106	0.0037	0.0069
72	0.0109	0.0038	0.0070
73	0.0112	0.0039	0.0072
74	0.0114	0.0040	0.0074
75	0.0118	0.0041	0.0076
76	0.0121	0.0043	0.0078
77	0.0125	0.0044	0.0081
78	0.0128	0.0045	0.0083
79	0.0133	0.0047	0.0086
80	0.0137	0.0048	0.0089
81	0.0143	0.0050	0.0092
82	0.0148	0.0052	0.0096
83	0.0155	0.0054	0.0100
84	0.0162	0.0057	0.0105
85	0.0170	0.0060	0.0110
86	0.0179	0.0063	0.0116
87	0.0190	0.0067	0.0123
88	0.0203	0.0072	0.0132
89	0.0219	0.0077	0.0142
90	0.0238	0.0084	0.0154
91	0.0262	0.0092	0.0170
92	0.0294	0.0104	0.0190
93	0.0296	0.0104	0.0192
94	0.0364	0.0128	0.0236
95	0.0497	0.0175	0.0322
96	0.0940	0.0204*	0.0736
97	0.2318	0.0204*	0.2114
98	0.0371	0.0131	0.0240
99	0.0295	0.0104	0.0191
100	0.0238	0.0084	0.0154
101	0.0203	0.0072	0.0132
102	0.0180	0.0063	0.0116
103	0.0162	0.0057	0.0105
104	0.0148	0.0052	0.0096
105	0.0138	0.0048	0.0089
106	0.0129	0.0045	0.0083
107	0.0121	0.0043	0.0078
108	0.0114	0.0040	0.0074
109	0.0109	0.0038	0.0071
110	0.0104	0.0037	0.0067
111	0.0099	0.0035	0.0064
112	0.0096	0.0034	0.0062
113	0.0092	0.0032	0.0060
114	0.0089	0.0031	0.0058
115	0.0086	0.0030	0.0056
116	0.0083	0.0029	0.0054

117	0.0081	0.0028	0.0052
118	0.0078	0.0028	0.0051
119	0.0076	0.0027	0.0049
120	0.0074	0.0026	0.0048
121	0.0073	0.0026	0.0047
122	0.0071	0.0025	0.0046
123	0.0069	0.0024	0.0045
124	0.0068	0.0024	0.0044
125	0.0066	0.0023	0.0043
126	0.0065	0.0023	0.0042
127	0.0064	0.0022	0.0041
128	0.0062	0.0022	0.0040
129	0.0061	0.0022	0.0040
130	0.0060	0.0021	0.0039
131	0.0059	0.0021	0.0038
132	0.0058	0.0020	0.0038
133	0.0057	0.0020	0.0037
134	0.0056	0.0020	0.0036
135	0.0055	0.0019	0.0036
136	0.0054	0.0019	0.0035
137	0.0054	0.0019	0.0035
138	0.0053	0.0019	0.0034
139	0.0052	0.0018	0.0034
140	0.0051	0.0018	0.0033
141	0.0051	0.0018	0.0033
142	0.0050	0.0018	0.0032
143	0.0049	0.0017	0.0032
144	0.0049	0.0017	0.0032
	1.7262	0.5339	1.1922

Total soil rain loss = 0.53(In)
Total effective rainfall = 1.19(In)
Peak flow rate in flood hydrograph = 0.96(CFS)

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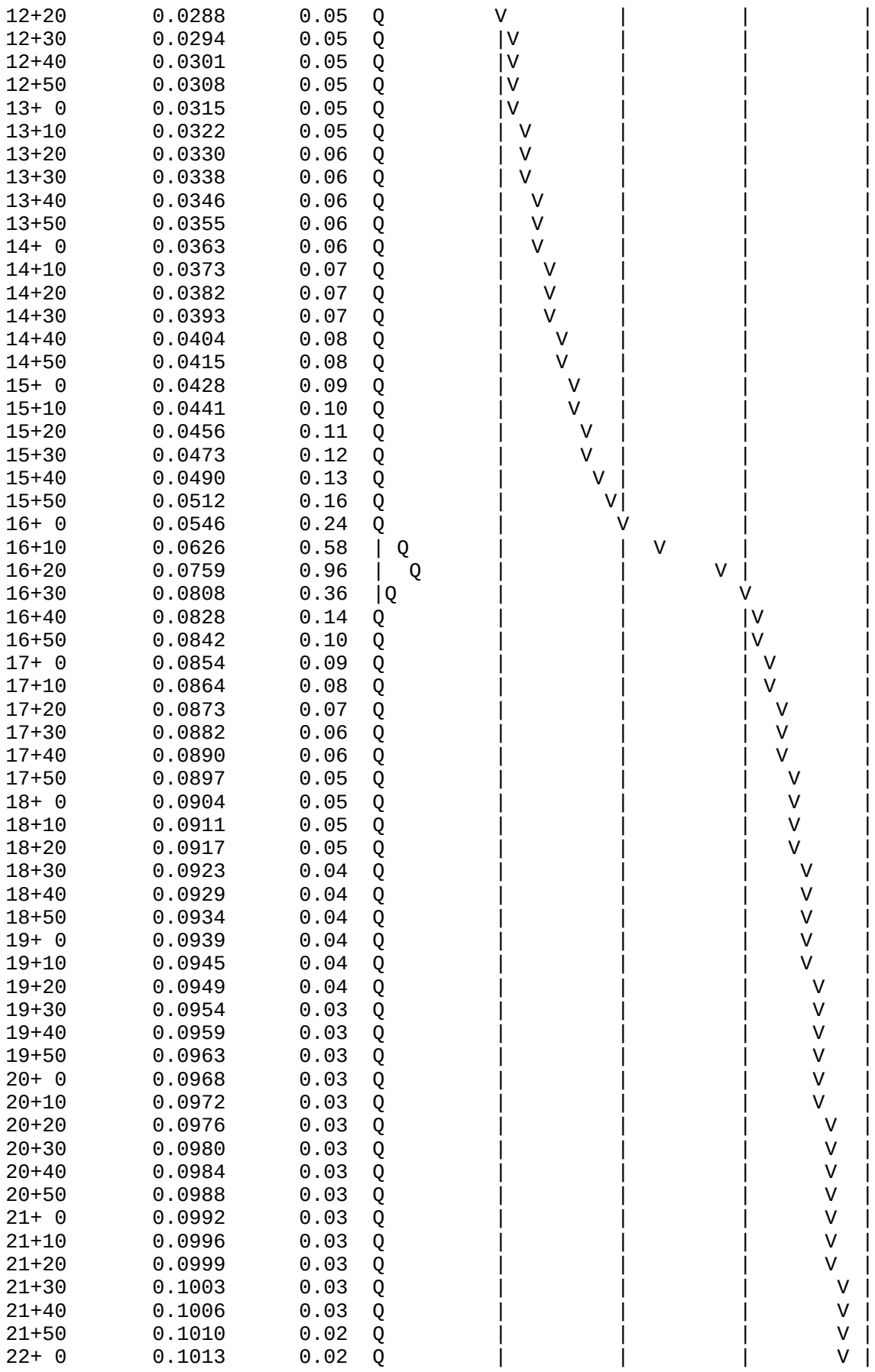
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 10 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+10	0.0001	0.00	Q				
0+20	0.0003	0.02	Q				
0+30	0.0006	0.02	Q				
0+40	0.0008	0.02	Q				
0+50	0.0011	0.02	Q				
1+ 0	0.0014	0.02	Q				
1+10	0.0017	0.02	Q				
1+20	0.0020	0.02	Q				
1+30	0.0023	0.02	Q				
1+40	0.0026	0.02	Q				
1+50	0.0029	0.02	QV				
2+ 0	0.0031	0.02	QV				
2+10	0.0034	0.02	QV				
2+20	0.0037	0.02	QV				

2+30	0.0040	0.02	QV	|	|	|	|
2+40	0.0044	0.02	QV	|	|	|	|
2+50	0.0047	0.02	QV	|	|	|	|
3+ 0	0.0050	0.02	QV	|	|	|	|
3+10	0.0053	0.02	Q V	|	|	|	|
3+20	0.0056	0.02	Q V	|	|	|	|
3+30	0.0059	0.02	Q V	|	|	|	|
3+40	0.0062	0.02	Q V	|	|	|	|
3+50	0.0066	0.02	Q V	|	|	|	|
4+ 0	0.0069	0.02	Q V	|	|	|	|
4+10	0.0072	0.02	Q V	|	|	|	|
4+20	0.0075	0.02	Q V	|	|	|	|
4+30	0.0079	0.02	Q V	|	|	|	|
4+40	0.0082	0.02	Q V	|	|	|	|
4+50	0.0085	0.02	Q V	|	|	|	|
5+ 0	0.0089	0.02	Q V	|	|	|	|
5+10	0.0092	0.02	Q V	|	|	|	|
5+20	0.0096	0.03	Q V	|	|	|	|
5+30	0.0099	0.03	Q V	|	|	|	|
5+40	0.0103	0.03	Q V	|	|	|	|
5+50	0.0106	0.03	Q V	|	|	|	|
6+ 0	0.0110	0.03	Q V	|	|	|	|
6+10	0.0114	0.03	Q V	|	|	|	|
6+20	0.0117	0.03	Q V	|	|	|	|
6+30	0.0121	0.03	Q V	|	|	|	|
6+40	0.0125	0.03	Q V	|	|	|	|
6+50	0.0128	0.03	Q V	|	|	|	|
7+ 0	0.0132	0.03	Q V	|	|	|	|
7+10	0.0136	0.03	Q V	|	|	|	|
7+20	0.0140	0.03	Q V	|	|	|	|
7+30	0.0144	0.03	Q V	|	|	|	|
7+40	0.0148	0.03	Q V	|	|	|	|
7+50	0.0152	0.03	Q V	|	|	|	|
8+ 0	0.0156	0.03	Q V	|	|	|	|
8+10	0.0160	0.03	Q V	|	|	|	|
8+20	0.0165	0.03	Q V	|	|	|	|
8+30	0.0169	0.03	Q V	|	|	|	|
8+40	0.0173	0.03	Q V	|	|	|	|
8+50	0.0177	0.03	Q V	|	|	|	|
9+ 0	0.0182	0.03	Q V	|	|	|	|
9+10	0.0186	0.03	Q V	|	|	|	|
9+20	0.0191	0.03	Q V	|	|	|	|
9+30	0.0196	0.03	Q V	|	|	|	|
9+40	0.0200	0.03	Q V	|	|	|	|
9+50	0.0205	0.03	Q V	|	|	|	|
10+ 0	0.0210	0.04	Q V	|	|	|	|
10+10	0.0215	0.04	Q V	|	|	|	|
10+20	0.0220	0.04	Q V	|	|	|	|
10+30	0.0225	0.04	Q V	|	|	|	|
10+40	0.0230	0.04	Q V	|	|	|	|
10+50	0.0235	0.04	Q V	|	|	|	|
11+ 0	0.0241	0.04	Q V|	|	|	|
11+10	0.0246	0.04	Q V|	|	|	|
11+20	0.0252	0.04	Q V|	|	|	|
11+30	0.0257	0.04	Q V|	|	|	|
11+40	0.0263	0.04	Q V|	|	|	|
11+50	0.0269	0.04	Q V	|	|	|
12+ 0	0.0275	0.04	Q V	|	|	|
12+10	0.0281	0.05	Q V	|	|	|


12+20 0.0288 0.05 Q
12+30 0.0294 0.05 Q
12+40 0.0301 0.05 Q
12+50 0.0308 0.05 Q
13+ 0 0.0315 0.05 Q
13+10 0.0322 0.05 Q
13+20 0.0330 0.06 Q
13+30 0.0338 0.06 Q
13+40 0.0346 0.06 Q
13+50 0.0355 0.06 Q
14+ 0 0.0363 0.06 Q
14+10 0.0373 0.07 Q
14+20 0.0382 0.07 Q
14+30 0.0393 0.07 Q
14+40 0.0404 0.08 Q
14+50 0.0415 0.08 Q
15+ 0 0.0428 0.09 Q
15+10 0.0441 0.10 Q
15+20 0.0456 0.11 Q
15+30 0.0473 0.12 Q
15+40 0.0490 0.13 Q
15+50 0.0512 0.16 Q
16+ 0 0.0546 0.24 Q
16+10 0.0626 0.58 Q
16+20 0.0759 0.96 Q
16+30 0.0808 0.36 Q
16+40 0.0828 0.14 Q
16+50 0.0842 0.10 Q
17+ 0 0.0854 0.09 Q
17+10 0.0864 0.08 Q
17+20 0.0873 0.07 Q
17+30 0.0882 0.06 Q
17+40 0.0890 0.06 Q
17+50 0.0897 0.05 Q
18+ 0 0.0904 0.05 Q
18+10 0.0911 0.05 Q
18+20 0.0917 0.05 Q
18+30 0.0923 0.04 Q
18+40 0.0929 0.04 Q
18+50 0.0934 0.04 Q
19+ 0 0.0939 0.04 Q
19+10 0.0945 0.04 Q
19+20 0.0949 0.04 Q
19+30 0.0954 0.03 Q
19+40 0.0959 0.03 Q
19+50 0.0963 0.03 Q
20+ 0 0.0968 0.03 Q
20+10 0.0972 0.03 Q
20+20 0.0976 0.03 Q
20+30 0.0980 0.03 Q
20+40 0.0984 0.03 Q
20+50 0.0988 0.03 Q
21+ 0 0.0992 0.03 Q
21+10 0.0996 0.03 Q
21+20 0.0999 0.03 Q
21+30 0.1003 0.03 Q
21+40 0.1006 0.03 Q
21+50 0.1010 0.02 Q
22+ 0 0.1013 0.02 Q

```
   22+10       0.1016      0.02  Q          |          |          |       V |
   22+20       0.1020      0.02  Q          |          |          |       V |
   22+30       0.1023      0.02  Q          |          |          |       V |
   22+40       0.1026      0.02  Q          |          |          |       V |
   22+50       0.1029      0.02  Q          |          |          |        V|
   23+ 0       0.1032      0.02  Q          |          |          |        V|
   23+10       0.1035      0.02  Q          |          |          |        V|
   23+20       0.1038      0.02  Q          |          |          |        V|
   23+30       0.1041      0.02  Q          |          |          |        V|
   23+40       0.1044      0.02  Q          |          |          |        V|
   23+50       0.1047      0.02  Q          |          |          |        V|
   24+ 0       0.1050      0.02  Q          |          |          |        V|
   24+10       0.1052      0.02  Q          |          |          |        V|
   24+20       0.1053      0.00  Q          |          |          |        V|
   24+30       0.1053      0.00  Q          |          |          |         V
---------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 2004-2014, Version 9.0

Study date 06/15/20

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Kern County Synthetic Unit Hydrograph Hydrology Method
Manual date - 1992

Program License Serial Number 6394

A3
10 YR - 24 HR STORM EVENT

Storm Event Year = 10

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.650

Zone Designation: San Joaquin Valley Latitude = 35.40

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
1.64	6	0.66
Rainfall data for year 2		
1.64	24	0.97
Rainfall data for year 100		
1.64	6	1.64
Rainfall data for year 100		
1.64	24	2.81

++
SAN JOAQUIN VALLEY area of study
Log-Log Rainfall Intensity Slope = 0.65

******** Area-averaged max loss rate, Fm ********

SCS curve Number	Area (Ac.)	Area Fraction	Fp (In/Hr)	Ap (dec.)	Fm (In/Hr)
86.0	1.64	1.000	0.272	0.450	0.122

Area-averaged adjusted loss rate Fm (In/Hr) = 0.122

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	S	Pervious Yield Fr
0.74	0.450	86.0	1.63	0.375
0.90	0.550	98.0	0.20	0.871

Area-averaged catchment yield fraction, Y = 0.648
Area-averaged low loss fraction, Yb = 0.352
Direct entry of lag time by user
++
Watershed area = 1.64(Ac.)
Catchment Lag time = 0.160 hours
Unit interval = 10.000 minutes
Unit interval percentage of lag time = 104.1667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.122(In/Hr)
Average low loss rate fraction (Yb) = 0.352 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.201(In)
Computed peak 30-minute rainfall = 0.376(In)
Specified peak 1-hour rainfall = 0.479(In)
Computed peak 3-hour rainfall = 0.746(In)
Specified peak 6-hour rainfall = 0.986(In)
Specified peak 24-hour rainfall = 1.726(In)

Rainfall depth area reduction factors:
Using a total area of 1.64(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.201(In)
30-minute factor = 1.000 Adjusted rainfall = 0.375(In)
1-hour factor = 1.000 Adjusted rainfall = 0.479(In)
3-hour factor = 1.000 Adjusted rainfall = 0.746(In)
6-hour factor = 1.000 Adjusted rainfall = 0.986(In)
24-hour factor = 1.000 Adjusted rainfall = 1.726(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 9.92 (CFS))	
1	18.421	1.827
2	81.273	6.233
3	98.453	1.704
4	100.000	0.153

Rainfall values calculated at 5 minute intervals:

Peak Rainfall Unit Number	Intensity	Depth	Adjusted	Unit Rainfall (In)
1	2.41	0.20	0.20	0.201
2	1.53	0.26	0.26	0.055
3	1.18	0.29	0.29	0.039
4	0.98	0.33	0.33	0.031
5	0.85	0.35	0.35	0.026
6	0.75	0.38	0.38	0.023
7	0.68	0.40	0.40	0.021
8	0.62	0.42	0.42	0.019
9	0.58	0.43	0.43	0.017
10	0.54	0.45	0.45	0.016
11	0.51	0.46	0.46	0.015
12	0.48	0.48	0.48	0.014
13	0.46	0.49	0.49	0.016
14	0.44	0.51	0.51	0.015
15	0.42	0.52	0.52	0.014
16	0.40	0.54	0.54	0.014
17	0.39	0.55	0.55	0.013
18	0.38	0.56	0.56	0.013
19	0.36	0.58	0.58	0.012
20	0.35	0.59	0.59	0.012
21	0.34	0.60	0.60	0.012
22	0.33	0.61	0.61	0.011
23	0.32	0.62	0.62	0.011
24	0.32	0.63	0.63	0.011
25	0.31	0.64	0.64	0.011
26	0.30	0.65	0.65	0.010
27	0.30	0.66	0.66	0.010
28	0.29	0.67	0.67	0.010
29	0.28	0.68	0.68	0.010
30	0.28	0.69	0.69	0.009
31	0.27	0.70	0.70	0.009
32	0.27	0.71	0.71	0.009
33	0.26	0.72	0.72	0.009
34	0.26	0.73	0.73	0.009
35	0.25	0.74	0.74	0.009
36	0.25	0.75	0.75	0.008
37	0.24	0.75	0.75	0.008
38	0.24	0.76	0.76	0.008
39	0.24	0.77	0.77	0.008
40	0.23	0.78	0.78	0.008
41	0.23	0.79	0.79	0.008
42	0.23	0.79	0.79	0.008
43	0.22	0.80	0.80	0.008
44	0.22	0.81	0.81	0.007
45	0.22	0.82	0.82	0.007
46	0.21	0.82	0.82	0.007
47	0.21	0.83	0.83	0.007
48	0.21	0.84	0.84	0.007
49	0.21	0.84	0.84	0.007
50	0.20	0.85	0.85	0.007
51	0.20	0.86	0.86	0.007
52	0.20	0.87	0.87	0.007
53	0.20	0.87	0.87	0.007
54	0.20	0.88	0.88	0.007
55	0.19	0.88	0.88	0.007
56	0.19	0.89	0.89	0.006

57	0.19	0.90	0.90	0.006
58	0.19	0.90	0.90	0.006
59	0.19	0.91	0.91	0.006
60	0.18	0.92	0.92	0.006
61	0.18	0.92	0.92	0.006
62	0.18	0.93	0.93	0.006
63	0.18	0.93	0.93	0.006
64	0.18	0.94	0.94	0.006
65	0.17	0.95	0.95	0.006
66	0.17	0.95	0.95	0.006
67	0.17	0.96	0.96	0.006
68	0.17	0.96	0.96	0.006
69	0.17	0.97	0.97	0.006
70	0.17	0.98	0.98	0.006
71	0.17	0.98	0.98	0.006
72	0.16	0.99	0.99	0.006
73	0.16	0.99	0.99	0.006
74	0.16	1.00	1.00	0.005
75	0.16	1.00	1.00	0.005
76	0.16	1.01	1.01	0.005
77	0.16	1.01	1.01	0.005
78	0.16	1.02	1.02	0.005
79	0.16	1.02	1.02	0.005
80	0.15	1.03	1.03	0.005
81	0.15	1.03	1.03	0.005
82	0.15	1.04	1.04	0.005
83	0.15	1.04	1.04	0.005
84	0.15	1.05	1.05	0.005
85	0.15	1.05	1.05	0.005
86	0.15	1.06	1.06	0.005
87	0.15	1.06	1.06	0.005
88	0.15	1.07	1.07	0.005
89	0.14	1.07	1.07	0.005
90	0.14	1.08	1.08	0.005
91	0.14	1.08	1.08	0.005
92	0.14	1.09	1.09	0.005
93	0.14	1.09	1.09	0.005
94	0.14	1.10	1.10	0.005
95	0.14	1.10	1.10	0.005
96	0.14	1.11	1.11	0.005
97	0.14	1.11	1.11	0.005
98	0.14	1.12	1.12	0.005
99	0.14	1.12	1.12	0.005
100	0.14	1.13	1.13	0.005
101	0.13	1.13	1.13	0.005
102	0.13	1.14	1.14	0.005
103	0.13	1.14	1.14	0.004
104	0.13	1.14	1.14	0.004
105	0.13	1.15	1.15	0.004
106	0.13	1.15	1.15	0.004
107	0.13	1.16	1.16	0.004
108	0.13	1.16	1.16	0.004
109	0.13	1.17	1.17	0.004
110	0.13	1.17	1.17	0.004
111	0.13	1.17	1.17	0.004
112	0.13	1.18	1.18	0.004
113	0.13	1.18	1.18	0.004
114	0.12	1.19	1.19	0.004
115	0.12	1.19	1.19	0.004

116	0.12	1.20	1.20	0.004
117	0.12	1.20	1.20	0.004
118	0.12	1.20	1.20	0.004
119	0.12	1.21	1.21	0.004
120	0.12	1.21	1.21	0.004
121	0.12	1.22	1.22	0.004
122	0.12	1.22	1.22	0.004
123	0.12	1.22	1.22	0.004
124	0.12	1.23	1.23	0.004
125	0.12	1.23	1.23	0.004
126	0.12	1.24	1.24	0.004
127	0.12	1.24	1.24	0.004
128	0.12	1.24	1.24	0.004
129	0.12	1.25	1.25	0.004
130	0.12	1.25	1.25	0.004
131	0.12	1.26	1.26	0.004
132	0.11	1.26	1.26	0.004
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139	0.11	1.29	1.29	0.004
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143	0.11	1.30	1.30	0.004
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147	0.11	1.32	1.32	0.004
148	0.11	1.32	1.32	0.004
149	0.11	1.32	1.32	0.004
150	0.11	1.33	1.33	0.004
151	0.11	1.33	1.33	0.004
152	0.11	1.33	1.33	0.004
153	0.10	1.34	1.34	0.004
154	0.10	1.34	1.34	0.004
155	0.10	1.34	1.34	0.004
156	0.10	1.35	1.35	0.003
157	0.10	1.35	1.35	0.003
158	0.10	1.35	1.35	0.003
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160	0.10	1.36	1.36	0.003
161	0.10	1.37	1.37	0.003
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186	0.09	1.45	1.45	0.003
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201	0.09	1.49	1.49	0.003
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216	0.09	1.54	1.54	0.003
217	0.09	1.54	1.54	0.003
218	0.08	1.54	1.54	0.003
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249	0.08	1.63	1.63	0.003
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251	0.08	1.63	1.63	0.003
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253	0.08	1.64	1.64	0.003
254	0.08	1.64	1.64	0.003
255	0.08	1.64	1.64	0.003
256	0.08	1.65	1.65	0.003
257	0.08	1.65	1.65	0.003
258	0.08	1.65	1.65	0.003
259	0.08	1.65	1.65	0.003
260	0.08	1.66	1.66	0.003
261	0.08	1.66	1.66	0.003
262	0.08	1.66	1.66	0.003
263	0.08	1.66	1.66	0.003
264	0.08	1.67	1.67	0.003
265	0.08	1.67	1.67	0.003
266	0.08	1.67	1.67	0.003
267	0.08	1.67	1.67	0.003
268	0.08	1.68	1.68	0.003
269	0.07	1.68	1.68	0.003
270	0.07	1.68	1.68	0.003
271	0.07	1.68	1.68	0.003
272	0.07	1.69	1.69	0.003
273	0.07	1.69	1.69	0.003
274	0.07	1.69	1.69	0.002
275	0.07	1.69	1.69	0.002
276	0.07	1.70	1.70	0.002
277	0.07	1.70	1.70	0.002
278	0.07	1.70	1.70	0.002
279	0.07	1.70	1.70	0.002
280	0.07	1.71	1.71	0.002
281	0.07	1.71	1.71	0.002
282	0.07	1.71	1.71	0.002
283	0.07	1.71	1.71	0.002
284	0.07	1.72	1.72	0.002
285	0.07	1.72	1.72	0.002
286	0.07	1.72	1.72	0.002
287	0.07	1.72	1.72	0.002
288	0.07	1.73	1.73	0.002

Time = 24.00 Hours Total unit rainfall = 1.73(In)

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0048	0.0017	0.0031
2	0.0049	0.0017	0.0032
3	0.0049	0.0017	0.0032
4	0.0049	0.0017	0.0032
5	0.0050	0.0018	0.0032
6	0.0050	0.0018	0.0032
7	0.0050	0.0018	0.0033
8	0.0051	0.0018	0.0033
9	0.0051	0.0018	0.0033
10	0.0051	0.0018	0.0033
11	0.0052	0.0018	0.0034
12	0.0052	0.0018	0.0034
13	0.0053	0.0018	0.0034
14	0.0053	0.0019	0.0034
15	0.0053	0.0019	0.0035
16	0.0054	0.0019	0.0035
17	0.0054	0.0019	0.0035
18	0.0054	0.0019	0.0035
19	0.0055	0.0019	0.0036
20	0.0055	0.0019	0.0036
21	0.0056	0.0020	0.0036
22	0.0056	0.0020	0.0036
23	0.0057	0.0020	0.0037
24	0.0057	0.0020	0.0037
25	0.0058	0.0020	0.0037
26	0.0058	0.0020	0.0038
27	0.0059	0.0021	0.0038
28	0.0059	0.0021	0.0038
29	0.0060	0.0021	0.0039
30	0.0060	0.0021	0.0039
31	0.0061	0.0021	0.0039
32	0.0061	0.0022	0.0040
33	0.0062	0.0022	0.0040
34	0.0062	0.0022	0.0040
35	0.0063	0.0022	0.0041
36	0.0064	0.0022	0.0041
37	0.0064	0.0023	0.0042
38	0.0065	0.0023	0.0042
39	0.0066	0.0023	0.0042
40	0.0066	0.0023	0.0043
41	0.0067	0.0024	0.0043
42	0.0068	0.0024	0.0044
43	0.0068	0.0024	0.0044
44	0.0069	0.0024	0.0045
45	0.0070	0.0025	0.0045
46	0.0071	0.0025	0.0046
47	0.0072	0.0025	0.0046
48	0.0073	0.0026	0.0047
49	0.0073	0.0026	0.0048
50	0.0074	0.0026	0.0048
51	0.0075	0.0027	0.0049
52	0.0076	0.0027	0.0049
53	0.0077	0.0027	0.0050
54	0.0078	0.0028	0.0051
55	0.0080	0.0028	0.0052
56	0.0081	0.0028	0.0052
57	0.0082	0.0029	0.0053

58	0.0083	0.0029	0.0054
59	0.0085	0.0030	0.0055
60	0.0086	0.0030	0.0056
61	0.0087	0.0031	0.0057
62	0.0089	0.0031	0.0058
63	0.0090	0.0032	0.0059
64	0.0092	0.0032	0.0060
65	0.0094	0.0033	0.0061
66	0.0096	0.0034	0.0062
67	0.0097	0.0034	0.0063
68	0.0099	0.0035	0.0064
69	0.0102	0.0036	0.0066
70	0.0104	0.0037	0.0067
71	0.0106	0.0037	0.0069
72	0.0109	0.0038	0.0070
73	0.0112	0.0039	0.0072
74	0.0114	0.0040	0.0074
75	0.0118	0.0041	0.0076
76	0.0121	0.0043	0.0078
77	0.0125	0.0044	0.0081
78	0.0128	0.0045	0.0083
79	0.0133	0.0047	0.0086
80	0.0137	0.0048	0.0089
81	0.0143	0.0050	0.0092
82	0.0148	0.0052	0.0096
83	0.0155	0.0054	0.0100
84	0.0162	0.0057	0.0105
85	0.0170	0.0060	0.0110
86	0.0179	0.0063	0.0116
87	0.0190	0.0067	0.0123
88	0.0203	0.0072	0.0132
89	0.0219	0.0077	0.0142
90	0.0238	0.0084	0.0154
91	0.0262	0.0092	0.0170
92	0.0294	0.0104	0.0190
93	0.0296	0.0104	0.0192
94	0.0364	0.0128	0.0236
95	0.0497	0.0175	0.0322
96	0.0940	0.0204*	0.0736
97	0.2318	0.0204*	0.2114
98	0.0371	0.0131	0.0240
99	0.0295	0.0104	0.0191
100	0.0238	0.0084	0.0154
101	0.0203	0.0072	0.0132
102	0.0180	0.0063	0.0116
103	0.0162	0.0057	0.0105
104	0.0148	0.0052	0.0096
105	0.0138	0.0048	0.0089
106	0.0129	0.0045	0.0083
107	0.0121	0.0043	0.0078
108	0.0114	0.0040	0.0074
109	0.0109	0.0038	0.0071
110	0.0104	0.0037	0.0067
111	0.0099	0.0035	0.0064
112	0.0096	0.0034	0.0062
113	0.0092	0.0032	0.0060
114	0.0089	0.0031	0.0058
115	0.0086	0.0030	0.0056
116	0.0083	0.0029	0.0054

117	0.0081	0.0028	0.0052
118	0.0078	0.0028	0.0051
119	0.0076	0.0027	0.0049
120	0.0074	0.0026	0.0048
121	0.0073	0.0026	0.0047
122	0.0071	0.0025	0.0046
123	0.0069	0.0024	0.0045
124	0.0068	0.0024	0.0044
125	0.0066	0.0023	0.0043
126	0.0065	0.0023	0.0042
127	0.0064	0.0022	0.0041
128	0.0062	0.0022	0.0040
129	0.0061	0.0022	0.0040
130	0.0060	0.0021	0.0039
131	0.0059	0.0021	0.0038
132	0.0058	0.0020	0.0038
133	0.0057	0.0020	0.0037
134	0.0056	0.0020	0.0036
135	0.0055	0.0019	0.0036
136	0.0054	0.0019	0.0035
137	0.0054	0.0019	0.0035
138	0.0053	0.0019	0.0034
139	0.0052	0.0018	0.0034
140	0.0051	0.0018	0.0033
141	0.0051	0.0018	0.0033
142	0.0050	0.0018	0.0032
143	0.0049	0.0017	0.0032
144	0.0049	0.0017	0.0032
	1.7262	0.5339	1.1922

Total soil rain loss = 0.53(In)
Total effective rainfall = 1.19(In)
Peak flow rate in flood hydrograph = 1.49(CFS)

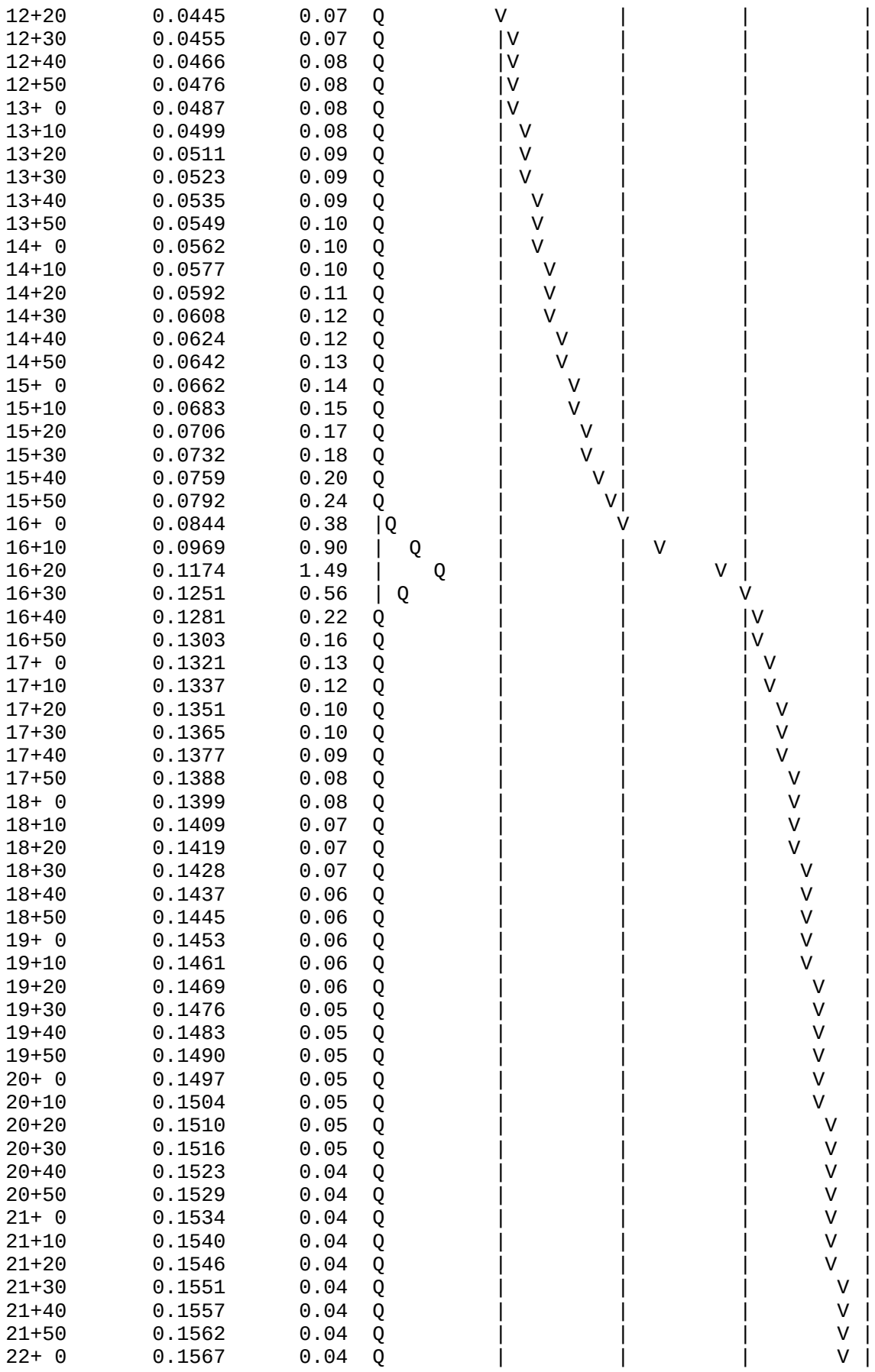
++

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

Hydrograph in 10 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+10	0.0001	0.01	Q				
0+20	0.0004	0.03	Q				
0+30	0.0009	0.03	Q				
0+40	0.0013	0.03	Q				
0+50	0.0017	0.03	Q				
1+ 0	0.0022	0.03	Q				
1+10	0.0026	0.03	Q				
1+20	0.0031	0.03	Q				
1+30	0.0035	0.03	Q				
1+40	0.0040	0.03	Q				
1+50	0.0044	0.03	QV				
2+ 0	0.0049	0.03	QV				
2+10	0.0053	0.03	QV				
2+20	0.0058	0.03	QV				

```
 2+30       0.0063      0.03  QV        |         |         |         |
 2+40       0.0067      0.03  QV        |         |         |         |
 2+50       0.0072      0.03  QV        |         |         |         |
 3+ 0       0.0077      0.03  QV        |         |         |         |
 3+10       0.0082      0.04  Q V       |         |         |         |
 3+20       0.0087      0.04  Q V       |         |         |         |
 3+30       0.0091      0.04  Q V       |         |         |         |
 3+40       0.0096      0.04  Q V       |         |         |         |
 3+50       0.0101      0.04  Q V       |         |         |         |
 4+ 0       0.0106      0.04  Q V       |         |         |         |
 4+10       0.0111      0.04  Q V       |         |         |         |
 4+20       0.0117      0.04  Q V       |         |         |         |
 4+30       0.0122      0.04  Q V       |         |         |         |
 4+40       0.0127      0.04  Q  V      |         |         |         |
 4+50       0.0132      0.04  Q  V      |         |         |         |
 5+ 0       0.0137      0.04  Q  V      |         |         |         |
 5+10       0.0143      0.04  Q  V      |         |         |         |
 5+20       0.0148      0.04  Q  V      |         |         |         |
 5+30       0.0153      0.04  Q  V      |         |         |         |
 5+40       0.0159      0.04  Q  V      |         |         |         |
 5+50       0.0164      0.04  Q   V     |         |         |         |
 6+ 0       0.0170      0.04  Q   V     |         |         |         |
 6+10       0.0176      0.04  Q   V     |         |         |         |
 6+20       0.0181      0.04  Q   V     |         |         |         |
 6+30       0.0187      0.04  Q   V     |         |         |         |
 6+40       0.0193      0.04  Q   V     |         |         |         |
 6+50       0.0199      0.04  Q   V     |         |         |         |
 7+ 0       0.0205      0.04  Q    V    |         |         |         |
 7+10       0.0211      0.04  Q    V    |         |         |         |
 7+20       0.0217      0.04  Q    V    |         |         |         |
 7+30       0.0223      0.04  Q    V    |         |         |         |
 7+40       0.0229      0.04  Q    V    |         |         |         |
 7+50       0.0235      0.05  Q    V    |         |         |         |
 8+ 0       0.0242      0.05  Q    V    |         |         |         |
 8+10       0.0248      0.05  Q     V   |         |         |         |
 8+20       0.0255      0.05  Q     V   |         |         |         |
 8+30       0.0261      0.05  Q     V   |         |         |         |
 8+40       0.0268      0.05  Q     V   |         |         |         |
 8+50       0.0275      0.05  Q     V   |         |         |         |
 9+ 0       0.0281      0.05  Q     V   |         |         |         |
 9+10       0.0288      0.05  Q      V  |         |         |         |
 9+20       0.0295      0.05  Q      V  |         |         |         |
 9+30       0.0303      0.05  Q      V  |         |         |         |
 9+40       0.0310      0.05  Q      V  |         |         |         |
 9+50       0.0317      0.05  Q      V  |         |         |         |
10+ 0       0.0325      0.05  Q      V  |         |         |         |
10+10       0.0332      0.06  Q       V |         |         |         |
10+20       0.0340      0.06  Q       V |         |         |         |
10+30       0.0348      0.06  Q       V |         |         |         |
10+40       0.0356      0.06  Q       V |         |         |         |
10+50       0.0364      0.06  Q       V |         |         |         |
11+ 0       0.0372      0.06  Q        V|         |         |         |
11+10       0.0381      0.06  Q        V|         |         |         |
11+20       0.0389      0.06  Q        V|         |         |         |
11+30       0.0398      0.06  Q        V|         |         |         |
11+40       0.0407      0.07  Q        V|         |         |         |
11+50       0.0416      0.07  Q         V        |         |         |
12+ 0       0.0426      0.07  Q         V        |         |         |
12+10       0.0435      0.07  Q         V        |         |         |
```


12+20 0.0445 0.07
12+30 0.0455 0.07
12+40 0.0466 0.08
12+50 0.0476 0.08
13+ 0 0.0487 0.08
13+10 0.0499 0.08
13+20 0.0511 0.09
13+30 0.0523 0.09
13+40 0.0535 0.09
13+50 0.0549 0.10
14+ 0 0.0562 0.10
14+10 0.0577 0.10
14+20 0.0592 0.11
14+30 0.0608 0.12
14+40 0.0624 0.12
14+50 0.0642 0.13
15+ 0 0.0662 0.14
15+10 0.0683 0.15
15+20 0.0706 0.17
15+30 0.0732 0.18
15+40 0.0759 0.20
15+50 0.0792 0.24
16+ 0 0.0844 0.38
16+10 0.0969 0.90
16+20 0.1174 1.49
16+30 0.1251 0.56
16+40 0.1281 0.22
16+50 0.1303 0.16
17+ 0 0.1321 0.13
17+10 0.1337 0.12
17+20 0.1351 0.10
17+30 0.1365 0.10
17+40 0.1377 0.09
17+50 0.1388 0.08
18+ 0 0.1399 0.08
18+10 0.1409 0.07
18+20 0.1419 0.07
18+30 0.1428 0.07
18+40 0.1437 0.06
18+50 0.1445 0.06
19+ 0 0.1453 0.06
19+10 0.1461 0.06
19+20 0.1469 0.06
19+30 0.1476 0.05
19+40 0.1483 0.05
19+50 0.1490 0.05
20+ 0 0.1497 0.05
20+10 0.1504 0.05
20+20 0.1510 0.05
20+30 0.1516 0.05
20+40 0.1523 0.04
20+50 0.1529 0.04
21+ 0 0.1534 0.04
21+10 0.1540 0.04
21+20 0.1546 0.04
21+30 0.1551 0.04
21+40 0.1557 0.04
21+50 0.1562 0.04
22+ 0 0.1567 0.04

```
   22+10       0.1572      0.04  Q          |          |          |       V |
   22+20       0.1578      0.04  Q          |          |          |       V |
   22+30       0.1583      0.04  Q          |          |          |       V |
   22+40       0.1587      0.04  Q          |          |          |       V |
   22+50       0.1592      0.04  Q          |          |          |        V|
   23+ 0       0.1597      0.03  Q          |          |          |        V|
   23+10       0.1602      0.03  Q          |          |          |        V|
   23+20       0.1606      0.03  Q          |          |          |        V|
   23+30       0.1611      0.03  Q          |          |          |        V|
   23+40       0.1615      0.03  Q          |          |          |        V|
   23+50       0.1620      0.03  Q          |          |          |        V|
   24+ 0       0.1624      0.03  Q          |          |          |        V|
   24+10       0.1628      0.03  Q          |          |          |        V|
   24+20       0.1628      0.01  Q          |          |          |        V|
   24+30       0.1629      0.00  Q          |          |          |         V
---------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 2004-2014, Version 9.0

Study date 06/15/20

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Kern County Synthetic Unit Hydrograph Hydrology Method
Manual date - 1992

Program License Serial Number 6394

A4
10 YR - 24 HR STORM EVENT

Storm Event Year = 10

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.650

Zone Designation: San Joaquin Valley Latitude = 35.40

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)	
Rainfall data for year 2			
2.80	6	0.66	
Rainfall data for year 2			
2.80	24	0.97	
Rainfall data for year 100			
2.80	6	1.64	
Rainfall data for year 100			
2.80	24	2.81	

++
SAN JOAQUIN VALLEY area of study
Log-Log Rainfall Intensity Slope = 0.65

******** Area-averaged max loss rate, Fm ********

SCS curve Number	Area (Ac.)	Area Fraction	Fp (In/Hr)	Ap (dec.)	Fm (In/Hr)
86.0	2.80	1.000	0.272	0.350	0.095

Area-averaged adjusted loss rate Fm (In/Hr) = 0.095

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	S	Pervious Yield Fr
0.98	0.350	86.0	1.63	0.375
1.82	0.650	98.0	0.20	0.871

Area-averaged catchment yield fraction, Y = 0.697
Area-averaged low loss fraction, Yb = 0.303
Direct entry of lag time by user
++
Watershed area = 2.80(Ac.)
Catchment Lag time = 0.160 hours
Unit interval = 10.000 minutes
Unit interval percentage of lag time = 104.1667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.095(In/Hr)
Average low loss rate fraction (Yb) = 0.303 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.201(In)
Computed peak 30-minute rainfall = 0.376(In)
Specified peak 1-hour rainfall = 0.479(In)
Computed peak 3-hour rainfall = 0.746(In)
Specified peak 6-hour rainfall = 0.986(In)
Specified peak 24-hour rainfall = 1.726(In)

Rainfall depth area reduction factors:
Using a total area of 2.80(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.201(In)
30-minute factor = 1.000 Adjusted rainfall = 0.375(In)
1-hour factor = 1.000 Adjusted rainfall = 0.479(In)
3-hour factor = 1.000 Adjusted rainfall = 0.746(In)
6-hour factor = 1.000 Adjusted rainfall = 0.986(In)
24-hour factor = 1.000 Adjusted rainfall = 1.726(In)

U n i t H y d r o g r a p h

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 16.93 (CFS))	
1	18.421	3.119
2	81.273	10.642
3	98.453	2.909
4	100.000	0.262

Rainfall values calculated at 5 minute intervals:

Peak Rainfall Unit Number	Intensity	Depth	Adjusted	Unit Rainfall (In)
1	2.41	0.20	0.20	0.201
2	1.53	0.26	0.26	0.055
3	1.18	0.29	0.29	0.039
4	0.98	0.33	0.33	0.031
5	0.85	0.35	0.35	0.026
6	0.75	0.38	0.38	0.023
7	0.68	0.40	0.40	0.021
8	0.62	0.42	0.42	0.019
9	0.58	0.43	0.43	0.017
10	0.54	0.45	0.45	0.016
11	0.51	0.46	0.46	0.015
12	0.48	0.48	0.48	0.014
13	0.46	0.49	0.49	0.016
14	0.44	0.51	0.51	0.015
15	0.42	0.52	0.52	0.014
16	0.40	0.54	0.54	0.014
17	0.39	0.55	0.55	0.013
18	0.38	0.56	0.56	0.013
19	0.36	0.58	0.58	0.012
20	0.35	0.59	0.59	0.012
21	0.34	0.60	0.60	0.012
22	0.33	0.61	0.61	0.011
23	0.32	0.62	0.62	0.011
24	0.32	0.63	0.63	0.011
25	0.31	0.64	0.64	0.011
26	0.30	0.65	0.65	0.010
27	0.30	0.66	0.66	0.010
28	0.29	0.67	0.67	0.010
29	0.28	0.68	0.68	0.010
30	0.28	0.69	0.69	0.009
31	0.27	0.70	0.70	0.009
32	0.27	0.71	0.71	0.009
33	0.26	0.72	0.72	0.009
34	0.26	0.73	0.73	0.009
35	0.25	0.74	0.74	0.009
36	0.25	0.75	0.75	0.008
37	0.24	0.75	0.75	0.008
38	0.24	0.76	0.76	0.008
39	0.24	0.77	0.77	0.008
40	0.23	0.78	0.78	0.008
41	0.23	0.79	0.79	0.008
42	0.23	0.79	0.79	0.008
43	0.22	0.80	0.80	0.008
44	0.22	0.81	0.81	0.007
45	0.22	0.82	0.82	0.007
46	0.21	0.82	0.82	0.007
47	0.21	0.83	0.83	0.007
48	0.21	0.84	0.84	0.007
49	0.21	0.84	0.84	0.007
50	0.20	0.85	0.85	0.007
51	0.20	0.86	0.86	0.007
52	0.20	0.87	0.87	0.007
53	0.20	0.87	0.87	0.007
54	0.20	0.88	0.88	0.007
55	0.19	0.88	0.88	0.007
56	0.19	0.89	0.89	0.006

57	0.19	0.90	0.90	0.006
58	0.19	0.90	0.90	0.006
59	0.19	0.91	0.91	0.006
60	0.18	0.92	0.92	0.006
61	0.18	0.92	0.92	0.006
62	0.18	0.93	0.93	0.006
63	0.18	0.93	0.93	0.006
64	0.18	0.94	0.94	0.006
65	0.17	0.95	0.95	0.006
66	0.17	0.95	0.95	0.006
67	0.17	0.96	0.96	0.006
68	0.17	0.96	0.96	0.006
69	0.17	0.97	0.97	0.006
70	0.17	0.98	0.98	0.006
71	0.17	0.98	0.98	0.006
72	0.16	0.99	0.99	0.006
73	0.16	0.99	0.99	0.006
74	0.16	1.00	1.00	0.005
75	0.16	1.00	1.00	0.005
76	0.16	1.01	1.01	0.005
77	0.16	1.01	1.01	0.005
78	0.16	1.02	1.02	0.005
79	0.16	1.02	1.02	0.005
80	0.15	1.03	1.03	0.005
81	0.15	1.03	1.03	0.005
82	0.15	1.04	1.04	0.005
83	0.15	1.04	1.04	0.005
84	0.15	1.05	1.05	0.005
85	0.15	1.05	1.05	0.005
86	0.15	1.06	1.06	0.005
87	0.15	1.06	1.06	0.005
88	0.15	1.07	1.07	0.005
89	0.14	1.07	1.07	0.005
90	0.14	1.08	1.08	0.005
91	0.14	1.08	1.08	0.005
92	0.14	1.09	1.09	0.005
93	0.14	1.09	1.09	0.005
94	0.14	1.10	1.10	0.005
95	0.14	1.10	1.10	0.005
96	0.14	1.11	1.11	0.005
97	0.14	1.11	1.11	0.005
98	0.14	1.12	1.12	0.005
99	0.14	1.12	1.12	0.005
100	0.14	1.13	1.13	0.005
101	0.13	1.13	1.13	0.005
102	0.13	1.14	1.14	0.005
103	0.13	1.14	1.14	0.004
104	0.13	1.14	1.14	0.004
105	0.13	1.15	1.15	0.004
106	0.13	1.15	1.15	0.004
107	0.13	1.16	1.16	0.004
108	0.13	1.16	1.16	0.004
109	0.13	1.17	1.17	0.004
110	0.13	1.17	1.17	0.004
111	0.13	1.17	1.17	0.004
112	0.13	1.18	1.18	0.004
113	0.13	1.18	1.18	0.004
114	0.12	1.19	1.19	0.004
115	0.12	1.19	1.19	0.004

116	0.12	1.20	1.20	0.004
117	0.12	1.20	1.20	0.004
118	0.12	1.20	1.20	0.004
119	0.12	1.21	1.21	0.004
120	0.12	1.21	1.21	0.004
121	0.12	1.22	1.22	0.004
122	0.12	1.22	1.22	0.004
123	0.12	1.22	1.22	0.004
124	0.12	1.23	1.23	0.004
125	0.12	1.23	1.23	0.004
126	0.12	1.24	1.24	0.004
127	0.12	1.24	1.24	0.004
128	0.12	1.24	1.24	0.004
129	0.12	1.25	1.25	0.004
130	0.12	1.25	1.25	0.004
131	0.12	1.26	1.26	0.004
132	0.11	1.26	1.26	0.004
133	0.11	1.26	1.26	0.004
134	0.11	1.27	1.27	0.004
135	0.11	1.27	1.27	0.004
136	0.11	1.28	1.28	0.004
137	0.11	1.28	1.28	0.004
138	0.11	1.28	1.28	0.004
139	0.11	1.29	1.29	0.004
140	0.11	1.29	1.29	0.004
141	0.11	1.29	1.29	0.004
142	0.11	1.30	1.30	0.004
143	0.11	1.30	1.30	0.004
144	0.11	1.30	1.30	0.004
145	0.11	1.31	1.31	0.004
146	0.11	1.31	1.31	0.004
147	0.11	1.32	1.32	0.004
148	0.11	1.32	1.32	0.004
149	0.11	1.32	1.32	0.004
150	0.11	1.33	1.33	0.004
151	0.11	1.33	1.33	0.004
152	0.11	1.33	1.33	0.004
153	0.10	1.34	1.34	0.004
154	0.10	1.34	1.34	0.004
155	0.10	1.34	1.34	0.004
156	0.10	1.35	1.35	0.003
157	0.10	1.35	1.35	0.003
158	0.10	1.35	1.35	0.003
159	0.10	1.36	1.36	0.003
160	0.10	1.36	1.36	0.003
161	0.10	1.37	1.37	0.003
162	0.10	1.37	1.37	0.003
163	0.10	1.37	1.37	0.003
164	0.10	1.38	1.38	0.003
165	0.10	1.38	1.38	0.003
166	0.10	1.38	1.38	0.003
167	0.10	1.39	1.39	0.003
168	0.10	1.39	1.39	0.003
169	0.10	1.39	1.39	0.003
170	0.10	1.40	1.40	0.003
171	0.10	1.40	1.40	0.003
172	0.10	1.40	1.40	0.003
173	0.10	1.41	1.41	0.003
174	0.10	1.41	1.41	0.003

175	0.10	1.41	1.41	0.003
176	0.10	1.41	1.41	0.003
177	0.10	1.42	1.42	0.003
178	0.10	1.42	1.42	0.003
179	0.10	1.42	1.42	0.003
180	0.10	1.43	1.43	0.003
181	0.09	1.43	1.43	0.003
182	0.09	1.43	1.43	0.003
183	0.09	1.44	1.44	0.003
184	0.09	1.44	1.44	0.003
185	0.09	1.44	1.44	0.003
186	0.09	1.45	1.45	0.003
187	0.09	1.45	1.45	0.003
188	0.09	1.45	1.45	0.003
189	0.09	1.46	1.46	0.003
190	0.09	1.46	1.46	0.003
191	0.09	1.46	1.46	0.003
192	0.09	1.47	1.47	0.003
193	0.09	1.47	1.47	0.003
194	0.09	1.47	1.47	0.003
195	0.09	1.47	1.47	0.003
196	0.09	1.48	1.48	0.003
197	0.09	1.48	1.48	0.003
198	0.09	1.48	1.48	0.003
199	0.09	1.49	1.49	0.003
200	0.09	1.49	1.49	0.003
201	0.09	1.49	1.49	0.003
202	0.09	1.50	1.50	0.003
203	0.09	1.50	1.50	0.003
204	0.09	1.50	1.50	0.003
205	0.09	1.50	1.50	0.003
206	0.09	1.51	1.51	0.003
207	0.09	1.51	1.51	0.003
208	0.09	1.51	1.51	0.003
209	0.09	1.52	1.52	0.003
210	0.09	1.52	1.52	0.003
211	0.09	1.52	1.52	0.003
212	0.09	1.53	1.53	0.003
213	0.09	1.53	1.53	0.003
214	0.09	1.53	1.53	0.003
215	0.09	1.53	1.53	0.003
216	0.09	1.54	1.54	0.003
217	0.09	1.54	1.54	0.003
218	0.08	1.54	1.54	0.003
219	0.08	1.55	1.55	0.003
220	0.08	1.55	1.55	0.003
221	0.08	1.55	1.55	0.003
222	0.08	1.55	1.55	0.003
223	0.08	1.56	1.56	0.003
224	0.08	1.56	1.56	0.003
225	0.08	1.56	1.56	0.003
226	0.08	1.57	1.57	0.003
227	0.08	1.57	1.57	0.003
228	0.08	1.57	1.57	0.003
229	0.08	1.57	1.57	0.003
230	0.08	1.58	1.58	0.003
231	0.08	1.58	1.58	0.003
232	0.08	1.58	1.58	0.003
233	0.08	1.58	1.58	0.003

234	0.08	1.59	1.59	0.003
235	0.08	1.59	1.59	0.003
236	0.08	1.59	1.59	0.003
237	0.08	1.60	1.60	0.003
238	0.08	1.60	1.60	0.003
239	0.08	1.60	1.60	0.003
240	0.08	1.60	1.60	0.003
241	0.08	1.61	1.61	0.003
242	0.08	1.61	1.61	0.003
243	0.08	1.61	1.61	0.003
244	0.08	1.61	1.61	0.003
245	0.08	1.62	1.62	0.003
246	0.08	1.62	1.62	0.003
247	0.08	1.62	1.62	0.003
248	0.08	1.63	1.63	0.003
249	0.08	1.63	1.63	0.003
250	0.08	1.63	1.63	0.003
251	0.08	1.63	1.63	0.003
252	0.08	1.64	1.64	0.003
253	0.08	1.64	1.64	0.003
254	0.08	1.64	1.64	0.003
255	0.08	1.64	1.64	0.003
256	0.08	1.65	1.65	0.003
257	0.08	1.65	1.65	0.003
258	0.08	1.65	1.65	0.003
259	0.08	1.65	1.65	0.003
260	0.08	1.66	1.66	0.003
261	0.08	1.66	1.66	0.003
262	0.08	1.66	1.66	0.003
263	0.08	1.66	1.66	0.003
264	0.08	1.67	1.67	0.003
265	0.08	1.67	1.67	0.003
266	0.08	1.67	1.67	0.003
267	0.08	1.67	1.67	0.003
268	0.08	1.68	1.68	0.003
269	0.07	1.68	1.68	0.003
270	0.07	1.68	1.68	0.003
271	0.07	1.68	1.68	0.003
272	0.07	1.69	1.69	0.003
273	0.07	1.69	1.69	0.003
274	0.07	1.69	1.69	0.002
275	0.07	1.69	1.69	0.002
276	0.07	1.70	1.70	0.002
277	0.07	1.70	1.70	0.002
278	0.07	1.70	1.70	0.002
279	0.07	1.70	1.70	0.002
280	0.07	1.71	1.71	0.002
281	0.07	1.71	1.71	0.002
282	0.07	1.71	1.71	0.002
283	0.07	1.71	1.71	0.002
284	0.07	1.72	1.72	0.002
285	0.07	1.72	1.72	0.002
286	0.07	1.72	1.72	0.002
287	0.07	1.72	1.72	0.002
288	0.07	1.73	1.73	0.002

Time = 24.00 Hours Total unit rainfall = 1.73(In)

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0048	0.0015	0.0034
2	0.0049	0.0015	0.0034
3	0.0049	0.0015	0.0034
4	0.0049	0.0015	0.0034
5	0.0050	0.0015	0.0035
6	0.0050	0.0015	0.0035
7	0.0050	0.0015	0.0035
8	0.0051	0.0015	0.0035
9	0.0051	0.0015	0.0036
10	0.0051	0.0016	0.0036
11	0.0052	0.0016	0.0036
12	0.0052	0.0016	0.0036
13	0.0053	0.0016	0.0037
14	0.0053	0.0016	0.0037
15	0.0053	0.0016	0.0037
16	0.0054	0.0016	0.0037
17	0.0054	0.0016	0.0038
18	0.0054	0.0016	0.0038
19	0.0055	0.0017	0.0038
20	0.0055	0.0017	0.0039
21	0.0056	0.0017	0.0039
22	0.0056	0.0017	0.0039
23	0.0057	0.0017	0.0040
24	0.0057	0.0017	0.0040
25	0.0058	0.0017	0.0040
26	0.0058	0.0018	0.0041
27	0.0059	0.0018	0.0041
28	0.0059	0.0018	0.0041
29	0.0060	0.0018	0.0042
30	0.0060	0.0018	0.0042
31	0.0061	0.0018	0.0042
32	0.0061	0.0019	0.0043
33	0.0062	0.0019	0.0043
34	0.0062	0.0019	0.0044
35	0.0063	0.0019	0.0044
36	0.0064	0.0019	0.0044
37	0.0064	0.0019	0.0045
38	0.0065	0.0020	0.0045
39	0.0066	0.0020	0.0046
40	0.0066	0.0020	0.0046
41	0.0067	0.0020	0.0047
42	0.0068	0.0020	0.0047
43	0.0068	0.0021	0.0048
44	0.0069	0.0021	0.0048
45	0.0070	0.0021	0.0049
46	0.0071	0.0021	0.0049
47	0.0072	0.0022	0.0050
48	0.0073	0.0022	0.0051
49	0.0073	0.0022	0.0051
50	0.0074	0.0023	0.0052
51	0.0075	0.0023	0.0053
52	0.0076	0.0023	0.0053
53	0.0077	0.0023	0.0054
54	0.0078	0.0024	0.0055
55	0.0080	0.0024	0.0056
56	0.0081	0.0024	0.0056
57	0.0082	0.0025	0.0057

58	0.0083	0.0025	0.0058
59	0.0085	0.0026	0.0059
60	0.0086	0.0026	0.0060
61	0.0087	0.0026	0.0061
62	0.0089	0.0027	0.0062
63	0.0090	0.0027	0.0063
64	0.0092	0.0028	0.0064
65	0.0094	0.0028	0.0065
66	0.0096	0.0029	0.0067
67	0.0097	0.0029	0.0068
68	0.0099	0.0030	0.0069
69	0.0102	0.0031	0.0071
70	0.0104	0.0031	0.0072
71	0.0106	0.0032	0.0074
72	0.0109	0.0033	0.0076
73	0.0112	0.0034	0.0078
74	0.0114	0.0035	0.0080
75	0.0118	0.0036	0.0082
76	0.0121	0.0037	0.0084
77	0.0125	0.0038	0.0087
78	0.0128	0.0039	0.0090
79	0.0133	0.0040	0.0093
80	0.0137	0.0042	0.0096
81	0.0143	0.0043	0.0099
82	0.0148	0.0045	0.0103
83	0.0155	0.0047	0.0108
84	0.0162	0.0049	0.0113
85	0.0170	0.0051	0.0119
86	0.0179	0.0054	0.0125
87	0.0190	0.0058	0.0133
88	0.0203	0.0061	0.0142
89	0.0219	0.0066	0.0152
90	0.0238	0.0072	0.0166
91	0.0262	0.0079	0.0183
92	0.0294	0.0089	0.0205
93	0.0296	0.0090	0.0206
94	0.0364	0.0110	0.0254
95	0.0497	0.0150	0.0346
96	0.0940	0.0159*	0.0782
97	0.2318	0.0159*	0.2159
98	0.0371	0.0112	0.0259
99	0.0295	0.0089	0.0206
100	0.0238	0.0072	0.0166
101	0.0203	0.0062	0.0142
102	0.0180	0.0054	0.0125
103	0.0162	0.0049	0.0113
104	0.0148	0.0045	0.0104
105	0.0138	0.0042	0.0096
106	0.0129	0.0039	0.0090
107	0.0121	0.0037	0.0084
108	0.0114	0.0035	0.0080
109	0.0109	0.0033	0.0076
110	0.0104	0.0031	0.0072
111	0.0099	0.0030	0.0069
112	0.0096	0.0029	0.0067
113	0.0092	0.0028	0.0064
114	0.0089	0.0027	0.0062
115	0.0086	0.0026	0.0060
116	0.0083	0.0025	0.0058

117	0.0081	0.0024	0.0056
118	0.0078	0.0024	0.0055
119	0.0076	0.0023	0.0053
120	0.0074	0.0023	0.0052
121	0.0073	0.0022	0.0051
122	0.0071	0.0021	0.0049
123	0.0069	0.0021	0.0048
124	0.0068	0.0020	0.0047
125	0.0066	0.0020	0.0046
126	0.0065	0.0020	0.0045
127	0.0064	0.0019	0.0044
128	0.0062	0.0019	0.0044
129	0.0061	0.0019	0.0043
130	0.0060	0.0018	0.0042
131	0.0059	0.0018	0.0041
132	0.0058	0.0018	0.0041
133	0.0057	0.0017	0.0040
134	0.0056	0.0017	0.0039
135	0.0055	0.0017	0.0039
136	0.0054	0.0016	0.0038
137	0.0054	0.0016	0.0037
138	0.0053	0.0016	0.0037
139	0.0052	0.0016	0.0036
140	0.0051	0.0016	0.0036
141	0.0051	0.0015	0.0035
142	0.0050	0.0015	0.0035
143	0.0049	0.0015	0.0034
144	0.0049	0.0015	0.0034
	1.7262	0.4555	1.2707

Total soil rain loss = 0.46(In)
Total effective rainfall = 1.27(In)
Peak flow rate in flood hydrograph = 2.61(CFS)

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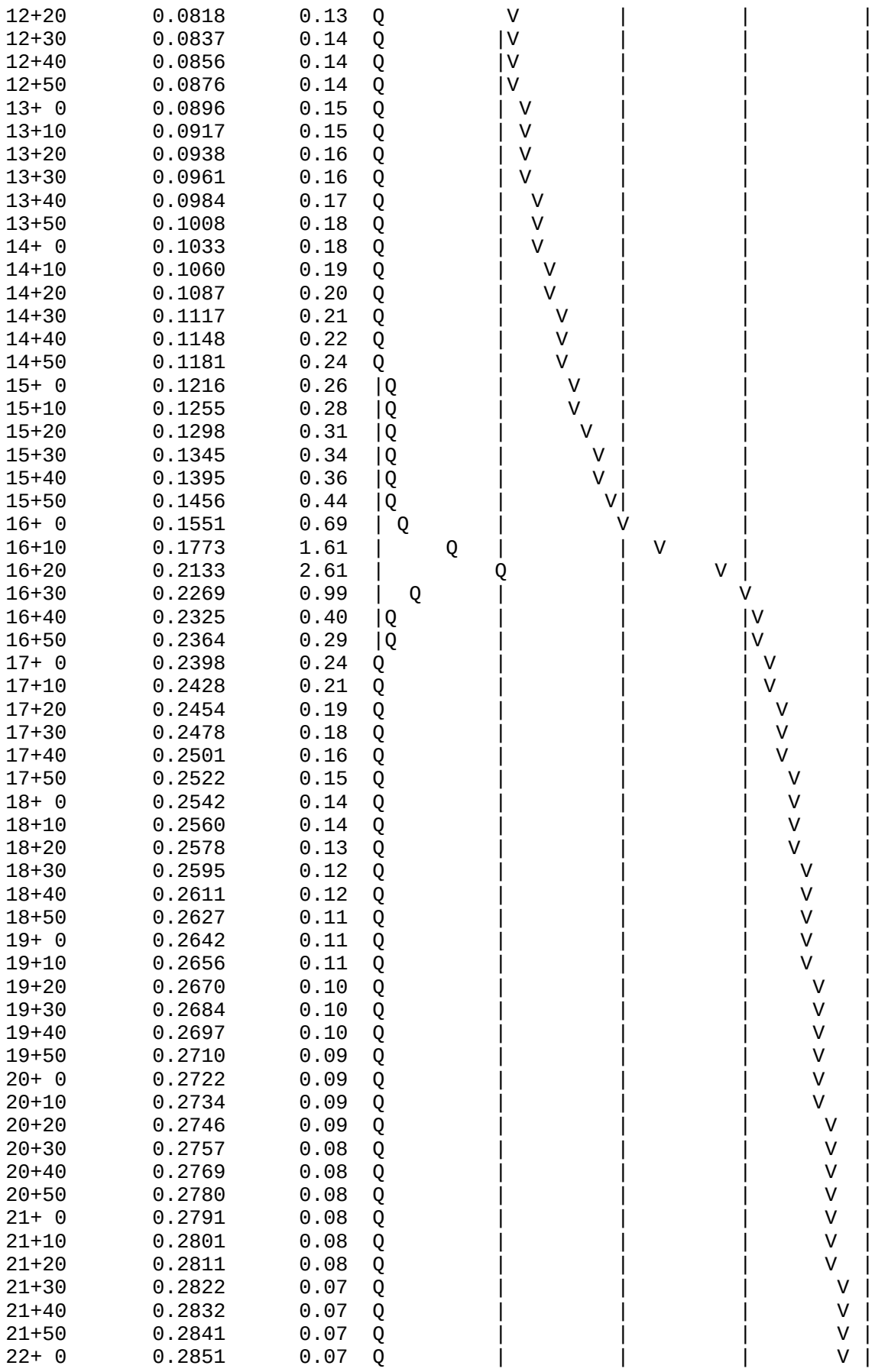
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 10 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+10	0.0001	0.01	Q				
0+20	0.0008	0.05	Q				
0+30	0.0016	0.06	Q				
0+40	0.0024	0.06	Q				
0+50	0.0032	0.06	Q				
1+ 0	0.0040	0.06	Q				
1+10	0.0048	0.06	Q				
1+20	0.0056	0.06	Q				
1+30	0.0064	0.06	Q				
1+40	0.0073	0.06	Q				
1+50	0.0081	0.06	QV				
2+ 0	0.0089	0.06	QV				
2+10	0.0098	0.06	QV				
2+20	0.0106	0.06	QV				

2+30	0.0115	0.06	QV	|	|	|	|
2+40	0.0124	0.06	QV	|	|	|	|
2+50	0.0132	0.06	QV	|	|	|	|
3+ 0	0.0141	0.06	QV	|	|	|	|
3+10	0.0150	0.06	Q V	|	|	|	|
3+20	0.0159	0.06	Q V	|	|	|	|
3+30	0.0168	0.07	Q V	|	|	|	|
3+40	0.0177	0.07	Q V	|	|	|	|
3+50	0.0186	0.07	Q V	|	|	|	|
4+ 0	0.0196	0.07	Q V	|	|	|	|
4+10	0.0205	0.07	Q V	|	|	|	|
4+20	0.0214	0.07	Q V	|	|	|	|
4+30	0.0224	0.07	Q V	|	|	|	|
4+40	0.0233	0.07	Q V	|	|	|	|
4+50	0.0243	0.07	Q V	|	|	|	|
5+ 0	0.0252	0.07	Q V	|	|	|	|
5+10	0.0262	0.07	Q V	|	|	|	|
5+20	0.0272	0.07	Q V	|	|	|	|
5+30	0.0282	0.07	Q V	|	|	|	|
5+40	0.0292	0.07	Q V	|	|	|	|
5+50	0.0302	0.07	Q V	|	|	|	|
6+ 0	0.0312	0.07	Q V	|	|	|	|
6+10	0.0323	0.08	Q V	|	|	|	|
6+20	0.0333	0.08	Q V	|	|	|	|
6+30	0.0344	0.08	Q V	|	|	|	|
6+40	0.0354	0.08	Q V	|	|	|	|
6+50	0.0365	0.08	Q V	|	|	|	|
7+ 0	0.0376	0.08	Q V	|	|	|	|
7+10	0.0387	0.08	Q V	|	|	|	|
7+20	0.0398	0.08	Q V	|	|	|	|
7+30	0.0410	0.08	Q V	|	|	|	|
7+40	0.0421	0.08	Q V	|	|	|	|
7+50	0.0432	0.08	Q V	|	|	|	|
8+ 0	0.0444	0.08	Q V	|	|	|	|
8+10	0.0456	0.09	Q V	|	|	|	|
8+20	0.0468	0.09	Q V	|	|	|	|
8+30	0.0480	0.09	Q V	|	|	|	|
8+40	0.0492	0.09	Q V	|	|	|	|
8+50	0.0505	0.09	Q V	|	|	|	|
9+ 0	0.0517	0.09	Q V	|	|	|	|
9+10	0.0530	0.09	Q V	|	|	|	|
9+20	0.0543	0.09	Q V	|	|	|	|
9+30	0.0556	0.10	Q V	|	|	|	|
9+40	0.0569	0.10	Q V	|	|	|	|
9+50	0.0583	0.10	Q V	|	|	|	|
10+ 0	0.0597	0.10	Q V	|	|	|	|
10+10	0.0611	0.10	Q V	|	|	|	|
10+20	0.0625	0.10	Q V	|	|	|	|
10+30	0.0639	0.10	Q V	|	|	|	|
10+40	0.0654	0.11	Q V	|	|	|	|
10+50	0.0669	0.11	Q V	|	|	|	|
11+ 0	0.0684	0.11	Q V	|	|	|	|
11+10	0.0700	0.11	Q V	|	|	|	|
11+20	0.0716	0.12	Q V	|	|	|	|
11+30	0.0732	0.12	Q V	|	|	|	|
11+40	0.0748	0.12	Q V	|	|	|	|
11+50	0.0765	0.12	Q V	|	|	|	|
12+ 0	0.0782	0.13	Q V	|	|	|	|
12+10	0.0800	0.13	Q V	|	|	|	|



```
   22+10       0.2860      0.07  Q          |          |          |       V |
   22+20       0.2870      0.07  Q          |          |          |       V |
   22+30       0.2879      0.07  Q          |          |          |       V |
   22+40       0.2888      0.07  Q          |          |          |       V |
   22+50       0.2897      0.06  Q          |          |          |        V|
   23+ 0       0.2905      0.06  Q          |          |          |        V|
   23+10       0.2914      0.06  Q          |          |          |        V|
   23+20       0.2923      0.06  Q          |          |          |        V|
   23+30       0.2931      0.06  Q          |          |          |        V|
   23+40       0.2939      0.06  Q          |          |          |        V|
   23+50       0.2947      0.06  Q          |          |          |        V|
   24+ 0       0.2955      0.06  Q          |          |          |        V|
   24+10       0.2962      0.05  Q          |          |          |        V|
   24+20       0.2963      0.01  Q          |          |          |        V|
   24+30       0.2963      0.00  Q          |          |          |        V|
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 2004-2014, Version 9.0

Study date 06/15/20

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Kern County Synthetic Unit Hydrograph Hydrology Method
Manual date - 1992

Program License Serial Number 6394

A1
100 YR - 24 HR STORM

Storm Event Year = 100

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.650

Zone Designation: Desert Region Latitude = 35.40

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
1.31	6	0.66
Rainfall data for year 2		
1.31	24	0.97
Rainfall data for year 100		
1.31	6	1.64
Rainfall data for year 100		
1.31	24	2.81

++
DESERT REGION area of study
Log-Log Rainfall Intensity Slope = 0.65

******** Area-averaged max loss rate, Fm ********

SCS curve Number	Area (Ac.)	Area Fraction	Fp (In/Hr)	Ap (dec.)	Fm (In/Hr)
86.0	1.31	1.000	0.272	0.200	0.054

Area-averaged adjusted loss rate Fm (In/Hr) = 0.054

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	S	Pervious Yield Fr
0.26	0.200	86.0	1.63	0.534
1.05	0.800	98.0	0.20	0.918

Area-averaged catchment yield fraction, Y = 0.841
Area-averaged low loss fraction, Yb = 0.159
Direct entry of lag time by user
++
Watershed area = 1.31(Ac.)
Catchment Lag time = 0.160 hours
Unit interval = 10.000 minutes
Unit interval percentage of lag time = 104.1667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.054(In/Hr)
Average low loss rate fraction (Yb) = 0.159 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.451(In)
Computed peak 30-minute rainfall = 0.845(In)
Specified peak 1-hour rainfall = 1.077(In)
Computed peak 3-hour rainfall = 1.394(In)
Specified peak 6-hour rainfall = 1.640(In)
Specified peak 24-hour rainfall = 2.810(In)

Rainfall depth area reduction factors:
Using a total area of 1.31(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.451(In)
30-minute factor = 1.000 Adjusted rainfall = 0.845(In)
1-hour factor = 1.000 Adjusted rainfall = 1.077(In)
3-hour factor = 1.000 Adjusted rainfall = 1.394(In)
6-hour factor = 1.000 Adjusted rainfall = 1.640(In)
24-hour factor = 1.000 Adjusted rainfall = 2.810(In)

U n i t H y d r o g r a p h

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 7.92 (CFS))	
1	18.421	1.459
2	81.273	4.979
3	98.453	1.361
4	100.000	0.123

Rainfall values calculated at 5 minute intervals:

Peak Rainfall Unit Number	Intensity	Depth	Adjusted	Unit Rainfall (In)
1	5.42	0.45	0.45	0.451
2	3.45	0.58	0.58	0.124
3	2.65	0.66	0.66	0.088
4	2.20	0.73	0.73	0.070
5	1.90	0.79	0.79	0.060
6	1.69	0.85	0.85	0.052
7	1.53	0.89	0.89	0.047
8	1.40	0.93	0.93	0.043
9	1.30	0.97	0.97	0.039
10	1.21	1.01	1.01	0.037
11	1.14	1.04	1.04	0.034
12	1.08	1.08	1.08	0.032
13	1.01	1.10	1.10	0.020
14	0.96	1.12	1.12	0.019
15	0.91	1.14	1.14	0.018
16	0.86	1.15	1.15	0.017
17	0.83	1.17	1.17	0.017
18	0.79	1.18	1.18	0.016
19	0.76	1.20	1.20	0.015
20	0.73	1.21	1.21	0.015
21	0.70	1.23	1.23	0.014
22	0.68	1.24	1.24	0.013
23	0.65	1.25	1.25	0.013
24	0.63	1.27	1.27	0.013
25	0.61	1.28	1.28	0.012
26	0.60	1.29	1.29	0.012
27	0.58	1.30	1.30	0.011
28	0.56	1.31	1.31	0.011
29	0.55	1.32	1.32	0.011
30	0.53	1.34	1.34	0.011
31	0.52	1.35	1.35	0.010
32	0.51	1.36	1.36	0.010
33	0.50	1.37	1.37	0.010
34	0.49	1.38	1.38	0.010
35	0.47	1.38	1.38	0.009
36	0.46	1.39	1.39	0.009
37	0.45	1.40	1.40	0.009
38	0.45	1.41	1.41	0.009
39	0.44	1.42	1.42	0.009
40	0.43	1.43	1.43	0.008
41	0.42	1.44	1.44	0.008
42	0.41	1.45	1.45	0.008
43	0.41	1.45	1.45	0.008
44	0.40	1.46	1.46	0.008
45	0.39	1.47	1.47	0.008
46	0.39	1.48	1.48	0.008
47	0.38	1.48	1.48	0.007
48	0.37	1.49	1.49	0.007
49	0.37	1.50	1.50	0.007
50	0.36	1.51	1.51	0.007
51	0.36	1.51	1.51	0.007
52	0.35	1.52	1.52	0.007
53	0.35	1.53	1.53	0.007
54	0.34	1.53	1.53	0.007
55	0.34	1.54	1.54	0.007
56	0.33	1.55	1.55	0.007

57	0.33	1.55	1.55	0.006
58	0.32	1.56	1.56	0.006
59	0.32	1.57	1.57	0.006
60	0.31	1.57	1.57	0.006
61	0.31	1.58	1.58	0.006
62	0.31	1.58	1.58	0.006
63	0.30	1.59	1.59	0.006
64	0.30	1.60	1.60	0.006
65	0.30	1.60	1.60	0.006
66	0.29	1.61	1.61	0.006
67	0.29	1.61	1.61	0.006
68	0.29	1.62	1.62	0.006
69	0.28	1.62	1.62	0.006
70	0.28	1.63	1.63	0.005
71	0.28	1.63	1.63	0.005
72	0.27	1.64	1.64	0.005
73	0.27	1.65	1.65	0.009
74	0.27	1.66	1.66	0.009
75	0.27	1.67	1.67	0.009
76	0.26	1.67	1.67	0.009
77	0.26	1.68	1.68	0.009
78	0.26	1.69	1.69	0.008
79	0.26	1.70	1.70	0.008
80	0.26	1.71	1.71	0.008
81	0.25	1.72	1.72	0.008
82	0.25	1.72	1.72	0.008
83	0.25	1.73	1.73	0.008
84	0.25	1.74	1.74	0.008
85	0.25	1.75	1.75	0.008
86	0.25	1.76	1.76	0.008
87	0.24	1.77	1.77	0.008
88	0.24	1.77	1.77	0.008
89	0.24	1.78	1.78	0.008
90	0.24	1.79	1.79	0.008
91	0.24	1.80	1.80	0.008
92	0.24	1.80	1.80	0.008
93	0.23	1.81	1.81	0.008
94	0.23	1.82	1.82	0.008
95	0.23	1.83	1.83	0.007
96	0.23	1.83	1.83	0.007
97	0.23	1.84	1.84	0.007
98	0.23	1.85	1.85	0.007
99	0.22	1.86	1.86	0.007
100	0.22	1.86	1.86	0.007
101	0.22	1.87	1.87	0.007
102	0.22	1.88	1.88	0.007
103	0.22	1.88	1.88	0.007
104	0.22	1.89	1.89	0.007
105	0.22	1.90	1.90	0.007
106	0.22	1.91	1.91	0.007
107	0.21	1.91	1.91	0.007
108	0.21	1.92	1.92	0.007
109	0.21	1.93	1.93	0.007
110	0.21	1.93	1.93	0.007
111	0.21	1.94	1.94	0.007
112	0.21	1.95	1.95	0.007
113	0.21	1.95	1.95	0.007
114	0.21	1.96	1.96	0.007
115	0.21	1.97	1.97	0.007

116	0.20	1.97	1.97	0.007
117	0.20	1.98	1.98	0.007
118	0.20	1.99	1.99	0.007
119	0.20	1.99	1.99	0.007
120	0.20	2.00	2.00	0.006
121	0.20	2.01	2.01	0.006
122	0.20	2.01	2.01	0.006
123	0.20	2.02	2.02	0.006
124	0.20	2.03	2.03	0.006
125	0.20	2.03	2.03	0.006
126	0.19	2.04	2.04	0.006
127	0.19	2.04	2.04	0.006
128	0.19	2.05	2.05	0.006
129	0.19	2.06	2.06	0.006
130	0.19	2.06	2.06	0.006
131	0.19	2.07	2.07	0.006
132	0.19	2.08	2.08	0.006
133	0.19	2.08	2.08	0.006
134	0.19	2.09	2.09	0.006
135	0.19	2.09	2.09	0.006
136	0.19	2.10	2.10	0.006
137	0.18	2.11	2.11	0.006
138	0.18	2.11	2.11	0.006
139	0.18	2.12	2.12	0.006
140	0.18	2.12	2.12	0.006
141	0.18	2.13	2.13	0.006
142	0.18	2.14	2.14	0.006
143	0.18	2.14	2.14	0.006
144	0.18	2.15	2.15	0.006
145	0.18	2.15	2.15	0.006
146	0.18	2.16	2.16	0.006
147	0.18	2.16	2.16	0.006
148	0.18	2.17	2.17	0.006
149	0.18	2.18	2.18	0.006
150	0.17	2.18	2.18	0.006
151	0.17	2.19	2.19	0.006
152	0.17	2.19	2.19	0.006
153	0.17	2.20	2.20	0.006
154	0.17	2.20	2.20	0.006
155	0.17	2.21	2.21	0.006
156	0.17	2.21	2.21	0.006
157	0.17	2.22	2.22	0.006
158	0.17	2.23	2.23	0.005
159	0.17	2.23	2.23	0.005
160	0.17	2.24	2.24	0.005
161	0.17	2.24	2.24	0.005
162	0.17	2.25	2.25	0.005
163	0.17	2.25	2.25	0.005
164	0.17	2.26	2.26	0.005
165	0.16	2.26	2.26	0.005
166	0.16	2.27	2.27	0.005
167	0.16	2.27	2.27	0.005
168	0.16	2.28	2.28	0.005
169	0.16	2.28	2.28	0.005
170	0.16	2.29	2.29	0.005
171	0.16	2.29	2.29	0.005
172	0.16	2.30	2.30	0.005
173	0.16	2.31	2.31	0.005
174	0.16	2.31	2.31	0.005

175	0.16	2.32	2.32	0.005
176	0.16	2.32	2.32	0.005
177	0.16	2.33	2.33	0.005
178	0.16	2.33	2.33	0.005
179	0.16	2.34	2.34	0.005
180	0.16	2.34	2.34	0.005
181	0.16	2.35	2.35	0.005
182	0.16	2.35	2.35	0.005
183	0.15	2.36	2.36	0.005
184	0.15	2.36	2.36	0.005
185	0.15	2.37	2.37	0.005
186	0.15	2.37	2.37	0.005
187	0.15	2.38	2.38	0.005
188	0.15	2.38	2.38	0.005
189	0.15	2.39	2.39	0.005
190	0.15	2.39	2.39	0.005
191	0.15	2.40	2.40	0.005
192	0.15	2.40	2.40	0.005
193	0.15	2.41	2.41	0.005
194	0.15	2.41	2.41	0.005
195	0.15	2.42	2.42	0.005
196	0.15	2.42	2.42	0.005
197	0.15	2.42	2.42	0.005
198	0.15	2.43	2.43	0.005
199	0.15	2.43	2.43	0.005
200	0.15	2.44	2.44	0.005
201	0.15	2.44	2.44	0.005
202	0.15	2.45	2.45	0.005
203	0.15	2.45	2.45	0.005
204	0.14	2.46	2.46	0.005
205	0.14	2.46	2.46	0.005
206	0.14	2.47	2.47	0.005
207	0.14	2.47	2.47	0.005
208	0.14	2.48	2.48	0.005
209	0.14	2.48	2.48	0.005
210	0.14	2.49	2.49	0.005
211	0.14	2.49	2.49	0.005
212	0.14	2.49	2.49	0.005
213	0.14	2.50	2.50	0.005
214	0.14	2.50	2.50	0.005
215	0.14	2.51	2.51	0.005
216	0.14	2.51	2.51	0.005
217	0.14	2.52	2.52	0.005
218	0.14	2.52	2.52	0.004
219	0.14	2.53	2.53	0.004
220	0.14	2.53	2.53	0.004
221	0.14	2.54	2.54	0.004
222	0.14	2.54	2.54	0.004
223	0.14	2.54	2.54	0.004
224	0.14	2.55	2.55	0.004
225	0.14	2.55	2.55	0.004
226	0.14	2.56	2.56	0.004
227	0.14	2.56	2.56	0.004
228	0.14	2.57	2.57	0.004
229	0.13	2.57	2.57	0.004
230	0.13	2.57	2.57	0.004
231	0.13	2.58	2.58	0.004
232	0.13	2.58	2.58	0.004
233	0.13	2.59	2.59	0.004

234	0.13	2.59	2.59	0.004
235	0.13	2.60	2.60	0.004
236	0.13	2.60	2.60	0.004
237	0.13	2.61	2.61	0.004
238	0.13	2.61	2.61	0.004
239	0.13	2.61	2.61	0.004
240	0.13	2.62	2.62	0.004
241	0.13	2.62	2.62	0.004
242	0.13	2.63	2.63	0.004
243	0.13	2.63	2.63	0.004
244	0.13	2.63	2.63	0.004
245	0.13	2.64	2.64	0.004
246	0.13	2.64	2.64	0.004
247	0.13	2.65	2.65	0.004
248	0.13	2.65	2.65	0.004
249	0.13	2.66	2.66	0.004
250	0.13	2.66	2.66	0.004
251	0.13	2.66	2.66	0.004
252	0.13	2.67	2.67	0.004
253	0.13	2.67	2.67	0.004
254	0.13	2.68	2.68	0.004
255	0.13	2.68	2.68	0.004
256	0.13	2.68	2.68	0.004
257	0.13	2.69	2.69	0.004
258	0.13	2.69	2.69	0.004
259	0.12	2.70	2.70	0.004
260	0.12	2.70	2.70	0.004
261	0.12	2.70	2.70	0.004
262	0.12	2.71	2.71	0.004
263	0.12	2.71	2.71	0.004
264	0.12	2.72	2.72	0.004
265	0.12	2.72	2.72	0.004
266	0.12	2.72	2.72	0.004
267	0.12	2.73	2.73	0.004
268	0.12	2.73	2.73	0.004
269	0.12	2.74	2.74	0.004
270	0.12	2.74	2.74	0.004
271	0.12	2.74	2.74	0.004
272	0.12	2.75	2.75	0.004
273	0.12	2.75	2.75	0.004
274	0.12	2.76	2.76	0.004
275	0.12	2.76	2.76	0.004
276	0.12	2.76	2.76	0.004
277	0.12	2.77	2.77	0.004
278	0.12	2.77	2.77	0.004
279	0.12	2.78	2.78	0.004
280	0.12	2.78	2.78	0.004
281	0.12	2.78	2.78	0.004
282	0.12	2.79	2.79	0.004
283	0.12	2.79	2.79	0.004
284	0.12	2.79	2.79	0.004
285	0.12	2.80	2.80	0.004
286	0.12	2.80	2.80	0.004
287	0.12	2.81	2.81	0.004
288	0.12	2.81	2.81	0.004

Time = 24.00 Hours Total unit rainfall = 2.81(In)

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0076	0.0012	0.0064
2	0.0076	0.0012	0.0064
3	0.0077	0.0012	0.0065
4	0.0077	0.0012	0.0065
5	0.0078	0.0012	0.0066
6	0.0078	0.0012	0.0066
7	0.0079	0.0013	0.0066
8	0.0080	0.0013	0.0067
9	0.0080	0.0013	0.0067
10	0.0081	0.0013	0.0068
11	0.0081	0.0013	0.0068
12	0.0082	0.0013	0.0069
13	0.0082	0.0013	0.0069
14	0.0083	0.0013	0.0070
15	0.0084	0.0013	0.0070
16	0.0084	0.0013	0.0071
17	0.0085	0.0014	0.0071
18	0.0086	0.0014	0.0072
19	0.0086	0.0014	0.0073
20	0.0087	0.0014	0.0073
21	0.0088	0.0014	0.0074
22	0.0088	0.0014	0.0074
23	0.0089	0.0014	0.0075
24	0.0090	0.0014	0.0076
25	0.0091	0.0014	0.0076
26	0.0091	0.0015	0.0077
27	0.0092	0.0015	0.0078
28	0.0093	0.0015	0.0078
29	0.0094	0.0015	0.0079
30	0.0095	0.0015	0.0080
31	0.0096	0.0015	0.0080
32	0.0097	0.0015	0.0081
33	0.0097	0.0015	0.0082
34	0.0098	0.0016	0.0083
35	0.0099	0.0016	0.0084
36	0.0100	0.0016	0.0084
37	0.0101	0.0016	0.0085
38	0.0102	0.0016	0.0086
39	0.0104	0.0016	0.0087
40	0.0105	0.0017	0.0088
41	0.0106	0.0017	0.0089
42	0.0107	0.0017	0.0090
43	0.0108	0.0017	0.0091
44	0.0109	0.0017	0.0092
45	0.0111	0.0018	0.0093
46	0.0112	0.0018	0.0094
47	0.0113	0.0018	0.0095
48	0.0115	0.0018	0.0097
49	0.0116	0.0018	0.0098
50	0.0118	0.0019	0.0099
51	0.0119	0.0019	0.0100
52	0.0121	0.0019	0.0102
53	0.0123	0.0020	0.0103
54	0.0124	0.0020	0.0105
55	0.0126	0.0020	0.0106
56	0.0128	0.0020	0.0108
57	0.0130	0.0021	0.0109

58	0.0132	0.0021	0.0111
59	0.0134	0.0021	0.0113
60	0.0137	0.0022	0.0115
61	0.0139	0.0022	0.0117
62	0.0141	0.0022	0.0119
63	0.0144	0.0023	0.0121
64	0.0147	0.0023	0.0123
65	0.0149	0.0024	0.0126
66	0.0152	0.0024	0.0128
67	0.0155	0.0025	0.0131
68	0.0159	0.0025	0.0134
69	0.0162	0.0026	0.0136
70	0.0166	0.0026	0.0140
71	0.0170	0.0027	0.0143
72	0.0174	0.0028	0.0146
73	0.0108	0.0017	0.0091
74	0.0112	0.0018	0.0094
75	0.0116	0.0018	0.0097
76	0.0120	0.0019	0.0101
77	0.0124	0.0020	0.0105
78	0.0130	0.0021	0.0109
79	0.0135	0.0021	0.0114
80	0.0141	0.0022	0.0119
81	0.0148	0.0024	0.0125
82	0.0156	0.0025	0.0131
83	0.0164	0.0026	0.0138
84	0.0174	0.0028	0.0147
85	0.0186	0.0030	0.0156
86	0.0199	0.0032	0.0167
87	0.0214	0.0034	0.0180
88	0.0233	0.0037	0.0196
89	0.0256	0.0041	0.0215
90	0.0285	0.0045	0.0240
91	0.0323	0.0051	0.0272
92	0.0375	0.0060	0.0315
93	0.0666	0.0091*	0.0575
94	0.0820	0.0091*	0.0729
95	0.1118	0.0091*	0.1027
96	0.2117	0.0091*	0.2026
97	0.5216	0.0091*	0.5126
98	0.0834	0.0091*	0.0744
99	0.0377	0.0060	0.0317
100	0.0286	0.0045	0.0241
101	0.0234	0.0037	0.0197
102	0.0199	0.0032	0.0167
103	0.0174	0.0028	0.0147
104	0.0156	0.0025	0.0131
105	0.0141	0.0022	0.0119
106	0.0130	0.0021	0.0109
107	0.0120	0.0019	0.0101
108	0.0112	0.0018	0.0094
109	0.0174	0.0028	0.0146
110	0.0166	0.0026	0.0140
111	0.0159	0.0025	0.0134
112	0.0152	0.0024	0.0128
113	0.0147	0.0023	0.0123
114	0.0141	0.0022	0.0119
115	0.0137	0.0022	0.0115
116	0.0132	0.0021	0.0111

117	0.0128	0.0020	0.0108
118	0.0124	0.0020	0.0105
119	0.0121	0.0019	0.0102
120	0.0118	0.0019	0.0099
121	0.0115	0.0018	0.0097
122	0.0112	0.0018	0.0094
123	0.0109	0.0017	0.0092
124	0.0107	0.0017	0.0090
125	0.0105	0.0017	0.0088
126	0.0102	0.0016	0.0086
127	0.0100	0.0016	0.0084
128	0.0098	0.0016	0.0083
129	0.0097	0.0015	0.0081
130	0.0095	0.0015	0.0080
131	0.0093	0.0015	0.0078
132	0.0091	0.0015	0.0077
133	0.0090	0.0014	0.0076
134	0.0088	0.0014	0.0074
135	0.0087	0.0014	0.0073
136	0.0086	0.0014	0.0072
137	0.0084	0.0013	0.0071
138	0.0083	0.0013	0.0070
139	0.0082	0.0013	0.0069
140	0.0081	0.0013	0.0068
141	0.0080	0.0013	0.0067
142	0.0078	0.0012	0.0066
143	0.0077	0.0012	0.0065
144	0.0076	0.0012	0.0064
	2.8100	0.3298	2.4802

Total soil rain loss = 0.33(In)
Total effective rainfall = 2.48(In)
Peak flow rate in flood hydrograph = 2.95(CFS)

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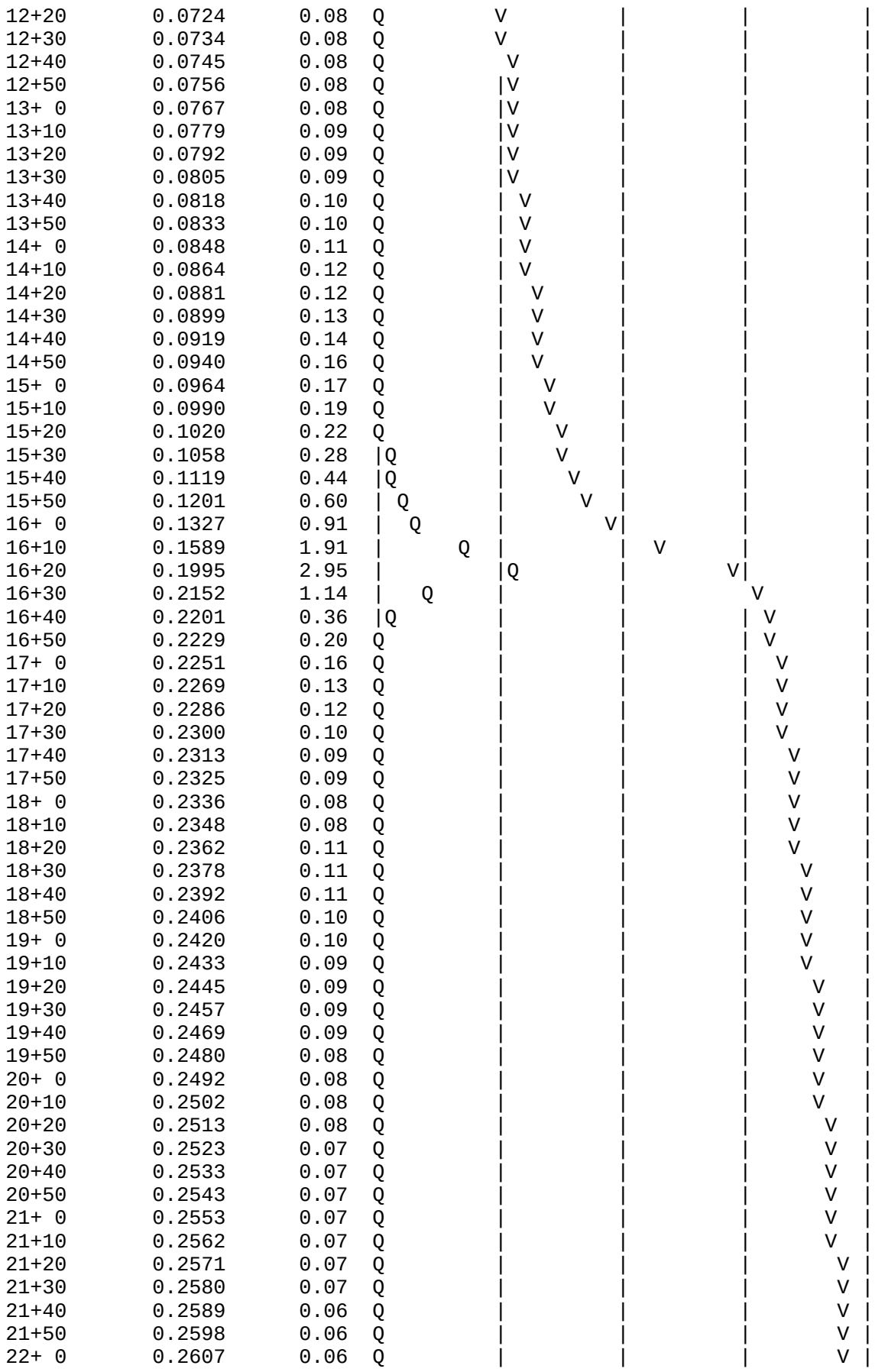
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 10 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+10	0.0001	0.01	Q				
0+20	0.0007	0.04	Q				
0+30	0.0014	0.05	Q				
0+40	0.0021	0.05	Q				
0+50	0.0028	0.05	Q				
1+ 0	0.0035	0.05	Q				
1+10	0.0042	0.05	Q				
1+20	0.0050	0.05	Q				
1+30	0.0057	0.05	Q				
1+40	0.0064	0.05	Q				
1+50	0.0072	0.05	QV				
2+ 0	0.0079	0.05	QV				
2+10	0.0087	0.05	QV				
2+20	0.0094	0.05	QV				

```
 2+30       0.0102      0.06  QV        |         |         |         |
 2+40       0.0110      0.06  QV        |         |         |         |
 2+50       0.0117      0.06  QV        |         |         |         |
 3+ 0       0.0125      0.06  QV        |         |         |         |
 3+10       0.0133      0.06  QV        |         |         |         |
 3+20       0.0141      0.06  Q V       |         |         |         |
 3+30       0.0149      0.06  Q V       |         |         |         |
 3+40       0.0157      0.06  Q V       |         |         |         |
 3+50       0.0165      0.06  Q V       |         |         |         |
 4+ 0       0.0173      0.06  Q V       |         |         |         |
 4+10       0.0181      0.06  Q V       |         |         |         |
 4+20       0.0190      0.06  Q V       |         |         |         |
 4+30       0.0198      0.06  Q V       |         |         |         |
 4+40       0.0207      0.06  Q  V      |         |         |         |
 4+50       0.0215      0.06  Q  V      |         |         |         |
 5+ 0       0.0224      0.06  Q  V      |         |         |         |
 5+10       0.0232      0.06  Q  V      |         |         |         |
 5+20       0.0241      0.06  Q  V      |         |         |         |
 5+30       0.0250      0.06  Q  V      |         |         |         |
 5+40       0.0259      0.06  Q  V      |         |         |         |
 5+50       0.0268      0.07  Q  V      |         |         |         |
 6+ 0       0.0277      0.07  Q   V     |         |         |         |
 6+10       0.0286      0.07  Q   V     |         |         |         |
 6+20       0.0296      0.07  Q   V     |         |         |         |
 6+30       0.0305      0.07  Q   V     |         |         |         |
 6+40       0.0315      0.07  Q   V     |         |         |         |
 6+50       0.0324      0.07  Q   V     |         |         |         |
 7+ 0       0.0334      0.07  Q   V     |         |         |         |
 7+10       0.0344      0.07  Q    V    |         |         |         |
 7+20       0.0354      0.07  Q    V    |         |         |         |
 7+30       0.0364      0.07  Q    V    |         |         |         |
 7+40       0.0374      0.07  Q    V    |         |         |         |
 7+50       0.0384      0.07  Q    V    |         |         |         |
 8+ 0       0.0394      0.08  Q    V    |         |         |         |
 8+10       0.0405      0.08  Q    V    |         |         |         |
 8+20       0.0416      0.08  Q     V   |         |         |         |
 8+30       0.0427      0.08  Q     V   |         |         |         |
 8+40       0.0437      0.08  Q     V   |         |         |         |
 8+50       0.0449      0.08  Q     V   |         |         |         |
 9+ 0       0.0460      0.08  Q     V   |         |         |         |
 9+10       0.0471      0.08  Q     V   |         |         |         |
 9+20       0.0483      0.08  Q      V  |         |         |         |
 9+30       0.0495      0.09  Q      V  |         |         |         |
 9+40       0.0507      0.09  Q      V  |         |         |         |
 9+50       0.0519      0.09  Q      V  |         |         |         |
10+ 0       0.0531      0.09  Q      V  |         |         |         |
10+10       0.0544      0.09  Q       V |         |         |         |
10+20       0.0556      0.09  Q       V |         |         |         |
10+30       0.0569      0.09  Q       V |         |         |         |
10+40       0.0582      0.10  Q       V |         |         |         |
10+50       0.0596      0.10  Q       V |         |         |         |
11+ 0       0.0610      0.10  Q        V|         |         |         |
11+10       0.0624      0.10  Q        V|         |         |         |
11+20       0.0638      0.10  Q        V|         |         |         |
11+30       0.0652      0.11  Q        V|         |         |         |
11+40       0.0667      0.11  Q        V|         |         |         |
11+50       0.0683      0.11  Q         V        |         |         |
12+ 0       0.0698      0.11  Q         V        |         |         |
12+10       0.0713      0.11  Q         V        |         |         |
```



```
   22+10       0.2615      0.06  Q          |          |          |        V |
   22+20       0.2623      0.06  Q          |          |          |        V |
   22+30       0.2631      0.06  Q          |          |          |        V |
   22+40       0.2639      0.06  Q          |          |          |         V|
   22+50       0.2647      0.06  Q          |          |          |         V|
   23+ 0       0.2655      0.06  Q          |          |          |         V|
   23+10       0.2662      0.06  Q          |          |          |         V|
   23+20       0.2670      0.05  Q          |          |          |         V|
   23+30       0.2677      0.05  Q          |          |          |         V|
   23+40       0.2685      0.05  Q          |          |          |         V|
   23+50       0.2692      0.05  Q          |          |          |         V|
   24+ 0       0.2699      0.05  Q          |          |          |         V|
   24+10       0.2705      0.04  Q          |          |          |         V|
   24+20       0.2706      0.01  Q          |          |          |         V|
   24+30       0.2706      0.00  Q          |          |          |         V|
-------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 2004-2014, Version 9.0

Study date 06/15/20

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Kern County Synthetic Unit Hydrograph Hydrology Method
Manual date - 1992

Program License Serial Number 6394

A2
100 YR - 24 HR STORM EVENT

Storm Event Year = 100

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.650

Zone Designation: San Joaquin Valley Latitude = 35.40

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
1.06	6	0.66
Rainfall data for year 2		
1.06	24	0.97
Rainfall data for year 100		
1.06	6	1.64
Rainfall data for year 100		
1.06	24	2.81

++
SAN JOAQUIN VALLEY area of study
Log-Log Rainfall Intensity Slope = 0.65

******** Area-averaged max loss rate, Fm ********

SCS curve Number	Area (Ac.)	Area Fraction	Fp (In/Hr)	Ap (dec.)	Fm (In/Hr)
86.0	1.06	1.000	0.272	0.450	0.122

Area-averaged adjusted loss rate Fm (In/Hr) = 0.122

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	S	Pervious Yield Fr
0.48	0.450	86.0	1.63	0.534
0.58	0.550	98.0	0.20	0.918

Area-averaged catchment yield fraction, Y = 0.745
Area-averaged low loss fraction, Yb = 0.255
Direct entry of lag time by user
++
Watershed area = 1.06(Ac.)
Catchment Lag time = 0.160 hours
Unit interval = 10.000 minutes
Unit interval percentage of lag time = 104.1667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.122(In/Hr)
Average low loss rate fraction (Yb) = 0.255 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.298(In)
Computed peak 30-minute rainfall = 0.558(In)
Specified peak 1-hour rainfall = 0.712(In)
Computed peak 3-hour rainfall = 1.187(In)
Specified peak 6-hour rainfall = 1.640(In)
Specified peak 24-hour rainfall = 2.810(In)

Rainfall depth area reduction factors:
Using a total area of 1.06(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000	Adjusted rainfall = 0.298(In)
30-minute factor = 1.000	Adjusted rainfall = 0.558(In)
1-hour factor = 1.000	Adjusted rainfall = 0.712(In)
3-hour factor = 1.000	Adjusted rainfall = 1.187(In)
6-hour factor = 1.000	Adjusted rainfall = 1.640(In)
24-hour factor = 1.000	Adjusted rainfall = 2.810(In)

U n i t H y d r o g r a p h

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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 6.41 (CFS))	
1	18.421	1.181
2	81.273	4.029
3	98.453	1.101
4	100.000	0.099

Rainfall values calculated at 5 minute intervals:

Peak Rainfall Unit Number	Intensity	Depth	Adjusted	Unit Rainfall (In)
1	3.58	0.30	0.30	0.298
2	2.28	0.38	0.38	0.082
3	1.75	0.44	0.44	0.058
4	1.45	0.48	0.48	0.046
5	1.26	0.52	0.52	0.039
6	1.12	0.56	0.56	0.035
7	1.01	0.59	0.59	0.031
8	0.93	0.62	0.62	0.028
9	0.86	0.64	0.64	0.026
10	0.80	0.67	0.67	0.024
11	0.75	0.69	0.69	0.023
12	0.71	0.71	0.71	0.021
13	0.68	0.74	0.74	0.027
14	0.66	0.76	0.76	0.026
15	0.63	0.79	0.79	0.025
16	0.61	0.81	0.81	0.024
17	0.59	0.84	0.84	0.023
18	0.57	0.86	0.86	0.023
19	0.56	0.88	0.88	0.022
20	0.54	0.90	0.90	0.021
21	0.53	0.92	0.92	0.021
22	0.51	0.94	0.94	0.020
23	0.50	0.96	0.96	0.020
24	0.49	0.98	0.98	0.019
25	0.48	1.00	1.00	0.019
26	0.47	1.02	1.02	0.018
27	0.46	1.04	1.04	0.018
28	0.45	1.06	1.06	0.018
29	0.44	1.07	1.07	0.017
30	0.44	1.09	1.09	0.017
31	0.43	1.11	1.11	0.017
32	0.42	1.12	1.12	0.017
33	0.41	1.14	1.14	0.016
34	0.41	1.16	1.16	0.016
35	0.40	1.17	1.17	0.016
36	0.40	1.19	1.19	0.015
37	0.39	1.20	1.20	0.015
38	0.38	1.22	1.22	0.015
39	0.38	1.23	1.23	0.015
40	0.37	1.25	1.25	0.015
41	0.37	1.26	1.26	0.014
42	0.36	1.28	1.28	0.014
43	0.36	1.29	1.29	0.014
44	0.36	1.30	1.30	0.014
45	0.35	1.32	1.32	0.014
46	0.35	1.33	1.33	0.014
47	0.34	1.34	1.34	0.013
48	0.34	1.36	1.36	0.013
49	0.34	1.37	1.37	0.013
50	0.33	1.38	1.38	0.013
51	0.33	1.40	1.40	0.013
52	0.33	1.41	1.41	0.013
53	0.32	1.42	1.42	0.013
54	0.32	1.43	1.43	0.012
55	0.32	1.45	1.45	0.012
56	0.31	1.46	1.46	0.012

57	0.31	1.47	1.47	0.012
58	0.31	1.48	1.48	0.012
59	0.30	1.49	1.49	0.012
60	0.30	1.51	1.51	0.012
61	0.30	1.52	1.52	0.012
62	0.30	1.53	1.53	0.012
63	0.29	1.54	1.54	0.011
64	0.29	1.55	1.55	0.011
65	0.29	1.56	1.56	0.011
66	0.29	1.57	1.57	0.011
67	0.28	1.59	1.59	0.011
68	0.28	1.60	1.60	0.011
69	0.28	1.61	1.61	0.011
70	0.28	1.62	1.62	0.011
71	0.28	1.63	1.63	0.011
72	0.27	1.64	1.64	0.011
73	0.27	1.65	1.65	0.009
74	0.27	1.66	1.66	0.009
75	0.27	1.67	1.67	0.009
76	0.26	1.67	1.67	0.009
77	0.26	1.68	1.68	0.009
78	0.26	1.69	1.69	0.008
79	0.26	1.70	1.70	0.008
80	0.26	1.71	1.71	0.008
81	0.25	1.72	1.72	0.008
82	0.25	1.72	1.72	0.008
83	0.25	1.73	1.73	0.008
84	0.25	1.74	1.74	0.008
85	0.25	1.75	1.75	0.008
86	0.25	1.76	1.76	0.008
87	0.24	1.77	1.77	0.008
88	0.24	1.77	1.77	0.008
89	0.24	1.78	1.78	0.008
90	0.24	1.79	1.79	0.008
91	0.24	1.80	1.80	0.008
92	0.24	1.80	1.80	0.008
93	0.23	1.81	1.81	0.008
94	0.23	1.82	1.82	0.008
95	0.23	1.83	1.83	0.007
96	0.23	1.83	1.83	0.007
97	0.23	1.84	1.84	0.007
98	0.23	1.85	1.85	0.007
99	0.22	1.86	1.86	0.007
100	0.22	1.86	1.86	0.007
101	0.22	1.87	1.87	0.007
102	0.22	1.88	1.88	0.007
103	0.22	1.88	1.88	0.007
104	0.22	1.89	1.89	0.007
105	0.22	1.90	1.90	0.007
106	0.22	1.91	1.91	0.007
107	0.21	1.91	1.91	0.007
108	0.21	1.92	1.92	0.007
109	0.21	1.93	1.93	0.007
110	0.21	1.93	1.93	0.007
111	0.21	1.94	1.94	0.007
112	0.21	1.95	1.95	0.007
113	0.21	1.95	1.95	0.007
114	0.21	1.96	1.96	0.007
115	0.21	1.97	1.97	0.007

116	0.20	1.97	1.97	0.007
117	0.20	1.98	1.98	0.007
118	0.20	1.99	1.99	0.007
119	0.20	1.99	1.99	0.007
120	0.20	2.00	2.00	0.006
121	0.20	2.01	2.01	0.006
122	0.20	2.01	2.01	0.006
123	0.20	2.02	2.02	0.006
124	0.20	2.03	2.03	0.006
125	0.20	2.03	2.03	0.006
126	0.19	2.04	2.04	0.006
127	0.19	2.04	2.04	0.006
128	0.19	2.05	2.05	0.006
129	0.19	2.06	2.06	0.006
130	0.19	2.06	2.06	0.006
131	0.19	2.07	2.07	0.006
132	0.19	2.08	2.08	0.006
133	0.19	2.08	2.08	0.006
134	0.19	2.09	2.09	0.006
135	0.19	2.09	2.09	0.006
136	0.19	2.10	2.10	0.006
137	0.18	2.11	2.11	0.006
138	0.18	2.11	2.11	0.006
139	0.18	2.12	2.12	0.006
140	0.18	2.12	2.12	0.006
141	0.18	2.13	2.13	0.006
142	0.18	2.14	2.14	0.006
143	0.18	2.14	2.14	0.006
144	0.18	2.15	2.15	0.006
145	0.18	2.15	2.15	0.006
146	0.18	2.16	2.16	0.006
147	0.18	2.16	2.16	0.006
148	0.18	2.17	2.17	0.006
149	0.18	2.18	2.18	0.006
150	0.17	2.18	2.18	0.006
151	0.17	2.19	2.19	0.006
152	0.17	2.19	2.19	0.006
153	0.17	2.20	2.20	0.006
154	0.17	2.20	2.20	0.006
155	0.17	2.21	2.21	0.006
156	0.17	2.21	2.21	0.006
157	0.17	2.22	2.22	0.006
158	0.17	2.23	2.23	0.005
159	0.17	2.23	2.23	0.005
160	0.17	2.24	2.24	0.005
161	0.17	2.24	2.24	0.005
162	0.17	2.25	2.25	0.005
163	0.17	2.25	2.25	0.005
164	0.17	2.26	2.26	0.005
165	0.16	2.26	2.26	0.005
166	0.16	2.27	2.27	0.005
167	0.16	2.27	2.27	0.005
168	0.16	2.28	2.28	0.005
169	0.16	2.28	2.28	0.005
170	0.16	2.29	2.29	0.005
171	0.16	2.29	2.29	0.005
172	0.16	2.30	2.30	0.005
173	0.16	2.31	2.31	0.005
174	0.16	2.31	2.31	0.005

175	0.16	2.32	2.32	0.005
176	0.16	2.32	2.32	0.005
177	0.16	2.33	2.33	0.005
178	0.16	2.33	2.33	0.005
179	0.16	2.34	2.34	0.005
180	0.16	2.34	2.34	0.005
181	0.16	2.35	2.35	0.005
182	0.16	2.35	2.35	0.005
183	0.15	2.36	2.36	0.005
184	0.15	2.36	2.36	0.005
185	0.15	2.37	2.37	0.005
186	0.15	2.37	2.37	0.005
187	0.15	2.38	2.38	0.005
188	0.15	2.38	2.38	0.005
189	0.15	2.39	2.39	0.005
190	0.15	2.39	2.39	0.005
191	0.15	2.40	2.40	0.005
192	0.15	2.40	2.40	0.005
193	0.15	2.41	2.41	0.005
194	0.15	2.41	2.41	0.005
195	0.15	2.42	2.42	0.005
196	0.15	2.42	2.42	0.005
197	0.15	2.42	2.42	0.005
198	0.15	2.43	2.43	0.005
199	0.15	2.43	2.43	0.005
200	0.15	2.44	2.44	0.005
201	0.15	2.44	2.44	0.005
202	0.15	2.45	2.45	0.005
203	0.15	2.45	2.45	0.005
204	0.14	2.46	2.46	0.005
205	0.14	2.46	2.46	0.005
206	0.14	2.47	2.47	0.005
207	0.14	2.47	2.47	0.005
208	0.14	2.48	2.48	0.005
209	0.14	2.48	2.48	0.005
210	0.14	2.49	2.49	0.005
211	0.14	2.49	2.49	0.005
212	0.14	2.49	2.49	0.005
213	0.14	2.50	2.50	0.005
214	0.14	2.50	2.50	0.005
215	0.14	2.51	2.51	0.005
216	0.14	2.51	2.51	0.005
217	0.14	2.52	2.52	0.005
218	0.14	2.52	2.52	0.004
219	0.14	2.53	2.53	0.004
220	0.14	2.53	2.53	0.004
221	0.14	2.54	2.54	0.004
222	0.14	2.54	2.54	0.004
223	0.14	2.54	2.54	0.004
224	0.14	2.55	2.55	0.004
225	0.14	2.55	2.55	0.004
226	0.14	2.56	2.56	0.004
227	0.14	2.56	2.56	0.004
228	0.14	2.57	2.57	0.004
229	0.13	2.57	2.57	0.004
230	0.13	2.57	2.57	0.004
231	0.13	2.58	2.58	0.004
232	0.13	2.58	2.58	0.004
233	0.13	2.59	2.59	0.004

234	0.13	2.59	2.59	0.004
235	0.13	2.60	2.60	0.004
236	0.13	2.60	2.60	0.004
237	0.13	2.61	2.61	0.004
238	0.13	2.61	2.61	0.004
239	0.13	2.61	2.61	0.004
240	0.13	2.62	2.62	0.004
241	0.13	2.62	2.62	0.004
242	0.13	2.63	2.63	0.004
243	0.13	2.63	2.63	0.004
244	0.13	2.63	2.63	0.004
245	0.13	2.64	2.64	0.004
246	0.13	2.64	2.64	0.004
247	0.13	2.65	2.65	0.004
248	0.13	2.65	2.65	0.004
249	0.13	2.66	2.66	0.004
250	0.13	2.66	2.66	0.004
251	0.13	2.66	2.66	0.004
252	0.13	2.67	2.67	0.004
253	0.13	2.67	2.67	0.004
254	0.13	2.68	2.68	0.004
255	0.13	2.68	2.68	0.004
256	0.13	2.68	2.68	0.004
257	0.13	2.69	2.69	0.004
258	0.13	2.69	2.69	0.004
259	0.12	2.70	2.70	0.004
260	0.12	2.70	2.70	0.004
261	0.12	2.70	2.70	0.004
262	0.12	2.71	2.71	0.004
263	0.12	2.71	2.71	0.004
264	0.12	2.72	2.72	0.004
265	0.12	2.72	2.72	0.004
266	0.12	2.72	2.72	0.004
267	0.12	2.73	2.73	0.004
268	0.12	2.73	2.73	0.004
269	0.12	2.74	2.74	0.004
270	0.12	2.74	2.74	0.004
271	0.12	2.74	2.74	0.004
272	0.12	2.75	2.75	0.004
273	0.12	2.75	2.75	0.004
274	0.12	2.76	2.76	0.004
275	0.12	2.76	2.76	0.004
276	0.12	2.76	2.76	0.004
277	0.12	2.77	2.77	0.004
278	0.12	2.77	2.77	0.004
279	0.12	2.78	2.78	0.004
280	0.12	2.78	2.78	0.004
281	0.12	2.78	2.78	0.004
282	0.12	2.79	2.79	0.004
283	0.12	2.79	2.79	0.004
284	0.12	2.79	2.79	0.004
285	0.12	2.80	2.80	0.004
286	0.12	2.80	2.80	0.004
287	0.12	2.81	2.81	0.004
288	0.12	2.81	2.81	0.004

Time = 24.00 Hours Total unit rainfall = 2.81(In)

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0076	0.0019	0.0057
2	0.0076	0.0019	0.0057
3	0.0077	0.0020	0.0057
4	0.0077	0.0020	0.0058
5	0.0078	0.0020	0.0058
6	0.0078	0.0020	0.0058
7	0.0079	0.0020	0.0059
8	0.0080	0.0020	0.0059
9	0.0080	0.0020	0.0060
10	0.0081	0.0021	0.0060
11	0.0081	0.0021	0.0061
12	0.0082	0.0021	0.0061
13	0.0082	0.0021	0.0061
14	0.0083	0.0021	0.0062
15	0.0084	0.0021	0.0062
16	0.0084	0.0021	0.0063
17	0.0085	0.0022	0.0063
18	0.0086	0.0022	0.0064
19	0.0086	0.0022	0.0064
20	0.0087	0.0022	0.0065
21	0.0088	0.0022	0.0065
22	0.0088	0.0023	0.0066
23	0.0089	0.0023	0.0066
24	0.0090	0.0023	0.0067
25	0.0091	0.0023	0.0068
26	0.0091	0.0023	0.0068
27	0.0092	0.0024	0.0069
28	0.0093	0.0024	0.0069
29	0.0094	0.0024	0.0070
30	0.0095	0.0024	0.0071
31	0.0096	0.0024	0.0071
32	0.0097	0.0025	0.0072
33	0.0097	0.0025	0.0073
34	0.0098	0.0025	0.0073
35	0.0099	0.0025	0.0074
36	0.0100	0.0026	0.0075
37	0.0101	0.0026	0.0076
38	0.0102	0.0026	0.0076
39	0.0104	0.0026	0.0077
40	0.0105	0.0027	0.0078
41	0.0106	0.0027	0.0079
42	0.0107	0.0027	0.0080
43	0.0108	0.0028	0.0081
44	0.0109	0.0028	0.0082
45	0.0111	0.0028	0.0083
46	0.0112	0.0029	0.0083
47	0.0113	0.0029	0.0085
48	0.0115	0.0029	0.0086
49	0.0116	0.0030	0.0087
50	0.0118	0.0030	0.0088
51	0.0119	0.0030	0.0089
52	0.0121	0.0031	0.0090
53	0.0123	0.0031	0.0091
54	0.0124	0.0032	0.0093
55	0.0126	0.0032	0.0094
56	0.0128	0.0033	0.0096
57	0.0130	0.0033	0.0097

58	0.0132	0.0034	0.0099
59	0.0134	0.0034	0.0100
60	0.0137	0.0035	0.0102
61	0.0139	0.0035	0.0103
62	0.0141	0.0036	0.0105
63	0.0144	0.0037	0.0107
64	0.0147	0.0037	0.0109
65	0.0149	0.0038	0.0111
66	0.0152	0.0039	0.0114
67	0.0155	0.0040	0.0116
68	0.0159	0.0040	0.0118
69	0.0162	0.0041	0.0121
70	0.0166	0.0042	0.0124
71	0.0170	0.0043	0.0127
72	0.0174	0.0044	0.0130
73	0.0214	0.0054	0.0159
74	0.0219	0.0056	0.0163
75	0.0224	0.0057	0.0167
76	0.0230	0.0059	0.0171
77	0.0236	0.0060	0.0176
78	0.0243	0.0062	0.0181
79	0.0250	0.0064	0.0186
80	0.0258	0.0066	0.0192
81	0.0267	0.0068	0.0199
82	0.0276	0.0070	0.0206
83	0.0287	0.0073	0.0214
84	0.0299	0.0076	0.0222
85	0.0312	0.0080	0.0233
86	0.0327	0.0083	0.0244
87	0.0345	0.0088	0.0257
88	0.0366	0.0093	0.0273
89	0.0391	0.0100	0.0291
90	0.0421	0.0107	0.0314
91	0.0459	0.0117	0.0342
92	0.0509	0.0130	0.0380
93	0.0440	0.0112	0.0328
94	0.0542	0.0138	0.0404
95	0.0739	0.0188	0.0551
96	0.1399	0.0204*	0.1195
97	0.3447	0.0204*	0.3243
98	0.0551	0.0140	0.0411
99	0.0511	0.0130	0.0381
100	0.0422	0.0107	0.0314
101	0.0366	0.0093	0.0273
102	0.0328	0.0083	0.0244
103	0.0299	0.0076	0.0223
104	0.0276	0.0070	0.0206
105	0.0258	0.0066	0.0192
106	0.0243	0.0062	0.0181
107	0.0230	0.0059	0.0171
108	0.0219	0.0056	0.0163
109	0.0174	0.0044	0.0130
110	0.0166	0.0042	0.0124
111	0.0159	0.0040	0.0118
112	0.0152	0.0039	0.0114
113	0.0147	0.0037	0.0109
114	0.0141	0.0036	0.0105
115	0.0137	0.0035	0.0102
116	0.0132	0.0034	0.0099

117	0.0128	0.0033	0.0096
118	0.0124	0.0032	0.0093
119	0.0121	0.0031	0.0090
120	0.0118	0.0030	0.0088
121	0.0115	0.0029	0.0086
122	0.0112	0.0029	0.0083
123	0.0109	0.0028	0.0082
124	0.0107	0.0027	0.0080
125	0.0105	0.0027	0.0078
126	0.0102	0.0026	0.0076
127	0.0100	0.0026	0.0075
128	0.0098	0.0025	0.0073
129	0.0097	0.0025	0.0072
130	0.0095	0.0024	0.0071
131	0.0093	0.0024	0.0069
132	0.0091	0.0023	0.0068
133	0.0090	0.0023	0.0067
134	0.0088	0.0023	0.0066
135	0.0087	0.0022	0.0065
136	0.0086	0.0022	0.0064
137	0.0084	0.0021	0.0063
138	0.0083	0.0021	0.0062
139	0.0082	0.0021	0.0061
140	0.0081	0.0021	0.0060
141	0.0080	0.0020	0.0059
142	0.0078	0.0020	0.0058
143	0.0077	0.0020	0.0058
144	0.0076	0.0019	0.0057
	2.8100	0.6334	2.1766

Total soil rain loss = 0.63(In)
Total effective rainfall = 2.18(In)
Peak flow rate in flood hydrograph = 1.49(CFS)

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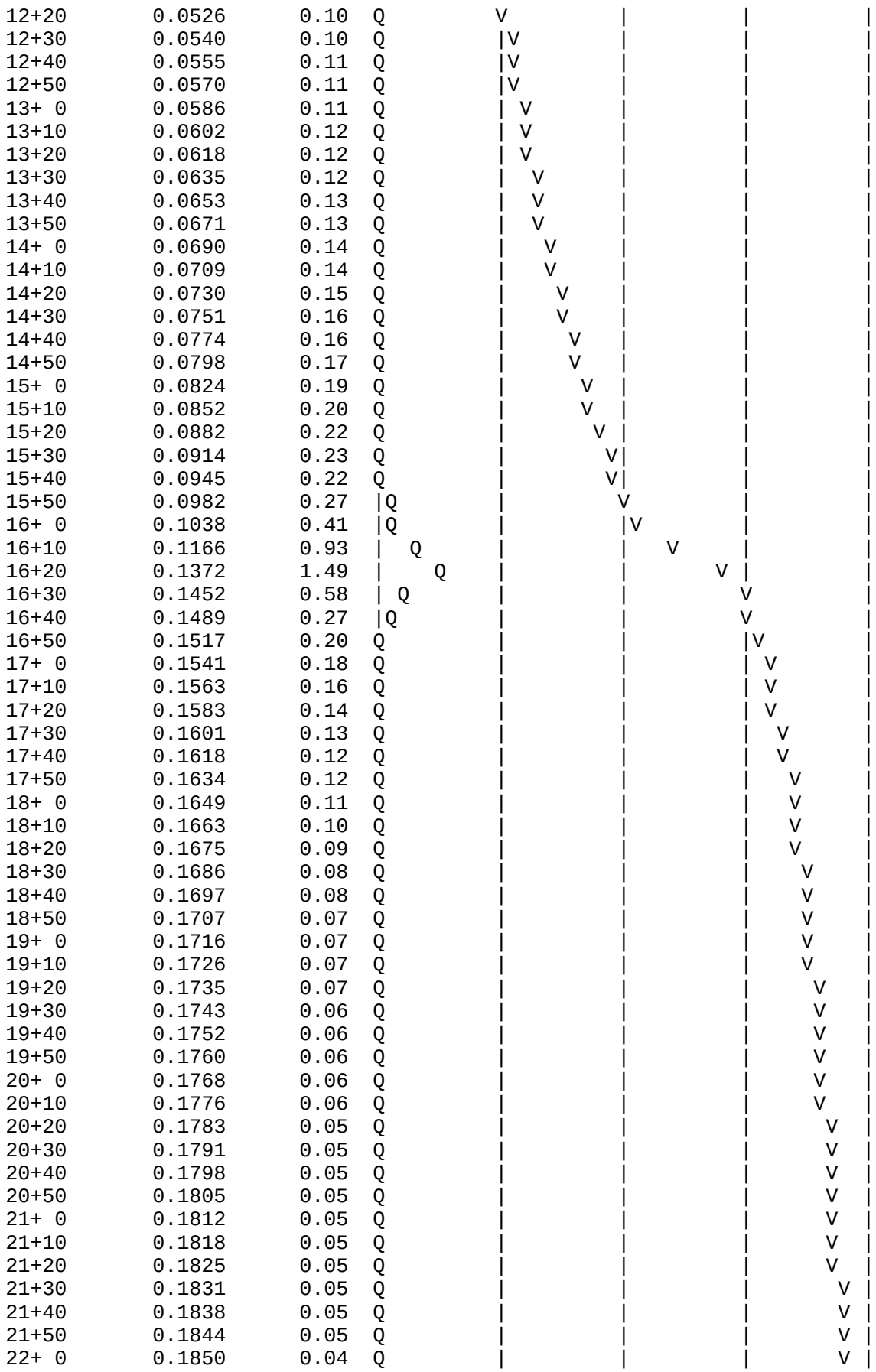
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 10 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+10	0.0001	0.01	Q				
0+20	0.0005	0.03	Q				
0+30	0.0010	0.04	Q				
0+40	0.0015	0.04	Q				
0+50	0.0020	0.04	Q				
1+ 0	0.0025	0.04	Q				
1+10	0.0030	0.04	Q				
1+20	0.0036	0.04	Q				
1+30	0.0041	0.04	Q				
1+40	0.0046	0.04	Q				
1+50	0.0051	0.04	QV				
2+ 0	0.0057	0.04	QV				
2+10	0.0062	0.04	QV				
2+20	0.0068	0.04	QV				

2+30	0.0073	0.04	QV	|	|	|	|
2+40	0.0079	0.04	QV	|	|	|	|
2+50	0.0084	0.04	QV	|	|	|	|
3+ 0	0.0090	0.04	QV	|	|	|	|
3+10	0.0095	0.04	QV	|	|	|	|
3+20	0.0101	0.04	Q V	|	|	|	|
3+30	0.0107	0.04	Q V	|	|	|	|
3+40	0.0112	0.04	Q V	|	|	|	|
3+50	0.0118	0.04	Q V	|	|	|	|
4+ 0	0.0124	0.04	Q V	|	|	|	|
4+10	0.0130	0.04	Q V	|	|	|	|
4+20	0.0136	0.04	Q V	|	|	|	|
4+30	0.0142	0.04	Q V	|	|	|	|
4+40	0.0148	0.04	Q V	|	|	|	|
4+50	0.0154	0.04	Q V	|	|	|	|
5+ 0	0.0160	0.04	Q V	|	|	|	|
5+10	0.0167	0.05	Q V	|	|	|	|
5+20	0.0173	0.05	Q V	|	|	|	|
5+30	0.0179	0.05	Q V	|	|	|	|
5+40	0.0186	0.05	Q V	|	|	|	|
5+50	0.0192	0.05	Q V	|	|	|	|
6+ 0	0.0199	0.05	Q V	|	|	|	|
6+10	0.0205	0.05	Q V	|	|	|	|
6+20	0.0212	0.05	Q V	|	|	|	|
6+30	0.0219	0.05	Q V	|	|	|	|
6+40	0.0225	0.05	Q V	|	|	|	|
6+50	0.0232	0.05	Q V	|	|	|	|
7+ 0	0.0239	0.05	Q V	|	|	|	|
7+10	0.0246	0.05	Q V	|	|	|	|
7+20	0.0253	0.05	Q V	|	|	|	|
7+30	0.0261	0.05	Q V	|	|	|	|
7+40	0.0268	0.05	Q V	|	|	|	|
7+50	0.0275	0.05	Q V	|	|	|	|
8+ 0	0.0283	0.05	Q V	|	|	|	|
8+10	0.0290	0.05	Q V	|	|	|	|
8+20	0.0298	0.06	Q V	|	|	|	|
8+30	0.0306	0.06	Q V	|	|	|	|
8+40	0.0314	0.06	Q V	|	|	|	|
8+50	0.0322	0.06	Q V	|	|	|	|
9+ 0	0.0330	0.06	Q V	|	|	|	|
9+10	0.0338	0.06	Q V	|	|	|	|
9+20	0.0346	0.06	Q V	|	|	|	|
9+30	0.0355	0.06	Q V	|	|	|	|
9+40	0.0363	0.06	Q V	|	|	|	|
9+50	0.0372	0.06	Q V	|	|	|	|
10+ 0	0.0381	0.06	Q V	|	|	|	|
10+10	0.0390	0.07	Q V	|	|	|	|
10+20	0.0399	0.07	Q V	|	|	|	|
10+30	0.0408	0.07	Q V	|	|	|	|
10+40	0.0418	0.07	Q V	|	|	|	|
10+50	0.0427	0.07	Q V	|	|	|	|
11+ 0	0.0437	0.07	Q V	|	|	|	|
11+10	0.0447	0.07	Q V	|	|	|	|
11+20	0.0457	0.07	Q V	|	|	|	|
11+30	0.0468	0.08	Q V	|	|	|	|
11+40	0.0478	0.08	Q V	|	|	|	|
11+50	0.0489	0.08	Q V	|	|	|	|
12+ 0	0.0500	0.08	Q V	|	|	|	|
12+10	0.0512	0.09	Q V	|	|	|	|



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   22+10       0.1856      0.04  Q          |          |          |       V |
   22+20       0.1862      0.04  Q          |          |          |       V |
   22+30       0.1868      0.04  Q          |          |          |       V |
   22+40       0.1874      0.04  Q          |          |          |        V|
   22+50       0.1879      0.04  Q          |          |          |        V|
   23+ 0       0.1885      0.04  Q          |          |          |        V|
   23+10       0.1890      0.04  Q          |          |          |        V|
   23+20       0.1896      0.04  Q          |          |          |        V|
   23+30       0.1901      0.04  Q          |          |          |        V|
   23+40       0.1906      0.04  Q          |          |          |        V|
   23+50       0.1911      0.04  Q          |          |          |        V|
   24+ 0       0.1917      0.04  Q          |          |          |        V|
   24+10       0.1921      0.03  Q          |          |          |        V|
   24+20       0.1922      0.01  Q          |          |          |        V|
   24+30       0.1922      0.00  Q          |          |          |        V|
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 06/15/20

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Kern County Synthetic Unit Hydrograph Hydrology Method
Manual date - 1992

Program License Serial Number 6394

A3
100 yr - 24 Storm Event

Storm Event Year = 100

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.650

Zone Designation: San Joaquin Valley Latitude = 35.40

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
1.64	6	0.66
Rainfall data for year 2		
1.64	24	0.97
Rainfall data for year 100		
1.64	6	1.64
Rainfall data for year 100		
1.64	24	2.81

++
SAN JOAQUIN VALLEY area of study
Log-Log Rainfall Intensity Slope = 0.65

******** Area-averaged max loss rate, Fm ********

SCS curve Number	Area (Ac.)	Area Fraction	Fp (In/Hr)	Ap (dec.)	Fm (In/Hr)
86.0	1.64	1.000	0.272	0.450	0.122

Area-averaged adjusted loss rate Fm (In/Hr) = 0.122

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	S	Pervious Yield Fr
0.74	0.450	86.0	1.63	0.534
0.90	0.550	98.0	0.20	0.918

Area-averaged catchment yield fraction, Y = 0.745
Area-averaged low loss fraction, Yb = 0.255
Direct entry of lag time by user
++
Watershed area = 1.64(Ac.)
Catchment Lag time = 0.160 hours
Unit interval = 10.000 minutes
Unit interval percentage of lag time = 104.1667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.122(In/Hr)
Average low loss rate fraction (Yb) = 0.255 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.298(In)
Computed peak 30-minute rainfall = 0.558(In)
Specified peak 1-hour rainfall = 0.712(In)
Computed peak 3-hour rainfall = 1.187(In)
Specified peak 6-hour rainfall = 1.640(In)
Specified peak 24-hour rainfall = 2.810(In)

Rainfall depth area reduction factors:
Using a total area of 1.64(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.298(In)
30-minute factor = 1.000 Adjusted rainfall = 0.558(In)
1-hour factor = 1.000 Adjusted rainfall = 0.712(In)
3-hour factor = 1.000 Adjusted rainfall = 1.187(In)
6-hour factor = 1.000 Adjusted rainfall = 1.640(In)
24-hour factor = 1.000 Adjusted rainfall = 2.810(In)

U n i t H y d r o g r a p h

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 9.92 (CFS))	
1	18.421	1.827
2	81.273	6.233
3	98.453	1.704
4	100.000	0.153

Rainfall values calculated at 5 minute intervals:

Peak Rainfall Unit Number	Intensity	Depth	Adjusted	Unit Rainfall (In)
1	3.58	0.30	0.30	0.298
2	2.28	0.38	0.38	0.082
3	1.75	0.44	0.44	0.058
4	1.45	0.48	0.48	0.046
5	1.26	0.52	0.52	0.039
6	1.12	0.56	0.56	0.035
7	1.01	0.59	0.59	0.031
8	0.93	0.62	0.62	0.028
9	0.86	0.64	0.64	0.026
10	0.80	0.67	0.67	0.024
11	0.75	0.69	0.69	0.023
12	0.71	0.71	0.71	0.021
13	0.68	0.74	0.74	0.027
14	0.66	0.76	0.76	0.026
15	0.63	0.79	0.79	0.025
16	0.61	0.81	0.81	0.024
17	0.59	0.84	0.84	0.023
18	0.57	0.86	0.86	0.023
19	0.56	0.88	0.88	0.022
20	0.54	0.90	0.90	0.021
21	0.53	0.92	0.92	0.021
22	0.51	0.94	0.94	0.020
23	0.50	0.96	0.96	0.020
24	0.49	0.98	0.98	0.019
25	0.48	1.00	1.00	0.019
26	0.47	1.02	1.02	0.018
27	0.46	1.04	1.04	0.018
28	0.45	1.06	1.06	0.018
29	0.44	1.07	1.07	0.017
30	0.44	1.09	1.09	0.017
31	0.43	1.11	1.11	0.017
32	0.42	1.12	1.12	0.017
33	0.41	1.14	1.14	0.016
34	0.41	1.16	1.16	0.016
35	0.40	1.17	1.17	0.016
36	0.40	1.19	1.19	0.015
37	0.39	1.20	1.20	0.015
38	0.38	1.22	1.22	0.015
39	0.38	1.23	1.23	0.015
40	0.37	1.25	1.25	0.015
41	0.37	1.26	1.26	0.014
42	0.36	1.28	1.28	0.014
43	0.36	1.29	1.29	0.014
44	0.36	1.30	1.30	0.014
45	0.35	1.32	1.32	0.014
46	0.35	1.33	1.33	0.014
47	0.34	1.34	1.34	0.013
48	0.34	1.36	1.36	0.013
49	0.34	1.37	1.37	0.013
50	0.33	1.38	1.38	0.013
51	0.33	1.40	1.40	0.013
52	0.33	1.41	1.41	0.013
53	0.32	1.42	1.42	0.013
54	0.32	1.43	1.43	0.012
55	0.32	1.45	1.45	0.012
56	0.31	1.46	1.46	0.012

57	0.31	1.47	1.47	0.012
58	0.31	1.48	1.48	0.012
59	0.30	1.49	1.49	0.012
60	0.30	1.51	1.51	0.012
61	0.30	1.52	1.52	0.012
62	0.30	1.53	1.53	0.012
63	0.29	1.54	1.54	0.011
64	0.29	1.55	1.55	0.011
65	0.29	1.56	1.56	0.011
66	0.29	1.57	1.57	0.011
67	0.28	1.59	1.59	0.011
68	0.28	1.60	1.60	0.011
69	0.28	1.61	1.61	0.011
70	0.28	1.62	1.62	0.011
71	0.28	1.63	1.63	0.011
72	0.27	1.64	1.64	0.011
73	0.27	1.65	1.65	0.009
74	0.27	1.66	1.66	0.009
75	0.27	1.67	1.67	0.009
76	0.26	1.67	1.67	0.009
77	0.26	1.68	1.68	0.009
78	0.26	1.69	1.69	0.008
79	0.26	1.70	1.70	0.008
80	0.26	1.71	1.71	0.008
81	0.25	1.72	1.72	0.008
82	0.25	1.72	1.72	0.008
83	0.25	1.73	1.73	0.008
84	0.25	1.74	1.74	0.008
85	0.25	1.75	1.75	0.008
86	0.25	1.76	1.76	0.008
87	0.24	1.77	1.77	0.008
88	0.24	1.77	1.77	0.008
89	0.24	1.78	1.78	0.008
90	0.24	1.79	1.79	0.008
91	0.24	1.80	1.80	0.008
92	0.24	1.80	1.80	0.008
93	0.23	1.81	1.81	0.008
94	0.23	1.82	1.82	0.008
95	0.23	1.83	1.83	0.007
96	0.23	1.83	1.83	0.007
97	0.23	1.84	1.84	0.007
98	0.23	1.85	1.85	0.007
99	0.22	1.86	1.86	0.007
100	0.22	1.86	1.86	0.007
101	0.22	1.87	1.87	0.007
102	0.22	1.88	1.88	0.007
103	0.22	1.88	1.88	0.007
104	0.22	1.89	1.89	0.007
105	0.22	1.90	1.90	0.007
106	0.22	1.91	1.91	0.007
107	0.21	1.91	1.91	0.007
108	0.21	1.92	1.92	0.007
109	0.21	1.93	1.93	0.007
110	0.21	1.93	1.93	0.007
111	0.21	1.94	1.94	0.007
112	0.21	1.95	1.95	0.007
113	0.21	1.95	1.95	0.007
114	0.21	1.96	1.96	0.007
115	0.21	1.97	1.97	0.007

116	0.20	1.97	1.97	0.007
117	0.20	1.98	1.98	0.007
118	0.20	1.99	1.99	0.007
119	0.20	1.99	1.99	0.007
120	0.20	2.00	2.00	0.006
121	0.20	2.01	2.01	0.006
122	0.20	2.01	2.01	0.006
123	0.20	2.02	2.02	0.006
124	0.20	2.03	2.03	0.006
125	0.20	2.03	2.03	0.006
126	0.19	2.04	2.04	0.006
127	0.19	2.04	2.04	0.006
128	0.19	2.05	2.05	0.006
129	0.19	2.06	2.06	0.006
130	0.19	2.06	2.06	0.006
131	0.19	2.07	2.07	0.006
132	0.19	2.08	2.08	0.006
133	0.19	2.08	2.08	0.006
134	0.19	2.09	2.09	0.006
135	0.19	2.09	2.09	0.006
136	0.19	2.10	2.10	0.006
137	0.18	2.11	2.11	0.006
138	0.18	2.11	2.11	0.006
139	0.18	2.12	2.12	0.006
140	0.18	2.12	2.12	0.006
141	0.18	2.13	2.13	0.006
142	0.18	2.14	2.14	0.006
143	0.18	2.14	2.14	0.006
144	0.18	2.15	2.15	0.006
145	0.18	2.15	2.15	0.006
146	0.18	2.16	2.16	0.006
147	0.18	2.16	2.16	0.006
148	0.18	2.17	2.17	0.006
149	0.18	2.18	2.18	0.006
150	0.17	2.18	2.18	0.006
151	0.17	2.19	2.19	0.006
152	0.17	2.19	2.19	0.006
153	0.17	2.20	2.20	0.006
154	0.17	2.20	2.20	0.006
155	0.17	2.21	2.21	0.006
156	0.17	2.21	2.21	0.006
157	0.17	2.22	2.22	0.006
158	0.17	2.23	2.23	0.005
159	0.17	2.23	2.23	0.005
160	0.17	2.24	2.24	0.005
161	0.17	2.24	2.24	0.005
162	0.17	2.25	2.25	0.005
163	0.17	2.25	2.25	0.005
164	0.17	2.26	2.26	0.005
165	0.16	2.26	2.26	0.005
166	0.16	2.27	2.27	0.005
167	0.16	2.27	2.27	0.005
168	0.16	2.28	2.28	0.005
169	0.16	2.28	2.28	0.005
170	0.16	2.29	2.29	0.005
171	0.16	2.29	2.29	0.005
172	0.16	2.30	2.30	0.005
173	0.16	2.31	2.31	0.005
174	0.16	2.31	2.31	0.005

175	0.16	2.32	2.32	0.005
176	0.16	2.32	2.32	0.005
177	0.16	2.33	2.33	0.005
178	0.16	2.33	2.33	0.005
179	0.16	2.34	2.34	0.005
180	0.16	2.34	2.34	0.005
181	0.16	2.35	2.35	0.005
182	0.16	2.35	2.35	0.005
183	0.15	2.36	2.36	0.005
184	0.15	2.36	2.36	0.005
185	0.15	2.37	2.37	0.005
186	0.15	2.37	2.37	0.005
187	0.15	2.38	2.38	0.005
188	0.15	2.38	2.38	0.005
189	0.15	2.39	2.39	0.005
190	0.15	2.39	2.39	0.005
191	0.15	2.40	2.40	0.005
192	0.15	2.40	2.40	0.005
193	0.15	2.41	2.41	0.005
194	0.15	2.41	2.41	0.005
195	0.15	2.42	2.42	0.005
196	0.15	2.42	2.42	0.005
197	0.15	2.42	2.42	0.005
198	0.15	2.43	2.43	0.005
199	0.15	2.43	2.43	0.005
200	0.15	2.44	2.44	0.005
201	0.15	2.44	2.44	0.005
202	0.15	2.45	2.45	0.005
203	0.15	2.45	2.45	0.005
204	0.14	2.46	2.46	0.005
205	0.14	2.46	2.46	0.005
206	0.14	2.47	2.47	0.005
207	0.14	2.47	2.47	0.005
208	0.14	2.48	2.48	0.005
209	0.14	2.48	2.48	0.005
210	0.14	2.49	2.49	0.005
211	0.14	2.49	2.49	0.005
212	0.14	2.49	2.49	0.005
213	0.14	2.50	2.50	0.005
214	0.14	2.50	2.50	0.005
215	0.14	2.51	2.51	0.005
216	0.14	2.51	2.51	0.005
217	0.14	2.52	2.52	0.005
218	0.14	2.52	2.52	0.004
219	0.14	2.53	2.53	0.004
220	0.14	2.53	2.53	0.004
221	0.14	2.54	2.54	0.004
222	0.14	2.54	2.54	0.004
223	0.14	2.54	2.54	0.004
224	0.14	2.55	2.55	0.004
225	0.14	2.55	2.55	0.004
226	0.14	2.56	2.56	0.004
227	0.14	2.56	2.56	0.004
228	0.14	2.57	2.57	0.004
229	0.13	2.57	2.57	0.004
230	0.13	2.57	2.57	0.004
231	0.13	2.58	2.58	0.004
232	0.13	2.58	2.58	0.004
233	0.13	2.59	2.59	0.004

234	0.13	2.59	2.59	0.004
235	0.13	2.60	2.60	0.004
236	0.13	2.60	2.60	0.004
237	0.13	2.61	2.61	0.004
238	0.13	2.61	2.61	0.004
239	0.13	2.61	2.61	0.004
240	0.13	2.62	2.62	0.004
241	0.13	2.62	2.62	0.004
242	0.13	2.63	2.63	0.004
243	0.13	2.63	2.63	0.004
244	0.13	2.63	2.63	0.004
245	0.13	2.64	2.64	0.004
246	0.13	2.64	2.64	0.004
247	0.13	2.65	2.65	0.004
248	0.13	2.65	2.65	0.004
249	0.13	2.66	2.66	0.004
250	0.13	2.66	2.66	0.004
251	0.13	2.66	2.66	0.004
252	0.13	2.67	2.67	0.004
253	0.13	2.67	2.67	0.004
254	0.13	2.68	2.68	0.004
255	0.13	2.68	2.68	0.004
256	0.13	2.68	2.68	0.004
257	0.13	2.69	2.69	0.004
258	0.13	2.69	2.69	0.004
259	0.12	2.70	2.70	0.004
260	0.12	2.70	2.70	0.004
261	0.12	2.70	2.70	0.004
262	0.12	2.71	2.71	0.004
263	0.12	2.71	2.71	0.004
264	0.12	2.72	2.72	0.004
265	0.12	2.72	2.72	0.004
266	0.12	2.72	2.72	0.004
267	0.12	2.73	2.73	0.004
268	0.12	2.73	2.73	0.004
269	0.12	2.74	2.74	0.004
270	0.12	2.74	2.74	0.004
271	0.12	2.74	2.74	0.004
272	0.12	2.75	2.75	0.004
273	0.12	2.75	2.75	0.004
274	0.12	2.76	2.76	0.004
275	0.12	2.76	2.76	0.004
276	0.12	2.76	2.76	0.004
277	0.12	2.77	2.77	0.004
278	0.12	2.77	2.77	0.004
279	0.12	2.78	2.78	0.004
280	0.12	2.78	2.78	0.004
281	0.12	2.78	2.78	0.004
282	0.12	2.79	2.79	0.004
283	0.12	2.79	2.79	0.004
284	0.12	2.79	2.79	0.004
285	0.12	2.80	2.80	0.004
286	0.12	2.80	2.80	0.004
287	0.12	2.81	2.81	0.004
288	0.12	2.81	2.81	0.004

Time = 24.00 Hours Total unit rainfall = 2.81(In)

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0076	0.0019	0.0057
2	0.0076	0.0019	0.0057
3	0.0077	0.0020	0.0057
4	0.0077	0.0020	0.0058
5	0.0078	0.0020	0.0058
6	0.0078	0.0020	0.0058
7	0.0079	0.0020	0.0059
8	0.0080	0.0020	0.0059
9	0.0080	0.0020	0.0060
10	0.0081	0.0021	0.0060
11	0.0081	0.0021	0.0061
12	0.0082	0.0021	0.0061
13	0.0082	0.0021	0.0061
14	0.0083	0.0021	0.0062
15	0.0084	0.0021	0.0062
16	0.0084	0.0021	0.0063
17	0.0085	0.0022	0.0063
18	0.0086	0.0022	0.0064
19	0.0086	0.0022	0.0064
20	0.0087	0.0022	0.0065
21	0.0088	0.0022	0.0065
22	0.0088	0.0023	0.0066
23	0.0089	0.0023	0.0066
24	0.0090	0.0023	0.0067
25	0.0091	0.0023	0.0068
26	0.0091	0.0023	0.0068
27	0.0092	0.0024	0.0069
28	0.0093	0.0024	0.0069
29	0.0094	0.0024	0.0070
30	0.0095	0.0024	0.0071
31	0.0096	0.0024	0.0071
32	0.0097	0.0025	0.0072
33	0.0097	0.0025	0.0073
34	0.0098	0.0025	0.0073
35	0.0099	0.0025	0.0074
36	0.0100	0.0026	0.0075
37	0.0101	0.0026	0.0076
38	0.0102	0.0026	0.0076
39	0.0104	0.0026	0.0077
40	0.0105	0.0027	0.0078
41	0.0106	0.0027	0.0079
42	0.0107	0.0027	0.0080
43	0.0108	0.0028	0.0081
44	0.0109	0.0028	0.0082
45	0.0111	0.0028	0.0083
46	0.0112	0.0029	0.0083
47	0.0113	0.0029	0.0085
48	0.0115	0.0029	0.0086
49	0.0116	0.0030	0.0087
50	0.0118	0.0030	0.0088
51	0.0119	0.0030	0.0089
52	0.0121	0.0031	0.0090
53	0.0123	0.0031	0.0091
54	0.0124	0.0032	0.0093
55	0.0126	0.0032	0.0094
56	0.0128	0.0033	0.0096
57	0.0130	0.0033	0.0097

58	0.0132	0.0034	0.0099
59	0.0134	0.0034	0.0100
60	0.0137	0.0035	0.0102
61	0.0139	0.0035	0.0103
62	0.0141	0.0036	0.0105
63	0.0144	0.0037	0.0107
64	0.0147	0.0037	0.0109
65	0.0149	0.0038	0.0111
66	0.0152	0.0039	0.0114
67	0.0155	0.0040	0.0116
68	0.0159	0.0040	0.0118
69	0.0162	0.0041	0.0121
70	0.0166	0.0042	0.0124
71	0.0170	0.0043	0.0127
72	0.0174	0.0044	0.0130
73	0.0214	0.0054	0.0159
74	0.0219	0.0056	0.0163
75	0.0224	0.0057	0.0167
76	0.0230	0.0059	0.0171
77	0.0236	0.0060	0.0176
78	0.0243	0.0062	0.0181
79	0.0250	0.0064	0.0186
80	0.0258	0.0066	0.0192
81	0.0267	0.0068	0.0199
82	0.0276	0.0070	0.0206
83	0.0287	0.0073	0.0214
84	0.0299	0.0076	0.0222
85	0.0312	0.0080	0.0233
86	0.0327	0.0083	0.0244
87	0.0345	0.0088	0.0257
88	0.0366	0.0093	0.0273
89	0.0391	0.0100	0.0291
90	0.0421	0.0107	0.0314
91	0.0459	0.0117	0.0342
92	0.0509	0.0130	0.0380
93	0.0440	0.0112	0.0328
94	0.0542	0.0138	0.0404
95	0.0739	0.0188	0.0551
96	0.1399	0.0204*	0.1195
97	0.3447	0.0204*	0.3243
98	0.0551	0.0140	0.0411
99	0.0511	0.0130	0.0381
100	0.0422	0.0107	0.0314
101	0.0366	0.0093	0.0273
102	0.0328	0.0083	0.0244
103	0.0299	0.0076	0.0223
104	0.0276	0.0070	0.0206
105	0.0258	0.0066	0.0192
106	0.0243	0.0062	0.0181
107	0.0230	0.0059	0.0171
108	0.0219	0.0056	0.0163
109	0.0174	0.0044	0.0130
110	0.0166	0.0042	0.0124
111	0.0159	0.0040	0.0118
112	0.0152	0.0039	0.0114
113	0.0147	0.0037	0.0109
114	0.0141	0.0036	0.0105
115	0.0137	0.0035	0.0102
116	0.0132	0.0034	0.0099

117	0.0128	0.0033	0.0096
118	0.0124	0.0032	0.0093
119	0.0121	0.0031	0.0090
120	0.0118	0.0030	0.0088
121	0.0115	0.0029	0.0086
122	0.0112	0.0029	0.0083
123	0.0109	0.0028	0.0082
124	0.0107	0.0027	0.0080
125	0.0105	0.0027	0.0078
126	0.0102	0.0026	0.0076
127	0.0100	0.0026	0.0075
128	0.0098	0.0025	0.0073
129	0.0097	0.0025	0.0072
130	0.0095	0.0024	0.0071
131	0.0093	0.0024	0.0069
132	0.0091	0.0023	0.0068
133	0.0090	0.0023	0.0067
134	0.0088	0.0023	0.0066
135	0.0087	0.0022	0.0065
136	0.0086	0.0022	0.0064
137	0.0084	0.0021	0.0063
138	0.0083	0.0021	0.0062
139	0.0082	0.0021	0.0061
140	0.0081	0.0021	0.0060
141	0.0080	0.0020	0.0059
142	0.0078	0.0020	0.0058
143	0.0077	0.0020	0.0058
144	0.0076	0.0019	0.0057
	2.8100	0.6334	2.1766

Total soil rain loss = 0.63(In)
Total effective rainfall = 2.18(In)
Peak flow rate in flood hydrograph = 2.31(CFS)

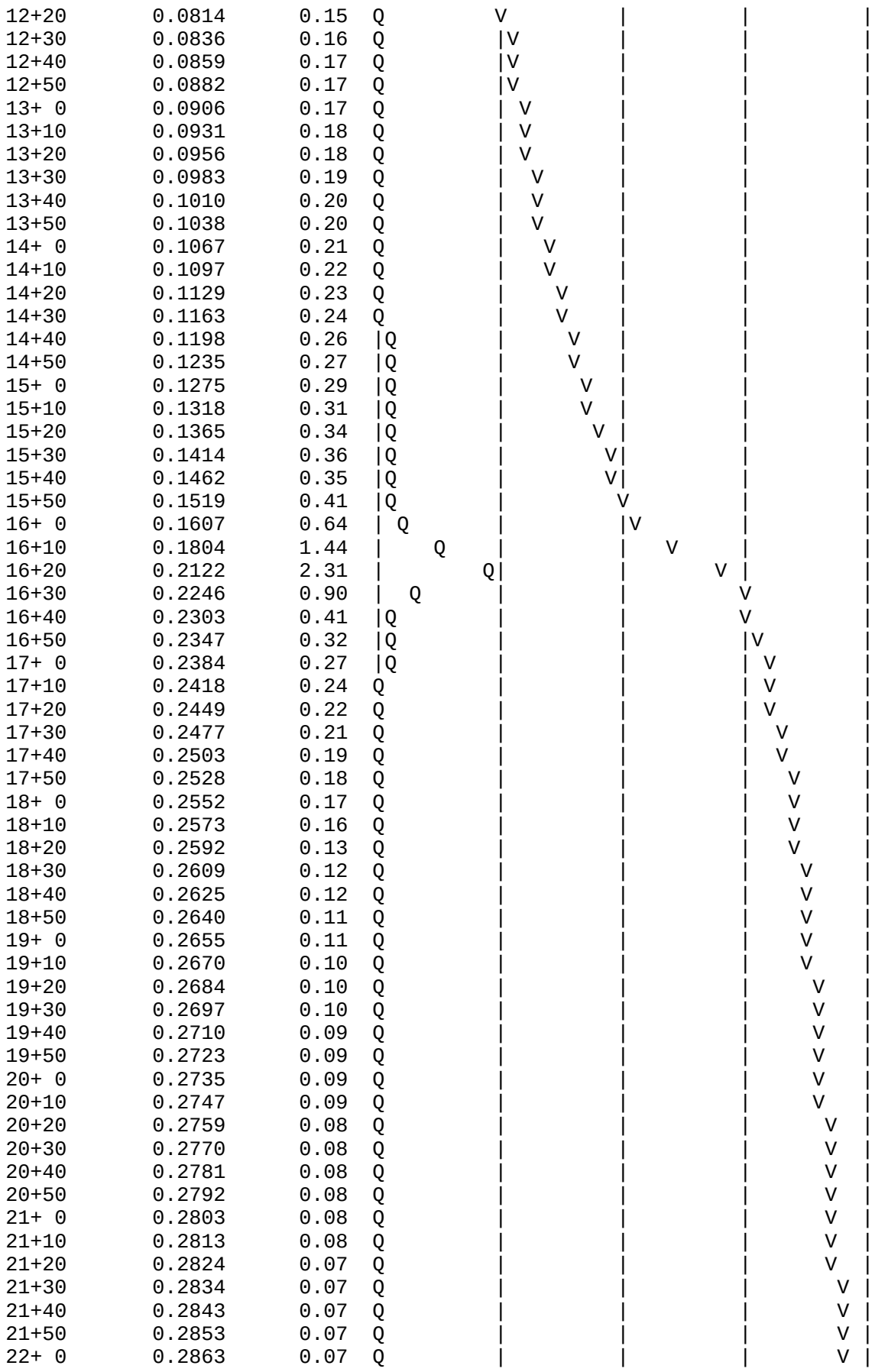
++

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

Hydrograph in 10 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+10	0.0001	0.01	Q				
0+20	0.0008	0.05	Q				
0+30	0.0015	0.06	Q				
0+40	0.0023	0.06	Q				
0+50	0.0031	0.06	Q				
1+ 0	0.0039	0.06	Q				
1+10	0.0047	0.06	Q				
1+20	0.0055	0.06	Q				
1+30	0.0063	0.06	Q				
1+40	0.0071	0.06	Q				
1+50	0.0080	0.06	QV				
2+ 0	0.0088	0.06	QV				
2+10	0.0096	0.06	QV				
2+20	0.0105	0.06	QV				

```
 2+30       0.0113      0.06  QV        |         |         |         |
 2+40       0.0121      0.06  QV        |         |         |         |
 2+50       0.0130      0.06  QV        |         |         |         |
 3+ 0       0.0139      0.06  QV        |         |         |         |
 3+10       0.0147      0.06  QV        |         |         |         |
 3+20       0.0156      0.06  Q V       |         |         |         |
 3+30       0.0165      0.06  Q V       |         |         |         |
 3+40       0.0174      0.06  Q V       |         |         |         |
 3+50       0.0183      0.07  Q V       |         |         |         |
 4+ 0       0.0192      0.07  Q V       |         |         |         |
 4+10       0.0201      0.07  Q V       |         |         |         |
 4+20       0.0210      0.07  Q V       |         |         |         |
 4+30       0.0220      0.07  Q V       |         |         |         |
 4+40       0.0229      0.07  Q  V      |         |         |         |
 4+50       0.0239      0.07  Q  V      |         |         |         |
 5+ 0       0.0248      0.07  Q  V      |         |         |         |
 5+10       0.0258      0.07  Q  V      |         |         |         |
 5+20       0.0268      0.07  Q  V      |         |         |         |
 5+30       0.0277      0.07  Q  V      |         |         |         |
 5+40       0.0287      0.07  Q  V      |         |         |         |
 5+50       0.0297      0.07  Q  V      |         |         |         |
 6+ 0       0.0307      0.07  Q   V     |         |         |         |
 6+10       0.0318      0.07  Q   V     |         |         |         |
 6+20       0.0328      0.07  Q   V     |         |         |         |
 6+30       0.0338      0.08  Q   V     |         |         |         |
 6+40       0.0349      0.08  Q   V     |         |         |         |
 6+50       0.0360      0.08  Q   V     |         |         |         |
 7+ 0       0.0370      0.08  Q   V     |         |         |         |
 7+10       0.0381      0.08  Q    V    |         |         |         |
 7+20       0.0392      0.08  Q    V    |         |         |         |
 7+30       0.0403      0.08  Q    V    |         |         |         |
 7+40       0.0415      0.08  Q    V    |         |         |         |
 7+50       0.0426      0.08  Q    V    |         |         |         |
 8+ 0       0.0438      0.08  Q    V    |         |         |         |
 8+10       0.0449      0.08  Q     V   |         |         |         |
 8+20       0.0461      0.09  Q     V   |         |         |         |
 8+30       0.0473      0.09  Q     V   |         |         |         |
 8+40       0.0485      0.09  Q     V   |         |         |         |
 8+50       0.0498      0.09  Q     V   |         |         |         |
 9+ 0       0.0510      0.09  Q     V   |         |         |         |
 9+10       0.0523      0.09  Q      V  |         |         |         |
 9+20       0.0536      0.09  Q      V  |         |         |         |
 9+30       0.0549      0.09  Q      V  |         |         |         |
 9+40       0.0562      0.10  Q      V  |         |         |         |
 9+50       0.0575      0.10  Q      V  |         |         |         |
10+ 0       0.0589      0.10  Q      V  |         |         |         |
10+10       0.0603      0.10  Q       V |         |         |         |
10+20       0.0617      0.10  Q       V |         |         |         |
10+30       0.0631      0.10  Q       V |         |         |         |
10+40       0.0646      0.11  Q       V |         |         |         |
10+50       0.0661      0.11  Q       V |         |         |         |
11+ 0       0.0676      0.11  Q        V|         |         |         |
11+10       0.0692      0.11  Q        V|         |         |         |
11+20       0.0707      0.11  Q        V|         |         |         |
11+30       0.0724      0.12  Q        V|         |         |         |
11+40       0.0740      0.12  Q        V|         |         |         |
11+50       0.0757      0.12  Q         V        |         |         |
12+ 0       0.0774      0.13  Q         V        |         |         |
12+10       0.0793      0.13  Q         V        |         |         |
```



```
   22+10       0.2872      0.07  Q          |          |          |       V |
   22+20       0.2881      0.07  Q          |          |          |       V |
   22+30       0.2890      0.07  Q          |          |          |       V |
   22+40       0.2899      0.06  Q          |          |          |        V|
   22+50       0.2908      0.06  Q          |          |          |        V|
   23+ 0       0.2916      0.06  Q          |          |          |        V|
   23+10       0.2925      0.06  Q          |          |          |        V|
   23+20       0.2933      0.06  Q          |          |          |        V|
   23+30       0.2941      0.06  Q          |          |          |        V|
   23+40       0.2949      0.06  Q          |          |          |        V|
   23+50       0.2957      0.06  Q          |          |          |        V|
   24+ 0       0.2965      0.06  Q          |          |          |        V|
   24+10       0.2972      0.05  Q          |          |          |        V|
   24+20       0.2973      0.01  Q          |          |          |        V|
   24+30       0.2973      0.00  Q          |          |          |         V
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 2004-2014, Version 9.0

Study date 06/15/20

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Kern County Synthetic Unit Hydrograph Hydrology Method
Manual date - 1992

Program License Serial Number 6394

A4
100 YR - 24 HR STORM EVENT

Storm Event Year = 100

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.650

Zone Designation: San Joaquin Valley Latitude = 35.40

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
2.80	6	0.66
Rainfall data for year 2		
2.80	24	0.97
Rainfall data for year 100		
2.80	6	1.64
Rainfall data for year 100		
2.80	24	2.81

++
SAN JOAQUIN VALLEY area of study
Log-Log Rainfall Intensity Slope = 0.65

******** Area-averaged max loss rate, Fm ********

SCS curve Number	Area (Ac.)	Area Fraction	Fp (In/Hr)	Ap (dec.)	Fm (In/Hr)
86.0	2.80	1.000	0.272	0.350	0.095

Area-averaged adjusted loss rate Fm (In/Hr) = 0.095

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	S	Pervious Yield Fr
0.98	0.350	86.0	1.63	0.534
1.82	0.650	98.0	0.20	0.918

Area-averaged catchment yield fraction, Y = 0.784
Area-averaged low loss fraction, Yb = 0.216
Direct entry of lag time by user
++
Watershed area = 2.80(Ac.)
Catchment Lag time = 0.160 hours
Unit interval = 10.000 minutes
Unit interval percentage of lag time = 104.1667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.095(In/Hr)
Average low loss rate fraction (Yb) = 0.216 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.298(In)
Computed peak 30-minute rainfall = 0.558(In)
Specified peak 1-hour rainfall = 0.712(In)
Computed peak 3-hour rainfall = 1.187(In)
Specified peak 6-hour rainfall = 1.640(In)
Specified peak 24-hour rainfall = 2.810(In)

Rainfall depth area reduction factors:
Using a total area of 2.80(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.298(In)
30-minute factor = 1.000 Adjusted rainfall = 0.558(In)
1-hour factor = 1.000 Adjusted rainfall = 0.712(In)
3-hour factor = 1.000 Adjusted rainfall = 1.187(In)
6-hour factor = 1.000 Adjusted rainfall = 1.640(In)
24-hour factor = 1.000 Adjusted rainfall = 2.810(In)

U n i t H y d r o g r a p h

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 16.93 (CFS))		
1	18.421	3.119
2	81.273	10.642
3	98.453	2.909
4	100.000	0.262

Rainfall values calculated at 5 minute intervals:

Peak Rainfall Unit Number	Intensity	Depth	Adjusted	Unit Rainfall (In)
1	3.58	0.30	0.30	0.298
2	2.28	0.38	0.38	0.082
3	1.75	0.44	0.44	0.058
4	1.45	0.48	0.48	0.046
5	1.26	0.52	0.52	0.039
6	1.12	0.56	0.56	0.035
7	1.01	0.59	0.59	0.031
8	0.93	0.62	0.62	0.028
9	0.86	0.64	0.64	0.026
10	0.80	0.67	0.67	0.024
11	0.75	0.69	0.69	0.023
12	0.71	0.71	0.71	0.021
13	0.68	0.74	0.74	0.027
14	0.66	0.76	0.76	0.026
15	0.63	0.79	0.79	0.025
16	0.61	0.81	0.81	0.024
17	0.59	0.84	0.84	0.023
18	0.57	0.86	0.86	0.023
19	0.56	0.88	0.88	0.022
20	0.54	0.90	0.90	0.021
21	0.53	0.92	0.92	0.021
22	0.51	0.94	0.94	0.020
23	0.50	0.96	0.96	0.020
24	0.49	0.98	0.98	0.019
25	0.48	1.00	1.00	0.019
26	0.47	1.02	1.02	0.018
27	0.46	1.04	1.04	0.018
28	0.45	1.06	1.06	0.018
29	0.44	1.07	1.07	0.017
30	0.44	1.09	1.09	0.017
31	0.43	1.11	1.11	0.017
32	0.42	1.12	1.12	0.017
33	0.41	1.14	1.14	0.016
34	0.41	1.16	1.16	0.016
35	0.40	1.17	1.17	0.016
36	0.40	1.19	1.19	0.015
37	0.39	1.20	1.20	0.015
38	0.38	1.22	1.22	0.015
39	0.38	1.23	1.23	0.015
40	0.37	1.25	1.25	0.015
41	0.37	1.26	1.26	0.014
42	0.36	1.28	1.28	0.014
43	0.36	1.29	1.29	0.014
44	0.36	1.30	1.30	0.014
45	0.35	1.32	1.32	0.014
46	0.35	1.33	1.33	0.014
47	0.34	1.34	1.34	0.013
48	0.34	1.36	1.36	0.013
49	0.34	1.37	1.37	0.013
50	0.33	1.38	1.38	0.013
51	0.33	1.40	1.40	0.013
52	0.33	1.41	1.41	0.013
53	0.32	1.42	1.42	0.013
54	0.32	1.43	1.43	0.012
55	0.32	1.45	1.45	0.012
56	0.31	1.46	1.46	0.012

57	0.31	1.47	1.47	0.012
58	0.31	1.48	1.48	0.012
59	0.30	1.49	1.49	0.012
60	0.30	1.51	1.51	0.012
61	0.30	1.52	1.52	0.012
62	0.30	1.53	1.53	0.012
63	0.29	1.54	1.54	0.011
64	0.29	1.55	1.55	0.011
65	0.29	1.56	1.56	0.011
66	0.29	1.57	1.57	0.011
67	0.28	1.59	1.59	0.011
68	0.28	1.60	1.60	0.011
69	0.28	1.61	1.61	0.011
70	0.28	1.62	1.62	0.011
71	0.28	1.63	1.63	0.011
72	0.27	1.64	1.64	0.011
73	0.27	1.65	1.65	0.009
74	0.27	1.66	1.66	0.009
75	0.27	1.67	1.67	0.009
76	0.26	1.67	1.67	0.009
77	0.26	1.68	1.68	0.009
78	0.26	1.69	1.69	0.008
79	0.26	1.70	1.70	0.008
80	0.26	1.71	1.71	0.008
81	0.25	1.72	1.72	0.008
82	0.25	1.72	1.72	0.008
83	0.25	1.73	1.73	0.008
84	0.25	1.74	1.74	0.008
85	0.25	1.75	1.75	0.008
86	0.25	1.76	1.76	0.008
87	0.24	1.77	1.77	0.008
88	0.24	1.77	1.77	0.008
89	0.24	1.78	1.78	0.008
90	0.24	1.79	1.79	0.008
91	0.24	1.80	1.80	0.008
92	0.24	1.80	1.80	0.008
93	0.23	1.81	1.81	0.008
94	0.23	1.82	1.82	0.008
95	0.23	1.83	1.83	0.007
96	0.23	1.83	1.83	0.007
97	0.23	1.84	1.84	0.007
98	0.23	1.85	1.85	0.007
99	0.22	1.86	1.86	0.007
100	0.22	1.86	1.86	0.007
101	0.22	1.87	1.87	0.007
102	0.22	1.88	1.88	0.007
103	0.22	1.88	1.88	0.007
104	0.22	1.89	1.89	0.007
105	0.22	1.90	1.90	0.007
106	0.22	1.91	1.91	0.007
107	0.21	1.91	1.91	0.007
108	0.21	1.92	1.92	0.007
109	0.21	1.93	1.93	0.007
110	0.21	1.93	1.93	0.007
111	0.21	1.94	1.94	0.007
112	0.21	1.95	1.95	0.007
113	0.21	1.95	1.95	0.007
114	0.21	1.96	1.96	0.007
115	0.21	1.97	1.97	0.007

116	0.20	1.97	1.97	0.007
117	0.20	1.98	1.98	0.007
118	0.20	1.99	1.99	0.007
119	0.20	1.99	1.99	0.007
120	0.20	2.00	2.00	0.006
121	0.20	2.01	2.01	0.006
122	0.20	2.01	2.01	0.006
123	0.20	2.02	2.02	0.006
124	0.20	2.03	2.03	0.006
125	0.20	2.03	2.03	0.006
126	0.19	2.04	2.04	0.006
127	0.19	2.04	2.04	0.006
128	0.19	2.05	2.05	0.006
129	0.19	2.06	2.06	0.006
130	0.19	2.06	2.06	0.006
131	0.19	2.07	2.07	0.006
132	0.19	2.08	2.08	0.006
133	0.19	2.08	2.08	0.006
134	0.19	2.09	2.09	0.006
135	0.19	2.09	2.09	0.006
136	0.19	2.10	2.10	0.006
137	0.18	2.11	2.11	0.006
138	0.18	2.11	2.11	0.006
139	0.18	2.12	2.12	0.006
140	0.18	2.12	2.12	0.006
141	0.18	2.13	2.13	0.006
142	0.18	2.14	2.14	0.006
143	0.18	2.14	2.14	0.006
144	0.18	2.15	2.15	0.006
145	0.18	2.15	2.15	0.006
146	0.18	2.16	2.16	0.006
147	0.18	2.16	2.16	0.006
148	0.18	2.17	2.17	0.006
149	0.18	2.18	2.18	0.006
150	0.17	2.18	2.18	0.006
151	0.17	2.19	2.19	0.006
152	0.17	2.19	2.19	0.006
153	0.17	2.20	2.20	0.006
154	0.17	2.20	2.20	0.006
155	0.17	2.21	2.21	0.006
156	0.17	2.21	2.21	0.006
157	0.17	2.22	2.22	0.006
158	0.17	2.23	2.23	0.005
159	0.17	2.23	2.23	0.005
160	0.17	2.24	2.24	0.005
161	0.17	2.24	2.24	0.005
162	0.17	2.25	2.25	0.005
163	0.17	2.25	2.25	0.005
164	0.17	2.26	2.26	0.005
165	0.16	2.26	2.26	0.005
166	0.16	2.27	2.27	0.005
167	0.16	2.27	2.27	0.005
168	0.16	2.28	2.28	0.005
169	0.16	2.28	2.28	0.005
170	0.16	2.29	2.29	0.005
171	0.16	2.29	2.29	0.005
172	0.16	2.30	2.30	0.005
173	0.16	2.31	2.31	0.005
174	0.16	2.31	2.31	0.005

175	0.16	2.32	2.32	0.005
176	0.16	2.32	2.32	0.005
177	0.16	2.33	2.33	0.005
178	0.16	2.33	2.33	0.005
179	0.16	2.34	2.34	0.005
180	0.16	2.34	2.34	0.005
181	0.16	2.35	2.35	0.005
182	0.16	2.35	2.35	0.005
183	0.15	2.36	2.36	0.005
184	0.15	2.36	2.36	0.005
185	0.15	2.37	2.37	0.005
186	0.15	2.37	2.37	0.005
187	0.15	2.38	2.38	0.005
188	0.15	2.38	2.38	0.005
189	0.15	2.39	2.39	0.005
190	0.15	2.39	2.39	0.005
191	0.15	2.40	2.40	0.005
192	0.15	2.40	2.40	0.005
193	0.15	2.41	2.41	0.005
194	0.15	2.41	2.41	0.005
195	0.15	2.42	2.42	0.005
196	0.15	2.42	2.42	0.005
197	0.15	2.42	2.42	0.005
198	0.15	2.43	2.43	0.005
199	0.15	2.43	2.43	0.005
200	0.15	2.44	2.44	0.005
201	0.15	2.44	2.44	0.005
202	0.15	2.45	2.45	0.005
203	0.15	2.45	2.45	0.005
204	0.14	2.46	2.46	0.005
205	0.14	2.46	2.46	0.005
206	0.14	2.47	2.47	0.005
207	0.14	2.47	2.47	0.005
208	0.14	2.48	2.48	0.005
209	0.14	2.48	2.48	0.005
210	0.14	2.49	2.49	0.005
211	0.14	2.49	2.49	0.005
212	0.14	2.49	2.49	0.005
213	0.14	2.50	2.50	0.005
214	0.14	2.50	2.50	0.005
215	0.14	2.51	2.51	0.005
216	0.14	2.51	2.51	0.005
217	0.14	2.52	2.52	0.005
218	0.14	2.52	2.52	0.004
219	0.14	2.53	2.53	0.004
220	0.14	2.53	2.53	0.004
221	0.14	2.54	2.54	0.004
222	0.14	2.54	2.54	0.004
223	0.14	2.54	2.54	0.004
224	0.14	2.55	2.55	0.004
225	0.14	2.55	2.55	0.004
226	0.14	2.56	2.56	0.004
227	0.14	2.56	2.56	0.004
228	0.14	2.57	2.57	0.004
229	0.13	2.57	2.57	0.004
230	0.13	2.57	2.57	0.004
231	0.13	2.58	2.58	0.004
232	0.13	2.58	2.58	0.004
233	0.13	2.59	2.59	0.004

234	0.13	2.59	2.59	0.004
235	0.13	2.60	2.60	0.004
236	0.13	2.60	2.60	0.004
237	0.13	2.61	2.61	0.004
238	0.13	2.61	2.61	0.004
239	0.13	2.61	2.61	0.004
240	0.13	2.62	2.62	0.004
241	0.13	2.62	2.62	0.004
242	0.13	2.63	2.63	0.004
243	0.13	2.63	2.63	0.004
244	0.13	2.63	2.63	0.004
245	0.13	2.64	2.64	0.004
246	0.13	2.64	2.64	0.004
247	0.13	2.65	2.65	0.004
248	0.13	2.65	2.65	0.004
249	0.13	2.66	2.66	0.004
250	0.13	2.66	2.66	0.004
251	0.13	2.66	2.66	0.004
252	0.13	2.67	2.67	0.004
253	0.13	2.67	2.67	0.004
254	0.13	2.68	2.68	0.004
255	0.13	2.68	2.68	0.004
256	0.13	2.68	2.68	0.004
257	0.13	2.69	2.69	0.004
258	0.13	2.69	2.69	0.004
259	0.12	2.70	2.70	0.004
260	0.12	2.70	2.70	0.004
261	0.12	2.70	2.70	0.004
262	0.12	2.71	2.71	0.004
263	0.12	2.71	2.71	0.004
264	0.12	2.72	2.72	0.004
265	0.12	2.72	2.72	0.004
266	0.12	2.72	2.72	0.004
267	0.12	2.73	2.73	0.004
268	0.12	2.73	2.73	0.004
269	0.12	2.74	2.74	0.004
270	0.12	2.74	2.74	0.004
271	0.12	2.74	2.74	0.004
272	0.12	2.75	2.75	0.004
273	0.12	2.75	2.75	0.004
274	0.12	2.76	2.76	0.004
275	0.12	2.76	2.76	0.004
276	0.12	2.76	2.76	0.004
277	0.12	2.77	2.77	0.004
278	0.12	2.77	2.77	0.004
279	0.12	2.78	2.78	0.004
280	0.12	2.78	2.78	0.004
281	0.12	2.78	2.78	0.004
282	0.12	2.79	2.79	0.004
283	0.12	2.79	2.79	0.004
284	0.12	2.79	2.79	0.004
285	0.12	2.80	2.80	0.004
286	0.12	2.80	2.80	0.004
287	0.12	2.81	2.81	0.004
288	0.12	2.81	2.81	0.004

Time = 24.00 Hours Total unit rainfall = 2.81(In)

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0076	0.0016	0.0060
2	0.0076	0.0017	0.0060
3	0.0077	0.0017	0.0060
4	0.0077	0.0017	0.0061
5	0.0078	0.0017	0.0061
6	0.0078	0.0017	0.0062
7	0.0079	0.0017	0.0062
8	0.0080	0.0017	0.0062
9	0.0080	0.0017	0.0063
10	0.0081	0.0017	0.0063
11	0.0081	0.0018	0.0064
12	0.0082	0.0018	0.0064
13	0.0082	0.0018	0.0065
14	0.0083	0.0018	0.0065
15	0.0084	0.0018	0.0066
16	0.0084	0.0018	0.0066
17	0.0085	0.0018	0.0067
18	0.0086	0.0019	0.0067
19	0.0086	0.0019	0.0068
20	0.0087	0.0019	0.0068
21	0.0088	0.0019	0.0069
22	0.0088	0.0019	0.0069
23	0.0089	0.0019	0.0070
24	0.0090	0.0019	0.0070
25	0.0091	0.0020	0.0071
26	0.0091	0.0020	0.0072
27	0.0092	0.0020	0.0072
28	0.0093	0.0020	0.0073
29	0.0094	0.0020	0.0074
30	0.0095	0.0021	0.0074
31	0.0096	0.0021	0.0075
32	0.0097	0.0021	0.0076
33	0.0097	0.0021	0.0076
34	0.0098	0.0021	0.0077
35	0.0099	0.0022	0.0078
36	0.0100	0.0022	0.0079
37	0.0101	0.0022	0.0079
38	0.0102	0.0022	0.0080
39	0.0104	0.0022	0.0081
40	0.0105	0.0023	0.0082
41	0.0106	0.0023	0.0083
42	0.0107	0.0023	0.0084
43	0.0108	0.0023	0.0085
44	0.0109	0.0024	0.0086
45	0.0111	0.0024	0.0087
46	0.0112	0.0024	0.0088
47	0.0113	0.0025	0.0089
48	0.0115	0.0025	0.0090
49	0.0116	0.0025	0.0091
50	0.0118	0.0026	0.0092
51	0.0119	0.0026	0.0094
52	0.0121	0.0026	0.0095
53	0.0123	0.0027	0.0096
54	0.0124	0.0027	0.0098
55	0.0126	0.0027	0.0099
56	0.0128	0.0028	0.0100
57	0.0130	0.0028	0.0102

58	0.0132	0.0029	0.0104
59	0.0134	0.0029	0.0105
60	0.0137	0.0030	0.0107
61	0.0139	0.0030	0.0109
62	0.0141	0.0031	0.0111
63	0.0144	0.0031	0.0113
64	0.0147	0.0032	0.0115
65	0.0149	0.0032	0.0117
66	0.0152	0.0033	0.0119
67	0.0155	0.0034	0.0122
68	0.0159	0.0034	0.0124
69	0.0162	0.0035	0.0127
70	0.0166	0.0036	0.0130
71	0.0170	0.0037	0.0133
72	0.0174	0.0038	0.0136
73	0.0214	0.0046	0.0168
74	0.0219	0.0047	0.0171
75	0.0224	0.0049	0.0176
76	0.0230	0.0050	0.0180
77	0.0236	0.0051	0.0185
78	0.0243	0.0053	0.0190
79	0.0250	0.0054	0.0196
80	0.0258	0.0056	0.0202
81	0.0267	0.0058	0.0209
82	0.0276	0.0060	0.0216
83	0.0287	0.0062	0.0225
84	0.0299	0.0065	0.0234
85	0.0312	0.0068	0.0245
86	0.0327	0.0071	0.0257
87	0.0345	0.0075	0.0270
88	0.0366	0.0079	0.0287
89	0.0391	0.0085	0.0306
90	0.0421	0.0091	0.0330
91	0.0459	0.0099	0.0360
92	0.0509	0.0110	0.0399
93	0.0440	0.0095	0.0345
94	0.0542	0.0117	0.0425
95	0.0739	0.0159*	0.0580
96	0.1399	0.0159*	0.1240
97	0.3447	0.0159*	0.3288
98	0.0551	0.0119	0.0432
99	0.0512	0.0111	0.0401
100	0.0422	0.0091	0.0330
101	0.0366	0.0079	0.0287
102	0.0328	0.0071	0.0257
103	0.0299	0.0065	0.0234
104	0.0276	0.0060	0.0216
105	0.0258	0.0056	0.0202
106	0.0243	0.0053	0.0190
107	0.0230	0.0050	0.0180
108	0.0219	0.0047	0.0171
109	0.0174	0.0038	0.0136
110	0.0166	0.0036	0.0130
111	0.0159	0.0034	0.0124
112	0.0152	0.0033	0.0119
113	0.0147	0.0032	0.0115
114	0.0141	0.0031	0.0111
115	0.0137	0.0030	0.0107
116	0.0132	0.0029	0.0104

117	0.0128	0.0028	0.0100
118	0.0124	0.0027	0.0098
119	0.0121	0.0026	0.0095
120	0.0118	0.0026	0.0092
121	0.0115	0.0025	0.0090
122	0.0112	0.0024	0.0088
123	0.0109	0.0024	0.0086
124	0.0107	0.0023	0.0084
125	0.0105	0.0023	0.0082
126	0.0102	0.0022	0.0080
127	0.0100	0.0022	0.0079
128	0.0098	0.0021	0.0077
129	0.0097	0.0021	0.0076
130	0.0095	0.0021	0.0074
131	0.0093	0.0020	0.0073
132	0.0091	0.0020	0.0072
133	0.0090	0.0019	0.0070
134	0.0088	0.0019	0.0069
135	0.0087	0.0019	0.0068
136	0.0086	0.0019	0.0067
137	0.0084	0.0018	0.0066
138	0.0083	0.0018	0.0065
139	0.0082	0.0018	0.0064
140	0.0081	0.0017	0.0063
141	0.0080	0.0017	0.0062
142	0.0078	0.0017	0.0062
143	0.0077	0.0017	0.0061
144	0.0076	0.0017	0.0060
	2.8100	0.5350	2.2750

Total soil rain loss = 0.53(In)
Total effective rainfall = 2.28(In)
Peak flow rate in flood hydrograph = 4.01(CFS)

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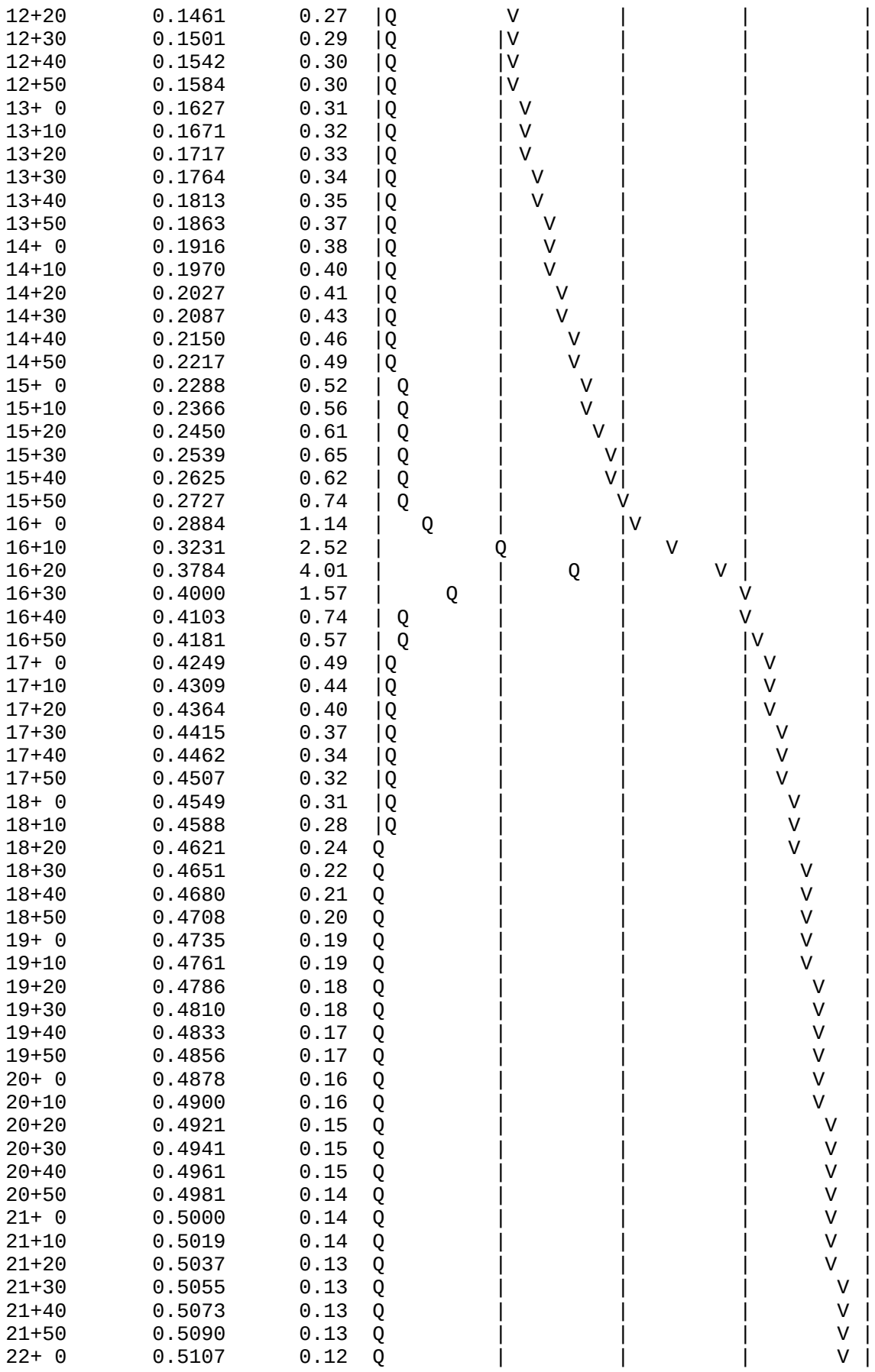
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 10 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+10	0.0003	0.02	Q				
0+20	0.0014	0.08	Q				
0+30	0.0028	0.10	Q				
0+40	0.0042	0.10	Q				
0+50	0.0056	0.10	Q				
1+ 0	0.0070	0.10	Q				
1+10	0.0084	0.10	Q				
1+20	0.0099	0.10	Q				
1+30	0.0113	0.11	Q				
1+40	0.0128	0.11	Q				
1+50	0.0143	0.11	QV				
2+ 0	0.0158	0.11	QV				
2+10	0.0173	0.11	QV				
2+20	0.0188	0.11	QV				

2+30	0.0203	0.11	QV	|	|	|	|
2+40	0.0218	0.11	QV	|	|	|	|
2+50	0.0234	0.11	QV	|	|	|	|
3+ 0	0.0249	0.11	QV	|	|	|	|
3+10	0.0265	0.11	QV	|	|	|	|
3+20	0.0280	0.11	Q V	|	|	|	|
3+30	0.0296	0.12	Q V	|	|	|	|
3+40	0.0312	0.12	Q V	|	|	|	|
3+50	0.0329	0.12	Q V	|	|	|	|
4+ 0	0.0345	0.12	Q V	|	|	|	|
4+10	0.0361	0.12	Q V	|	|	|	|
4+20	0.0378	0.12	Q V	|	|	|	|
4+30	0.0394	0.12	Q V	|	|	|	|
4+40	0.0411	0.12	Q V	|	|	|	|
4+50	0.0428	0.12	Q V	|	|	|	|
5+ 0	0.0445	0.12	Q V	|	|	|	|
5+10	0.0463	0.13	Q V	|	|	|	|
5+20	0.0480	0.13	Q V	|	|	|	|
5+30	0.0498	0.13	Q V	|	|	|	|
5+40	0.0516	0.13	Q V	|	|	|	|
5+50	0.0534	0.13	Q V	|	|	|	|
6+ 0	0.0552	0.13	Q V	|	|	|	|
6+10	0.0570	0.13	Q V	|	|	|	|
6+20	0.0589	0.13	Q V	|	|	|	|
6+30	0.0607	0.14	Q V	|	|	|	|
6+40	0.0626	0.14	Q V	|	|	|	|
6+50	0.0645	0.14	Q V	|	|	|	|
7+ 0	0.0665	0.14	Q V	|	|	|	|
7+10	0.0684	0.14	Q V	|	|	|	|
7+20	0.0704	0.14	Q V	|	|	|	|
7+30	0.0724	0.15	Q V	|	|	|	|
7+40	0.0744	0.15	Q V	|	|	|	|
7+50	0.0765	0.15	Q V	|	|	|	|
8+ 0	0.0785	0.15	Q V	|	|	|	|
8+10	0.0806	0.15	Q V	|	|	|	|
8+20	0.0828	0.15	Q V	|	|	|	|
8+30	0.0849	0.16	Q V	|	|	|	|
8+40	0.0871	0.16	Q V	|	|	|	|
8+50	0.0893	0.16	Q V	|	|	|	|
9+ 0	0.0916	0.16	Q V	|	|	|	|
9+10	0.0938	0.17	Q V	|	|	|	|
9+20	0.0961	0.17	Q V	|	|	|	|
9+30	0.0985	0.17	Q V	|	|	|	|
9+40	0.1009	0.17	Q V	|	|	|	|
9+50	0.1033	0.18	Q V	|	|	|	|
10+ 0	0.1057	0.18	Q V	|	|	|	|
10+10	0.1082	0.18	Q V	|	|	|	|
10+20	0.1108	0.18	Q V	|	|	|	|
10+30	0.1133	0.19	Q V	|	|	|	|
10+40	0.1160	0.19	Q V	|	|	|	|
10+50	0.1186	0.19	Q V	|	|	|	|
11+ 0	0.1214	0.20	Q V	|	|	|	|
11+10	0.1242	0.20	Q V	|	|	|	|
11+20	0.1270	0.21	Q V	|	|	|	|
11+30	0.1299	0.21	Q V	|	|	|	|
11+40	0.1329	0.22	Q V	|	|	|	|
11+50	0.1359	0.22	Q V	|	|	|	|
12+ 0	0.1390	0.23	Q V	|	|	|	|
12+10	0.1423	0.24	Q V	|	|	|	|



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   22+10       0.5124      0.12  Q          |          |          |       V |
   22+20       0.5140      0.12  Q          |          |          |       V |
   22+30       0.5156      0.12  Q          |          |          |       V |
   22+40       0.5172      0.12  Q          |          |          |       V |
   22+50       0.5188      0.11  Q          |          |          |        V|
   23+ 0       0.5203      0.11  Q          |          |          |        V|
   23+10       0.5219      0.11  Q          |          |          |        V|
   23+20       0.5234      0.11  Q          |          |          |        V|
   23+30       0.5248      0.11  Q          |          |          |        V|
   23+40       0.5263      0.11  Q          |          |          |        V|
   23+50       0.5277      0.10  Q          |          |          |        V|
   24+ 0       0.5291      0.10  Q          |          |          |        V|
   24+10       0.5303      0.08  Q          |          |          |        V|
   24+20       0.5305      0.02  Q          |          |          |        V|
   24+30       0.5306      0.00  Q          |          |          |        V|
-------------------------------------------------------------------------
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RATIONAL METHOD HYDROGRAPH PROGRAM
RUNDATE: 6/15/2020
HYDROGRAPH FILE: A1
TIME OF CONCENTRATION: 10
STORM: 100 YR 24 HR STORM

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+10	0.0001	0.01 Q	|	|	|	|	
0+20	0.0007	0.04 Q	|	|	|	|	
0+30	0.0014	0.05 Q	|	|	|	|	
0+40	0.0021	0.05 Q	|	|	|	|	
0+50	0.0028	0.05 Q	|	|	|	|	
1+ 0	0.0035	0.05 Q	|	|	|	|	
1+10	0.0042	0.05 Q	|	|	|	|	
1+20	0.0050	0.05 Q	|	|	|	|	
1+30	0.0057	0.05 Q	|	|	|	|	
1+40	0.0064	0.05 Q	|	|	|	|	
1+50	0.0072	0.05 QV	|	|	|	|	
2+ 0	0.0079	0.05 QV	|	|	|	|	
2+10	0.0087	0.05 QV	|	|	|	|	
2+20	0.0094	0.05 QV	|	|	|	|	
2+30	0.0102	0.06 QV	|	|	|	|	
2+40	0.0110	0.06 QV	|	|	|	|	
2+50	0.0117	0.06 QV	|	|	|	|	
3+ 0	0.0125	0.06 QV	|	|	|	|	
3+10	0.0133	0.06 QV	|	|	|	|	
3+20	0.0141	0.06 Q V	|	|	|	|	
3+30	0.0149	0.06 Q V	|	|	|	|	
3+40	0.0157	0.06 Q V	|	|	|	|	
3+50	0.0165	0.06 Q V	|	|	|	|	
4+ 0	0.0173	0.06 Q V	|	|	|	|	
4+10	0.0181	0.06 Q V	|	|	|	|	
4+20	0.0190	0.06 Q V	|	|	|	|	
4+30	0.0198	0.06 Q V	|	|	|	|	
4+40	0.0207	0.06 Q V	|	|	|	|	
4+50	0.0215	0.06 Q V	|	|	|	|	
5+ 0	0.0224	0.06 Q V	|	|	|	|	
5+10	0.0232	0.06 Q V	|	|	|	|	
5+20	0.0241	0.06 Q V	|	|	|	|	
5+30	0.0250	0.06 Q V	|	|	|	|	
5+40	0.0259	0.06 Q V	|	|	|	|	
5+50	0.0268	0.07 Q V	|	|	|	|	
6+ 0	0.0277	0.07 Q V	|	|	|	|	
6+10	0.0286	0.07 Q V	|	|	|	|	
6+20	0.0296	0.07 Q V	|	|	|	|	
6+30	0.0305	0.07 Q V	|	|	|	|	
6+40	0.0315	0.07 Q V	|	|	|	|	
6+50	0.0324	0.07 Q V	|	|	|	|	
7+ 0	0.0334	0.07 Q V	|	|	|	|	
7+10	0.0344	0.07 Q V	|	|	|	|	
7+20	0.0354	0.07 Q V	|	|	|	|	

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7+30    0.0364    0.07  Q   V   |       |       |       |
7+40    0.0374    0.07  Q   V   |       |       |       |
7+50    0.0384    0.07  Q   V   |       |       |       |
8+ 0    0.0394    0.08  Q   V   |       |       |       |
8+10    0.0405    0.08  Q   V   |       |       |       |
8+20    0.0416    0.08  Q   V   |       |       |       |
8+30    0.0427    0.08  Q   V   |       |       |       |
8+40    0.0437    0.08  Q   V   |       |       |       |
8+50    0.0449    0.08  Q   V   |       |       |       |
9+ 0    0.0460    0.08  Q   V   |       |       |       |
9+10    0.0471    0.08  Q   V   |       |       |       |
9+20    0.0483    0.08  Q   V   |       |       |       |
9+30    0.0495    0.09  Q   V   |       |       |       |
9+40    0.0507    0.09  Q   V   |       |       |       |
9+50    0.0519    0.09  Q   V   |       |       |       |
10+ 0   0.0531    0.09  Q   V   |       |       |       |
10+10   0.0544    0.09  Q   V   |       |       |       |
10+20   0.0556    0.09  Q   V   |       |       |       |
10+30   0.0569    0.09  Q   V   |       |       |       |
10+40   0.0582    0.10  Q   V   |       |       |       |
10+50   0.0596    0.10  Q   V   |       |       |       |
11+ 0   0.0610    0.10  Q   V   |       |       |       |
11+10   0.0624    0.10  Q   V   |       |       |       |
11+20   0.0638    0.10  Q   V   |       |       |       |
11+30   0.0652    0.11  Q   V   |       |       |       |
11+40   0.0667    0.11  Q   V   |       |       |       |
11+50   0.0683    0.11  Q   V   |       |       |       |
12+ 0   0.0698    0.11  Q   V   |       |       |       |
12+10   0.0713    0.11  Q   V   |       |       |       |
12+20   0.0724    0.08  Q   V   |       |       |       |
12+30   0.0734    0.08  Q   V   |       |       |       |
12+40   0.0745    0.08  Q   V   |       |       |       |
12+50   0.0756    0.08  Q   |V      |       |       |
13+ 0   0.0767    0.08  Q   |V      |       |       |
13+10   0.0779    0.09  Q   |V      |       |       |
13+20   0.0792    0.09  Q   |V      |       |       |
13+30   0.0805    0.09  Q   |V      |       |       |
13+40   0.0818    0.10  Q   | V     |       |       |
13+50   0.0833    0.10  Q   | V     |       |       |
14+ 0   0.0848    0.11  Q   | V     |       |       |
14+10   0.0864    0.12  Q   | V     |       |       |
14+20   0.0881    0.12  Q   |  V    |       |       |
14+30   0.0899    0.13  Q   |  V    |       |       |
14+40   0.0919    0.14  Q   |  V    |       |       |
14+50   0.0940    0.16  Q   |  V    |       |       |
15+ 0   0.0964    0.17  Q   |  V    |       |       |
15+10   0.0990    0.19  Q   |  V    |       |       |
15+20   0.1020    0.22  Q   |   V   |       |       |
15+30   0.1058    0.28  |Q   |   V   |       |       |
15+40   0.1119    0.44  |Q   |   V   |       |       |
15+50   0.1201    0.60  | Q  |   V   |       |       |
16+ 0   0.1327    0.91  |  Q |   V   |       |       |
16+10   0.1589    1.91  |   Q |   | V     |       |
```

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16+20    0.1995    2.95 |      |Q     |     V|      |
16+30    0.2152    1.14 |   Q  |      |      V      |
16+40    0.2201    0.36 |Q     |      |      | V    |
16+50    0.2229    0.20  Q      |      |      | V    |
17+ 0    0.2251    0.16  Q      |      |      | V    |
17+10    0.2269    0.13  Q      |      |      |  V   |
17+20    0.2286    0.12  Q      |      |      |  V   |
17+30    0.2300    0.10  Q      |      |      |  V   |
17+40    0.2313    0.09  Q      |      |      |   V  |
17+50    0.2325    0.09  Q      |      |      |   V  |
18+ 0    0.2336    0.08  Q      |      |      |   V  |
18+10    0.2348    0.08  Q      |      |      |   V  |
18+20    0.2362    0.11  Q      |      |      |   V  |
18+30    0.2378    0.11  Q      |      |      |    V |
18+40    0.2392    0.11  Q      |      |      |    V |
18+50    0.2406    0.10  Q      |      |      |    V |
19+ 0    0.2420    0.10  Q      |      |      |   V  |
19+10    0.2433    0.09  Q      |      |      |   V  |
19+20    0.2445    0.09  Q      |      |      |    V |
19+30    0.2457    0.09  Q      |      |      |    V |
19+40    0.2469    0.09  Q      |      |      |    V |
19+50    0.2480    0.08  Q      |      |      |    V |
20+ 0    0.2492    0.08  Q      |      |      |    V |
20+10    0.2502    0.08  Q      |      |      |    V |
20+20    0.2513    0.08  Q      |      |      |     V|
20+30    0.2523    0.07  Q      |      |      |     V|
20+40    0.2533    0.07  Q      |      |      |     V|
20+50    0.2543    0.07  Q      |      |      |     V|
21+ 0    0.2553    0.07  Q      |      |      |    V |
21+10    0.2562    0.07  Q      |      |      |     V|
21+20    0.2571    0.07  Q      |      |      |     V|
21+30    0.2580    0.07  Q      |      |      |     V|
21+40    0.2589    0.06  Q      |      |      |     V|
21+50    0.2598    0.06  Q      |      |      |     V|
22+ 0    0.2607    0.06  Q      |      |      |    V |
22+10    0.2615    0.06  Q      |      |      |     V|
22+20    0.2623    0.06  Q      |      |      |     V|
22+30    0.2631    0.06  Q      |      |      |     V|
22+40    0.2639    0.06  Q      |      |      |      V|
22+50    0.2647    0.06  Q      |      |      |      V|
23+ 0    0.2655    0.06  Q      |      |      |     V|
23+10    0.2662    0.06  Q      |      |      |      V|
23+20    0.2670    0.05  Q      |      |      |      V|
23+30    0.2677    0.05  Q      |      |      |      V|
23+40    0.2685    0.05  Q      |      |      |      V|
23+50    0.2692    0.05  Q      |      |      |      V|
24+ 0    0.2699    0.05  Q      |      |      |     V|
24+10    0.2705    0.04  Q      |      |      |      V|
24+20    0.2706    0.01  Q      |      |      |      V|
24+30    0.2706    0.00  Q      |      |      |      V|
--------------------------------------------------------------------------
```

RATIONAL METHOD HYDROGRAPH PROGRAM
RUNDATE: 6/15/2020
HYDROGRAPH FILE: A2
TIME OF CONCENTRATION: 10
STORM: 100 YR 24 HR STORM

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 2.5 5.0 7.5 10.0
0+10	0.0001	0.01	Q | | | |
0+20	0.0005	0.03	Q | | | |
0+30	0.0010	0.04	Q | | | |
0+40	0.0015	0.04	Q | | | |
0+50	0.0020	0.04	Q | | | |
1+ 0	0.0025	0.04	Q | | | |
1+10	0.0030	0.04	Q | | | |
1+20	0.0036	0.04	Q | | | |
1+30	0.0041	0.04	Q | | | |
1+40	0.0046	0.04	Q | | | |
1+50	0.0051	0.04	QV | | | |
2+ 0	0.0057	0.04	QV | | | |
2+10	0.0062	0.04	QV | | | |
2+20	0.0068	0.04	QV | | | |
2+30	0.0073	0.04	QV | | | |
2+40	0.0079	0.04	QV | | | |
2+50	0.0084	0.04	QV | | | |
3+ 0	0.0090	0.04	QV | | | |
3+10	0.0095	0.04	QV | | | |
3+20	0.0101	0.04	Q V | | | |
3+30	0.0107	0.04	Q V | | | |
3+40	0.0112	0.04	Q V | | | |
3+50	0.0118	0.04	Q V | | | |
4+ 0	0.0124	0.04	Q V | | | |
4+10	0.0130	0.04	Q V | | | |
4+20	0.0136	0.04	Q V | | | |
4+30	0.0142	0.04	Q V | | | |
4+40	0.0148	0.04	Q V | | | |
4+50	0.0154	0.04	Q V | | | |
5+ 0	0.0160	0.04	Q V | | | |
5+10	0.0167	0.05	Q V | | | |
5+20	0.0173	0.05	Q V | | | |
5+30	0.0179	0.05	Q V | | | |
5+40	0.0186	0.05	Q V | | | |
5+50	0.0192	0.05	Q V | | | |
6+ 0	0.0199	0.05	Q V | | | |
6+10	0.0205	0.05	Q V | | | |
6+20	0.0212	0.05	Q V | | | |
6+30	0.0219	0.05	Q V | | | |
6+40	0.0225	0.05	Q V | | | |
6+50	0.0232	0.05	Q V | | | |
7+ 0	0.0239	0.05	Q V | | | |
7+10	0.0246	0.05	Q V | | | |
7+20	0.0253	0.05	Q V | | | |

7+30	0.0261	0.05	Q	V	|	|	|	|
7+40	0.0268	0.05	Q	V	|	|	|	|
7+50	0.0275	0.05	Q	V	|	|	|	|
8+ 0	0.0283	0.05	Q	V	|	|	|	|
8+10	0.0290	0.05	Q	V	|	|	|	|
8+20	0.0298	0.06	Q	V	|	|	|	|
8+30	0.0306	0.06	Q	V	|	|	|	|
8+40	0.0314	0.06	Q	V	|	|	|	|
8+50	0.0322	0.06	Q	V	|	|	|	|
9+ 0	0.0330	0.06	Q	V	|	|	|	|
9+10	0.0338	0.06	Q	V	|	|	|	|
9+20	0.0346	0.06	Q	V	|	|	|	|
9+30	0.0355	0.06	Q	V	|	|	|	|
9+40	0.0363	0.06	Q	V	|	|	|	|
9+50	0.0372	0.06	Q	V	|	|	|	|
10+ 0	0.0381	0.06	Q	V	|	|	|	|
10+10	0.0390	0.07	Q	V	|	|	|	|
10+20	0.0399	0.07	Q	V	|	|	|	|
10+30	0.0408	0.07	Q	V	|	|	|	|
10+40	0.0418	0.07	Q	V	|	|	|	|
10+50	0.0427	0.07	Q	V	|	|	|	|
11+ 0	0.0437	0.07	Q	V	|	|	|	|
11+10	0.0447	0.07	Q	V	|	|	|	|
11+20	0.0457	0.07	Q	V	|	|	|	|
11+30	0.0468	0.08	Q	V	|	|	|	|
11+40	0.0478	0.08	Q	V	|	|	|	|
11+50	0.0489	0.08	Q	V	|	|	|	|
12+ 0	0.0500	0.08	Q	V	|	|	|	|
12+10	0.0512	0.09	Q	V	|	|	|	|
12+20	0.0526	0.10	Q	V	|	|	|	|
12+30	0.0540	0.10	Q	|	V	|	|	|
12+40	0.0555	0.11	Q	|	V	|	|	|
12+50	0.0570	0.11	Q	|	V	|	|	|
13+ 0	0.0586	0.11	Q	|	V	|	|	|
13+10	0.0602	0.12	Q	|	V	|	|	|
13+20	0.0618	0.12	Q	|	V	|	|	|
13+30	0.0635	0.12	Q	|	V	|	|	|
13+40	0.0653	0.13	Q	|	V	|	|	|
13+50	0.0671	0.13	Q	|	V	|	|	|
14+ 0	0.0690	0.14	Q	|	V	|	|	|
14+10	0.0709	0.14	Q	|	V	|	|	|
14+20	0.0730	0.15	Q	|	V	|	|	|
14+30	0.0751	0.16	Q	|	V	|	|	|
14+40	0.0774	0.16	Q	|	V	|	|	|
14+50	0.0798	0.17	Q	|	V	|	|	|
15+ 0	0.0824	0.19	Q	|	V	|	|	|
15+10	0.0852	0.20	Q	|	V	|	|	|
15+20	0.0882	0.22	Q	|	V	|	|	|
15+30	0.0914	0.23	Q	|	V	|	|	|
15+40	0.0945	0.22	Q	|	V	|	|	|
15+50	0.0982	0.27	| Q	|	V	|	|	|
16+ 0	0.1038	0.41	| Q	|	| V	|	|	|
16+10	0.1166	0.93	|	Q	|	|	V	|	|

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16+20    0.1372    1.49 |   Q   |       |     V |       |
16+30    0.1452    0.58 | Q     |       |      V        |
16+40    0.1489    0.27 |Q      |       |      V        |
16+50    0.1517    0.20  Q      |       |      |V       |
17+ 0    0.1541    0.18  Q      |       |      | V      |
17+10    0.1563    0.16  Q      |       |      | V      |
17+20    0.1583    0.14  Q      |       |      | V      |
17+30    0.1601    0.13  Q      |       |      |  V     |
17+40    0.1618    0.12  Q      |       |      |  V     |
17+50    0.1634    0.12  Q      |       |      |   V    |
18+ 0    0.1649    0.11  Q      |       |      |   V    |
18+10    0.1663    0.10  Q      |       |      |   V    |
18+20    0.1675    0.09  Q      |       |      |   V    |
18+30    0.1686    0.08  Q      |       |      |    V   |
18+40    0.1697    0.08  Q      |       |      |    V   |
18+50    0.1707    0.07  Q      |       |      |    V   |
19+ 0    0.1716    0.07  Q      |       |      |   V    |
19+10    0.1726    0.07  Q      |       |      |   V    |
19+20    0.1735    0.07  Q      |       |      |    V   |
19+30    0.1743    0.06  Q      |       |      |    V   |
19+40    0.1752    0.06  Q      |       |      |    V   |
19+50    0.1760    0.06  Q      |       |      |    V   |
20+ 0    0.1768    0.06  Q      |       |      |    V   |
20+10    0.1776    0.06  Q      |       |      |    V   |
20+20    0.1783    0.05  Q      |       |      |     V  |
20+30    0.1791    0.05  Q      |       |      |     V  |
20+40    0.1798    0.05  Q      |       |      |     V  |
20+50    0.1805    0.05  Q      |       |      |     V  |
21+ 0    0.1812    0.05  Q      |       |      |    V   |
21+10    0.1818    0.05  Q      |       |      |     V  |
21+20    0.1825    0.05  Q      |       |      |     V  |
21+30    0.1831    0.05  Q      |       |      |     V  |
21+40    0.1838    0.05  Q      |       |      |     V  |
21+50    0.1844    0.05  Q      |       |      |     V  |
22+ 0    0.1850    0.04  Q      |       |      |     V  |
22+10    0.1856    0.04  Q      |       |      |     V  |
22+20    0.1862    0.04  Q      |       |      |     V  |
22+30    0.1868    0.04  Q      |       |      |     V  |
22+40    0.1874    0.04  Q      |       |      |      V |
22+50    0.1879    0.04  Q      |       |      |      V |
23+ 0    0.1885    0.04  Q      |       |      |      V |
23+10    0.1890    0.04  Q      |       |      |      V |
23+20    0.1896    0.04  Q      |       |      |      V |
23+30    0.1901    0.04  Q      |       |      |      V |
23+40    0.1906    0.04  Q      |       |      |      V |
23+50    0.1911    0.04  Q      |       |      |      V |
24+ 0    0.1917    0.04  Q      |       |      |      V |
24+10    0.1921    0.03  Q      |       |      |      V |
24+20    0.1922    0.01  Q      |       |      |      V |
24+30    0.1922    0.00  Q      |       |      |      V |
-------------------------------------------------------------------------
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RATIONAL METHOD HYDROGRAPH PROGRAM
RUNDATE: 6/15/2020
HYDROGRAPH FILE: A3
TIME OF CONCENTRATION: 10
STORM: 100 YR 24 HR STORM

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+10	0.0001	0.01	Q				
0+20	0.0008	0.05	Q				
0+30	0.0015	0.06	Q				
0+40	0.0023	0.06	Q				
0+50	0.0031	0.06	Q				
1+ 0	0.0039	0.06	Q				
1+10	0.0047	0.06	Q				
1+20	0.0055	0.06	Q				
1+30	0.0063	0.06	Q				
1+40	0.0071	0.06	Q				
1+50	0.0080	0.06	QV				
2+ 0	0.0088	0.06	QV				
2+10	0.0096	0.06	QV				
2+20	0.0105	0.06	QV				
2+30	0.0113	0.06	QV				
2+40	0.0121	0.06	QV				
2+50	0.0130	0.06	QV				
3+ 0	0.0139	0.06	QV				
3+10	0.0147	0.06	QV				
3+20	0.0156	0.06	Q V				
3+30	0.0165	0.06	Q V				
3+40	0.0174	0.06	Q V				
3+50	0.0183	0.07	Q V				
4+ 0	0.0192	0.07	Q V				
4+10	0.0201	0.07	Q V				
4+20	0.0210	0.07	Q V				
4+30	0.0220	0.07	Q V				
4+40	0.0229	0.07	Q V				
4+50	0.0239	0.07	Q V				
5+ 0	0.0248	0.07	Q V				
5+10	0.0258	0.07	Q V				
5+20	0.0268	0.07	Q V				
5+30	0.0277	0.07	Q V				
5+40	0.0287	0.07	Q V				
5+50	0.0297	0.07	Q V				
6+ 0	0.0307	0.07	Q V				
6+10	0.0318	0.07	Q V				
6+20	0.0328	0.07	Q V				
6+30	0.0338	0.08	Q V				
6+40	0.0349	0.08	Q V				
6+50	0.0360	0.08	Q V				
7+ 0	0.0370	0.08	Q V				
7+10	0.0381	0.08	Q V				

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7+20    0.0392    0.08 Q   V   |       |       |       |
7+30    0.0403    0.08 Q   V   |       |       |       |
7+40    0.0415    0.08 Q   V   |       |       |       |
7+50    0.0426    0.08 Q   V   |       |       |       |
8+ 0    0.0438    0.08 Q   V   |       |       |       |
8+10    0.0449    0.08 Q    V  |       |       |       |
8+20    0.0461    0.09 Q    V  |       |       |       |
8+30    0.0473    0.09 Q    V  |       |       |       |
8+40    0.0485    0.09 Q    V  |       |       |       |
8+50    0.0498    0.09 Q    V  |       |       |       |
9+ 0    0.0510    0.09 Q    V  |       |       |       |
9+10    0.0523    0.09 Q    V  |       |       |       |
9+20    0.0536    0.09 Q    V  |       |       |       |
9+30    0.0549    0.09 Q    V  |       |       |       |
9+40    0.0562    0.10 Q    V  |       |       |       |
9+50    0.0575    0.10 Q    V  |       |       |       |
10+ 0   0.0589    0.10 Q    V  |       |       |       |
10+10   0.0603    0.10 Q     V |       |       |       |
10+20   0.0617    0.10 Q     V |       |       |       |
10+30   0.0631    0.10 Q     V |       |       |       |
10+40   0.0646    0.11 Q     V |       |       |       |
10+50   0.0661    0.11 Q     V |       |       |       |
11+ 0   0.0676    0.11 Q     V|       |       |       |
11+10   0.0692    0.11 Q     V|       |       |       |
11+20   0.0707    0.11 Q     V|       |       |       |
11+30   0.0724    0.12 Q     V|       |       |       |
11+40   0.0740    0.12 Q     V|       |       |       |
11+50   0.0757    0.12 Q      V       |       |       |
12+ 0   0.0774    0.13 Q      V       |       |       |
12+10   0.0793    0.13 Q      V       |       |       |
12+20   0.0814    0.15 Q      V       |       |       |
12+30   0.0836    0.16 Q      |V      |       |       |
12+40   0.0859    0.17 Q      |V      |       |       |
12+50   0.0882    0.17 Q      |V      |       |       |
13+ 0   0.0906    0.17 Q      | V     |       |       |
13+10   0.0931    0.18 Q      | V     |       |       |
13+20   0.0956    0.18 Q      | V     |       |       |
13+30   0.0983    0.19 Q      |  V    |       |       |
13+40   0.1010    0.20 Q      |  V    |       |       |
13+50   0.1038    0.20 Q      |  V    |       |       |
14+ 0   0.1067    0.21 Q      |  V    |       |       |
14+10   0.1097    0.22 Q      |  V    |       |       |
14+20   0.1129    0.23 Q      |  V    |       |       |
14+30   0.1163    0.24 Q      |  V    |       |       |
14+40   0.1198    0.26 |Q     |   V   |       |       |
14+50   0.1235    0.27 |Q     |   V   |       |       |
15+ 0   0.1275    0.29 |Q     |   V   |       |       |
15+10   0.1318    0.31 |Q     |   V   |       |       |
15+20   0.1365    0.34 |Q     |    V  |       |       |
15+30   0.1414    0.36 |Q     |     V |       |       |
15+40   0.1462    0.35 |Q     |     V |       |       |
15+50   0.1519    0.41 |Q     |      V|       |       |
16+ 0   0.1607    0.64 | Q    |       |V      |       |
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16+10	0.1804	1.44	| Q |	| V |		
16+20	0.2122	2.31	| Q|	| V |		
16+30	0.2246	0.90	| Q |	| V |		
16+40	0.2303	0.41	|Q |	| V |		
16+50	0.2347	0.32	|Q |	| |V |		
17+ 0	0.2384	0.27	|Q |	| | V |		
17+10	0.2418	0.24	Q |	| | V |		
17+20	0.2449	0.22	Q |	| | V |		
17+30	0.2477	0.21	Q |	| | V |		
17+40	0.2503	0.19	Q |	| | V |		
17+50	0.2528	0.18	Q |	| | V |		
18+ 0	0.2552	0.17	Q |	| | V |		
18+10	0.2573	0.16	Q |	| | V |		
18+20	0.2592	0.13	Q |	| | V |		
18+30	0.2609	0.12	Q |	| | V |		
18+40	0.2625	0.12	Q |	| | V |		
18+50	0.2640	0.11	Q |	| | V |		
19+ 0	0.2655	0.11	Q |	| | V |		
19+10	0.2670	0.10	Q |	| | V |		
19+20	0.2684	0.10	Q |	| | V |		
19+30	0.2697	0.10	Q |	| | V |		
19+40	0.2710	0.09	Q |	| | V |		
19+50	0.2723	0.09	Q |	| | V |		
20+ 0	0.2735	0.09	Q |	| | V |		
20+10	0.2747	0.09	Q |	| | V |		
20+20	0.2759	0.08	Q |	| | V |		
20+30	0.2770	0.08	Q |	| | V |		
20+40	0.2781	0.08	Q |	| | V |		
20+50	0.2792	0.08	Q |	| | V |		
21+ 0	0.2803	0.08	Q |	| | V |		
21+10	0.2813	0.08	Q |	| | V |		
21+20	0.2824	0.07	Q |	| | V |		
21+30	0.2834	0.07	Q |	| | V |		
21+40	0.2843	0.07	Q |	| | V |		
21+50	0.2853	0.07	Q |	| | V |		
22+ 0	0.2863	0.07	Q |	| | V |		
22+10	0.2872	0.07	Q |	| | V |		
22+20	0.2881	0.07	Q |	| | V |		
22+30	0.2890	0.07	Q |	| | V |		
22+40	0.2899	0.06	Q |	| | V|		
22+50	0.2908	0.06	Q |	| | V|		
23+ 0	0.2916	0.06	Q |	| | V|		
23+10	0.2925	0.06	Q |	| | V|		
23+20	0.2933	0.06	Q |	| | V|		
23+30	0.2941	0.06	Q |	| | V|		
23+40	0.2949	0.06	Q |	| | V|		
23+50	0.2957	0.06	Q |	| | V|		
24+ 0	0.2965	0.06	Q |	| | V|		
24+10	0.2972	0.05	Q |	| | V|		
24+20	0.2973	0.01	Q |	| | V|		
24+30	0.2973	0.00	Q |	| | V		

RATIONAL METHOD HYDROGRAPH PROGRAM
RUNDATE: 6/15/2020
HYDROGRAPH FILE: A4
TIME OF CONCENTRATION: 10
STORM: 100 YR 24 HR STORM

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+10	0.0003	0.02	Q				
0+20	0.0014	0.08	Q				
0+30	0.0028	0.10	Q				
0+40	0.0042	0.10	Q				
0+50	0.0056	0.10	Q				
1+ 0	0.0070	0.10	Q				
1+10	0.0084	0.10	Q				
1+20	0.0099	0.10	Q				
1+30	0.0113	0.11	Q				
1+40	0.0128	0.11	Q				
1+50	0.0143	0.11	QV				
2+ 0	0.0158	0.11	QV				
2+10	0.0173	0.11	QV				
2+20	0.0188	0.11	QV				
2+30	0.0203	0.11	QV				
2+40	0.0218	0.11	QV				
2+50	0.0234	0.11	QV				
3+ 0	0.0249	0.11	QV				
3+10	0.0265	0.11	QV				
3+20	0.0280	0.11	Q V				
3+30	0.0296	0.12	Q V				
3+40	0.0312	0.12	Q V				
3+50	0.0329	0.12	Q V				
4+ 0	0.0345	0.12	Q V				
4+10	0.0361	0.12	Q V				
4+20	0.0378	0.12	Q V				
4+30	0.0394	0.12	Q V				
4+40	0.0411	0.12	Q V				
4+50	0.0428	0.12	Q V				
5+ 0	0.0445	0.12	Q V				
5+10	0.0463	0.13	Q V				
5+20	0.0480	0.13	Q V				
5+30	0.0498	0.13	Q V				
5+40	0.0516	0.13	Q V				
5+50	0.0534	0.13	Q V				
6+ 0	0.0552	0.13	Q V				
6+10	0.0570	0.13	Q V				
6+20	0.0589	0.13	Q V				
6+30	0.0607	0.14	Q V				
6+40	0.0626	0.14	Q V				
6+50	0.0645	0.14	Q V				
7+ 0	0.0665	0.14	Q V				
7+10	0.0684	0.14	Q V				
7+20	0.0704	0.14	Q V				

7+30	0.0724	0.15	Q	V	|	|	|	|
7+40	0.0744	0.15	Q	V	|	|	|	|
7+50	0.0765	0.15	Q	V	|	|	|	|
8+ 0	0.0785	0.15	Q	V	|	|	|	|
8+10	0.0806	0.15	Q	V	|	|	|	|
8+20	0.0828	0.15	Q	V	|	|	|	|
8+30	0.0849	0.16	Q	V	|	|	|	|
8+40	0.0871	0.16	Q	V	|	|	|	|
8+50	0.0893	0.16	Q	V	|	|	|	|
9+ 0	0.0916	0.16	Q	V	|	|	|	|
9+10	0.0938	0.17	Q	V	|	|	|	|
9+20	0.0961	0.17	Q	V	|	|	|	|
9+30	0.0985	0.17	Q	V	|	|	|	|
9+40	0.1009	0.17	Q	V	|	|	|	|
9+50	0.1033	0.18	Q	V	|	|	|	|
10+ 0	0.1057	0.18	Q	V	|	|	|	|
10+10	0.1082	0.18	Q	V	|	|	|	|
10+20	0.1108	0.18	Q	V	|	|	|	|
10+30	0.1133	0.19	Q	V	|	|	|	|
10+40	0.1160	0.19	Q	V	|	|	|	|
10+50	0.1186	0.19	Q	V	|	|	|	|
11+ 0	0.1214	0.20	Q	V	|	|	|	|
11+10	0.1242	0.20	Q	V	|	|	|	|
11+20	0.1270	0.21	Q	V	|	|	|	|
11+30	0.1299	0.21	Q	V	|	|	|	|
11+40	0.1329	0.22	Q	V	|	|	|	|
11+50	0.1359	0.22	Q	V	|	|	|	|
12+ 0	0.1390	0.23	Q	V	|	|	|	|
12+10	0.1423	0.24	Q	V	|	|	|	|
12+20	0.1461	0.27	|Q	V	|	|	|	|
12+30	0.1501	0.29	|Q	|V	|	|	|	|
12+40	0.1542	0.30	|Q	|V	|	|	|	|
12+50	0.1584	0.30	|Q	|V	|	|	|	|
13+ 0	0.1627	0.31	|Q	| V	|	|	|	|
13+10	0.1671	0.32	|Q	| V	|	|	|	|
13+20	0.1717	0.33	|Q	| V	|	|	|	|
13+30	0.1764	0.34	|Q	| V	|	|	|	|
13+40	0.1813	0.35	|Q	| V	|	|	|	|
13+50	0.1863	0.37	|Q	| V	|	|	|	|
14+ 0	0.1916	0.38	|Q	| V	|	|	|	|
14+10	0.1970	0.40	|Q	| V	|	|	|	|
14+20	0.2027	0.41	|Q	| V	|	|	|	|
14+30	0.2087	0.43	|Q	| V	|	|	|	|
14+40	0.2150	0.46	|Q	| V	|	|	|	|
14+50	0.2217	0.49	|Q	| V	|	|	|	|
15+ 0	0.2288	0.52	| Q	| V	|	|	|	|
15+10	0.2366	0.56	| Q	| V	|	|	|	|
15+20	0.2450	0.61	| Q	| V	|	|	|	|
15+30	0.2539	0.65	| Q	| V	|	|	|	|
15+40	0.2625	0.62	| Q	| V	|	|	|	|
15+50	0.2727	0.74	| Q	| V	|	|	|	|
16+ 0	0.2884	1.14	| Q	|	|V	|	|	|
16+10	0.3231	2.52	|	Q	|	V	|	|	|

```
16+20    0.3784    4.01 |       |    Q  |     V |       |
16+30    0.4000    1.57 |    Q  |       |      V       |
16+40    0.4103    0.74 | Q     |       |      V       |
16+50    0.4181    0.57 | Q     |       |      |V      |
17+ 0    0.4249    0.49 |Q      |       |      | V     |
17+10    0.4309    0.44 |Q      |       |      | V     |
17+20    0.4364    0.40 |Q      |       |      | V     |
17+30    0.4415    0.37 |Q      |       |      |  V    |
17+40    0.4462    0.34 |Q      |       |      |  V    |
17+50    0.4507    0.32 |Q      |       |      |  V    |
18+ 0    0.4549    0.31 |Q      |       |      |  V    |
18+10    0.4588    0.28 |Q      |       |      |  V    |
18+20    0.4621    0.24  Q      |       |      |  V    |
18+30    0.4651    0.22  Q      |       |      |   V   |
18+40    0.4680    0.21  Q      |       |      |   V   |
18+50    0.4708    0.20  Q      |       |      |   V   |
19+ 0    0.4735    0.19  Q      |       |      |   V   |
19+10    0.4761    0.19  Q      |       |      |   V   |
19+20    0.4786    0.18  Q      |       |      |    V  |
19+30    0.4810    0.18  Q      |       |      |    V  |
19+40    0.4833    0.17  Q      |       |      |    V  |
19+50    0.4856    0.17  Q      |       |      |    V  |
20+ 0    0.4878    0.16  Q      |       |      |   V   |
20+10    0.4900    0.16  Q      |       |      |    V  |
20+20    0.4921    0.15  Q      |       |      |     V |
20+30    0.4941    0.15  Q      |       |      |     V |
20+40    0.4961    0.15  Q      |       |      |     V |
20+50    0.4981    0.14  Q      |       |      |     V |
21+ 0    0.5000    0.14  Q      |       |      |    V  |
21+10    0.5019    0.14  Q      |       |      |     V |
21+20    0.5037    0.13  Q      |       |      |     V |
21+30    0.5055    0.13  Q      |       |      |     V |
21+40    0.5073    0.13  Q      |       |      |     V |
21+50    0.5090    0.13  Q      |       |      |     V |
22+ 0    0.5107    0.12  Q      |       |      |     V |
22+10    0.5124    0.12  Q      |       |      |     V |
22+20    0.5140    0.12  Q      |       |      |     V |
22+30    0.5156    0.12  Q      |       |      |     V |
22+40    0.5172    0.12  Q      |       |      |     V |
22+50    0.5188    0.11  Q      |       |      |      V|
23+ 0    0.5203    0.11  Q      |       |      |     V|
23+10    0.5219    0.11  Q      |       |      |      V|
23+20    0.5234    0.11  Q      |       |      |      V|
23+30    0.5248    0.11  Q      |       |      |      V|
23+40    0.5263    0.11  Q      |       |      |      V|
23+50    0.5277    0.10  Q      |       |      |      V|
24+ 0    0.5291    0.10  Q      |       |      |     V|
24+10    0.5303    0.08  Q      |       |      |      V|
24+20    0.5305    0.02  Q      |       |      |      V|
24+30    0.5306    0.00  Q      |       |      |      V|
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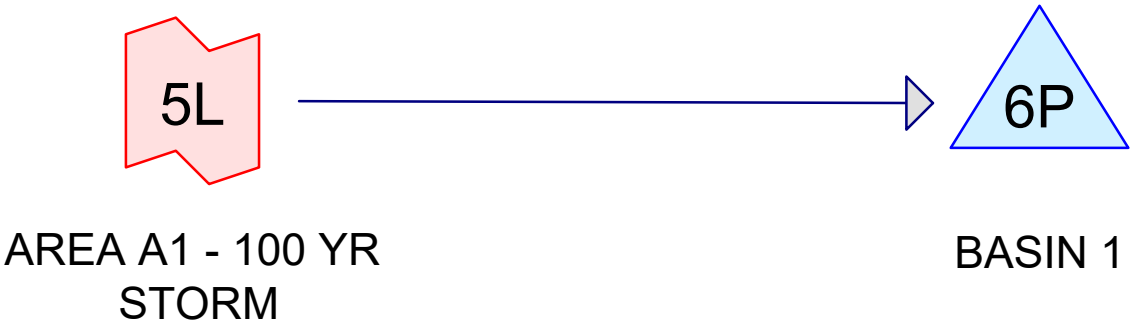

Subcat Reach Pond Link

Routing Diagram for BAKER A1

Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net, Printed 6/16/2020
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Project Notes

Copied 10 events from VISTA-001 24-hr S1 storm

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Area Listing (all nodes)

Area (acres)	C	Description (subcatchment-numbers)
0.000	**0.00**	**TOTAL AREA**

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.000		**TOTAL AREA**

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**TOTAL AREA**	

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Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	Copied 10 events from VISTA-001 24-hr S1 storm

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 6P: BASIN 1 Peak Elev=428.23' Storage=1,385 cf Inflow=2.92 cfs 0.260 af
Outflow=2.92 cfs 0.228 af

Link 5L: AREA A1 - 100 YR STORM Manual Hydrograph delayed by 10.0 min Inflow=2.95 cfs 0.260 af
Area= 1.310 ac 0.90% Imperv. Primary=2.92 cfs 0.260 af

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Summary for Pond 6P: BASIN 1

[92] Warning: Device #1 is above defined storage
[93] Warning: Storage range exceeded by 0.23'

Inflow Area = 1.310 ac, 0.90% Impervious, Inflow Depth > 2.38" for 100-yr event
Inflow = 2.92 cfs @ 15.21 hrs, Volume= 0.260 af
Outflow = 2.92 cfs @ 15.20 hrs, Volume= 0.228 af, Atten= 0%, Lag= 0.0 min
Primary = 2.92 cfs @ 15.20 hrs, Volume= 0.228 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 428.23' @ 15.20 hrs Surf.Area= 1,952 sf Storage= 1,385 cf

Plug-Flow detention time= 137.9 min calculated for 0.228 af (88% of inflow)
Center-of-Mass det. time= 81.5 min (890.2 - 808.7)

Volume	Invert	Avail.Storage	Storage Description
#1	426.00'	1,385 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
426.00	0	0	0
427.00	409	205	205
428.00	1,952	1,181	1,385

Device	Routing	Invert	Outlet Devices
#1	Primary	428.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.91 cfs @ 15.20 hrs HW=428.23' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 2.91 cfs @ 1.57 fps)

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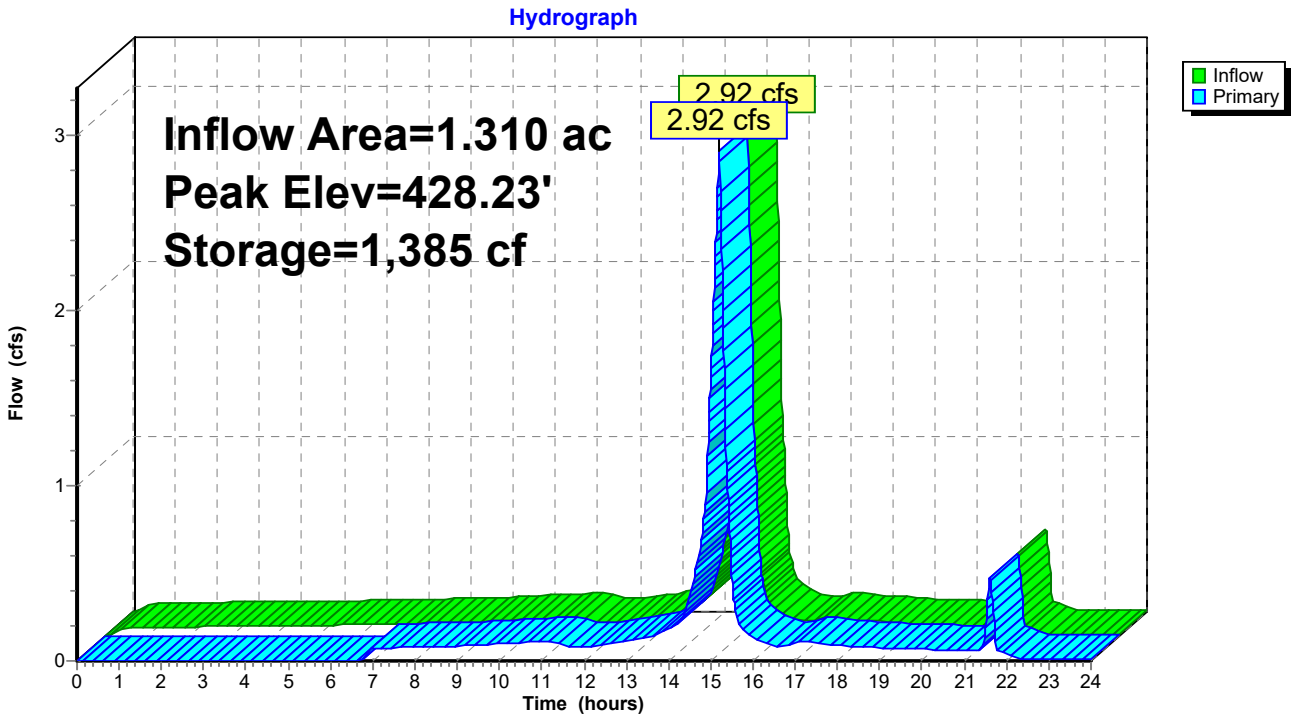
Pond 6P: BASIN 1



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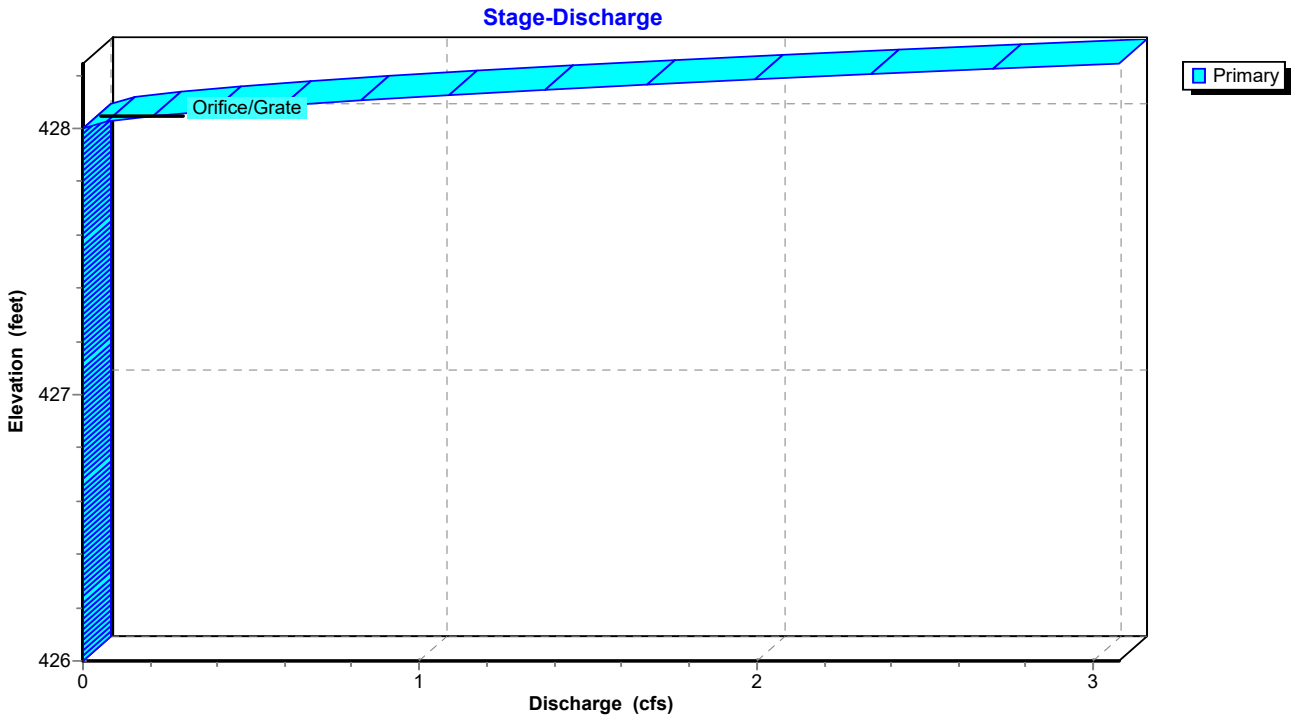
Pond 6P: BASIN 1



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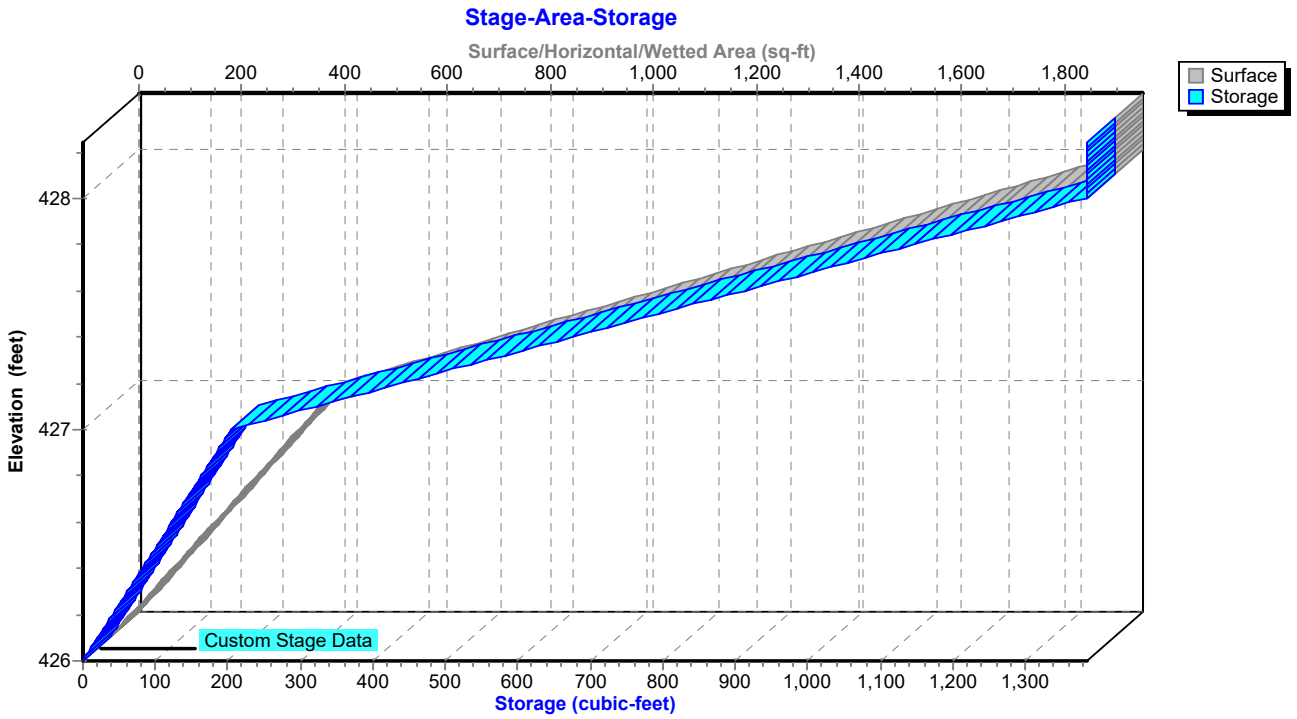
Pond 6P: BASIN 1



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Hydrograph for Pond 6P: BASIN 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	426.00	0.00
1.00	0.05	133	426.65	0.00
2.00	0.05	313	427.09	0.00
3.00	0.06	517	427.26	0.00
4.00	0.06	733	427.45	0.00
5.00	0.06	949	427.63	0.00
6.00	0.07	**1,182**	427.83	0.00
7.00	0.07	**1,385**	428.02	0.07
8.00	0.08	1,385	428.02	0.08
9.00	0.08	1,385	428.02	0.09
10.00	0.10	1,385	428.02	0.10
11.00	0.11	1,385	428.03	0.11
12.00	0.08	1,385	428.02	0.08
13.00	0.11	1,385	428.03	0.12
14.00	0.18	1,385	428.04	0.18
15.00	**1.62**	1,385	**428.16**	**1.62**
16.00	**0.13**	1,385	**428.03**	**0.14**
17.00	0.11	1,385	428.03	0.11
18.00	0.09	1,385	428.02	0.09
19.00	0.07	1,385	428.02	0.08
20.00	0.07	1,385	428.02	0.07
21.00	0.06	1,385	428.02	0.06
22.00	0.05	1,385	428.01	0.05
23.00	0.01	1,385	428.00	0.01
24.00	0.01	1,385	428.00	0.01

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Stage-Discharge for Pond 6P: BASIN 1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
426.00	0.00	426.92	0.00	427.84	0.00
426.02	0.00	426.94	0.00	427.86	0.00
426.04	0.00	426.96	0.00	427.88	0.00
426.06	0.00	426.98	0.00	427.90	0.00
426.08	0.00	427.00	0.00	427.92	0.00
426.10	0.00	427.02	0.00	427.94	0.00
426.12	0.00	427.04	0.00	427.96	0.00
426.14	0.00	427.06	0.00	427.98	0.00
426.16	0.00	427.08	0.00	428.00	0.00
426.18	0.00	427.10	0.00	428.02	0.07
426.20	0.00	427.12	0.00	428.04	0.21
426.22	0.00	427.14	0.00	428.06	0.38
426.24	0.00	427.16	0.00	428.08	0.59
426.26	0.00	427.18	0.00	428.10	0.83
426.28	0.00	427.20	0.00	428.12	1.09
426.30	0.00	427.22	0.00	428.14	1.37
426.32	0.00	427.24	0.00	428.16	1.67
426.34	0.00	427.26	0.00	428.18	2.00
426.36	0.00	427.28	0.00	428.20	2.34
426.38	0.00	427.30	0.00	428.22	2.70
426.40	0.00	427.32	0.00	428.24	**3.08**
426.42	0.00	427.34	0.00		
426.44	0.00	427.36	0.00		
426.46	0.00	427.38	0.00		
426.48	0.00	427.40	0.00		
426.50	0.00	427.42	0.00		
426.52	0.00	427.44	0.00		
426.54	0.00	427.46	0.00		
426.56	0.00	427.48	0.00		
426.58	0.00	427.50	0.00		
426.60	0.00	427.52	0.00		
426.62	0.00	427.54	0.00		
426.64	0.00	427.56	0.00		
426.66	0.00	427.58	0.00		
426.68	0.00	427.60	0.00		
426.70	0.00	427.62	0.00		
426.72	0.00	427.64	0.00		
426.74	0.00	427.66	0.00		
426.76	0.00	427.68	0.00		
426.78	0.00	427.70	0.00		
426.80	0.00	427.72	0.00		
426.82	0.00	427.74	0.00		
426.84	0.00	427.76	0.00		
426.86	0.00	427.78	0.00		
426.88	0.00	427.80	0.00		
426.90	0.00	427.82	0.00		

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Stage-Area-Storage for Pond 6P: BASIN 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
426.00	0	0
426.05	20	10
426.10	41	20
426.15	61	31
426.20	82	41
426.25	102	51
426.30	123	61
426.35	143	72
426.40	164	82
426.45	184	92
426.50	205	102
426.55	225	112
426.60	245	123
426.65	266	133
426.70	286	143
426.75	307	153
426.80	327	164
426.85	348	174
426.90	368	184
426.95	389	194
427.00	409	205
427.05	486	264
427.10	563	323
427.15	640	382
427.20	718	441
427.25	795	500
427.30	872	559
427.35	949	618
427.40	1,026	677
427.45	1,103	736
427.50	1,181	795
427.55	1,258	854
427.60	1,335	913
427.65	1,412	972
427.70	1,489	1,031
427.75	1,566	1,090
427.80	1,643	1,149
427.85	1,721	1,208
427.90	1,798	1,267
427.95	1,875	1,326
428.00	**1,952**	**1,385**
428.05	1,952	1,385
428.10	1,952	1,385
428.15	1,952	1,385
428.20	1,952	1,385

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Summary for Link 5L: AREA A1 - 100 YR STORM

Inflow Area = 1.310 ac, 0.90% Impervious, Inflow Depth > 2.38" for 100-yr event
Inflow = 2.95 cfs @ 15.04 hrs, Volume= 0.260 af
Primary = 2.92 cfs @ 15.21 hrs, Volume= 0.260 af, Atten= 1%, Lag= 10.0 min

Primary outflow = Inflow delayed by 10.0 min, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

100-yr 151 Point manual hydrograph, To= 0.00 hrs, dt= 0.16 hrs, Area= 1.310 ac, 0.90% Imp., cfs =

0.01	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09
0.09	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11
0.11	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.10	0.10
0.11	0.12	0.12	0.13	0.14	0.16	0.17	0.19	0.22	0.28
0.44	0.60	0.91	1.91	2.95	1.14	0.36	0.20	0.16	0.13
0.12	0.10	0.09	0.08	0.08	0.11	0.11	0.11	0.10	0.10
0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.05	0.50	0.05	0.05	0.04	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01									

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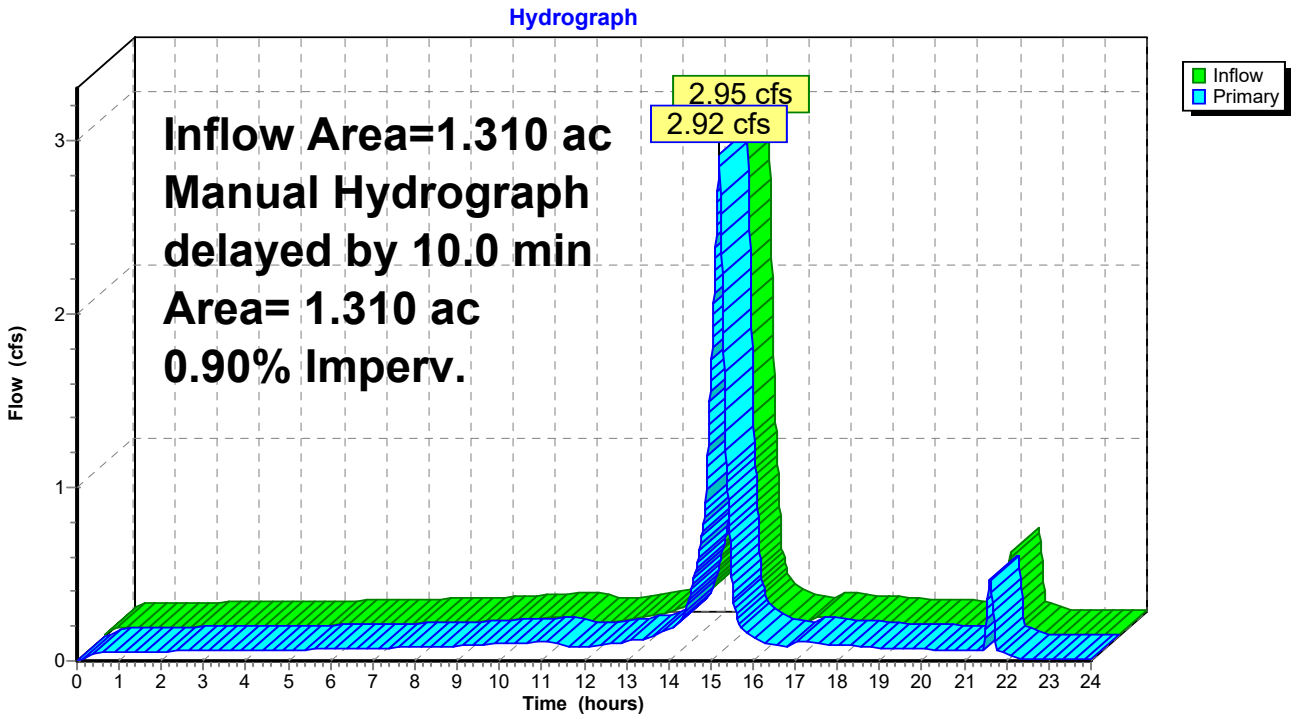
Link 5L: AREA A1 - 100 YR STORM



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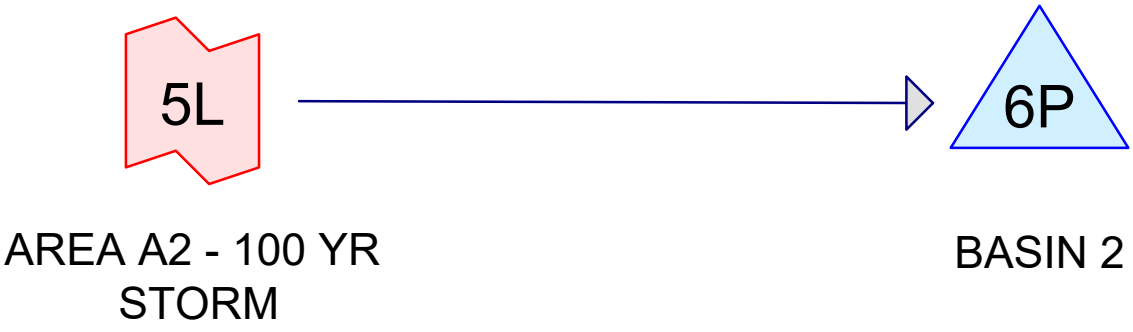
Hydrograph for Link 5L: AREA A1 - 100 YR STORM

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.01	**0.00**	0.00
0.50	0.05	0.00	0.05
1.00	0.05	0.00	0.05
1.50	0.05	0.00	0.05
2.00	0.05	0.00	0.05
2.50	0.06	0.00	0.06
3.00	0.06	0.00	0.06
3.50	0.06	0.00	0.06
4.00	0.06	0.00	0.06
4.50	0.06	0.00	0.06
5.00	0.06	0.00	0.06
5.50	0.07	0.00	0.06
6.00	0.07	0.00	0.07
6.50	0.07	0.00	0.07
7.00	0.07	0.00	0.07
7.50	0.08	0.00	0.07
8.00	0.08	0.00	0.08
8.50	0.08	0.00	0.08
9.00	0.09	0.00	0.08
9.50	0.09	0.00	0.09
10.00	0.10	0.00	0.10
10.50	0.11	0.00	0.10
11.00	0.11	0.00	0.11
11.50	0.08	0.00	0.09
12.00	0.08	0.00	0.08
12.50	0.10	0.00	0.09
13.00	0.12	0.00	0.11
13.50	0.15	0.00	0.13
14.00	0.21	0.00	0.18
14.50	0.54	0.00	0.37
15.00	**2.69**	0.00	**1.62**
15.50	**0.22**	0.00	**0.49**
16.00	0.12	0.00	0.13
16.50	0.08	0.00	0.09
17.00	0.11	0.00	0.11
17.50	0.10	0.00	0.10
18.00	0.09	0.00	0.09
18.50	0.08	0.00	0.08
19.00	0.07	0.00	0.07
19.50	0.07	0.00	0.07
20.00	0.06	0.00	0.07
20.50	0.06	0.00	0.06
21.00	0.06	0.00	0.06
21.50	0.33	0.00	0.20
22.00	0.03	0.00	0.05
22.50	0.01	0.00	0.01
23.00	0.01	0.00	0.01
23.50	0.01	0.00	0.01
24.00	0.01	0.00	0.01



Subcat Reach Pond Link

Routing Diagram for BAKER A2

Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net, Printed 6/16/2020
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Project Notes

Copied 10 events from VISTA-001 24-hr S1 storm

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Area Listing (all nodes)

Area (acres)	C	Description (subcatchment-numbers)
0.000	**0.00**	**TOTAL AREA**

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.000		**TOTAL AREA**

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**TOTAL AREA**	

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Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	Copied 10 events from VISTA-001 24-hr S1 storm

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 6P: BASIN 2 Peak Elev=427.15' Storage=3,116 cf Inflow=1.49 cfs 0.192 af
Outflow=1.56 cfs 0.121 af

Link 5L: AREA A2 - 100 YR STORM Manual Hydrograph delayed by 6.0 min Inflow=1.49 cfs 0.192 af
Area= 1.060 ac 0.90% Imperv. Primary=1.49 cfs 0.192 af

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Summary for Pond 6P: BASIN 2

[92] Warning: Device #1 is above defined storage
[93] Warning: Storage range exceeded by 0.15'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=501)

Inflow Area = 1.060 ac, 0.90% Impervious, Inflow Depth > 2.18" for 100-yr event
Inflow = 1.49 cfs @ 15.74 hrs, Volume= 0.192 af
Outflow = 1.56 cfs @ 15.74 hrs, Volume= 0.121 af, Atten= 0%, Lag= 0.1 min
Primary = 1.56 cfs @ 15.74 hrs, Volume= 0.121 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 427.15' @ 15.74 hrs Surf.Area= 0 sf Storage= 3,116 cf

Plug-Flow detention time= 325.4 min calculated for 0.121 af (63% of inflow)
Center-of-Mass det. time= 179.9 min (1,003.2 - 823.3)

Volume	Invert	Avail.Storage	Storage Description
#1	425.00'	3,116 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
425.00	0	0
426.00	1,194	1,194
427.00	1,922	3,116

Device	Routing	Invert	Outlet Devices
#1	Primary	427.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.55 cfs @ 15.74 hrs HW=427.15' (Free Discharge)
1=Orifice/Grate (Weir Controls 1.55 cfs @ 1.28 fps)

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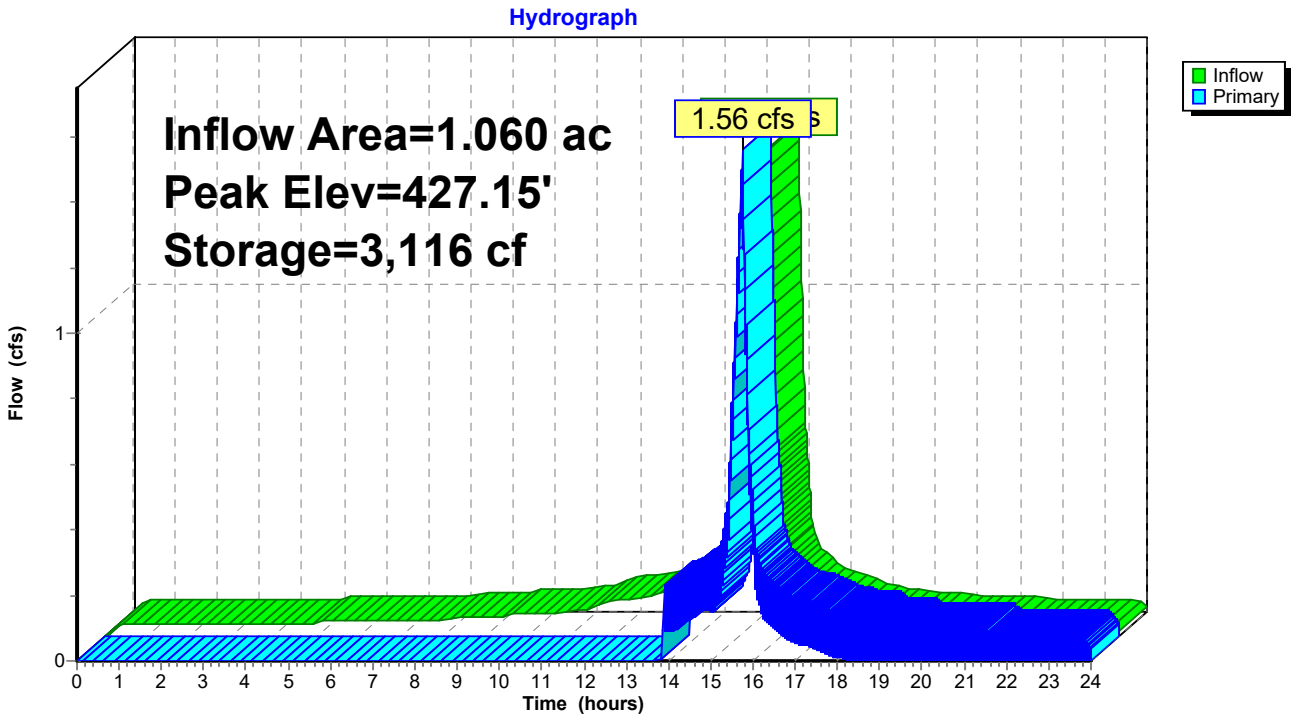
Pond 6P: BASIN 2



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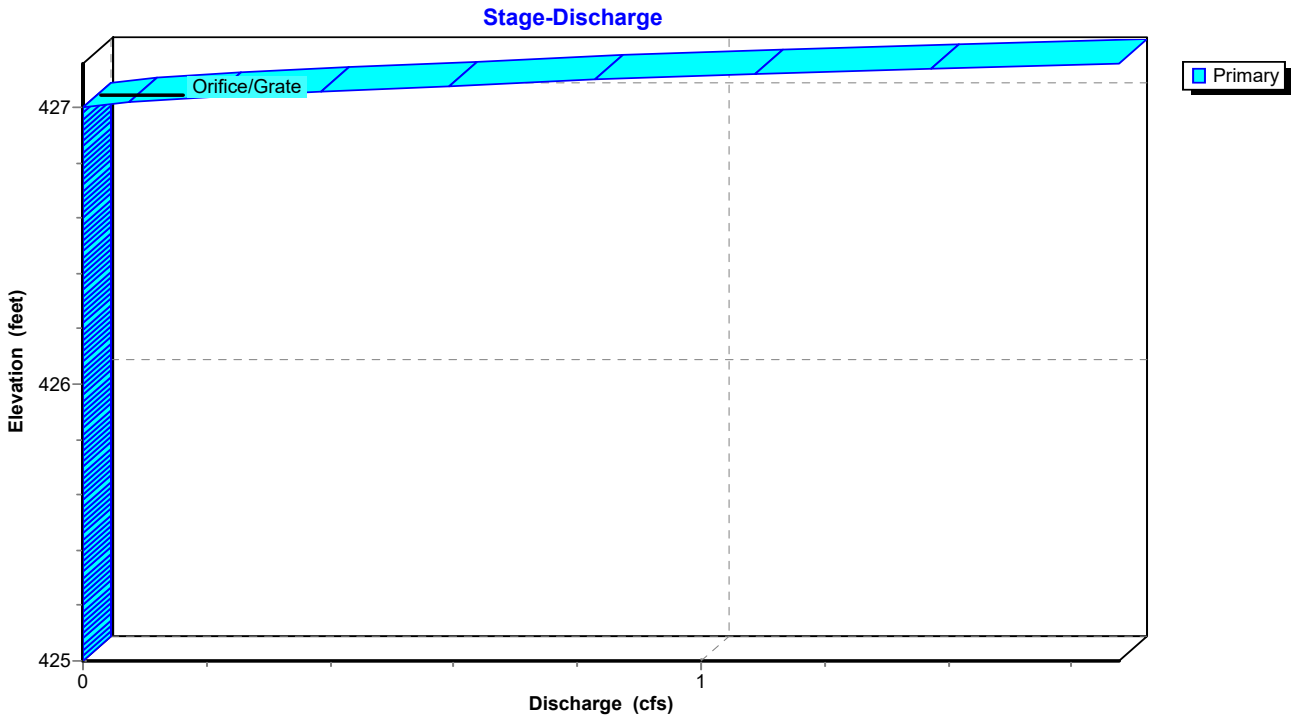
Pond 6P: BASIN 2



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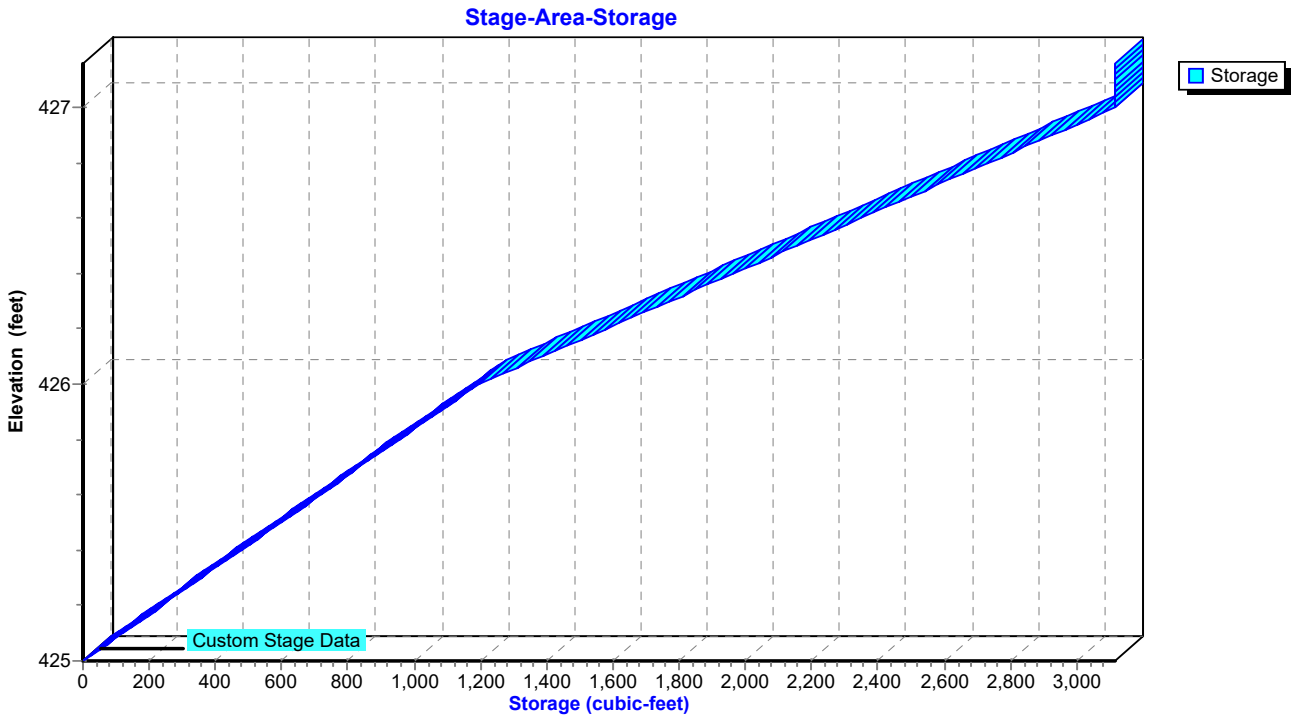
Pond 6P: BASIN 2



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Hydrograph for Pond 6P: BASIN 2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	425.00	0.00
1.00	0.04	114	425.10	0.00
2.00	0.04	258	425.22	0.00
3.00	0.04	402	425.34	0.00
4.00	0.04	546	425.46	0.00
5.00	0.04	690	425.58	0.00
6.00	0.05	866	425.73	0.00
7.00	0.05	1,046	425.88	0.00
8.00	0.05	1,226	426.02	0.00
9.00	0.06	1,436	426.13	0.00
10.00	0.07	1,669	426.25	0.00
11.00	0.08	1,925	426.38	0.00
12.00	0.11	2,246	426.55	0.00
13.00	0.13	**2,665**	426.77	0.00
14.00	0.16	**3,116**	427.04	0.23
15.00	**0.22**	3,116	**427.05**	**0.29**
16.00	**0.42**	3,116	**427.07**	**0.49**
17.00	0.13	3,116	427.04	0.20
18.00	0.08	3,116	427.03	0.15
19.00	0.06	3,116	427.03	0.12
20.00	0.05	3,116	427.02	0.10
21.00	0.05	3,116	427.02	0.10
22.00	0.04	3,116	427.02	0.08
23.00	0.04	3,116	427.02	0.08
24.00	0.02	3,116	427.01	0.04

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Stage-Discharge for Pond 6P: BASIN 2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
425.00	0.00	425.92	0.00	426.84	0.00
425.02	0.00	425.94	0.00	426.86	0.00
425.04	0.00	425.96	0.00	426.88	0.00
425.06	0.00	425.98	0.00	426.90	0.00
425.08	0.00	426.00	0.00	426.92	0.00
425.10	0.00	426.02	0.00	426.94	0.00
425.12	0.00	426.04	0.00	426.96	0.00
425.14	0.00	426.06	0.00	426.98	0.00
425.16	0.00	426.08	0.00	427.00	0.00
425.18	0.00	426.10	0.00	427.02	0.07
425.20	0.00	426.12	0.00	427.04	0.21
425.22	0.00	426.14	0.00	427.06	0.38
425.24	0.00	426.16	0.00	427.08	0.59
425.26	0.00	426.18	0.00	427.10	0.83
425.28	0.00	426.20	0.00	427.12	1.09
425.30	0.00	426.22	0.00	427.14	1.37
425.32	0.00	426.24	0.00	427.16	**1.67**
425.34	0.00	426.26	0.00		
425.36	0.00	426.28	0.00		
425.38	0.00	426.30	0.00		
425.40	0.00	426.32	0.00		
425.42	0.00	426.34	0.00		
425.44	0.00	426.36	0.00		
425.46	0.00	426.38	0.00		
425.48	0.00	426.40	0.00		
425.50	0.00	426.42	0.00		
425.52	0.00	426.44	0.00		
425.54	0.00	426.46	0.00		
425.56	0.00	426.48	0.00		
425.58	0.00	426.50	0.00		
425.60	0.00	426.52	0.00		
425.62	0.00	426.54	0.00		
425.64	0.00	426.56	0.00		
425.66	0.00	426.58	0.00		
425.68	0.00	426.60	0.00		
425.70	0.00	426.62	0.00		
425.72	0.00	426.64	0.00		
425.74	0.00	426.66	0.00		
425.76	0.00	426.68	0.00		
425.78	0.00	426.70	0.00		
425.80	0.00	426.72	0.00		
425.82	0.00	426.74	0.00		
425.84	0.00	426.76	0.00		
425.86	0.00	426.78	0.00		
425.88	0.00	426.80	0.00		
425.90	0.00	426.82	0.00		

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Stage-Area-Storage for Pond 6P: BASIN 2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
425.00	0	425.92	1,098	426.84	2,808
425.02	24	425.94	1,122	426.86	2,847
425.04	48	425.96	1,146	426.88	2,885
425.06	72	425.98	1,170	426.90	2,924
425.08	96	426.00	1,194	426.92	2,962
425.10	119	426.02	1,232	426.94	3,001
425.12	143	426.04	1,271	426.96	3,039
425.14	167	426.06	1,309	426.98	3,078
425.16	191	426.08	1,348	427.00	**3,116**
425.18	215	426.10	1,386	427.02	3,116
425.20	239	426.12	1,425	427.04	3,116
425.22	263	426.14	1,463	427.06	3,116
425.24	287	426.16	1,502	427.08	3,116
425.26	310	426.18	1,540	427.10	3,116
425.28	334	426.20	1,578	427.12	3,116
425.30	358	426.22	1,617	427.14	3,116
425.32	382	426.24	1,655	427.16	3,116
425.34	406	426.26	1,694		
425.36	430	426.28	1,732		
425.38	454	426.30	1,771		
425.40	478	426.32	1,809		
425.42	501	426.34	1,847		
425.44	525	426.36	1,886		
425.46	549	426.38	1,924		
425.48	573	426.40	1,963		
425.50	597	426.42	2,001		
425.52	621	426.44	2,040		
425.54	645	426.46	2,078		
425.56	669	426.48	2,117		
425.58	693	426.50	2,155		
425.60	716	426.52	2,193		
425.62	740	426.54	2,232		
425.64	764	426.56	2,270		
425.66	788	426.58	2,309		
425.68	812	426.60	2,347		
425.70	836	426.62	2,386		
425.72	860	426.64	2,424		
425.74	884	426.66	2,463		
425.76	907	426.68	2,501		
425.78	931	426.70	2,539		
425.80	955	426.72	2,578		
425.82	979	426.74	2,616		
425.84	1,003	426.76	2,655		
425.86	1,027	426.78	2,693		
425.88	1,051	426.80	2,732		
425.90	1,075	426.82	2,770		

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Summary for Link 5L: AREA A2 - 100 YR STORM

Inflow Area = 1.060 ac, 0.90% Impervious, Inflow Depth > 2.18" for 100-yr event
Inflow = 1.49 cfs @ 15.64 hrs, Volume= 0.192 af
Primary = 1.49 cfs @ 15.74 hrs, Volume= 0.192 af, Atten= 0%, Lag= 6.0 min

Primary outflow = Inflow delayed by 6.0 min, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

100-yr 150 Point manual hydrograph, To= 0.00 hrs, dt= 0.17 hrs, Area= 1.060 ac, 0.90% Imp., cfs =

0.01	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.10	0.10
0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14
0.15	0.16	0.16	0.17	0.19	0.20	0.22	0.23	0.22	0.27
0.41	0.93	1.49	0.58	0.27	0.20	0.18	0.16	0.14	0.13
0.12	0.12	0.11	0.10	0.09	0.08	0.08	0.07	0.07	0.07
0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.03	0.01	0.00	0.11	0.10	0.10	0.08	0.02	0.00	0.01

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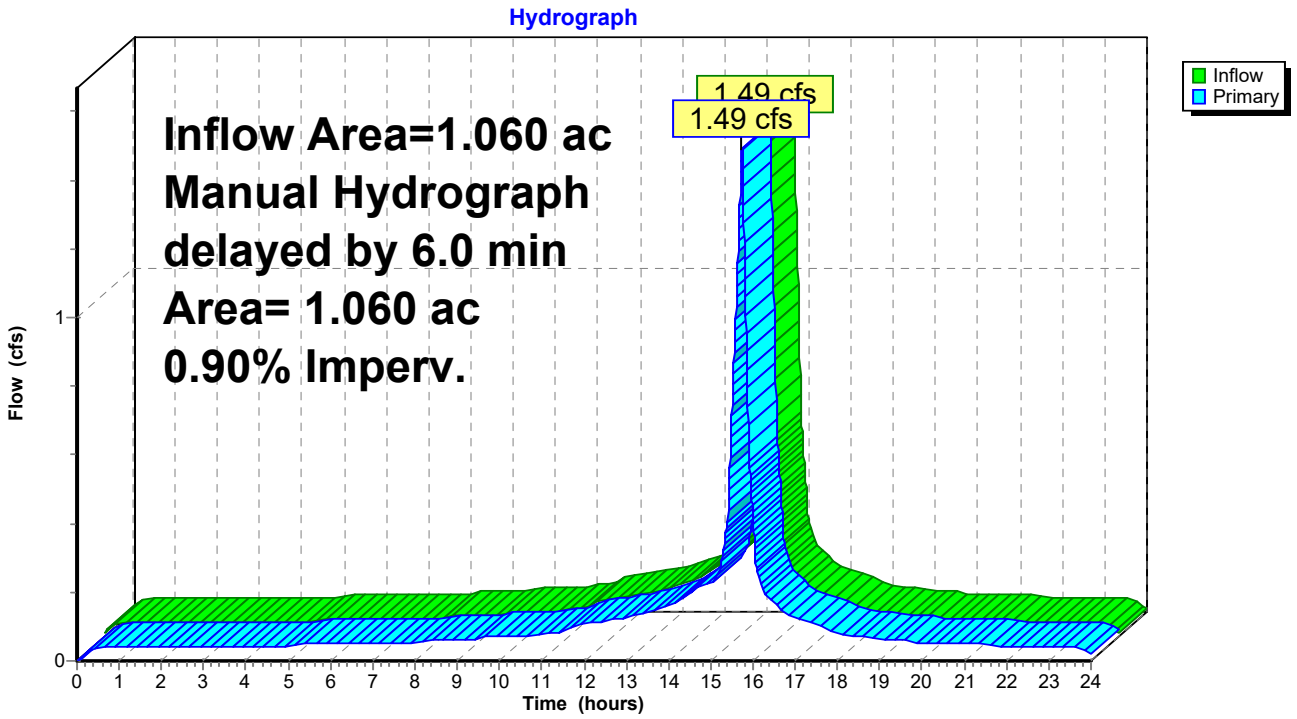
Link 5L: AREA A2 - 100 YR STORM



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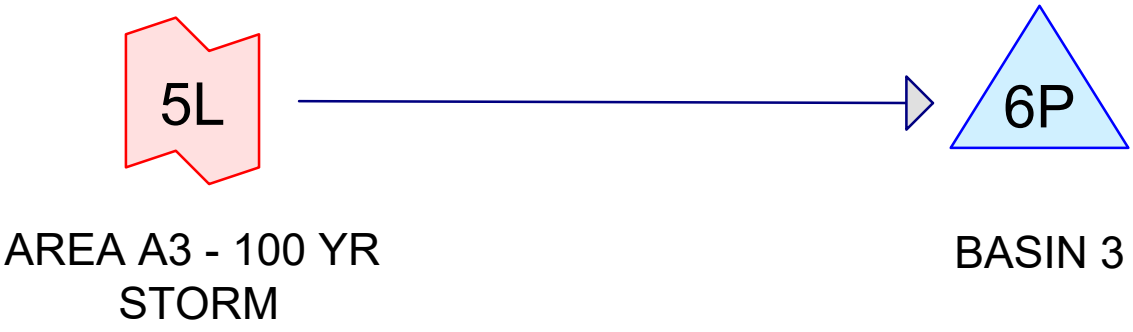
Hydrograph for Link 5L: AREA A2 - 100 YR STORM

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.01	**0.00**	0.00
0.50	0.04	0.00	0.04
1.00	0.04	0.00	0.04
1.50	0.04	0.00	0.04
2.00	0.04	0.00	0.04
2.50	0.04	0.00	0.04
3.00	0.04	0.00	0.04
3.50	0.04	0.00	0.04
4.00	0.04	0.00	0.04
4.50	0.04	0.00	0.04
5.00	0.04	0.00	0.04
5.50	0.05	0.00	0.05
6.00	0.05	0.00	0.05
6.50	0.05	0.00	0.05
7.00	0.05	0.00	0.05
7.50	0.05	0.00	0.05
8.00	0.05	0.00	0.05
8.50	0.06	0.00	0.06
9.00	0.06	0.00	0.06
9.50	0.07	0.00	0.06
10.00	0.07	0.00	0.07
10.50	0.07	0.00	0.07
11.00	0.08	0.00	0.08
11.50	0.09	0.00	0.08
12.00	0.11	0.00	0.11
12.50	0.12	0.00	0.12
13.00	0.13	0.00	0.13
13.50	0.14	0.00	0.14
14.00	0.16	0.00	0.16
14.50	0.21	0.00	0.20
15.00	0.23	0.00	0.22
15.50	**1.03**	0.00	**0.72**
16.00	**0.26**	0.00	**0.42**
16.50	0.16	0.00	0.17
17.00	0.12	0.00	0.13
17.50	0.10	0.00	0.11
18.00	0.08	0.00	0.08
18.50	0.07	0.00	0.07
19.00	0.06	0.00	0.06
19.50	0.06	0.00	0.06
20.00	0.05	0.00	0.05
20.50	0.05	0.00	0.05
21.00	0.05	0.00	0.05
21.50	0.05	0.00	0.05
22.00	0.04	0.00	0.04
22.50	0.04	0.00	0.04
23.00	0.04	0.00	0.04
23.50	0.04	0.00	0.04
24.00	0.01	0.00	0.02



Subcat Reach Pond Link

Routing Diagram for BAKER A3

Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net, Printed 6/16/2020
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Project Notes

Copied 10 events from VISTA-001 24-hr S1 storm

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Area Listing (all nodes)

Area (acres)	C	Description (subcatchment-numbers)
0.000	**0.00**	**TOTAL AREA**

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.000		**TOTAL AREA**

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**TOTAL AREA**	

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Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	Copied 10 events from VISTA-001 24-hr S1 storm

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 6P: BASIN 3 Peak Elev=428.19' Storage=1,620 cf Inflow=2.31 cfs 0.296 af
Outflow=2.17 cfs 0.267 af

Link 5L: AREA A3 - 100 YR STORM Manual Hydrograph delayed by 6.0 min Inflow=2.31 cfs 0.296 af
Area= 1.640 ac 0.90% Imperv. Primary=2.31 cfs 0.296 af

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Summary for Pond 6P: BASIN 3

Inflow Area = 1.640 ac, 0.90% Impervious, Inflow Depth = 2.16" for 100-yr event
Inflow = 2.31 cfs @ 15.94 hrs, Volume= 0.296 af
Outflow = 2.17 cfs @ 15.96 hrs, Volume= 0.267 af, Atten= 6%, Lag= 1.0 min
Primary = 2.17 cfs @ 15.96 hrs, Volume= 0.267 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 428.19' @ 15.96 hrs Surf.Area= 0 sf Storage= 1,620 cf

Plug-Flow detention time= 126.5 min calculated for 0.267 af (90% of inflow)
Center-of-Mass det. time= 77.1 min (884.1 - 807.0)

Volume	Invert	Avail.Storage	Storage Description
#1	427.00'	3,183 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
427.00	0	0
428.00	1,253	1,253
429.00	1,930	3,183

Device	Routing	Invert	Outlet Devices
#1	Primary	428.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.17 cfs @ 15.96 hrs HW=428.19' (Free Discharge)
↑**1=Orifice/Grate** (Weir Controls 2.17 cfs @ 1.43 fps)

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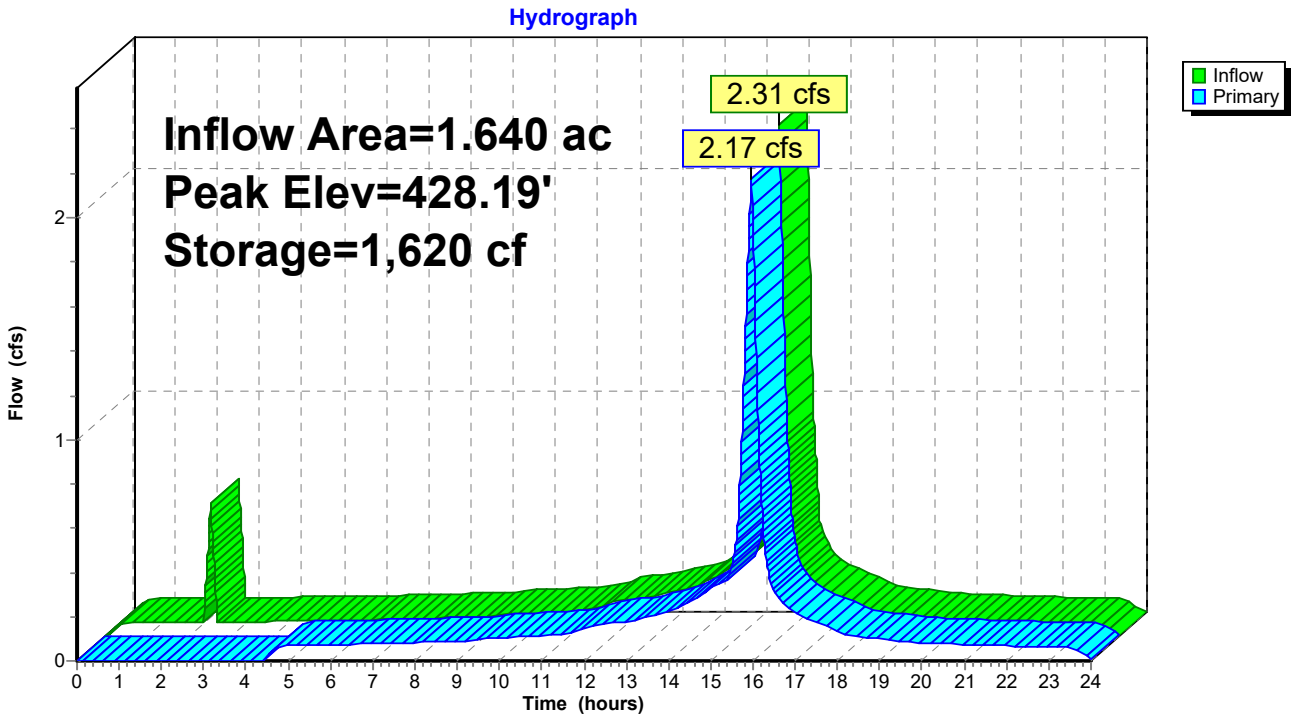
Pond 6P: BASIN 3



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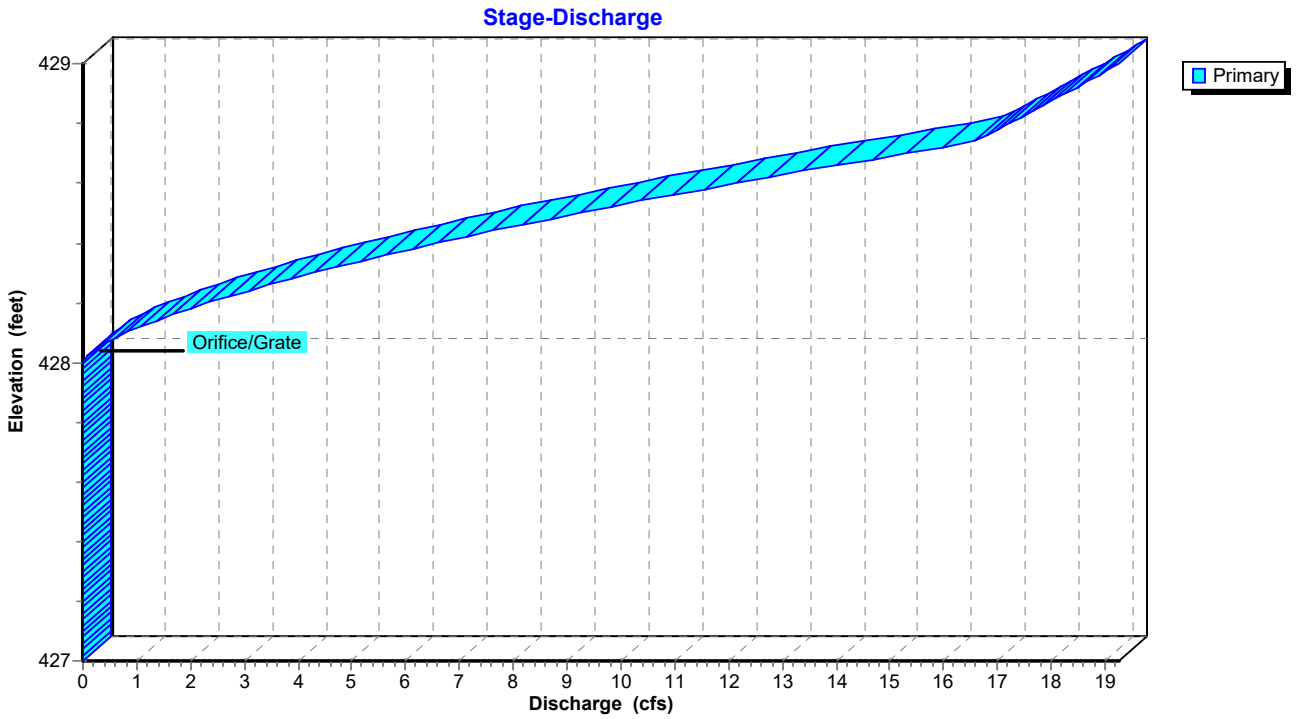
Pond 6P: BASIN 3



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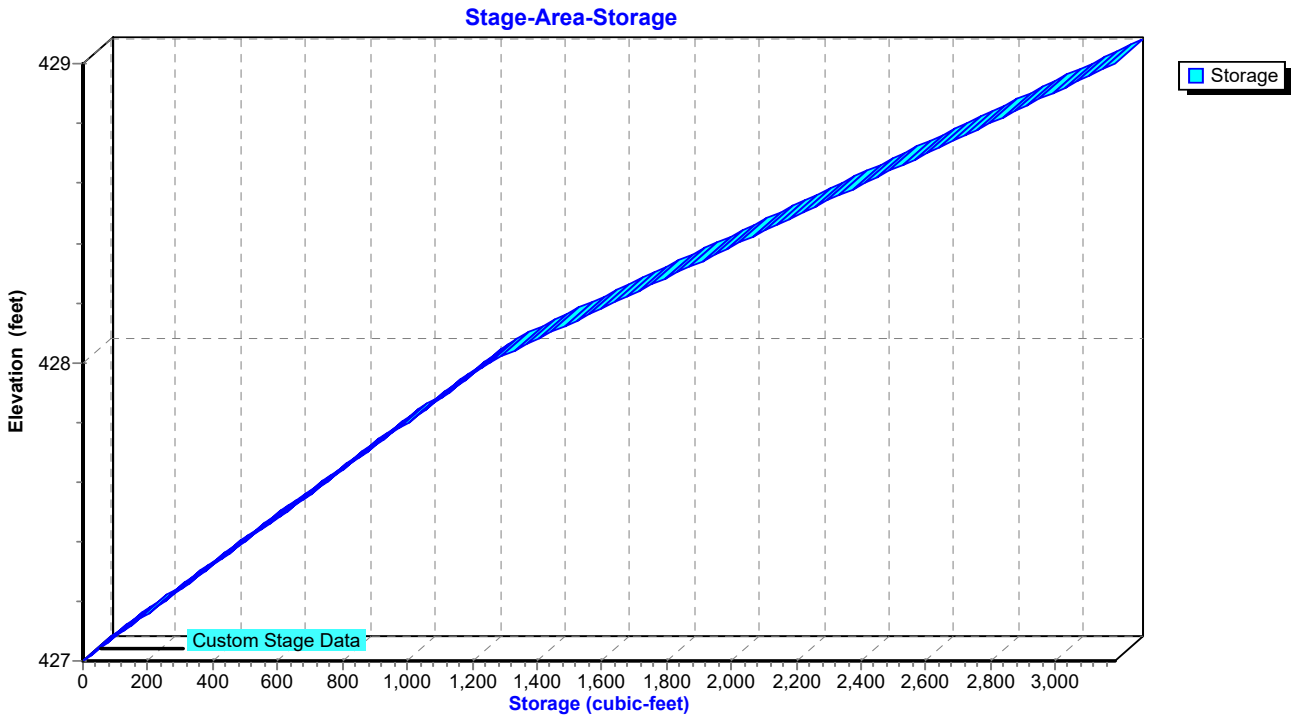
Pond 6P: BASIN 3



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Hydrograph for Pond 6P: BASIN 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	427.00	0.00
1.00	0.06	174	427.14	0.00
2.00	0.06	390	427.31	0.00
3.00	0.06	917	427.73	0.00
4.00	0.07	1,139	427.91	0.00
5.00	0.07	1,289	428.02	0.07
6.00	0.07	1,290	428.02	0.07
7.00	0.08	1,293	428.02	0.08
8.00	0.08	1,294	428.02	0.08
9.00	0.09	1,296	428.02	0.09
10.00	0.10	1,299	428.02	0.10
11.00	0.11	1,302	428.03	0.11
12.00	0.15	1,312	428.03	0.15
13.00	0.18	1,321	428.04	0.18
14.00	0.23	1,334	428.04	0.22
15.00	**0.34**	**1,357**	**428.05**	**0.33**
16.00	**1.78**	**1,600**	**428.18**	**1.99**
17.00	0.21	1,332	428.04	0.22
18.00	0.12	1,307	428.03	0.13
19.00	0.10	1,299	428.02	0.10
20.00	0.08	1,293	428.02	0.08
21.00	0.07	1,290	428.02	0.07
22.00	0.06	1,288	428.02	0.07
23.00	0.06	1,284	428.02	0.06
24.00	0.00	1,258	428.00	0.01

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Stage-Discharge for Pond 6P: BASIN 3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
427.00	0.00	427.92	0.00	428.84	17.65
427.02	0.00	427.94	0.00	428.86	17.86
427.04	0.00	427.96	0.00	428.88	18.07
427.06	0.00	427.98	0.00	428.90	18.27
427.08	0.00	428.00	0.00	428.92	18.47
427.10	0.00	428.02	0.07	428.94	18.67
427.12	0.00	428.04	0.21	428.96	18.87
427.14	0.00	428.06	0.38	428.98	19.07
427.16	0.00	428.08	0.59	429.00	**19.26**
427.18	0.00	428.10	0.83		
427.20	0.00	428.12	1.09		
427.22	0.00	428.14	1.37		
427.24	0.00	428.16	1.67		
427.26	0.00	428.18	2.00		
427.28	0.00	428.20	2.34		
427.30	0.00	428.22	2.70		
427.32	0.00	428.24	3.08		
427.34	0.00	428.26	3.47		
427.36	0.00	428.28	3.88		
427.38	0.00	428.30	4.30		
427.40	0.00	428.32	4.74		
427.42	0.00	428.34	5.19		
427.44	0.00	428.36	5.65		
427.46	0.00	428.38	6.13		
427.48	0.00	428.40	6.62		
427.50	0.00	428.42	7.12		
427.52	0.00	428.44	7.64		
427.54	0.00	428.46	8.16		
427.56	0.00	428.48	8.70		
427.58	0.00	428.50	9.25		
427.60	0.00	428.52	9.81		
427.62	0.00	428.54	10.38		
427.64	0.00	428.56	10.96		
427.66	0.00	428.58	11.56		
427.68	0.00	428.60	12.16		
427.70	0.00	428.62	12.77		
427.72	0.00	428.64	13.39		
427.74	0.00	428.66	14.03		
427.76	0.00	428.68	14.67		
427.78	0.00	428.70	15.32		
427.80	0.00	428.72	15.98		
427.82	0.00	428.74	16.57		
427.84	0.00	428.76	16.79		
427.86	0.00	428.78	17.01		
427.88	0.00	428.80	17.23		
427.90	0.00	428.82	17.44		

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Stage-Area-Storage for Pond 6P: BASIN 3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
427.00	0	427.92	1,153	428.84	2,874
427.02	25	427.94	1,178	428.86	2,913
427.04	50	427.96	1,203	428.88	2,951
427.06	75	427.98	1,228	428.90	2,990
427.08	100	428.00	1,253	428.92	3,029
427.10	125	428.02	1,292	428.94	3,067
427.12	150	428.04	1,330	428.96	3,106
427.14	175	428.06	1,369	428.98	3,144
427.16	200	428.08	1,407	429.00	**3,183**
427.18	226	428.10	1,446		
427.20	251	428.12	1,485		
427.22	276	428.14	1,523		
427.24	301	428.16	1,562		
427.26	326	428.18	1,600		
427.28	351	428.20	1,639		
427.30	376	428.22	1,678		
427.32	401	428.24	1,716		
427.34	426	428.26	1,755		
427.36	451	428.28	1,793		
427.38	476	428.30	1,832		
427.40	501	428.32	1,871		
427.42	526	428.34	1,909		
427.44	551	428.36	1,948		
427.46	576	428.38	1,986		
427.48	601	428.40	2,025		
427.50	627	428.42	2,064		
427.52	652	428.44	2,102		
427.54	677	428.46	2,141		
427.56	702	428.48	2,179		
427.58	727	428.50	2,218		
427.60	752	428.52	2,257		
427.62	777	428.54	2,295		
427.64	802	428.56	2,334		
427.66	827	428.58	2,372		
427.68	852	428.60	2,411		
427.70	877	428.62	2,450		
427.72	902	428.64	2,488		
427.74	927	428.66	2,527		
427.76	952	428.68	2,565		
427.78	977	428.70	2,604		
427.80	1,002	428.72	2,643		
427.82	1,027	428.74	2,681		
427.84	1,053	428.76	2,720		
427.86	1,078	428.78	2,758		
427.88	1,103	428.80	2,797		
427.90	1,128	428.82	2,836		

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Summary for Link 5L: AREA A3 - 100 YR STORM

Inflow Area = 1.640 ac, 0.90% Impervious, Inflow Depth = 2.16" for 100-yr event
Inflow = 2.31 cfs @ 15.84 hrs, Volume= 0.296 af
Primary = 2.31 cfs @ 15.94 hrs, Volume= 0.296 af, Atten= 0%, Lag= 6.0 min

Primary outflow = Inflow delayed by 6.0 min, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

100-yr 150 Point manual hydrograph, To= 0.00 hrs, dt= 0.16 hrs, Area= 1.640 ac, 0.90% Imp., cfs =

0.01	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.60	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.10
0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.12
0.12	0.12	0.13	0.13	0.15	0.16	0.17	0.17	0.17	0.17
0.18	0.18	0.19	0.20	0.20	0.21	0.22	0.23	0.24	0.26
0.27	0.29	0.31	0.34	0.36	0.35	0.41	0.64	1.44	2.31
0.90	0.41	0.32	0.27	0.24	0.22	0.21	0.19	0.18	0.17
0.16	0.13	0.12	0.12	0.11	0.11	0.10	0.10	0.10	0.09
0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.01	0.00

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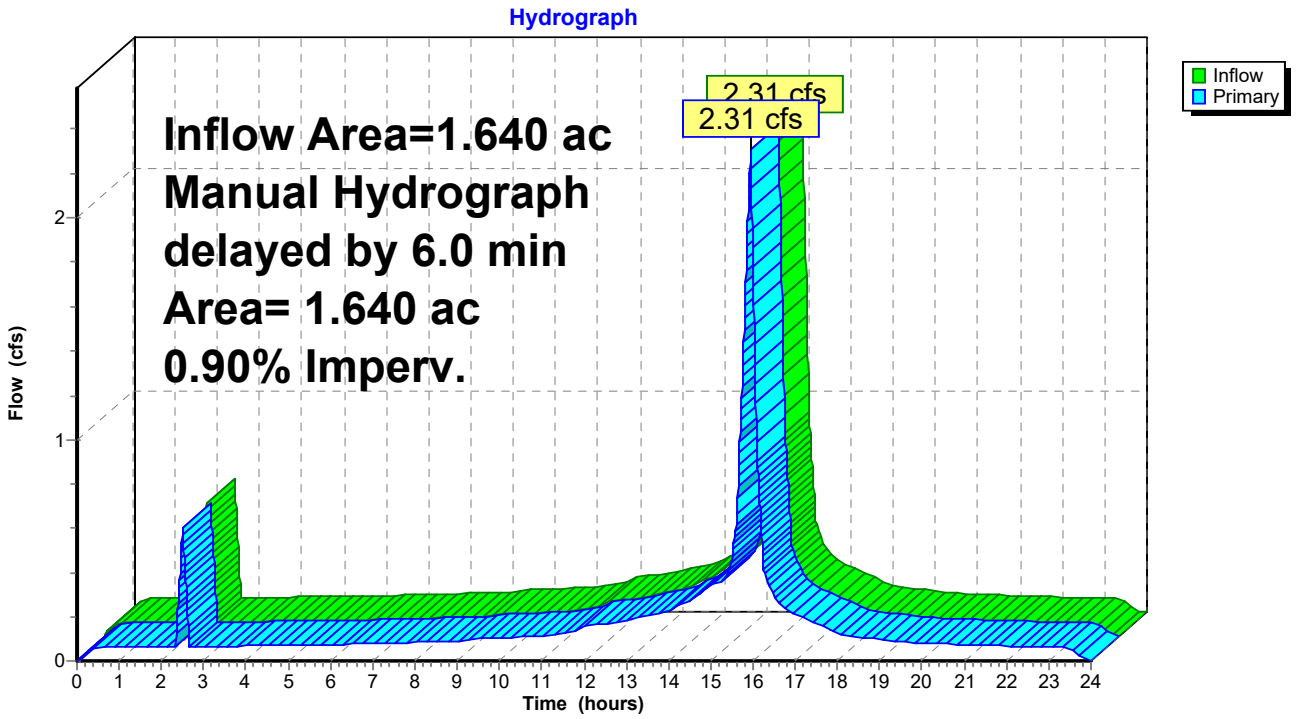
Link 5L: AREA A3 - 100 YR STORM



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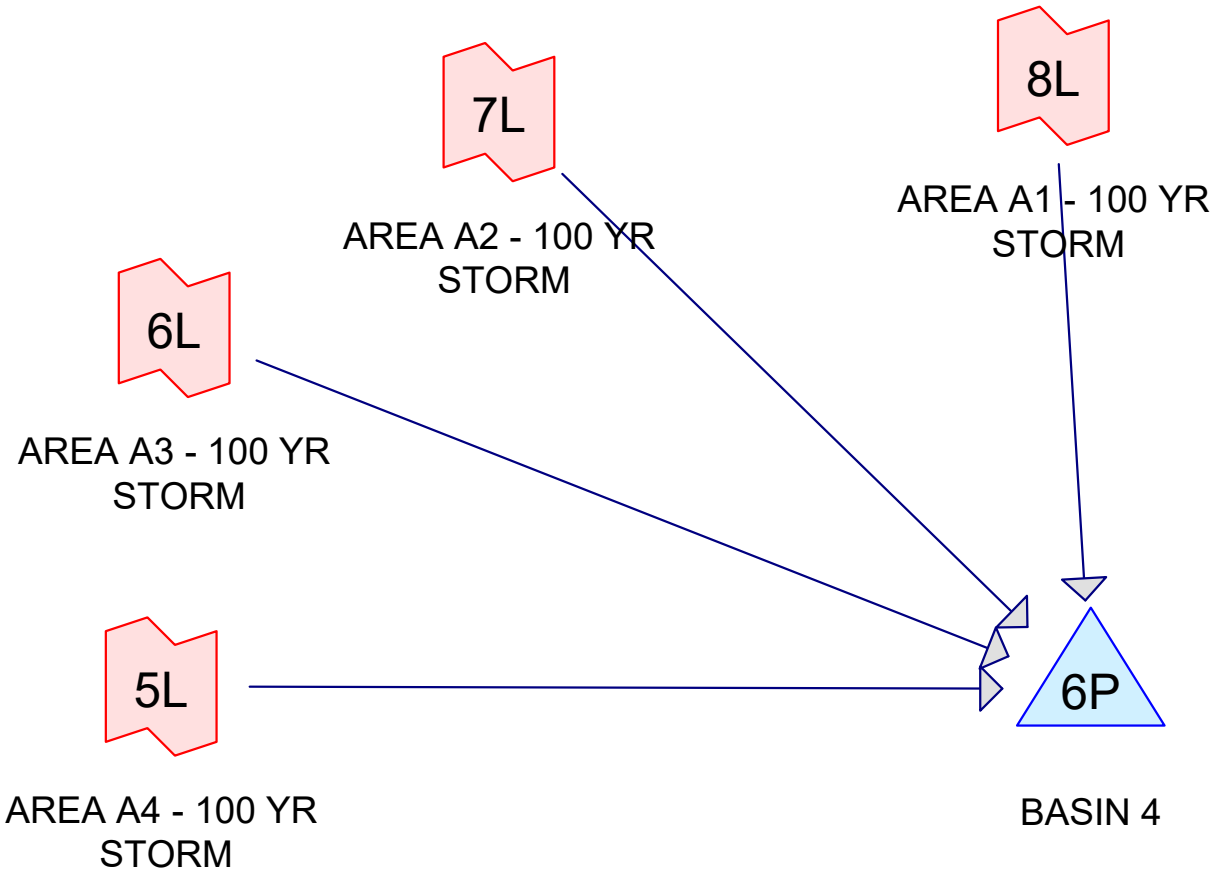
Hydrograph for Link 5L: AREA A3 - 100 YR STORM

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.01	**0.00**	0.00
0.50	0.06	0.00	0.06
1.00	0.06	0.00	0.06
1.50	0.06	0.00	0.06
2.00	0.06	0.00	0.06
2.50	0.26	0.00	0.60
3.00	0.06	0.00	0.06
3.50	0.06	0.00	0.06
4.00	0.07	0.00	0.07
4.50	0.07	0.00	0.07
5.00	0.07	0.00	0.07
5.50	0.07	0.00	0.07
6.00	0.07	0.00	0.07
6.50	0.08	0.00	0.08
7.00	0.08	0.00	0.08
7.50	0.08	0.00	0.08
8.00	0.09	0.00	0.08
8.50	0.09	0.00	0.09
9.00	0.09	0.00	0.09
9.50	0.10	0.00	0.10
10.00	0.10	0.00	0.10
10.50	0.11	0.00	0.11
11.00	0.12	0.00	0.11
11.50	0.13	0.00	0.12
12.00	0.16	0.00	0.15
12.50	0.17	0.00	0.17
13.00	0.18	0.00	0.18
13.50	0.20	0.00	0.20
14.00	0.23	0.00	0.23
14.50	0.28	0.00	0.27
15.00	0.35	0.00	0.34
15.50	**0.61**	0.00	**0.47**
16.00	**0.90**	0.00	**1.78**
16.50	0.27	0.00	0.30
17.00	0.20	0.00	0.21
17.50	0.17	0.00	0.17
18.00	0.12	0.00	0.12
18.50	0.10	0.00	0.11
19.00	0.09	0.00	0.10
19.50	0.09	0.00	0.09
20.00	0.08	0.00	0.08
20.50	0.08	0.00	0.08
21.00	0.07	0.00	0.07
21.50	0.07	0.00	0.07
22.00	0.06	0.00	0.06
22.50	0.06	0.00	0.06
23.00	0.06	0.00	0.06
23.50	0.05	0.00	0.06
24.00	0.00	0.00	0.00



Subcat Reach Pond Link

Routing Diagram for BAKER A4

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Project Notes

Copied 10 events from VISTA-001 24-hr S1 storm

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Area Listing (all nodes)

Area (acres)	C	Description (subcatchment-numbers)
0.000	**0.00**	**TOTAL AREA**

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.000		**TOTAL AREA**

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**TOTAL AREA**	

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Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	Copied 10 events from VISTA-001 24-hr S1 storm

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 6P: BASIN 4 Peak Elev=424.28' Storage=39,105 cf Inflow=5.51 cfs 1.258 af
Outflow=3.87 cfs 0.418 af

Link 5L: AREA A4 - 100 YR STORM Manual Hydrograph delayed by 6.0 min Inflow=4.01 cfs 0.510 af
Area= 2.800 ac 0.90% Imperv. Primary=4.01 cfs 0.510 af

Link 6L: AREA A3 - 100 YR STORM Manual Hydrograph delayed by 6.0 min Inflow=2.31 cfs 0.296 af
Area= 1.640 ac 0.90% Imperv. Primary=2.31 cfs 0.296 af

Link 7L: AREA A2 - 100 YR STORM Manual Hydrograph delayed by 6.0 min Inflow=1.49 cfs 0.192 af
Area= 1.060 ac 0.90% Imperv. Primary=1.49 cfs 0.192 af

Link 8L: AREA A1 - 100 YR STORM Manual Hydrograph delayed by 10.0 min Inflow=2.95 cfs 0.260 af
Area= 1.310 ac 0.90% Imperv. Primary=2.92 cfs 0.260 af

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Summary for Pond 6P: BASIN 4

Inflow Area = 6.810 ac, 0.90% Impervious, Inflow Depth > 2.22" for 100-yr event
Inflow = 5.51 cfs @ 15.94 hrs, Volume= 1.258 af
Outflow = 3.87 cfs @ 16.18 hrs, Volume= 0.418 af, Atten= 30%, Lag= 13.9 min
Primary = 3.87 cfs @ 16.18 hrs, Volume= 0.418 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 424.28' @ 16.18 hrs Surf.Area= 0 sf Storage= 39,105 cf

Plug-Flow detention time= 618.4 min calculated for 0.418 af (33% of inflow)
Center-of-Mass det. time= 274.4 min (1,093.8 - 819.4)

Volume	Invert	Avail.Storage	Storage Description
#1	418.00'	46,211 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
418.00	0	0
419.00	3,646	3,646
420.00	4,525	8,171
421.00	5,473	13,644
422.00	6,486	20,130
423.00	7,552	27,682
424.00	8,675	36,357
425.00	9,854	46,211

Device	Routing	Invert	Outlet Devices
#1	Primary	424.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.85 cfs @ 16.18 hrs HW=424.28' (Free Discharge)
↑**1=Orifice/Grate** (Weir Controls 3.85 cfs @ 1.73 fps)

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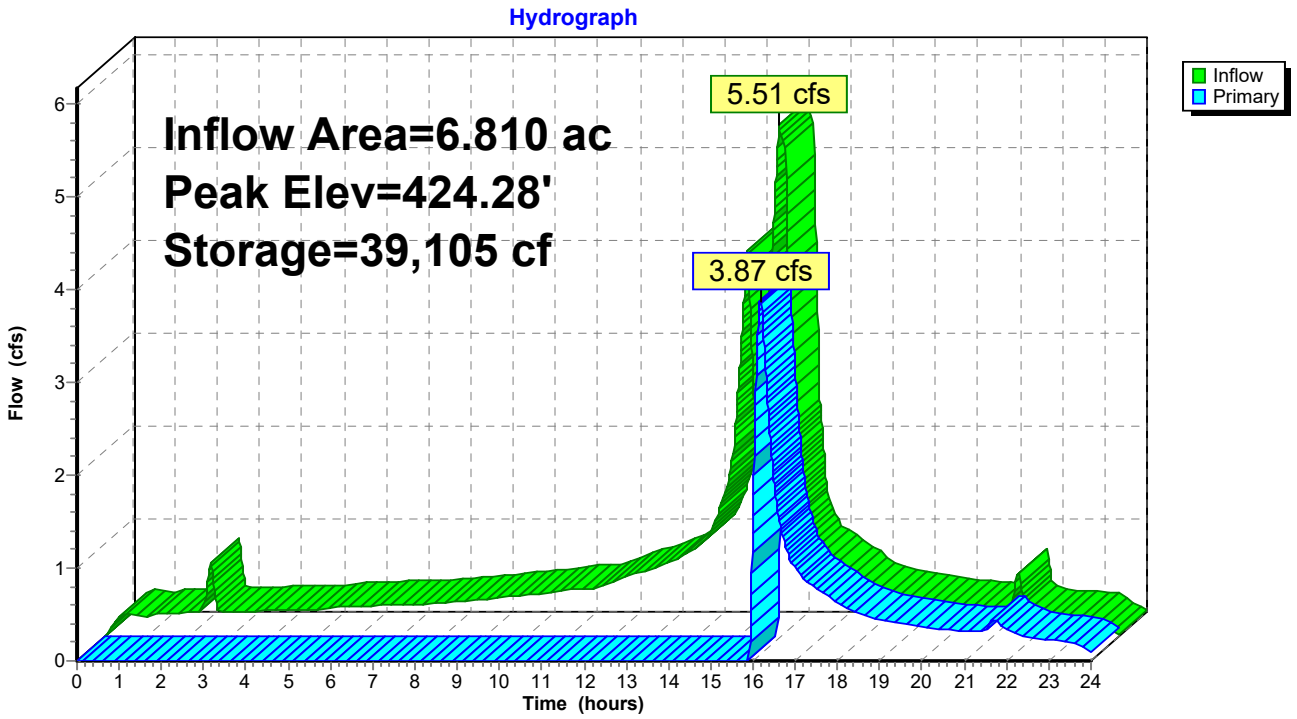
Pond 6P: BASIN 4



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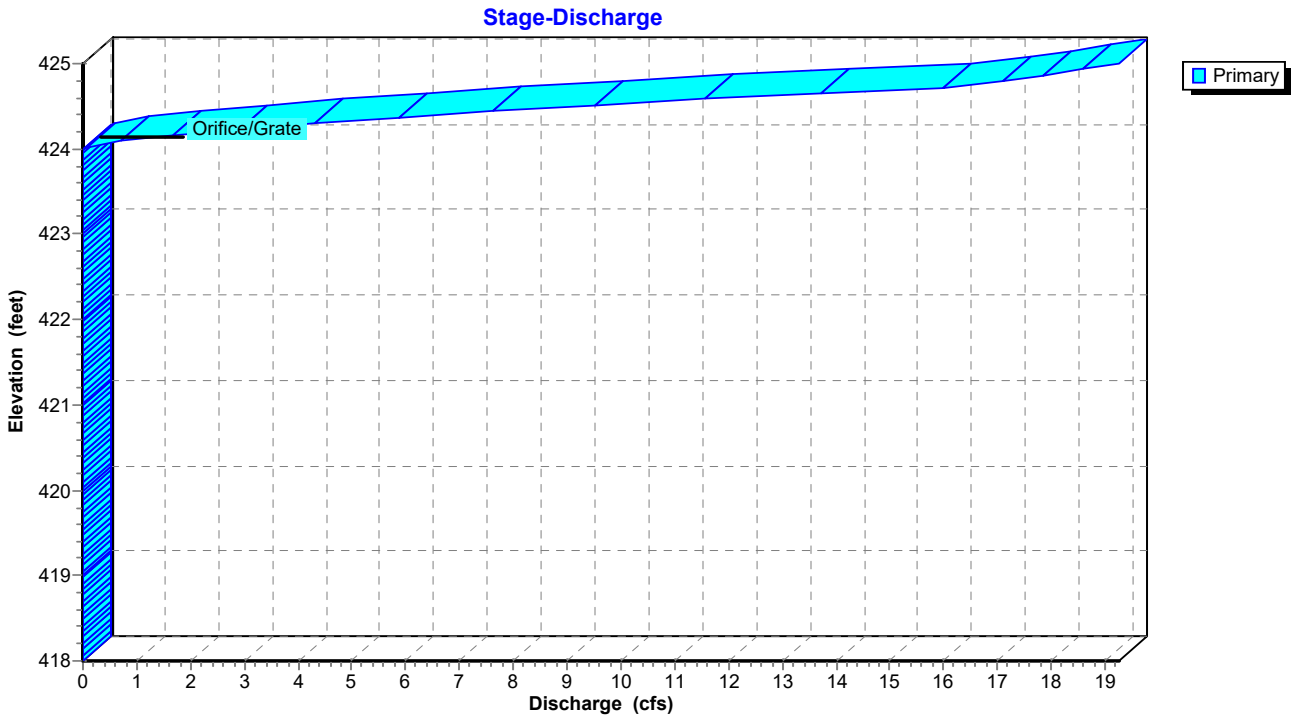
Pond 6P: BASIN 4



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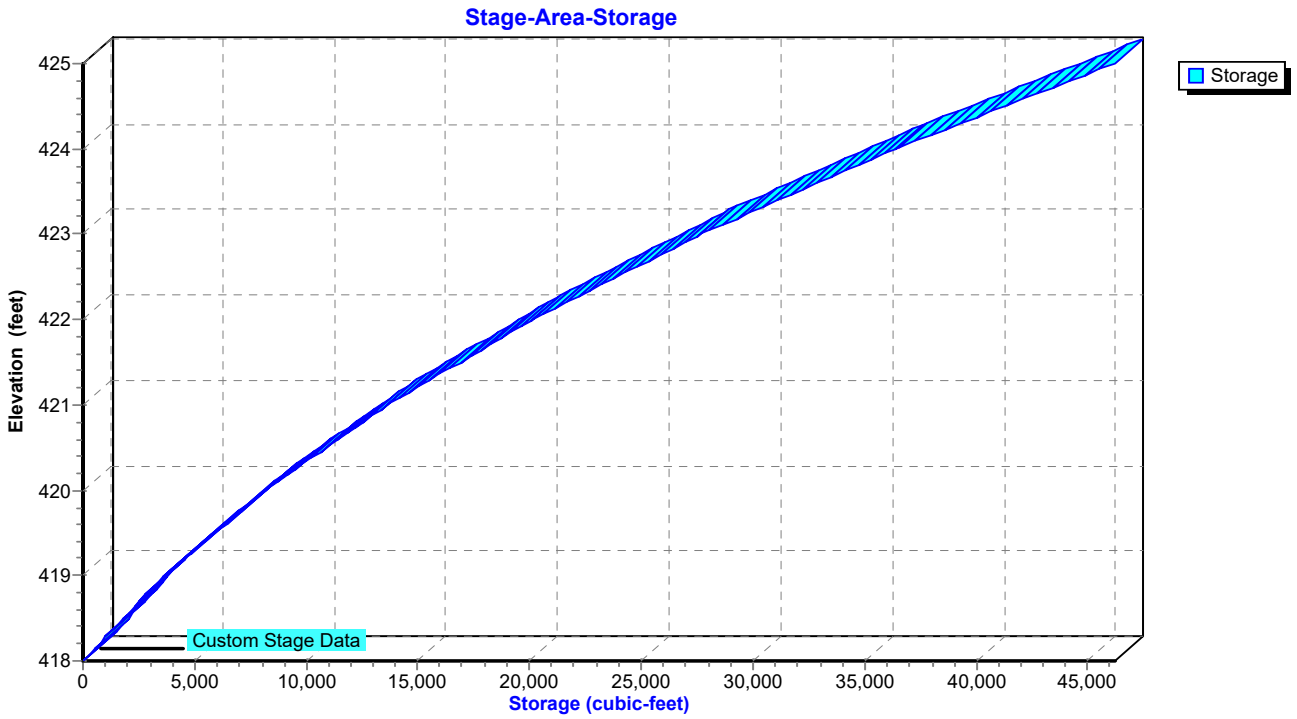
Pond 6P: BASIN 4



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Hydrograph for Pond 6P: BASIN 4

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	418.00	0.00
1.00	0.21	666	418.18	0.00
2.00	0.26	1,556	418.43	0.00
3.00	0.27	2,827	418.78	0.00
4.00	0.29	3,809	419.04	0.00
5.00	0.29	4,853	419.27	0.00
6.00	0.32	5,966	419.51	0.00
7.00	0.34	7,154	419.78	0.00
8.00	0.36	8,409	420.04	0.00
9.00	0.39	9,788	420.30	0.00
10.00	0.45	11,312	420.57	0.00
11.00	0.50	13,000	420.88	0.00
12.00	0.58	14,885	421.19	0.00
13.00	0.74	17,274	421.56	0.00
14.00	0.97	20,284	422.02	0.00
15.00	**2.75**	25,442	422.70	0.00
16.00	**5.41**	**37,862**	**424.15**	**1.57**
17.00	0.86	**37,451**	**424.11**	**1.00**
18.00	0.54	37,160	424.08	0.63
19.00	0.41	36,962	424.06	0.45
20.00	0.35	36,876	424.05	0.37
21.00	0.31	36,824	424.05	0.32
22.00	0.27	36,855	424.05	0.35
23.00	0.22	36,720	424.04	0.23
24.00	0.03	36,575	424.02	0.09

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Stage-Discharge for Pond 6P: BASIN 4

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
418.00	0.00	419.84	0.00	421.68	0.00	423.52	0.00
418.04	0.00	419.88	0.00	421.72	0.00	423.56	0.00
418.08	0.00	419.92	0.00	421.76	0.00	423.60	0.00
418.12	0.00	419.96	0.00	421.80	0.00	423.64	0.00
418.16	0.00	420.00	0.00	421.84	0.00	423.68	0.00
418.20	0.00	420.04	0.00	421.88	0.00	423.72	0.00
418.24	0.00	420.08	0.00	421.92	0.00	423.76	0.00
418.28	0.00	420.12	0.00	421.96	0.00	423.80	0.00
418.32	0.00	420.16	0.00	422.00	0.00	423.84	0.00
418.36	0.00	420.20	0.00	422.04	0.00	423.88	0.00
418.40	0.00	420.24	0.00	422.08	0.00	423.92	0.00
418.44	0.00	420.28	0.00	422.12	0.00	423.96	0.00
418.48	0.00	420.32	0.00	422.16	0.00	424.00	0.00
418.52	0.00	420.36	0.00	422.20	0.00	424.04	0.21
418.56	0.00	420.40	0.00	422.24	0.00	424.08	0.59
418.60	0.00	420.44	0.00	422.28	0.00	424.12	1.09
418.64	0.00	420.48	0.00	422.32	0.00	424.16	1.67
418.68	0.00	420.52	0.00	422.36	0.00	424.20	2.34
418.72	0.00	420.56	0.00	422.40	0.00	424.24	3.08
418.76	0.00	420.60	0.00	422.44	0.00	424.28	3.88
418.80	0.00	420.64	0.00	422.48	0.00	424.32	4.74
418.84	0.00	420.68	0.00	422.52	0.00	424.36	5.65
418.88	0.00	420.72	0.00	422.56	0.00	424.40	6.62
418.92	0.00	420.76	0.00	422.60	0.00	424.44	7.64
418.96	0.00	420.80	0.00	422.64	0.00	424.48	8.70
419.00	0.00	420.84	0.00	422.68	0.00	424.52	9.81
419.04	0.00	420.88	0.00	422.72	0.00	424.56	10.96
419.08	0.00	420.92	0.00	422.76	0.00	424.60	12.16
419.12	0.00	420.96	0.00	422.80	0.00	424.64	13.39
419.16	0.00	421.00	0.00	422.84	0.00	424.68	14.67
419.20	0.00	421.04	0.00	422.88	0.00	424.72	15.98
419.24	0.00	421.08	0.00	422.92	0.00	424.76	16.79
419.28	0.00	421.12	0.00	422.96	0.00	424.80	17.23
419.32	0.00	421.16	0.00	423.00	0.00	424.84	17.65
419.36	0.00	421.20	0.00	423.04	0.00	424.88	18.07
419.40	0.00	421.24	0.00	423.08	0.00	424.92	18.47
419.44	0.00	421.28	0.00	423.12	0.00	424.96	18.87
419.48	0.00	421.32	0.00	423.16	0.00	425.00	**19.26**
419.52	0.00	421.36	0.00	423.20	0.00		
419.56	0.00	421.40	0.00	423.24	0.00		
419.60	0.00	421.44	0.00	423.28	0.00		
419.64	0.00	421.48	0.00	423.32	0.00		
419.68	0.00	421.52	0.00	423.36	0.00		
419.72	0.00	421.56	0.00	423.40	0.00		
419.76	0.00	421.60	0.00	423.44	0.00		
419.80	0.00	421.64	0.00	423.48	0.00		

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Stage-Area-Storage for Pond 6P: BASIN 4

Elevation (feet)	Storage (cubic-feet)
418.00	0
418.10	365
418.20	729
418.30	1,094
418.40	1,458
418.50	1,823
418.60	2,188
418.70	2,552
418.80	2,917
418.90	3,281
419.00	3,646
419.10	4,099
419.20	4,551
419.30	5,004
419.40	5,456
419.50	5,909
419.60	6,361
419.70	6,813
419.80	7,266
419.90	7,718
420.00	8,171
420.10	8,718
420.20	9,266
420.30	9,813
420.40	10,360
420.50	10,908
420.60	11,455
420.70	12,002
420.80	12,549
420.90	13,097
421.00	13,644
421.10	14,293
421.20	14,941
421.30	15,590
421.40	16,238
421.50	16,887
421.60	17,536
421.70	18,184
421.80	18,833
421.90	19,481
422.00	20,130
422.10	20,885
422.20	21,640
422.30	22,396
422.40	23,151
422.50	23,906
422.60	24,661
422.70	25,416
422.80	26,172
422.90	26,927
423.00	27,682
423.10	28,550
423.20	29,417
423.30	30,285
423.40	31,152
423.50	32,020
423.60	32,887
423.70	33,754
423.80	34,622
423.90	35,489
424.00	36,357
424.10	37,342
424.20	38,328
424.30	39,313
424.40	40,299
424.50	41,284
424.60	42,269
424.70	43,255
424.80	44,240
424.90	45,226
425.00	**46,211**

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Summary for Link 5L: AREA A4 - 100 YR STORM

Inflow Area = 2.800 ac, 0.90% Impervious, Inflow Depth = 2.18" for 100-yr event
Inflow = 4.01 cfs @ 16.00 hrs, Volume= 0.510 af
Primary = 4.01 cfs @ 16.10 hrs, Volume= 0.510 af, Atten= 0%, Lag= 6.0 min

Primary outflow = Inflow delayed by 6.0 min, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

100-yr 150 Point manual hydrograph, To= 0.00 hrs, dt= 0.16 hrs, Area= 2.800 ac, 0.90% Imp., cfs =

0.02	0.08	0.10	0.10	0.10	0.02	0.08	0.10	0.10	0.10
0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12
0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13
0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.15	0.15	0.15
0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.17	0.17	0.17
0.17	0.18	0.18	0.18	0.18	0.19	0.19	0.19	0.20	0.20
0.21	0.21	0.22	0.22	0.23	0.24	0.27	0.29	0.30	0.30
0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.40	0.41	0.43
0.46	0.49	0.52	0.56	0.61	0.65	0.62	0.74	1.14	2.52
4.01	1.57	0.74	0.57	0.49	0.44	0.40	0.37	0.34	0.32
0.31	0.28	0.24	0.22	0.21	0.20	0.19	0.19	0.18	0.18
0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.14	0.14	0.14
0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.11	0.11
0.11	0.11	0.11	0.11	0.10	0.10	0.08	0.02	0.00	0.01

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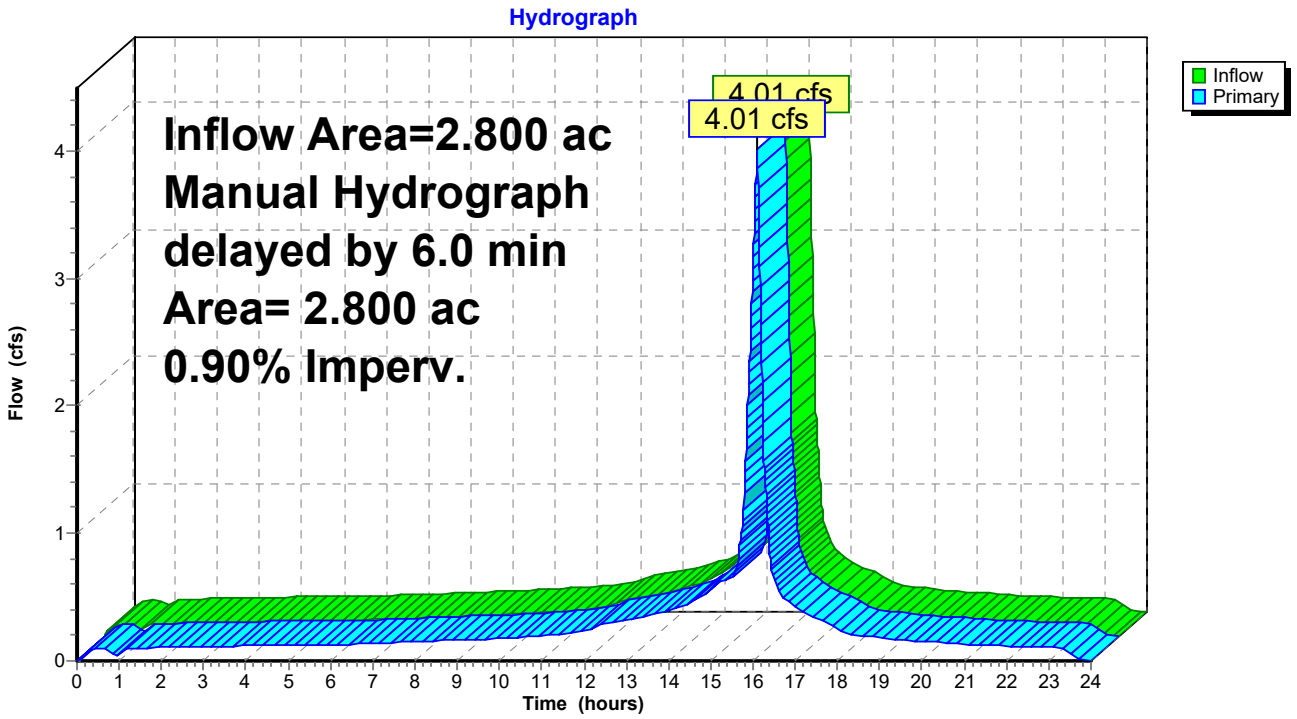
Link 5L: AREA A4 - 100 YR STORM



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Hydrograph for Link 5L: AREA A4 - 100 YR STORM

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.02	**0.00**	0.00
0.50	0.10	0.00	0.10
1.00	0.09	0.00	0.06
1.50	0.10	0.00	0.10
2.00	0.11	0.00	0.11
2.50	0.11	0.00	0.11
3.00	0.11	0.00	0.11
3.50	0.11	0.00	0.11
4.00	0.12	0.00	0.12
4.50	0.12	0.00	0.12
5.00	0.12	0.00	0.12
5.50	0.13	0.00	0.13
6.00	0.13	0.00	0.13
6.50	0.14	0.00	0.13
7.00	0.14	0.00	0.14
7.50	0.15	0.00	0.14
8.00	0.15	0.00	0.15
8.50	0.16	0.00	0.15
9.00	0.16	0.00	0.16
9.50	0.17	0.00	0.17
10.00	0.18	0.00	0.18
10.50	0.19	0.00	0.19
11.00	0.20	0.00	0.20
11.50	0.22	0.00	0.21
12.00	0.24	0.00	0.23
12.50	0.30	0.00	0.29
13.00	0.32	0.00	0.32
13.50	0.36	0.00	0.35
14.00	0.41	0.00	0.40
14.50	0.48	0.00	0.46
15.00	0.60	0.00	0.57
15.50	0.72	0.00	0.65
16.00	**4.01**	0.00	**3.08**
16.50	0.56	0.00	**0.66**
17.00	0.39	0.00	0.42
17.50	0.32	0.00	0.33
18.00	0.23	0.00	0.24
18.50	0.19	0.00	0.20
19.00	0.18	0.00	0.18
19.50	0.16	0.00	0.17
20.00	0.15	0.00	0.15
20.50	0.14	0.00	0.14
21.00	0.13	0.00	0.13
21.50	0.12	0.00	0.12
22.00	0.11	0.00	0.12
22.50	0.11	0.00	0.11
23.00	0.10	0.00	0.11
23.50	0.03	0.00	0.07
24.00	0.00	0.00	0.00

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Summary for Link 6L: AREA A3 - 100 YR STORM

Inflow Area = 1.640 ac, 0.90% Impervious, Inflow Depth = 2.16" for 100-yr event
Inflow = 2.31 cfs @ 15.84 hrs, Volume= 0.296 af
Primary = 2.31 cfs @ 15.94 hrs, Volume= 0.296 af, Atten= 0%, Lag= 6.0 min

Primary outflow = Inflow delayed by 6.0 min, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

100-yr 150 Point manual hydrograph, To= 0.00 hrs, dt= 0.16 hrs, Area= 1.640 ac, 0.90% Imp., cfs =

0.01	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.60	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.10
0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.12
0.12	0.12	0.13	0.13	0.15	0.16	0.17	0.17	0.17	0.17
0.18	0.18	0.19	0.20	0.20	0.21	0.22	0.23	0.24	0.26
0.27	0.29	0.31	0.34	0.36	0.35	0.41	0.64	1.44	2.31
0.90	0.41	0.32	0.27	0.24	0.22	0.21	0.19	0.18	0.17
0.16	0.13	0.12	0.12	0.11	0.11	0.10	0.10	0.10	0.09
0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.01	0.00

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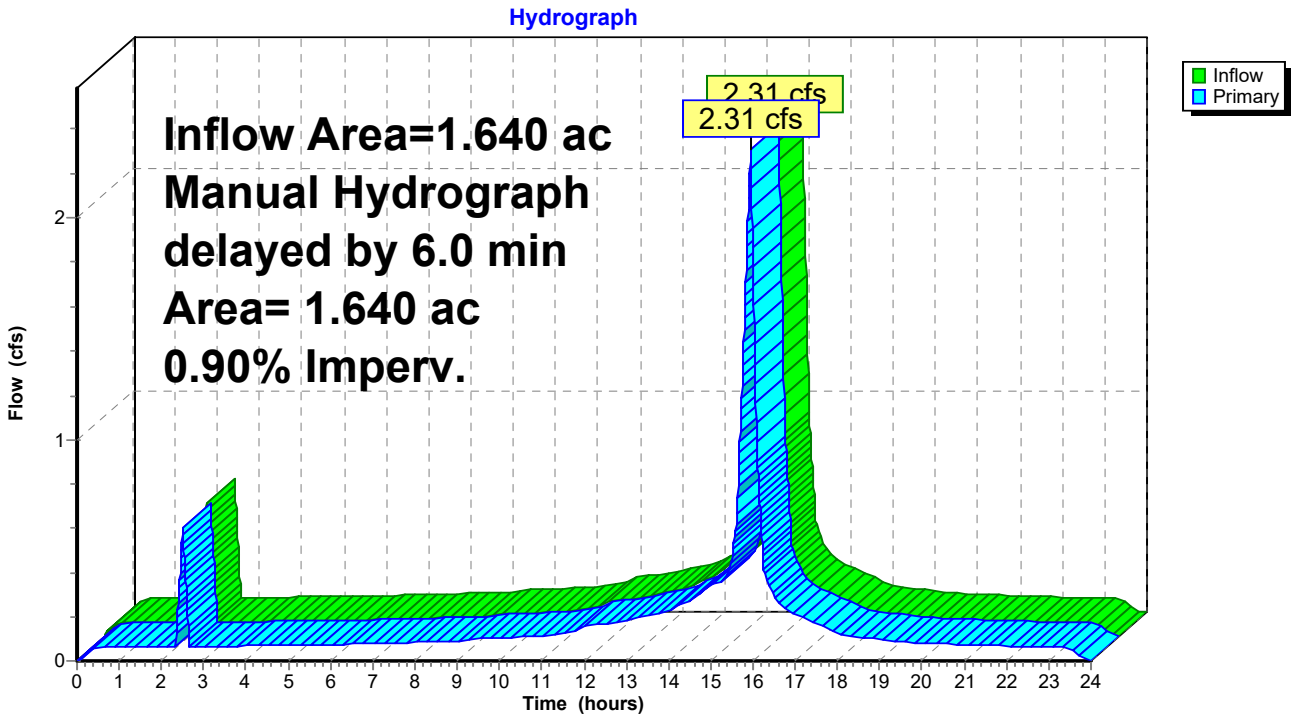
Link 6L: AREA A3 - 100 YR STORM



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Hydrograph for Link 6L: AREA A3 - 100 YR STORM

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.01	**0.00**	0.00	23.00	0.06	0.00	0.06
0.50	0.06	0.00	0.06	23.50	0.05	0.00	0.06
1.00	0.06	0.00	0.06	24.00	0.00	0.00	0.00
1.50	0.06	0.00	0.06				
2.00	0.06	0.00	0.06				
2.50	0.26	0.00	0.60				
3.00	0.06	0.00	0.06				
3.50	0.06	0.00	0.06				
4.00	0.07	0.00	0.07				
4.50	0.07	0.00	0.07				
5.00	0.07	0.00	0.07				
5.50	0.07	0.00	0.07				
6.00	0.07	0.00	0.07				
6.50	0.08	0.00	0.08				
7.00	0.08	0.00	0.08				
7.50	0.08	0.00	0.08				
8.00	0.09	0.00	0.08				
8.50	0.09	0.00	0.09				
9.00	0.09	0.00	0.09				
9.50	0.10	0.00	0.10				
10.00	0.10	0.00	0.10				
10.50	0.11	0.00	0.11				
11.00	0.12	0.00	0.11				
11.50	0.13	0.00	0.12				
12.00	0.16	0.00	0.15				
12.50	0.17	0.00	0.17				
13.00	0.18	0.00	0.18				
13.50	0.20	0.00	0.20				
14.00	0.23	0.00	0.23				
14.50	0.28	0.00	0.27				
15.00	0.35	0.00	0.34				
15.50	**0.61**	0.00	**0.47**				
16.00	**0.90**	0.00	**1.78**				
16.50	0.27	0.00	0.30				
17.00	0.20	0.00	0.21				
17.50	0.17	0.00	0.17				
18.00	0.12	0.00	0.12				
18.50	0.10	0.00	0.11				
19.00	0.09	0.00	0.10				
19.50	0.09	0.00	0.09				
20.00	0.08	0.00	0.08				
20.50	0.08	0.00	0.08				
21.00	0.07	0.00	0.07				
21.50	0.07	0.00	0.07				
22.00	0.06	0.00	0.06				
22.50	0.06	0.00	0.06				

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Summary for Link 7L: AREA A2 - 100 YR STORM

Inflow Area = 1.060 ac, 0.90% Impervious, Inflow Depth > 2.18" for 100-yr event
Inflow = 1.49 cfs @ 15.64 hrs, Volume= 0.192 af
Primary = 1.49 cfs @ 15.74 hrs, Volume= 0.192 af, Atten= 0%, Lag= 6.0 min

Primary outflow = Inflow delayed by 6.0 min, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

100-yr 150 Point manual hydrograph, To= 0.00 hrs, dt= 0.17 hrs, Area= 1.060 ac, 0.90% Imp., cfs =

0.01	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.10	0.10
0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14
0.15	0.16	0.16	0.17	0.19	0.20	0.22	0.23	0.22	0.27
0.41	0.93	1.49	0.58	0.27	0.20	0.18	0.16	0.14	0.13
0.12	0.12	0.11	0.10	0.09	0.08	0.08	0.07	0.07	0.07
0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.03	0.01	0.00	0.11	0.10	0.10	0.08	0.02	0.00	0.01

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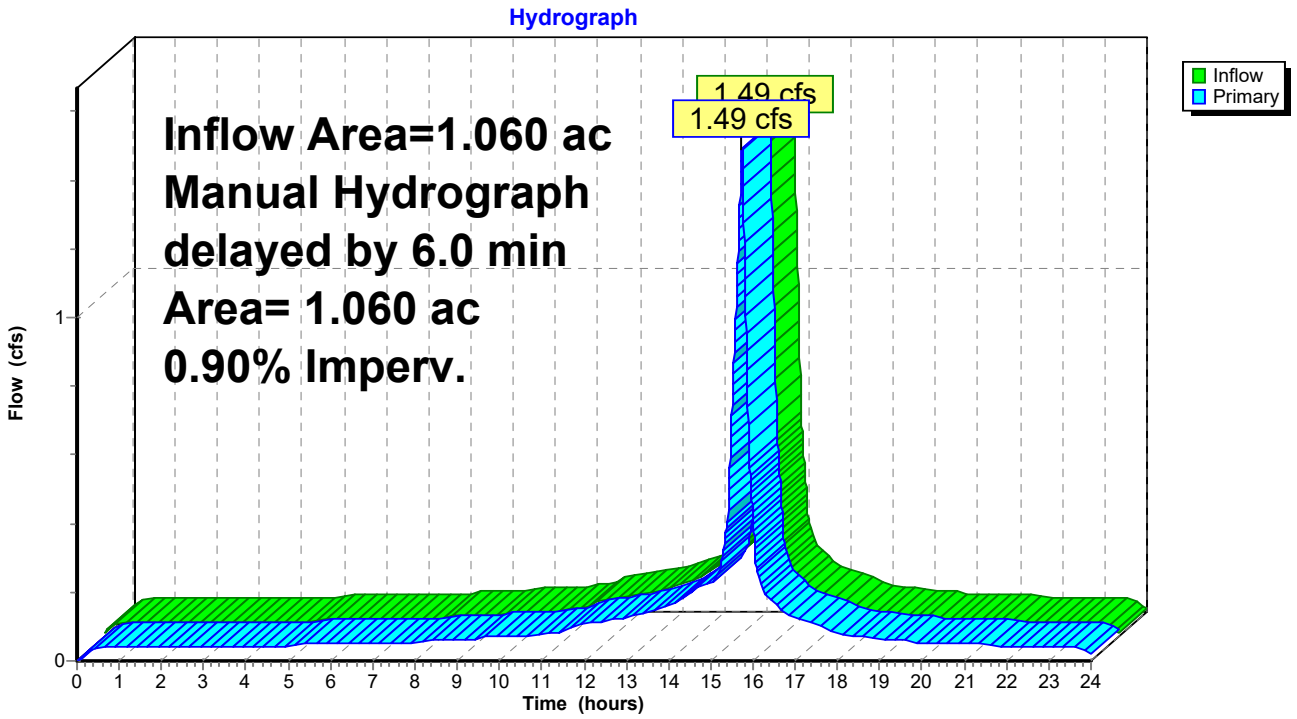
Link 7L: AREA A2 - 100 YR STORM



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Hydrograph for Link 7L: AREA A2 - 100 YR STORM

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.01	**0.00**	0.00
0.50	0.04	0.00	0.04
1.00	0.04	0.00	0.04
1.50	0.04	0.00	0.04
2.00	0.04	0.00	0.04
2.50	0.04	0.00	0.04
3.00	0.04	0.00	0.04
3.50	0.04	0.00	0.04
4.00	0.04	0.00	0.04
4.50	0.04	0.00	0.04
5.00	0.04	0.00	0.04
5.50	0.05	0.00	0.05
6.00	0.05	0.00	0.05
6.50	0.05	0.00	0.05
7.00	0.05	0.00	0.05
7.50	0.05	0.00	0.05
8.00	0.05	0.00	0.05
8.50	0.06	0.00	0.06
9.00	0.06	0.00	0.06
9.50	0.07	0.00	0.06
10.00	0.07	0.00	0.07
10.50	0.07	0.00	0.07
11.00	0.08	0.00	0.08
11.50	0.09	0.00	0.08
12.00	0.11	0.00	0.11
12.50	0.12	0.00	0.12
13.00	0.13	0.00	0.13
13.50	0.14	0.00	0.14
14.00	0.16	0.00	0.16
14.50	0.21	0.00	0.20
15.00	0.23	0.00	0.22
15.50	**1.03**	0.00	**0.72**
16.00	**0.26**	0.00	**0.42**
16.50	0.16	0.00	0.17
17.00	0.12	0.00	0.13
17.50	0.10	0.00	0.11
18.00	0.08	0.00	0.08
18.50	0.07	0.00	0.07
19.00	0.06	0.00	0.06
19.50	0.06	0.00	0.06
20.00	0.05	0.00	0.05
20.50	0.05	0.00	0.05
21.00	0.05	0.00	0.05
21.50	0.05	0.00	0.05
22.00	0.04	0.00	0.04
22.50	0.04	0.00	0.04
23.00	0.04	0.00	0.04
23.50	0.04	0.00	0.04
24.00	0.01	0.00	0.02

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Summary for Link 8L: AREA A1 - 100 YR STORM

Inflow Area = 1.310 ac, 0.90% Impervious, Inflow Depth > 2.38" for 100-yr event
Inflow = 2.95 cfs @ 15.04 hrs, Volume= 0.260 af
Primary = 2.92 cfs @ 15.21 hrs, Volume= 0.260 af, Atten= 1%, Lag= 10.0 min

Primary outflow = Inflow delayed by 10.0 min, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

100-yr 151 Point manual hydrograph, To= 0.00 hrs, dt= 0.16 hrs, Area= 1.310 ac, 0.90% Imp., cfs =

0.01	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09
0.09	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11
0.11	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.10	0.10
0.11	0.12	0.12	0.13	0.14	0.16	0.17	0.19	0.22	0.28
0.44	0.60	0.91	1.91	2.95	1.14	0.36	0.20	0.16	0.13
0.12	0.10	0.09	0.08	0.08	0.11	0.11	0.11	0.10	0.10
0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.05	0.50	0.05	0.05	0.04	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01									

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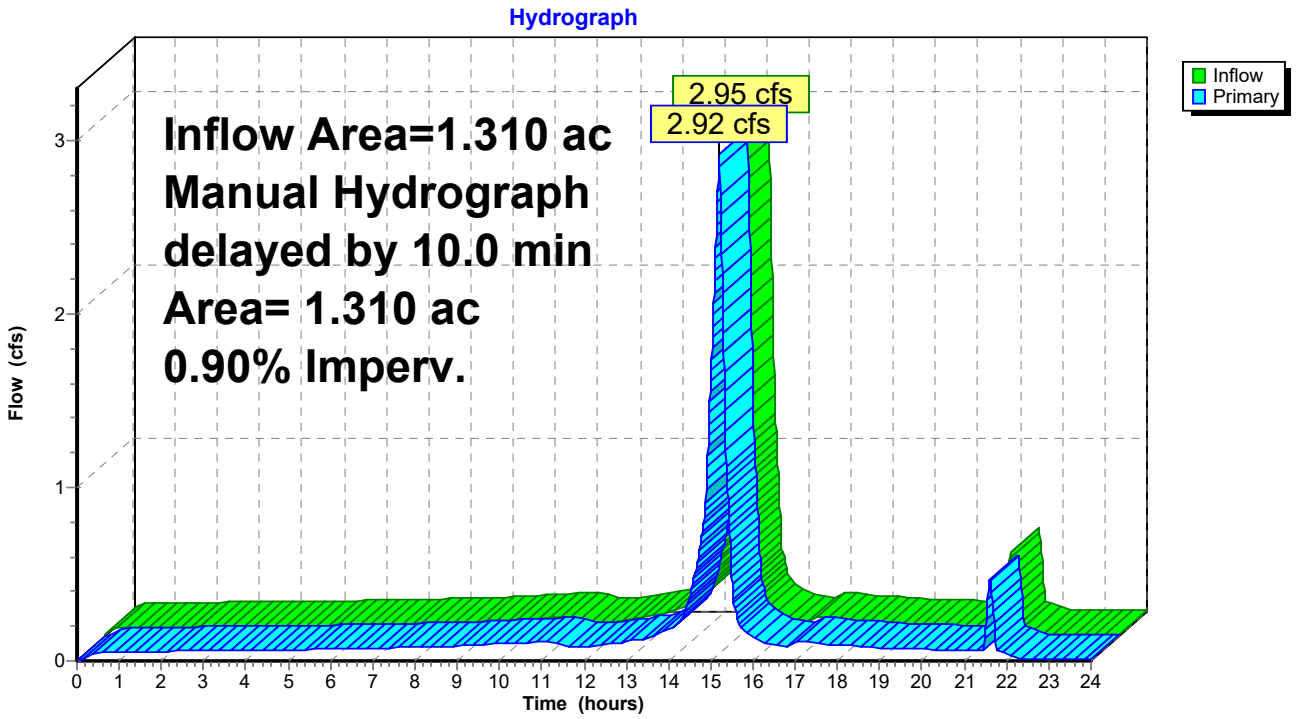
Link 8L: AREA A1 - 100 YR STORM



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Hydrograph for Link 8L: AREA A1 - 100 YR STORM

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.01	**0.00**	0.00
0.50	0.05	0.00	0.05
1.00	0.05	0.00	0.05
1.50	0.05	0.00	0.05
2.00	0.05	0.00	0.05
2.50	0.06	0.00	0.06
3.00	0.06	0.00	0.06
3.50	0.06	0.00	0.06
4.00	0.06	0.00	0.06
4.50	0.06	0.00	0.06
5.00	0.06	0.00	0.06
5.50	0.07	0.00	0.06
6.00	0.07	0.00	0.07
6.50	0.07	0.00	0.07
7.00	0.07	0.00	0.07
7.50	0.08	0.00	0.07
8.00	0.08	0.00	0.08
8.50	0.08	0.00	0.08
9.00	0.09	0.00	0.08
9.50	0.09	0.00	0.09
10.00	0.10	0.00	0.10
10.50	0.11	0.00	0.10
11.00	0.11	0.00	0.11
11.50	0.08	0.00	0.09
12.00	0.08	0.00	0.08
12.50	0.10	0.00	0.09
13.00	0.12	0.00	0.11
13.50	0.15	0.00	0.13
14.00	0.21	0.00	0.18
14.50	0.54	0.00	0.37
15.00	**2.69**	0.00	**1.62**
15.50	**0.22**	0.00	**0.49**
16.00	0.12	0.00	0.13
16.50	0.08	0.00	0.09
17.00	0.11	0.00	0.11
17.50	0.10	0.00	0.10
18.00	0.09	0.00	0.09
18.50	0.08	0.00	0.08
19.00	0.07	0.00	0.07
19.50	0.07	0.00	0.07
20.00	0.06	0.00	0.07
20.50	0.06	0.00	0.06
21.00	0.06	0.00	0.06
21.50	0.33	0.00	0.20
22.00	0.03	0.00	0.05
22.50	0.01	0.00	0.01
23.00	0.01	0.00	0.01
23.50	0.01	0.00	0.01
24.00	0.01	0.00	0.01

Inlet Report

CB 1

Curb Inlet

Location	= Sag
Curb Length (ft)	= 8.00
Throat Height (in)	= 8.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

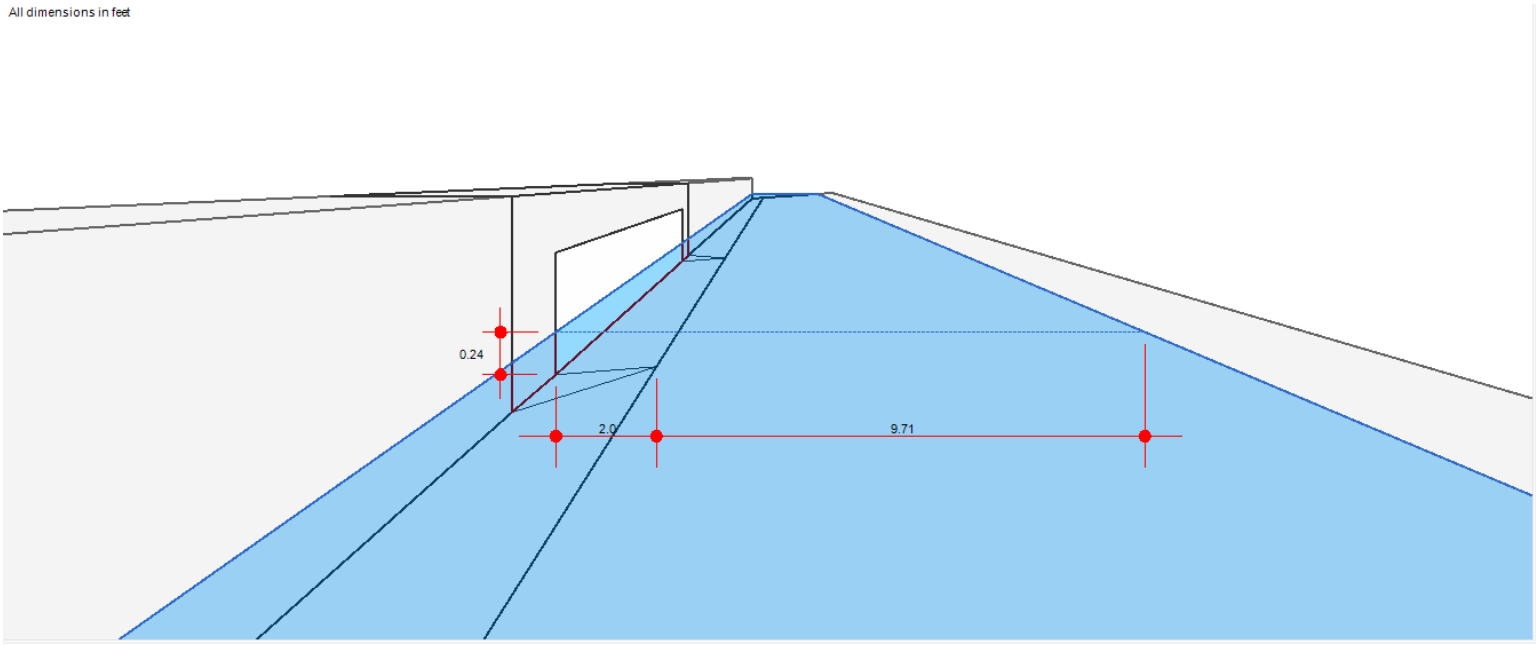
Slope, Sw (ft/ft)	= 0.018
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 0.10
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 2.95

Highlighted

Q Total (cfs)	= 2.95
Q Capt (cfs)	= 2.95
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 2.86
Efficiency (%)	= 100
Gutter Spread (ft)	= 11.71
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

CB 2

Curb Inlet

Location	= Sag
Curb Length (ft)	= 7.00
Throat Height (in)	= 8.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

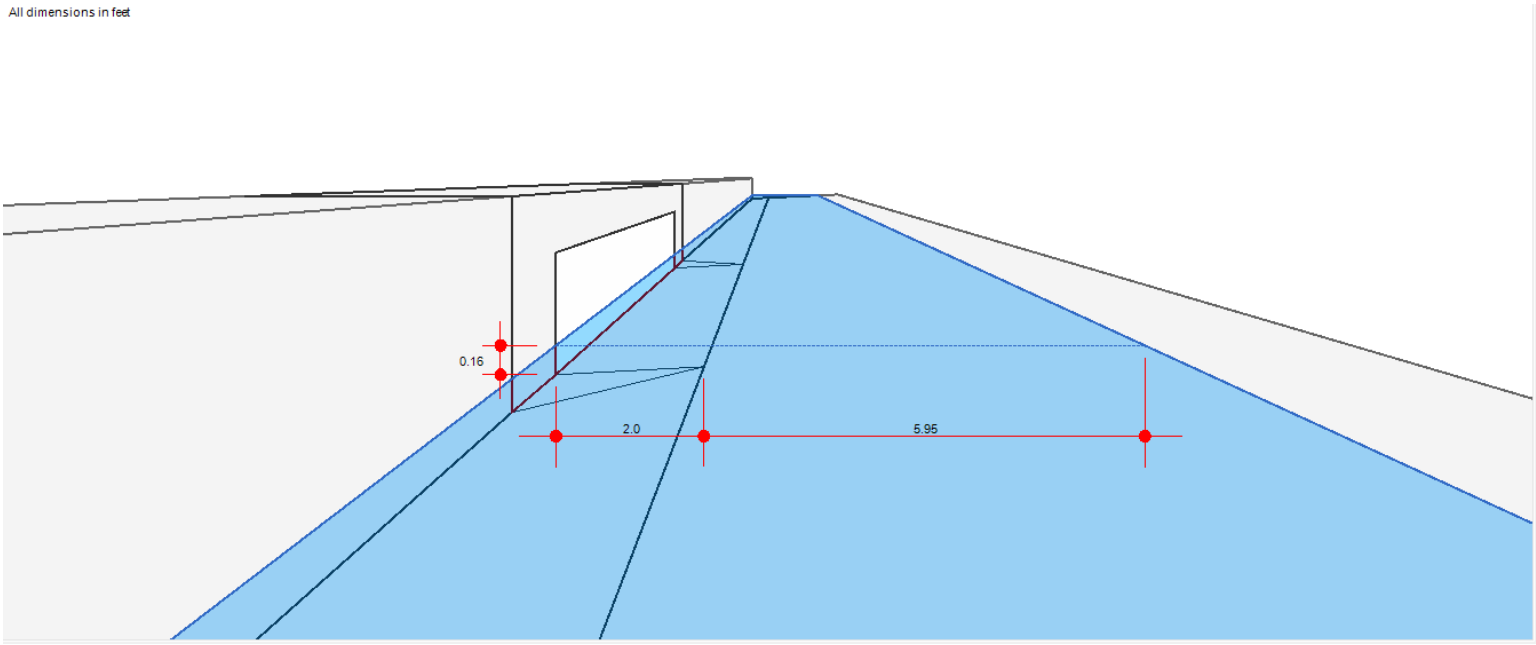
Slope, Sw (ft/ft)	= 0.018
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 0.10
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 1.49

Highlighted

Q Total (cfs)	= 1.49
Q Capt (cfs)	= 1.49
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 1.96
Efficiency (%)	= 100
Gutter Spread (ft)	= 7.95
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

CB 3

Curb Inlet

Location	= Sag
Curb Length (ft)	= 7.00
Throat Height (in)	= 8.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

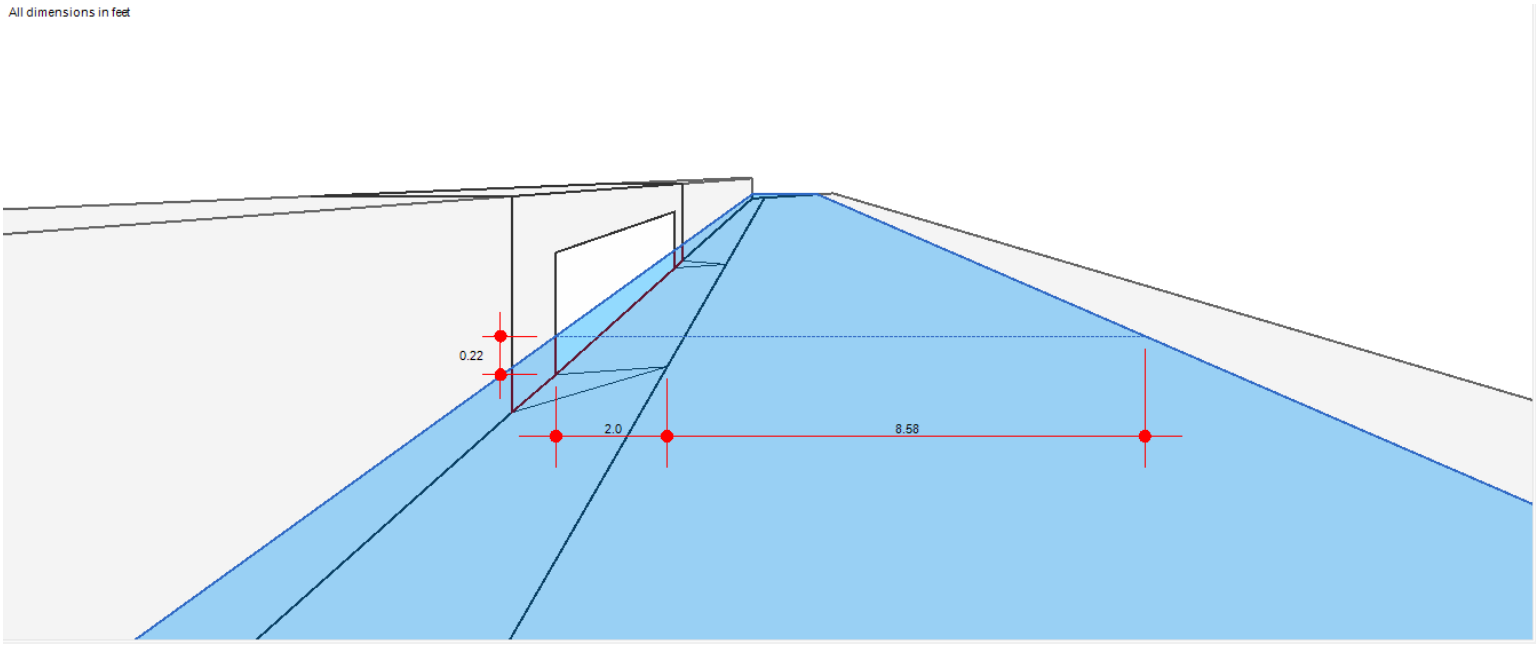
Slope, Sw (ft/ft)	= 0.018
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 0.10
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 2.31

Highlighted

Q Total (cfs)	= 2.31
Q Capt (cfs)	= 2.31
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 2.59
Efficiency (%)	= 100
Gutter Spread (ft)	= 10.58
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

CB 4

Curb Inlet

Location	= Sag
Curb Length (ft)	= 12.00
Throat Height (in)	= 8.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

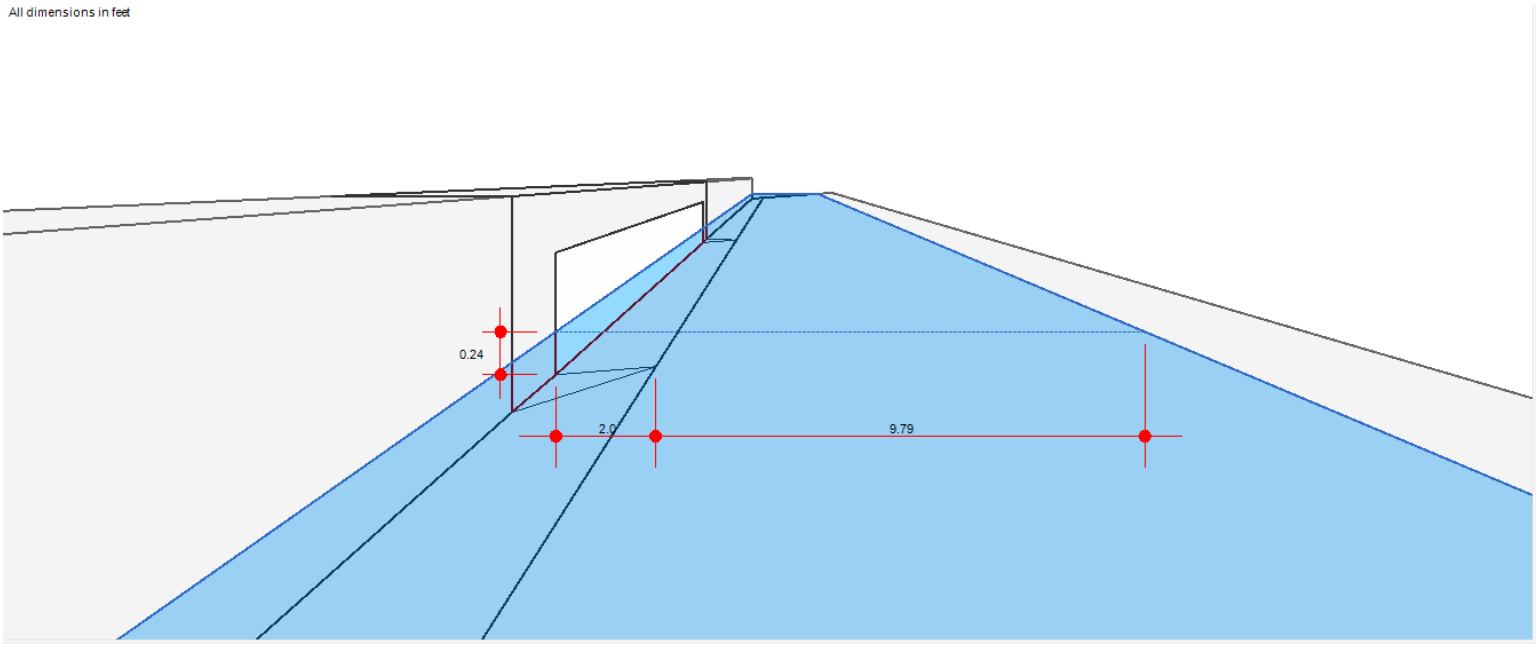
Slope, Sw (ft/ft)	= 0.018
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 0.10
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 4.01

Highlighted

Q Total (cfs)	= 4.01
Q Capt (cfs)	= 4.01
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 2.88
Efficiency (%)	= 100
Gutter Spread (ft)	= 11.79
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



BASIN 1
Project: BAKER-001
Basin Description: BASIN 1 VOLUME

Contour Elevation	Contour Area (sq. ft)	Depth (ft)	Incremental Volume Avg. End (cu. ft)	Cumulative Volume Avg. End (cu. ft)	Incremental Volume Conic (cu. ft)	Cumulative Volume Conic (cu. ft)
425.000	198.80	N/A	N/A	0.00	N/A	0.00
426.000	1,525.89	1.000	862.35	862.35	758.49	758.49
427.000	3,103.65	1.000	2314.77	3177.12	2268.58	3027.07

BASIN 2
Project: BAKER-001
Basin Description: BASIN 2 VOLUME

Contour Elevation	Contour Area (sq. ft)	Depth (ft)	Incremental Volume Avg. End (cu. ft)	Cumulative Volume Avg. End (cu. ft)	Incremental Volume Conic (cu. ft)	Cumulative Volume Conic (cu. ft)
425.000	632.87	N/A	N/A	0.00	N/A	0.00
426.000	1,194.88	1.000	913.88	913.88	899.12	899.12
427.000	1,922.13	1.000	1558.50	2472.38	1544.17	2443.28

BASIN 3 STORAGE
Project: BAKER-001
Basin Description: BASIN 3 VOLUME

Contour Elevation	Contour Area (sq. ft)	Depth (ft)	Incremental Volume Avg. End (cu. ft)	Cumulative Volume Avg. End (cu. ft)	Incremental Volume Conic (cu. ft)	Cumulative Volume Conic (cu. ft)
427.000	698.70	N/A	N/A	0.00	N/A	0.00
428.000	1,253.17	1.000	975.93	975.93	962.53	962.53
429.000	1,930.78	1.000	1591.98	2567.91	1579.82	2542.35

BASIN 4
Project: BAKER-001
Basin Description: BASIN 4 VOLUME

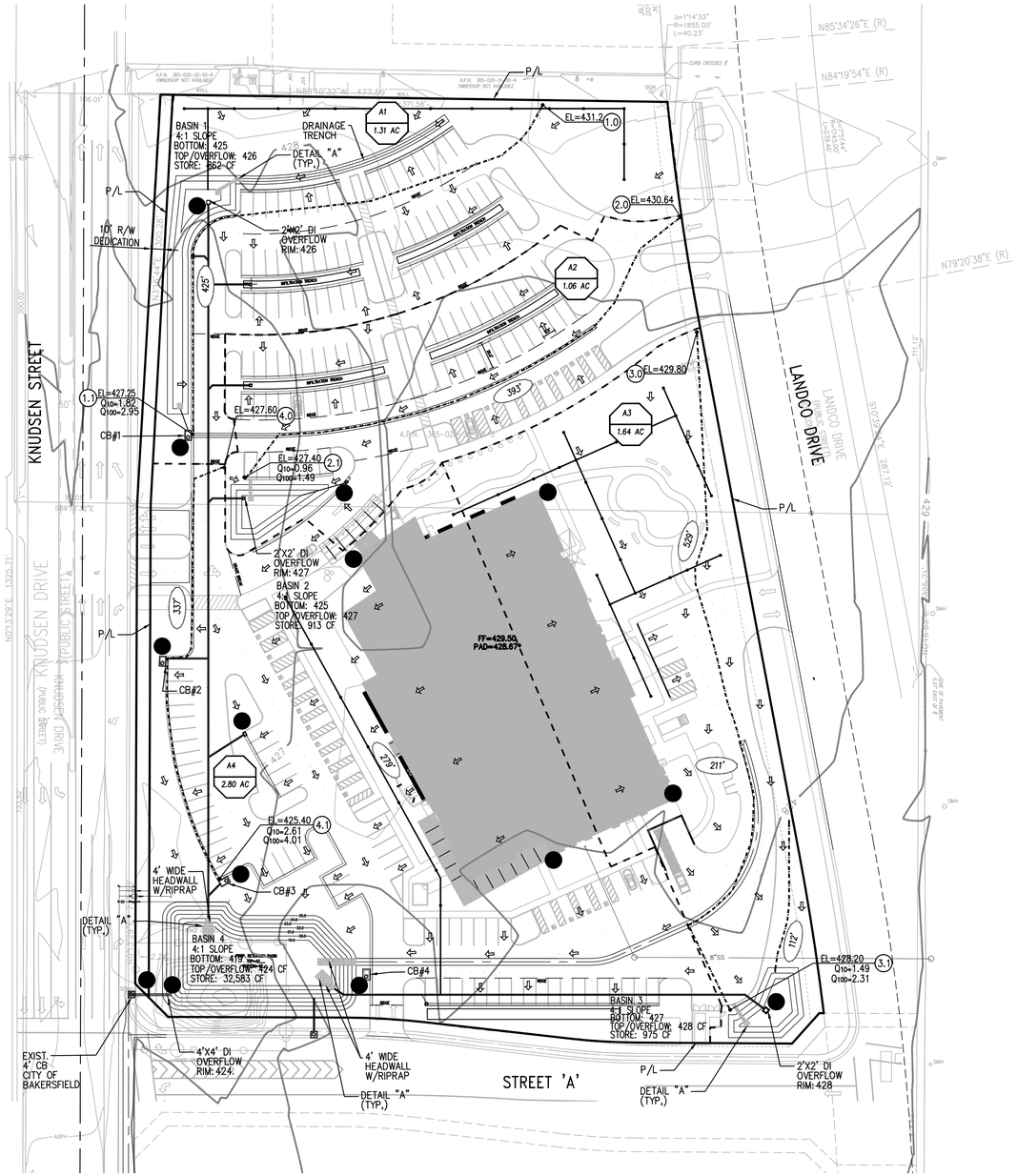
Contour Elevation	Contour Area (sq. ft)	Depth (ft)	Incremental Volume Avg. End (cu. ft)	Cumulative Volume Avg. End (cu. ft)	Incremental Volume Conic (cu. ft)	Cumulative Volume Conic (cu. ft)
419.000	3,646.94	N/A	N/A	0.00	N/A	0.00
420.000	4,525.92	1.000	4086.43	4086.43	4078.53	4078.53
421.000	5,473.04	1.000	4999.48	9085.91	4991.99	9070.51
422.000	6,486.61	1.000	5979.83	15065.73	5972.65	15043.17
423.000	7,552.21	1.000	7019.41	22085.15	7012.66	22055.83
424.000	8,675.42	1.000	8113.82	30198.96	8107.33	30163.16
425.000	9,854.71	1.000	9265.07	39464.03	9258.81	39421.97

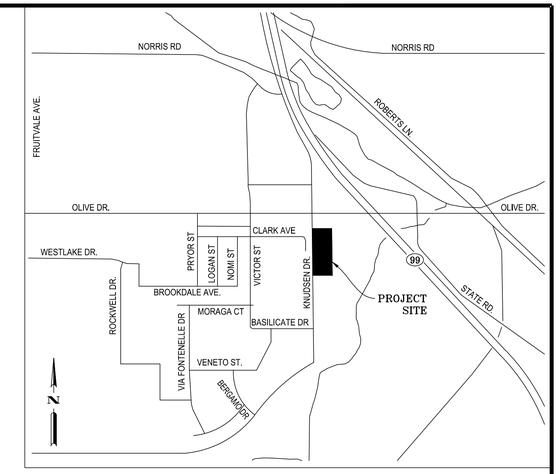
ATTACHMENT 4: EXHIBITS

This attachment contains the project site's vicinity map and hydrology exhibits. Please see the attached exhibit

PROPOSED HYDROLOGY EXHIBIT

KNUDSEN & OLIVE DR.
BAKERSFIELD, CA 93308
APN: 365-020-30
PROJECT NO: VA-101F-12-20010





VICINITY MAP

NOT TO SCALE

LEGEND

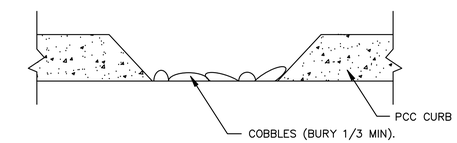
- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA SUB BOUNDARY, NUMBER, AND ACREAGE
- FLOW PATH, DIRECTION, LENGTH
- STUDY NODE NUMBER
- CONFLUENCE POINT
- PROPOSED BIORETENTION AREA
- DRAINAGE FLOW DIRECTION
- STORM DRAIN STENCILING
- FILTERED STORM DRAIN INLET WITH STORM DRAIN STENCILING
- DOWNSPOUT FROM ROOF

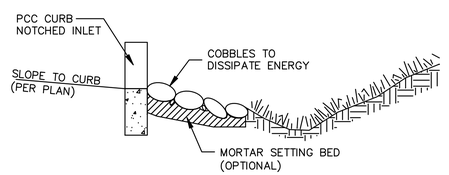
NO DUMPING GOES TO OCEAN thinkBLUE NO TIRAR BASURA LLEGA AL MAR

1. STENCIL OUTLINE SHALL BE 8" X 32".
2. STENCILS MUST BE PAINTED ABOVE THE STORM DRAIN. THE STENCIL MESSAGE MUST BE LEGIBLE FROM THE ROADSIDE. IF THE CURB IS RED, PAINT STENCIL ABOVE THE RED AREA.
3. STENCIL COLORING SHALL BE BLUE LETTERING AND SYMBOLS ON A WHITE BACKGROUND.

STORM DAIN STENCELING (TYP.)

NOT TO SCALE





DETAIL "A"
CURB CUTS WITH VELOCITY DISSIPATION

NOT TO SCALE

FLOOD HAZARD:

PER THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), PANEL NUMBER 06029C1825E DATED 9/26/08, THE SITE FALLS UNDER THE FLOOD ZONE X (OTHER AREAS) AND IS DESCRIBED AS: "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."

DATE OF PREPARATION: 5/28/20

1" = 50'
0 25 50 100

MARK	BY	DATE	REVISIONS	APPR.
ENGINEER				CITY

SEAL-CITY

SEAL-ENGINEER

REGISTERED PROFESSIONAL ENGINEER
GIL EVANGELISTA
No. 32512
Exp. 6-30-21
CIVIL
STATE OF CALIFORNIA

ENGINEER OF WORK

EA ENGINEERS, INC.
20505 E. VALLEY BLVD.,
SUITE 101.
WALNUT, CA 91789
909-598-5045

DATE: 6/1/2020

GIL EVANGELISTA
RCE 66532, EXP. 06/30/20

BENCHMARK:

DRAWN
DESIGNED
CHECKED
SCALE AS SHOWN
JOB NUMBER

KERN COUNTY
PROPOSED HYDROLOGY EXHIBIT
KNUDSEN & OLIVE DR.
BAKERSFIELD, CA 93308
APN: 365-020-30
PROJECT NO: VA-101F-12-20010

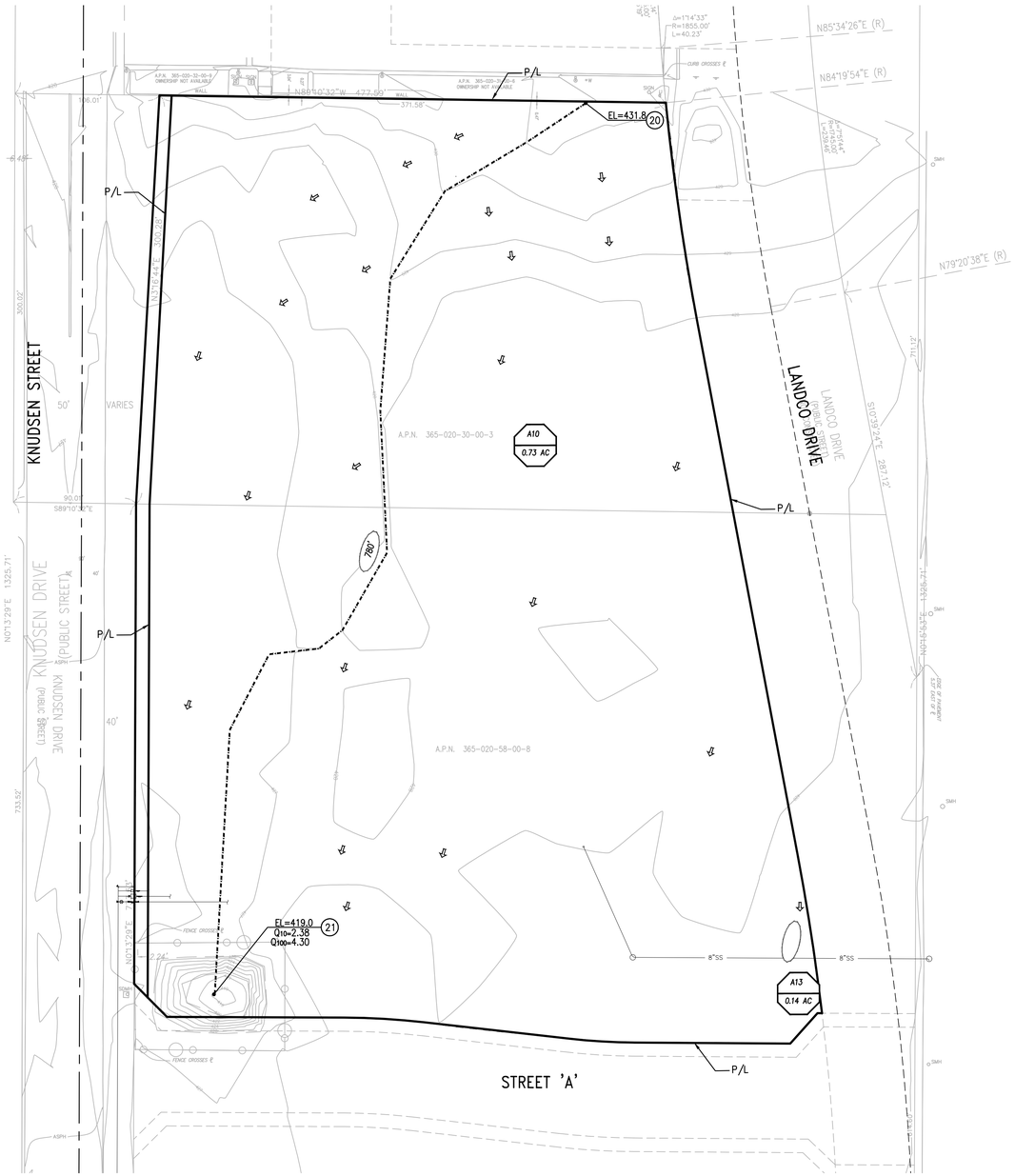
FOR: | W.O. | CITY FILE NO.

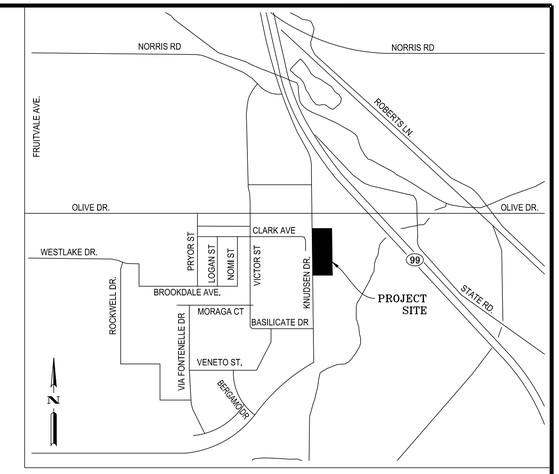
SHEET NO. 1 OF 1 SHEETS
FILE NO.

WDID NO. _____

EXISTING HYDROLOGY EXHIBIT

KNUDSEN & OLIVE DR.
BAKERSFIELD, CA 93308
APN: 365-020-30
PROJECT NO: VA-101F-12-20010





VICINITY MAP

NOT TO SCALE

LEGEND

- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA SUB BOUNDARY, NUMBER, AND ACREAGE
- FLOW PATH, DIRECTION, LENGTH
- STUDY NODE NUMBER
- CONFLUENCE POINT
- PROPOSED BIORETENTION AREA
- DRAINAGE FLOW DIRECTION
- STORM DRAIN STENCILING
- FILTERED STORM DRAIN INLET WITH STORM DRAIN STENCILING
- DOWNSPOUT FROM ROOF

FLOOD HAZARD:

PER THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), PANEL NUMBER 06029C1825E DATED 9/26/08, THE SITE FALLS UNDER THE FLOOD ZONE X (OTHER AREAS) AND IS DESCRIBED AS: "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."

DATE OF PREPARATION: 5/28/20

1" = 50'
0 25 50 100

MARK	BY	DATE	REVISIONS	APPR.
ENGINEER				CITY

SEAL-CITY

SEAL-ENGINEER

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909-598-5045

GIL EVANGELISTA
RCE 66532, EXP. 06/30/20
DATE: 6/1/2020

BENCHMARK:

DRAWN
DESIGNED
CHECKED
SCALE AS SHOWN
JOB NUMBER

KERN COUNTY
EXISTING HYDROLOGY EXHIBIT
KNUDSEN & OLIVE DR.
BAKERSFIELD, CA 93308
APN: 365-020-30
PROJECT NO: VA-101F-12-20010

FOR: | W.O. | CITY FILE NO.

SHEET NO. 1
OF 1 SHEETS
FILE NO.

WDID NO. _____

ATTACHMENT 5: FEMA DETERMINATION

This attachment contains the project site's FEMA determination. Please see the attached exhibits.

National Flood Hazard Layer FIRMette

FEMA

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/20/2020 at 11:00:13 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Kern County, California, Northwestern Part

May 20, 2020

Preface

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

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

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

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

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

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

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

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....8
Soil Map.....9
Legend.....10
Map Unit Legend.....11
Map Unit Descriptions.....11
Kern County, California, Northwestern Part.....13
174—Kimberlina fine sandy loam, 0 to 2 percent slopes MLRA 17.....13
References.....15

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

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

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

Soil Map

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

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,880 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

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

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

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

Soil Survey Area: Kern County, California, Northwestern Part
Survey Area Data: Version 12, Sep 16, 2019

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

Date(s) aerial images were photographed: Feb 25, 2019—Mar 15, 2019

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
174	Kimberlina fine sandy loam, 0 to 2 percent slopes MLRA 17	13.5	100.0%
Totals for Area of Interest		**13.5**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Kern County, California, Northwestern Part

174—Kimberlina fine sandy loam, 0 to 2 percent slopes MLRA 17

Map Unit Setting

National map unit symbol: 2ss96
Elevation: 120 to 1,160 feet
Mean annual precipitation: 4 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Kimberlina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimberlina

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 9 inches: fine sandy loam
C - 9 to 45 inches: fine sandy loam
2C - 45 to 71 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.3 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Wasco

Percent of map unit: 7 percent
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Milham

Percent of map unit: 6 percent
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

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ATTACHMENT 6: SOILS REPORT

This attachment contains the project site's soils report. Please see the attached exhibits.