

PRELIMINARY HYDROLOGY STUDY

TTM NO. 38031

7080 Sumner Avenue

City of Eastvale, County of Riverside

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7080 Sumner Avenue

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**Preliminary Hydrology Study
For
Tentative Tract Map No. 38031**

Acknowledgement and Signature Page

This Preliminary Hydrology Study was prepared by C&V Consulting, Inc. under the supervision of Ryan J. Bittner, P.E.

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C&V Consulting, Inc.

Date

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I. Purpose

The preliminary hydrology study will determine the amount of stormwater runoff generated from the project site under pre-development and post-development conditions. The values and statements within this report confirm the post-development site is designed and planned in accordance with the Riverside County Flood Control and Water Conservation District (RCFC&WCD) Hydrology Manual and the City of Eastvale drainage requirements. This study will anticipate whether detention or other peak flow mitigation methods will be required by comparing the post-development and pre-development condition peak flow rates for the 100-year storm events.

II. Site Description

The proposed site is located at 7080 Sumner Avenue, in the City of Eastvale, County of Riverside. The site is bordered by Schleisman Road to the north, Orange Street to the south, existing single-family residential to the east, and Sumner Avenue to the west.

The development site has a gross acre of 9.25 and net acre of 7.54. The proposed dedication areas around the perimeter of the proposed project site that are not included as part of the hydrologic calculation in comparison to the post-development site due to post-grading and/or perimeter controls.

According to the USDA Natural Resources Conservation Service, the majority of the site is located in the hydrologic soil group “C”.

According to the Federal Emergency Management Agency (FEMA), FIRM rate map Number 06065C0679G, effective date August 28, 2008, the site is located within flood Zone X. Zone X is areas determined to be outside of the 0.2% annual chance floodplain. Refer to the FIRM rate map within Appendix D.

III. Pre-Development Conditions

The current drainage condition of the site sheet flow to the concrete swale located on the southerly border, which terminates at a storm drain inlet near the south-westerly boundary of the site. There are existing single-family buildings with garages at both the northwest and southwest corners of the parcel. A single-story garage building remains near the middle of the parcel. There are existing large slabs of concrete spread through the site with previously demolished buildings according to historical photos. On-site stormwater appears to exit the site via swale on Orange Street and enters the 36” public RCP storm drain at an existing catch basin downstream.

The topographic survey was utilized to identify pre-development onsite high points and overall site conveyance of storm water runoff. All existing stormwater runoff ultimately reaches the outlet on Orange Street, the onsite development area was analyzed as a single drainage management area used to approximately quantify the runoff based on the longest hydraulic path from the most remote high point to low outlet point.

Refer to Appendix A, Preliminary Pre-Development Conditions Hydrology Map, for additional existing conditions information.

IV. Post-Development Conditions

The proposed project site development consists of 22 buildings with a total of 159 dwelling units over an approximate area of 7.54-acre site. The proposed development includes drive aisles, parking, landscaping, walkways, and common open space areas.

Preliminary grading of the site proposes to collect runoff at multiple inlets spread throughout the site which routes runoff into to the underground retention trench system with drywells designed for infiltration. The proposed development was separated into three (3) subareas per local sump inlet with upstream flow-through inlets. All subareas are interconnected with onsite storm drain which routes to the underground retention system. Additional subareas may be analyzed for onsite flow-through inlets during final engineering.

In an event where the proposed onsite storm drain system exceeds full capacity, stormwater will mitigate to the existing storm drain on Orange Street at the lowest catch basin outlet. Emergency overflow is provided with site grading to outlet preserving existing drainage pattern.

Refer to Appendix A, Preliminary Post-Development Conditions Hydrology Map, for additional proposed conditions information.

V. Methodology

The pre-development and post-development drainage conditions were analyzed by utilizing the County of Riverside Flood and Water Conservation District (RCFC&WCD) Hydrology Manual. Civil Design Hydrology Program is used following the standard set per Hydrology Manual. Drainage management subareas were divided per site existing topography and proposed grading. rational method is applied to the drainage areas to obtain the 10-, and 100-year storm event peak runoff. The rational method utilizes hydrology manual's rainfall data. The results are utilized for onsite drainage system capacity sizing and to determine if additional outlet mitigation is required.

As proposed development conditions generate higher peak flowrates in comparison to existing conditions, synthetic unit hydrograph method is utilized to generate existing parameters and proposed development hydrograph for routing analysis. NOAA rainfall data were applied for the synthetic unit hydrograph method for site specific results. 1-, 3-, 6-, 24-hour durations of the 100-year storm were analyzed for the existing and proposed conditions runoff peak flow rates and volume.

The post-development conditions were compared to that of the pre-development conditions for mitigation and retention design. Federal Highway Administration's Hydraulic Toolbox was utilized to verify the retention system storage and determine the outflow hydrograph with post-development conditions hydrograph as inflow.

In this preliminary hydrology study, the overall drainage of the development is designed and planned in accordance with the Riverside County Flood Control and Water Conservation District. Inlets capacity, pipe conveyance sizing and 100-year water surface elevation analysis will be provided during final engineering.

VI. Design Assumption

1. The property is located in the City of Eastvale, Riverside County rainfall region. Standard intensity-duration curves data (Plate D-4.1) for the “Riverside-Foothill” area is used for Rational Method analysis.
2. NOAA rainfall data was utilized for Synthetic Unit Hydrograph Method analysis.
3. Pre-development average runoff index determined to be 69 with a pervious fraction of 80% based on existing conditions geospatial observations.
4. Post-development average runoff index determined to be 69 with a pervious fraction of 20% based on development type.
5. The site is located within Hydrologic Soil Type “C” per the USDA Web Soil Survey Data.
6. Preliminary infiltration rate of 3.5 in/hour assumed throughout the site per Geotechnical recommendation.
7. 100-year storm event flood level protection analysis required for habitable structures per County of Riverside requirements.

VII. Hydrology Results

The results from this preliminary hydrology study utilizing the rational method provided by the City of Eastvale and the RCFC&WCD is summarized below:

Rational Method Summary

Pre-Development Conditions	Area (ac)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
DA-XA1	0.86	1.277	2.203
DA-XA2	6.68	8.218	14.728
Total	7.54	9.495	16.931

Post-Development Conditions	Area (ac)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
DA-A1	2.65	5.000	7.727
DA-A2	2.81	5.193	8.028
DA-A3	2.08	3.699	5.723
Total	7.54	13.892	21.478

Refer to Appendix B for additional computation information.

The results demonstrate that the post-development conditions storm water runoff peak flows are greater than the pre-development conditions peak flows; therefore, mitigation is required to preserve existing conditions.

Retention Sizing/ Routing Analysis

The Synthetic Unit Hydrograph Method per the Riverside County Flood Control and Water Conservation District Hydrology Manual was utilized through CivilDesign to generated proposed conditions hydrographs for the 1-, 3-, 6-, and 24-hour for 100-year storm event. Generated hydrograph is routed through the underground retention system storage with infiltration capacity to verify the design is adequate.

**Preliminary Hydrology Study
City of Eastvale, County of Riverside**

	Q100-yr, 1-hr (cfs)	Q100-yr, 3-hr (cfs)	Q100-yr, 6-hr (cfs)	Q100-yr, 24-hr (cfs)
Existing Conditions Hydrograph Peak Runoff	25.558	14.905	13.673	5.073
Proposed Conditions Hydrograph Peak Runoff	30.295	16.116	14.993	5.757
Mitigated Peak Outflow	10.314	13.808	12.445	4.792

Mitigated Peak Outflow includes a reduction of infiltrated rate.

The proposed retention/ infiltration system is also sized to accommodate the storage and infiltration of the required design capture volume per water quality requirements.

Water Quality Design Capture Volume (cuft)	Proposed Retention System Volume (cuft)	24-Hour Infiltration Capacity (cuft)	Infiltrated rate
18,927.6	29,060.2	60,471.6	0.70 cfs

Refer to the separately prepared project Preliminary WQMP for additional information regarding the water quality design.

Emergency overflow during excessive storm event will overflow onto Orange Street via onsite grading and continues downstream preserving historical drainage pattern. The development's proposed grading/ drainage design has been developed to limit the diversion of pre-development flow patterns and maintain the pre-development runoff conditions for overflow pathways to extend the feasibility for the developed site conditions. By implementing the total onsite retention for the post-development condition, no significant impact to the downstream water bodies is anticipated.

VIII. Hydraulics Analysis

Catch Basin Inlet Capacity Sizing

Catch basin capacity will be analyzed to intercept the 100-year storm event peak flow rate during final engineering. Inlet capacity will ensure the adequate private street runoff conveyance during the design storm event is properly mitigated.

Pipe Conveyance Sizing

Pipe Sizing will be analyzed using WSPG software to verify hydraulic grade line (HGL) based on the required storm event peak flow rate during final engineering for post-development onsite conveyance pipe.

A preliminary pipe sizing for onsite runoff conveyance using AutoCAD Civil 3D – HydraFlow based on open channel flow.

100-Year Water Surface Elevation (WSE)

The elevation of the 100-year water surface will be analyzed during final engineering. Building finished floors will be set at a minimum of at least 1 foot above the 100-year WSE.

IX. Conclusion

The results from this preliminary hydrology study utilizing Riverside County Flood Control and Water Conservation District Hydrology Manual demonstrate that the post-development condition stormwater peak flow for different year storm event frequencies from the subject site will increase compared to the pre-development condition peak flow as indicated in the rational method summary. Proper retention storage and mitigation is designed and proposed to preserve existing drainage patterns to satisfy City of Eastvale and County of Riverside drainage requirements.

In an event where the proposed onsite storm drain system exceeds full capacity, stormwater will mitigate to the existing storm drain on Orange Street at the lowest catch basin outlet. Emergency overflow during excessive storm event will overflow onto Orange Street via onsite grading and continues downstream preserving historical drainage pattern.

The development's proposed grading/ drainage design has been developed to limit the diversion of pre-development flow patterns and maintain the pre-development runoff conditions for overflow pathways to extend the feasibility for the developed site conditions. By implementing the total onsite retention for the post-development condition, no significant impact to the downstream water bodies is anticipated.

During final engineering, impervious areas for post-development conditions will be calculated in more details based on the finalized landscape plan. The post-development peak flow rates will be re-evaluated to reflect final engineering plans.

X. References

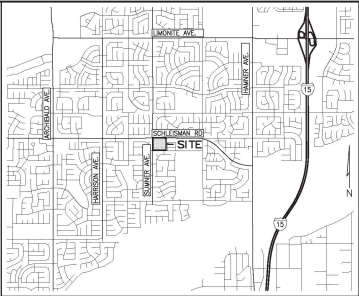
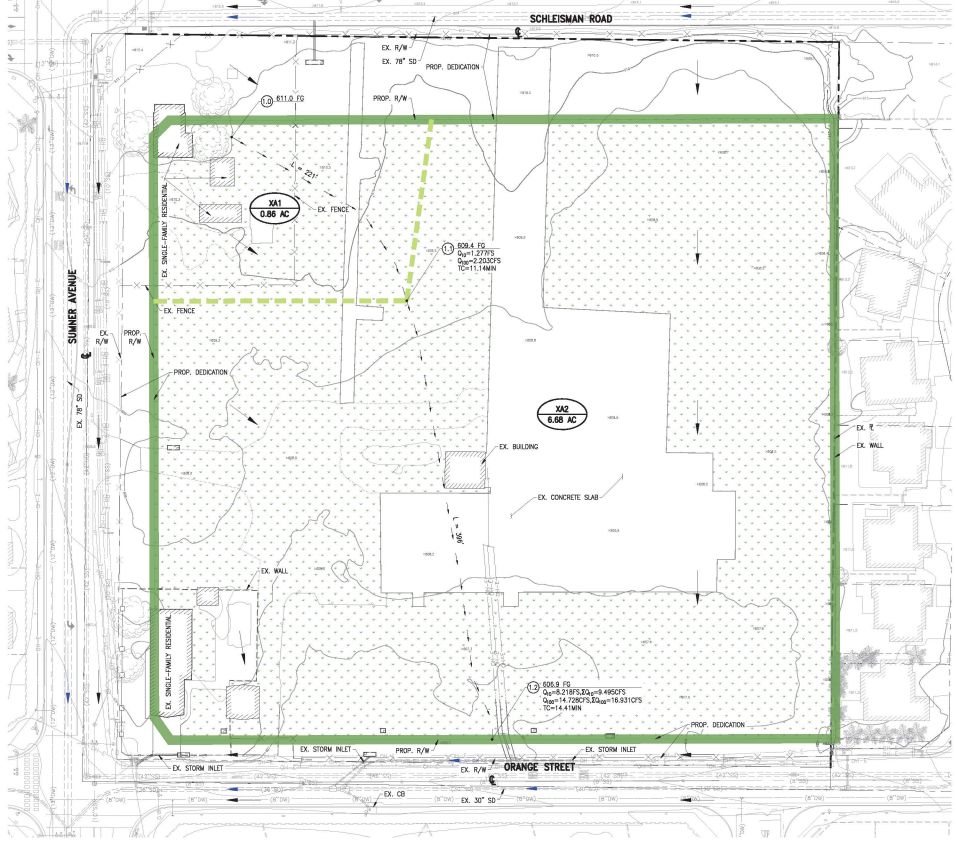
1. Riverside County Flood Control and Water Conservation District Hydrology Manual 1978.
2. UNRIV: Unit Hydrograph Hydrology, Riverside Co. CivilDesign.
3. United States Department of Agriculture Natural Resources Conservation Service Soil Map.
4. NOAA Atlas 14 Point Precipitation Frequency Estimates for California.
5. AutoCAD Civil 3D – HydraFlow Expressed used to preliminarily size tributary flow conveyance pipe.

APPENDIX A

Hydrology Maps

Preliminary Pre-Development Conditions Hydrology Map

PRELIMINARY PRE-DEVELOPMENT CONDITIONS HYDROLOGY MAP



VICINITY MAP
N.T.S.

LEGEND:

- DRAINAGE MANAGEMENT AREA (DMA) BOUNDARY
- DMA SUBAREA BOUNDARY
- SITE BOUNDARY
- RIGHT OF WAY
- EXISTING LOT LINE
- EXISTING EASEMENT LINE
- SURFACE FLOW DIRECTION
- PIPE SLOPE DIRECTION
- SURFACE LONGEST FLOWPATH
- PERVIOUS AREA
- INITIAL SUBAREA NODE
- SPOT ELEVATION
- PEAK RUNOFF IN CUBIC FEET PER SECOND (CFS)
- CONFLUENCE PEAK RUNOFF (CFS)
- TIME OF CONCENTRATION IN MINUTES (MIN)
- PROVIDED FOR 100-YR STORM EVENT
- DRAINAGE AREA (DA) NUMBER
- DMA SIZE (ACRES)

NOTES:
GROSS AREA: 9.25 AC
NET AREA: 7.54 AC
AREA TO BE DEDICATED ARE NOT ACCOUNTED FOR HYDROLOGY CALCULATION.
EXISTING CONDITIONS ASSUME AS 1 ACRES LOT BASED ON WATERPODS COVER.

PRE-DEVELOPMENT SITE CONDITIONS HYDROGRAPH METHOD PEAK FLOW RATE SUMMARY					
	AREA (AC)	Q _{100-19.1-HR} (CFS)	Q _{100-19.3-HR} (CFS)	Q _{100-19.6-HR} (CFS)	Q _{100-19.24-HR} (CFS)
EXISTING CONDITIONS GENERATED PEAK FLOW RATE	7.54	22,558	14,859	13,873	5,073

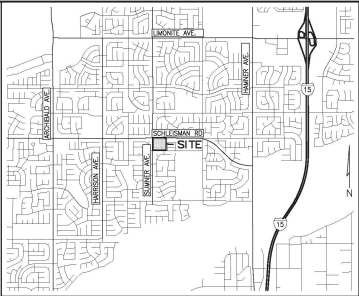
NOTE: PEAK FLOW RATE DETERMINE PER SYNTHETIC UNIT HYDROGRAPH METHOD PER INDIANE COUNTY HYDROLOGY MANUAL.

MARK	REVISIONS	APPROV.	DATE
DESIGNED BY	DRAWN BY	CHECKED BY	

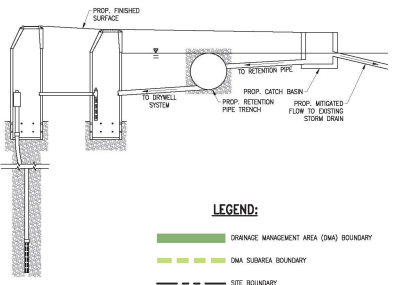
CITY OF EASTVALE
TTM 38031
PRELIMINARY PRE-DEVELOPMENT CONDITIONS
HYDROLOGY MAP

Preliminary Post-Development Conditions Hydrology Map

PRELIMINARY POST-DEVELOPMENT CONDITIONS HYDROLOGY MAP

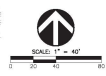


VICINITY MAP
N.T.S.



LEGEND:

- ORANGE MANAGEMENT AREA (OMA) BOUNDARY
- OMA SUBAREA BOUNDARY
- SITE BOUNDARY
- RIGHT OF WAY
- EXISTING LOT LINE
- EXISTING EASEMENT LINE
- SURFACE FLOW DIRECTION
- PIPE SLOPE DIRECTION
- SURFACE LONGEST FLOWPATH
- PERVIOUS AREA
- INITIAL SUBAREA NODE
SPOT ELEVATION
PEAK RAINFALL IN CUBIC FEET
PER SECOND (CFS)
CONFLUENCE PEAK RAINFALL (CFS)
TIME OF CONCENTRATION IN MINUTES (MIN)
PROVIDED FOR 100-YR STORM EVENT
- ORANGE AREA (OA) NUMBER
OMA SIZE (ACRES)



POST-DEVELOPMENT SITE CONDITIONS HYDROGRAPH METHOD PEAK FLOW RATE SUMMARY					
	AREA (AC)	$Q_{100-19.1-HR}$ (CFS)	$Q_{100-19.3-HR}$ (CFS)	$Q_{100-19.6-HR}$ (CFS)	$Q_{100-19.24-HR}$ (CFS)
EXISTING CONDITIONS GENERATED PEAK FLOW RATE	7.54	20,558	14,859	13,673	5,753
PROPOSED CONDITIONS GENERATED PEAK FLOW RATE	7.54	30,285	16,116	14,963	5,757
PROPOSED MITIGATED PEAK FLOW RATE	7.54	10,314	13,808	12,445	4,780

NOTE: PEAK FLOW RATE DETERMINE PER SYNTHETIC UNIT HYDROGRAPH METHOD PER RIVERSIDE COUNTY HYDROLOGIC MANUAL. MITIGATED FLOW INCLUDES A REDUCTION OF 0.70 CFS INFILTRATED RATE.

CITY OF EASTVALE			SHEET 1 OF 1
TTM 38031			
PRELIMINARY POST-DEVELOPMENT CONDITIONS HYDROLOGY MAP			
MARK	REVISIONS	APPRO. DATE	
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APPENDIX B

Hydrology Computations – Rational Method Analysis

Existing Conditions Rational Method Analysis

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/15/25 File:ST08X100.out

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
EXISTING CONDITIONS
100-YEAR STORM EVENT

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

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

Program License Serial Number 6677

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

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)

For the [Riverside-Foothill] area used.

10 year storm 10 minute intensity = 2.140(In/Hr)

10 year storm 60 minute intensity = 0.800(In/Hr)

100 year storm 10 minute intensity = 3.210(In/Hr)

100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 100.0

Calculated rainfall intensity data:

1 hour intensity = 1.200(In/Hr)

Slope of intensity duration curve = 0.5500

+++++
Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 221.000(Ft.)

Top (of initial area) elevation = 611.000(Ft.)

Bottom (of initial area) elevation = 609.400(Ft.)

Difference in elevation = 1.600(Ft.)
 Slope = 0.00724 s(percent)= 0.72
 $TC = k(0.480)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.144 min.
 Rainfall intensity = 3.029(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1 Acre Lot)
 Runoff Coefficient = 0.846
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.40
 Pervious area fraction = 0.800; Impervious fraction = 0.200
 Initial subarea runoff = 2.203(CFS)
 Total initial stream area = 0.860(Ac.)
 Pervious area fraction = 0.800

++++++
 Process from Point/Station 1.100 to Point/Station 1.200
 **** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 609.400(Ft.)
 End of natural channel elevation = 606.900(Ft.)
 Length of natural channel = 396.000(Ft.)
 Estimated mean flow rate at midpoint of channel = 10.760(CFS)

Natural valley channel type used
 L.A. County flood control district formula for channel velocity:
 $Velocity(ft/s) = (7 + 8(q(English\ Units)^{.352})(slope^{0.5}))$
 Velocity using mean channel flow = 2.02(Ft/s)

Correction to map slope used on extremely rugged channels with
 drops and waterfalls (Plate D-6.2)
 Normal channel slope = 0.0063
 Corrected/adjusted channel slope = 0.0063
 Travel time = 3.26 min. TC = 14.41 min.

Adding area flow to channel
 SINGLE FAMILY (1 Acre Lot)
 Runoff Coefficient = 0.838
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.40
 Pervious area fraction = 0.800; Impervious fraction = 0.200
 Rainfall intensity = 2.630(In/Hr) for a 100.0 year storm
 Subarea runoff = 14.728(CFS) for 6.680(Ac.)

Total runoff = 16.931(CFS) Total area = 7.540(Ac.)
End of computations, total study area = 7.54 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.800
Area averaged RI index number = 69.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/15/25 File:ST08X10.out

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
EXISTING CONDITIONS
10-YEAR STORM EVENT

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

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

Program License Serial Number 6677

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

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)

For the [Riverside-Foothill] area used.

10 year storm 10 minute intensity = 2.140(In/Hr)

10 year storm 60 minute intensity = 0.800(In/Hr)

100 year storm 10 minute intensity = 3.210(In/Hr)

100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 10.0

Calculated rainfall intensity data:

1 hour intensity = 0.800(In/Hr)

Slope of intensity duration curve = 0.5500

+++++
Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 221.000(Ft.)

Top (of initial area) elevation = 611.000(Ft.)

Bottom (of initial area) elevation = 609.400(Ft.)

Difference in elevation = 1.600(Ft.)
 Slope = 0.00724 s(percent)= 0.72
 $TC = k(0.480)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.144 min.
 Rainfall intensity = 2.019(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1 Acre Lot)
 Runoff Coefficient = 0.735
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 69.00
 Pervious area fraction = 0.800; Impervious fraction = 0.200
 Initial subarea runoff = 1.277(CFS)
 Total initial stream area = 0.860(Ac.)
 Pervious area fraction = 0.800

++++++
 Process from Point/Station 1.100 to Point/Station 1.200
 **** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 609.400(Ft.)
 End of natural channel elevation = 606.900(Ft.)
 Length of natural channel = 396.000(Ft.)
 Estimated mean flow rate at midpoint of channel = 6.236(CFS)

Natural valley channel type used
 L.A. County flood control district formula for channel velocity:
 $Velocity(ft/s) = (7 + 8(q(English\ Units)^{.352})(slope^{0.5}))$
 Velocity using mean channel flow = 1.77(Ft/s)

Correction to map slope used on extremely rugged channels with
 drops and waterfalls (Plate D-6.2)
 Normal channel slope = 0.0063
 Corrected/adjusted channel slope = 0.0063
 Travel time = 3.74 min. TC = 14.88 min.

Adding area flow to channel
 SINGLE FAMILY (1 Acre Lot)
 Runoff Coefficient = 0.714
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 69.00
 Pervious area fraction = 0.800; Impervious fraction = 0.200
 Rainfall intensity = 1.722(In/Hr) for a 10.0 year storm
 Subarea runoff = 8.218(CFS) for 6.680(Ac.)

Total runoff = 9.495(CFS) Total area = 7.540(Ac.)
End of computations, total study area = 7.54 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.800
Area averaged RI index number = 69.0

Proposed Conditions Rational Method Analysis

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 07/16/25 File:ST08P100.out

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
PROPOSED CONDITIONS
100-YEAR STORM EVENT

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

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

Program License Serial Number 6677

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

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)

For the [Riverside-Foothill] area used.

10 year storm 10 minute intensity = 2.140(In/Hr)

10 year storm 60 minute intensity = 0.800(In/Hr)

100 year storm 10 minute intensity = 3.210(In/Hr)

100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 100.0

Calculated rainfall intensity data:

1 hour intensity = 1.200(In/Hr)

Slope of intensity duration curve = 0.5500

+++++
Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 544.000(Ft.)

Top (of initial area) elevation = 614.700(Ft.)

Bottom (of initial area) elevation = 607.800(Ft.)

Difference in elevation = 6.900(Ft.)
Slope = 0.01268 s(percent)= 1.27
TC = $k(0.323)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
Initial area time of concentration = 9.612 min.
Rainfall intensity = 3.286(In/Hr) for a 100.0 year storm
APARTMENT subarea type
Runoff Coefficient = 0.887
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 84.40
Pervious area fraction = 0.200; Impervious fraction = 0.800
Initial subarea runoff = 7.727(CFS)
Total initial stream area = 2.650(Ac.)
Pervious area fraction = 0.200

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

Initial area flow distance = 490.000(Ft.)
Top (of initial area) elevation = 612.700(Ft.)
Bottom (of initial area) elevation = 608.500(Ft.)
Difference in elevation = 4.200(Ft.)
Slope = 0.00857 s(percent)= 0.86
TC = $k(0.323)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
Initial area time of concentration = 9.969 min.
Rainfall intensity = 3.220(In/Hr) for a 100.0 year storm
APARTMENT subarea type
Runoff Coefficient = 0.887
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 84.40
Pervious area fraction = 0.200; Impervious fraction = 0.800
Initial subarea runoff = 8.028(CFS)
Total initial stream area = 2.810(Ac.)
Pervious area fraction = 0.200

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

Initial area flow distance = 516.000(Ft.)
Top (of initial area) elevation = 609.900(Ft.)
Bottom (of initial area) elevation = 606.400(Ft.)

Difference in elevation = 3.500(Ft.)
 Slope = 0.00678 s(percent)= 0.68
 $TC = k(0.323)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.665 min.
 Rainfall intensity = 3.103(In/Hr) for a 100.0 year storm
 APARTMENT subarea type
 Runoff Coefficient = 0.887
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.40
 Pervious area fraction = 0.200; Impervious fraction = 0.800
 Initial subarea runoff = 5.723(CFS)
 Total initial stream area = 2.080(Ac.)
 Pervious area fraction = 0.200
 End of computations, total study area = 7.54 (Ac.)
 The following figures may
 be used for a unit hydrograph study of the same area.

 Area averaged pervious area fraction(A_p) = 0.200
 Area averaged RI index number = 69.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 07/16/25 File:ST08P10.out

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
PROPOSED CONDITIONS
10-YEAR STORM EVENT

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

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

Program License Serial Number 6677

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

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)

For the [Riverside-Foothill] area used.

10 year storm 10 minute intensity = 2.140(In/Hr)

10 year storm 60 minute intensity = 0.800(In/Hr)

100 year storm 10 minute intensity = 3.210(In/Hr)

100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 10.0

Calculated rainfall intensity data:

1 hour intensity = 0.800(In/Hr)

Slope of intensity duration curve = 0.5500

++++
Process from Point/Station 1.000 to Point/Station 1.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 544.000(Ft.)

Top (of initial area) elevation = 614.700(Ft.)

Bottom (of initial area) elevation = 607.800(Ft.)

Difference in elevation = 6.900(Ft.)
Slope = 0.01268 s(percent)= 1.27
TC = $k(0.323)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
Initial area time of concentration = 9.612 min.
Rainfall intensity = 2.190(In/Hr) for a 10.0 year storm
APARTMENT subarea type
Runoff Coefficient = 0.861
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 69.00
Pervious area fraction = 0.200; Impervious fraction = 0.800
Initial subarea runoff = 5.000(CFS)
Total initial stream area = 2.650(Ac.)
Pervious area fraction = 0.200

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

Initial area flow distance = 490.000(Ft.)
Top (of initial area) elevation = 612.700(Ft.)
Bottom (of initial area) elevation = 608.500(Ft.)
Difference in elevation = 4.200(Ft.)
Slope = 0.00857 s(percent)= 0.86
TC = $k(0.323)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
Initial area time of concentration = 9.969 min.
Rainfall intensity = 2.147(In/Hr) for a 10.0 year storm
APARTMENT subarea type
Runoff Coefficient = 0.861
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 69.00
Pervious area fraction = 0.200; Impervious fraction = 0.800
Initial subarea runoff = 5.193(CFS)
Total initial stream area = 2.810(Ac.)
Pervious area fraction = 0.200

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

Initial area flow distance = 516.000(Ft.)
Top (of initial area) elevation = 609.900(Ft.)
Bottom (of initial area) elevation = 606.400(Ft.)

Difference in elevation = 3.500(Ft.)
 Slope = 0.00678 s(percent)= 0.68
 $TC = k(0.323)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.665 min.
 Rainfall intensity = 2.069(In/Hr) for a 10.0 year storm
 APARTMENT subarea type
 Runoff Coefficient = 0.860
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 69.00
 Pervious area fraction = 0.200; Impervious fraction = 0.800
 Initial subarea runoff = 3.699(CFS)
 Total initial stream area = 2.080(Ac.)
 Pervious area fraction = 0.200
 End of computations, total study area = 7.54 (Ac.)
 The following figures may
 be used for a unit hydrograph study of the same area.

 Area averaged pervious area fraction(A_p) = 0.200
 Area averaged RI index number = 69.0

APPENDIX C

Synthetic Unit Hydrograph Analysis

Existing Conditions Unit Hydrographs

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0

Study date 01/16/25 File: ST08XHYD1100.out

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

Program License Serial Number 6677

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

English Units used in output format

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
EXISTING CONDITIONS HYDROGRAPH
100-YEAR STORM EVENT

Drainage Area = 7.54(Ac.) = 0.012 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 7.54(Ac.) =
0.012 Sq. Mi.
Length along longest watercourse = 617.00(Ft.)
Length along longest watercourse measured to centroid = 308.00(Ft.)
Length along longest watercourse = 0.117 Mi.
Length along longest watercourse measured to centroid = 0.058 Mi.
Difference in elevation = 4.10(Ft.)
Slope along watercourse = 35.0859 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.037 Hr.
Lag time = 2.20 Min.
25% of lag time = 0.55 Min.
40% of lag time = 0.88 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	0.52	3.95

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	1.34	10.10

STORM EVENT (YEAR) = 100.00

Area Averaged 2-Year Rainfall = 0.524(In)

Area Averaged 100-Year Rainfall = 1.340(In)

Point rain (area averaged) = 1.340(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.340(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
7.540	69.00	0.200
Total Area Entered = 7.54(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	84.4	0.194	0.200	0.159	1.000	0.159
Sum (F) =						0.159

Area averaged mean soil loss (F) (In/Hr) = 0.159

Minimum soil loss rate ((In/Hr)) = 0.079

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.740

Slope of intensity-duration curve for a 1 hour storm =0.5500

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

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	227.194	47.315
2	0.167	454.388	47.349
3	0.250	681.582	4.739
4	0.333	908.776	0.597
		Sum = 100.000	Sum= 7.599

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	3.30	0.531	0.159	(0.393)	0.372
2	0.17	4.20	0.675	0.159	(0.500)	0.516
3	0.25	4.40	0.707	0.159	(0.524)	0.549
4	0.33	4.80	0.772	0.159	(0.571)	0.613
5	0.42	5.20	0.836	0.159	(0.619)	0.677
6	0.50	6.20	0.997	0.159	(0.738)	0.838
7	0.58	6.80	1.093	0.159	(0.809)	0.934
8	0.67	8.80	1.415	0.159	(1.047)	1.256
9	0.75	13.90	2.235	0.159	(1.654)	2.076
10	0.83	31.40	5.049	0.159	(3.736)	4.890
11	0.92	7.20	1.158	0.159	(0.857)	0.999
12	1.00	3.80	0.611	0.159	(0.452)	0.452

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.2

Flood volume = Effective rainfall 1.18(In)
times area 7.5(Ac.)/[(In)/(Ft.)] = 0.7(Ac.Ft)
Total soil loss = 0.16(In)
Total soil loss = 0.100(Ac.Ft)
Total rainfall = 1.34(In)
Flood volume = 32323.1 Cubic Feet
Total soil loss = 4350.5 Cubic Feet

Peak flow rate of this hydrograph = 25.558(CFS)

+++++

1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0092	1.34	VQ				
0+10	0.0312	3.20	V Q				
0+15	0.0585	3.97	V Q				
0+20	0.0887	4.38	VQ				
0+25	0.1222	4.86	Q				
0+30	0.1614	5.70	QV				
0+35	0.2072	6.65	Q	V			
0+40	0.2638	8.21	Q	V			
0+45	0.3490	12.36		Q V			
0+50	0.5250	25.56				V	Q

0+55	0.6765	22.00				Q	V	
1+ 0	0.7252	7.08		Q			V	
1+ 5	0.7405	2.21	Q				V	
1+10	0.7419	0.21	Q				V	
1+15	0.7420	0.02	Q				V	

Unit Hydrograph Analysis

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Study date 01/16/25 File: ST08XHYD3100.out

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

Program License Serial Number 6677

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

English Units used in output format

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
EXISTING CONDITIONS HYDROGRAPH
100-YEAR STORM EVENT

Drainage Area = 7.54(Ac.) = 0.012 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 7.54(Ac.) =
0.012 Sq. Mi.
Length along longest watercourse = 617.00(Ft.)
Length along longest watercourse measured to centroid = 308.00(Ft.)
Length along longest watercourse = 0.117 Mi.
Length along longest watercourse measured to centroid = 0.058 Mi.
Difference in elevation = 4.10(Ft.)
Slope along watercourse = 35.0859 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.037 Hr.
Lag time = 2.20 Min.
25% of lag time = 0.55 Min.
40% of lag time = 0.88 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.))[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	0.95	7.15

100 YEAR Area rainfall data:

Area(Ac.))[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	2.30	17.34

STORM EVENT (YEAR) = 100.00

Area Averaged 2-Year Rainfall = 0.948(In)

Area Averaged 100-Year Rainfall = 2.300(In)

Point rain (area averaged) = 2.300(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.300(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
7.540	69.00	0.200
Total Area Entered = 7.54(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	84.4	0.194	0.200	0.159	1.000	0.159
Sum (F) =						0.159

Area averaged mean soil loss (F) (In/Hr) = 0.159

Minimum soil loss rate ((In/Hr)) = 0.079

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.740

Unit Hydrograph FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	227.194	47.315	3.595
2 0.167	454.388	47.349	3.598
3 0.250	681.582	4.739	0.360
4 0.333	908.776	0.597	0.045
Sum = 100.000		Sum=	7.599

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.359	0.159	(0.266)	0.200
2	0.17	1.30	0.359	0.159	(0.266)	0.200
3	0.25	1.10	0.304	0.159	(0.225)	0.145
4	0.33	1.50	0.414	0.159	(0.306)	0.255
5	0.42	1.50	0.414	0.159	(0.306)	0.255
6	0.50	1.80	0.497	0.159	(0.368)	0.338
7	0.58	1.50	0.414	0.159	(0.306)	0.255
8	0.67	1.80	0.497	0.159	(0.368)	0.338
9	0.75	1.80	0.497	0.159	(0.368)	0.338
10	0.83	1.50	0.414	0.159	(0.306)	0.255
11	0.92	1.60	0.442	0.159	(0.327)	0.283
12	1.00	1.80	0.497	0.159	(0.368)	0.338
13	1.08	2.20	0.607	0.159	(0.449)	0.448
14	1.17	2.20	0.607	0.159	(0.449)	0.448
15	1.25	2.20	0.607	0.159	(0.449)	0.448
16	1.33	2.00	0.552	0.159	(0.408)	0.393
17	1.42	2.60	0.718	0.159	(0.531)	0.559
18	1.50	2.70	0.745	0.159	(0.551)	0.586
19	1.58	2.40	0.662	0.159	(0.490)	0.503
20	1.67	2.70	0.745	0.159	(0.551)	0.586
21	1.75	3.30	0.911	0.159	(0.674)	0.752
22	1.83	3.10	0.856	0.159	(0.633)	0.697
23	1.92	2.90	0.800	0.159	(0.592)	0.641
24	2.00	3.00	0.828	0.159	(0.613)	0.669
25	2.08	3.10	0.856	0.159	(0.633)	0.697
26	2.17	4.20	1.159	0.159	(0.858)	1.000
27	2.25	5.00	1.380	0.159	(1.021)	1.221
28	2.33	3.50	0.966	0.159	(0.715)	0.807
29	2.42	6.80	1.877	0.159	(1.389)	1.718
30	2.50	7.30	2.015	0.159	(1.491)	1.856
31	2.58	8.20	2.263	0.159	(1.675)	2.104
32	2.67	5.90	1.628	0.159	(1.205)	1.469
33	2.75	2.00	0.552	0.159	(0.408)	0.393
34	2.83	1.80	0.497	0.159	(0.368)	0.338
35	2.92	1.80	0.497	0.159	(0.368)	0.338
36	3.00	0.60	0.166	(0.159)	0.123	0.043

(Loss Rate Not Used)

Sum = 100.0

Sum = 21.9

Flood volume = Effective rainfall 1.83(In)
times area 7.5(Ac.)/[(In)/(Ft.)) = 1.1(Ac.Ft)
Total soil loss = 0.47(In)
Total soil loss = 0.298(Ac.Ft)
Total rainfall = 2.30(In)
Flood volume = 49981.0 Cubic Feet
Total soil loss = 12968.3 Cubic Feet

Peak flow rate of this hydrograph = 14.905(CFS)

+++++

3 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0050	0.72	VQ					
0+10	0.0149	1.44	V Q					
0+15	0.0239	1.31	V Q					
0+20	0.0344	1.52	V Q					
0+25	0.0474	1.90	V Q					
0+30	0.0628	2.23	V Q					
0+35	0.0782	2.24	V Q					
0+40	0.0938	2.27	VQ					
0+45	0.1113	2.54	V Q					
0+50	0.1269	2.27	Q					
0+55	0.1412	2.07	Q					
1+ 0	0.1573	2.34	QV					
1+ 5	0.1775	2.94	QV					
1+10	0.2007	3.36	Q					
1+15	0.2241	3.40	QV					
1+20	0.2462	3.21	Q V					
1+25	0.2711	3.61	Q V					
1+30	0.3006	4.28	Q V					
1+35	0.3291	4.14	Q V					
1+40	0.3577	4.16	Q V					
1+45	0.3923	5.02	Q V					
1+50	0.4298	5.45	Q V					
1+55	0.4650	5.11	Q V					
2+ 0	0.4995	5.00	Q V					
2+ 5	0.5351	5.18	Q V					
2+10	0.5790	6.38	Q					
2+15	0.6360	8.27	Q					
2+20	0.6890	7.69	Q					
2+25	0.7549	9.57	Q					
2+30	0.8458	13.21						
2+35	0.9485	14.91						
2+40	1.0422	13.61						
2+45	1.0942	7.55						
2+50	1.1166	3.26	Q					
2+55	1.1348	2.64	Q					
3+ 0	1.1452	1.51	Q					
3+ 5	1.1472	0.29	Q					
3+10	1.1474	0.03	Q					

3+15

1.1474

0.00 Q

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Unit Hydrograph Analysis

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Study date 01/16/25 File: ST08XHYD6100.out

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

Program License Serial Number 6677

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

English Units used in output format

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
EXISTING CONDITIONS HYDROGRAPH
100-YEAR STORM EVENT

Drainage Area = 7.54(Ac.) = 0.012 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 7.54(Ac.) =
0.012 Sq. Mi.
Length along longest watercourse = 617.00(Ft.)
Length along longest watercourse measured to centroid = 308.00(Ft.)
Length along longest watercourse = 0.117 Mi.
Length along longest watercourse measured to centroid = 0.058 Mi.
Difference in elevation = 4.10(Ft.)
Slope along watercourse = 35.0859 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.037 Hr.
Lag time = 2.20 Min.
25% of lag time = 0.55 Min.
40% of lag time = 0.88 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	1.33	10.03

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	3.20	24.13

STORM EVENT (YEAR) = 100.00

Area Averaged 2-Year Rainfall = 1.330(In)

Area Averaged 100-Year Rainfall = 3.200(In)

Point rain (area averaged) = 3.200(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 3.200(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
7.540	69.00	0.200
Total Area Entered = 7.54(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	84.4	0.194	0.200	0.159	1.000	0.159
Sum (F) =						0.159

Area averaged mean soil loss (F) (In/Hr) = 0.159

Minimum soil loss rate ((In/Hr)) = 0.079

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.740

Unit Hydrograph FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	227.194	47.315	3.595
2 0.167	454.388	47.349	3.598
3 0.250	681.582	4.739	0.360
4 0.333	908.776	0.597	0.045
Sum = 100.000		Sum=	7.599

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.192	(0.159)	0.142	0.050
2	0.17	0.60	0.230	0.159	(0.170)	0.071
3	0.25	0.60	0.230	0.159	(0.170)	0.071
4	0.33	0.60	0.230	0.159	(0.170)	0.071
5	0.42	0.60	0.230	0.159	(0.170)	0.071
6	0.50	0.70	0.269	0.159	(0.199)	0.110
7	0.58	0.70	0.269	0.159	(0.199)	0.110
8	0.67	0.70	0.269	0.159	(0.199)	0.110
9	0.75	0.70	0.269	0.159	(0.199)	0.110
10	0.83	0.70	0.269	0.159	(0.199)	0.110
11	0.92	0.70	0.269	0.159	(0.199)	0.110
12	1.00	0.80	0.307	0.159	(0.227)	0.148
13	1.08	0.80	0.307	0.159	(0.227)	0.148
14	1.17	0.80	0.307	0.159	(0.227)	0.148
15	1.25	0.80	0.307	0.159	(0.227)	0.148
16	1.33	0.80	0.307	0.159	(0.227)	0.148
17	1.42	0.80	0.307	0.159	(0.227)	0.148
18	1.50	0.80	0.307	0.159	(0.227)	0.148
19	1.58	0.80	0.307	0.159	(0.227)	0.148
20	1.67	0.80	0.307	0.159	(0.227)	0.148
21	1.75	0.80	0.307	0.159	(0.227)	0.148
22	1.83	0.80	0.307	0.159	(0.227)	0.148
23	1.92	0.80	0.307	0.159	(0.227)	0.148
24	2.00	0.90	0.346	0.159	(0.256)	0.187
25	2.08	0.80	0.307	0.159	(0.227)	0.148
26	2.17	0.90	0.346	0.159	(0.256)	0.187
27	2.25	0.90	0.346	0.159	(0.256)	0.187
28	2.33	0.90	0.346	0.159	(0.256)	0.187
29	2.42	0.90	0.346	0.159	(0.256)	0.187
30	2.50	0.90	0.346	0.159	(0.256)	0.187
31	2.58	0.90	0.346	0.159	(0.256)	0.187
32	2.67	0.90	0.346	0.159	(0.256)	0.187
33	2.75	1.00	0.384	0.159	(0.284)	0.225
34	2.83	1.00	0.384	0.159	(0.284)	0.225
35	2.92	1.00	0.384	0.159	(0.284)	0.225
36	3.00	1.00	0.384	0.159	(0.284)	0.225
37	3.08	1.00	0.384	0.159	(0.284)	0.225
38	3.17	1.10	0.422	0.159	(0.313)	0.263
39	3.25	1.10	0.422	0.159	(0.313)	0.263
40	3.33	1.10	0.422	0.159	(0.313)	0.263
41	3.42	1.20	0.461	0.159	(0.341)	0.302
42	3.50	1.30	0.499	0.159	(0.369)	0.340
43	3.58	1.40	0.538	0.159	(0.398)	0.379
44	3.67	1.40	0.538	0.159	(0.398)	0.379
45	3.75	1.50	0.576	0.159	(0.426)	0.417

46	3.83	1.50	0.576	0.159	(0.426)	0.417
47	3.92	1.60	0.614	0.159	(0.455)	0.455
48	4.00	1.60	0.614	0.159	(0.455)	0.455
49	4.08	1.70	0.653	0.159	(0.483)	0.494
50	4.17	1.80	0.691	0.159	(0.511)	0.532
51	4.25	1.90	0.730	0.159	(0.540)	0.571
52	4.33	2.00	0.768	0.159	(0.568)	0.609
53	4.42	2.10	0.806	0.159	(0.597)	0.647
54	4.50	2.10	0.806	0.159	(0.597)	0.647
55	4.58	2.20	0.845	0.159	(0.625)	0.686
56	4.67	2.30	0.883	0.159	(0.654)	0.724
57	4.75	2.40	0.922	0.159	(0.682)	0.763
58	4.83	2.40	0.922	0.159	(0.682)	0.763
59	4.92	2.50	0.960	0.159	(0.710)	0.801
60	5.00	2.60	0.998	0.159	(0.739)	0.839
61	5.08	3.10	1.190	0.159	(0.881)	1.031
62	5.17	3.60	1.382	0.159	(1.023)	1.223
63	5.25	3.90	1.498	0.159	(1.108)	1.339
64	5.33	4.20	1.613	0.159	(1.193)	1.454
65	5.42	4.70	1.805	0.159	(1.336)	1.646
66	5.50	5.60	2.150	0.159	(1.591)	1.991
67	5.58	1.90	0.730	0.159	(0.540)	0.571
68	5.67	0.90	0.346	0.159	(0.256)	0.187
69	5.75	0.60	0.230	0.159	(0.170)	0.071
70	5.83	0.50	0.192	(0.159)	0.142	0.050
71	5.92	0.30	0.115	(0.159)	0.085	0.030
72	6.00	0.20	0.077	(0.159)	0.057	0.020

(Loss Rate Not Used)

Sum = 100.0

Sum = 27.2

Flood volume = Effective rainfall 2.26(In)
times area 7.5(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 0.94(In)
Total soil loss = 0.588(Ac.Ft)
Total rainfall = 3.20(In)
Flood volume = 61957.6 Cubic Feet
Total soil loss = 25624.8 Cubic Feet

Peak flow rate of this hydrograph = 13.673(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0012	0.18	Q				
0+10	0.0042	0.44	Q				

0+15	0.0079	0.53	VQ				
0+20	0.0116	0.54	VQ				
0+25	0.0154	0.54	VQ				
0+30	0.0201	0.68	VQ				
0+35	0.0257	0.82	VQ				
0+40	0.0315	0.83	VQ				
0+45	0.0372	0.84	Q				
0+50	0.0430	0.84	Q				
0+55	0.0487	0.84	Q				
1+ 0	0.0554	0.97	Q				
1+ 5	0.0631	1.11	VQ				
1+10	0.0708	1.13	VQ				
1+15	0.0786	1.13	Q				
1+20	0.0863	1.13	Q				
1+25	0.0941	1.13	Q				
1+30	0.1019	1.13	Q				
1+35	0.1096	1.13	QV				
1+40	0.1174	1.13	QV				
1+45	0.1252	1.13	QV				
1+50	0.1329	1.13	QV				
1+55	0.1407	1.13	QV				
2+ 0	0.1494	1.27	Q V				
2+ 5	0.1581	1.27	Q V				
2+10	0.1669	1.28	Q V				
2+15	0.1766	1.41	Q V				
2+20	0.1864	1.42	Q V				
2+25	0.1961	1.42	Q V				
2+30	0.2059	1.42	Q V				
2+35	0.2157	1.42	Q V				
2+40	0.2254	1.42	Q V				
2+45	0.2362	1.56	Q V				
2+50	0.2478	1.70	Q V				
2+55	0.2596	1.71	Q V				
3+ 0	0.2714	1.71	Q V				
3+ 5	0.2832	1.71	Q V				
3+10	0.2959	1.85	Q V				
3+15	0.3096	1.99	Q V				
3+20	0.3234	2.00	Q V				
3+25	0.3381	2.14	Q V				
3+30	0.3548	2.42	Q V				
3+35	0.3734	2.71	Q V				
3+40	0.3931	2.86	Q V				
3+45	0.4139	3.02	Q V				
3+50	0.4356	3.16	Q V				
3+55	0.4584	3.31	Q V				
4+ 0	0.4821	3.45	Q V				
4+ 5	0.5069	3.60	Q V				
4+10	0.5336	3.88	Q V				
4+15	0.5623	4.17	Q V				
4+20	0.5930	4.46	Q V				

4+25	0.6258	4.75		Q		V					
4+30	0.6596	4.90		Q		V					
4+35	0.6944	5.06		Q		V					
4+40	0.7311	5.34		Q		V					
4+45	0.7699	5.63		Q		V					
4+50	0.8097	5.78		Q		V					
4+55	0.8506	5.93		Q		V					
5+ 0	0.8934	6.21			Q				V		
5+ 5	0.9420	7.06				Q			V		
5+10	1.0002	8.45				Q			V		
5+15	1.0665	9.63				Q			V		
5+20	1.1391	10.54				Q			V		
5+25	1.2196	11.69				Q			V		
5+30	1.3137	13.67				Q			V		
5+35	1.3818	9.88				Q			V		
5+40	1.4060	3.52		Q					V		
5+45	1.4145	1.22		Q					V		
5+50	1.4181	0.53		Q					V		
5+55	1.4203	0.32		Q					V		
6+ 0	1.4217	0.20		Q					V		
6+ 5	1.4223	0.08		Q					V		
6+10	1.4223	0.01		Q					V		
6+15	1.4224	0.00		Q					V		

Unit Hydrograph Analysis

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Study date 01/16/25 File: ST08XHYD24100.out

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

Program License Serial Number 6677

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

English Units used in output format

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
EXISTING CONDITIONS HYDROGRAPH
100-YEAR STORM EVENT

Drainage Area = 7.54(Ac.) = 0.012 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 7.54(Ac.) =
0.012 Sq. Mi.
Length along longest watercourse = 617.00(Ft.)
Length along longest watercourse measured to centroid = 308.00(Ft.)
Length along longest watercourse = 0.117 Mi.
Length along longest watercourse measured to centroid = 0.058 Mi.
Difference in elevation = 4.10(Ft.)
Slope along watercourse = 35.0859 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.037 Hr.
Lag time = 2.20 Min.
25% of lag time = 0.55 Min.
40% of lag time = 0.88 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.))[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	2.34	17.64

100 YEAR Area rainfall data:

Area(Ac.))[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	5.91	44.56

STORM EVENT (YEAR) = 100.00

Area Averaged 2-Year Rainfall = 2.340(In)

Area Averaged 100-Year Rainfall = 5.910(In)

Point rain (area averaged) = 5.910(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 5.910(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
7.540	69.00	0.200
Total Area Entered = 7.54(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	84.4	0.194	0.200	0.159	1.000	0.159
Sum (F) =						0.159

Area averaged mean soil loss (F) (In/Hr) = 0.159

Minimum soil loss rate ((In/Hr)) = 0.079

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.740

Unit Hydrograph FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	227.194	47.315	3.595
2 0.167	454.388	47.349	3.598
3 0.250	681.582	4.739	0.360
4 0.333	908.776	0.597	0.045
Sum = 100.000		Sum=	7.599

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.047	(0.282)	0.035	0.012
2	0.17	0.07	0.047	(0.281)	0.035	0.012
3	0.25	0.07	0.047	(0.280)	0.035	0.012
4	0.33	0.10	0.071	(0.279)	0.052	0.018
5	0.42	0.10	0.071	(0.277)	0.052	0.018
6	0.50	0.10	0.071	(0.276)	0.052	0.018
7	0.58	0.10	0.071	(0.275)	0.052	0.018
8	0.67	0.10	0.071	(0.274)	0.052	0.018
9	0.75	0.10	0.071	(0.273)	0.052	0.018
10	0.83	0.13	0.095	(0.272)	0.070	0.025
11	0.92	0.13	0.095	(0.271)	0.070	0.025
12	1.00	0.13	0.095	(0.270)	0.070	0.025
13	1.08	0.10	0.071	(0.269)	0.052	0.018
14	1.17	0.10	0.071	(0.268)	0.052	0.018
15	1.25	0.10	0.071	(0.267)	0.052	0.018
16	1.33	0.10	0.071	(0.266)	0.052	0.018
17	1.42	0.10	0.071	(0.265)	0.052	0.018
18	1.50	0.10	0.071	(0.264)	0.052	0.018
19	1.58	0.10	0.071	(0.262)	0.052	0.018
20	1.67	0.10	0.071	(0.261)	0.052	0.018
21	1.75	0.10	0.071	(0.260)	0.052	0.018
22	1.83	0.13	0.095	(0.259)	0.070	0.025
23	1.92	0.13	0.095	(0.258)	0.070	0.025
24	2.00	0.13	0.095	(0.257)	0.070	0.025
25	2.08	0.13	0.095	(0.256)	0.070	0.025
26	2.17	0.13	0.095	(0.255)	0.070	0.025
27	2.25	0.13	0.095	(0.254)	0.070	0.025
28	2.33	0.13	0.095	(0.253)	0.070	0.025
29	2.42	0.13	0.095	(0.252)	0.070	0.025
30	2.50	0.13	0.095	(0.251)	0.070	0.025
31	2.58	0.17	0.118	(0.250)	0.087	0.031
32	2.67	0.17	0.118	(0.249)	0.087	0.031
33	2.75	0.17	0.118	(0.248)	0.087	0.031
34	2.83	0.17	0.118	(0.247)	0.087	0.031
35	2.92	0.17	0.118	(0.246)	0.087	0.031
36	3.00	0.17	0.118	(0.245)	0.087	0.031
37	3.08	0.17	0.118	(0.244)	0.087	0.031
38	3.17	0.17	0.118	(0.243)	0.087	0.031
39	3.25	0.17	0.118	(0.242)	0.087	0.031
40	3.33	0.17	0.118	(0.241)	0.087	0.031
41	3.42	0.17	0.118	(0.240)	0.087	0.031
42	3.50	0.17	0.118	(0.239)	0.087	0.031
43	3.58	0.17	0.118	(0.238)	0.087	0.031
44	3.67	0.17	0.118	(0.237)	0.087	0.031
45	3.75	0.17	0.118	(0.236)	0.087	0.031

46	3.83	0.20	0.142	(0.235)	0.105	0.037
47	3.92	0.20	0.142	(0.234)	0.105	0.037
48	4.00	0.20	0.142	(0.233)	0.105	0.037
49	4.08	0.20	0.142	(0.232)	0.105	0.037
50	4.17	0.20	0.142	(0.231)	0.105	0.037
51	4.25	0.20	0.142	(0.230)	0.105	0.037
52	4.33	0.23	0.165	(0.229)	0.122	0.043
53	4.42	0.23	0.165	(0.228)	0.122	0.043
54	4.50	0.23	0.165	(0.227)	0.122	0.043
55	4.58	0.23	0.165	(0.226)	0.122	0.043
56	4.67	0.23	0.165	(0.225)	0.122	0.043
57	4.75	0.23	0.165	(0.224)	0.122	0.043
58	4.83	0.27	0.189	(0.223)	0.140	0.049
59	4.92	0.27	0.189	(0.222)	0.140	0.049
60	5.00	0.27	0.189	(0.221)	0.140	0.049
61	5.08	0.20	0.142	(0.220)	0.105	0.037
62	5.17	0.20	0.142	(0.219)	0.105	0.037
63	5.25	0.20	0.142	(0.218)	0.105	0.037
64	5.33	0.23	0.165	(0.217)	0.122	0.043
65	5.42	0.23	0.165	(0.216)	0.122	0.043
66	5.50	0.23	0.165	(0.215)	0.122	0.043
67	5.58	0.27	0.189	(0.215)	0.140	0.049
68	5.67	0.27	0.189	(0.214)	0.140	0.049
69	5.75	0.27	0.189	(0.213)	0.140	0.049
70	5.83	0.27	0.189	(0.212)	0.140	0.049
71	5.92	0.27	0.189	(0.211)	0.140	0.049
72	6.00	0.27	0.189	(0.210)	0.140	0.049
73	6.08	0.30	0.213	(0.209)	0.157	0.055
74	6.17	0.30	0.213	(0.208)	0.157	0.055
75	6.25	0.30	0.213	(0.207)	0.157	0.055
76	6.33	0.30	0.213	(0.206)	0.157	0.055
77	6.42	0.30	0.213	(0.205)	0.157	0.055
78	6.50	0.30	0.213	(0.204)	0.157	0.055
79	6.58	0.33	0.236	(0.203)	0.175	0.061
80	6.67	0.33	0.236	(0.202)	0.175	0.061
81	6.75	0.33	0.236	(0.202)	0.175	0.061
82	6.83	0.33	0.236	(0.201)	0.175	0.061
83	6.92	0.33	0.236	(0.200)	0.175	0.061
84	7.00	0.33	0.236	(0.199)	0.175	0.061
85	7.08	0.33	0.236	(0.198)	0.175	0.061
86	7.17	0.33	0.236	(0.197)	0.175	0.061
87	7.25	0.33	0.236	(0.196)	0.175	0.061
88	7.33	0.37	0.260	(0.195)	0.192	0.068
89	7.42	0.37	0.260	(0.194)	0.192	0.068
90	7.50	0.37	0.260	(0.193)	0.192	0.068
91	7.58	0.40	0.284	0.193 (0.210)		0.091
92	7.67	0.40	0.284	0.192 (0.210)		0.092
93	7.75	0.40	0.284	0.191 (0.210)		0.093
94	7.83	0.43	0.307	0.190 (0.227)		0.117
95	7.92	0.43	0.307	0.189 (0.227)		0.118

96	8.00	0.43	0.307	0.188	(0.227)	0.119
97	8.08	0.50	0.355	0.187	(0.262)	0.167
98	8.17	0.50	0.355	0.186	(0.262)	0.168
99	8.25	0.50	0.355	0.185	(0.262)	0.169
100	8.33	0.50	0.355	0.185	(0.262)	0.170
101	8.42	0.50	0.355	0.184	(0.262)	0.171
102	8.50	0.50	0.355	0.183	(0.262)	0.172
103	8.58	0.53	0.378	0.182	(0.280)	0.196
104	8.67	0.53	0.378	0.181	(0.280)	0.197
105	8.75	0.53	0.378	0.180	(0.280)	0.198
106	8.83	0.57	0.402	0.179	(0.297)	0.222
107	8.92	0.57	0.402	0.179	(0.297)	0.223
108	9.00	0.57	0.402	0.178	(0.297)	0.224
109	9.08	0.63	0.449	0.177	(0.332)	0.272
110	9.17	0.63	0.449	0.176	(0.332)	0.273
111	9.25	0.63	0.449	0.175	(0.332)	0.274
112	9.33	0.67	0.473	0.174	(0.350)	0.298
113	9.42	0.67	0.473	0.174	(0.350)	0.299
114	9.50	0.67	0.473	0.173	(0.350)	0.300
115	9.58	0.70	0.496	0.172	(0.367)	0.324
116	9.67	0.70	0.496	0.171	(0.367)	0.325
117	9.75	0.70	0.496	0.170	(0.367)	0.326
118	9.83	0.73	0.520	0.169	(0.385)	0.351
119	9.92	0.73	0.520	0.169	(0.385)	0.351
120	10.00	0.73	0.520	0.168	(0.385)	0.352
121	10.08	0.50	0.355	0.167	(0.262)	0.188
122	10.17	0.50	0.355	0.166	(0.262)	0.188
123	10.25	0.50	0.355	0.165	(0.262)	0.189
124	10.33	0.50	0.355	0.165	(0.262)	0.190
125	10.42	0.50	0.355	0.164	(0.262)	0.191
126	10.50	0.50	0.355	0.163	(0.262)	0.192
127	10.58	0.67	0.473	0.162	(0.350)	0.311
128	10.67	0.67	0.473	0.161	(0.350)	0.311
129	10.75	0.67	0.473	0.161	(0.350)	0.312
130	10.83	0.67	0.473	0.160	(0.350)	0.313
131	10.92	0.67	0.473	0.159	(0.350)	0.314
132	11.00	0.67	0.473	0.158	(0.350)	0.315
133	11.08	0.63	0.449	0.158	(0.332)	0.292
134	11.17	0.63	0.449	0.157	(0.332)	0.292
135	11.25	0.63	0.449	0.156	(0.332)	0.293
136	11.33	0.63	0.449	0.155	(0.332)	0.294
137	11.42	0.63	0.449	0.154	(0.332)	0.295
138	11.50	0.63	0.449	0.154	(0.332)	0.295
139	11.58	0.57	0.402	0.153	(0.297)	0.249
140	11.67	0.57	0.402	0.152	(0.297)	0.250
141	11.75	0.57	0.402	0.151	(0.297)	0.250
142	11.83	0.60	0.426	0.151	(0.315)	0.275
143	11.92	0.60	0.426	0.150	(0.315)	0.276
144	12.00	0.60	0.426	0.149	(0.315)	0.276
145	12.08	0.83	0.591	0.148	(0.437)	0.443

146	12.17	0.83	0.591	0.148	(0.437)	0.443
147	12.25	0.83	0.591	0.147	(0.437)	0.444
148	12.33	0.87	0.615	0.146	(0.455)	0.468
149	12.42	0.87	0.615	0.145	(0.455)	0.469
150	12.50	0.87	0.615	0.145	(0.455)	0.470
151	12.58	0.93	0.662	0.144	(0.490)	0.518
152	12.67	0.93	0.662	0.143	(0.490)	0.519
153	12.75	0.93	0.662	0.143	(0.490)	0.519
154	12.83	0.97	0.686	0.142	(0.507)	0.544
155	12.92	0.97	0.686	0.141	(0.507)	0.544
156	13.00	0.97	0.686	0.140	(0.507)	0.545
157	13.08	1.13	0.804	0.140	(0.595)	0.664
158	13.17	1.13	0.804	0.139	(0.595)	0.665
159	13.25	1.13	0.804	0.138	(0.595)	0.666
160	13.33	1.13	0.804	0.138	(0.595)	0.666
161	13.42	1.13	0.804	0.137	(0.595)	0.667
162	13.50	1.13	0.804	0.136	(0.595)	0.668
163	13.58	0.77	0.544	0.135	(0.402)	0.408
164	13.67	0.77	0.544	0.135	(0.402)	0.409
165	13.75	0.77	0.544	0.134	(0.402)	0.410
166	13.83	0.77	0.544	0.133	(0.402)	0.410
167	13.92	0.77	0.544	0.133	(0.402)	0.411
168	14.00	0.77	0.544	0.132	(0.402)	0.412
169	14.08	0.90	0.638	0.131	(0.472)	0.507
170	14.17	0.90	0.638	0.131	(0.472)	0.508
171	14.25	0.90	0.638	0.130	(0.472)	0.508
172	14.33	0.87	0.615	0.129	(0.455)	0.485
173	14.42	0.87	0.615	0.129	(0.455)	0.486
174	14.50	0.87	0.615	0.128	(0.455)	0.487
175	14.58	0.87	0.615	0.127	(0.455)	0.487
176	14.67	0.87	0.615	0.127	(0.455)	0.488
177	14.75	0.87	0.615	0.126	(0.455)	0.489
178	14.83	0.83	0.591	0.125	(0.437)	0.466
179	14.92	0.83	0.591	0.125	(0.437)	0.466
180	15.00	0.83	0.591	0.124	(0.437)	0.467
181	15.08	0.80	0.567	0.124	(0.420)	0.444
182	15.17	0.80	0.567	0.123	(0.420)	0.444
183	15.25	0.80	0.567	0.122	(0.420)	0.445
184	15.33	0.77	0.544	0.122	(0.402)	0.422
185	15.42	0.77	0.544	0.121	(0.402)	0.423
186	15.50	0.77	0.544	0.120	(0.402)	0.423
187	15.58	0.63	0.449	0.120	(0.332)	0.329
188	15.67	0.63	0.449	0.119	(0.332)	0.330
189	15.75	0.63	0.449	0.119	(0.332)	0.331
190	15.83	0.63	0.449	0.118	(0.332)	0.331
191	15.92	0.63	0.449	0.117	(0.332)	0.332
192	16.00	0.63	0.449	0.117	(0.332)	0.332
193	16.08	0.13	0.095	(0.116)	0.070	0.025
194	16.17	0.13	0.095	(0.116)	0.070	0.025
195	16.25	0.13	0.095	(0.115)	0.070	0.025

196	16.33	0.13	0.095	(0.114)	0.070	0.025
197	16.42	0.13	0.095	(0.114)	0.070	0.025
198	16.50	0.13	0.095	(0.113)	0.070	0.025
199	16.58	0.10	0.071	(0.113)	0.052	0.018
200	16.67	0.10	0.071	(0.112)	0.052	0.018
201	16.75	0.10	0.071	(0.111)	0.052	0.018
202	16.83	0.10	0.071	(0.111)	0.052	0.018
203	16.92	0.10	0.071	(0.110)	0.052	0.018
204	17.00	0.10	0.071	(0.110)	0.052	0.018
205	17.08	0.17	0.118	(0.109)	0.087	0.031
206	17.17	0.17	0.118	(0.109)	0.087	0.031
207	17.25	0.17	0.118	(0.108)	0.087	0.031
208	17.33	0.17	0.118	(0.108)	0.087	0.031
209	17.42	0.17	0.118	(0.107)	0.087	0.031
210	17.50	0.17	0.118	(0.107)	0.087	0.031
211	17.58	0.17	0.118	(0.106)	0.087	0.031
212	17.67	0.17	0.118	(0.105)	0.087	0.031
213	17.75	0.17	0.118	(0.105)	0.087	0.031
214	17.83	0.13	0.095	(0.104)	0.070	0.025
215	17.92	0.13	0.095	(0.104)	0.070	0.025
216	18.00	0.13	0.095	(0.103)	0.070	0.025
217	18.08	0.13	0.095	(0.103)	0.070	0.025
218	18.17	0.13	0.095	(0.102)	0.070	0.025
219	18.25	0.13	0.095	(0.102)	0.070	0.025
220	18.33	0.13	0.095	(0.101)	0.070	0.025
221	18.42	0.13	0.095	(0.101)	0.070	0.025
222	18.50	0.13	0.095	(0.100)	0.070	0.025
223	18.58	0.10	0.071	(0.100)	0.052	0.018
224	18.67	0.10	0.071	(0.099)	0.052	0.018
225	18.75	0.10	0.071	(0.099)	0.052	0.018
226	18.83	0.07	0.047	(0.098)	0.035	0.012
227	18.92	0.07	0.047	(0.098)	0.035	0.012
228	19.00	0.07	0.047	(0.098)	0.035	0.012
229	19.08	0.10	0.071	(0.097)	0.052	0.018
230	19.17	0.10	0.071	(0.097)	0.052	0.018
231	19.25	0.10	0.071	(0.096)	0.052	0.018
232	19.33	0.13	0.095	(0.096)	0.070	0.025
233	19.42	0.13	0.095	(0.095)	0.070	0.025
234	19.50	0.13	0.095	(0.095)	0.070	0.025
235	19.58	0.10	0.071	(0.094)	0.052	0.018
236	19.67	0.10	0.071	(0.094)	0.052	0.018
237	19.75	0.10	0.071	(0.094)	0.052	0.018
238	19.83	0.07	0.047	(0.093)	0.035	0.012
239	19.92	0.07	0.047	(0.093)	0.035	0.012
240	20.00	0.07	0.047	(0.092)	0.035	0.012
241	20.08	0.10	0.071	(0.092)	0.052	0.018
242	20.17	0.10	0.071	(0.091)	0.052	0.018
243	20.25	0.10	0.071	(0.091)	0.052	0.018
244	20.33	0.10	0.071	(0.091)	0.052	0.018
245	20.42	0.10	0.071	(0.090)	0.052	0.018

246	20.50	0.10	0.071	(0.090)	0.052	0.018
247	20.58	0.10	0.071	(0.090)	0.052	0.018
248	20.67	0.10	0.071	(0.089)	0.052	0.018
249	20.75	0.10	0.071	(0.089)	0.052	0.018
250	20.83	0.07	0.047	(0.088)	0.035	0.012
251	20.92	0.07	0.047	(0.088)	0.035	0.012
252	21.00	0.07	0.047	(0.088)	0.035	0.012
253	21.08	0.10	0.071	(0.087)	0.052	0.018
254	21.17	0.10	0.071	(0.087)	0.052	0.018
255	21.25	0.10	0.071	(0.087)	0.052	0.018
256	21.33	0.07	0.047	(0.086)	0.035	0.012
257	21.42	0.07	0.047	(0.086)	0.035	0.012
258	21.50	0.07	0.047	(0.086)	0.035	0.012
259	21.58	0.10	0.071	(0.085)	0.052	0.018
260	21.67	0.10	0.071	(0.085)	0.052	0.018
261	21.75	0.10	0.071	(0.085)	0.052	0.018
262	21.83	0.07	0.047	(0.084)	0.035	0.012
263	21.92	0.07	0.047	(0.084)	0.035	0.012
264	22.00	0.07	0.047	(0.084)	0.035	0.012
265	22.08	0.10	0.071	(0.084)	0.052	0.018
266	22.17	0.10	0.071	(0.083)	0.052	0.018
267	22.25	0.10	0.071	(0.083)	0.052	0.018
268	22.33	0.07	0.047	(0.083)	0.035	0.012
269	22.42	0.07	0.047	(0.083)	0.035	0.012
270	22.50	0.07	0.047	(0.082)	0.035	0.012
271	22.58	0.07	0.047	(0.082)	0.035	0.012
272	22.67	0.07	0.047	(0.082)	0.035	0.012
273	22.75	0.07	0.047	(0.082)	0.035	0.012
274	22.83	0.07	0.047	(0.081)	0.035	0.012
275	22.92	0.07	0.047	(0.081)	0.035	0.012
276	23.00	0.07	0.047	(0.081)	0.035	0.012
277	23.08	0.07	0.047	(0.081)	0.035	0.012
278	23.17	0.07	0.047	(0.081)	0.035	0.012
279	23.25	0.07	0.047	(0.080)	0.035	0.012
280	23.33	0.07	0.047	(0.080)	0.035	0.012
281	23.42	0.07	0.047	(0.080)	0.035	0.012
282	23.50	0.07	0.047	(0.080)	0.035	0.012
283	23.58	0.07	0.047	(0.080)	0.035	0.012
284	23.67	0.07	0.047	(0.080)	0.035	0.012
285	23.75	0.07	0.047	(0.080)	0.035	0.012
286	23.83	0.07	0.047	(0.080)	0.035	0.012
287	23.92	0.07	0.047	(0.080)	0.035	0.012
288	24.00	0.07	0.047	(0.079)	0.035	0.012

(Loss Rate Not Used)

Sum = 100.0

Sum = 40.9

Flood volume = Effective rainfall 3.41(In)
times area 7.5(Ac.)/[(In)/(Ft.)] = 2.1(Ac.Ft)
Total soil loss = 2.50(In)
Total soil loss = 1.571(Ac.Ft)
Total rainfall = 5.91(In)

Flood volume = 93303.9 Cubic Feet
 Total soil loss = 68451.6 Cubic Feet

 Peak flow rate of this hydrograph = 5.073(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0003	0.04	Q				
0+10	0.0009	0.09	Q				
0+15	0.0016	0.09	Q				
0+20	0.0023	0.12	Q				
0+25	0.0033	0.14	Q				
0+30	0.0043	0.14	Q				
0+35	0.0052	0.14	Q				
0+40	0.0062	0.14	Q				
0+45	0.0072	0.14	Q				
0+50	0.0083	0.16	Q				
0+55	0.0095	0.18	Q				
1+ 0	0.0108	0.19	Q				
1+ 5	0.0120	0.16	Q				
1+10	0.0129	0.14	Q				
1+15	0.0139	0.14	Q				
1+20	0.0149	0.14	Q				
1+25	0.0158	0.14	Q				
1+30	0.0168	0.14	Q				
1+35	0.0178	0.14	Q				
1+40	0.0187	0.14	Q				
1+45	0.0197	0.14	Q				
1+50	0.0208	0.16	Q				
1+55	0.0221	0.18	Q				
2+ 0	0.0234	0.19	Q				
2+ 5	0.0247	0.19	Q				
2+10	0.0260	0.19	Q				
2+15	0.0272	0.19	Q				
2+20	0.0285	0.19	Q				
2+25	0.0298	0.19	Q				
2+30	0.0311	0.19	Q				
2+35	0.0325	0.21	Q				
2+40	0.0341	0.23	Q				
2+45	0.0357	0.23	Q				
2+50	0.0374	0.23	Q				
2+55	0.0390	0.23	Q				
3+ 0	0.0406	0.23	Q				

3+ 5	0.0422	0.23	Q				
3+10	0.0438	0.23	Q				
3+15	0.0454	0.23	Q				
3+20	0.0470	0.23	Q				
3+25	0.0486	0.23	Q				
3+30	0.0502	0.23	Q				
3+35	0.0518	0.23	Q				
3+40	0.0534	0.23	Q				
3+45	0.0551	0.23	QV				
3+50	0.0568	0.26	Q				
3+55	0.0587	0.28	Q				
4+ 0	0.0607	0.28	Q				
4+ 5	0.0626	0.28	Q				
4+10	0.0645	0.28	Q				
4+15	0.0665	0.28	Q				
4+20	0.0685	0.30	Q				
4+25	0.0708	0.32	Q				
4+30	0.0730	0.33	Q				
4+35	0.0753	0.33	Q				
4+40	0.0775	0.33	Q				
4+45	0.0798	0.33	Q				
4+50	0.0822	0.35	Q				
4+55	0.0847	0.37	Q				
5+ 0	0.0873	0.37	Q				
5+ 5	0.0896	0.33	Q				
5+10	0.0916	0.29	Q				
5+15	0.0935	0.28	Q				
5+20	0.0956	0.30	Q				
5+25	0.0978	0.32	Q				
5+30	0.1001	0.33	Q				
5+35	0.1025	0.35	Q				
5+40	0.1050	0.37	Q				
5+45	0.1076	0.37	QV				
5+50	0.1102	0.37	QV				
5+55	0.1127	0.37	QV				
6+ 0	0.1153	0.37	QV				
6+ 5	0.1180	0.40	QV				
6+10	0.1209	0.42	QV				
6+15	0.1238	0.42	QV				
6+20	0.1267	0.42	QV				
6+25	0.1296	0.42	QV				
6+30	0.1325	0.42	QV				
6+35	0.1356	0.44	QV				
6+40	0.1388	0.46	QV				
6+45	0.1420	0.47	QV				
6+50	0.1452	0.47	QV				
6+55	0.1484	0.47	QV				
7+ 0	0.1516	0.47	QV				
7+ 5	0.1548	0.47	QV				
7+10	0.1581	0.47	QV				

7+15	0.1613	0.47	Q V				
7+20	0.1647	0.49	Q V				
7+25	0.1682	0.51	QV				
7+30	0.1717	0.51	QV				
7+35	0.1758	0.60	QV				
7+40	0.1806	0.69	QV				
7+45	0.1854	0.70	QV				
7+50	0.1909	0.79	Q				
7+55	0.1970	0.89	Q				
8+ 0	0.2032	0.90	Q				
8+ 5	0.2106	1.08	VQ				
8+10	0.2193	1.26	VQ				
8+15	0.2281	1.28	VQ				
8+20	0.2369	1.29	VQ				
8+25	0.2459	1.29	VQ				
8+30	0.2548	1.30	VQ				
8+35	0.2644	1.39	VQ				
8+40	0.2746	1.48	Q				
8+45	0.2850	1.50	Q				
8+50	0.2959	1.59	VQ				
8+55	0.3075	1.68	VQ				
9+ 0	0.3192	1.70	VQ				
9+ 5	0.3322	1.88	VQ				
9+10	0.3463	2.05	V Q				
9+15	0.3606	2.08	V Q				
9+20	0.3755	2.17	VQ				
9+25	0.3911	2.26	V Q				
9+30	0.4068	2.28	V Q				
9+35	0.4231	2.37	V Q				
9+40	0.4400	2.46	VQ				
9+45	0.4571	2.47	VQ				
9+50	0.4748	2.57	V Q				
9+55	0.4931	2.66	VQ				
10+ 0	0.5115	2.67	VQ				
10+ 5	0.5259	2.09	QV				
10+10	0.5362	1.50	Q V				
10+15	0.5461	1.44	Q V				
10+20	0.5560	1.44	Q V				
10+25	0.5660	1.45	Q V				
10+30	0.5760	1.45	Q V				
10+35	0.5890	1.88	Q V				
10+40	0.6049	2.32	Q V				
10+45	0.6212	2.36	Q V				
10+50	0.6375	2.38	Q V				
10+55	0.6540	2.38	Q V				
11+ 0	0.6704	2.39	Q V				
11+ 5	0.6863	2.31	Q V				
11+10	0.7016	2.23	Q V				
11+15	0.7170	2.23	Q V				
11+20	0.7324	2.23	Q V				

11+25	0.7478	2.24	Q	V			
11+30	0.7632	2.24	Q	V			
11+35	0.7775	2.08	Q	V			
11+40	0.7907	1.91	Q	V			
11+45	0.8038	1.90	Q	V			
11+50	0.8175	1.99	Q	V			
11+55	0.8319	2.08	Q	V			
12+ 0	0.8463	2.10	Q	V			
12+ 5	0.8649	2.70	Q	V			
12+10	0.8876	3.30		Q	V		
12+15	0.9108	3.37		Q	V		
12+20	0.9347	3.46		Q	V		
12+25	0.9592	3.55		Q	V		
12+30	0.9837	3.57		Q	V		
12+35	1.0095	3.75		Q	V		
12+40	1.0365	3.92		Q	V		
12+45	1.0637	3.94		Q	V		
12+50	1.0915	4.04		Q	V		
12+55	1.1199	4.13		Q	V		
13+ 0	1.1484	4.14		Q	V		
13+ 5	1.1799	4.57		Q	V		
13+10	1.2144	5.00		Q	V		
13+15	1.2492	5.05		Q	V		
13+20	1.2840	5.06		Q	V		
13+25	1.3189	5.07		Q	V		
13+30	1.3539	5.07		Q	V		
13+35	1.3824	4.14		Q	V		
13+40	1.4045	3.21	Q		V		
13+45	1.4260	3.12	Q		V		
13+50	1.4475	3.12	Q		V		
13+55	1.4690	3.12	Q		V		
14+ 0	1.4905	3.13	Q		V		
14+ 5	1.5144	3.47	Q		V		
14+10	1.5407	3.82		Q	V		
14+15	1.5673	3.86		Q	V		
14+20	1.5933	3.78		Q	V		
14+25	1.6188	3.70		Q	V		
14+30	1.6443	3.70		Q	V		
14+35	1.6698	3.70		Q	V		
14+40	1.6953	3.71		Q	V		
14+45	1.7209	3.71		Q	V		
14+50	1.7459	3.63		Q	V		
14+55	1.7703	3.55		Q	V		
15+ 0	1.7948	3.55		Q	V		
15+ 5	1.8186	3.47		Q	V		
15+10	1.8420	3.39		Q	V		
15+15	1.8653	3.38		Q	V		
15+20	1.8880	3.30		Q	V		
15+25	1.9102	3.22	Q		V		
15+30	1.9323	3.22	Q		V		

15+35	1.9522	2.88		Q			V	
15+40	1.9697	2.54		Q			V	
15+45	1.9870	2.52		Q			V	
15+50	2.0043	2.52		Q			V	
15+55	2.0217	2.52		Q			V	
16+ 0	2.0391	2.52		Q			V	
16+ 5	2.0489	1.42		Q			V	
16+10	2.0510	0.31	Q				V	
16+15	2.0524	0.20	Q				V	
16+20	2.0537	0.19	Q				V	
16+25	2.0550	0.19	Q				V	
16+30	2.0562	0.19	Q				V	
16+35	2.0574	0.16	Q				V	
16+40	2.0584	0.14	Q				V	
16+45	2.0593	0.14	Q				V	
16+50	2.0603	0.14	Q				V	
16+55	2.0613	0.14	Q				V	
17+ 0	2.0622	0.14	Q				V	
17+ 5	2.0635	0.18	Q				V	
17+10	2.0651	0.23	Q				V	
17+15	2.0667	0.23	Q				V	
17+20	2.0683	0.23	Q				V	
17+25	2.0699	0.23	Q				V	
17+30	2.0715	0.23	Q				V	
17+35	2.0731	0.23	Q				V	
17+40	2.0747	0.23	Q				V	
17+45	2.0763	0.23	Q				V	
17+50	2.0778	0.21	Q				V	
17+55	2.0791	0.19	Q				V	
18+ 0	2.0804	0.19	Q				V	
18+ 5	2.0817	0.19	Q				V	
18+10	2.0830	0.19	Q				V	
18+15	2.0842	0.19	Q				V	
18+20	2.0855	0.19	Q				V	
18+25	2.0868	0.19	Q				V	
18+30	2.0881	0.19	Q				V	
18+35	2.0892	0.16	Q				V	
18+40	2.0902	0.14	Q				V	
18+45	2.0912	0.14	Q				V	
18+50	2.0920	0.12	Q				V	
18+55	2.0927	0.10	Q				V	
19+ 0	2.0933	0.09	Q				V	
19+ 5	2.0941	0.12	Q				V	
19+10	2.0951	0.14	Q				V	
19+15	2.0960	0.14	Q				V	
19+20	2.0971	0.16	Q				V	
19+25	2.0984	0.18	Q				V	
19+30	2.0997	0.19	Q				V	
19+35	2.1008	0.16	Q				V	
19+40	2.1018	0.14	Q				V	

19+45	2.1028	0.14	Q				V
19+50	2.1036	0.12	Q				V
19+55	2.1043	0.10	Q				V
20+ 0	2.1049	0.09	Q				V
20+ 5	2.1057	0.12	Q				V
20+10	2.1066	0.14	Q				V
20+15	2.1076	0.14	Q				V
20+20	2.1086	0.14	Q				V
20+25	2.1095	0.14	Q				V
20+30	2.1105	0.14	Q				V
20+35	2.1115	0.14	Q				V
20+40	2.1124	0.14	Q				V
20+45	2.1134	0.14	Q				V
20+50	2.1142	0.12	Q				V
20+55	2.1149	0.10	Q				V
21+ 0	2.1155	0.09	Q				V
21+ 5	2.1163	0.12	Q				V
21+10	2.1173	0.14	Q				V
21+15	2.1182	0.14	Q				V
21+20	2.1190	0.12	Q				V
21+25	2.1197	0.10	Q				V
21+30	2.1203	0.09	Q				V
21+35	2.1211	0.12	Q				V
21+40	2.1221	0.14	Q				V
21+45	2.1231	0.14	Q				V
21+50	2.1239	0.12	Q				V
21+55	2.1245	0.10	Q				V
22+ 0	2.1252	0.09	Q				V
22+ 5	2.1260	0.12	Q				V
22+10	2.1269	0.14	Q				V
22+15	2.1279	0.14	Q				V
22+20	2.1287	0.12	Q				V
22+25	2.1294	0.10	Q				V
22+30	2.1300	0.09	Q				V
22+35	2.1306	0.09	Q				V
22+40	2.1313	0.09	Q				V
22+45	2.1319	0.09	Q				V
22+50	2.1326	0.09	Q				V
22+55	2.1332	0.09	Q				V
23+ 0	2.1339	0.09	Q				V
23+ 5	2.1345	0.09	Q				V
23+10	2.1351	0.09	Q				V
23+15	2.1358	0.09	Q				V
23+20	2.1364	0.09	Q				V
23+25	2.1371	0.09	Q				V
23+30	2.1377	0.09	Q				V
23+35	2.1384	0.09	Q				V
23+40	2.1390	0.09	Q				V
23+45	2.1397	0.09	Q				V
23+50	2.1403	0.09	Q				V

23+55	2.1409	0.09	Q				V
24+ 0	2.1416	0.09	Q				V
24+ 5	2.1419	0.05	Q				V
24+10	2.1420	0.00	Q				V
24+15	2.1420	0.00	Q				V

Proposed Conditions Unit Hydrographs

Unit Hydrograph Analysis

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Study date 01/16/25 File: ST08PHYD1100.out

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

Program License Serial Number 6677

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

English Units used in output format

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
PROPOSED CONDITIONS HYDROGRAPH
100-YEAR STORM EVENT

Drainage Area = 7.54(Ac.) = 0.012 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 7.54(Ac.) =
0.012 Sq. Mi.
Length along longest watercourse = 574.00(Ft.)
Length along longest watercourse measured to centroid = 287.00(Ft.)
Length along longest watercourse = 0.109 Mi.
Length along longest watercourse measured to centroid = 0.054 Mi.
Difference in elevation = 7.30(Ft.)
Slope along watercourse = 67.1498 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.023 Hr.
Lag time = 1.38 Min.
25% of lag time = 0.35 Min.
40% of lag time = 0.55 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.))[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	0.52	3.95

100 YEAR Area rainfall data:

Area(Ac.))[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	1.34	10.10

STORM EVENT (YEAR) = 100.00

Area Averaged 2-Year Rainfall = 0.524(In)

Area Averaged 100-Year Rainfall = 1.340(In)

Point rain (area averaged) = 1.340(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.340(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
7.540	69.00	0.800
Total Area Entered = 7.54(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	84.4	0.194	0.800	0.054	1.000	0.054
Sum (F) =						0.054

Area averaged mean soil loss (F) (In/Hr) = 0.054

Minimum soil loss rate ((In/Hr)) = 0.027

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.260

Slope of intensity-duration curve for a 1 hour storm =0.5500

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

----- Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	361.805	64.114
2	0.167	723.611	35.886
		Sum = 100.000	Sum= 7.599

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	3.30	0.531	0.054	(0.138)	0.476
2	0.17	4.20	0.675	0.054	(0.176)	0.621
3	0.25	4.40	0.707	0.054	(0.184)	0.653
4	0.33	4.80	0.772	0.054	(0.201)	0.718
5	0.42	5.20	0.836	0.054	(0.217)	0.782
6	0.50	6.20	0.997	0.054	(0.259)	0.943
7	0.58	6.80	1.093	0.054	(0.284)	1.039
8	0.67	8.80	1.415	0.054	(0.368)	1.361
9	0.75	13.90	2.235	0.054	(0.581)	2.181
10	0.83	31.40	5.049	0.054	(1.313)	4.994
11	0.92	7.20	1.158	0.054	(0.301)	1.103
12	1.00	3.80	0.611	0.054	(0.159)	0.557

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.4

Flood volume = Effective rainfall 1.29(In)
times area 7.5(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)

Total soil loss = 0.05(In)

Total soil loss = 0.034(Ac.Ft)

Total rainfall = 1.34(In)

Flood volume = 35188.0 Cubic Feet

Total soil loss = 1485.5 Cubic Feet

Peak flow rate of this hydrograph = 30.295(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0160	2.32	V Q				
0+10	0.0458	4.33	V Q				
0+15	0.0794	4.88	VQ				
0+20	0.1157	5.28	Q				
0+25	0.1555	5.77	Q V				
0+30	0.2018	6.73	Q V				
0+35	0.2544	7.64	Q	V			
0+40	0.3196	9.47	Q	V			
0+45	0.4184	14.34		Q	V		
0+50	0.6270	30.30				QV	
0+55	0.7579	19.01			Q		V
1+ 0	0.7973	5.72	Q				V

1+ 5

0.8078

1.52 |Q

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Unit Hydrograph Analysis

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Study date 01/16/25 File: ST08PHYD3100.out

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

Program License Serial Number 6677

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

English Units used in output format

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
PROPOSED CONDITIONS HYDROGRAPH
100-YEAR STORM EVENT

Drainage Area = 7.54(Ac.) = 0.012 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 7.54(Ac.) =
0.012 Sq. Mi.
Length along longest watercourse = 574.00(Ft.)
Length along longest watercourse measured to centroid = 287.00(Ft.)
Length along longest watercourse = 0.109 Mi.
Length along longest watercourse measured to centroid = 0.054 Mi.
Difference in elevation = 7.30(Ft.)
Slope along watercourse = 67.1498 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.023 Hr.
Lag time = 1.38 Min.
25% of lag time = 0.35 Min.
40% of lag time = 0.55 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	0.95	7.15

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	2.30	17.34

STORM EVENT (YEAR) = 100.00

Area Averaged 2-Year Rainfall = 0.948(In)

Area Averaged 100-Year Rainfall = 2.300(In)

Point rain (area averaged) = 2.300(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.300(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
7.540	69.00	0.800
Total Area Entered = 7.54(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	84.4	0.194	0.800	0.054	1.000	0.054
Sum (F) =						0.054

Area averaged mean soil loss (F) (In/Hr) = 0.054

Minimum soil loss rate ((In/Hr)) = 0.027

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.260

Unit Hydrograph FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	361.805	64.114
2	0.167	723.611	35.886
		Sum = 100.000	Sum= 7.599

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.359	0.054	(0.093)	0.305
2	0.17	1.30	0.359	0.054	(0.093)	0.305
3	0.25	1.10	0.304	0.054	(0.079)	0.249
4	0.33	1.50	0.414	0.054	(0.108)	0.360
5	0.42	1.50	0.414	0.054	(0.108)	0.360
6	0.50	1.80	0.497	0.054	(0.129)	0.443
7	0.58	1.50	0.414	0.054	(0.108)	0.360
8	0.67	1.80	0.497	0.054	(0.129)	0.443
9	0.75	1.80	0.497	0.054	(0.129)	0.443
10	0.83	1.50	0.414	0.054	(0.108)	0.360
11	0.92	1.60	0.442	0.054	(0.115)	0.387
12	1.00	1.80	0.497	0.054	(0.129)	0.443
13	1.08	2.20	0.607	0.054	(0.158)	0.553
14	1.17	2.20	0.607	0.054	(0.158)	0.553
15	1.25	2.20	0.607	0.054	(0.158)	0.553
16	1.33	2.00	0.552	0.054	(0.144)	0.498
17	1.42	2.60	0.718	0.054	(0.187)	0.663
18	1.50	2.70	0.745	0.054	(0.194)	0.691
19	1.58	2.40	0.662	0.054	(0.172)	0.608
20	1.67	2.70	0.745	0.054	(0.194)	0.691
21	1.75	3.30	0.911	0.054	(0.237)	0.856
22	1.83	3.10	0.856	0.054	(0.222)	0.801
23	1.92	2.90	0.800	0.054	(0.208)	0.746
24	2.00	3.00	0.828	0.054	(0.215)	0.774
25	2.08	3.10	0.856	0.054	(0.222)	0.801
26	2.17	4.20	1.159	0.054	(0.301)	1.105
27	2.25	5.00	1.380	0.054	(0.359)	1.326
28	2.33	3.50	0.966	0.054	(0.251)	0.912
29	2.42	6.80	1.877	0.054	(0.488)	1.822
30	2.50	7.30	2.015	0.054	(0.524)	1.960
31	2.58	8.20	2.263	0.054	(0.588)	2.209
32	2.67	5.90	1.628	0.054	(0.423)	1.574
33	2.75	2.00	0.552	0.054	(0.144)	0.498
34	2.83	1.80	0.497	0.054	(0.129)	0.443
35	2.92	1.80	0.497	0.054	(0.129)	0.443
36	3.00	0.60	0.166	(0.054)	0.043	0.123

(Loss Rate Not Used)

Sum = 100.0

Sum = 25.7

Flood volume = Effective rainfall 2.14(In)
times area 7.5(Ac.)/[(In)/(Ft.)] = 1.3(Ac.Ft)
Total soil loss = 0.16(In)
Total soil loss = 0.102(Ac.Ft)
Total rainfall = 2.30(In)
Flood volume = 58518.4 Cubic Feet
Total soil loss = 4431.0 Cubic Feet

Peak flow rate of this hydrograph = 16.116(CFS)

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3 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0102	1.48	V Q					
0+10	0.0262	2.32	V Q					
0+15	0.0403	2.05	V Q					
0+20	0.0570	2.43	V Q					
0+25	0.0759	2.73	V Q					
0+30	0.0975	3.14	V Q					
0+35	0.1179	2.96	V Q					
0+40	0.1395	3.14	V Q					
0+45	0.1626	3.36	V Q					
0+50	0.1830	2.96	Q					
0+55	0.2028	2.87	QV					
1+ 0	0.2249	3.21	Q					
1+ 5	0.2518	3.90	Q					
1+10	0.2808	4.20	Q					
1+15	0.3097	4.20	QV					
1+20	0.3368	3.93	Q V					
1+25	0.3684	4.59	QV					
1+30	0.4041	5.18	Q V					
1+35	0.4375	4.85	Q V					
1+40	0.4721	5.03	Q V					
1+45	0.5138	6.06	Q V					
1+50	0.5568	6.24	Q V					
1+55	0.5969	5.82	Q V					
2+ 0	0.6369	5.81	Q V					
2+ 5	0.6784	6.02	Q V					
2+10	0.7305	7.57	Q V					
2+15	0.7958	9.48	Q V					
2+20	0.8513	8.06	Q V					
2+25	0.9296	11.37	Q V					
2+30	1.0297	14.53	QV					
2+35	1.1407	16.12	QV					
2+40	1.2350	13.70	Q V					
2+45	1.2813	6.72	Q V					
2+50	1.3055	3.51	Q V					
2+55	1.3287	3.36	Q V					
3+ 0	1.3411	1.80	Q V					
3+ 5	1.3434	0.33	Q V					

Unit Hydrograph Analysis

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Study date 01/16/25 File: ST08PHYD6100.out

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

Program License Serial Number 6677

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

English Units used in output format

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
PROPOSED CONDITIONS HYDROGRAPH
100-YEAR STORM EVENT

Drainage Area = 7.54(Ac.) = 0.012 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 7.54(Ac.) =
0.012 Sq. Mi.
Length along longest watercourse = 574.00(Ft.)
Length along longest watercourse measured to centroid = 287.00(Ft.)
Length along longest watercourse = 0.109 Mi.
Length along longest watercourse measured to centroid = 0.054 Mi.
Difference in elevation = 7.30(Ft.)
Slope along watercourse = 67.1498 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.023 Hr.
Lag time = 1.38 Min.
25% of lag time = 0.35 Min.
40% of lag time = 0.55 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	1.33	10.03

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	3.20	24.13

STORM EVENT (YEAR) = 100.00

Area Averaged 2-Year Rainfall = 1.330(In)

Area Averaged 100-Year Rainfall = 3.200(In)

Point rain (area averaged) = 3.200(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 3.200(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
7.540	69.00	0.800
Total Area Entered = 7.54(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	84.4	0.194	0.800	0.054	1.000	0.054
Sum (F) =						0.054

Area averaged mean soil loss (F) (In/Hr) = 0.054

Minimum soil loss rate ((In/Hr)) = 0.027

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.260

Unit Hydrograph FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	361.805	64.114	4.872
2 0.167	723.611	35.886	2.727
Sum = 100.000		Sum=	7.599

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.192	(0.054)	0.050	0.142
2	0.17	0.60	0.230	0.054	(0.060)	0.176
3	0.25	0.60	0.230	0.054	(0.060)	0.176
4	0.33	0.60	0.230	0.054	(0.060)	0.176
5	0.42	0.60	0.230	0.054	(0.060)	0.176
6	0.50	0.70	0.269	0.054	(0.070)	0.215
7	0.58	0.70	0.269	0.054	(0.070)	0.215
8	0.67	0.70	0.269	0.054	(0.070)	0.215
9	0.75	0.70	0.269	0.054	(0.070)	0.215
10	0.83	0.70	0.269	0.054	(0.070)	0.215
11	0.92	0.70	0.269	0.054	(0.070)	0.215
12	1.00	0.80	0.307	0.054	(0.080)	0.253
13	1.08	0.80	0.307	0.054	(0.080)	0.253
14	1.17	0.80	0.307	0.054	(0.080)	0.253
15	1.25	0.80	0.307	0.054	(0.080)	0.253
16	1.33	0.80	0.307	0.054	(0.080)	0.253
17	1.42	0.80	0.307	0.054	(0.080)	0.253
18	1.50	0.80	0.307	0.054	(0.080)	0.253
19	1.58	0.80	0.307	0.054	(0.080)	0.253
20	1.67	0.80	0.307	0.054	(0.080)	0.253
21	1.75	0.80	0.307	0.054	(0.080)	0.253
22	1.83	0.80	0.307	0.054	(0.080)	0.253
23	1.92	0.80	0.307	0.054	(0.080)	0.253
24	2.00	0.90	0.346	0.054	(0.090)	0.291
25	2.08	0.80	0.307	0.054	(0.080)	0.253
26	2.17	0.90	0.346	0.054	(0.090)	0.291
27	2.25	0.90	0.346	0.054	(0.090)	0.291
28	2.33	0.90	0.346	0.054	(0.090)	0.291
29	2.42	0.90	0.346	0.054	(0.090)	0.291
30	2.50	0.90	0.346	0.054	(0.090)	0.291
31	2.58	0.90	0.346	0.054	(0.090)	0.291
32	2.67	0.90	0.346	0.054	(0.090)	0.291
33	2.75	1.00	0.384	0.054	(0.100)	0.330
34	2.83	1.00	0.384	0.054	(0.100)	0.330
35	2.92	1.00	0.384	0.054	(0.100)	0.330
36	3.00	1.00	0.384	0.054	(0.100)	0.330
37	3.08	1.00	0.384	0.054	(0.100)	0.330
38	3.17	1.10	0.422	0.054	(0.110)	0.368
39	3.25	1.10	0.422	0.054	(0.110)	0.368
40	3.33	1.10	0.422	0.054	(0.110)	0.368
41	3.42	1.20	0.461	0.054	(0.120)	0.407
42	3.50	1.30	0.499	0.054	(0.130)	0.445
43	3.58	1.40	0.538	0.054	(0.140)	0.483
44	3.67	1.40	0.538	0.054	(0.140)	0.483
45	3.75	1.50	0.576	0.054	(0.150)	0.522
46	3.83	1.50	0.576	0.054	(0.150)	0.522
47	3.92	1.60	0.614	0.054	(0.160)	0.560

48	4.00	1.60	0.614	0.054	(0.160)	0.560
49	4.08	1.70	0.653	0.054	(0.170)	0.599
50	4.17	1.80	0.691	0.054	(0.180)	0.637
51	4.25	1.90	0.730	0.054	(0.190)	0.675
52	4.33	2.00	0.768	0.054	(0.200)	0.714
53	4.42	2.10	0.806	0.054	(0.210)	0.752
54	4.50	2.10	0.806	0.054	(0.210)	0.752
55	4.58	2.20	0.845	0.054	(0.220)	0.791
56	4.67	2.30	0.883	0.054	(0.230)	0.829
57	4.75	2.40	0.922	0.054	(0.240)	0.867
58	4.83	2.40	0.922	0.054	(0.240)	0.867
59	4.92	2.50	0.960	0.054	(0.250)	0.906
60	5.00	2.60	0.998	0.054	(0.260)	0.944
61	5.08	3.10	1.190	0.054	(0.309)	1.136
62	5.17	3.60	1.382	0.054	(0.359)	1.328
63	5.25	3.90	1.498	0.054	(0.389)	1.443
64	5.33	4.20	1.613	0.054	(0.419)	1.558
65	5.42	4.70	1.805	0.054	(0.469)	1.750
66	5.50	5.60	2.150	0.054	(0.559)	2.096
67	5.58	1.90	0.730	0.054	(0.190)	0.675
68	5.67	0.90	0.346	0.054	(0.090)	0.291
69	5.75	0.60	0.230	0.054	(0.060)	0.176
70	5.83	0.50	0.192	(0.054)	0.050	0.142
71	5.92	0.30	0.115	(0.054)	0.030	0.085
72	6.00	0.20	0.077	(0.054)	0.020	0.057

(Loss Rate Not Used)

Sum = 100.0

Sum = 34.6

Flood volume = Effective rainfall 2.88(In)
times area 7.5(Ac.)/[(In)/(Ft.)] = 1.8(Ac.Ft)
Total soil loss = 0.32(In)
Total soil loss = 0.201(Ac.Ft)
Total rainfall = 3.20(In)
Flood volume = 78822.8 Cubic Feet
Total soil loss = 8759.5 Cubic Feet

Peak flow rate of this hydrograph = 14.993(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0

0+ 5	0.0048	0.69	VQ				
0+10	0.0134	1.25	V Q				
0+15	0.0226	1.34	V Q				
0+20	0.0318	1.34	V Q				

0+25	0.0410	1.34	V Q				
0+30	0.0515	1.53	V Q				
0+35	0.0628	1.63	V Q				
0+40	0.0740	1.63	V Q				
0+45	0.0852	1.63	V Q				
0+50	0.0965	1.63	VQ				
0+55	0.1077	1.63	VQ				
1+ 0	0.1202	1.82	VQ				
1+ 5	0.1335	1.92	VQ				
1+10	0.1467	1.92	Q				
1+15	0.1599	1.92	Q				
1+20	0.1732	1.92	Q				
1+25	0.1864	1.92	QV				
1+30	0.1997	1.92	QV				
1+35	0.2129	1.92	QV				
1+40	0.2262	1.92	QV				
1+45	0.2394	1.92	Q V				
1+50	0.2526	1.92	Q V				
1+55	0.2659	1.92	Q V				
2+ 0	0.2804	2.11	Q V				
2+ 5	0.2944	2.03	Q V				
2+10	0.3089	2.11	Q V				
2+15	0.3242	2.21	Q V				
2+20	0.3394	2.21	Q V				
2+25	0.3547	2.21	Q V				
2+30	0.3699	2.21	Q V				
2+35	0.3852	2.21	Q V				
2+40	0.4004	2.21	Q V				
2+45	0.4170	2.40	Q V				
2+50	0.4342	2.51	Q V				
2+55	0.4515	2.51	Q V				
3+ 0	0.4688	2.51	Q V				
3+ 5	0.4860	2.51	Q V				
3+10	0.5046	2.69	Q V				
3+15	0.5239	2.80	Q V				
3+20	0.5431	2.80	Q V				
3+25	0.5637	2.99	Q V				
3+30	0.5863	3.28	Q V				
3+35	0.6109	3.57	Q V				
3+40	0.6362	3.67	Q V				
3+45	0.6628	3.86	Q V				
3+50	0.6901	3.97	Q V				
3+55	0.7187	4.15	Q V				
4+ 0	0.7480	4.26	Q V				
4+ 5	0.7786	4.45	Q V				
4+10	0.8113	4.74	Q V				
4+15	0.8459	5.03	Q V				
4+20	0.8825	5.32	Q V				
4+25	0.9212	5.61	Q V				
4+30	0.9606	5.72	Q V				

4+35	1.0013	5.91			Q		V		
4+40	1.0439	6.20			Q		V		
4+45	1.0886	6.49			Q		V		
4+50	1.1340	6.59			Q		V		
4+55	1.1807	6.78			Q		V		
5+ 0	1.2295	7.07			Q		V		
5+ 5	1.2853	8.11			Q		V		
5+10	1.3513	9.57				Q		V	
5+15	1.4247	10.66				Q		V	
5+20	1.5041	11.53				Q		V	
5+25	1.5922	12.78					Q		V
5+30	1.6954	14.99					Q		V
5+35	1.7575	9.01			Q				V
5+40	1.7799	3.26		Q					V
5+45	1.7913	1.65		Q					V
5+50	1.7994	1.17		Q					V
5+55	1.8049	0.80		Q					V
6+ 0	1.8085	0.51		Q					V
6+ 5	1.8095	0.16	Q						V

Unit Hydrograph Analysis

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Study date 01/16/25 File: ST08PHYD24100.out

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

Program License Serial Number 6677

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

English Units used in output format

7080 SUMNER AVENUE
EASTVALE, RIVERSIDE COUNTY
PROPOSED CONDITIONS HYDROGRAPH
100-YEAR STORM EVENT

Drainage Area = 7.54(Ac.) = 0.012 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 7.54(Ac.) =
0.012 Sq. Mi.
Length along longest watercourse = 574.00(Ft.)
Length along longest watercourse measured to centroid = 287.00(Ft.)
Length along longest watercourse = 0.109 Mi.
Length along longest watercourse measured to centroid = 0.054 Mi.
Difference in elevation = 7.30(Ft.)
Slope along watercourse = 67.1498 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.023 Hr.
Lag time = 1.38 Min.
25% of lag time = 0.35 Min.
40% of lag time = 0.55 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	2.34	17.64

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
7.54	5.91	44.56

STORM EVENT (YEAR) = 100.00

Area Averaged 2-Year Rainfall = 2.340(In)

Area Averaged 100-Year Rainfall = 5.910(In)

Point rain (area averaged) = 5.910(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 5.910(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
7.540	69.00	0.800
Total Area Entered = 7.54(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	84.4	0.194	0.800	0.054	1.000	0.054
Sum (F) =						0.054

Area averaged mean soil loss (F) (In/Hr) = 0.054

Minimum soil loss rate ((In/Hr)) = 0.027

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.260

Unit Hydrograph FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	361.805	64.114
2	0.167	723.611	35.886
		Sum = 100.000	Sum= 7.599

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.047	(0.096)	0.012	0.035
2	0.17	0.07	0.047	(0.096)	0.012	0.035
3	0.25	0.07	0.047	(0.095)	0.012	0.035
4	0.33	0.10	0.071	(0.095)	0.018	0.052
5	0.42	0.10	0.071	(0.095)	0.018	0.052
6	0.50	0.10	0.071	(0.094)	0.018	0.052
7	0.58	0.10	0.071	(0.094)	0.018	0.052
8	0.67	0.10	0.071	(0.094)	0.018	0.052
9	0.75	0.10	0.071	(0.093)	0.018	0.052
10	0.83	0.13	0.095	(0.093)	0.025	0.070
11	0.92	0.13	0.095	(0.093)	0.025	0.070
12	1.00	0.13	0.095	(0.092)	0.025	0.070
13	1.08	0.10	0.071	(0.092)	0.018	0.052
14	1.17	0.10	0.071	(0.091)	0.018	0.052
15	1.25	0.10	0.071	(0.091)	0.018	0.052
16	1.33	0.10	0.071	(0.091)	0.018	0.052
17	1.42	0.10	0.071	(0.090)	0.018	0.052
18	1.50	0.10	0.071	(0.090)	0.018	0.052
19	1.58	0.10	0.071	(0.090)	0.018	0.052
20	1.67	0.10	0.071	(0.089)	0.018	0.052
21	1.75	0.10	0.071	(0.089)	0.018	0.052
22	1.83	0.13	0.095	(0.089)	0.025	0.070
23	1.92	0.13	0.095	(0.088)	0.025	0.070
24	2.00	0.13	0.095	(0.088)	0.025	0.070
25	2.08	0.13	0.095	(0.087)	0.025	0.070
26	2.17	0.13	0.095	(0.087)	0.025	0.070
27	2.25	0.13	0.095	(0.087)	0.025	0.070
28	2.33	0.13	0.095	(0.086)	0.025	0.070
29	2.42	0.13	0.095	(0.086)	0.025	0.070
30	2.50	0.13	0.095	(0.086)	0.025	0.070
31	2.58	0.17	0.118	(0.085)	0.031	0.087
32	2.67	0.17	0.118	(0.085)	0.031	0.087
33	2.75	0.17	0.118	(0.085)	0.031	0.087
34	2.83	0.17	0.118	(0.084)	0.031	0.087
35	2.92	0.17	0.118	(0.084)	0.031	0.087
36	3.00	0.17	0.118	(0.084)	0.031	0.087
37	3.08	0.17	0.118	(0.083)	0.031	0.087
38	3.17	0.17	0.118	(0.083)	0.031	0.087
39	3.25	0.17	0.118	(0.083)	0.031	0.087
40	3.33	0.17	0.118	(0.082)	0.031	0.087
41	3.42	0.17	0.118	(0.082)	0.031	0.087
42	3.50	0.17	0.118	(0.082)	0.031	0.087
43	3.58	0.17	0.118	(0.081)	0.031	0.087
44	3.67	0.17	0.118	(0.081)	0.031	0.087
45	3.75	0.17	0.118	(0.081)	0.031	0.087
46	3.83	0.20	0.142	(0.080)	0.037	0.105
47	3.92	0.20	0.142	(0.080)	0.037	0.105

48	4.00	0.20	0.142	(0.080)	0.037	0.105
49	4.08	0.20	0.142	(0.079)	0.037	0.105
50	4.17	0.20	0.142	(0.079)	0.037	0.105
51	4.25	0.20	0.142	(0.079)	0.037	0.105
52	4.33	0.23	0.165	(0.078)	0.043	0.122
53	4.42	0.23	0.165	(0.078)	0.043	0.122
54	4.50	0.23	0.165	(0.078)	0.043	0.122
55	4.58	0.23	0.165	(0.077)	0.043	0.122
56	4.67	0.23	0.165	(0.077)	0.043	0.122
57	4.75	0.23	0.165	(0.077)	0.043	0.122
58	4.83	0.27	0.189	(0.076)	0.049	0.140
59	4.92	0.27	0.189	(0.076)	0.049	0.140
60	5.00	0.27	0.189	(0.076)	0.049	0.140
61	5.08	0.20	0.142	(0.075)	0.037	0.105
62	5.17	0.20	0.142	(0.075)	0.037	0.105
63	5.25	0.20	0.142	(0.075)	0.037	0.105
64	5.33	0.23	0.165	(0.074)	0.043	0.122
65	5.42	0.23	0.165	(0.074)	0.043	0.122
66	5.50	0.23	0.165	(0.074)	0.043	0.122
67	5.58	0.27	0.189	(0.073)	0.049	0.140
68	5.67	0.27	0.189	(0.073)	0.049	0.140
69	5.75	0.27	0.189	(0.073)	0.049	0.140
70	5.83	0.27	0.189	(0.072)	0.049	0.140
71	5.92	0.27	0.189	(0.072)	0.049	0.140
72	6.00	0.27	0.189	(0.072)	0.049	0.140
73	6.08	0.30	0.213	(0.071)	0.055	0.157
74	6.17	0.30	0.213	(0.071)	0.055	0.157
75	6.25	0.30	0.213	(0.071)	0.055	0.157
76	6.33	0.30	0.213	(0.070)	0.055	0.157
77	6.42	0.30	0.213	(0.070)	0.055	0.157
78	6.50	0.30	0.213	(0.070)	0.055	0.157
79	6.58	0.33	0.236	(0.069)	0.061	0.175
80	6.67	0.33	0.236	(0.069)	0.061	0.175
81	6.75	0.33	0.236	(0.069)	0.061	0.175
82	6.83	0.33	0.236	(0.068)	0.061	0.175
83	6.92	0.33	0.236	(0.068)	0.061	0.175
84	7.00	0.33	0.236	(0.068)	0.061	0.175
85	7.08	0.33	0.236	(0.068)	0.061	0.175
86	7.17	0.33	0.236	(0.067)	0.061	0.175
87	7.25	0.33	0.236	(0.067)	0.061	0.175
88	7.33	0.37	0.260	0.067 (0.068)		0.193
89	7.42	0.37	0.260	0.066 (0.068)		0.194
90	7.50	0.37	0.260	0.066 (0.068)		0.194
91	7.58	0.40	0.284	0.066 (0.074)		0.218
92	7.67	0.40	0.284	0.065 (0.074)		0.218
93	7.75	0.40	0.284	0.065 (0.074)		0.219
94	7.83	0.43	0.307	0.065 (0.080)		0.242
95	7.92	0.43	0.307	0.065 (0.080)		0.243
96	8.00	0.43	0.307	0.064 (0.080)		0.243
97	8.08	0.50	0.355	0.064 (0.092)		0.291

98	8.17	0.50	0.355	0.064	(0.092)	0.291
99	8.25	0.50	0.355	0.063	(0.092)	0.291
100	8.33	0.50	0.355	0.063	(0.092)	0.292
101	8.42	0.50	0.355	0.063	(0.092)	0.292
102	8.50	0.50	0.355	0.062	(0.092)	0.292
103	8.58	0.53	0.378	0.062	(0.098)	0.316
104	8.67	0.53	0.378	0.062	(0.098)	0.316
105	8.75	0.53	0.378	0.062	(0.098)	0.317
106	8.83	0.57	0.402	0.061	(0.104)	0.341
107	8.92	0.57	0.402	0.061	(0.104)	0.341
108	9.00	0.57	0.402	0.061	(0.104)	0.341
109	9.08	0.63	0.449	0.060	(0.117)	0.389
110	9.17	0.63	0.449	0.060	(0.117)	0.389
111	9.25	0.63	0.449	0.060	(0.117)	0.389
112	9.33	0.67	0.473	0.060	(0.123)	0.413
113	9.42	0.67	0.473	0.059	(0.123)	0.414
114	9.50	0.67	0.473	0.059	(0.123)	0.414
115	9.58	0.70	0.496	0.059	(0.129)	0.438
116	9.67	0.70	0.496	0.058	(0.129)	0.438
117	9.75	0.70	0.496	0.058	(0.129)	0.438
118	9.83	0.73	0.520	0.058	(0.135)	0.462
119	9.92	0.73	0.520	0.058	(0.135)	0.462
120	10.00	0.73	0.520	0.057	(0.135)	0.463
121	10.08	0.50	0.355	0.057	(0.092)	0.298
122	10.17	0.50	0.355	0.057	(0.092)	0.298
123	10.25	0.50	0.355	0.056	(0.092)	0.298
124	10.33	0.50	0.355	0.056	(0.092)	0.298
125	10.42	0.50	0.355	0.056	(0.092)	0.299
126	10.50	0.50	0.355	0.056	(0.092)	0.299
127	10.58	0.67	0.473	0.055	(0.123)	0.417
128	10.67	0.67	0.473	0.055	(0.123)	0.418
129	10.75	0.67	0.473	0.055	(0.123)	0.418
130	10.83	0.67	0.473	0.055	(0.123)	0.418
131	10.92	0.67	0.473	0.054	(0.123)	0.418
132	11.00	0.67	0.473	0.054	(0.123)	0.419
133	11.08	0.63	0.449	0.054	(0.117)	0.395
134	11.17	0.63	0.449	0.054	(0.117)	0.396
135	11.25	0.63	0.449	0.053	(0.117)	0.396
136	11.33	0.63	0.449	0.053	(0.117)	0.396
137	11.42	0.63	0.449	0.053	(0.117)	0.396
138	11.50	0.63	0.449	0.052	(0.117)	0.397
139	11.58	0.57	0.402	0.052	(0.104)	0.350
140	11.67	0.57	0.402	0.052	(0.104)	0.350
141	11.75	0.57	0.402	0.052	(0.104)	0.350
142	11.83	0.60	0.426	0.051	(0.111)	0.374
143	11.92	0.60	0.426	0.051	(0.111)	0.374
144	12.00	0.60	0.426	0.051	(0.111)	0.375
145	12.08	0.83	0.591	0.051	(0.154)	0.540
146	12.17	0.83	0.591	0.050	(0.154)	0.541
147	12.25	0.83	0.591	0.050	(0.154)	0.541

148	12.33	0.87	0.615	0.050	(0.160)	0.565
149	12.42	0.87	0.615	0.050	(0.160)	0.565
150	12.50	0.87	0.615	0.049	(0.160)	0.565
151	12.58	0.93	0.662	0.049	(0.172)	0.613
152	12.67	0.93	0.662	0.049	(0.172)	0.613
153	12.75	0.93	0.662	0.049	(0.172)	0.613
154	12.83	0.97	0.686	0.048	(0.178)	0.637
155	12.92	0.97	0.686	0.048	(0.178)	0.637
156	13.00	0.97	0.686	0.048	(0.178)	0.638
157	13.08	1.13	0.804	0.048	(0.209)	0.756
158	13.17	1.13	0.804	0.047	(0.209)	0.756
159	13.25	1.13	0.804	0.047	(0.209)	0.757
160	13.33	1.13	0.804	0.047	(0.209)	0.757
161	13.42	1.13	0.804	0.047	(0.209)	0.757
162	13.50	1.13	0.804	0.046	(0.209)	0.757
163	13.58	0.77	0.544	0.046	(0.141)	0.497
164	13.67	0.77	0.544	0.046	(0.141)	0.498
165	13.75	0.77	0.544	0.046	(0.141)	0.498
166	13.83	0.77	0.544	0.046	(0.141)	0.498
167	13.92	0.77	0.544	0.045	(0.141)	0.498
168	14.00	0.77	0.544	0.045	(0.141)	0.499
169	14.08	0.90	0.638	0.045	(0.166)	0.593
170	14.17	0.90	0.638	0.045	(0.166)	0.594
171	14.25	0.90	0.638	0.044	(0.166)	0.594
172	14.33	0.87	0.615	0.044	(0.160)	0.570
173	14.42	0.87	0.615	0.044	(0.160)	0.571
174	14.50	0.87	0.615	0.044	(0.160)	0.571
175	14.58	0.87	0.615	0.043	(0.160)	0.571
176	14.67	0.87	0.615	0.043	(0.160)	0.571
177	14.75	0.87	0.615	0.043	(0.160)	0.572
178	14.83	0.83	0.591	0.043	(0.154)	0.548
179	14.92	0.83	0.591	0.043	(0.154)	0.548
180	15.00	0.83	0.591	0.042	(0.154)	0.549
181	15.08	0.80	0.567	0.042	(0.148)	0.525
182	15.17	0.80	0.567	0.042	(0.148)	0.525
183	15.25	0.80	0.567	0.042	(0.148)	0.526
184	15.33	0.77	0.544	0.042	(0.141)	0.502
185	15.42	0.77	0.544	0.041	(0.141)	0.502
186	15.50	0.77	0.544	0.041	(0.141)	0.503
187	15.58	0.63	0.449	0.041	(0.117)	0.408
188	15.67	0.63	0.449	0.041	(0.117)	0.408
189	15.75	0.63	0.449	0.040	(0.117)	0.409
190	15.83	0.63	0.449	0.040	(0.117)	0.409
191	15.92	0.63	0.449	0.040	(0.117)	0.409
192	16.00	0.63	0.449	0.040	(0.117)	0.409
193	16.08	0.13	0.095	(0.040)	0.025	0.070
194	16.17	0.13	0.095	(0.039)	0.025	0.070
195	16.25	0.13	0.095	(0.039)	0.025	0.070
196	16.33	0.13	0.095	(0.039)	0.025	0.070
197	16.42	0.13	0.095	(0.039)	0.025	0.070

198	16.50	0.13	0.095	(0.039)	0.025	0.070
199	16.58	0.10	0.071	(0.038)	0.018	0.052
200	16.67	0.10	0.071	(0.038)	0.018	0.052
201	16.75	0.10	0.071	(0.038)	0.018	0.052
202	16.83	0.10	0.071	(0.038)	0.018	0.052
203	16.92	0.10	0.071	(0.038)	0.018	0.052
204	17.00	0.10	0.071	(0.037)	0.018	0.052
205	17.08	0.17	0.118	(0.037)	0.031	0.087
206	17.17	0.17	0.118	(0.037)	0.031	0.087
207	17.25	0.17	0.118	(0.037)	0.031	0.087
208	17.33	0.17	0.118	(0.037)	0.031	0.087
209	17.42	0.17	0.118	(0.037)	0.031	0.087
210	17.50	0.17	0.118	(0.036)	0.031	0.087
211	17.58	0.17	0.118	(0.036)	0.031	0.087
212	17.67	0.17	0.118	(0.036)	0.031	0.087
213	17.75	0.17	0.118	(0.036)	0.031	0.087
214	17.83	0.13	0.095	(0.036)	0.025	0.070
215	17.92	0.13	0.095	(0.035)	0.025	0.070
216	18.00	0.13	0.095	(0.035)	0.025	0.070
217	18.08	0.13	0.095	(0.035)	0.025	0.070
218	18.17	0.13	0.095	(0.035)	0.025	0.070
219	18.25	0.13	0.095	(0.035)	0.025	0.070
220	18.33	0.13	0.095	(0.035)	0.025	0.070
221	18.42	0.13	0.095	(0.034)	0.025	0.070
222	18.50	0.13	0.095	(0.034)	0.025	0.070
223	18.58	0.10	0.071	(0.034)	0.018	0.052
224	18.67	0.10	0.071	(0.034)	0.018	0.052
225	18.75	0.10	0.071	(0.034)	0.018	0.052
226	18.83	0.07	0.047	(0.034)	0.012	0.035
227	18.92	0.07	0.047	(0.033)	0.012	0.035
228	19.00	0.07	0.047	(0.033)	0.012	0.035
229	19.08	0.10	0.071	(0.033)	0.018	0.052
230	19.17	0.10	0.071	(0.033)	0.018	0.052
231	19.25	0.10	0.071	(0.033)	0.018	0.052
232	19.33	0.13	0.095	(0.033)	0.025	0.070
233	19.42	0.13	0.095	(0.033)	0.025	0.070
234	19.50	0.13	0.095	(0.032)	0.025	0.070
235	19.58	0.10	0.071	(0.032)	0.018	0.052
236	19.67	0.10	0.071	(0.032)	0.018	0.052
237	19.75	0.10	0.071	(0.032)	0.018	0.052
238	19.83	0.07	0.047	(0.032)	0.012	0.035
239	19.92	0.07	0.047	(0.032)	0.012	0.035
240	20.00	0.07	0.047	(0.032)	0.012	0.035
241	20.08	0.10	0.071	(0.031)	0.018	0.052
242	20.17	0.10	0.071	(0.031)	0.018	0.052
243	20.25	0.10	0.071	(0.031)	0.018	0.052
244	20.33	0.10	0.071	(0.031)	0.018	0.052
245	20.42	0.10	0.071	(0.031)	0.018	0.052
246	20.50	0.10	0.071	(0.031)	0.018	0.052
247	20.58	0.10	0.071	(0.031)	0.018	0.052

248	20.67	0.10	0.071	(0.030)	0.018	0.052
249	20.75	0.10	0.071	(0.030)	0.018	0.052
250	20.83	0.07	0.047	(0.030)	0.012	0.035
251	20.92	0.07	0.047	(0.030)	0.012	0.035
252	21.00	0.07	0.047	(0.030)	0.012	0.035
253	21.08	0.10	0.071	(0.030)	0.018	0.052
254	21.17	0.10	0.071	(0.030)	0.018	0.052
255	21.25	0.10	0.071	(0.030)	0.018	0.052
256	21.33	0.07	0.047	(0.029)	0.012	0.035
257	21.42	0.07	0.047	(0.029)	0.012	0.035
258	21.50	0.07	0.047	(0.029)	0.012	0.035
259	21.58	0.10	0.071	(0.029)	0.018	0.052
260	21.67	0.10	0.071	(0.029)	0.018	0.052
261	21.75	0.10	0.071	(0.029)	0.018	0.052
262	21.83	0.07	0.047	(0.029)	0.012	0.035
263	21.92	0.07	0.047	(0.029)	0.012	0.035
264	22.00	0.07	0.047	(0.029)	0.012	0.035
265	22.08	0.10	0.071	(0.029)	0.018	0.052
266	22.17	0.10	0.071	(0.028)	0.018	0.052
267	22.25	0.10	0.071	(0.028)	0.018	0.052
268	22.33	0.07	0.047	(0.028)	0.012	0.035
269	22.42	0.07	0.047	(0.028)	0.012	0.035
270	22.50	0.07	0.047	(0.028)	0.012	0.035
271	22.58	0.07	0.047	(0.028)	0.012	0.035
272	22.67	0.07	0.047	(0.028)	0.012	0.035
273	22.75	0.07	0.047	(0.028)	0.012	0.035
274	22.83	0.07	0.047	(0.028)	0.012	0.035
275	22.92	0.07	0.047	(0.028)	0.012	0.035
276	23.00	0.07	0.047	(0.028)	0.012	0.035
277	23.08	0.07	0.047	(0.028)	0.012	0.035
278	23.17	0.07	0.047	(0.028)	0.012	0.035
279	23.25	0.07	0.047	(0.027)	0.012	0.035
280	23.33	0.07	0.047	(0.027)	0.012	0.035
281	23.42	0.07	0.047	(0.027)	0.012	0.035
282	23.50	0.07	0.047	(0.027)	0.012	0.035
283	23.58	0.07	0.047	(0.027)	0.012	0.035
284	23.67	0.07	0.047	(0.027)	0.012	0.035
285	23.75	0.07	0.047	(0.027)	0.012	0.035
286	23.83	0.07	0.047	(0.027)	0.012	0.035
287	23.92	0.07	0.047	(0.027)	0.012	0.035
288	24.00	0.07	0.047	(0.027)	0.012	0.035

(Loss Rate Not Used)

Sum = 100.0

Sum = 60.5

Flood volume = Effective rainfall 5.04(In)

times area 7.5(Ac.)/[(In)/(Ft.)] = 3.2(Ac.Ft)

Total soil loss = 0.87(In)

Total soil loss = 0.544(Ac.Ft)

Total rainfall = 5.91(In)

Flood volume = 138063.8 Cubic Feet

Total soil loss = 23691.7 Cubic Feet

Peak flow rate of this hydrograph = 5.757(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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0012		0.17	Q				
0+10	0.0030		0.27	VQ				
0+15	0.0048		0.27	VQ				
0+20	0.0073		0.35	VQ				
0+25	0.0100		0.40	VQ				
0+30	0.0128		0.40	VQ				
0+35	0.0155		0.40	VQ				
0+40	0.0182		0.40	VQ				
0+45	0.0210		0.40	VQ				
0+50	0.0243		0.48	VQ				
0+55	0.0280		0.53	V Q				
1+ 0	0.0317		0.53	V Q				
1+ 5	0.0347		0.45	VQ				
1+10	0.0375		0.40	VQ				
1+15	0.0402		0.40	VQ				
1+20	0.0430		0.40	VQ				
1+25	0.0457		0.40	VQ				
1+30	0.0485		0.40	VQ				
1+35	0.0512		0.40	VQ				
1+40	0.0540		0.40	VQ				
1+45	0.0567		0.40	VQ				
1+50	0.0601		0.48	VQ				
1+55	0.0637		0.53	V Q				
2+ 0	0.0674		0.53	V Q				
2+ 5	0.0710		0.53	V Q				
2+10	0.0747		0.53	V Q				
2+15	0.0784		0.53	V Q				
2+20	0.0820		0.53	VQ				
2+25	0.0857		0.53	VQ				
2+30	0.0894		0.53	VQ				
2+35	0.0936		0.62	VQ				
2+40	0.0982		0.66	VQ				
2+45	0.1028		0.66	VQ				
2+50	0.1074		0.66	VQ				
2+55	0.1119		0.66	VQ				
3+ 0	0.1165		0.66	VQ				
3+ 5	0.1211		0.66	VQ				
3+10	0.1257		0.66	VQ				

3+15	0.1303	0.66	VQ				
3+20	0.1348	0.66	VQ				
3+25	0.1394	0.66	VQ				
3+30	0.1440	0.66	VQ				
3+35	0.1486	0.66	VQ				
3+40	0.1532	0.66	VQ				
3+45	0.1577	0.66	VQ				
3+50	0.1629	0.75	VQ				
3+55	0.1684	0.80	VQ				
4+ 0	0.1739	0.80	VQ				
4+ 5	0.1794	0.80	VQ				
4+10	0.1849	0.80	VQ				
4+15	0.1904	0.80	VQ				
4+20	0.1965	0.88	VQ				
4+25	0.2029	0.93	VQ				
4+30	0.2093	0.93	VQ				
4+35	0.2157	0.93	VQ				
4+40	0.2221	0.93	VQ				
4+45	0.2285	0.93	VQ				
4+50	0.2355	1.02	V Q				
4+55	0.2429	1.06	VQ				
5+ 0	0.2502	1.06	VQ				
5+ 5	0.2563	0.89	Q				
5+10	0.2618	0.80	Q				
5+15	0.2673	0.80	Q				
5+20	0.2734	0.88	Q				
5+25	0.2798	0.93	Q				
5+30	0.2862	0.93	Q				
5+35	0.2932	1.02	VQ				
5+40	0.3006	1.06	VQ				
5+45	0.3079	1.06	VQ				
5+50	0.3152	1.06	VQ				
5+55	0.3225	1.06	Q				
6+ 0	0.3299	1.06	Q				
6+ 5	0.3378	1.15	Q				
6+10	0.3460	1.20	Q				
6+15	0.3543	1.20	Q				
6+20	0.3625	1.20	Q				
6+25	0.3708	1.20	Q				
6+30	0.3790	1.20	Q				
6+35	0.3878	1.28	VQ				
6+40	0.3970	1.33	Q				
6+45	0.4062	1.33	Q				
6+50	0.4153	1.33	Q				
6+55	0.4245	1.33	Q				
7+ 0	0.4336	1.33	Q				
7+ 5	0.4428	1.33	Q				
7+10	0.4520	1.33	Q				
7+15	0.4611	1.33	Q				
7+20	0.4709	1.42	Q				

7+25	0.4810	1.47	QV				
7+30	0.4912	1.47	QV				
7+35	0.5021	1.59	Q				
7+40	0.5136	1.66	Q				
7+45	0.5250	1.66	Q				
7+50	0.5372	1.78	VQ				
7+55	0.5500	1.85	VQ				
8+ 0	0.5627	1.85	Q				
8+ 5	0.5770	2.08	VQ				
8+10	0.5922	2.21	VQ				
8+15	0.6075	2.21	VQ				
8+20	0.6227	2.22	VQ				
8+25	0.6380	2.22	Q				
8+30	0.6533	2.22	Q				
8+35	0.6694	2.34	VQ				
8+40	0.6860	2.40	VQ				
8+45	0.7025	2.41	VQ				
8+50	0.7199	2.52	VQ				
8+55	0.7378	2.59	VQ				
9+ 0	0.7556	2.59	VQ				
9+ 5	0.7751	2.83	V Q				
9+10	0.7954	2.96	VQ				
9+15	0.8158	2.96	VQ				
9+20	0.8370	3.08	V Q				
9+25	0.8587	3.14	V Q				
9+30	0.8803	3.15	VQ				
9+35	0.9028	3.26	V Q				
9+40	0.9257	3.33	V Q				
9+45	0.9487	3.33	V Q				
9+50	0.9724	3.45	VQ				
9+55	0.9966	3.52	V Q				
10+ 0	1.0209	3.52	V Q				
10+ 5	1.0395	2.71	Q V				
10+10	1.0551	2.26	Q V				
10+15	1.0707	2.27	Q V				
10+20	1.0863	2.27	Q V				
10+25	1.1020	2.27	Q V				
10+30	1.1176	2.27	Q V				
10+35	1.1373	2.85	Q V				
10+40	1.1591	3.17	Q V				
10+45	1.1810	3.18	Q V				
10+50	1.2029	3.18	Q V				
10+55	1.2248	3.18	Q V				
11+ 0	1.2467	3.18	Q V				
11+ 5	1.2679	3.07	Q V				
11+10	1.2886	3.01	Q V				
11+15	1.3093	3.01	Q V				
11+20	1.3300	3.01	Q V				
11+25	1.3508	3.01	Q V				
11+30	1.3716	3.02	Q V				

11+35	1.3907	2.79	Q	V			
11+40	1.4091	2.66	Q	V			
11+45	1.4274	2.66	Q	V			
11+50	1.4465	2.78	Q	V			
11+55	1.4661	2.85	Q	V			
12+ 0	1.4857	2.85	Q	V			
12+ 5	1.5109	3.66		Q	V		
12+10	1.5392	4.11			Q	V	
12+15	1.5675	4.11			Q	V	
12+20	1.5967	4.23			Q	V	
12+25	1.6262	4.29			Q	V	
12+30	1.6558	4.30			Q	V	
12+35	1.6870	4.53			Q	V	
12+40	1.7191	4.66			Q	V	
12+45	1.7512	4.66			Q	V	
12+50	1.7841	4.78			Q	V	
12+55	1.8175	4.85			Q	V	
13+ 0	1.8509	4.85			Q	V	
13+ 5	1.8882	5.43				Q	V
13+10	1.9278	5.75				Q	V
13+15	1.9674	5.75				Q	V
13+20	2.0071	5.75				Q	V
13+25	2.0467	5.75				Q	V
13+30	2.0863	5.76				Q	V
13+35	2.1173	4.49			Q		V
13+40	2.1433	3.78		Q			V
13+45	2.1694	3.79		Q			V
13+50	2.1955	3.79		Q			V
13+55	2.2216	3.79		Q			V
14+ 0	2.2477	3.79		Q			V
14+ 5	2.2770	4.25			Q		V
14+10	2.3080	4.51			Q		V
14+15	2.3391	4.51			Q		V
14+20	2.3694	4.40			Q		V
14+25	2.3993	4.34			Q		V
14+30	2.4292	4.34			Q		V
14+35	2.4591	4.34			Q		V
14+40	2.4890	4.34			Q		V
14+45	2.5190	4.35			Q		V
14+50	2.5481	4.23			Q		V
14+55	2.5768	4.17			Q		V
15+ 0	2.6055	4.17			Q		V
15+ 5	2.6335	4.06			Q		V
15+10	2.6610	3.99			Q		V
15+15	2.6885	4.00			Q		V
15+20	2.7152	3.88			Q		V
15+25	2.7415	3.82			Q		V
15+30	2.7678	3.82			Q		V
15+35	2.7910	3.36		Q			V
15+40	2.8124	3.10		Q			V

15+45	2.8338	3.11		Q	V
15+50	2.8552	3.11		Q	V
15+55	2.8766	3.11		Q	V
16+ 0	2.8980	3.11		Q	V
16+ 5	2.9081	1.46	Q		V
16+10	2.9117	0.53	Q		V
16+15	2.9154	0.53	Q		V
16+20	2.9190	0.53	Q		V
16+25	2.9227	0.53	Q		V
16+30	2.9264	0.53	Q		V
16+35	2.9295	0.45	Q		V
16+40	2.9322	0.40	Q		V
16+45	2.9349	0.40	Q		V
16+50	2.9377	0.40	Q		V
16+55	2.9404	0.40	Q		V
17+ 0	2.9432	0.40	Q		V
17+ 5	2.9471	0.57	Q		V
17+10	2.9517	0.66	Q		V
17+15	2.9563	0.66	Q		V
17+20	2.9609	0.66	Q		V
17+25	2.9654	0.66	Q		V
17+30	2.9700	0.66	Q		V
17+35	2.9746	0.66	Q		V
17+40	2.9792	0.66	Q		V
17+45	2.9838	0.66	Q		V
17+50	2.9877	0.58	Q		V
17+55	2.9914	0.53	Q		V
18+ 0	2.9951	0.53	Q		V
18+ 5	2.9987	0.53	Q		V
18+10	3.0024	0.53	Q		V
18+15	3.0061	0.53	Q		V
18+20	3.0097	0.53	Q		V
18+25	3.0134	0.53	Q		V
18+30	3.0171	0.53	Q		V
18+35	3.0201	0.45	Q		V
18+40	3.0229	0.40	Q		V
18+45	3.0256	0.40	Q		V
18+50	3.0278	0.31	Q		V
18+55	3.0296	0.27	Q		V
19+ 0	3.0315	0.27	Q		V
19+ 5	3.0339	0.35	Q		V
19+10	3.0366	0.40	Q		V
19+15	3.0394	0.40	Q		V
19+20	3.0427	0.48	Q		V
19+25	3.0464	0.53	Q		V
19+30	3.0500	0.53	Q		V
19+35	3.0531	0.45	Q		V
19+40	3.0559	0.40	Q		V
19+45	3.0586	0.40	Q		V
19+50	3.0608	0.31	Q		V

19+55	3.0626	0.27	Q				V
20+ 0	3.0644	0.27	Q				V
20+ 5	3.0668	0.35	Q				V
20+10	3.0696	0.40	Q				V
20+15	3.0723	0.40	Q				V
20+20	3.0751	0.40	Q				V
20+25	3.0778	0.40	Q				V
20+30	3.0806	0.40	Q				V
20+35	3.0833	0.40	Q				V
20+40	3.0861	0.40	Q				V
20+45	3.0888	0.40	Q				V
20+50	3.0910	0.31	Q				V
20+55	3.0928	0.27	Q				V
21+ 0	3.0947	0.27	Q				V
21+ 5	3.0971	0.35	Q				V
21+10	3.0998	0.40	Q				V
21+15	3.1026	0.40	Q				V
21+20	3.1047	0.31	Q				V
21+25	3.1066	0.27	Q				V
21+30	3.1084	0.27	Q				V
21+35	3.1108	0.35	Q				V
21+40	3.1136	0.40	Q				V
21+45	3.1163	0.40	Q				V
21+50	3.1185	0.31	Q				V
21+55	3.1203	0.27	Q				V
22+ 0	3.1221	0.27	Q				V
22+ 5	3.1246	0.35	Q				V
22+10	3.1273	0.40	Q				V
22+15	3.1301	0.40	Q				V
22+20	3.1322	0.31	Q				V
22+25	3.1340	0.27	Q				V
22+30	3.1359	0.27	Q				V
22+35	3.1377	0.27	Q				V
22+40	3.1395	0.27	Q				V
22+45	3.1414	0.27	Q				V
22+50	3.1432	0.27	Q				V
22+55	3.1450	0.27	Q				V
23+ 0	3.1469	0.27	Q				V
23+ 5	3.1487	0.27	Q				V
23+10	3.1505	0.27	Q				V
23+15	3.1524	0.27	Q				V
23+20	3.1542	0.27	Q				V
23+25	3.1560	0.27	Q				V
23+30	3.1579	0.27	Q				V
23+35	3.1597	0.27	Q				V
23+40	3.1615	0.27	Q				V
23+45	3.1634	0.27	Q				V
23+50	3.1652	0.27	Q				V
23+55	3.1670	0.27	Q				V
24+ 0	3.1689	0.27	Q				V

24+ 5

3.1695

0.10 Q

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V

APPENDIX D

Hydrology Reference Data

NOAA Precipitation Data



NOAA Atlas 14, Volume 6, Version 2
Location name: Eastvale, California, USA*
Latitude: 33.9597°, Longitude: -117.5745°
Elevation: 611 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 & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.25 (1.04-1.51)	1.68 (1.39-2.03)	2.23 (1.86-2.71)	2.69 (2.22-3.30)	3.31 (2.64-4.20)	3.79 (2.95-4.92)	4.28 (3.25-5.70)	4.79 (3.53-6.56)	5.48 (3.88-7.85)	6.02 (4.10-8.93)
10-min	0.894 (0.744-1.08)	1.20 (1.00-1.45)	1.60 (1.33-1.94)	1.93 (1.59-2.36)	2.38 (1.89-3.01)	2.72 (2.12-3.53)	3.07 (2.33-4.09)	3.43 (2.53-4.70)	3.93 (2.77-5.62)	4.31 (2.94-6.40)
15-min	0.720 (0.604-0.872)	0.968 (0.808-1.17)	1.29 (1.08-1.57)	1.56 (1.28-1.90)	1.92 (1.52-2.43)	2.19 (1.71-2.84)	2.48 (1.88-3.29)	2.77 (2.04-3.79)	3.17 (2.24-4.53)	3.48 (2.37-5.16)
30-min	0.532 (0.444-0.642)	0.714 (0.596-0.864)	0.952 (0.792-1.16)	1.15 (0.946-1.40)	1.41 (1.12-1.79)	1.62 (1.26-2.10)	1.82 (1.39-2.43)	2.04 (1.50-2.79)	2.33 (1.65-3.34)	2.56 (1.75-3.80)
60-min	0.390 (0.326-0.471)	0.524 (0.437-0.634)	0.699 (0.581-0.848)	0.841 (0.694-1.03)	1.04 (0.825-1.31)	1.19 (0.924-1.54)	1.34 (1.02-1.78)	1.50 (1.10-2.05)	1.71 (1.21-2.45)	1.88 (1.28-2.79)
2-hr	0.288 (0.241-0.349)	0.382 (0.319-0.463)	0.504 (0.419-0.612)	0.602 (0.497-0.738)	0.735 (0.586-0.933)	0.837 (0.652-1.09)	0.941 (0.714-1.25)	1.05 (0.772-1.43)	1.19 (0.841-1.70)	1.30 (0.887-1.93)
3-hr	0.239 (0.199-0.289)	0.315 (0.263-0.382)	0.414 (0.344-0.503)	0.494 (0.407-0.605)	0.601 (0.479-0.763)	0.683 (0.532-0.886)	0.766 (0.582-1.02)	0.852 (0.628-1.17)	0.967 (0.682-1.38)	1.06 (0.719-1.57)
6-hr	0.168 (0.140-0.203)	0.222 (0.185-0.268)	0.291 (0.242-0.353)	0.346 (0.285-0.424)	0.421 (0.335-0.534)	0.477 (0.372-0.619)	0.535 (0.406-0.711)	0.593 (0.437-0.813)	0.672 (0.475-0.962)	0.733 (0.499-1.09)
12-hr	0.108 (0.091-0.131)	0.145 (0.121-0.175)	0.191 (0.159-0.232)	0.229 (0.189-0.280)	0.279 (0.222-0.354)	0.317 (0.247-0.411)	0.355 (0.270-0.473)	0.395 (0.291-0.541)	0.447 (0.316-0.640)	0.488 (0.332-0.724)
24-hr	0.072 (0.063-0.083)	0.097 (0.086-0.112)	0.130 (0.114-0.150)	0.156 (0.137-0.182)	0.192 (0.162-0.231)	0.219 (0.181-0.269)	0.246 (0.199-0.310)	0.273 (0.215-0.354)	0.311 (0.235-0.419)	0.339 (0.248-0.473)
2-day	0.044 (0.039-0.050)	0.060 (0.053-0.069)	0.081 (0.072-0.094)	0.098 (0.086-0.115)	0.122 (0.103-0.147)	0.140 (0.116-0.172)	0.158 (0.128-0.199)	0.176 (0.139-0.228)	0.202 (0.152-0.272)	0.221 (0.162-0.308)
3-day	0.031 (0.028-0.036)	0.043 (0.038-0.050)	0.059 (0.052-0.069)	0.072 (0.063-0.085)	0.090 (0.076-0.109)	0.104 (0.086-0.128)	0.118 (0.095-0.149)	0.132 (0.104-0.171)	0.152 (0.115-0.205)	0.167 (0.122-0.233)
4-day	0.025 (0.022-0.029)	0.035 (0.031-0.041)	0.049 (0.043-0.057)	0.060 (0.052-0.070)	0.075 (0.063-0.090)	0.086 (0.071-0.106)	0.098 (0.079-0.124)	0.110 (0.087-0.143)	0.127 (0.096-0.171)	0.140 (0.102-0.195)
7-day	0.016 (0.015-0.019)	0.023 (0.020-0.027)	0.032 (0.028-0.037)	0.040 (0.035-0.046)	0.050 (0.042-0.060)	0.058 (0.048-0.071)	0.066 (0.053-0.083)	0.074 (0.058-0.096)	0.086 (0.065-0.116)	0.095 (0.069-0.133)
10-day	0.012 (0.011-0.014)	0.018 (0.015-0.020)	0.024 (0.021-0.028)	0.030 (0.026-0.035)	0.038 (0.032-0.046)	0.044 (0.037-0.055)	0.051 (0.041-0.064)	0.057 (0.045-0.074)	0.067 (0.050-0.090)	0.074 (0.054-0.103)
20-day	0.007 (0.006-0.008)	0.010 (0.009-0.012)	0.015 (0.013-0.017)	0.018 (0.016-0.021)	0.023 (0.020-0.028)	0.027 (0.023-0.034)	0.032 (0.025-0.040)	0.036 (0.028-0.047)	0.042 (0.032-0.057)	0.047 (0.035-0.066)
30-day	0.006 (0.005-0.006)	0.008 (0.007-0.009)	0.011 (0.010-0.013)	0.014 (0.013-0.017)	0.019 (0.016-0.022)	0.022 (0.018-0.027)	0.025 (0.021-0.032)	0.029 (0.023-0.038)	0.035 (0.026-0.047)	0.039 (0.028-0.055)
45-day	0.004 (0.004-0.005)	0.006 (0.005-0.007)	0.009 (0.008-0.010)	0.011 (0.010-0.013)	0.015 (0.012-0.018)	0.017 (0.014-0.022)	0.020 (0.016-0.026)	0.024 (0.018-0.031)	0.028 (0.021-0.038)	0.032 (0.023-0.045)
60-day	0.004 (0.003-0.004)	0.005 (0.005-0.006)	0.008 (0.007-0.009)	0.010 (0.008-0.011)	0.013 (0.011-0.015)	0.015 (0.012-0.019)	0.018 (0.014-0.022)	0.020 (0.016-0.027)	0.025 (0.018-0.033)	0.028 (0.020-0.039)

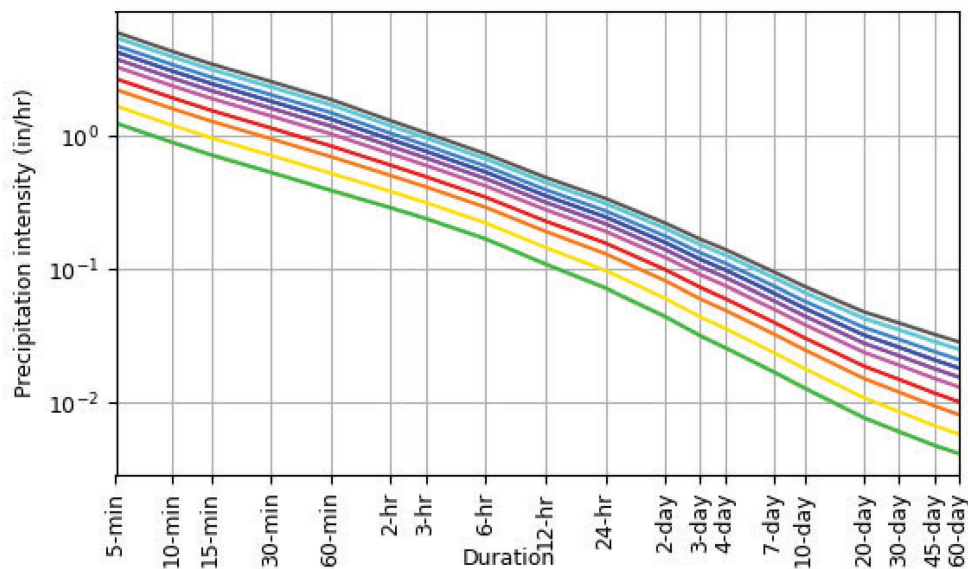
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
 Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and 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.

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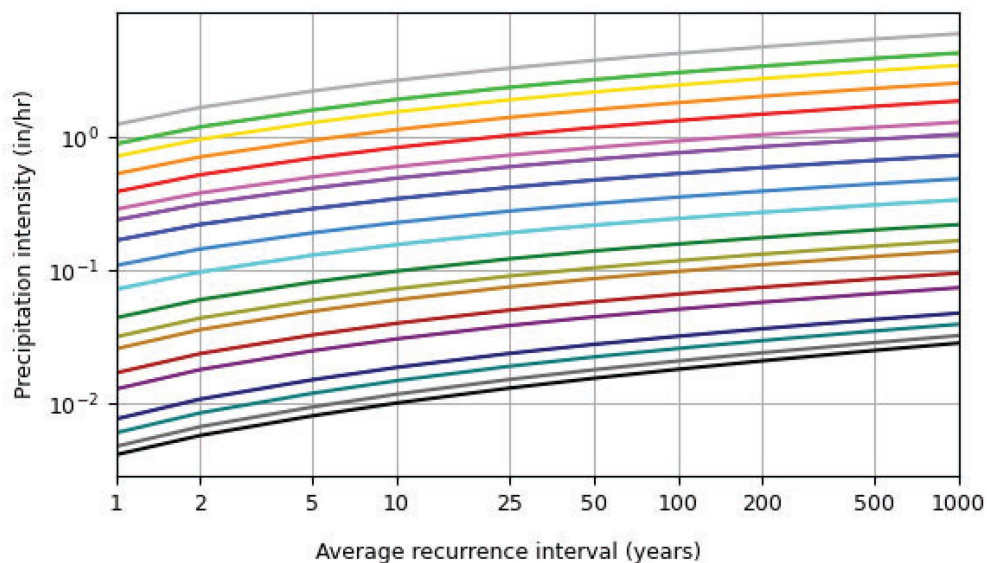
PF graphical

PDS-based intensity-duration-frequency (IDF) curves

Latitude: 33.9597°, Longitude: -117.5745°



Average recurrence interval (years)
1
2
5
10
25
50
100
200
500
1000



Duration
5-min
10-min
15-min
30-min
60-min
2-hr
3-hr
6-hr
12-hr
24-hr
2-day
3-day
4-day
7-day
10-day
20-day
30-day
45-day
60-day

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Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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NOAA Atlas 14, Volume 6, Version 2
Location name: Eastvale, California, USA*
Latitude: 33.9597°, Longitude: -117.5745°
Elevation: 611 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 & aerals](#)

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	0.104 (0.087-0.126)	0.140 (0.116-0.169)	0.186 (0.155-0.226)	0.224 (0.185-0.275)	0.276 (0.220-0.350)	0.316 (0.246-0.410)	0.357 (0.271-0.475)	0.399 (0.294-0.547)	0.457 (0.323-0.654)	0.502 (0.342-0.744)
10-min	0.149 (0.124-0.180)	0.200 (0.167-0.242)	0.267 (0.222-0.324)	0.322 (0.265-0.394)	0.396 (0.315-0.502)	0.453 (0.353-0.588)	0.512 (0.389-0.681)	0.572 (0.422-0.784)	0.655 (0.462-0.937)	0.719 (0.490-1.07)
15-min	0.180 (0.151-0.218)	0.242 (0.202-0.293)	0.323 (0.269-0.392)	0.389 (0.321-0.476)	0.479 (0.381-0.607)	0.548 (0.427-0.711)	0.619 (0.470-0.823)	0.692 (0.510-0.948)	0.792 (0.559-1.13)	0.870 (0.592-1.29)
30-min	0.266 (0.222-0.321)	0.357 (0.298-0.432)	0.476 (0.396-0.578)	0.573 (0.473-0.702)	0.706 (0.562-0.895)	0.808 (0.630-1.05)	0.912 (0.693-1.21)	1.02 (0.752-1.40)	1.17 (0.824-1.67)	1.28 (0.873-1.90)
60-min	0.390 (0.326-0.471)	0.524 (0.437-0.634)	0.699 (0.581-0.848)	0.841 (0.694-1.03)	1.04 (0.825-1.31)	1.19 (0.924-1.54)	1.34 (1.02-1.78)	1.50 (1.10-2.05)	1.71 (1.21-2.45)	1.88 (1.28-2.79)
2-hr	0.577 (0.482-0.698)	0.765 (0.638-0.926)	1.01 (0.839-1.22)	1.20 (0.994-1.48)	1.47 (1.17-1.87)	1.68 (1.30-2.17)	1.88 (1.43-2.50)	2.09 (1.54-2.87)	2.38 (1.68-3.41)	2.60 (1.77-3.86)
3-hr	0.719 (0.600-0.869)	0.948 (0.791-1.15)	1.24 (1.04-1.51)	1.48 (1.22-1.82)	1.81 (1.44-2.29)	2.05 (1.60-2.66)	2.30 (1.75-3.06)	2.56 (1.89-3.51)	2.90 (2.05-4.16)	3.17 (2.16-4.70)
6-hr	1.01 (0.843-1.22)	1.33 (1.11-1.61)	1.74 (1.45-2.12)	2.08 (1.71-2.54)	2.52 (2.01-3.20)	2.86 (2.23-3.71)	3.20 (2.43-4.26)	3.56 (2.62-4.87)	4.03 (2.84-5.76)	4.39 (2.99-6.52)
12-hr	1.31 (1.10-1.59)	1.75 (1.46-2.12)	2.31 (1.92-2.81)	2.76 (2.28-3.38)	3.37 (2.68-4.27)	3.83 (2.98-4.96)	4.29 (3.26-5.70)	4.76 (3.51-6.52)	5.40 (3.81-7.72)	5.88 (4.01-8.73)
24-hr	1.73 (1.53-2.00)	2.34 (2.07-2.70)	3.13 (2.76-3.62)	3.76 (3.29-4.39)	4.61 (3.90-5.56)	5.26 (4.36-6.47)	5.91 (4.78-7.44)	6.57 (5.18-8.51)	7.46 (5.65-10.1)	8.15 (5.96-11.4)
2-day	2.12 (1.87-2.44)	2.90 (2.56-3.35)	3.92 (3.46-4.54)	4.75 (4.15-5.54)	5.87 (4.97-7.07)	6.73 (5.58-8.28)	7.60 (6.15-9.57)	8.49 (6.69-11.0)	9.70 (7.34-13.1)	10.6 (7.78-14.8)
3-day	2.28 (2.02-2.63)	3.16 (2.79-3.65)	4.32 (3.80-5.00)	5.26 (4.60-6.13)	6.53 (5.53-7.88)	7.52 (6.24-9.25)	8.52 (6.90-10.7)	9.56 (7.54-12.4)	11.0 (8.30-14.8)	12.1 (8.84-16.8)
4-day	2.48 (2.19-2.86)	3.45 (3.05-3.98)	4.74 (4.17-5.48)	5.78 (5.06-6.75)	7.22 (6.11-8.70)	8.33 (6.91-10.2)	9.46 (7.66-11.9)	10.6 (8.38-13.8)	12.2 (9.26-16.5)	13.5 (9.87-18.8)
7-day	2.85 (2.52-3.29)	3.99 (3.53-4.61)	5.50 (4.85-6.37)	6.75 (5.90-7.87)	8.46 (7.16-10.2)	9.79 (8.12-12.0)	11.2 (9.03-14.1)	12.6 (9.91-16.3)	14.5 (11.0-19.6)	16.0 (11.7-22.4)
10-day	3.08 (2.73-3.56)	4.32 (3.82-4.99)	5.98 (5.27-6.92)	7.35 (6.43-8.58)	9.25 (7.83-11.2)	10.7 (8.91-13.2)	12.3 (9.94-15.5)	13.9 (10.9-18.0)	16.1 (12.2-21.7)	17.8 (13.0-24.9)
20-day	3.67 (3.25-4.24)	5.19 (4.58-5.99)	7.24 (6.39-8.39)	8.98 (7.85-10.5)	11.4 (9.66-13.8)	13.4 (11.1-16.4)	15.4 (12.5-19.4)	17.5 (13.8-22.7)	20.6 (15.6-27.7)	23.0 (16.8-32.0)
30-day	4.34 (3.84-5.00)	6.13 (5.42-7.08)	8.61 (7.59-9.97)	10.7 (9.37-12.5)	13.7 (11.6-16.5)	16.1 (13.4-19.9)	18.7 (15.1-23.6)	21.4 (16.9-27.8)	25.3 (19.2-34.1)	28.5 (20.8-39.7)
45-day	5.14 (4.55-5.93)	7.24 (6.40-8.36)	10.2 (8.97-11.8)	12.7 (11.1-14.8)	16.4 (13.9-19.7)	19.4 (16.1-23.8)	22.6 (18.3-28.4)	26.0 (20.5-33.7)	31.0 (23.5-41.8)	35.1 (25.7-48.9)
60-day	5.94 (5.26-6.85)	8.30 (7.34-9.59)	11.6 (10.3-13.5)	14.6 (12.7-17.0)	18.8 (15.9-22.7)	22.3 (18.5-27.4)	26.1 (21.1-32.8)	30.2 (23.8-39.1)	36.1 (27.3-48.7)	41.0 (30.0-57.2)

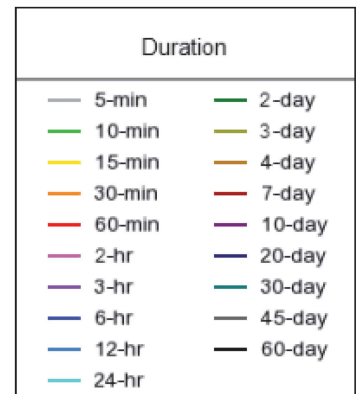
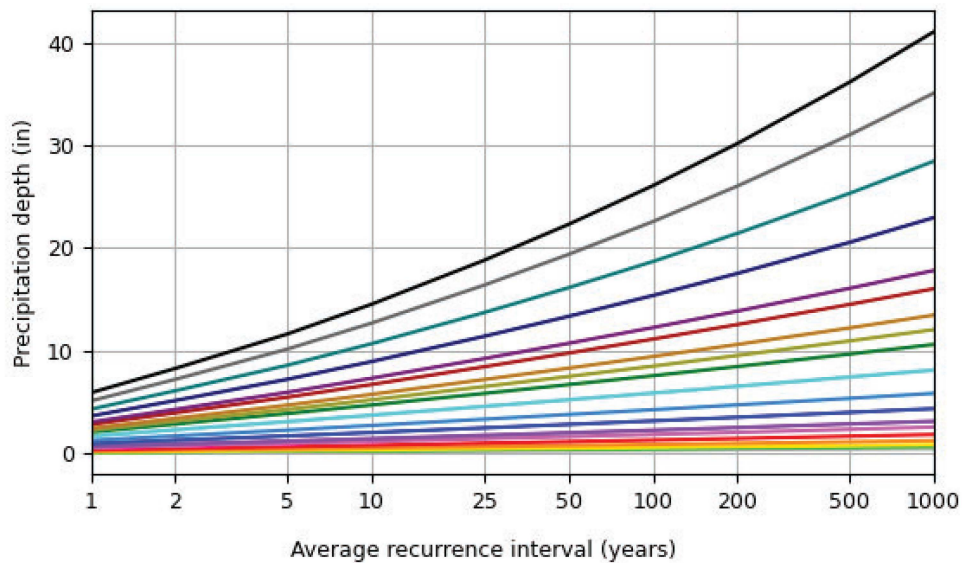
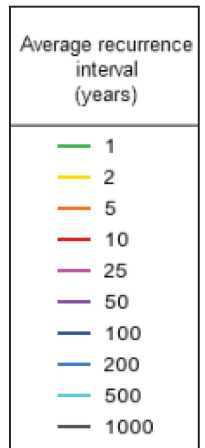
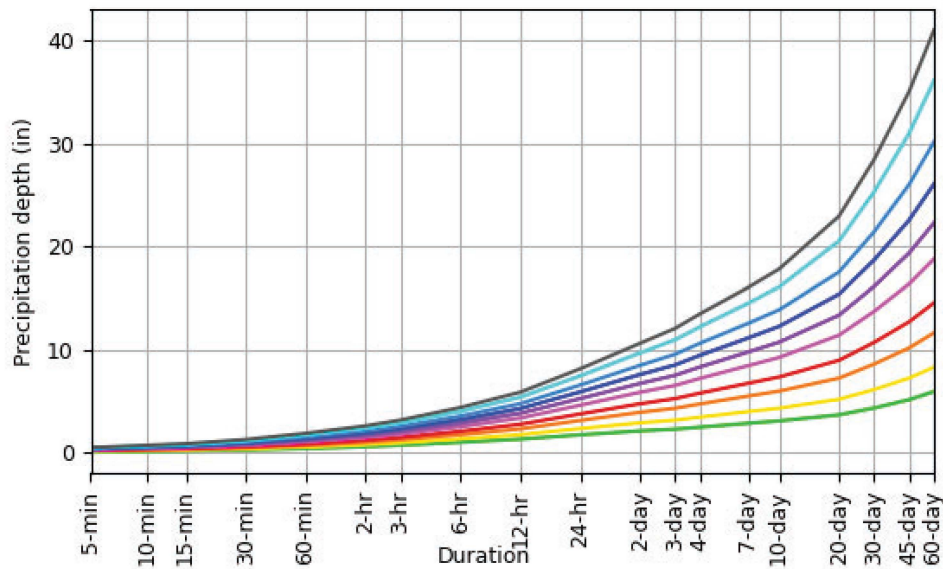
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
 Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and 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.

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PF graphical

PDS-based depth-duration-frequency (DDF) curves

Latitude: 33.9597°, Longitude: -117.5745°



NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Wed Jan 15 22:13:23 2025

[Back to Top](#)**Maps & aerials**

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



[Back to Top](#)

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[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

[Disclaimer](#)

**Preliminary Hydrology Study
City of Eastvale, County of Riverside**

USDA Soil Map

Soil Map—Western Riverside Area, California
(STRA-006 SOIL MAP)



Soil Map—Western Riverside Area, California
(STRA-006 SOIL MAP)

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 1:15,800.

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: Western Riverside Area, California

Survey Area Data: Version 13, May 27, 2020

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

Date(s) aerial images were photographed: May 10, 2018—Jun 5, 2018

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
HgA	Hanford fine sandy loam, 0 to 2 percent slopes	0.6	2.5%
HIA	Hilmar loamy very fine sand, 0 to 2 percent slopes	2.5	10.7%
HIC	Hilmar loamy very fine sand, 2 to 8 percent slopes	3.4	15.0%
RaA	Ramona sandy loam, 0 to 2 percent slopes, MLRA 19	8.8	38.5%
RaB2	Ramona sandy loam, 2 to 5 percent slopes, eroded	7.6	33.3%
Totals for Area of Interest		22.9	100.0%

Western Riverside Area, California

RaB2—Ramona sandy loam, 2 to 5 percent slopes, eroded

Map Unit Setting

National map unit symbol: hcy5

Elevation: 250 to 3,500 feet

Mean annual precipitation: 10 to 20 inches

Mean annual air temperature: 63 degrees F

Frost-free period: 230 to 320 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ramona and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ramona

Setting

Landform: Alluvial fans, terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 14 inches: sandy loam

H2 - 14 to 23 inches: fine sandy loam

H3 - 23 to 68 inches: sandy clay loam

H4 - 68 to 74 inches: gravelly sandy loam

Properties and qualities

Slope: 2 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 1 percent

Available water capacity: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: R019XD029CA

Hydric soil rating: No

Minor Components

Greenfield

Percent of map unit: 4 percent

Hydric soil rating: No

Arlington

Percent of map unit: 4 percent

Hydric soil rating: No

Hanford

Percent of map unit: 4 percent

Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent

Hydric soil rating: No

Data Source Information

Soil Survey Area: Western Riverside Area, California

Survey Area Data: Version 13, May 27, 2020

Western Riverside Area, California

HIA—Hilmar loamy very fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hcw9

Elevation: 10 to 20 feet

Mean annual precipitation: 8 to 15 inches

Mean annual air temperature: 61 to 63 degrees F

Frost-free period: 250 to 260 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hilmar and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hilmar

Setting

Landform: Alluvial fans

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 16 inches: loamy fine sand

H2 - 16 to 72 inches: loamy fine sand, loamy sand

H2 - 16 to 72 inches:

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum content: 5 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 50.0

Available water capacity: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: A

Ecological site: R019XD035CA
Hydric soil rating: No

Minor Components

Delhi

Percent of map unit: 5 percent
Hydric soil rating: No

Chino

Percent of map unit: 5 percent
Hydric soil rating: No

Tujunga

Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 13, May 27, 2020

Western Riverside Area, California

RaA—Ramona sandy loam, 0 to 2 percent slopes, MLRA 19

Map Unit Setting

National map unit symbol: 2x52z

Elevation: 370 to 2,620 feet

Mean annual precipitation: 9 to 17 inches

Mean annual air temperature: 64 to 65 degrees F

Frost-free period: 260 to 340 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ramona and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ramona

Setting

Landform: Terraces, alluvial fans

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

A - 0 to 20 inches: sandy loam

Bt - 20 to 60 inches: sandy clay loam

C - 60 to 74 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2s

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: B

Ecological site: R019XD029CA

Hydric soil rating: No

Minor Components

Greenfield

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

Hanford

Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Tujunga

Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Placentia

Percent of map unit: 1 percent
Landform: Alluvial fans, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

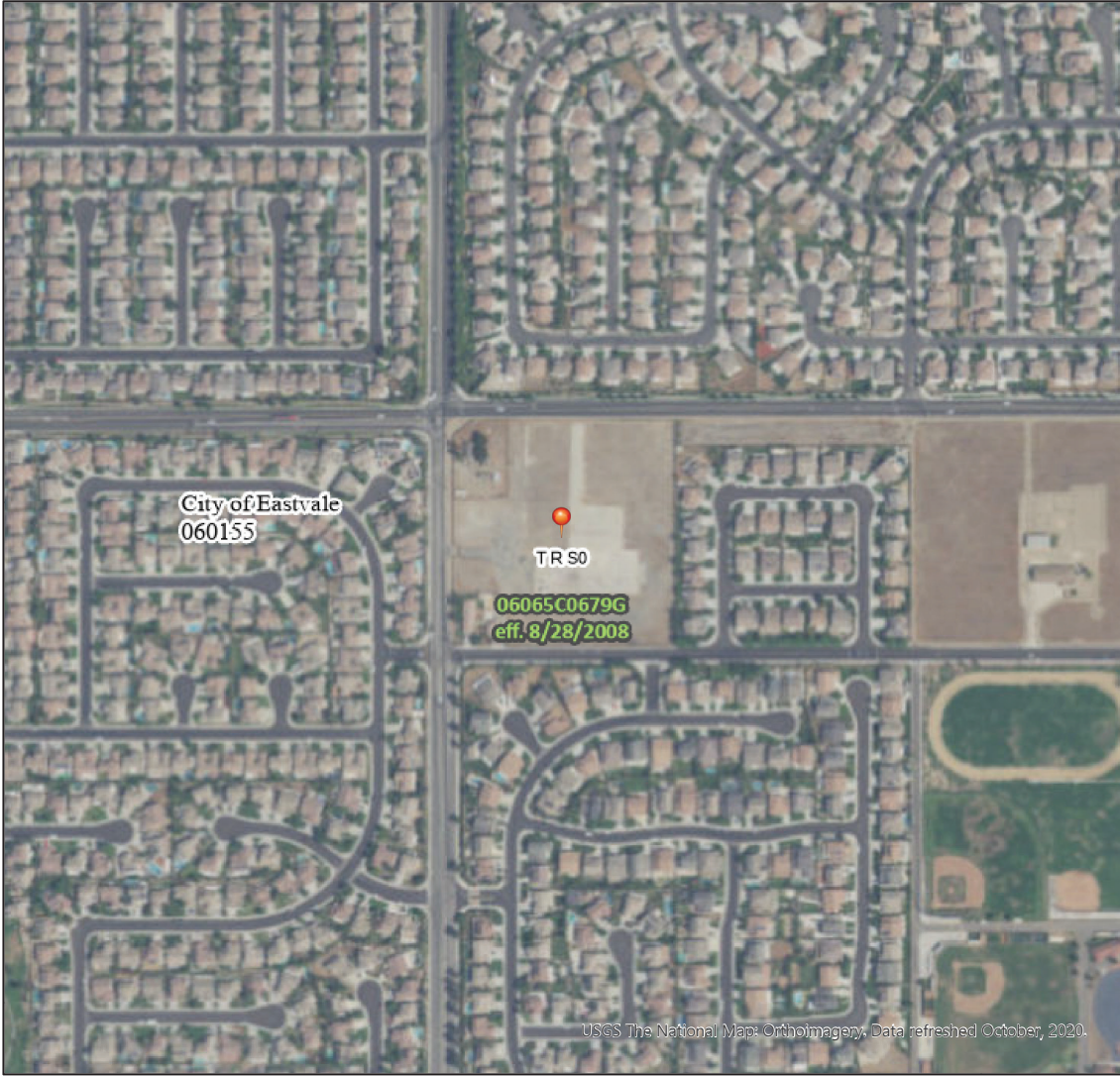
Data Source Information

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 13, May 27, 2020

FEMA Flood Map

National Flood Hazard Layer FIRMette

117°34'47"W 33°57'51"N



USGS The National Map Orthoimagery, Data refreshed October, 2020. 117°34'10"W 33°57'21"N

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
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual Chance
MAP PANELS		Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped
		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 10/20/2020 at 5:05 PM 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.

APPENDIX E

Retention Routing Analysis

RETENTION/ INFILTRATION CALCULATIONS

Drywell System Calculations:

Maxwell Plus Drywell Systems Parameters

20-ft depth setting chamber at 4-ft diameter

40-ft depth Drywell at 6-ft diameter including a 20-ft chamber at 4-ft diameter

Volume of the Drywell System

$$V_{Chamber} = \pi r^2 h = \pi (2)^2 (40) = 502.6 \text{ cf}$$

$$V_{Drywell} = \pi r^2 h \times 0.40 \text{ void ratio} = \pi (3)^2 (20) \times .40 = 226.2 \text{ cf}$$

$$\Sigma V_{static} = V_{Chamber} + V_{Drywell} = 728.8 \text{ cf}$$

Surface Area of Drywell System

(Infiltration occurs between 10-ft and 40-ft for Drywell assuming 10-ft slurry)

$$Surface \text{ Area}_{(Drywell)} = 2\pi r h + \pi r^2 = 2\pi (3) \times (30) + \pi (3)^2 = 593.8 \text{ sf}$$

Retention Perforated Pipe Trench Calculations:

Retention Trench System Parameters

60-in diameter perforated HDPE retention pipe

810 linear feet pipe length

7-ft trench width and height

0.40 gravel void ratio

Volume of the Retention Pipe Trench

$$V_{Pipe} = \pi r^2 h = \pi (2.5)^2 (810) = 15,900.3 \text{ cf}$$

$$V_{Trench} = ((7 \times 7) - \pi (2.5)^2) \times 0.40 = 9,515.9 \text{ cf}$$

$$V_{System} = 15,900.3 + 9,515.9 = 25,416.2 \text{ cf}$$

Surface Area of Retention Trench

(Assume bottom of trench as infiltration surface)

$$Surface \text{ Area}_{(Trench)} = 810 \times 7 = 5,670 \text{ sqft}$$

DMA – A

Design Parameter

DCV: 18,927.6 cuft

Number of Drywell System: 5

K_{DESIGN} (design infiltration rate) = 3.5 in/hr

Retention/Infiltration System Calculations

$$V_{\text{Drywell}} = 5 \text{ unit} \times 728.8 \text{ cf} = 3,644.0 \text{ cf}$$

$$\Sigma V_{\text{static}} = V_{\text{Drywell}} + V_{\text{Retention}} = 3,644.0 \text{ cf} + 25,416.2 \text{ cf} = 29,060.2 \text{ cf}$$

$$\Sigma \text{Surface Area} = 5 \text{ unit} \times 593.8 \text{ sf} + 5670 \text{ sf} = 9,314.0 \text{ sf}$$

$$V_{\text{infiltration-24hrs}} = \left(\frac{1 \text{ ft}}{12 \text{ in}} \right) \times \left(\frac{3.5 \text{ in}}{\text{hr}} \right) \times (9,314.0 \text{ sf}) \times (24 \text{ hr}) = 60,471.6 \text{ cf} > 18,927.6 \text{ cf}$$

$$Q_{\text{infiltration}} = \left(\frac{1 \text{ ft}}{12 \text{ in}} \right) \times \left(\frac{3.5 \text{ in}}{\text{hr}} \right) \times \left(\frac{\text{hr}}{60 \text{ min}} \right) \times \left(\frac{\text{min}}{60 \text{ sec}} \right) \times (9,314.0 \text{ sf}) = 0.70 \text{ cfs}$$

SUMMARY:

(DMA)	Required DCV	Total Provided Volume	Treatment Volume 24-hour	Infiltrated flowrate
A	18,927.6 cuft	29,060.2 cuft	60,471.6 cuft	0.70 cfs

The proposed underground retention system provides the sufficient storage and infiltration surface for the design capture volume to be infiltrated within a 24-hour drawdown duration.

Hydraulic Analysis Report

Project Data

Project Title: STRA-008 Retention Routing

Designer: C&V Consulting, Inc.

Project Date: Wednesday, January 15, 2025

Project Units: U.S. Customary Units

Notes: Federal Highway Administration. Hydraulic Toolbox 5.3.0.0.

Detention Basin Analysis: 100-YR, 24-HR Storm Routing

Notes:

Storage Input Parameters

Storage Capacity: Known volume

Elevation ft	Volume acre-ft
0.00	0.00
1.00	0.00
30.00	0.11
31.00	0.20
32.00	0.30
33.00	0.41
34.00	0.52
35.00	0.60
36.00	0.66
37.00	0.66
38.00	0.66
39.00	0.67
40.00	0.67

Discharge Input Parameters

Known Discharge: Infiltration

Discharge cfs

0.00	0.00
1.00	0.00
30.00	0.70
31.00	0.70
32.00	0.70
33.00	0.70

34.00	0.70
35.00	0.70
36.00	0.70
37.00	0.70
38.00	0.70
39.00	0.70
40.00	0.70

Riser: Mitigated Pipe

Circular Opening

Opening Diameter: 1.0000 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 32.5000 ft

Base Elevation: 0.0000 ft

Riser: Overflow

Circular Opening

Opening Diameter: 1.5000 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 34.0000 ft

Base Elevation: 0.0000 ft

Storage & Discharge Input Parameters

Elevation - Storage - Discharge

Elevation ft	Storage acre-ft	Discharge cfs
0.00	0.00	0.00
1.00	0.00	0.00
30.00	0.11	0.70
31.00	0.20	0.70
32.00	0.30	0.70
33.00	0.41	1.40
34.00	0.52	4.48
35.00	0.60	8.27
36.00	0.66	16.76
37.00	0.66	21.03
38.00	0.66	24.50

39.00	0.67	27.50
40.00	0.67	30.20

Detention Basin Input Parameters

Inflow Hydrograph

Peak Inflow Discharge: 5.760 cfs, Time to Peak: 810.00 (min), Total Inflow Volume: 138025.50 ft³

Time (min)	Discharge cfs
5.00	0.17
10.00	0.27
15.00	0.27
20.00	0.35
25.00	0.40
30.00	0.40
35.00	0.40
40.00	0.40
45.00	0.40
50.00	0.48
55.00	0.53
60.00	0.53
65.00	0.45
70.00	0.40
75.00	0.40
80.00	0.40
85.00	0.40
90.00	0.40
95.00	0.40
100.00	0.40
105.00	0.40
110.00	0.48
115.00	0.53
120.00	0.53
125.00	0.53
130.00	0.53
135.00	0.53
140.00	0.53
145.00	0.53
150.00	0.53
155.00	0.62
160.00	0.66
165.00	0.66
170.00	0.66
175.00	0.66
180.00	0.66
185.00	0.66
190.00	0.66
195.00	0.66

200.00	0.66
205.00	0.66
210.00	0.66
215.00	0.66
220.00	0.66
225.00	0.66
230.00	0.75
235.00	0.80
240.00	0.80
245.00	0.80
250.00	0.80
255.00	0.80
260.00	0.88
265.00	0.93
270.00	0.93
275.00	0.93
280.00	0.93
285.00	0.93
290.00	1.02
295.00	1.06
300.00	1.06
305.00	0.89
310.00	0.80
315.00	0.80
320.00	0.88
325.00	0.93
330.00	0.93
335.00	1.02
340.00	1.06
345.00	1.06
350.00	1.06
355.00	1.06
360.00	1.06
365.00	1.15
370.00	1.20
375.00	1.20
380.00	1.20
385.00	1.20
390.00	1.20
395.00	1.28
400.00	1.33
405.00	1.33
410.00	1.33
415.00	1.33
420.00	1.33
425.00	1.33
430.00	1.33
435.00	1.33
440.00	1.42
445.00	1.47

450.00	1.47
455.00	1.59
460.00	1.66
465.00	1.66
470.00	1.78
475.00	1.85
480.00	1.85
485.00	2.08
490.00	2.21
495.00	2.21
500.00	2.22
505.00	2.22
510.00	2.22
515.00	2.34
520.00	2.40
525.00	2.41
530.00	2.52
535.00	2.59
540.00	2.59
545.00	2.83
550.00	2.96
555.00	2.96
560.00	3.08
565.00	3.14
570.00	3.15
575.00	3.26
580.00	3.33
585.00	3.33
590.00	3.45
595.00	3.52
600.00	3.52
605.00	2.71
610.00	2.26
615.00	2.27
620.00	2.27
625.00	2.27
630.00	2.27
635.00	2.85
640.00	3.17
645.00	3.18
650.00	3.18
655.00	3.18
660.00	3.18
665.00	3.07
670.00	3.01
675.00	3.01
680.00	3.01
685.00	3.01
690.00	3.02
695.00	2.79

700.00	2.66
705.00	2.66
710.00	2.78
715.00	2.85
720.00	2.85
725.00	3.66
730.00	4.11
735.00	4.11
740.00	4.23
745.00	4.29
750.00	4.30
755.00	4.53
760.00	4.66
765.00	4.66
770.00	4.78
775.00	4.85
780.00	4.85
785.00	5.43
790.00	5.75
795.00	5.75
800.00	5.75
805.00	5.75
810.00	5.76
815.00	4.49
820.00	3.78
825.00	3.79
830.00	3.79
835.00	3.79
840.00	3.79
845.00	4.25
850.00	4.51
855.00	4.51
860.00	4.40
865.00	4.34
870.00	4.34
875.00	4.34
880.00	4.34
885.00	4.35
890.00	4.23
895.00	4.17
900.00	4.17
905.00	4.06
910.00	3.99
915.00	4.00
920.00	3.88
925.00	3.82
930.00	3.82
935.00	3.36
940.00	3.10
945.00	3.11

950.00	3.11
955.00	3.11
960.00	3.11
965.00	1.46
970.00	0.53
975.00	0.53
980.00	0.53
985.00	0.53
990.00	0.53
995.00	0.45
1000.00	0.40
1005.00	0.40
1010.00	0.40
1015.00	0.40
1020.00	0.40
1025.00	0.57
1030.00	0.66
1035.00	0.66
1040.00	0.66
1045.00	0.66
1050.00	0.66
1055.00	0.66
1060.00	0.66
1065.00	0.66
1070.00	0.58
1075.00	0.53
1080.00	0.53
1085.00	0.53
1090.00	0.53
1095.00	0.53
1100.00	0.53
1105.00	0.53
1110.00	0.53
1115.00	0.45
1120.00	0.40
1125.00	0.40
1130.00	0.31
1135.00	0.27
1140.00	0.27
1145.00	0.35
1150.00	0.40
1155.00	0.40
1160.00	0.48
1165.00	0.53
1170.00	0.53
1175.00	0.45
1180.00	0.40
1185.00	0.40
1190.00	0.31
1195.00	0.27

1200.00	0.27
1205.00	0.35
1210.00	0.40
1215.00	0.40
1220.00	0.40
1225.00	0.40
1230.00	0.40
1235.00	0.40
1240.00	0.40
1245.00	0.40
1250.00	0.31
1255.00	0.27
1260.00	0.27
1265.00	0.35
1270.00	0.40
1275.00	0.40
1280.00	0.31
1285.00	0.27
1290.00	0.27
1295.00	0.35
1300.00	0.40
1305.00	0.40
1310.00	0.31
1315.00	0.27
1320.00	0.27
1325.00	0.35
1330.00	0.40
1335.00	0.40
1340.00	0.31
1345.00	0.27
1350.00	0.27
1355.00	0.27
1360.00	0.27
1365.00	0.27
1370.00	0.27
1375.00	0.27
1380.00	0.27
1385.00	0.27
1390.00	0.27
1395.00	0.27
1400.00	0.27
1405.00	0.27
1410.00	0.27
1415.00	0.27
1420.00	0.27
1425.00	0.27
1430.00	0.27
1435.00	0.27
1440.00	0.27
1445.00	0.10

Initial Storage = 0.0000 acre-ft

Detention Basin Result Parameters

Routed Hydrograph

Peak Outflow Discharge: 5.492 cfs, Time to Peak: 810.00 (min), Total Outflow Volume: 137929.53 ft³

Time min	Discharge cfs	Storage acre-ft
0.00	0.00	0.000000
10.00	0.00	0.001859
15.00	0.01	0.003666
20.00	0.02	0.005936
25.00	0.04	0.008447
30.00	0.05	0.010854
35.00	0.07	0.013160
40.00	0.08	0.015370
45.00	0.09	0.017486
50.00	0.11	0.020054
55.00	0.12	0.022851
60.00	0.14	0.025531
65.00	0.16	0.027560
70.00	0.17	0.029166
75.00	0.18	0.030705
80.00	0.19	0.032180
85.00	0.19	0.033593
90.00	0.20	0.034946
95.00	0.21	0.036243
100.00	0.22	0.037486
105.00	0.23	0.038677
110.00	0.24	0.040357
115.00	0.25	0.042304
120.00	0.26	0.044169
125.00	0.27	0.045956
130.00	0.28	0.047669
135.00	0.29	0.049310
140.00	0.30	0.050882
145.00	0.31	0.052388
150.00	0.32	0.053831
155.00	0.33	0.055820
160.00	0.34	0.057996
165.00	0.36	0.060081
170.00	0.37	0.062078
175.00	0.38	0.063992
180.00	0.39	0.065826
185.00	0.40	0.067583
190.00	0.42	0.069266
195.00	0.43	0.070879
200.00	0.44	0.072424

205.00	0.45	0.073904
210.00	0.45	0.075323
215.00	0.46	0.076682
220.00	0.47	0.077984
225.00	0.48	0.079232
230.00	0.49	0.081034
235.00	0.50	0.083098
240.00	0.51	0.085076
245.00	0.52	0.086970
250.00	0.54	0.088785
255.00	0.55	0.090525
260.00	0.56	0.092731
265.00	0.57	0.095181
270.00	0.59	0.097529
275.00	0.60	0.099779
280.00	0.62	0.101934
285.00	0.63	0.103999
290.00	0.64	0.106585
295.00	0.66	0.109332
300.00	0.68	0.111964
305.00	0.69	0.113339
310.00	0.70	0.114280
315.00	0.70	0.114969
320.00	0.70	0.116208
325.00	0.70	0.117792
330.00	0.70	0.119376
335.00	0.70	0.121580
340.00	0.70	0.124060
345.00	0.70	0.126539
350.00	0.70	0.129018
355.00	0.70	0.131498
360.00	0.70	0.133977
365.00	0.70	0.137076
370.00	0.70	0.140520
375.00	0.70	0.143963
380.00	0.70	0.147407
385.00	0.70	0.150850
390.00	0.70	0.154294
395.00	0.70	0.158288
400.00	0.70	0.162627
405.00	0.70	0.166966
410.00	0.70	0.171305
415.00	0.70	0.175643
420.00	0.70	0.179982
425.00	0.70	0.184321
430.00	0.70	0.188660
435.00	0.70	0.192999
440.00	0.70	0.197957
445.00	0.70	0.203260
450.00	0.70	0.208563

455.00	0.70	0.214693
460.00	0.70	0.221304
465.00	0.70	0.227916
470.00	0.70	0.235354
475.00	0.70	0.243274
480.00	0.70	0.251194
485.00	0.70	0.260698
490.00	0.70	0.271098
495.00	0.70	0.281497
500.00	0.70	0.291965
505.00	0.70	0.302434
510.00	0.72	0.312768
515.00	0.79	0.323467
520.00	0.85	0.334111
525.00	0.92	0.344366
530.00	0.99	0.354922
535.00	1.05	0.365496
540.00	1.12	0.375616
545.00	1.19	0.386919
550.00	1.26	0.398613
555.00	1.33	0.409805
560.00	1.44	0.421121
565.00	1.74	0.430729
570.00	2.00	0.438633
575.00	2.22	0.445770
580.00	2.42	0.452031
585.00	2.59	0.457141
590.00	2.74	0.462061
595.00	2.87	0.466513
600.00	2.99	0.470146
605.00	3.02	0.469451
610.00	2.92	0.466137
615.00	2.80	0.462504
620.00	2.70	0.459540
625.00	2.62	0.457122
630.00	2.56	0.455148
635.00	2.56	0.457164
640.00	2.64	0.460811
645.00	2.74	0.463849
650.00	2.82	0.466328
655.00	2.89	0.468351
660.00	2.94	0.470002
665.00	2.97	0.470661
670.00	2.99	0.470824
675.00	2.99	0.470956
680.00	2.99	0.471065
685.00	3.00	0.471153
690.00	3.00	0.471288
695.00	2.98	0.469959
700.00	2.94	0.468062

705.00	2.88	0.466515
710.00	2.85	0.466002
715.00	2.85	0.466021
720.00	2.85	0.466037
725.00	2.92	0.471115
730.00	3.10	0.478073
735.00	3.29	0.483751
740.00	3.45	0.489134
745.00	3.60	0.493902
750.00	3.73	0.497856
755.00	3.85	0.502520
760.00	3.99	0.507139
765.00	4.11	0.510908
770.00	4.22	0.514735
775.00	4.33	0.518294
780.00	4.43	0.521199
785.00	4.59	0.526960
790.00	4.86	0.533102
795.00	5.10	0.537612
800.00	5.27	0.540925
805.00	5.40	0.543358
810.00	5.49	0.545204
815.00	5.39	0.539826
820.00	5.06	0.532304
825.00	4.72	0.525890
830.00	4.48	0.521163
835.00	4.35	0.517306
840.00	4.25	0.514158
845.00	4.21	0.514466
850.00	4.24	0.516344
855.00	4.29	0.517876
860.00	4.32	0.518438
865.00	4.33	0.518522
870.00	4.33	0.518590
875.00	4.33	0.518646
880.00	4.33	0.518691
885.00	4.34	0.518791
890.00	4.33	0.518121
895.00	4.30	0.517200
900.00	4.28	0.516448
905.00	4.25	0.515147
910.00	4.21	0.513647
915.00	4.17	0.512486
920.00	4.13	0.510788
925.00	4.08	0.509028
930.00	4.03	0.507591
935.00	3.95	0.503542
940.00	3.82	0.498612
945.00	3.69	0.494652
950.00	3.58	0.491420

955.00	3.49	0.488783
960.00	3.42	0.486631
965.00	3.21	0.476186
970.00	2.81	0.462315
975.00	2.39	0.449530
980.00	2.04	0.439097
985.00	1.77	0.430583
990.00	1.54	0.423636
995.00	1.39	0.417190
1000.00	1.34	0.410684
1005.00	1.30	0.404457
1010.00	1.27	0.398497
1015.00	1.23	0.392793
1020.00	1.19	0.387334
1025.00	1.16	0.383256
1030.00	1.14	0.379958
1035.00	1.12	0.376803
1040.00	1.10	0.373783
1045.00	1.08	0.370892
1050.00	1.06	0.368126
1055.00	1.04	0.365478
1060.00	1.03	0.362944
1065.00	1.01	0.360519
1070.00	1.00	0.357659
1075.00	0.98	0.354584
1080.00	0.96	0.351642
1085.00	0.94	0.348826
1090.00	0.92	0.346131
1095.00	0.90	0.343551
1100.00	0.89	0.341082
1105.00	0.87	0.338720
1110.00	0.86	0.336458
1115.00	0.84	0.333755
1120.00	0.82	0.330831
1125.00	0.81	0.328032
1130.00	0.79	0.324747
1135.00	0.77	0.321334
1140.00	0.74	0.318066
1145.00	0.73	0.315479
1150.00	0.71	0.313339
1155.00	0.70	0.311273
1160.00	0.70	0.309758
1165.00	0.70	0.308587
1170.00	0.70	0.307416
1175.00	0.70	0.305695
1180.00	0.70	0.303629
1185.00	0.70	0.301562
1190.00	0.70	0.298876
1195.00	0.70	0.295915
1200.00	0.70	0.292954

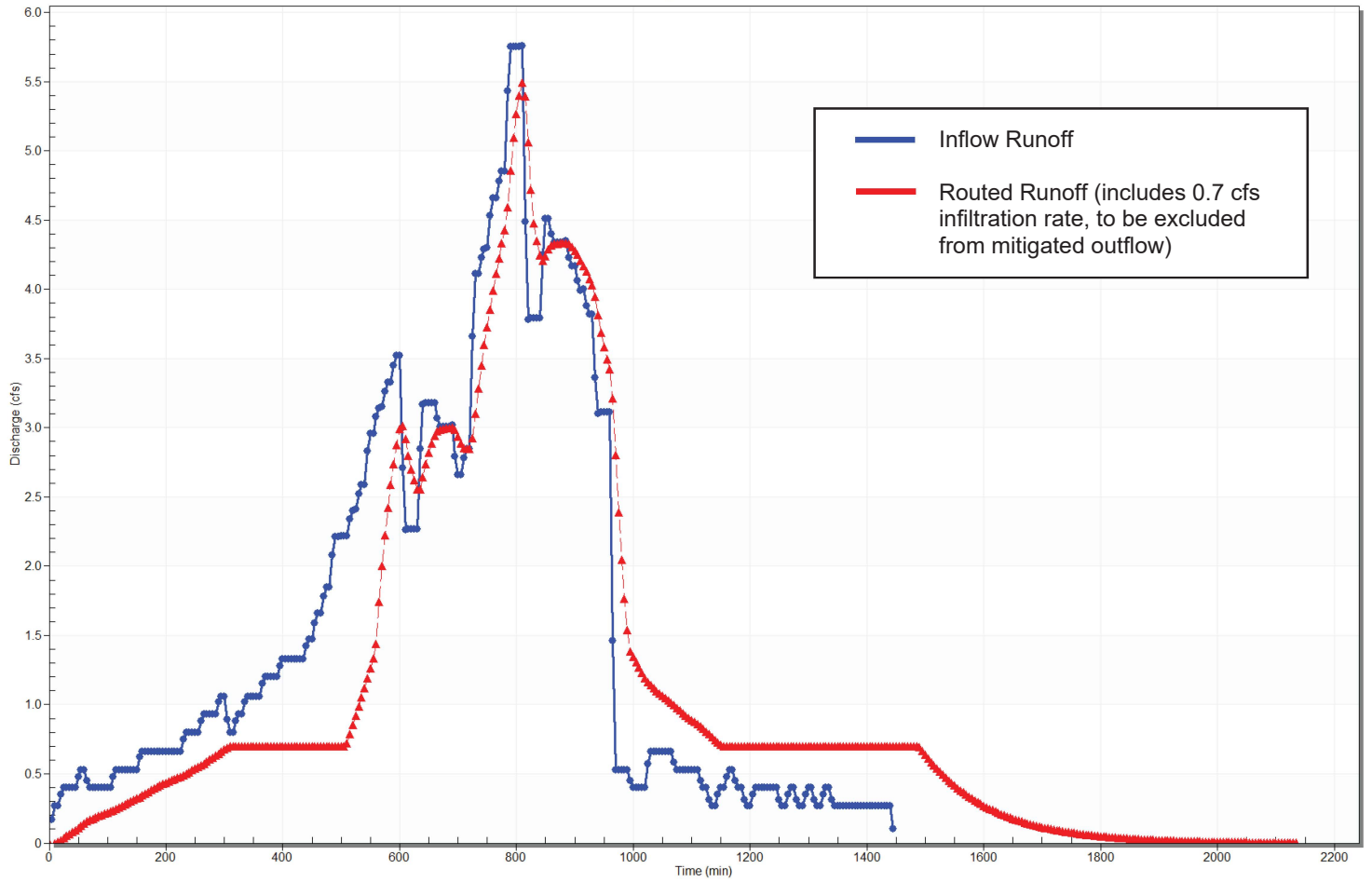
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1225.00	0.70	0.282279
1230.00	0.70	0.280213
1235.00	0.70	0.278147
1240.00	0.70	0.276080
1245.00	0.70	0.274014
1250.00	0.70	0.271328
1255.00	0.70	0.268367
1260.00	0.70	0.265406
1265.00	0.70	0.262995
1270.00	0.70	0.260929
1275.00	0.70	0.258863
1280.00	0.70	0.256177
1285.00	0.70	0.253216
1290.00	0.70	0.250254
1295.00	0.70	0.247844
1300.00	0.70	0.245778
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1315.00	0.70	0.238064
1320.00	0.70	0.235103
1325.00	0.70	0.232692
1330.00	0.70	0.230626
1335.00	0.70	0.228560
1340.00	0.70	0.225874
1345.00	0.70	0.222913
1350.00	0.70	0.219951
1355.00	0.70	0.216990
1360.00	0.70	0.214028
1365.00	0.70	0.211067
1370.00	0.70	0.208106
1375.00	0.70	0.205144
1380.00	0.70	0.202183
1385.00	0.70	0.199221
1390.00	0.70	0.196260
1395.00	0.70	0.193298
1400.00	0.70	0.190337
1405.00	0.70	0.187376
1410.00	0.70	0.184414
1415.00	0.70	0.181453
1420.00	0.70	0.178491
1425.00	0.70	0.175530
1430.00	0.70	0.172568
1435.00	0.70	0.169607
1440.00	0.70	0.166646
1445.00	0.70	0.162513
1450.00	0.70	0.157692

1455.00	0.70	0.152872
1460.00	0.70	0.148051
1465.00	0.70	0.143230
1470.00	0.70	0.138409
1475.00	0.70	0.133588
1480.00	0.70	0.128767
1485.00	0.70	0.123946
1490.00	0.69	0.119171
1495.00	0.66	0.114596
1500.00	0.64	0.110213
1505.00	0.61	0.106013
1510.00	0.58	0.101989
1515.00	0.56	0.098134
1520.00	0.54	0.094440
1525.00	0.51	0.090901
1530.00	0.49	0.087510
1535.00	0.47	0.084261
1540.00	0.45	0.081148
1545.00	0.43	0.078166
1550.00	0.41	0.075308
1555.00	0.40	0.072570
1560.00	0.38	0.069947
1565.00	0.36	0.067434
1570.00	0.35	0.065025
1575.00	0.34	0.062718
1580.00	0.32	0.060507
1585.00	0.31	0.058389
1590.00	0.29	0.056360
1595.00	0.28	0.054416
1600.00	0.27	0.052553
1605.00	0.26	0.050768
1610.00	0.25	0.049058
1615.00	0.24	0.047419
1620.00	0.23	0.045849
1625.00	0.22	0.044345
1630.00	0.21	0.042904
1635.00	0.20	0.041523
1640.00	0.19	0.040200
1645.00	0.18	0.038933
1650.00	0.18	0.037718
1655.00	0.17	0.036555
1660.00	0.16	0.035440
1665.00	0.16	0.034371
1670.00	0.15	0.033348
1675.00	0.14	0.032367
1680.00	0.14	0.031428
1685.00	0.13	0.030528
1690.00	0.13	0.029665
1695.00	0.12	0.028839
1700.00	0.11	0.028047

1705.00	0.11	0.027289
1710.00	0.11	0.026562
1715.00	0.10	0.025865
1720.00	0.10	0.025198
1725.00	0.09	0.024559
1730.00	0.09	0.023946
1735.00	0.09	0.023360
1740.00	0.08	0.022797
1745.00	0.08	0.022259
1750.00	0.07	0.021742
1755.00	0.07	0.021248
1760.00	0.07	0.020774
1765.00	0.07	0.020320
1770.00	0.06	0.019885
1775.00	0.06	0.019468
1780.00	0.06	0.019069
1785.00	0.06	0.018686
1790.00	0.05	0.018320
1795.00	0.05	0.017969
1800.00	0.05	0.017632
1805.00	0.05	0.017310
1810.00	0.04	0.017001
1815.00	0.04	0.016705
1820.00	0.04	0.016421
1825.00	0.04	0.016150
1830.00	0.04	0.015889
1835.00	0.04	0.015640
1840.00	0.03	0.015401
1845.00	0.03	0.015172
1850.00	0.03	0.014953
1855.00	0.03	0.014743
1860.00	0.03	0.014541
1865.00	0.03	0.014348
1870.00	0.03	0.014163
1875.00	0.03	0.013986
1880.00	0.02	0.013817
1885.00	0.02	0.013654
1890.00	0.02	0.013498
1895.00	0.02	0.013349
1900.00	0.02	0.013206
1905.00	0.02	0.013069
1910.00	0.02	0.012938
1915.00	0.02	0.012812
1920.00	0.02	0.012691
1925.00	0.02	0.012576
1930.00	0.02	0.012465
1935.00	0.02	0.012359
1940.00	0.01	0.012258
1945.00	0.01	0.012160
1950.00	0.01	0.012067

1955.00	0.01	0.011978
1960.00	0.01	0.011892
1965.00	0.01	0.011810
1970.00	0.01	0.011732
1975.00	0.01	0.011656
1980.00	0.01	0.011584
1985.00	0.01	0.011515
1990.00	0.01	0.011449
1995.00	0.01	0.011385
2000.00	0.01	0.011325
2005.00	0.01	0.011266
2010.00	0.01	0.011211
2015.00	0.01	0.011157
2020.00	0.01	0.011106
2025.00	0.01	0.011057
2030.00	0.01	0.011010
2035.00	0.01	0.010965
2040.00	0.01	0.010922
2045.00	0.01	0.010880
2050.00	0.01	0.010841
2055.00	0.01	0.010803
2060.00	0.01	0.010766
2065.00	0.01	0.010731
2070.00	0.00	0.010698
2075.00	0.00	0.010666
2080.00	0.00	0.010635
2085.00	0.00	0.010606
2090.00	0.00	0.010578
2095.00	0.00	0.010551
2100.00	0.00	0.010525
2105.00	0.00	0.010500
2110.00	0.00	0.010477
2115.00	0.00	0.010454
2120.00	0.00	0.010432
2125.00	0.00	0.010411
2130.00	0.00	0.010391
2135.00	0.00	0.010372

Routed Hydrographs
100-YR, 24-HR Storm Event



Detention Basin Analysis: 100-YR, 6-HR Storm Routing

Notes:

Storage Input Parameters

Storage Capacity: Known volume

Elevation ft	Volume acre-ft
0.00	0.00
1.00	0.00
30.00	0.11
31.00	0.20
32.00	0.30
33.00	0.41
34.00	0.52
35.00	0.60
36.00	0.66
37.00	0.66
38.00	0.66
39.00	0.67
40.00	0.67

Discharge Input Parameters

Known Discharge: Infiltration

Discharge cfs

0.00	0.00
1.00	0.00
30.00	0.70
31.00	0.70
32.00	0.70
33.00	0.70
34.00	0.70
35.00	0.70
36.00	0.70
37.00	0.70
38.00	0.70
39.00	0.70
40.00	0.70

Riser: Mitigated Pipe

Circular Opening

Opening Diameter: 1.0000 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 32.5000 ft

Base Elevation: 0.0000 ft

Riser: Overflow

Circular Opening

Opening Diameter: 1.5000 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 34.0000 ft

Base Elevation: 0.0000 ft

Storage & Discharge Input Parameters

Elevation - Storage - Discharge

Elevation ft	Storage acre-ft	Discharge cfs
0.00	0.00	0.00
1.00	0.00	0.00
30.00	0.11	0.70
31.00	0.20	0.70
32.00	0.30	0.70
33.00	0.41	1.40
34.00	0.52	4.48
35.00	0.60	8.27
36.00	0.66	16.76
37.00	0.66	21.03
38.00	0.66	24.50
39.00	0.67	27.50
40.00	0.67	30.20

Detention Basin Input Parameters

Inflow Hydrograph

Peak Inflow Discharge: 14.990 cfs, Time to Peak: 330.00 (min), Total Inflow Volume: 78676.50 ft³

Time (min)	Discharge cfs
5.00	0.69
10.00	1.25
15.00	1.34
20.00	1.34
25.00	1.34
30.00	1.53

35.00	1.63
40.00	1.63
45.00	1.63
50.00	1.63
55.00	1.63
60.00	1.82
65.00	1.92
70.00	1.92
75.00	1.92
80.00	1.92
85.00	1.92
90.00	1.92
95.00	1.92
100.00	1.92
105.00	1.92
110.00	1.92
115.00	1.92
120.00	2.11
125.00	2.03
130.00	2.11
135.00	2.21
140.00	2.21
145.00	2.21
150.00	2.21
155.00	2.21
160.00	2.21
165.00	2.40
170.00	2.51
175.00	2.51
180.00	2.51
185.00	2.51
190.00	2.69
195.00	2.80
200.00	2.80
205.00	2.99
210.00	3.28
215.00	3.57
220.00	3.67
225.00	3.86
230.00	3.97
235.00	4.15
240.00	4.26
245.00	4.45
250.00	4.74
255.00	5.03
260.00	5.32
265.00	5.61
270.00	5.72
275.00	5.91
280.00	6.20

285.00	6.49
290.00	6.59
295.00	6.78
300.00	7.07
305.00	8.11
310.00	9.57
315.00	10.66
320.00	11.53
325.00	12.78
330.00	14.99
335.00	9.01
340.00	3.26
345.00	1.65
350.00	1.17
355.00	0.80
360.00	0.51
365.00	0.16

Initial Storage = 0.0000 acre-ft

Detention Basin Result Parameters

Routed Hydrograph

Peak Outflow Discharge: 13.145 cfs, Time to Peak: 330.00 (min), Total Outflow Volume: 78499.80 ft³

Time min	Discharge cfs	Storage acre-ft
0.00	0.00	0.000000
10.00	0.03	0.008417
15.00	0.08	0.017088
20.00	0.13	0.025396
25.00	0.18	0.033357
30.00	0.24	0.042264
35.00	0.29	0.051474
40.00	0.35	0.060297
45.00	0.40	0.068751
50.00	0.45	0.076851
55.00	0.50	0.084612
60.00	0.55	0.093328
65.00	0.61	0.102354
70.00	0.66	0.111002
75.00	0.70	0.119404
80.00	0.70	0.127807
85.00	0.70	0.136209
90.00	0.70	0.144611
95.00	0.70	0.153013
100.00	0.70	0.161415
105.00	0.70	0.169817
110.00	0.70	0.178220
115.00	0.70	0.186622

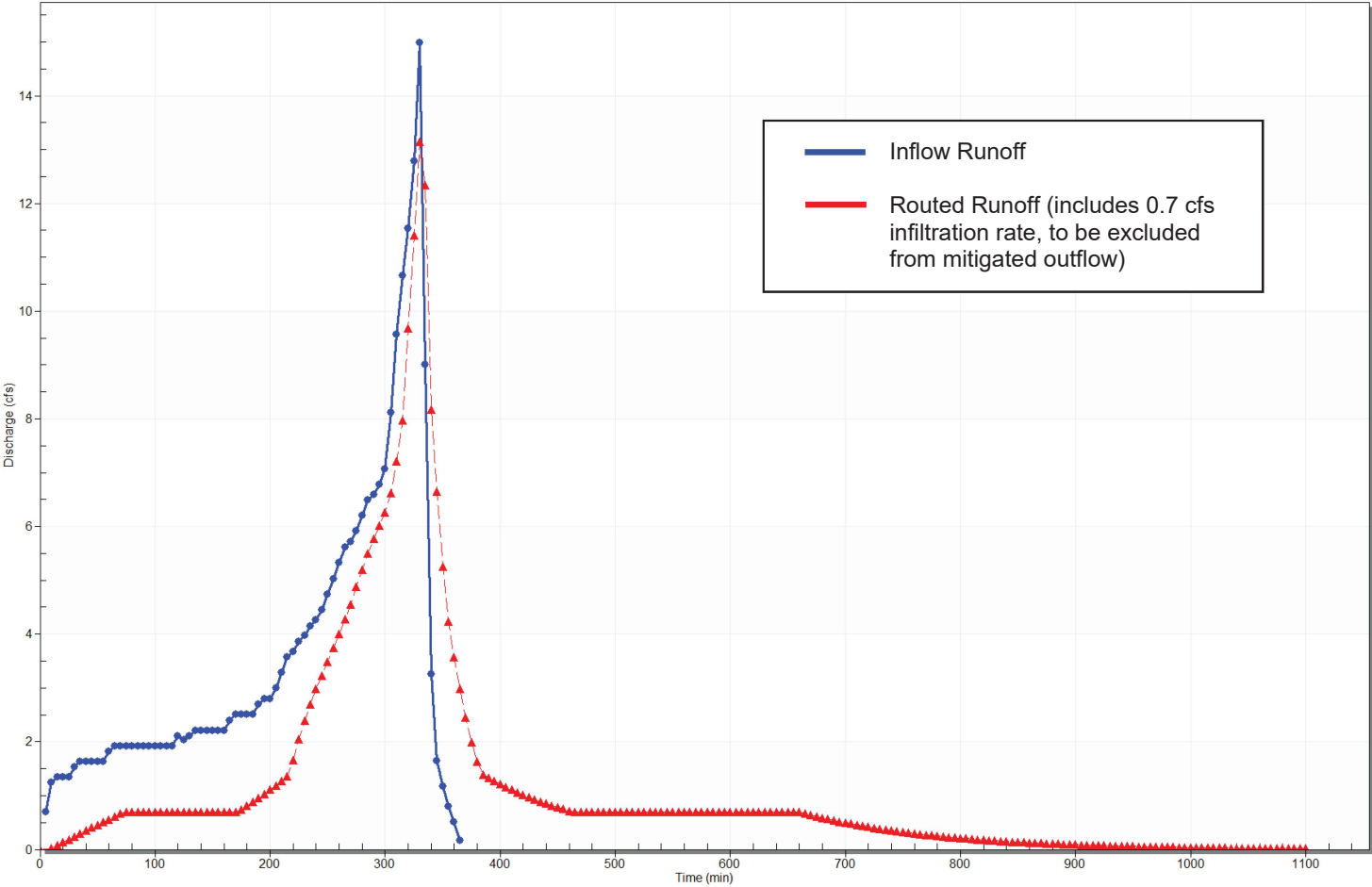
120.00	0.70	0.196332
125.00	0.70	0.205492
130.00	0.70	0.215203
135.00	0.70	0.225602
140.00	0.70	0.236002
145.00	0.70	0.246401
150.00	0.70	0.256801
155.00	0.70	0.267200
160.00	0.70	0.277599
165.00	0.70	0.289307
170.00	0.70	0.301773
175.00	0.73	0.314003
180.00	0.81	0.325708
185.00	0.88	0.336911
190.00	0.96	0.348845
195.00	1.03	0.361009
200.00	1.11	0.372650
205.00	1.19	0.385072
210.00	1.27	0.398915
215.00	1.36	0.414119
220.00	1.66	0.427958
225.00	2.05	0.440439
230.00	2.39	0.451312
235.00	2.70	0.461310
240.00	2.98	0.470156
245.00	3.23	0.478563
250.00	3.48	0.487237
255.00	3.74	0.496128
260.00	4.00	0.505196
265.00	4.27	0.514410
270.00	4.55	0.522474
275.00	4.89	0.529530
280.00	5.20	0.536445
285.00	5.50	0.543255
290.00	5.78	0.548853
295.00	6.02	0.554100
300.00	6.26	0.559684
305.00	6.61	0.569997
310.00	7.20	0.586291
315.00	7.98	0.604767
320.00	9.67	0.617549
325.00	11.41	0.626967
330.00	13.14	0.639674
335.00	12.34	0.630574
340.00	8.17	0.602197
345.00	6.65	0.568075
350.00	5.26	0.539916
355.00	4.23	0.516268
360.00	3.58	0.495157
365.00	2.98	0.475742

370.00	2.45	0.458899
375.00	2.00	0.445155
380.00	1.63	0.433939
385.00	1.38	0.424421
390.00	1.32	0.415312
395.00	1.27	0.406593
400.00	1.21	0.398249
405.00	1.16	0.390263
410.00	1.11	0.382620
415.00	1.06	0.375306
420.00	1.02	0.368305
425.00	0.97	0.361604
430.00	0.93	0.355192
435.00	0.89	0.349055
440.00	0.85	0.343181
445.00	0.82	0.337559
450.00	0.78	0.332179
455.00	0.75	0.327030
460.00	0.72	0.322101
465.00	0.70	0.317280
470.00	0.70	0.312460
475.00	0.70	0.307639
480.00	0.70	0.302818
485.00	0.70	0.297997
490.00	0.70	0.293176
495.00	0.70	0.288355
500.00	0.70	0.283534
505.00	0.70	0.278713
510.00	0.70	0.273892
515.00	0.70	0.269071
520.00	0.70	0.264250
525.00	0.70	0.259429
530.00	0.70	0.254609
535.00	0.70	0.249788
540.00	0.70	0.244967
545.00	0.70	0.240146
550.00	0.70	0.235325
555.00	0.70	0.230504
560.00	0.70	0.225683
565.00	0.70	0.220862
570.00	0.70	0.216041
575.00	0.70	0.211220
580.00	0.70	0.206399
585.00	0.70	0.201578
590.00	0.70	0.196758
595.00	0.70	0.191937
600.00	0.70	0.187116
605.00	0.70	0.182295
610.00	0.70	0.177474
615.00	0.70	0.172653

620.00	0.70	0.167832
625.00	0.70	0.163011
630.00	0.70	0.158190
635.00	0.70	0.153369
640.00	0.70	0.148548
645.00	0.70	0.143727
650.00	0.70	0.138907
655.00	0.70	0.134086
660.00	0.70	0.129279
665.00	0.67	0.124674
670.00	0.64	0.120262
675.00	0.61	0.116034
680.00	0.59	0.111984
685.00	0.56	0.108103
690.00	0.54	0.104385
695.00	0.52	0.100822
700.00	0.50	0.097409
705.00	0.47	0.094138
710.00	0.45	0.091005
715.00	0.44	0.088003
720.00	0.42	0.085126
725.00	0.40	0.082370
730.00	0.38	0.079730
735.00	0.37	0.077200
740.00	0.35	0.074775
745.00	0.34	0.072453
750.00	0.32	0.070228
755.00	0.31	0.068096
760.00	0.30	0.066053
765.00	0.28	0.064096
770.00	0.27	0.062220
775.00	0.26	0.060424
780.00	0.25	0.058702
785.00	0.24	0.057053
790.00	0.23	0.055473
795.00	0.22	0.053959
800.00	0.21	0.052508
805.00	0.20	0.051118
810.00	0.19	0.049786
815.00	0.19	0.048510
820.00	0.18	0.047288
825.00	0.17	0.046116
830.00	0.16	0.044994
835.00	0.16	0.043919
840.00	0.15	0.042889
845.00	0.14	0.041902
850.00	0.14	0.040956
855.00	0.13	0.040050
860.00	0.13	0.039182
865.00	0.12	0.038350

870.00	0.12	0.037553
875.00	0.11	0.036789
880.00	0.11	0.036058
885.00	0.10	0.035357
890.00	0.10	0.034685
895.00	0.09	0.034041
900.00	0.09	0.033425
905.00	0.09	0.032834
910.00	0.08	0.032268
915.00	0.08	0.031726
920.00	0.08	0.031206
925.00	0.07	0.030709
930.00	0.07	0.030232
935.00	0.07	0.029775
940.00	0.06	0.029337
945.00	0.06	0.028917
950.00	0.06	0.028515
955.00	0.06	0.028130
960.00	0.05	0.027761
965.00	0.05	0.027408
970.00	0.05	0.027069
975.00	0.05	0.026744
980.00	0.05	0.026434
985.00	0.04	0.026136
990.00	0.04	0.025850
995.00	0.04	0.025577
1000.00	0.04	0.025315
1005.00	0.04	0.025064
1010.00	0.03	0.024823
1015.00	0.03	0.024593
1020.00	0.03	0.024372
1025.00	0.03	0.024160
1030.00	0.03	0.023957
1035.00	0.03	0.023763
1040.00	0.03	0.023577
1045.00	0.03	0.023399
1050.00	0.02	0.023228
1055.00	0.02	0.023064
1060.00	0.02	0.022908
1065.00	0.02	0.022757
1070.00	0.02	0.022613
1075.00	0.02	0.022475
1080.00	0.02	0.022343
1085.00	0.02	0.022217
1090.00	0.02	0.022095
1095.00	0.02	0.021979
1100.00	0.02	0.021868

Routed Hydrographs
100-YR, 6-HR Storm Event



Detention Basin Analysis: 100-YR, 3-HR Storm Routing

Notes:

Storage Input Parameters

Storage Capacity: Known volume

Elevation ft	Volume acre-ft
0.00	0.00
1.00	0.00
30.00	0.11
31.00	0.20
32.00	0.30
33.00	0.41
34.00	0.52
35.00	0.60
36.00	0.66
37.00	0.66
38.00	0.66
39.00	0.67
40.00	0.67

Discharge Input Parameters

Known Discharge: Infiltration

Discharge cfs

0.00	0.00
1.00	0.00
30.00	0.70
31.00	0.70
32.00	0.70
33.00	0.70
34.00	0.70
35.00	0.70
36.00	0.70
37.00	0.70
38.00	0.70
39.00	0.70
40.00	0.70

Riser: Mitigated Pipe

Circular Opening

Opening Diameter: 1.0000 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 32.5000 ft

Base Elevation: 0.0000 ft

Riser: Overflow

Circular Opening

Opening Diameter: 1.5000 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 34.0000 ft

Base Elevation: 0.0000 ft

Storage & Discharge Input Parameters

Elevation - Storage - Discharge

Elevation ft	Storage acre-ft	Discharge cfs
0.00	0.00	0.00
1.00	0.00	0.00
30.00	0.11	0.70
31.00	0.20	0.70
32.00	0.30	0.70
33.00	0.41	1.40
34.00	0.52	4.48
35.00	0.60	8.27
36.00	0.66	16.76
37.00	0.66	21.03
38.00	0.66	24.50
39.00	0.67	27.50
40.00	0.67	30.20

Detention Basin Input Parameters

Inflow Hydrograph

Peak Inflow Discharge: 16.120 cfs, Time to Peak: 155.00 (min), Total Inflow Volume: 58237.50 ft³

Time (min)	Discharge cfs
5.00	1.48
10.00	2.32
15.00	2.05
20.00	2.43
25.00	2.73
30.00	3.14

35.00	2.96
40.00	3.14
45.00	3.36
50.00	2.96
55.00	2.87
60.00	3.21
65.00	3.90
70.00	4.20
75.00	4.20
80.00	3.93
85.00	4.59
90.00	5.18
95.00	4.85
100.00	5.03
105.00	6.06
110.00	6.24
115.00	5.82
120.00	5.81
125.00	6.02
130.00	7.57
135.00	9.48
140.00	8.06
145.00	11.37
150.00	14.53
155.00	16.12
160.00	13.70
165.00	6.72
170.00	3.51
175.00	3.36
180.00	1.80
185.00	0.33

Initial Storage = 0.0000 acre-ft

Detention Basin Result Parameters

Routed Hydrograph

Peak Outflow Discharge: 14.508 cfs, Time to Peak: 160.00 (min), Total Outflow Volume: 55524.38 ft³

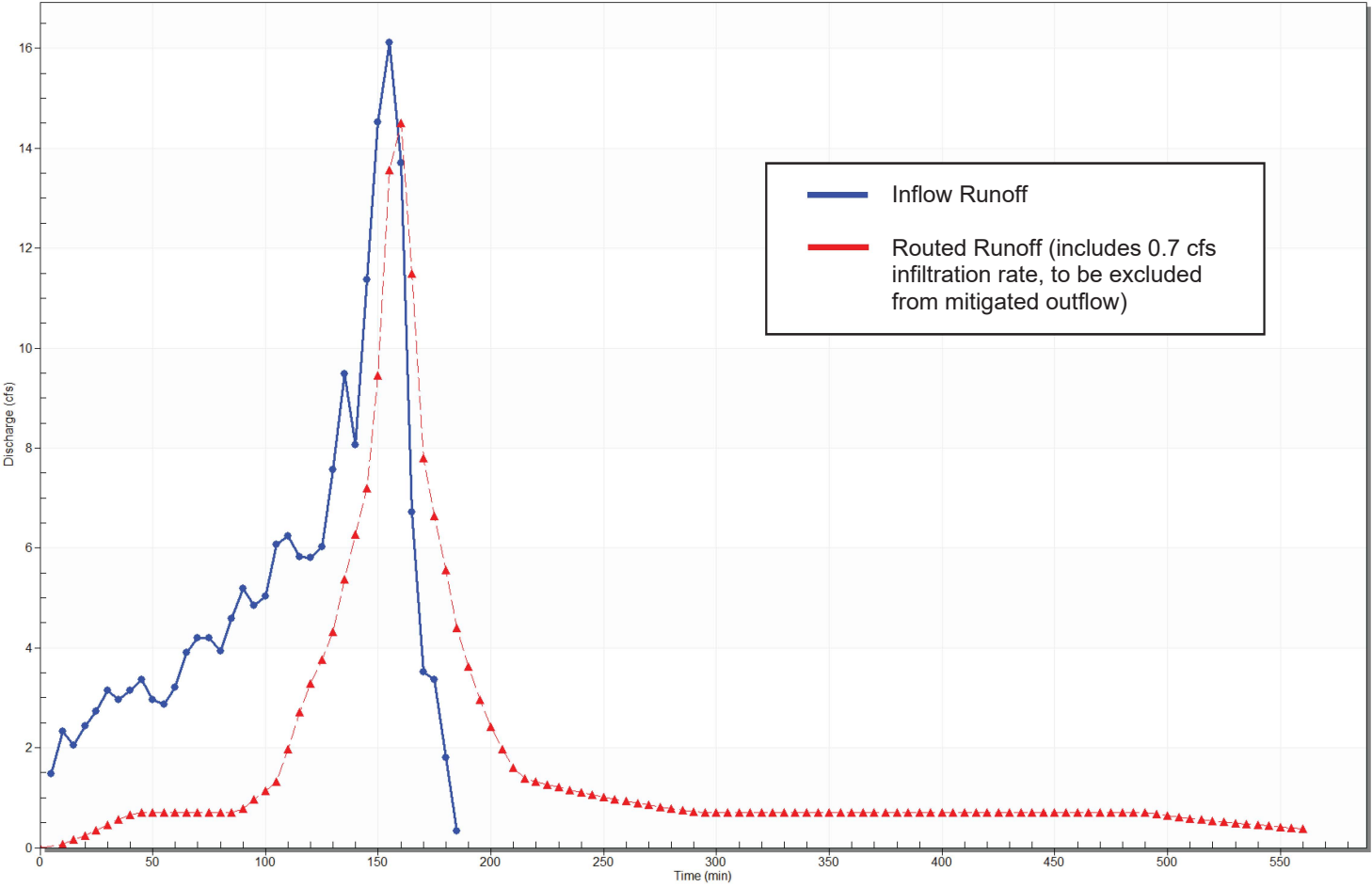
Time min	Discharge cfs	Storage acre-ft
0.00	0.00	0.000000
10.00	0.07	0.015518
15.00	0.16	0.028565
20.00	0.24	0.043628
25.00	0.34	0.060084
30.00	0.45	0.078614
35.00	0.56	0.095155
40.00	0.66	0.112217
45.00	0.70	0.130536

50.00	0.70	0.146101
55.00	0.70	0.161046
60.00	0.70	0.178332
65.00	0.70	0.200371
70.00	0.70	0.224475
75.00	0.70	0.248580
80.00	0.70	0.270825
85.00	0.70	0.297615
90.00	0.78	0.327901
95.00	0.96	0.354662
100.00	1.13	0.381488
105.00	1.32	0.414103
110.00	1.97	0.443516
115.00	2.72	0.464891
120.00	3.29	0.482271
125.00	3.77	0.497766
130.00	4.33	0.520103
135.00	5.37	0.548388
140.00	6.28	0.560680
145.00	7.19	0.589476
150.00	9.45	0.624488
155.00	13.57	0.642082
160.00	14.51	0.644397
165.00	11.50	0.625169
170.00	7.80	0.595616
175.00	6.64	0.573016
180.00	5.56	0.547101
185.00	4.40	0.519050
190.00	3.62	0.494096
195.00	2.96	0.473734
200.00	2.41	0.457118
205.00	1.97	0.443559
210.00	1.61	0.432495
215.00	1.38	0.423006
220.00	1.32	0.413924
225.00	1.26	0.405232
230.00	1.21	0.396913
235.00	1.16	0.388951
240.00	1.11	0.381331
245.00	1.06	0.374039
250.00	1.01	0.367059
255.00	0.97	0.360379
260.00	0.93	0.353986
265.00	0.89	0.347867
270.00	0.85	0.342011
275.00	0.81	0.336407
280.00	0.78	0.331043
285.00	0.75	0.325909
290.00	0.71	0.320996
295.00	0.70	0.316175

300.00	0.70	0.311354
305.00	0.70	0.306533
310.00	0.70	0.301712
315.00	0.70	0.296891
320.00	0.70	0.292070
325.00	0.70	0.287249
330.00	0.70	0.282428
335.00	0.70	0.277608
340.00	0.70	0.272787
345.00	0.70	0.267966
350.00	0.70	0.263145
355.00	0.70	0.258324
360.00	0.70	0.253503
365.00	0.70	0.248682
370.00	0.70	0.243861
375.00	0.70	0.239040
380.00	0.70	0.234219
385.00	0.70	0.229398
390.00	0.70	0.224577
395.00	0.70	0.219757
400.00	0.70	0.214936
405.00	0.70	0.210115
410.00	0.70	0.205294
415.00	0.70	0.200473
420.00	0.70	0.195652
425.00	0.70	0.190831
430.00	0.70	0.186010
435.00	0.70	0.181189
440.00	0.70	0.176368
445.00	0.70	0.171547
450.00	0.70	0.166726
455.00	0.70	0.161906
460.00	0.70	0.157085
465.00	0.70	0.152264
470.00	0.70	0.147443
475.00	0.70	0.142622
480.00	0.70	0.137801
485.00	0.70	0.132980
490.00	0.70	0.128188
495.00	0.67	0.123596
500.00	0.64	0.119196
505.00	0.61	0.114981
510.00	0.59	0.110942
515.00	0.56	0.107073
520.00	0.54	0.103365
525.00	0.52	0.099813
530.00	0.49	0.096409
535.00	0.47	0.093148
540.00	0.45	0.090024
545.00	0.43	0.087031

550.00	0.42	0.084162
555.00	0.40	0.081414
560.00	0.38	0.078782

Routed Hydrographs
100-YR, 3-HR Storm Event



Detention Basin Analysis: 100-YR, 1-HR Storm Routing

Notes:

Storage Input Parameters

Storage Capacity: Known volume

Elevation ft	Volume acre-ft
0.00	0.00
1.00	0.00
30.00	0.11
31.00	0.20
32.00	0.30
33.00	0.41
34.00	0.52
35.00	0.60
36.00	0.66
37.00	0.66
38.00	0.66
39.00	0.67
40.00	0.67

Discharge Input Parameters

Known Discharge: Infiltration

Discharge cfs

0.00	0.00
1.00	0.00
30.00	0.70
31.00	0.70
32.00	0.70
33.00	0.70
34.00	0.70
35.00	0.70
36.00	0.70
37.00	0.70
38.00	0.70
39.00	0.70
40.00	0.70

Riser: Mitigated Pipe

Circular Opening

Opening Diameter: 1.0000 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 32.5000 ft

Base Elevation: 0.0000 ft

Riser: Overflow

Circular Opening

Opening Diameter: 1.5000 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 34.0000 ft

Base Elevation: 0.0000 ft

Storage & Discharge Input Parameters

Elevation - Storage - Discharge

Elevation ft	Storage acre-ft	Discharge cfs
0.00	0.00	0.00
1.00	0.00	0.00
30.00	0.11	0.70
31.00	0.20	0.70
32.00	0.30	0.70
33.00	0.41	1.40
34.00	0.52	4.48
35.00	0.60	8.27
36.00	0.66	16.76
37.00	0.66	21.03
38.00	0.66	24.50
39.00	0.67	27.50
40.00	0.67	30.20

Detention Basin Input Parameters

Inflow Hydrograph

Peak Inflow Discharge: 30.300 cfs, Time to Peak: 50.00 (min), Total Inflow Volume: 34617.00 ft³

Time (min)	Discharge cfs
5.00	2.32
10.00	4.33
15.00	4.88
20.00	5.28
25.00	5.77
30.00	6.73

35.00	7.64
40.00	9.47
45.00	14.34
50.00	30.30
55.00	19.01
60.00	5.72
65.00	1.52

Initial Storage = 0.0000 acre-ft

Detention Basin Result Parameters

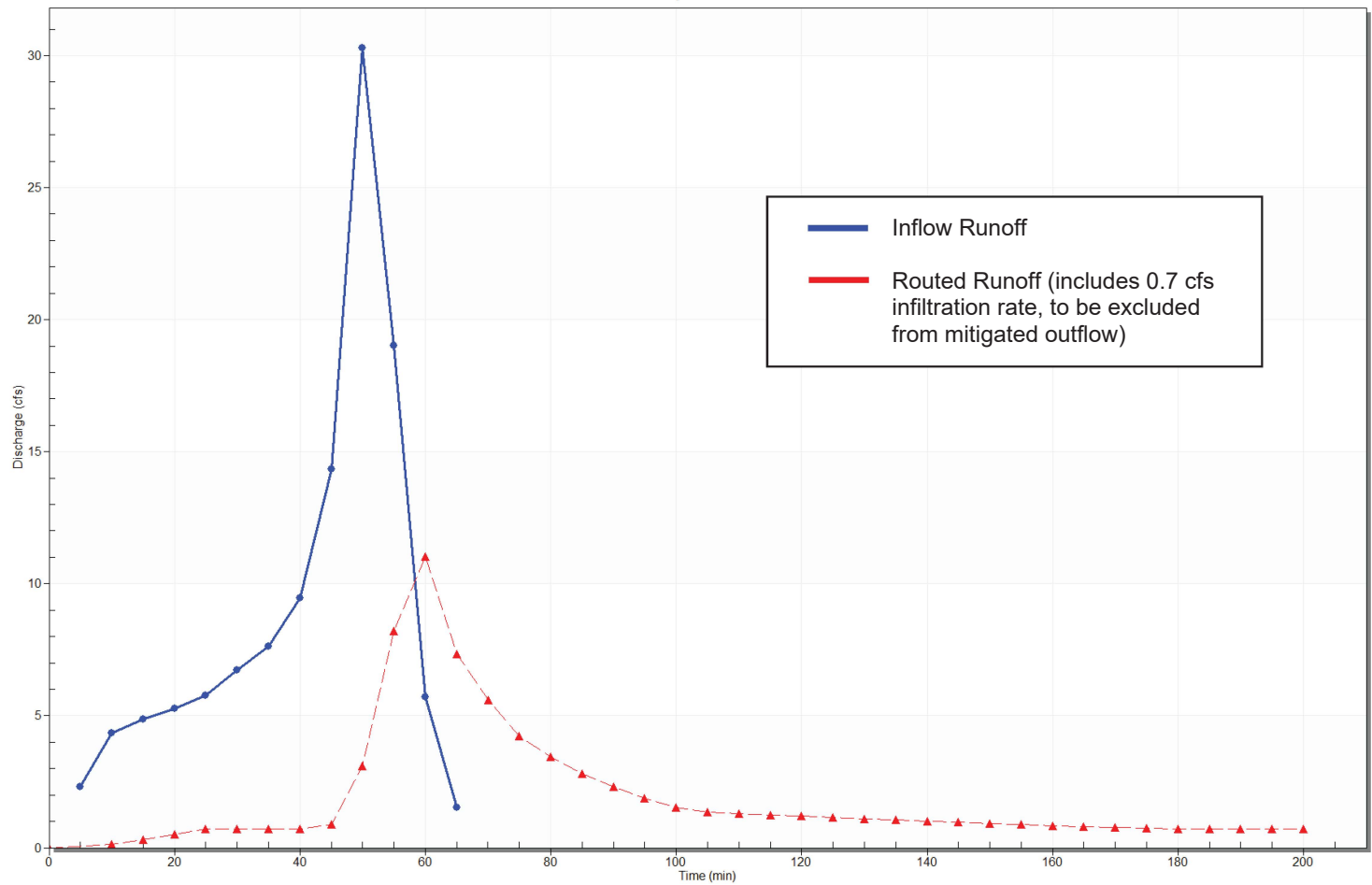
Routed Hydrograph

Peak Outflow Discharge: 11.014 cfs, Time to Peak: 60.00 (min), Total Outflow Volume: 22383.98 ft³

Time min	Discharge cfs	Storage acre-ft
0.00	0.00	0.000000
10.00	0.13	0.028950
15.00	0.31	0.060396
20.00	0.51	0.093222
25.00	0.70	0.128139
30.00	0.70	0.169668
35.00	0.70	0.217463
40.00	0.70	0.277863
45.00	0.87	0.370603
50.00	3.10	0.557946
55.00	8.21	0.632329
60.00	11.01	0.622089
65.00	7.35	0.583786
70.00	5.60	0.545223
75.00	4.23	0.516121
80.00	3.45	0.492374
85.00	2.81	0.472995
90.00	2.30	0.457182
95.00	1.87	0.444279
100.00	1.53	0.433749
105.00	1.36	0.424362
110.00	1.30	0.415378
115.00	1.25	0.406779
120.00	1.19	0.398549
125.00	1.14	0.390673
130.00	1.09	0.383135
135.00	1.05	0.375921
140.00	1.00	0.369016
145.00	0.96	0.362408
150.00	0.92	0.356083
155.00	0.88	0.350030
160.00	0.84	0.344237
165.00	0.81	0.338692

170.00	0.77	0.333386
175.00	0.74	0.328307
180.00	0.71	0.323447
185.00	0.70	0.318626
190.00	0.70	0.313805
195.00	0.70	0.308984
200.00	0.70	0.304163

Routed Hydrographs
100-YR, 1-HR Storm Event



APPENDIX F

Hydraulic Calculations

(To be provided during final engineering)

Channel Report

DA A1

Circular

Diameter (ft)

= 1.50

Invert Elev (ft)

= 100.00

Slope (%)

= 1.00

N-Value

= 0.013

Highlighted

Depth (ft)

= 0.95

Q (cfs)

= 7.637

Area (sqft)

= 1.18

Velocity (ft/s)

= 6.45

Wetted Perim (ft)

= 2.77

Crit Depth, Yc (ft)

= 1.07

Top Width (ft)

= 1.44

EGL (ft)

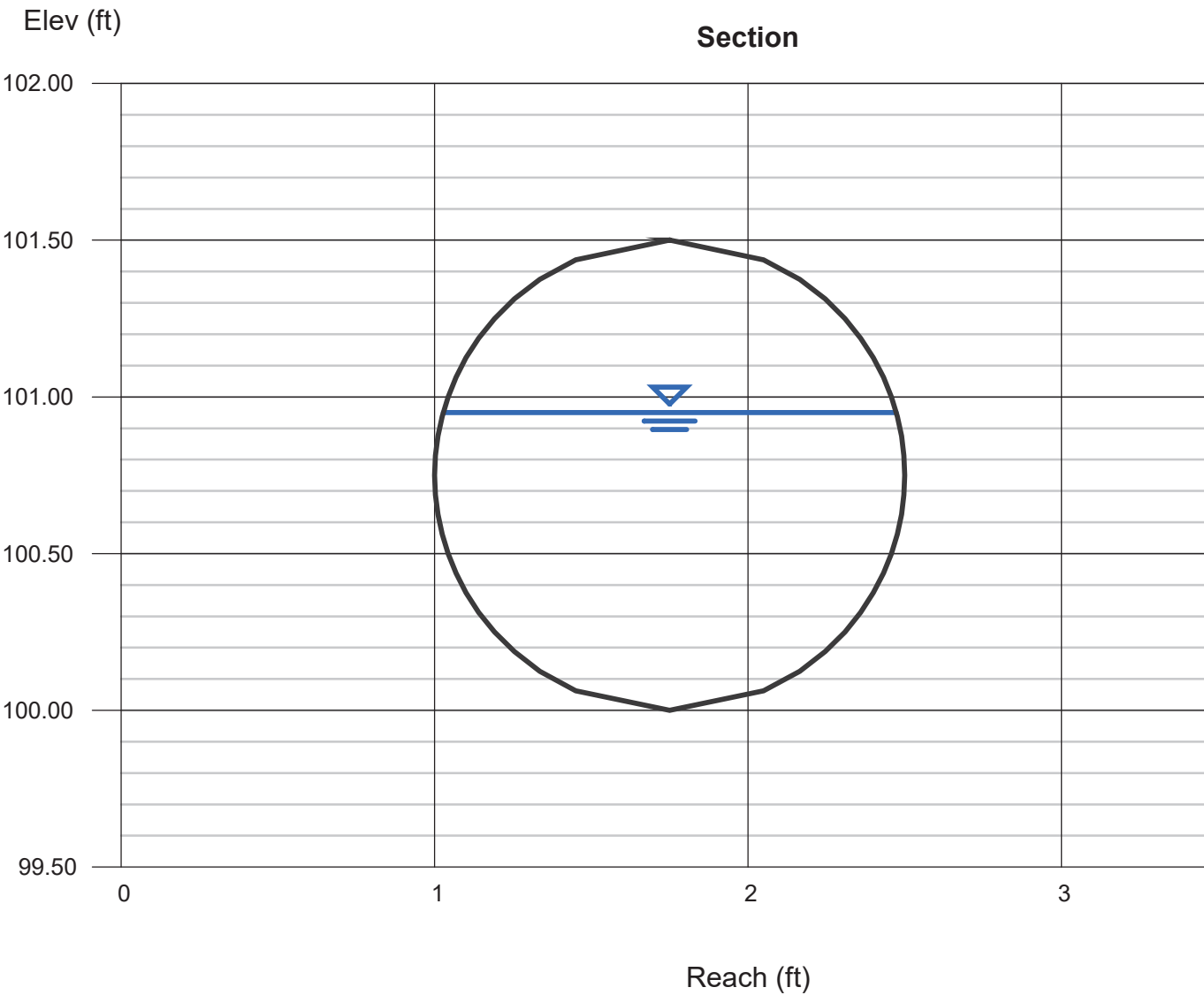
= 1.60

Calculations

Compute by: Known Q

Known Q (cfs)

= 7.64



Channel Report

DA A2

Circular

Diameter (ft) = 1.50

Invert Elev (ft) = 100.00

Slope (%) = 1.00

N-Value = 0.013

Calculations

Compute by: Known Q

Known Q (cfs) = 8.07

Highlighted

Depth (ft) = 0.99

Q (cfs) = 8.070

Area (sqft) = 1.24

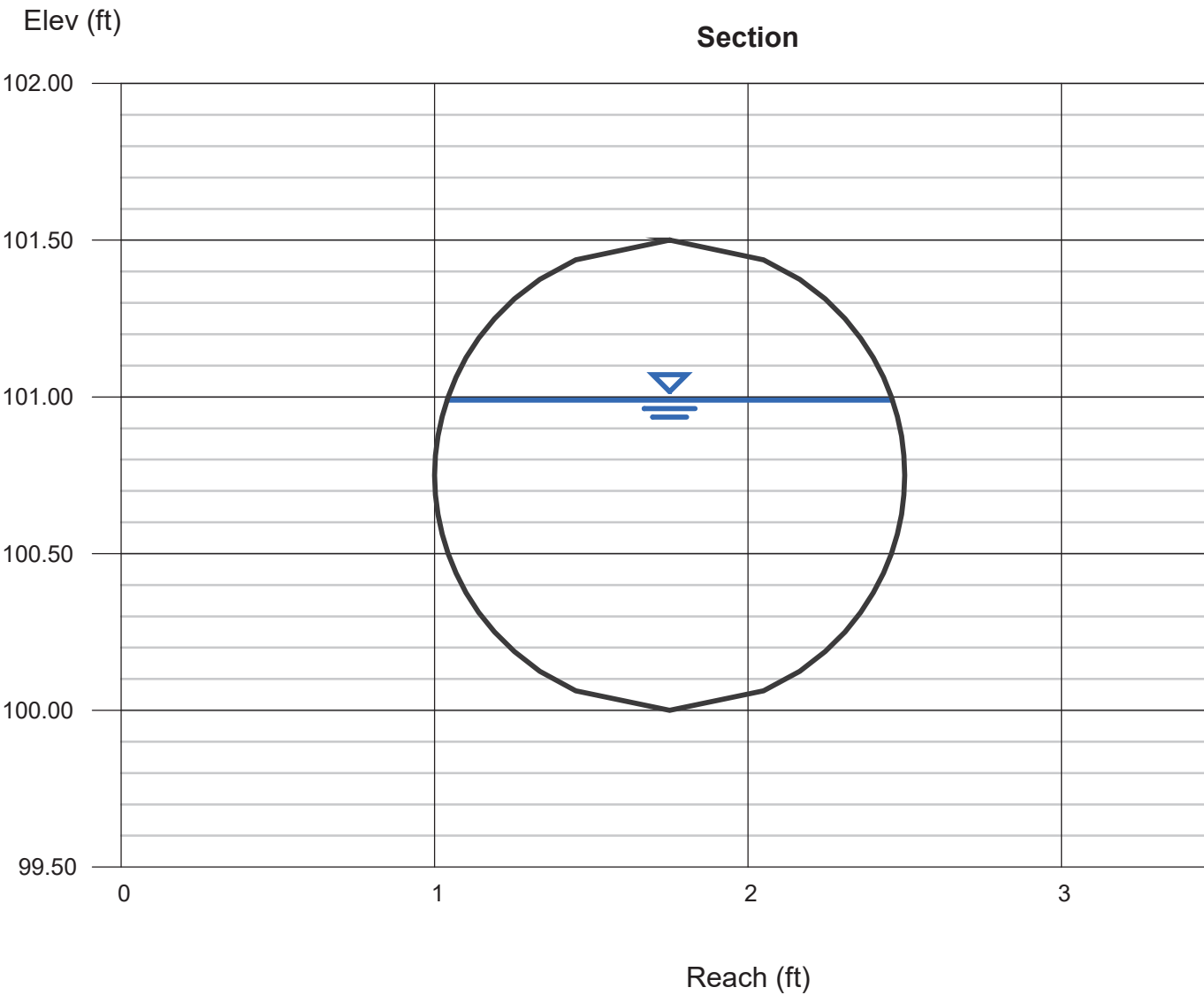
Velocity (ft/s) = 6.50

Wetted Perim (ft) = 2.85

Crit Depth, Yc (ft) = 1.10

Top Width (ft) = 1.42

EGL (ft) = 1.65



Channel Report

DA A3

Circular

Diameter (ft) = 1.50

Invert Elev (ft) = 100.00

Slope (%) = 1.00

N-Value = 0.013

Calculations

Compute by: Known Q

Known Q (cfs) = 5.78

Highlighted

Depth (ft) = 0.80

Q (cfs) = 5.776

Area (sqft) = 0.96

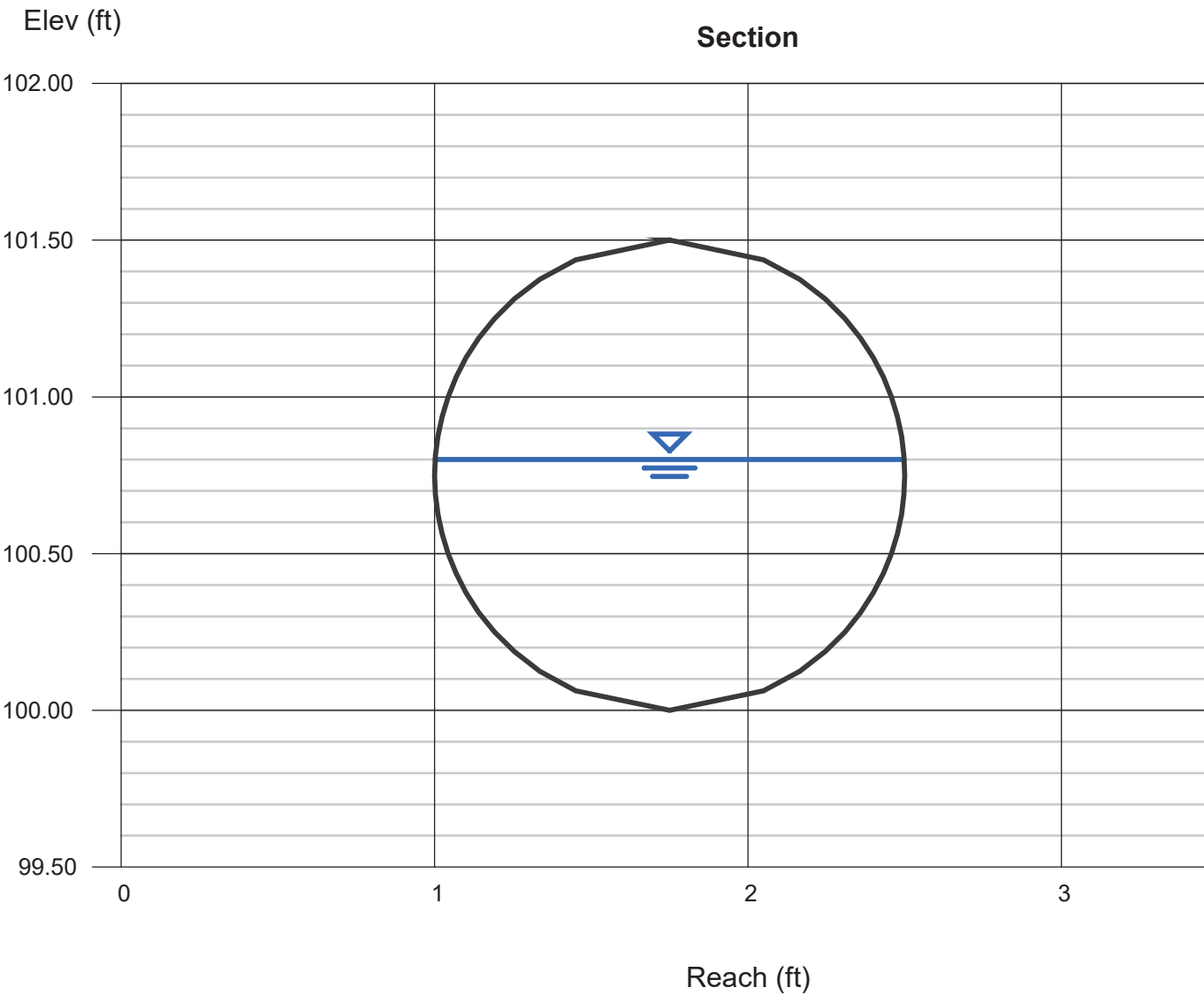
Velocity (ft/s) = 6.01

Wetted Perim (ft) = 2.46

Crit Depth, Yc (ft) = 0.93

Top Width (ft) = 1.50

EGL (ft) = 1.36



APPENDIX G

Reference Documents

Riverside County Hydrology Manual Reference

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent(2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. ($\frac{1}{2}$ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 -100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.
2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area should always be made, and a review of aerial photos, where available may assist in estimating the percentage of impervious cover in developed areas.
3. For typical horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

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**IMPERVIOUS COVER
FOR
DEVELOPED AREAS**

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group			
		A	B	C	D
<u>NATURAL COVERS -</u>					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
<u>URBAN COVERS -</u>					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
<u>AGRICULTURAL COVERS -</u>					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

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**RUNOFF INDEX NUMBERS
FOR
PERVIOUS AREAS**

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group			
		A	B	C	D
<u>AGRICULTURAL COVERS</u> (cont.) -					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Deciduous (Apples, apricots, pears, walnuts, etc.)		See Note 4			
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87
Vineyard		See Note 4			

Notes:

1. All runoff index (RI) numbers are for Antecedent Moisture Condition (AMC) II.
2. Quality of cover definitions:
 Poor-Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.
 Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.
 Good-Heavy or dense cover with more than 75 percent of the ground surface protected.
3. See Plate C-2 for a detailed description of cover types.
4. Use runoff index numbers based on ground cover type. See discussion under "Cover Type Descriptions" on Plate C-2.
5. Reference Bibliography item 17.

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**RUNOFF INDEX NUMBERS
FOR
PERVIOUS AREAS**