APPENDIX E

Preliminary Offsite Hydrology Study

For

304-acre parcel at

APN 0599-191-49

Aberdeen Drive

Joshua Tree, California

County of San Bernardino

PRELIMINARY OFFSITE HYDROLOGY STUDY

FOR

304-Acre Parcel at
APN 0599-191-49
Tentative Tract Map No. 20584
Aberdeen Drive
Joshua Tree, California
County of San Bernardino

Job No. 227521-0000165.00
October 26, 2022

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Vickie L. Bridenstine — 10/27/22

VICKIE L. BRIDENSTINE, P.E. — DATE

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1 INTRODUCTION

This memorandum includes a summary of NV5's preliminary hydrologic and hydraulic analysis to support the proposed Tentative Tract Map No. 20584 creating 23 residential lots (referred to as Project) for JT304, LLC. The project is located in San Bernardino County APN 0599-191-49, Joshua Tree, CA. The project site includes 23 residential lots with a footprint of approximately 304 acres. The locations of the project site are shown in Figure 1 and Figure 2, respectively.

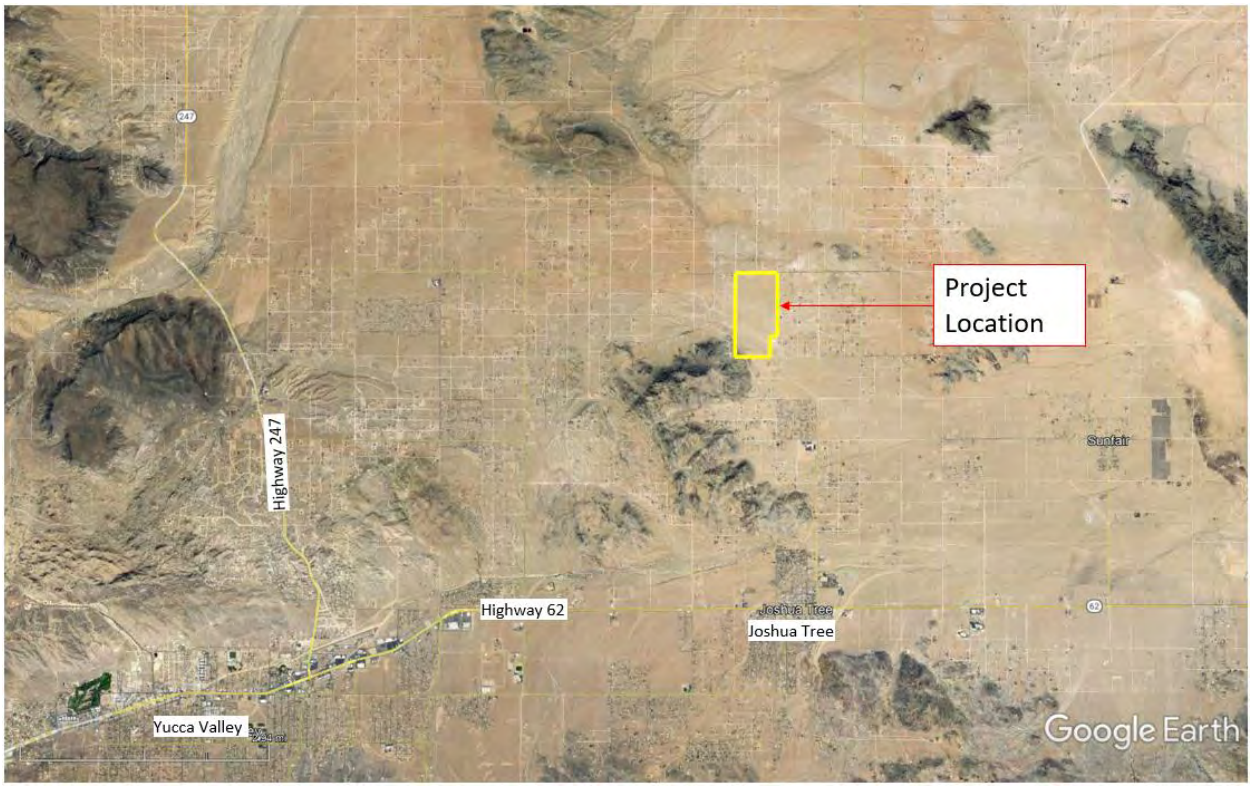


Figure 1. Site Vicinity Map

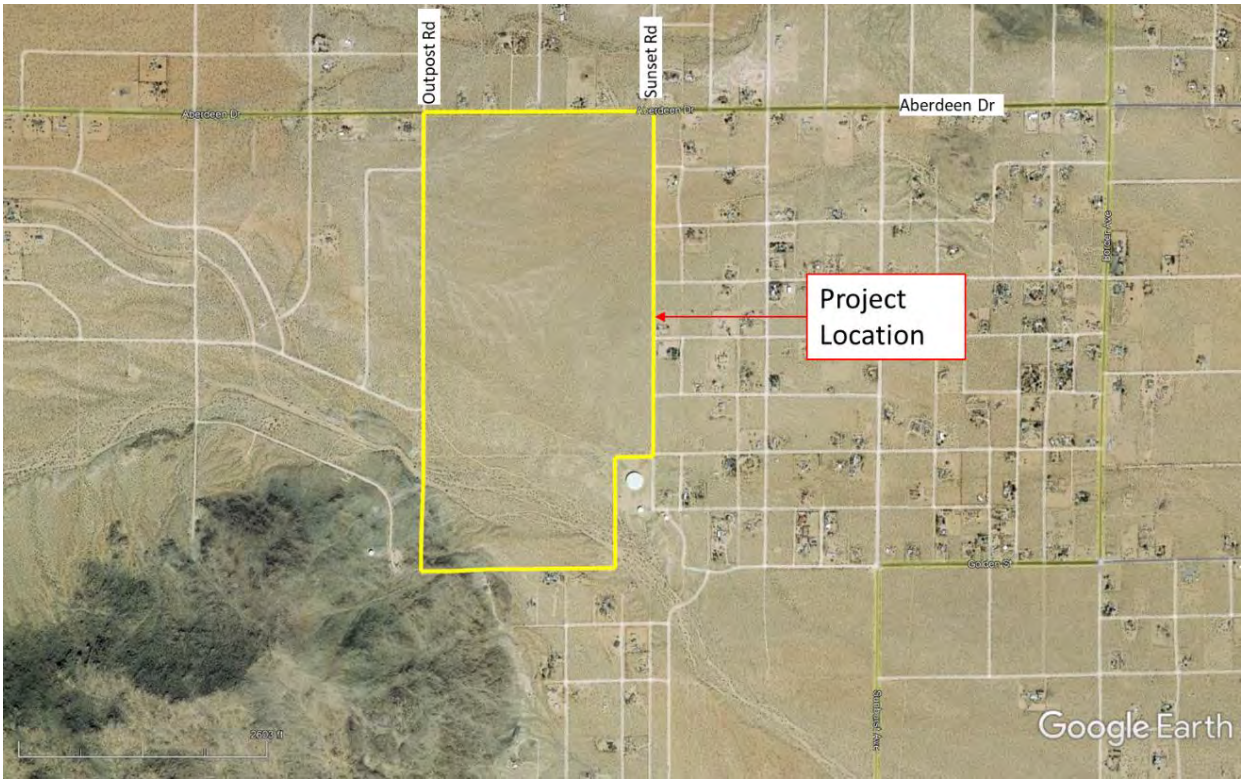


Figure 2. Site Location Map

The project site lies within FEMA Flood Insurance Rate Map (FIRM) product ID 06071CIND2E, Area "06071C8140J" and "*06071C8130H". This area is designated as Zone D where "flood hazards are undetermined, but possible". Please refer to FEMA FIRM included in Appendix A.

2 HYDROLOGIC ANALYSIS

The hydrologic analysis was performed in accordance with the San Bernardino County Hydrology Manual (1986). The San Bernardino County Unit Hydrology Program in the CivilDesign Software (version 9.0 dated 2014), which incorporates the methodology of the San Bernardino County Hydrology Manual, was used in this analysis to determine the 100-year flow.

The CivilDesign software is a computer-aided design program where the user develops a node link model of the watershed. In CivilDesign, independent node link models are developed for each sub basin, and these sub models are then linked together to generate the node link model for the entire watershed. The intensity-duration-frequency relationships are applied to each of the drainage areas in the model to get the peak flow rates at each point of interest.

2.1 Hydrology Methodology

Following the guidelines of the San Bernardino County Hydrology Manual, the Unit Hydrograph Method assumes that watershed discharge is related to the total volume of runoff, and that the time factors which affect the unit hydrograph shape are invariant, and that watershed storm rainfall-runoff relationship are characterized by watershed area, slope, and shape factors. The unit hydrograph method for determining the time distribution of runoff is used for hydrology studies of all San Bernardino County watersheds in excess of approximately one square mile in area.

2.2 Basin Delineation

The sub-basin delineation was conducted based on data downloaded from the United States Geological Survey (USGS) one arc-second resolution Lidar data and USGS Watershed Boundary Dataset. The basin delineation is shown in Figure 3 and the detailed sub-basin information is presented in the Hydrology Work Maps in Appendix A.

As shown in the Hydrology Work Map, four sub-basins, totaling approximately 10 square miles, were used to represent the drainage basin for the project. The surface runoff of Sub-Basins 102 and 104 flow into Sub-Basin 100 and continue flowing towards the west to the project site. Surface runoff of Sub-Basin 200 also flows towards the east into the project site. The boundary of the watershed delineated in the analysis is similar to that automatically delineated by USGS StreamStats program, which is shown in Figure 4.

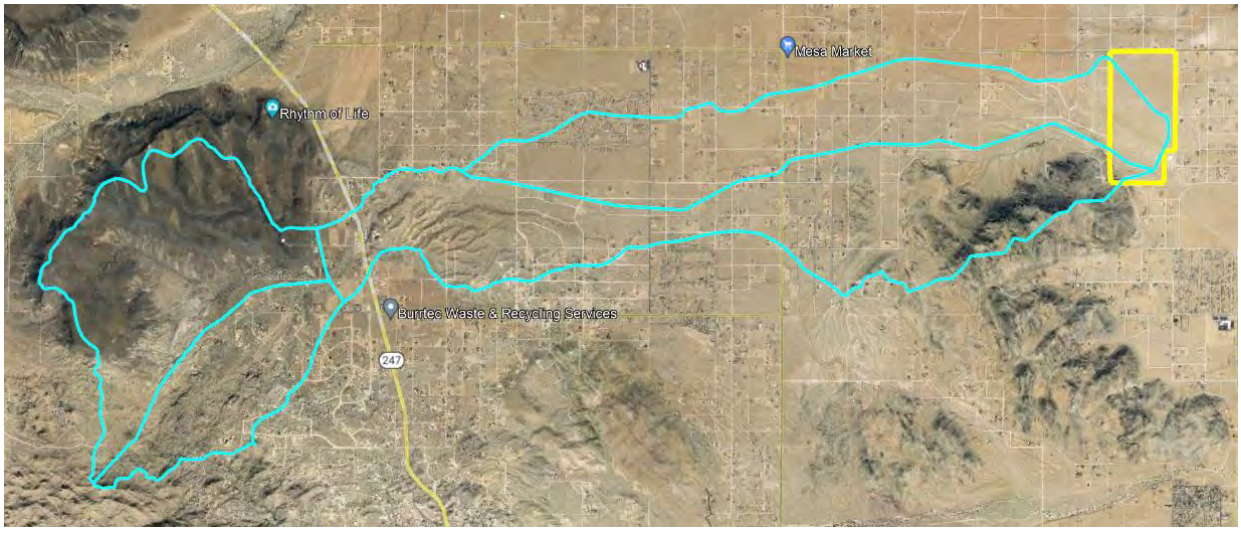


Figure 3. Drainage Basin Map

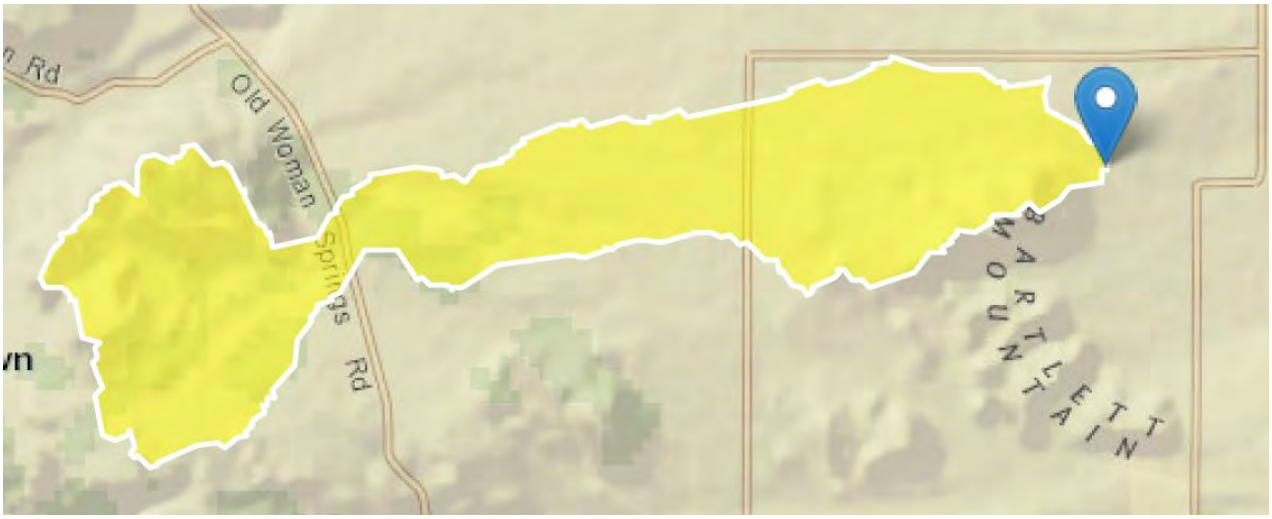


Figure 4. USGS StreamStats Basin Delineation Map

2.3 Precipitation Data

The County of San Bernardino Hydrology Manual contains isohyetal maps based on the National Oceanic and Atmospheric Administration (NOAA) Atlas 2 (1973) information. The NOAA published Atlas 14 in 2004 and revised 2006. NOAA Atlas 14 provides updated information for various peak durations of rainfall depths and for various return periods (return frequencies), including all key duration and return periods detailed in the Hydrology Manual. Therefore, NOAA Atlas 14 was used in this analysis to determine the 100-year rainfall depths, as shown in Appendix B.

2.4 Lag Time

Lag time for a watershed can be defined as the elapsed time (in hours) from the beginning of unit effective rainfall to the instant that the summation hydrograph for the point of concentration reaches 50 percent of ultimate discharge. The lag relationship given by the empirical formula:

$$lag\ (hours) = C_t \times ((L \times L_{Ca})/S^{0.5})^m$$

where:

$C_t = 24\bar{n}$ ($\bar{n}$ is the visually estimated basin factor of all collection streams and watershed channels, refers to hydrology manual figure E-2)

L = Length of longest watercourse (miles)

L_{Ca} = Length along longest watercourse, measured upstream to a point (miles)

$m = 0.38$

2.5 S-Graph

Five S-Graph are used for unit hydrograph development in San Bernardino County. These S-graphs are entitled Valley: Developed; Valley: Undeveloped; Foothill; Mountain; and Desert. The S-Graph selected in this analysis is listed in the table in Appendix C. The watershed of the project site is composed of steep upper canons with moderate slopes in lower canyons. Based on the Figure E-2 of the Hydrology Manual, the basin factor $\bar{n}$ was set to 0.04.

2.6 Soil Cover and Type

According to the County Addendum (2010), the soil grouping information contained in Section C of the Hydrology Manual (1986) shall be updated with the National Resources Conservation Service (NRCS) Web Soil Survey data. However, the NRCS soil survey does not have the soil type data for the project areas. Therefore, the soil type was determined based on the Hydrology Manual. Based on the Hydrologic Soils Group Map for the Southcentral Area (Figure C-11 of Hydrology Manual), the soil type of the project area is Group C, indicating that the soils have slow infiltration rates when thoroughly wetted and consisting chiefly of silty-loam soils with a layer that impedes downward movement of water, or soil with moderately fine to fine texture. These soils have a slow rate of water transmission.

According to Figure C-3 of the Hydrology Manual, the cover type of the project sites belongs to Natural Covers-Barren with the curve number (CN) of 91 for Antecedent Moisture Condition (AMC) II. Based on the Hydrology Manual, a low AMC index should be used in developing the runoff for storm with short return period, and a moderate to thigh AMC index (low loss rates) should be used for storms with longer return periods. In our analysis for the 100-year event, the curve number for AMC III was converted from the number for AMC II in the CivilDesign software based on the methodology in Section C.5.1 of the Hydrology Manual.

2.7 Catchment Loss Rates and Impervious Data

Figure C-6 of the Hydrology Manual shows the infiltration rates for pervious areas versus Soil Conservation Service (SCS) curve numbers. The relationship between the infiltration rate and the maximum loss rate can be expressed as:

$$F_m = a_p \times F_p$$

where:

F_m = Catchment maximum loss rates

a_p = Pervious area fraction

F_p = Infiltration rate for the pervious area

F_p is a function of the SCS curve number. F_m for AMC III was calculated in CivilDesign for a given curve number and a pervious area fraction for each sub-basin. Since the current project area is bare covered with sand and soil, the existing pervious area fraction a_p is 1.

2.8 Hydrology Results

The 100-year peak flow rates at the west boundary of the project site are summarized in **Table 1**. The input data of the San Bernardino County Unit Hydrograph Program in CivilDesign analysis is included in Appendix C. The detailed outputs for each sub-basin are also presented in Appendix C.

Table 1. Hydrology Results to the West Boundary of Project Site

Node	Condition	Flow Rate (cfs)	Total Volume (ac.ft)
100	Existing	5,680	1,920
200	Existing	1,965	677

3 HYDRAULIC ANALYSIS

A hydraulic analysis was conducted using the HEC-RAS model that was developed by U.S. Army Corps of Engineers' Hydrologic Engineering Center. The hydraulic analysis was conducted for the 100-year flow event that the peak flow rate was determined in the hydrologic analysis.

3.1 Description of HEC-RAS

The HEC-RAS system contains four river analysis components for (1) steady flow simulation, (2) unsteady flow simulation (one-dimensional and two-dimensional hydrodynamics), (3) quasi unsteady or full unsteady flow sediment transport computations (1D and 2D), and (4) water quality analysis. The steady flow component of HEC-RAS, which was used in our hydraulic analysis, is capable of modeling subcritical, supercritical, and mixed flow regime water surface profiles. The basic computational procedure is based on the solution of the one-dimensional energy equation. Energy losses are evaluated by friction (Manning's equation) and contraction/expansion (coefficient multiplied by the change in velocity head). The momentum equation is utilized in situations where the water surface profile is rapidly varied. Data input requirements for HEC-RAS steady flow module include the geometric data of the river system and the flow data.

3.2 Channel Geometry

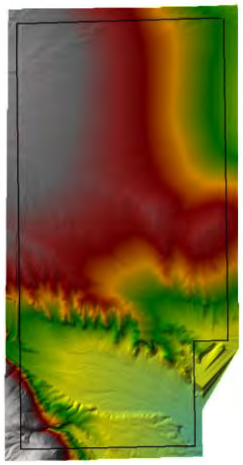
The geometric data includes the river system connectivity (schematic), and cross-section data (geometry, Manning's roughness, contraction/expansion losses, ineffective flow areas, etc.). The

channel geometry used in HEC-RAS was developed based on the topographic data collected by NV5 surveyors and the USGS Digital Elevation Model (DEM) data.

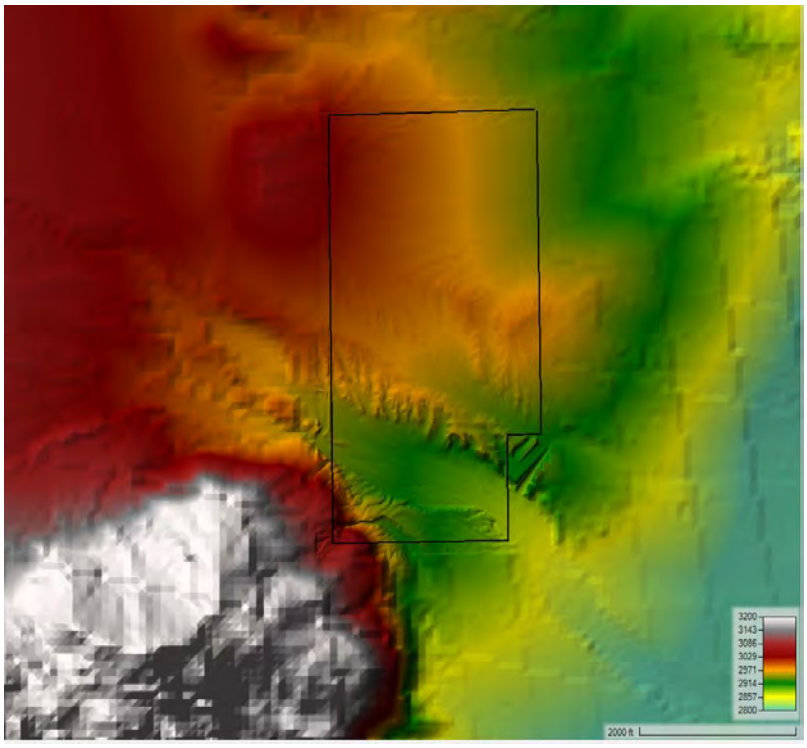
3.2.1 Development of Digital Terrain Model (DTM)

NV5 conducted a topographic survey of the project site in 2022. A terrain surface was built in AutoCAD from the survey points, with the spatial reference of the North American Datum of 1983 (NAD83), California State Plane Zone 5, in US survey feet. The DEM exported from this surface is shown in Figure 5.

The standard one-meter resolution digital elevation model (DEM) data, which was produced through the USGS's 3DElevation Program (3DEP), was used to supplement the topographic information that is required for the modeled channel reach in the HEC-RAS model. The spatial reference of the original USGS DEM is Universal Transverse Mercator (UTM) in units of meters. It was converted to California State Plane Zone 5, in feet, before being combined with the survey data to derive the Digital Terrain Model (DTM) for the HEC-RAS model. As shown in Figure 5, the combined DTM covers a much larger area than the survey area. It is noted that the vertical datum of the terrain is North American Vertical Datum of 1988 (NAVD88), in feet.



DTM Based on NV5's Survey



Combined DTM

Figure 5. Digital Terrain Model (DTM)

3.2.2 Channel Geometry

The channel geometry was developed using HEC-RAS Mapper, and then was refined for each cross-section. Three reaches were included in the HEC-RAS model, the confluence point was defined based on the USGS Quadrangle Maps (20-foot contours) shown in Figure 6. Sixteen cross-sections were used to represent approximately 1,700 feet north branch (Reach 1), fifteen cross-sections were used to represent approximately 2,000 feet south branch (Reach 2), and twenty cross-sections were used to represent approximately 3,500 feet lower reach (Reach 3) after the confluence point. The modeled reaches and the extend of the cross-sections are shown in Figure 7. As an example, Figure 8**Error! Reference source not found.** shows the channel cross section at (HEC-RAS) Station 3806, where one of the sections of the project site is approximately located.

Based on the preliminary model runs, it was observed that the two upstream reaches are hydraulically connected. Therefore, a lateral structure was added along the left overbank (facing downstream) of Reach 2 between Stations 5432 and 3859 with the tailwater connection to Reach 1 at Station 5367 to allow water exchange between Reach 1 and Reach 2.

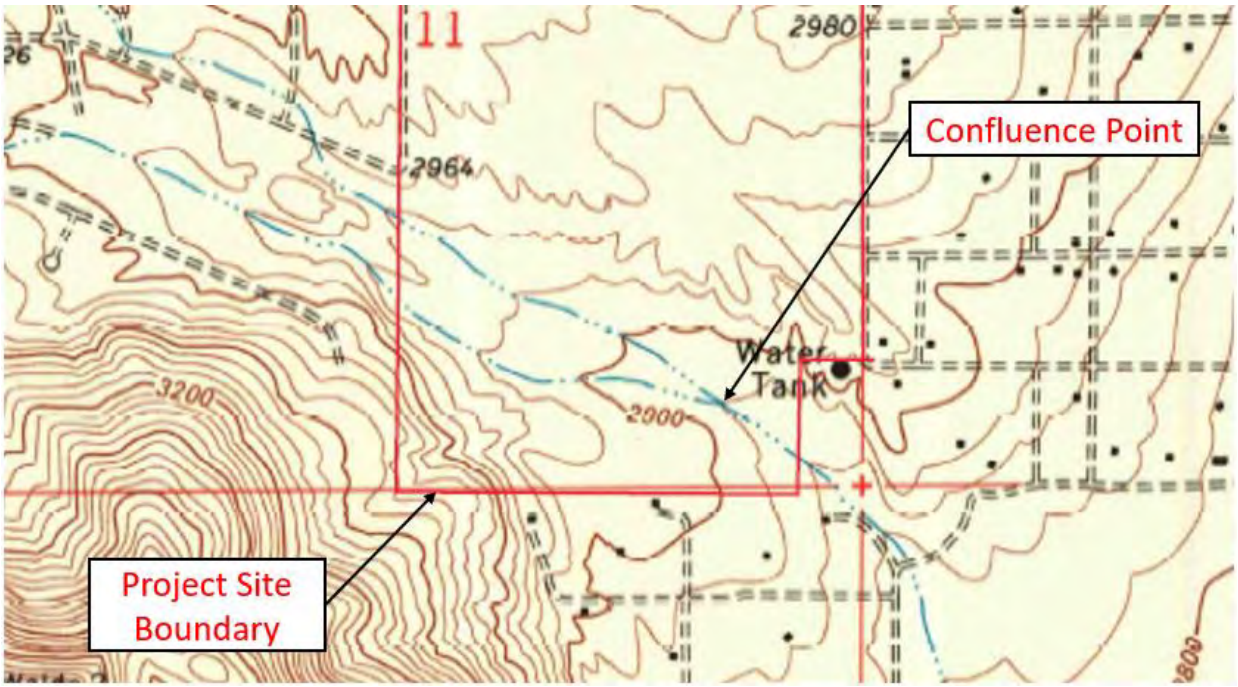


Figure 6. USGS Quadrangle Map

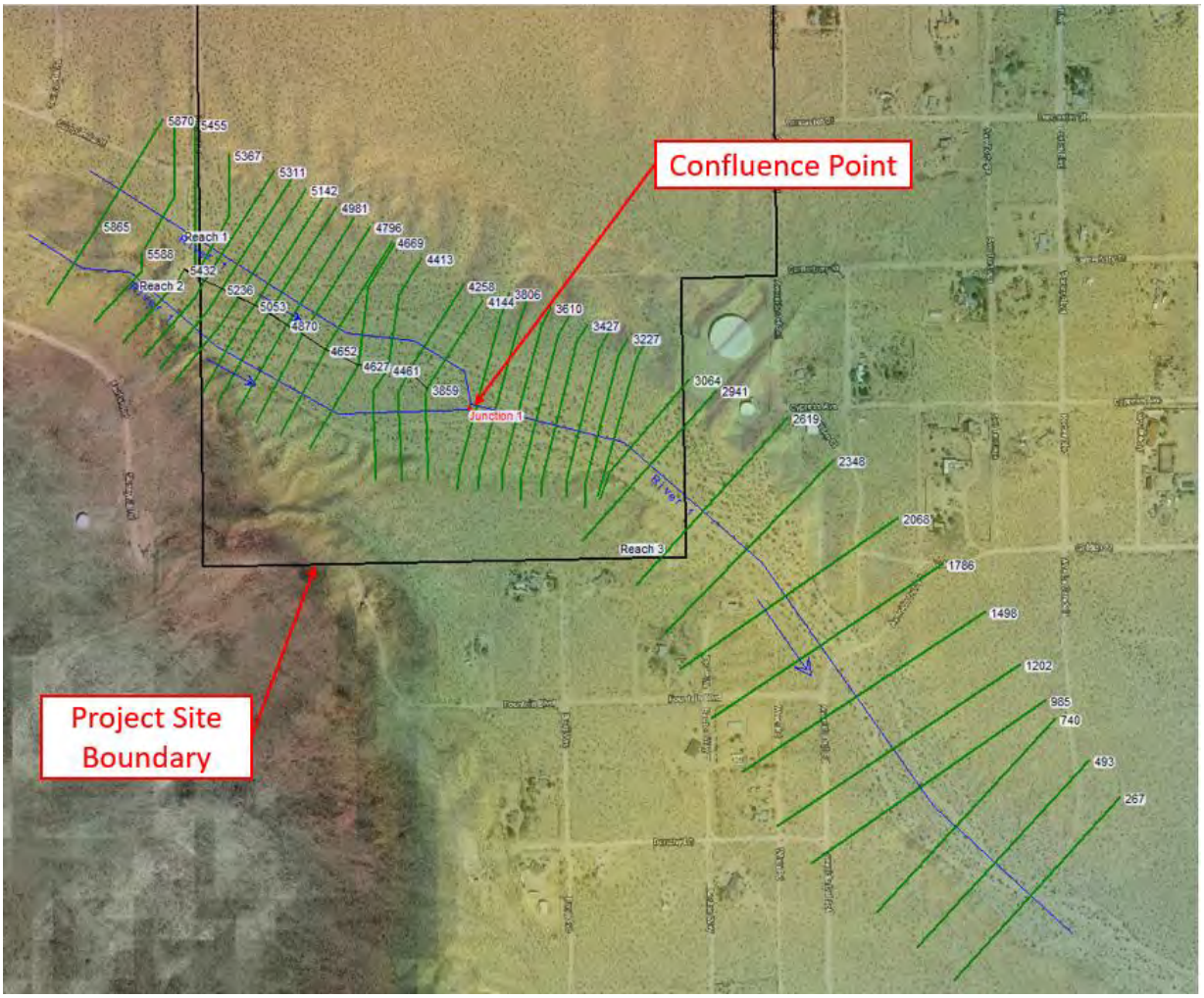


Figure 7. HEC-RAS Modeled Reach and Cross-Section Cutlines

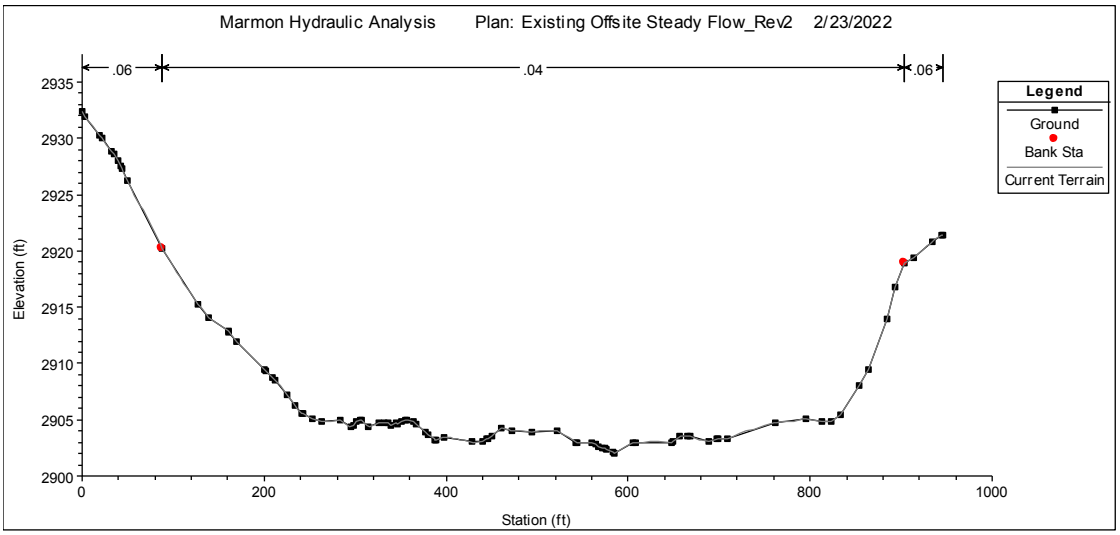


Figure 8. HEC-RAS Cross-Section at Station 3806

3.2.3 Manning's N-Values

According to the Google Earth aerial images and the HEC-RAS Hydraulic Reference Manual, the Manning's n-value was set to 0.04 for the channel and 0.06 for the floodplains.

3.3 Boundary Conditions

The steady flow data input of HEC-RAS includes the flow discharges at the upstream boundary of the reaches and the downstream boundary condition. The 100-year peak flow discharges, which were determined in the hydrologic analysis, were specified as the upstream boundary conditions in the HEC-RAS model for the three reaches. The 100-year peak flow discharge at the upstream boundary is 1,965 cubic feet per second (cfs) of the north branch (Reach 1), 5,680 cfs of the south branch (Reach 2), and 7,645 cfs for the lower reach (Reach 3). The flow data for each reach is listed in **Table 2**.

Table 2. HEC-RAS Flow Data Input

Reach Number	Reach Description	Steady Flow Data (cfs)
Reach 1	North Branch	1,965
Reach 2	South Branch	5,680
Reach 3	Lower Reach	7,645

A normal depth with an energy slope of 0.03 was specified as the downstream boundary condition of Reach 3. The channel longitudinal slope in Reach 3 is approximately 0.03 and preliminary HEC-RAS runs also confirmed that the energy slope at the downstream end is similar to the channel slope.

3.4 Hydraulic Results

The HEC-RAS steady flow analysis was conducted for the 100-year flow event. The water surface profile is shown in Figure 9. As example, Figure 10 shows the cross-sectional flow area at Station 3806. Map showing the spatial variations of the water surface elevations and the water depths are shown in Figure 11 and Figure 12, respectively.

The proposed residential lots are located approximately from Station 5367 in Reach 1, Station 5324 in Reach 2 to Station 2941 in Reach 3. The flood extents are shown in Figure 13. The average flow condition at the project site is summarized in Table 3. The detailed output of HEC-RAS is included in Appendix D.

Table 3. Flow Condition at Project Site

	Flow Condition	Location
Flow Event	100-Year	Station 5367 (Reach 1), Station 5324 (Reach 2) to Station 2941 (Reach 3)
Average Water Depth (ft)	2.99	-
Maximum Water Depth (ft)	4.93	Station 315 of Reach 3
Average Water Surface Elevation (ft, NAVD88)	2902.20	-
Maximum Water Surface Elevation (ft, NAVD88)	2947.66	Station 5324 of Reach 2
Minimum Water Surface Elevation (ft, NAVD88)	2882.01	Station 2941 of Reach 3
Average Flood Width (ft)	306	-
Maximum Flood Width (ft)	576	Station 3806 of Reach 3

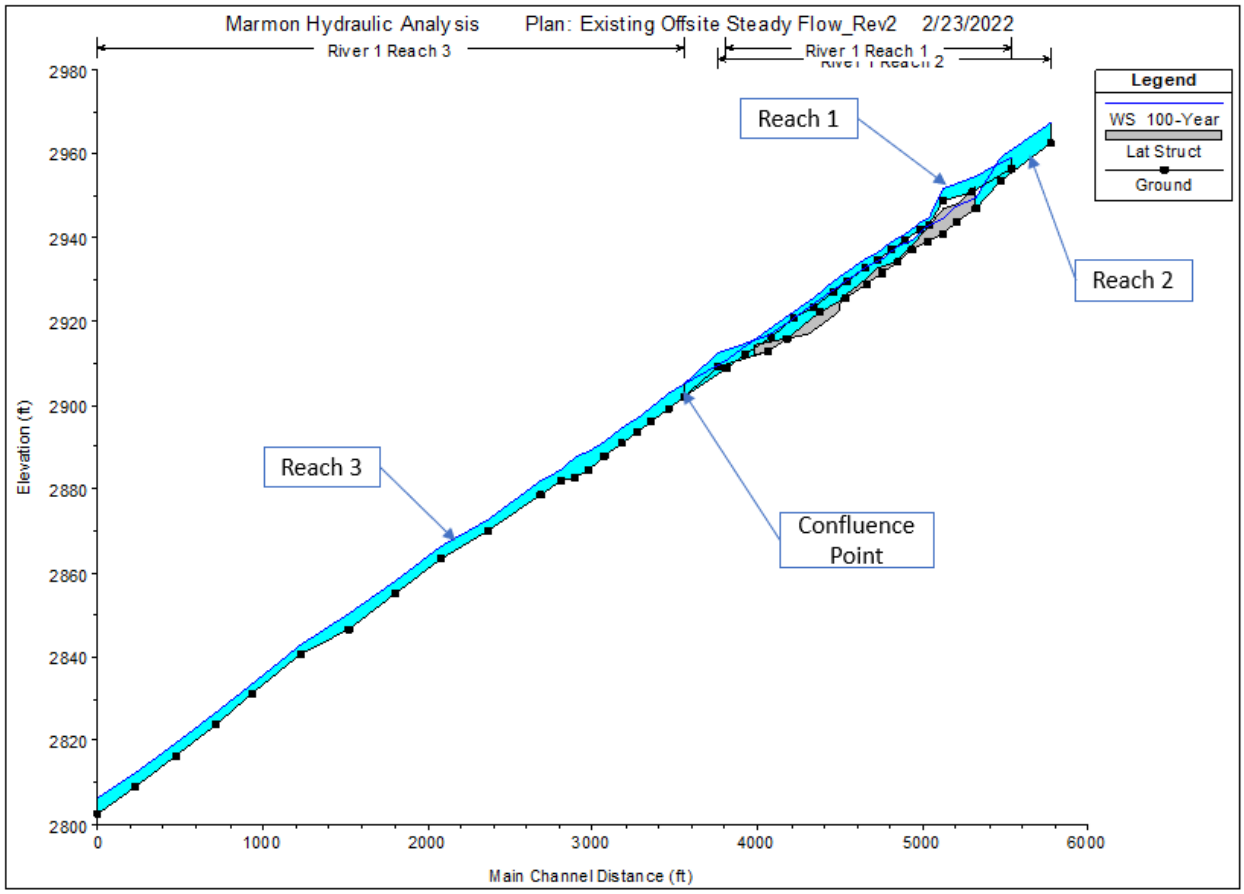


Figure 9. 100-Year Water Surface Profile

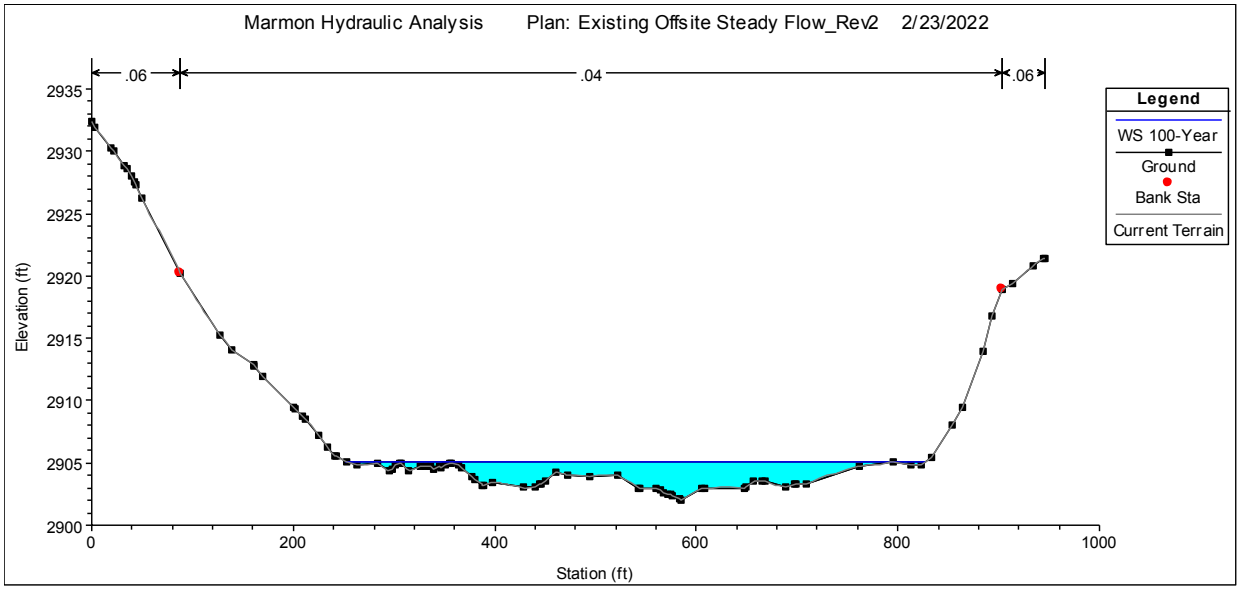


Figure 10. 100-Year Flow Area at Station 3806

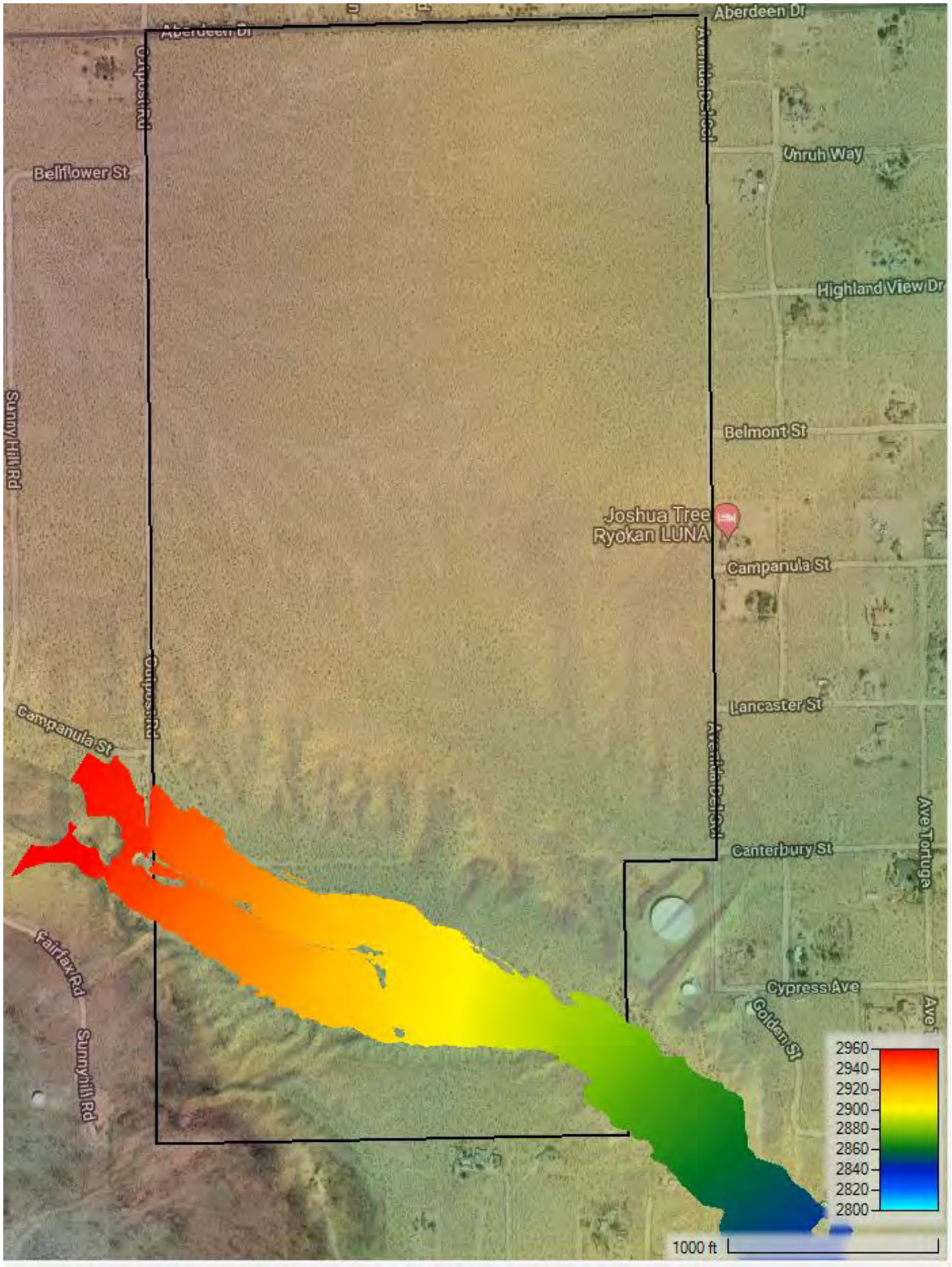


Figure 11. 100-Year Water Surface Elevation (ft, NAVD88)

Figure 12. 100-Year Water Depth (ft)

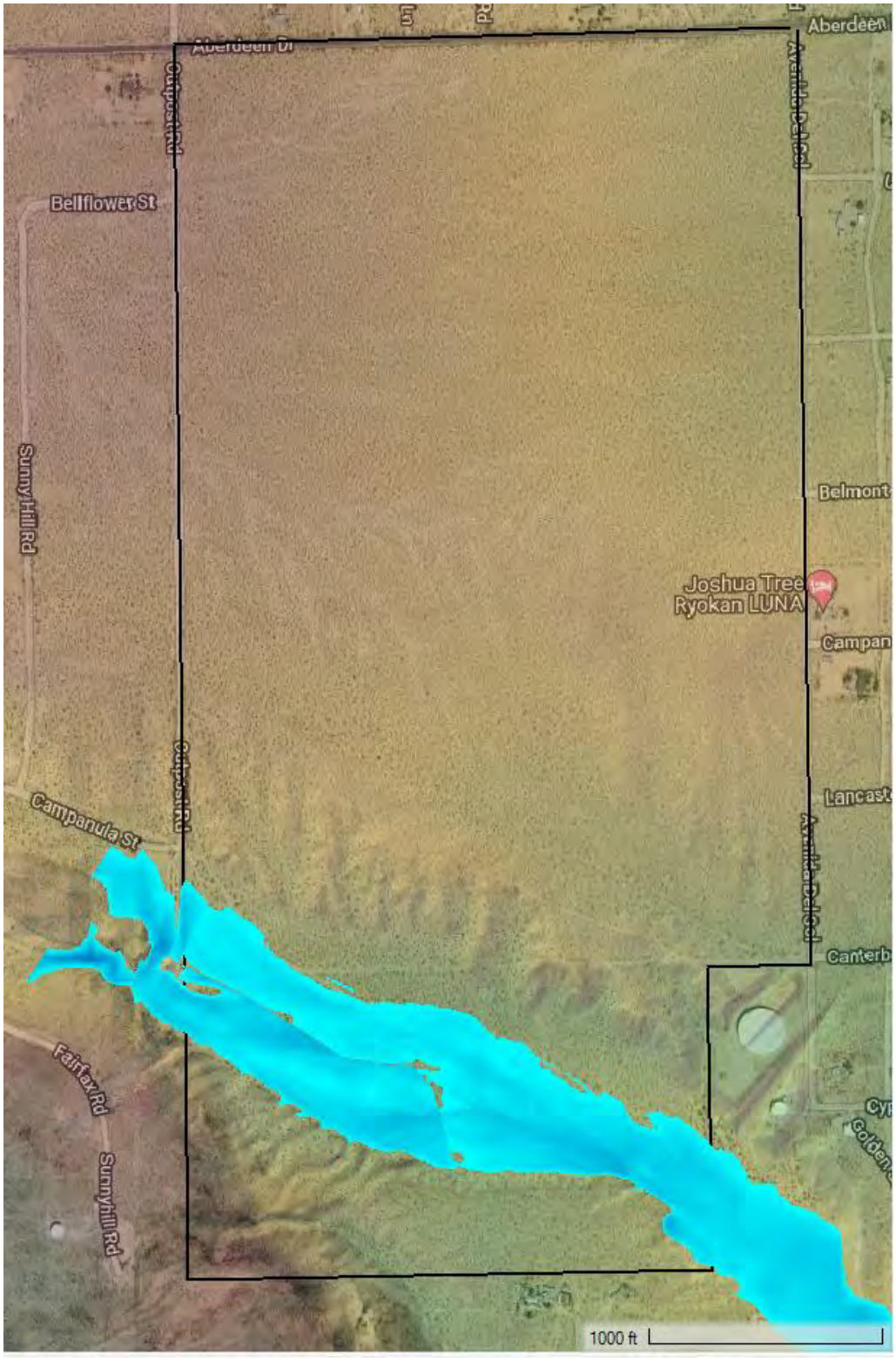


Figure 13. 100-Year Flood Extent

4 SUMMARY

The purpose of this preliminary hydrologic and hydraulic study is to support the proposed development of 23 residential lots in San Bernardino County APN 0599-191-49, Joshua Tree, CA.

This hydrologic analysis was performed in accordance with the San Bernardino County Hydrology Manual (1986) using San Bernardino County Unit Hydrology Program in CivilDesign Software (version 9.0 dated 2014). The computed 100-year peak flow rates at the west boundary of the project site were 1,965 cfs of the north branch and 5,680 cfs of the south branch.

The hydraulic analysis was conducted using the HEC-RAS model that was developed by U.S. Army Corps of Engineers' Hydrologic Engineering Center. The computed maximum water depth within the project site was approximately 4.93 feet, and the maximum flood width is expected to be approximately 576 feet.

As shown in Figure 13, a portion of the proposed development might be flooded when the 100-year flow occurs. An open storm channel that is capable to convey the 100-year flow is recommended to prevent the developed residential lots from being located within the 100-year floodplain. The development has been planned to avoid the areas that are expected to subject to flooding where the 100-year flow occurs, with larger lots created in the region of the natural channel. The Tentative Tract map has depicted a proposed San Bernardino County Drainage Easement based upon the 100 year flood limits with a 50' building setback line. The larger lots provide adequate potential building sites for future residential development.

5 REFERENCES

Federal Emergency Management Agency (FEMA) National Flood Insurance Program, Flood Insurance Rate Map of San Bernardino County, California, September 2, 2016

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USACE (2021), HEC-RAS River Analysis System Hydraulic Reference Manual, Version 6.0, May 2021.

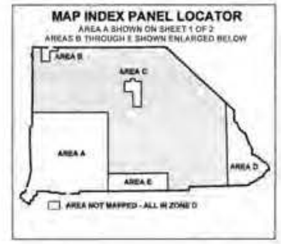
APPENDIX A

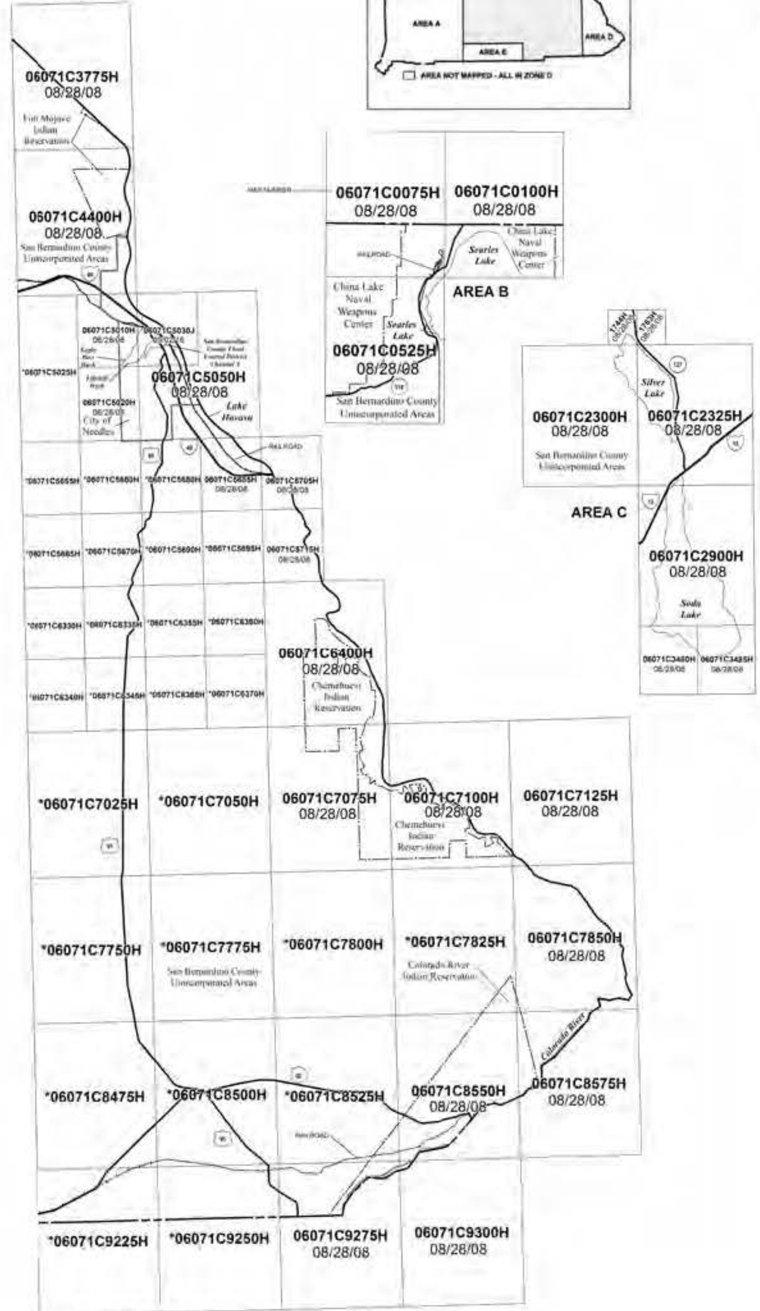
FEMA Map and Hydrology Work Maps

LISTING OF COMMUNITIES

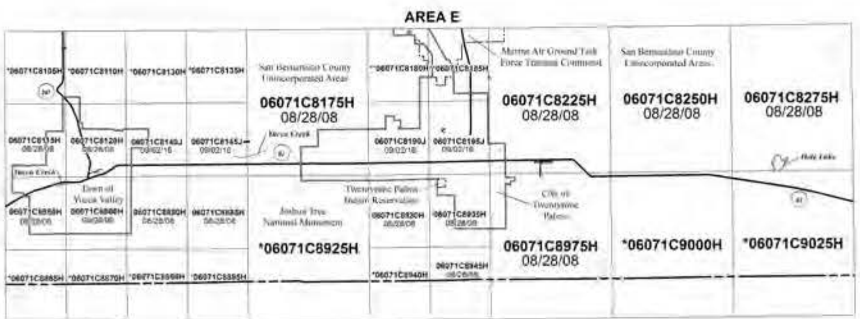
COMMUNITY NAME	COMMUNITY NUMBER	LOCATED ON PANEL(S)	INITIAL NFIP MAP DATE	INITIAL FIRM DATE	MOST RECENT FIRM PANEL DATE
ADELANTO, CITY OF	060630	[illegible]	NOVEMBER 7, 1975	APRIL 15, 1982	SEPTEMBER 2, 2016
APPLE VALLEY, TOWN OF	060752	[illegible]	MARCH 18, 1980	MARCH 18, 1996	SEPTEMBER 2, 2016
BARSTOW, CITY OF	060271	[illegible]	JANUARY 17, 1975	FEBRUARY 1, 1980	SEPTEMBER 2, 2016
BIG BEAR LAKE, CITY OF	060731	[illegible]	SEPTEMBER 25, 1979	SEPTEMBER 25, 1979	AUGUST 28, 2008
CHINO, CITY OF	060272	[illegible]	MARCH 18, 1996	MARCH 18, 1996	AUGUST 28, 2008
CHINO HILLS, CITY OF	060734	[illegible]	MARCH 18, 1996	MARCH 18, 1996	AUGUST 28, 2008
COLORADO RIVER INDIAN RESERVATION	[illegible]	[illegible]	MARCH 4, 1987	MARCH 4, 1987	AUGUST 28, 2008
COLTON, CITY OF	060273	[illegible]	SEPTEMBER 17, 1980	SEPTEMBER 17, 1980	SEPTEMBER 2, 2016
FONTANA, CITY OF	060274	[illegible]	JUNE 21, 1974	JUNE 3, 1987	SEPTEMBER 2, 2016
FORT MOJAVE INDIAN RESERVATION	060743	3775, 4400	MARCH 18, 1996	MARCH 18, 1996	AUGUST 8, 2008
GRAND TERRACE, CITY OF	060737	[illegible]	MARCH 18, 1996	MARCH 18, 1996	SEPTEMBER 2, 2016
HESPERIA, CITY OF	060733	[illegible]	SEPTEMBER 29, 1989	SEPTEMBER 29, 1989	SEPTEMBER 2, 2016
HIGHLAND, CITY OF	060732	[illegible]	SEPTEMBER 29, 1989	SEPTEMBER 29, 1989	SEPTEMBER 2, 2016
LOMA LINDA, CITY OF	[illegible]	[illegible]	MARCH 2, 1973	JULY 16, 1987	SEPTEMBER 2, 2016
MONTCLAIR, CITY OF	[illegible]	[illegible]	MARCH 18, 1996	MARCH 18, 1996	AUGUST 28, 2008
NEEDLES, CITY OF	060277	[illegible]	JUNE 14, 1974	JULY 15, 1977	SEPTEMBER 2, 2016
ONTARIO, CITY OF	060278	[illegible]	AUGUST 9, 1974	DECEMBER 2, 1980	SEPTEMBER 2, 2016
RANCHO CUCAMONGA, CITY OF	060671	[illegible]	SEPTEMBER 5, 1984	SEPTEMBER 5, 1984	SEPTEMBER 2, 2016
REDLANDS, CITY OF	060279	[illegible]	NOVEMBER 21, 1975	JANUARY 3, 1979	SEPTEMBER 2, 2016
RIALTO, CITY OF	[illegible]	[illegible]	MARCH 15, 1996	MARCH 18, 1996	SEPTEMBER 2, 2016
SAN BERNARDINO, CITY OF	060281	[illegible]	JUNE 28, 1974	JULY 16, 1979	SEPTEMBER 2, 2016
SAN BERNARDINO COUNTY (UNINCORPORATED AREAS)	[illegible]	[illegible]	SEPTEMBER 29, 1978	SEPTEMBER 29, 1978	SEPTEMBER 2, 2016
TWENTYNINE PALMS, CITY OF	[illegible]	[illegible]	SEPTEMBER 29, 1978	SEPTEMBER 29, 1978	SEPTEMBER 2, 2016
UPLAND, CITY OF	[illegible]	[illegible]	JUNE 25, 1974	MARCH 18, 1996	SEPTEMBER 2, 2016
VICTORVILLE, CITY OF	[illegible]	[illegible]	SEPTEMBER 21, 1973	SEPTEMBER 21, 1973	SEPTEMBER 2, 2016
YUCAIPA, CITY OF	[illegible]	[illegible]	MARCH 18, 1996	MARCH 18, 1996	AUGUST 28, 2008
YUCCA VALLEY, TOWN OF	[illegible]	[illegible]	MARCH 18, 1996	MARCH 18, 1996	SEPTEMBER 2, 2016

*Panel Not Printed
**Initial Identification Date is July 16, 1974
***Initial Identification Date is May 17, 1974





* PANEL NOT PRINTED - AREA ALL IN ZONE D
** PANEL NOT PRINTED - UNINCORPORATED AREAS ZONE D, OTHER AREAS ZONE X
*** PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS
**** PANEL NOT PRINTED - AREA OUTSIDE COUNTY BOUNDARY



MAP DATES

This FIRM Index displays the map date for each FIRM panel at the time this Index was printed. Beacuse this Index may not be distributed to unaffected communities in subsequent revisions, users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website at http://msc.fema.gov or by calling the FEMA Information eXchange (FMIX) at 1-877-336-2627.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

NOTE TO USER

Future revisions to this FIRM Index will only be issued to communities that are located on FIRM panels being revised. This FIRM Index therefore remains valid for FIRM panels dated September 2, 2016 or earlier. Please refer to the "MOST RECENT FIRM PANEL DATE" column in the Listing of Communities table to determine the most recent FIRM Index date for each community.

MAP REPOSITORIES

(Maps available for reference only, not for distribution.)

ADELANTO, CITY OF:
CITY HALL
11600 AIR EXPRESSWAY
ADELANTO, CALIFORNIA 92301

APPLE VALLEY, TOWN OF:
TOWN HALL
14955 DALE EVANS PARKWAY
APPLE VALLEY, CALIFORNIA 92307

BARSTOW, CITY OF:
ENGINEERING DEPARTMENT
220 EAST MOUNTAIN VIEW STREET, SUITE A
BARSTOW, CALIFORNIA 92311

BIG BEAR LAKE, CITY OF:
CITY HALL
39707 BIG BEAR BOULEVARD
BIG BEAR LAKE, CALIFORNIA 92315

CHINO, CITY OF:
CITY HALL
13220 CENTRAL AVENUE
CHINO, CALIFORNIA 91710

CHINO HILLS, CITY OF:
CITY HALL
14000 CITY CENTER DRIVE
CHINO HILLS, CALIFORNIA 91709

COLORADO RIVER INDIAN RESERVATION:
WATER RESOURCES DEPARTMENT
26600 MOHAVE ROAD
PARKER, ARIZONA 85344

COLTON, CITY OF:
PUBLIC WORKS DEPARTMENT
160 SOUTH TENTH STREET
COLTON, CALIFORNIA 92324

FONTANA, CITY OF:
CITY HALL
ENGINEERING DEPARTMENT
8353 SIERRA AVENUE
FONTANA, CALIFORNIA 92335

FORT MOJAVE INDIAN RESERVATION:
TRIBAL ADMINISTRATIVE OFFICE
500 MERRIMAN AVENUE
NEEDLES, CALIFORNIA 92363

GRAND TERRACE, CITY OF:
CITY HALL
22795 BARTON ROAD
GRAND TERRACE, CALIFORNIA 92313

HESPERIA, CITY OF:
CITY HALL
9700 SEVENTH AVENUE
HESPERIA, CALIFORNIA 92345

HIGHLAND, CITY OF:
CITY HALL
27215 BASE LINE STREET
HIGHLAND, CALIFORNIA 92346

LOMA LINDA, CITY OF:
CITY HALL
25541 BARTON ROAD
LOMA LINDA, CALIFORNIA 92354

MONTCLAIR, CITY OF:
CITY HALL
5111 BENITO STREET
MONTCLAIR, CALIFORNIA 91763

NEEDLES, CITY OF:
CITY HALL
ENGINEERING DEPARTMENT
817 THIRD STREET
NEEDLES, CALIFORNIA 92363

ONTARIO, CITY OF:
CITY HALL
ENGINEERING DEPARTMENT PUBLIC COUNTER
303 EAST B STREET
ONTARIO, CALIFORNIA 91764

RANCHO CUCAMONGA, CITY OF:
CITY HALL
ENGINEERING DEPARTMENT PLAZA LEVEL
10500 CIVIC CENTER DRIVE
RANCHO CUCAMONGA, CALIFORNIA 91730

REDLANDS, CITY OF:
CITY HALL
35 CAJON STREET
REDLANDS, CALIFORNIA 92373

RIALTO, CITY OF:
CITY HALL
150 SOUTH PALM AVENUE
RIALTO, CALIFORNIA 92376

SAN BERNARDINO, CITY OF:
CITY HALL
300 NORTH D STREET
SAN BERNARDINO, CALIFORNIA 92418

SAN BERNARDINO COUNTY (UNINCORPORATED AREAS):
PUBLIC WORKS DEPARTMENT
WATER RESOURCES DEPARTMENT
825 EAST THIRD STREET
SAN BERNARDINO, CALIFORNIA 92415

TWENTYNINE PALMS, CITY OF:
CITY HALL
6136 ADOBE ROAD
TWENTYNINE PALMS, CALIFORNIA 92277

UPLAND, CITY OF:
CITY HALL
460 NORTH EUCLID AVENUE
UPLAND, CALIFORNIA 91786

VICTORVILLE, CITY OF:
CITY HALL
PLANNING DEPARTMENT
14343 CIVIC DRIVE
VICTORVILLE, CALIFORNIA 92393

YUCAIPA, CITY OF:
CITY HALL
34272 YUCAIPA BOULEVARD
YUCAIPA, CALIFORNIA 92399

YUCCA VALLEY, TOWN OF:
PLANNING DIVISION
MONTEREY BUSINESS CENTER
58928 BUSINESS CENTER DRIVE
YUCCA VALLEY, CALIFORNIA 92284

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

MAP INDEX

FIRM
FLOOD INSURANCE RATE MAP

SAN BERNARDINO COUNTY, CALIFORNIA
AND INCORPORATED AREAS
(SEE LISTING OF COMMUNITIES TABLE)

MAP INDEX
SHEET 2 OF 2

PANELS PRINTED: [illegible]

(SEE SHEET 1 FOR ADDITIONAL PANELS PRINTED)

MAP NUMBER
06071CIND2E

MAP REVISED
SEPTEMBER 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11 North. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by the San Bernardino County ISD GIS Department, United States Geological Survey, the Bureau of Land Management, the United States Department of Agriculture, and the National Geodetic Survey. The imagery was flown by U.S. Department of Agriculture Farm Sevice Agency in 2012 and was produced with a 1-meter ground sampling distance.

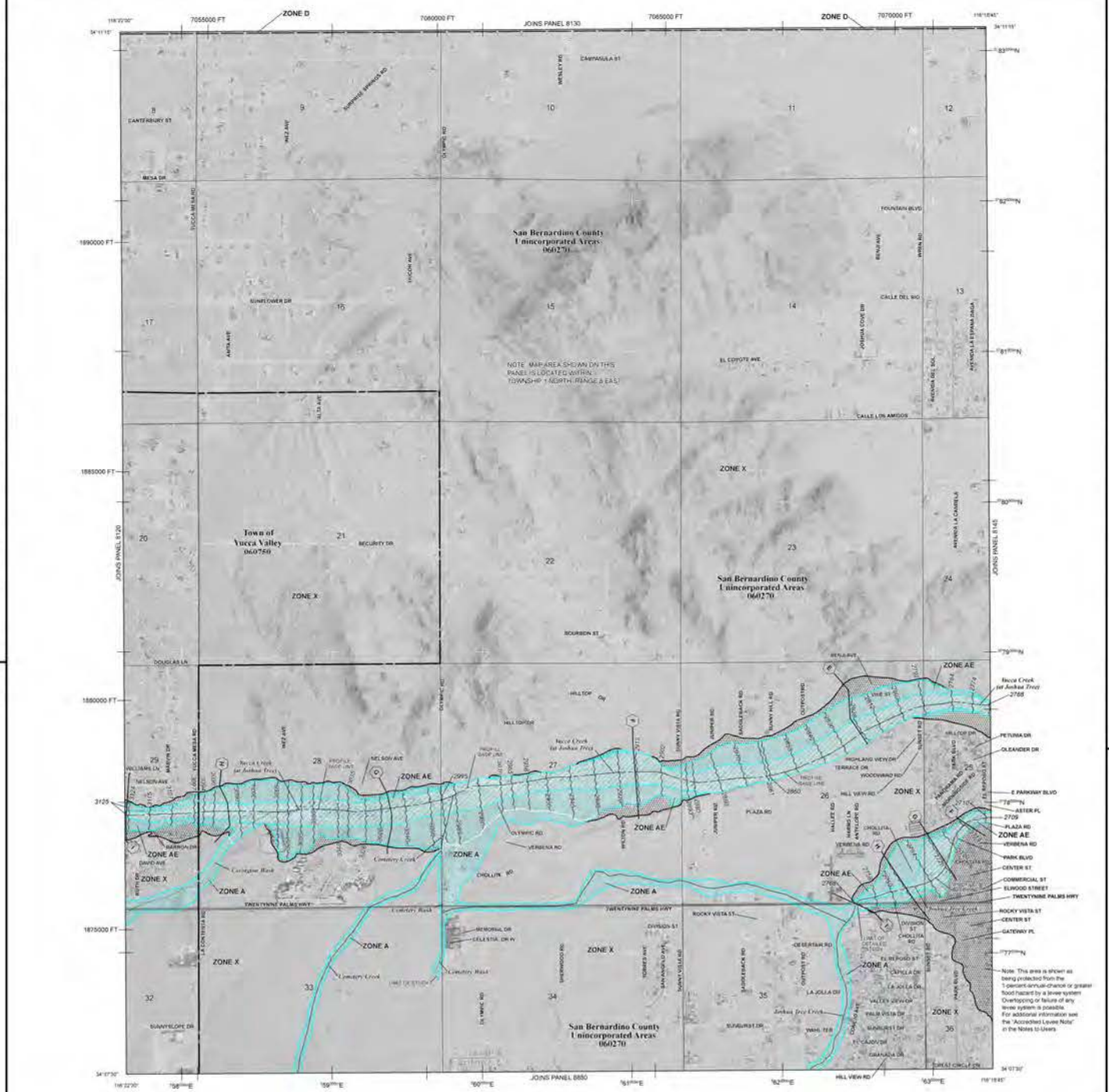
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

ACCREDITED LEVEE NOTES TO USERS: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA website at http://www.fema.gov/business/nfip/index.shtm.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referred to the North American Vertical Datum of 1988

- (A)–(A) Cross section line.
- (23)–(23) Transect line.
- 87°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1000-meter Universal Transverse Mercator grid values, zone 11
- 6000000 FT 5000-foot grid ticks: California State Plane coordinate system, Zone V (FIPSZONE = 405), Lambert projection
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 2, 2016 – to change Base Flood Elevations, to add Base Flood Elevations, to change Special Flood Hazard Areas, to add Special Flood Hazard Areas, to change zone designations, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 8140J

FIRM
FLOOD INSURANCE RATE MAP
SAN BERNARDINO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 8140 OF 9400

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

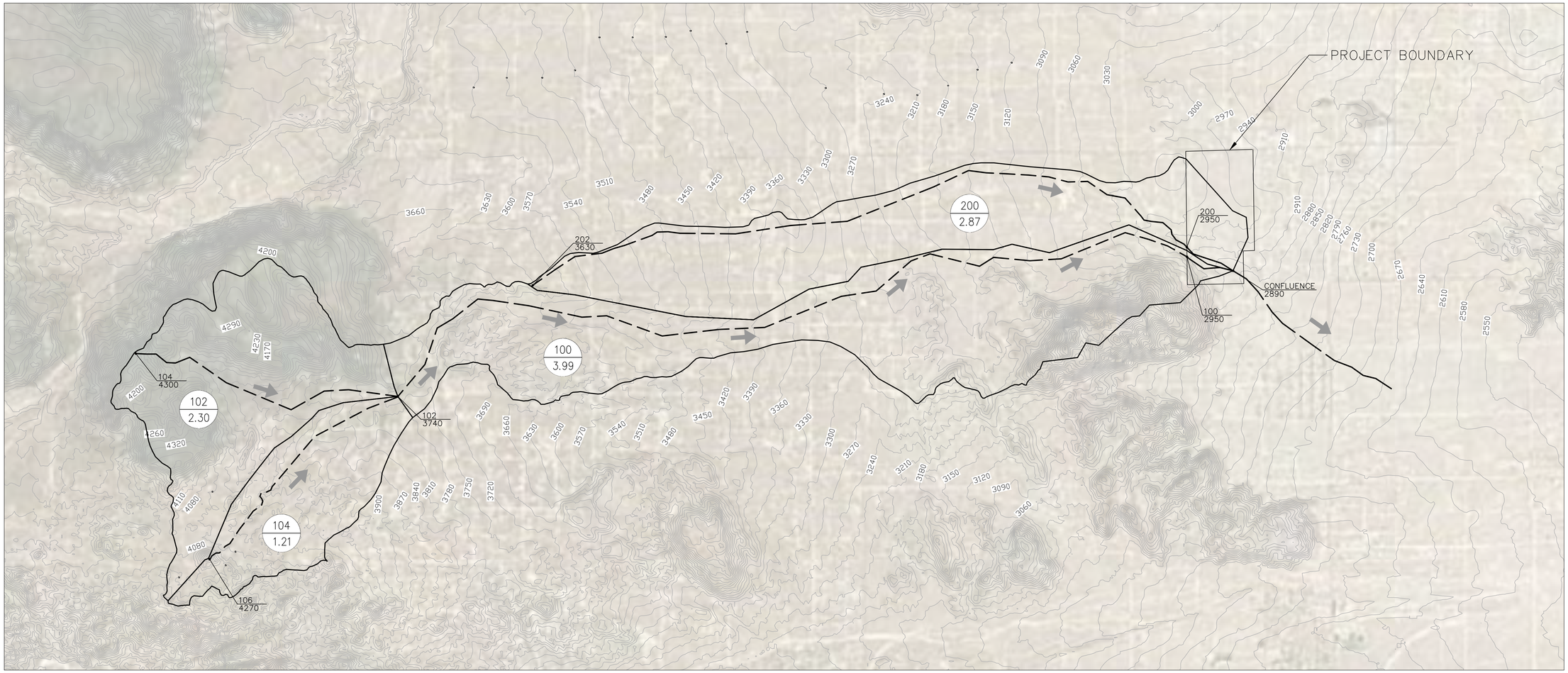
COMMUNITY	NUMBER	PANEL	SUFFIX
SAN BERNARDINO COUNTY	060270	8140	J
YUCCA VALLEY, TOWN OF	060750	8140	J

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

MAP NUMBER
06071C8140J

MAP REVISED
SEPTEMBER 2, 2016

Federal Emergency Management Agency



LEGEND

- 101 / 6.1 — BASIN I.D. / AREA (SQUARE MILES)
- 175.2 / 3520 — NODE I.D. / INVERT ELEVATION (FT)
- BASIN BOUNDARY
- FLOW DIRECTION
- FLOW PATH
- PROJECT BOUNDARY
- 3350 — CONTOUR ELEVATION (FEET)

0 1000 2000 4000 Feet

1:24000.05

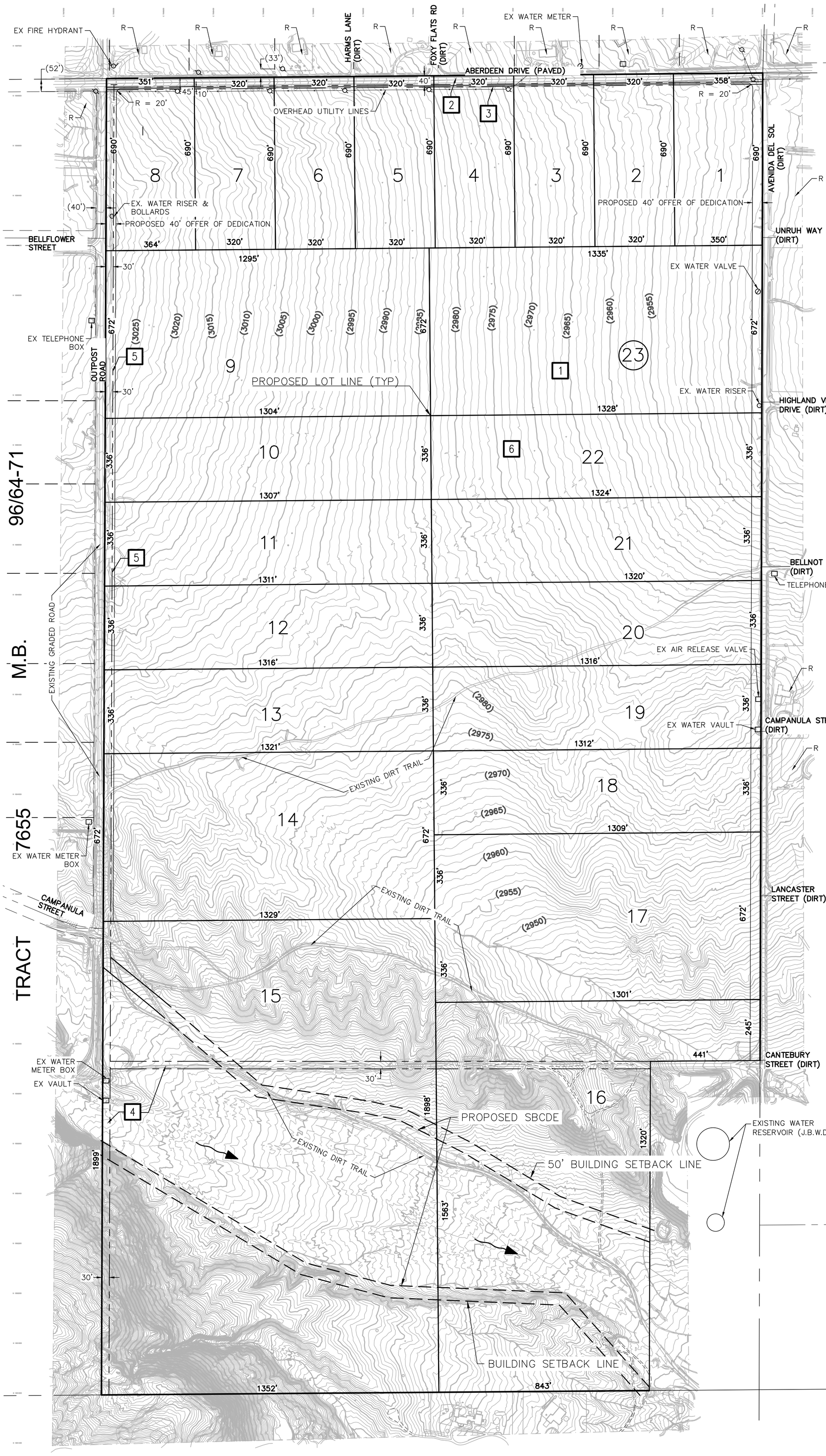
SCALE 1:2000	N|V|5	SAN BERNARDINO COUNTY
JOB NUMBER 227521-0000165	15092 AVENUE OF SCIENCE, SUITE 200 SAN DIEGO, CA 92128 858.385.0500 TEL 858.385.0400 FAX WWW.NV5.COM	JT304, LLC
CREATED: 01/05/2022		EXISTING CONDITION HYDROLOGY WORK MAP PAGE 1

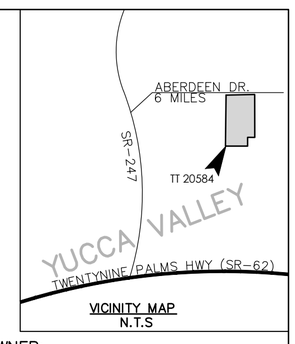
\\NV5.COM\PANZURA\INF\PROJECTS\2275--SD\227521-0000165\HH\CAD\MARMON_HYDROLOGY_WORKMAP.DWG 3/4/2022 12:06 PM

SAN BERNARDINO COUNTY, STATE OF CALIFORNIA

TENTATIVE TRACT MAP No. 20584

BEING A SUBDIVISION OF A PORTION OF THE EAST ONE-HALF OF SECTION 11, T.I.N. , R.6E, S.B.B&M





VICINITY MAP
N.T.S

APPLICANT AND OWNER:
JT304 LLC
18340 VENTURA BLVD SUITE 218
TARZANA, CA 91358
(619) 521 3500

NOTES:
1. GRADING ON LOTS IS NOT PROPOSED WITH SUBDIVISION.
2. NUMBER OF SUBDIVISION PHASES PROPOSED: ONE
3. THE SUBDIVIDER OWNS NOW CONTIGUOUS LAND
4. CURRENT ZONING DESIGNATION OF ALL SURROUNDING LAND: JT/RL

LEGAL DESCRIPTION

THE EAST ½ OF SECTION 11, TOWNSHIP 1 NORTH, RANGE 6 EAST, SAN BERNARDINO MERIDIAN, IN THE COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF.

EXCEPT THEREFROM THE FOLLOWING:

BEGINNING AT A POINT IN THE EAST LINE OF THE SOUTHEAST ¼ OF THE SOUTHEAST ¼ OF THE SOUTHEAST ¼ OF SAID SECTION 11 WHICH IS 66.95 FEET SOUTHERLY THE NORTHEAST CORNER THEREOF, THENCE WESTERLY AT RIGHT ANGLES TO SAID EASTERLY LINE A DISTANCE OF 40 FEET TO THE TRUE POINT OF BEGINNING: THENCE CONTINUING WESTERLY A DISTANCE OF 200 FEET; THENCE NORTHERLY AT RIGHT ANGLES, A DISTANCE OF 200 FEET; THENCE EASTERLY AT RIGHT ANGLES, A DISTANCE OF 200 FEET; THENCE SOUTHERLY A DISTANCE OF 200 FEET TO THE TRUE POINT OF BEGINNING.

ALSO EXCEPTING THEREFROM THAT PORTION DEEDED TO THE JOSHUA BASIN WATER DISTRICT ON JULY 8, 1999 AS INSTRUMENT NO. 99-288005, OFFICIAL RECORDS.

NUMBER OF PROPOSED LOTS: 23

AVERAGE LOT SIZE: 13.3 ACRES (GROSS)

MINIMUM LOT SIZE: 5.1 ACRES (GROSS)

EXISTING AND PROPOSED GENERAL PLAN DESIGNATION: JT/RL

EXISTING LAND USE: VACANT

PROPOSED LAND USE: 23 LOTS FOR PROPOSED FUTURE RESIDENCES

TOTAL GROSS AREA: APPROX. 306 ACRES (13,330,000 S.F.)

TOTAL NET AREA: APPROX. 304 ACRES (13,240,000 S.F.)

GROSS AREA OF LOTS

LOT ID	SQ. FT.	ACRES
1	244,000	5.61
2	221,000	5.10
3	221,000	5.10
4	221,000	5.10
5	221,000	5.10
6	221,000	5.10
7	221,000	5.10
8	245,000	5.60
9	873,000	20.10
10	439,000	10.10
11	440,000	10.1
12	441,000	10.1
13	443,000	10.2
14	890,000	20.4
15	2,544,000	58.4
16	1,440,000	33.1
17	876,000	20.1
18	440,000	10.1
19	441,000	10.1
20	443,000	10.2
21	444,000	10.2
22	445,000	10.2
23	894,000	20.5

UTILITY PURVEYORS

WATER	JOSHUA BASIN WATER DISTRICT (J.B.W.D.) 61750 CHOLLITA RD JOSHUA TREE, CALIFORNIA 92252 ATTENTION: XXX PHONE: (760)366-8438
TELEPHONE	FRONTIER COMMUNICATIONS 295 N. SUNRISE WAY PALM SPRINGS, CALIFORNIA 92262 PHONE: (760)778-3603
ELECTRICITY	SOUTHERN CALIFORNIA EDISON 6999 OLD WOMAN SPRINGS ROAD YUCCA VALLEY, CALIFORNIA 92284 PHONE: (760)369-5449E
NATURAL GAS	THE GAS COMPANY 7320 PIONEERTOWN ROAD YUCCA VALLEY, CALIFORNIA 92284 PHONE: (760)228-0908
TV CABLE	SPECTRUM 83-473 AVENUE 45 INDIO, CA 92201 PHONE: (760)674-5455
REFUSE DISPOSAL	BURRTEC 4878 NEWTON ROAD YUCCA VALLEY, CALIFORNIA 92284 PHONE: (760)365-2015

LEGEND

- PROPOSED LOT LINE
- BUILDING SETBACK LINE
- EXISTING UTILITY POLE
- EXISTING LOT LINE
- EXISTING TOPOGRAPHY
- B.S.L. — BUILDING SETBACK LINE
- S.B.C.D.E. — SAN BERNARDINO COUNTY DRAINAGE EASEMENT
- (–) — EXISTING DIMENSION
- DIRECTION OF WATER FLOW OR DOWNWARD GRADIENT
- R — EXISTING RESIDENCE
- # — EASEMENT NOTE NUMBER

EASEMENT NOTES

1. UTILITY EASEMENT RESERVATION PER BOOK 2523, PAGE 209 OF OFFICIAL RECORDS. AFFECTS THE ENTIRETY OF THE SUBJECT PARCEL. (TITLE REPORT EXCEPTION NUMBER 1)
2. AN EASEMENT FOR HIGHWAY AND ROAD PURPOSES TO THE COUNTY OF SAN BERNARDINO PER BOOK 6610, PAGE 857 OF OFFICIAL RECORDS. (TITLE REPORT EXCEPTION NUMBER 2)
3. AN EASEMENT TO SOUTHERN CALIFORNIA EDISON COMPANY, A CORPORATION FOR POLE LINES AND CONDUITS PER BOOK 6828, PAGE 726 OF OFFICIAL RECORDS. (TITLE REPORT EXCEPTION NUMBER 3)
4. AN EASEMENT TO JOSHUA BASIN COUNTY WATER DISTRICT FOR ABOVE GROUND OR UNDERGROUND CONDUITS OR BOTH PER BOOK 8815, PAGE 1300 OF OFFICIAL RECORDS (TITLE REPORT ITEM NUMBER 4)
5. AN EASEMENT TO JOSHUA BASIN WATER DISTRICT FOR ABOVE OR UNDERGROUND CONDUITS OR BOTH PER INSTRUMENT NO. 90-411181 (TITLE REPORT ITEM NUMBER 5)
6. RESERVATIONS, EXCEPTIONS AND PROVISIONS CONTAINED IN THE PATENT FROM THE UNITED STATES OF AMERICA, AND IN THE ACTS AUTHORIZING THE ISSUANCE THEREOF PER INSTRUMENT NUMBER 2005-0149016 (TITLE REPORT ITEM NO. 6) AFFECTS THE ENTIRETY OF THE SUBJECT PARCEL.

0' 200' 400' 600'
SCALE 1"= 200'

N

REGISTERED PROFESSIONAL ENGINEER
VICKIE L. BRIDENSTINE
No. 57142
CIVIL
STATE OF CALIFORNIA

R.C.E VICKIE L. BRIDENSTINE

PREPARATION DATE
OCTOBER 26, 2022

NOTE:
NO EXISTING WELLS WERE OBSERVED ONSITE OR ON THE SURROUNDING PROPERTIES DURING OUR FIELD INVESTIGATION

REVISIONS

DATE	DESCRIPTION	BY

N|V5
42-829 COOK ST., SUITE 104 PALM DESERT, CA 92211
760.341.3101 TEL 760.341.5999 FAX WWW.NV5.COM

APPENDIX B

Hydrologic Reference

USGS 1 arc-second n35w117 1 x 1 degree

View

Dates

Publication Date :
2019-09-17
Start Date :
2018-05-27
End Date :
2018-10-12
File Modification Date :
2021-12-01 00:17:16

Citation

U.S. Geological Survey, 20190917, USGS 1 arc-second n35w117 1 x 1 degree: U.S. Geological Survey.

Summary

This tile of the 3D Elevation Program (3DEP) seamless products is 1 arc-second resolution. 3DEP data serve as the elevation layer of The National Map, and provide basic elevation information for Earth science studies and mapping applications in the United States. Scientists and resource managers use 3DEP data for global change research, hydrologic modeling, resource monitoring, mapping and visualization, and many other applications. 3DEP data compose an elevation dataset that consists of seamless layers and a high resolution layer. Each of these layers consists of the best available raster elevation data of the conterminous United States, Alaska, Hawaii, territorial islands, Mexico and Canada. 3DEP data are updated continually as new [...]

Contacts

Publisher :
U.S. Geological Survey (/catalog/catalogParty/show?partyId=U.S.+Geological+Survey)
Originator :
U.S. Geological Survey (/catalog/catalogParty/show?partyId=U.S.+Geological+Survey)
Metadata Contact :
U.S. Geological Survey (/catalog/catalogParty/show?partyId=U.S.+Geological+Survey)
Distributor :
U.S. Geological Survey (/catalog/catalogParty/show?partyId=U.S.+Geological+Survey)

Attached Files

Related External Resources

Type: Online Link

Web Link	https://nationalmap.gov/elevation.html (https://nationalmap.gov/elevation.html)
Web Link	https://nationalmap.gov/viewer.html (https://nationalmap.gov/viewer.html)

Type: Original Metadata

3D Elevation Program (3DEP) Metadata	https://nationalmap.gov/3DEP/3dep_prodmetadata.html (https://nationalmap.gov/3DEP/3dep_prodmetadata.html)
Product Metadata	https://thor-f5.er.usgs.gov/ngtoc/metadata/waf/elevation/1_arc-second/geotiff/undefined/USGS_1_n35w117_20190917.xml (https://thor-f5.er.usgs.gov/ngtoc/metadata/waf/elevation/1_arc-second/geotiff/undefined/USGS_1_n35w117_20190917.xml)

Type: Browse Image

Thumbnail JPG image	https://prd-tnm.s3.amazonaws.com/StagedProducts/Elevation/StagedProducts/Elevation/1/TIFF/historical/n35w117/USGS_1_n35w117_20190917.jpg (https://prd-tnm.s3.amazonaws.com/StagedProducts/Elevation/StagedProducts/Elevation/1/TIFF/historical/n35w117/USGS_1_n35w117_20190917.jpg)

Type: Download

TIFF	https://prd-tnm.s3.amazonaws.com/StagedProducts/Elevation/1/TIFF/historical/n35w117/USGS_1_n35w117_20190917.tif (https://prd-tnm.s3.amazonaws.com/StagedProducts/Elevation/1/TIFF/historical/n35w117/USGS_1_n35w117_20190917.tif)

Purpose

The 3DEP data serves as the elevation layer of The National Map, and provides basic elevation information for Earth science studies and mapping applications in the United States. The data are utilized by the scientific and resource management communities for global change research, hydrologic modeling, resource monitoring, mapping and visualization applications.

Preview Image


Thumbnail JPG image

Thumbnail JPG image

Map » (/catalog/item/imap/5df04e92e4b02caea0f4f8be)

(/catalog/item/imap/5df04e92e4b02caea0f4f8be)

Communities

- National Geospatial Program
- The National Map ✱

Tags

Theme : 1 arc-second DEM (/catalog/items?q=&filter=tags%3D1+arc-second+DEM), 1 x 1 degree (/catalog/items?q=&filter=tags%3D1+x+1+degree), 1-degree DEM (/catalog/items?q=&filter=tags%3D1-degree+DEM), 3D Elevation Program (/catalog/items?q=&filter=tags%3D3D+Elevation+Program), 3DEP (/catalog/items?q=&filter=tags%3D3DEP), Bare Earth (/catalog/items?q=&filter=tags%3DBare+Earth), Cartography (/catalog/items?q=&filter=tags%3DCartography), DEM (/catalog/items?q=&filter=tags%3DDEM), Digital Elevation Model (/catalog/items?q=&filter=tags%3DDigital+Elevation+Model), Digital Mapping (/catalog/items?q=&filter=tags%3DDigital+Mapping), Digital Terrain Model (/catalog/items?q=&filter=tags%3DDigital+Terrain+Model), Downloadable Data (/catalog/items?q=&filter=tags%3DDownloadable+Data), Elevation (/catalog/items?q=&filter=tags%3DElevation), Elevation (/catalog/items?q=&filter=tags%3DElevation), Elevation (/catalog/items?q=&filter=tags%3DElevation), GIS (/catalog/items?q=&filter=tags%3DGIS), GeoTIFF (/catalog/items?q=&filter=tags%3DGeoTIFF), Geodata (/catalog/items?q=&filter=tags%3DGeodata), Geographic Information System (/catalog/items?q=&filter=tags%3DGeographic+Information+System), Grid (/catalog/items?q=&filter=tags%3DGrid), High Resolution (/catalog/items?q=&filter=tags%3DHigh+Resolution), Hydro-Flattened (/catalog/items?q=&filter=tags%3DHydro-Flattened), IFSAR (/catalog/items?q=&filter=tags%3DIFSAR), Interferometric Synthetic Aperture Radar (/catalog/items?q=&filter=tags%3DInterferometric+Synthetic+Aperture+Radar), LIDAR (/catalog/items?q=&filter=tags%3DLIDAR), Light Detection And Ranging (/catalog/items?q=&filter=tags%3DLight+Detection+And+Ranging), Mapping (/catalog/items?q=&filter=tags%3DMapping), NED (/catalog/items?q=&filter=tags%3DNED), National Elevation Dataset (NED) (/catalog/items?q=&filter=tags%3DNational+Elevation+Dataset+%28NED%29), National Elevation Dataset (NED) 1 arc-second (/catalog/items?q=&filter=tags%3DNational+Elevation+Dataset+%28NED%29+1+arc-second), National Elevation Dataset (NED) 1 arc-second Current (/catalog/items?q=&filter=tags%3DNational+Elevation+Dataset+%28NED%29+1+arc-second+Current), National Elevation Dataset (/catalog/items?q=&filter=tags%3DNational+Elevation+Dataset), Raster (/catalog/items?q=&filter=tags%3DRaster), Terrain Elevation (/catalog/items?

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Place : US (/catalog/items?q=&filter=tags%3DUS), United States (/catalog/items?q=&filter=tags%3DUnited+States)

Provenance

Data source : NGP Product Inventory System

Additional Information

Identifiers

Type	Scheme	Key
uuid	inventory	c1fe4ee2-cf01-5a1b-9061-772cd9dcb554

Item Actions

View Item as ...

JSON (/catalog/item/5df04e92e4b02caea0f4f8be?format=json)

ATOM (/catalog/item/5df04e92e4b02caea0f4f8be?format=atom)

ISO XML (/catalog/item/5df04e92e4b02caea0f4f8be?format=isohtml)

Save Item as ...

JSON (/catalog/item/download/5df04e92e4b02caea0f4f8be?format=json)

FGDC (/catalog/item/download/5df04e92e4b02caea0f4f8be?format=fgdc)

MODS XML (/catalog/item/download/5df04e92e4b02caea0f4f8be?format=modsxml)

ISO XML (/catalog/item/download/5df04e92e4b02caea0f4f8be?format=iso)

View Item...

Metrics (/catalog/item/metrics/5df04e92e4b02caea0f4f8be)

App Version: 2.182.3

USGS Watershed Boundary Dataset (WBD) for 2-digit Hydrologic Unit - 18 (published 20201204)

View

Dates

Publication Date :
2020-12-04
Start Date :
1980-01-01
End Date :
2016-01-01
File Modification Date :
2021-03-30 14:47:53

Citation

U.S. Geological Survey (USGS), 20201204, USGS Watershed Boundary Dataset (WBD) for 2-digit Hydrologic Unit - 18 (published 20201204): U.S. Geological Survey (USGS).

Summary

The Watershed Boundary Dataset (WBD) is a comprehensive aggregated collection of hydrologic unit data consistent with the national criteria for delineation and resolution. It defines the areal extent of surface water drainage to a point except in coastal or lake front areas where there could be multiple outlets as stated by the "Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD)" "Standard" (https://pubs.usgs.gov/tm/11/a3/). Watershed boundaries are determined solely upon science-based hydrologic principles, not favoring any administrative boundaries or special projects, nor particular program or agency. This dataset represents the hydrologic unit boundaries to the 12-digit (6th level) for the entire [...]

Contacts

Publisher :
Unknown (/catalog/catalogParty/show?partyId=Unknown)
Originator :
U.S. Geological Survey (USGS) (/catalog/catalogParty/show?partyId=U.S.+Geological+Survey+%28USGS%29)
Point of Contact :
U.S. Geological Survey (/catalog/catalogParty/show?partyId=U.S.+Geological+Survey)
Metadata Contact :
Unknown (/catalog/catalogParty/show?partyId=Unknown)

Distributor :
U.S. Geological Survey (/catalog/catalogParty/show?partyId=U.S.+Geological+Survey)

Attached Files

Related External Resources

Type: Original Metadata

Product Metadata	https://thor-f5.er.usgs.gov/ngtoc/metadata/waf/hydrography/wbd/filegdb101/WBD_18_HU2_GDB.xml (https://thor-f5.er.usgs.gov/ngtoc/metadata/waf/hydrography/wbd/filegdb101/WBD_18_HU2_GDB.xml)

Type: Browse Image

Thumbnail JPG image	https://prd-tnm.s3.amazonaws.com/StagedProducts/Hydrography/WBD/HU2/GDB/WBD_18_HU2_GDB.jpg (https://prd-tnm.s3.amazonaws.com/StagedProducts/Hydrography/WBD/HU2/GDB/WBD_18_HU2_GDB.jpg)

Type: Download

FileGDB	https://prd-tnm.s3.amazonaws.com/StagedProducts/Hydrography/WBD/HU2/GDB/WBD_18_HU2_GDB.zip (https://prd-tnm.s3.amazonaws.com/StagedProducts/Hydrography/WBD/HU2/GDB/WBD_18_HU2_GDB.zip)

Purpose

The intent of defining Hydrologic Units (HU) within the Watershed Boundary Dataset is to establish a base-line drainage boundary framework, accounting for all land and surface areas. Hydrologic units are intended to be used as a tool for water-resource management and planning activities particularly for site-specific and localized studies requiring a level of detail provided by large-scale map information. The WBD complements the National Hydrography Dataset (NHD) and supports numerous programmatic missions and activities including: watershed management, rehabilitation and enhancement, aquatic species conservation strategies, flood plain management and flood prevention, water-quality initiatives and programs, dam safety programs, fire assessment and management, resource inventory and assessment, water data analysis and water census.

Preview Image

Thumbnail JPG image

Map » (/catalog/item/imap/5a1632b8e4b09fc93dd1720f)

(/catalog/item/imap/5a1632b8e4b09fc93dd1720f)

Communities

- National Geospatial Program
- The National Map ✱

Tags

Theme : 10-digit (/catalog/items?q=&filter=tags%3D10-digit), 12-digit (/catalog/items?q=&filter=tags%3D12-digit), 14-digit (/catalog/items?q=&filter=tags%3D14-digit), 16-digit (/catalog/items?q=&filter=tags%3D16-digit), 2-digit (/catalog/items?q=&filter=tags%3D2-digit), 4-digit (/catalog/items?q=&filter=tags%3D4-digit), 6-digit (/catalog/items?q=&filter=tags%3D6-digit), 8-digit (/catalog/items?q=&filter=tags%3D8-digit), Basin (/catalog/items?q=&filter=tags%3DBasin), Downloadable Data (/catalog/items?q=&filter=tags%3DDownloadable+Data), FileGDB 10.1 (/catalog/items?q=&filter=tags%3DFileGDB+10.1), FileGDB 10.1 (/catalog/items?q=&filter=tags%3DFileGDB+10.1), HU-2 Region (/catalog/items?q=&filter=tags%3DHU-2+Region), HU-2 Region (/catalog/items?q=&filter=tags%3DHU-2+Region), HUC (/catalog/items?q=&filter=tags%3DHUC), Hydrography (/catalog/items?q=&filter=tags%3DHydrography), Hydrologic Unit Code (/catalog/items?q=&filter=tags%3DHydrologic+Unit+Code), Hydrologic Units (/catalog/items?q=&filter=tags%3DHydrologic+Units), National Watershed Boundary Dataset (WBD) (/catalog/items?q=&filter=tags%3DNational+Watershed+Boundary+Dataset+%28WBD%29), National Watershed Boundary Dataset (WBD) (/catalog/items?q=&filter=tags%3DNational+Watershed+Boundary+Dataset+%28WBD%29), Region (/catalog/items?q=&filter=tags%3DRegion), Sub-basin (/catalog/items?q=&filter=tags%3DSub-basin), Sub-region (/catalog/items?q=&filter=tags%3DSub-region), Subwatershed (/catalog/items?q=&filter=tags%3DSubwatershed), WBD (/catalog/items?q=&filter=tags%3DWBD), Watershed (/catalog/items?q=&filter=tags%3DWatershed), Watershed Boundary Dataset (/catalog/items?q=&filter=tags%3DWatershed+Boundary+Dataset), inlandWaters (/catalog/items?q=&filter=tags%3DinlandWaters)

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q=&filter=tags%3DTuolumne+County), US (/catalog/items?q=&filter=tags%3DUS), US

(/catalog/items?q=&filter=tags%3DUS), United States (/catalog/items?q=&filter=tags%3DUnited+States), United States (/catalog/items?q=&filter=tags%3DUnited+States), Ventura County (/catalog/items?q=&filter=tags%3DVentura+County), Washoe County (/catalog/items?q=&filter=tags%3DWashoe+County), Yolo County (/catalog/items?q=&filter=tags%3DYolo+County), Yuba County (/catalog/items?q=&filter=tags%3DYuba+County)

Provenance

Data source : NGP Product Inventory System

Additional Information

Identifiers

Type	Scheme	Key
uuid	inventory	334f7f6a-71d3-9317-e7e1-77e9a0dc0574

Item Actions

View Item as ...

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Save Item as ...

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FGDC (/catalog/item/download/5a1632b8e4b09fc93dd1720f?format=fgdc)

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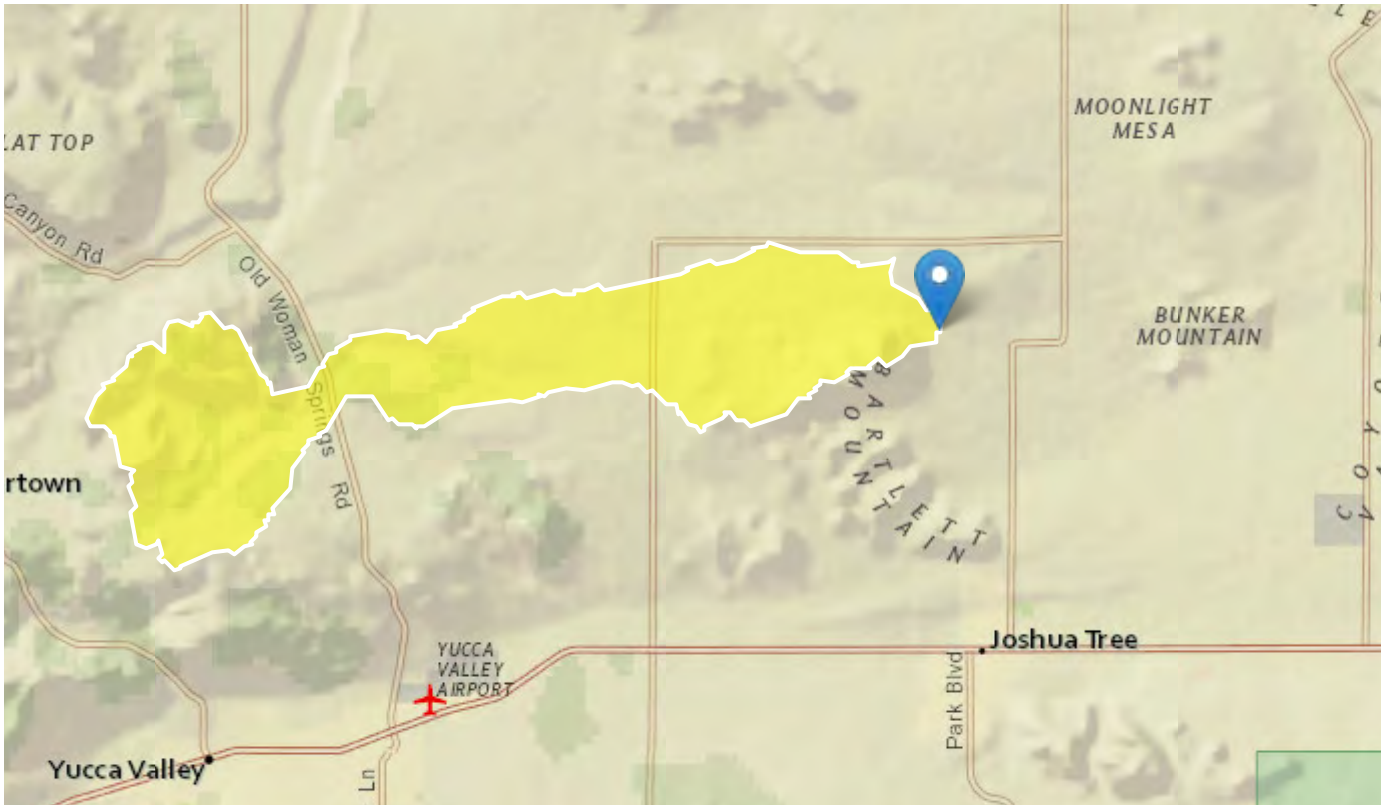
View Item...

Metrics (/catalog/item/metrics/5a1632b8e4b09fc93dd1720f)

App Version: 2.182.3

StreamStats Report

Region ID: CA
Workspace ID: CA20220111171118111000
Clicked Point (Latitude, Longitude): 34.18018, -116.32032
Time: 2022-01-11 09:11:41 -0800



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	9.9	square miles

Peak-Flow Statistics Parameters [2012 5113 Region 6 Desert]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	9.9	square miles	0.04	173

Peak-Flow Statistics Flow Report [2012 5113 Region 6 Desert]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	ASEp
50-percent AEP flood	32.9	ft^3/s	214
20-percent AEP flood	191	ft^3/s	226
10-percent AEP flood	482	ft^3/s	248
4-percent AEP flood	1290	ft^3/s	298
2-percent AEP flood	2420	ft^3/s	357
1-percent AEP flood	4310	ft^3/s	444
0.5-percent AEP flood	7240	ft^3/s	575
0.2-percent AEP flood	13700	ft^3/s	856

Peak-Flow Statistics Citations

Gotvald, A.J., Barth, N.A., Veilleux, A.G., and Parrett, Charles,2012, Methods for determining magnitude and frequency of floods in California, based on data through water year 2006: U.S. Geological Survey Scientific Investigations Report 2012–5113, 38 p., 1 pl. (http://pubs.usgs.gov/sir/2012/5113/)

Application Version: 4.6.2
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

Basin 104 Precipitation Data

NOAA Atlas 14, Volume 6, Version 2
Location name: Yucca Valley, California, USA*
Latitude: 34.1641°, Longitude: -116.4402°
Elevation: 3844.54 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.093 (0.077-0.113)	0.135 (0.112-0.165)	0.198 (0.163-0.243)	0.255 (0.209-0.315)	0.342 (0.271-0.437)	0.418 (0.324-0.545)	0.503 (0.380-0.672)	0.601 (0.442-0.825)	0.751 (0.530-1.07)	0.922 (0.629-1.37)
10-min	0.133 (0.110-0.162)	0.194 (0.160-0.237)	0.284 (0.234-0.348)	0.366 (0.299-0.452)	0.491 (0.388-0.626)	0.599 (0.464-0.781)	0.721 (0.545-0.963)	0.861 (0.633-1.18)	1.08 (0.760-1.54)	1.32 (0.901-1.96)
15-min	0.161 (0.133-0.196)	0.235 (0.194-0.287)	0.344 (0.283-0.421)	0.442 (0.362-0.546)	0.593 (0.469-0.757)	0.724 (0.561-0.944)	0.872 (0.659-1.16)	1.04 (0.766-1.43)	1.30 (0.919-1.86)	1.60 (1.09-2.37)
30-min	0.244 (0.202-0.297)	0.356 (0.295-0.436)	0.522 (0.430-0.639)	0.671 (0.549-0.830)	0.901 (0.712-1.15)	1.10 (0.852-1.43)	1.32 (1.00-1.77)	1.58 (1.16-2.17)	1.98 (1.40-2.83)	2.42 (1.65-3.59)
60-min	0.340 (0.282-0.415)	0.498 (0.411-0.608)	0.729 (0.601-0.893)	0.938 (0.767-1.16)	1.26 (0.995-1.61)	1.54 (1.19-2.00)	1.85 (1.40-2.47)	2.21 (1.62-3.03)	2.76 (1.95-3.95)	3.39 (2.31-5.01)
2-hr	0.469 (0.388-0.572)	0.661 (0.546-0.807)	0.937 (0.772-1.15)	1.18 (0.967-1.46)	1.55 (1.23-1.98)	1.86 (1.44-2.42)	2.20 (1.67-2.94)	2.59 (1.90-3.55)	3.16 (2.23-4.52)	3.66 (2.49-5.41)
3-hr	0.558 (0.462-0.681)	0.776 (0.642-0.948)	1.09 (0.897-1.33)	1.36 (1.12-1.68)	1.77 (1.40-2.26)	2.11 (1.64-2.76)	2.49 (1.88-3.32)	2.91 (2.14-3.99)	3.52 (2.49-5.04)	4.04 (2.76-5.99)
6-hr	0.735 (0.608-0.897)	1.01 (0.838-1.24)	1.41 (1.16-1.72)	1.75 (1.43-2.16)	2.25 (1.78-2.87)	2.66 (2.06-3.47)	3.11 (2.35-4.15)	3.60 (2.65-4.94)	4.31 (3.04-6.17)	4.91 (3.35-7.27)
12-hr	0.925 (0.765-1.13)	1.28 (1.06-1.57)	1.78 (1.47-2.18)	2.21 (1.81-2.74)	2.84 (2.25-3.63)	3.36 (2.60-4.38)	3.91 (2.96-5.23)	4.52 (3.33-6.21)	5.40 (3.81-7.73)	6.13 (4.18-9.08)
24-hr	1.17 (1.03-1.35)	1.64 (1.45-1.89)	2.31 (2.04-2.67)	2.88 (2.53-3.36)	3.73 (3.16-4.49)	4.42 (3.67-5.43)	5.18 (4.20-6.51)	6.00 (4.73-7.76)	7.21 (5.46-9.71)	8.21 (6.02-11.4)
2-day	1.32 (1.17-1.52)	1.89 (1.67-2.18)	2.70 (2.38-3.12)	3.41 (2.98-3.97)	4.45 (3.77-5.36)	5.33 (4.42-6.54)	6.28 (5.09-7.90)	7.33 (5.78-9.48)	8.88 (6.73-12.0)	10.2 (7.46-14.2)
3-day	1.44 (1.27-1.66)	2.08 (1.84-2.40)	3.00 (2.65-3.47)	3.82 (3.34-4.45)	5.03 (4.27-6.06)	6.06 (5.03-7.44)	7.18 (5.82-9.03)	8.43 (6.65-10.9)	10.3 (7.79-13.8)	11.9 (8.68-16.5)
4-day	1.50 (1.33-1.73)	2.19 (1.94-2.52)	3.17 (2.80-3.67)	4.05 (3.55-4.72)	5.36 (4.54-6.45)	6.47 (5.37-7.95)	7.69 (6.23-9.68)	9.05 (7.14-11.7)	11.1 (8.39-14.9)	12.8 (9.38-17.8)
7-day	1.66 (1.47-1.92)	2.46 (2.17-2.83)	3.60 (3.18-4.16)	4.62 (4.04-5.38)	6.14 (5.20-7.39)	7.43 (6.17-9.13)	8.86 (7.19-11.2)	10.5 (8.25-13.5)	12.9 (9.74-17.3)	14.9 (10.9-20.8)
10-day	1.78 (1.58-2.05)	2.65 (2.34-3.05)	3.89 (3.43-4.49)	4.99 (4.37-5.82)	6.65 (5.64-8.00)	8.05 (6.69-9.90)	9.61 (7.79-12.1)	11.3 (8.95-14.7)	13.9 (10.6-18.8)	16.2 (11.8-22.5)
20-day	1.99 (1.76-2.29)	2.97 (2.63-3.42)	4.37 (3.85-5.05)	5.61 (4.91-6.53)	7.45 (6.31-8.97)	9.01 (7.48-11.1)	10.7 (8.69-13.5)	12.6 (9.97-16.4)	15.5 (11.7-20.9)	18.0 (13.2-25.0)
30-day	2.23 (1.98-2.57)	3.33 (2.95-3.84)	4.90 (4.32-5.66)	6.27 (5.49-7.31)	8.31 (7.04-10.0)	10.0 (8.32-12.3)	11.9 (9.65-15.0)	14.0 (11.0-18.1)	17.1 (13.0-23.1)	19.8 (14.5-27.6)
45-day	2.59 (2.29-2.98)	3.84 (3.40-4.43)	5.60 (4.95-6.48)	7.14 (6.25-8.32)	9.40 (7.97-11.3)	11.3 (9.37-13.9)	13.4 (10.8-16.8)	15.6 (12.3-20.2)	19.1 (14.4-25.7)	21.9 (16.1-30.6)
60-day	2.94 (2.60-3.38)	4.33 (3.83-4.99)	6.27 (5.53-7.24)	7.95 (6.96-9.27)	10.4 (8.82-12.5)	12.5 (10.3-15.3)	14.7 (11.9-18.5)	17.1 (13.5-22.2)	20.8 (15.7-28.0)	23.9 (17.5-33.2)

[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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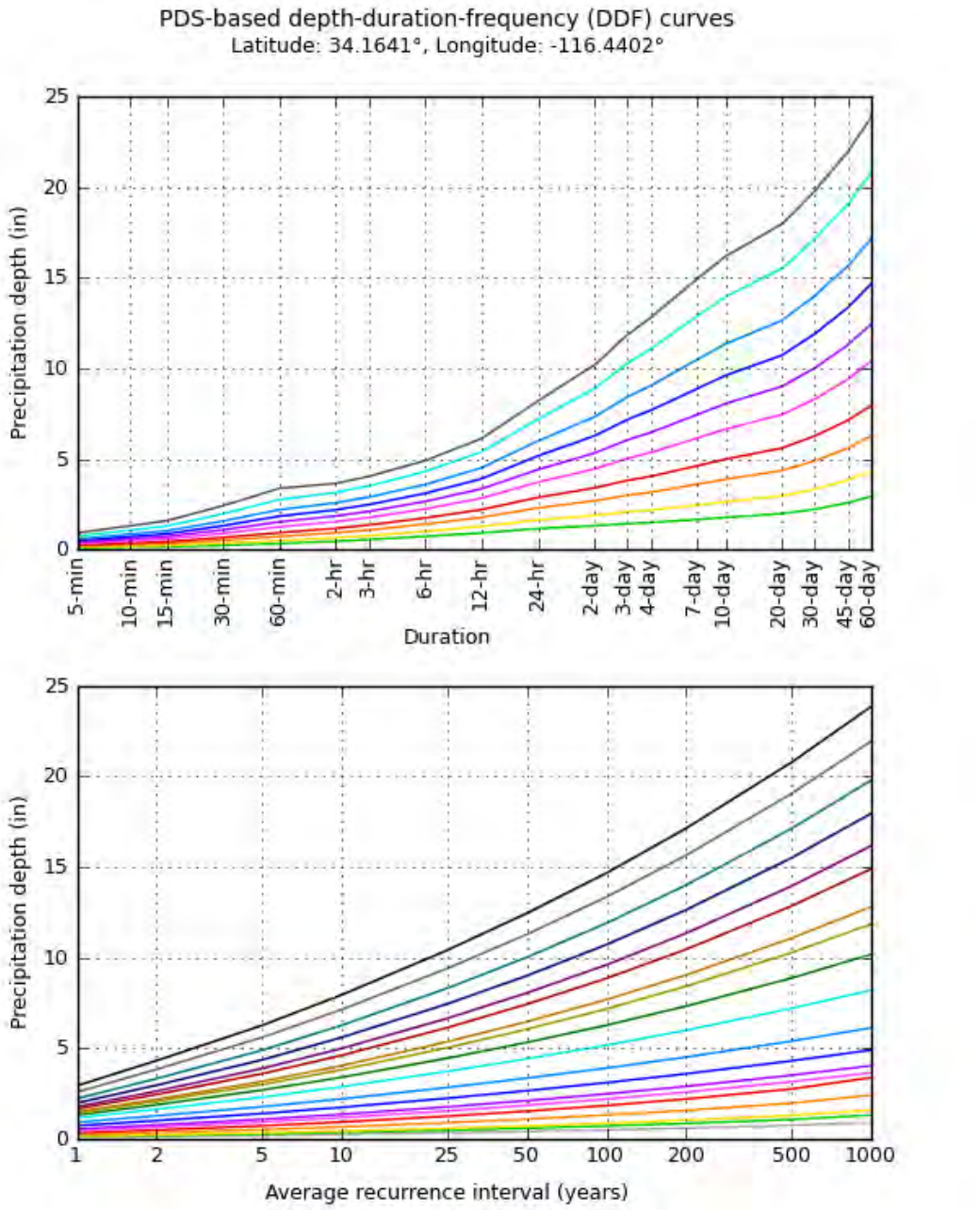
PF graphical



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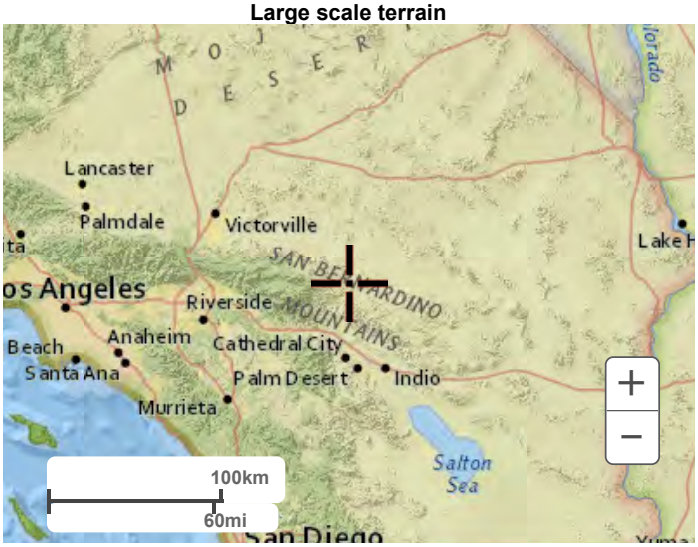
Maps & aerials

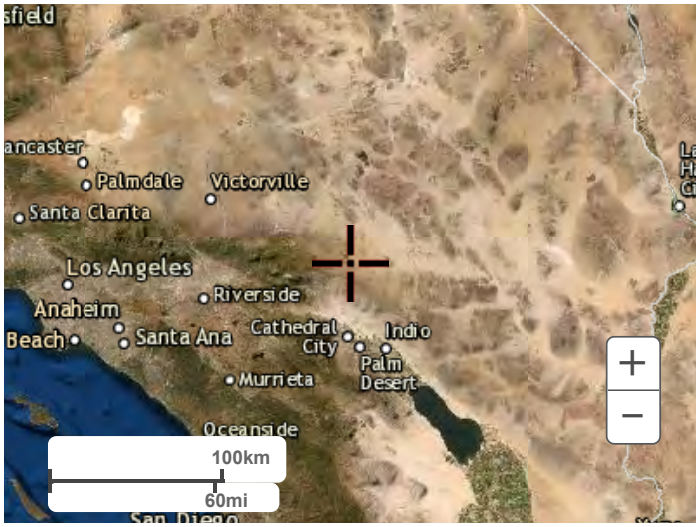
Small scale terrain

Large scale terrain



Large scale map

Large scale aerial



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

Basin 102 Precipitation Data

NOAA Atlas 14, Volume 6, Version 2
Location name: Yucca Valley, California, USA*
Latitude: 34.1717°, Longitude: -116.4548°
Elevation: 3987.11 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.100 (0.083-0.122)	0.145 (0.120-0.177)	0.208 (0.172-0.255)	0.264 (0.216-0.327)	0.348 (0.275-0.445)	0.419 (0.325-0.546)	0.497 (0.376-0.664)	0.585 (0.430-0.804)	0.718 (0.507-1.03)	0.835 (0.569-1.24)
10-min	0.144 (0.119-0.175)	0.207 (0.171-0.253)	0.299 (0.246-0.366)	0.379 (0.310-0.468)	0.499 (0.395-0.637)	0.600 (0.465-0.783)	0.713 (0.539-0.952)	0.839 (0.617-1.15)	1.03 (0.726-1.47)	1.20 (0.816-1.77)
15-min	0.174 (0.144-0.212)	0.251 (0.207-0.307)	0.361 (0.298-0.442)	0.458 (0.375-0.566)	0.603 (0.477-0.771)	0.726 (0.563-0.947)	0.862 (0.652-1.15)	1.01 (0.746-1.39)	1.24 (0.878-1.78)	1.45 (0.987-2.14)
30-min	0.264 (0.218-0.322)	0.381 (0.315-0.465)	0.548 (0.451-0.671)	0.695 (0.568-0.859)	0.916 (0.724-1.17)	1.10 (0.854-1.44)	1.31 (0.989-1.75)	1.54 (1.13-2.11)	1.89 (1.33-2.70)	2.20 (1.50-3.25)
60-min	0.368 (0.305-0.450)	0.532 (0.440-0.650)	0.765 (0.631-0.938)	0.972 (0.794-1.20)	1.28 (1.01-1.63)	1.54 (1.19-2.01)	1.83 (1.38-2.44)	2.15 (1.58-2.95)	2.64 (1.86-3.77)	3.07 (2.09-4.54)
2-hr	0.500 (0.414-0.610)	0.702 (0.581-0.858)	0.991 (0.817-1.21)	1.24 (1.02-1.54)	1.62 (1.28-2.07)	1.93 (1.50-2.52)	2.27 (1.72-3.03)	2.65 (1.95-3.64)	3.21 (2.26-4.59)	3.68 (2.51-5.45)
3-hr	0.593 (0.490-0.723)	0.826 (0.682-1.01)	1.16 (0.953-1.42)	1.45 (1.18-1.79)	1.87 (1.48-2.39)	2.23 (1.73-2.91)	2.62 (1.98-3.50)	3.04 (2.24-4.18)	3.67 (2.59-5.25)	4.20 (2.87-6.22)
6-hr	0.782 (0.647-0.955)	1.08 (0.896-1.33)	1.51 (1.24-1.85)	1.88 (1.54-2.32)	2.42 (1.91-3.09)	2.86 (2.22-3.73)	3.35 (2.53-4.47)	3.87 (2.85-5.32)	4.64 (3.28-6.64)	5.28 (3.60-7.82)
12-hr	0.993 (0.822-1.21)	1.38 (1.14-1.69)	1.93 (1.59-2.36)	2.40 (1.96-2.96)	3.08 (2.43-3.93)	3.63 (2.81-4.73)	4.23 (3.20-5.65)	4.87 (3.59-6.69)	5.81 (4.10-8.31)	6.58 (4.49-9.75)
24-hr	1.27 (1.12-1.46)	1.79 (1.58-2.06)	2.51 (2.22-2.91)	3.14 (2.75-3.66)	4.04 (3.42-4.86)	4.78 (3.97-5.87)	5.57 (4.51-7.01)	6.43 (5.07-8.32)	7.67 (5.81-10.3)	8.70 (6.37-12.1)
2-day	1.44 (1.28-1.66)	2.08 (1.84-2.40)	2.97 (2.62-3.44)	3.75 (3.29-4.38)	4.90 (4.15-5.90)	5.85 (4.86-7.19)	6.88 (5.58-8.66)	8.01 (6.32-10.4)	9.67 (7.33-13.0)	11.1 (8.10-15.4)
3-day	1.57 (1.39-1.81)	2.29 (2.03-2.64)	3.32 (2.93-3.83)	4.22 (3.70-4.92)	5.57 (4.72-6.71)	6.71 (5.57-8.24)	7.95 (6.44-10.0)	9.33 (7.36-12.1)	11.4 (8.61-15.3)	13.1 (9.59-18.3)
4-day	1.64 (1.45-1.88)	2.40 (2.13-2.77)	3.51 (3.10-4.06)	4.49 (3.93-5.23)	5.96 (5.05-7.17)	7.19 (5.97-8.84)	8.56 (6.94-10.8)	10.1 (7.95-13.0)	12.3 (9.35-16.6)	14.3 (10.5-19.9)
7-day	1.82 (1.61-2.09)	2.70 (2.39-3.11)	3.97 (3.51-4.60)	5.11 (4.47-5.96)	6.81 (5.78-8.20)	8.26 (6.86-10.2)	9.86 (8.00-12.4)	11.7 (9.19-15.1)	14.3 (10.9-19.3)	16.6 (12.2-23.2)
10-day	1.94 (1.72-2.24)	2.90 (2.57-3.35)	4.29 (3.79-4.96)	5.52 (4.84-6.44)	7.38 (6.25-8.88)	8.95 (7.44-11.0)	10.7 (8.67-13.5)	12.7 (9.98-16.4)	15.6 (11.8-21.0)	18.1 (13.2-25.2)
20-day	2.14 (1.89-2.46)	3.23 (2.85-3.72)	4.79 (4.23-5.54)	6.18 (5.41-7.21)	8.27 (7.01-9.95)	10.0 (8.33-12.3)	12.0 (9.71-15.1)	14.2 (11.2-18.3)	17.4 (13.2-23.5)	20.2 (14.8-28.2)
30-day	2.39 (2.12-2.75)	3.62 (3.20-4.17)	5.38 (4.75-6.22)	6.94 (6.08-8.09)	9.26 (7.85-11.2)	11.2 (9.32-13.8)	13.4 (10.9-16.9)	15.8 (12.5-20.4)	19.4 (14.7-26.1)	22.5 (16.5-31.3)
45-day	2.75 (2.44-3.17)	4.16 (3.68-4.79)	6.16 (5.44-7.12)	7.92 (6.94-9.23)	10.5 (8.93-12.7)	12.7 (10.6-15.6)	15.1 (12.3-19.0)	17.8 (14.0-23.0)	21.8 (16.5-29.3)	25.1 (18.4-35.0)
60-day	3.10 (2.74-3.57)	4.66 (4.12-5.37)	6.87 (6.06-7.94)	8.81 (7.71-10.3)	11.7 (9.88-14.0)	14.0 (11.7-17.3)	16.6 (13.5-21.0)	19.5 (15.4-25.3)	23.8 (18.0-32.1)	27.4 (20.1-38.2)

[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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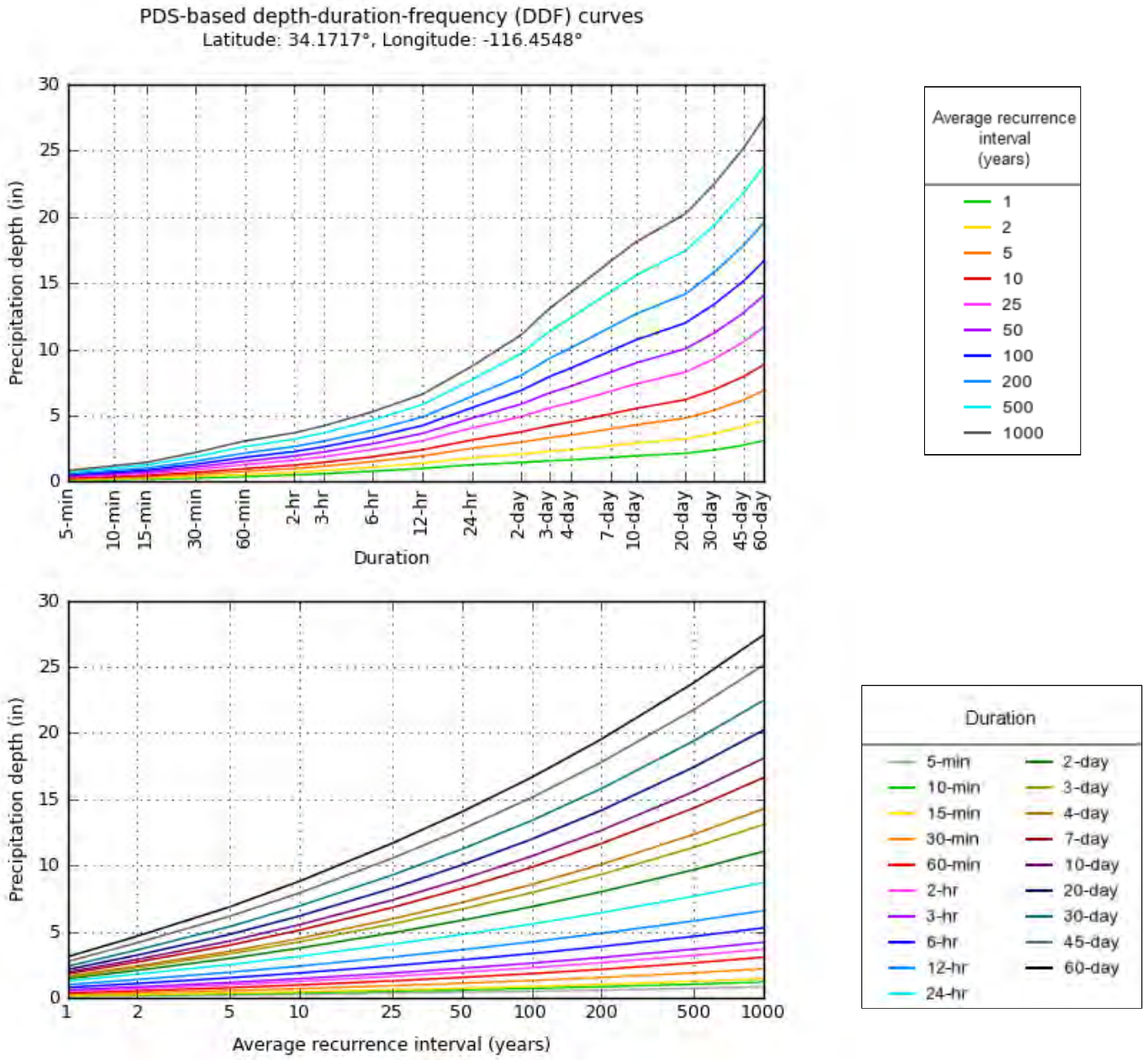
PF graphical



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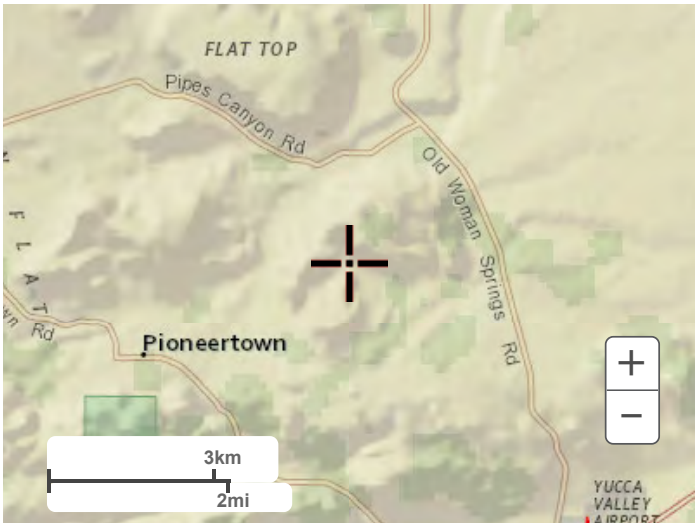
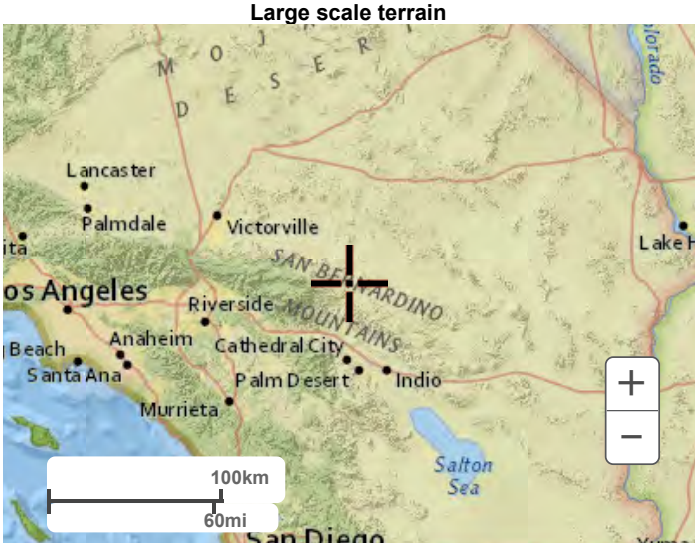
Small scale terrain



Large scale terrain



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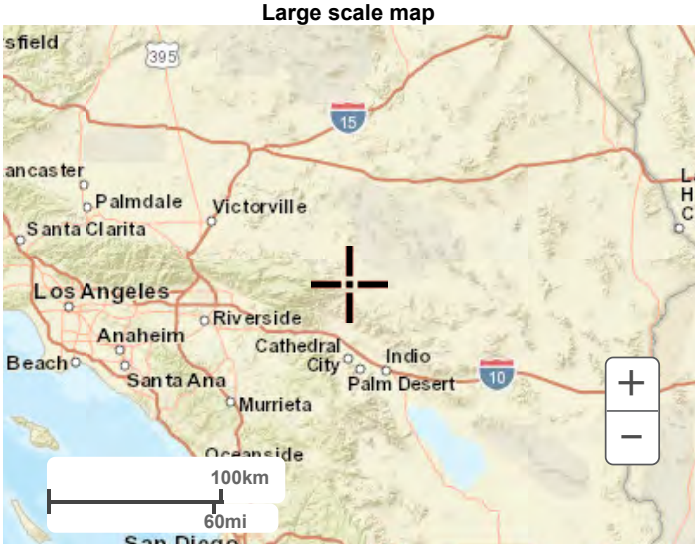
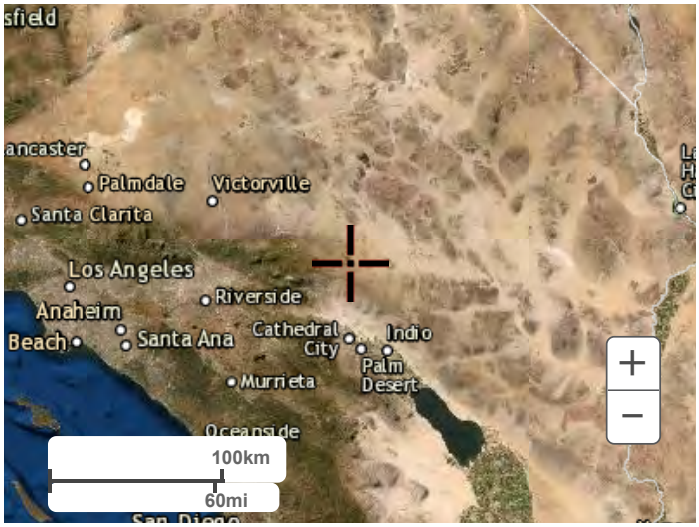


Large scale aerial



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

Basin 100 Precipitation Data

NOAA Atlas 14, Volume 6, Version 2
Location name: Yucca Valley, California, USA*
Latitude: 34.1704°, Longitude: -116.407°
Elevation: 3606.32 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.085 (0.070-0.104)	0.125 (0.104-0.153)	0.186 (0.153-0.228)	0.242 (0.198-0.299)	0.329 (0.261-0.421)	0.406 (0.315-0.530)	0.495 (0.374-0.661)	0.597 (0.439-0.820)	0.785 (0.554-1.12)	1.05 (0.717-1.56)
10-min	0.122 (0.101-0.148)	0.180 (0.148-0.219)	0.267 (0.220-0.327)	0.347 (0.284-0.429)	0.472 (0.373-0.603)	0.583 (0.451-0.760)	0.709 (0.536-0.947)	0.856 (0.629-1.18)	1.13 (0.794-1.61)	1.51 (1.03-2.23)
15-min	0.147 (0.122-0.179)	0.217 (0.179-0.265)	0.322 (0.266-0.395)	0.419 (0.343-0.518)	0.571 (0.452-0.729)	0.705 (0.546-0.918)	0.857 (0.648-1.15)	1.03 (0.761-1.42)	1.36 (0.961-1.95)	1.82 (1.24-2.70)
30-min	0.224 (0.185-0.274)	0.331 (0.274-0.404)	0.491 (0.405-0.602)	0.639 (0.523-0.790)	0.870 (0.689-1.11)	1.07 (0.832-1.40)	1.31 (0.989-1.75)	1.58 (1.16-2.17)	2.07 (1.46-2.97)	2.78 (1.89-4.11)
60-min	0.311 (0.257-0.380)	0.459 (0.380-0.561)	0.682 (0.562-0.836)	0.887 (0.725-1.10)	1.21 (0.956-1.54)	1.49 (1.16-1.94)	1.81 (1.37-2.42)	2.19 (1.61-3.01)	2.88 (2.03-4.12)	3.85 (2.63-5.70)
2-hr	0.432 (0.358-0.527)	0.609 (0.504-0.745)	0.868 (0.715-1.06)	1.10 (0.899-1.36)	1.45 (1.15-1.85)	1.75 (1.35-2.28)	2.08 (1.57-2.78)	2.45 (1.81-3.37)	3.02 (2.13-4.32)	3.89 (2.65-5.76)
3-hr	0.514 (0.425-0.627)	0.713 (0.590-0.872)	1.00 (0.824-1.23)	1.25 (1.02-1.55)	1.63 (1.29-2.09)	1.95 (1.51-2.55)	2.30 (1.74-3.08)	2.69 (1.98-3.70)	3.27 (2.31-4.68)	3.93 (2.68-5.82)
6-hr	0.672 (0.556-0.820)	0.922 (0.762-1.13)	1.27 (1.05-1.56)	1.58 (1.29-1.95)	2.03 (1.60-2.59)	2.40 (1.86-3.12)	2.79 (2.11-3.73)	3.23 (2.38-4.44)	3.87 (2.73-5.53)	4.40 (3.00-6.51)
12-hr	0.832 (0.688-1.02)	1.15 (0.948-1.40)	1.59 (1.31-1.95)	1.97 (1.61-2.44)	2.53 (2.00-3.23)	2.99 (2.32-3.90)	3.48 (2.64-4.65)	4.02 (2.96-5.53)	4.81 (3.39-6.88)	5.46 (3.72-8.08)
24-hr	1.04 (0.919-1.19)	1.45 (1.29-1.67)	2.04 (1.80-2.36)	2.55 (2.23-2.97)	3.30 (2.80-3.97)	3.92 (3.26-4.82)	4.60 (3.73-5.79)	5.35 (4.22-6.91)	6.44 (4.88-8.67)	7.35 (5.38-10.2)
2-day	1.15 (1.02-1.33)	1.64 (1.45-1.89)	2.34 (2.06-2.70)	2.95 (2.58-3.44)	3.86 (3.27-4.64)	4.61 (3.83-5.67)	5.44 (4.41-6.85)	6.35 (5.01-8.22)	7.70 (5.83-10.4)	8.84 (6.47-12.3)
3-day	1.25 (1.10-1.43)	1.80 (1.59-2.07)	2.59 (2.28-2.99)	3.28 (2.88-3.83)	4.32 (3.66-5.20)	5.19 (4.31-6.37)	6.14 (4.98-7.73)	7.20 (5.68-9.31)	8.76 (6.64-11.8)	10.1 (7.39-14.1)
4-day	1.30 (1.15-1.49)	1.89 (1.67-2.18)	2.74 (2.41-3.16)	3.49 (3.05-4.06)	4.60 (3.90-5.54)	5.54 (4.60-6.81)	6.57 (5.33-8.27)	7.72 (6.09-9.98)	9.41 (7.13-12.7)	10.9 (7.95-15.1)
7-day	1.43 (1.27-1.65)	2.12 (1.88-2.44)	3.10 (2.74-3.59)	3.98 (3.48-4.63)	5.28 (4.47-6.36)	6.38 (5.30-7.84)	7.59 (6.15-9.55)	8.94 (7.05-11.6)	10.9 (8.29-14.7)	12.6 (9.26-17.6)
10-day	1.53 (1.36-1.76)	2.28 (2.02-2.63)	3.35 (2.96-3.88)	4.31 (3.77-5.02)	5.73 (4.85-6.89)	6.93 (5.75-8.51)	8.24 (6.68-10.4)	9.71 (7.66-12.6)	11.9 (9.01-16.0)	13.8 (10.1-19.2)
20-day	1.73 (1.53-1.99)	2.58 (2.29-2.98)	3.80 (3.36-4.40)	4.88 (4.27-5.69)	6.48 (5.49-7.80)	7.82 (6.50-9.61)	9.29 (7.53-11.7)	10.9 (8.62-14.1)	13.3 (10.1-18.0)	15.4 (11.3-21.4)
30-day	1.93 (1.71-2.22)	2.89 (2.56-3.33)	4.25 (3.75-4.91)	5.44 (4.76-6.34)	7.21 (6.11-8.67)	8.68 (7.21-10.7)	10.3 (8.34-12.9)	12.1 (9.52-15.6)	14.7 (11.1-19.8)	16.9 (12.4-23.5)
45-day	2.25 (1.99-2.59)	3.33 (2.95-3.84)	4.86 (4.29-5.62)	6.19 (5.42-7.22)	8.15 (6.91-9.81)	9.78 (8.12-12.0)	11.5 (9.36-14.5)	13.5 (10.6-17.4)	16.3 (12.4-22.0)	18.7 (13.7-26.1)
60-day	2.56 (2.26-2.94)	3.76 (3.33-4.33)	5.44 (4.81-6.29)	6.91 (6.05-8.05)	9.05 (7.67-10.9)	10.8 (8.98-13.3)	12.7 (10.3-16.0)	14.8 (11.7-19.2)	17.9 (13.5-24.1)	20.4 (14.9-28.4)

[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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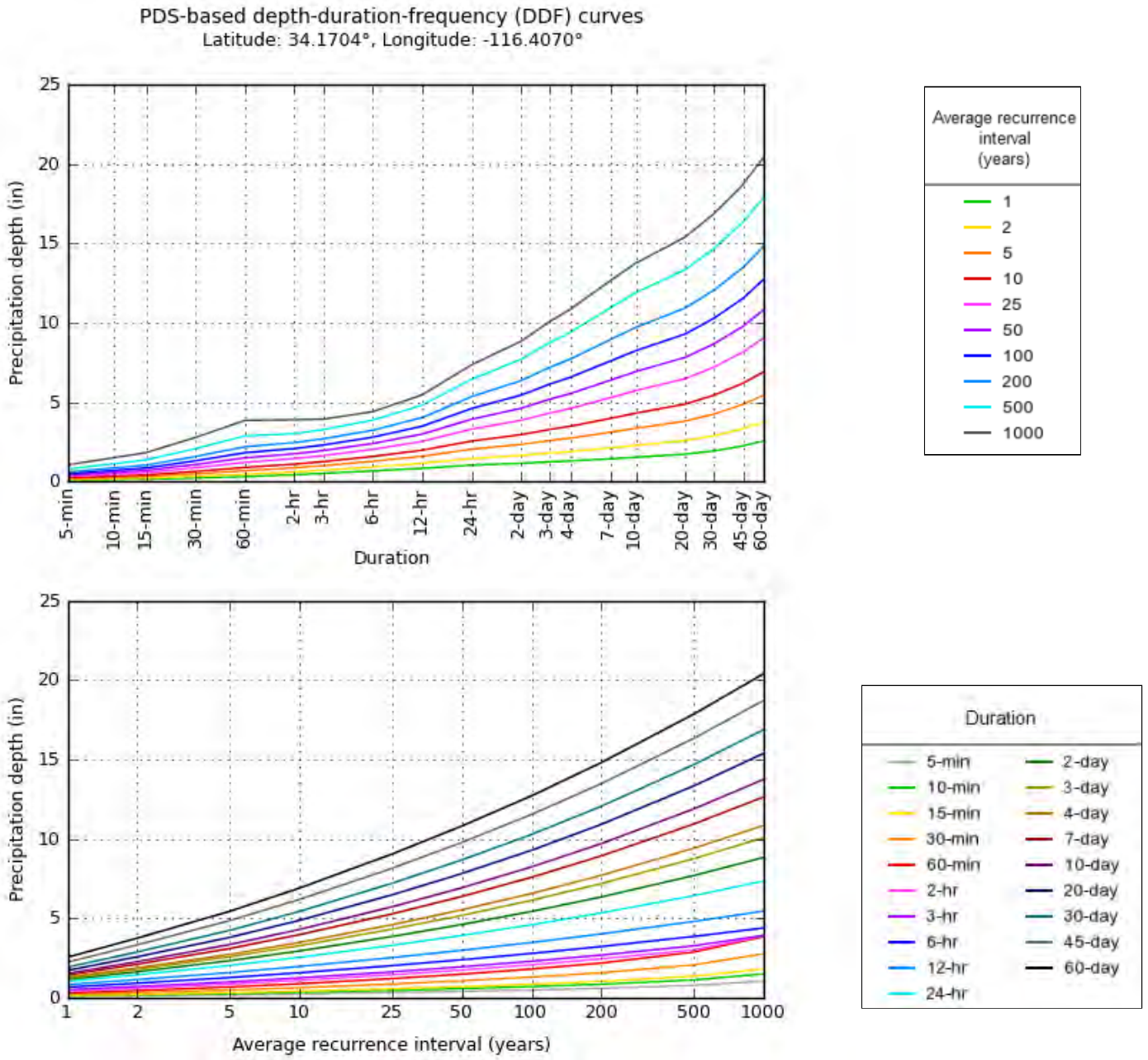
PF graphical



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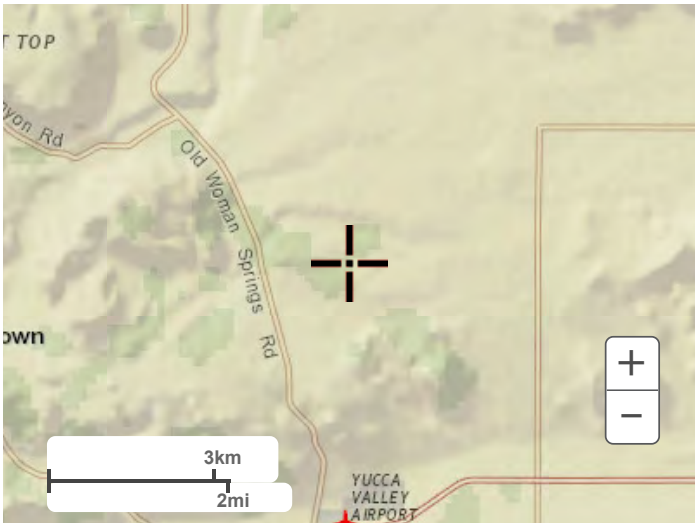
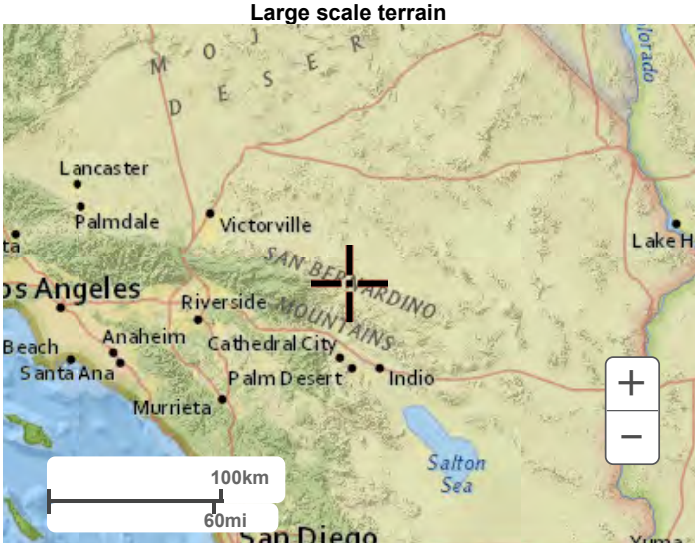
Maps & aerials

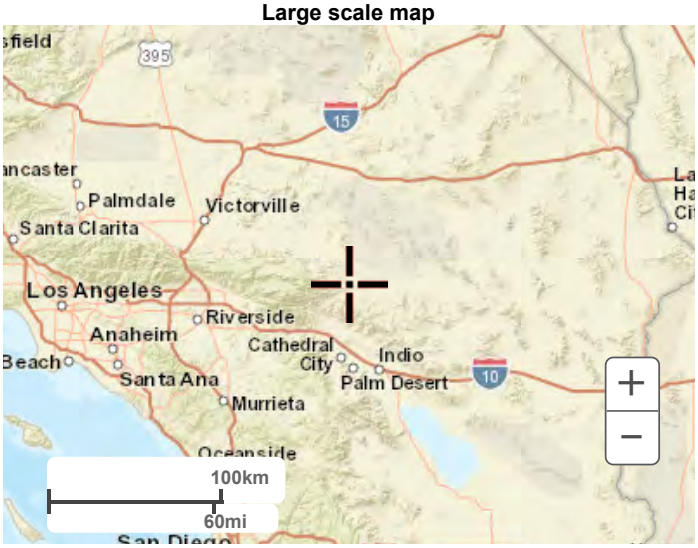
Small scale terrain



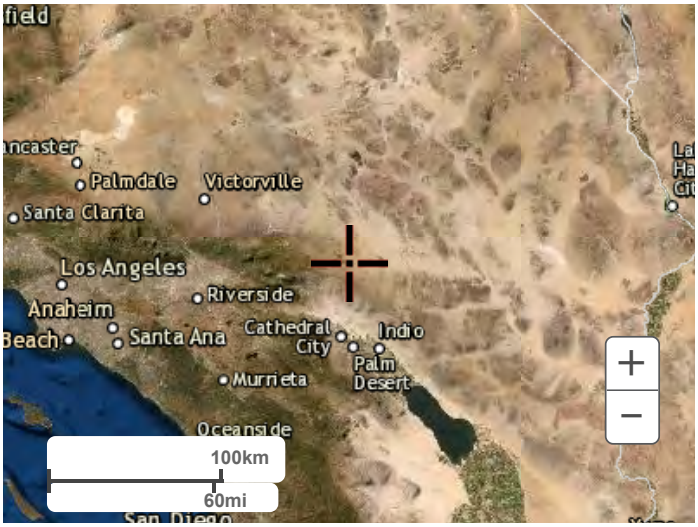
Large scale terrain



Large scale map



Large scale aerial



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

Basin 200 Precipitation Data

NOAA Atlas 14, Volume 6, Version 2
Location name: Yucca Valley, California, USA*
Latitude: 34.182°, Longitude: -116.3754°
Elevation: 3349.98 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.088 (0.073-0.107)	0.129 (0.106-0.158)	0.190 (0.157-0.233)	0.246 (0.201-0.304)	0.332 (0.263-0.425)	0.408 (0.316-0.532)	0.494 (0.374-0.660)	0.593 (0.437-0.815)	0.747 (0.528-1.07)	0.981 (0.669-1.45)
10-min	0.126 (0.104-0.154)	0.185 (0.153-0.226)	0.272 (0.224-0.334)	0.352 (0.288-0.436)	0.476 (0.377-0.609)	0.585 (0.453-0.763)	0.708 (0.536-0.946)	0.851 (0.626-1.17)	1.07 (0.756-1.53)	1.41 (0.959-2.08)
15-min	0.152 (0.126-0.186)	0.223 (0.185-0.273)	0.329 (0.271-0.404)	0.426 (0.348-0.527)	0.576 (0.456-0.736)	0.707 (0.548-0.922)	0.857 (0.648-1.14)	1.03 (0.757-1.41)	1.30 (0.915-1.85)	1.70 (1.16-2.52)
30-min	0.230 (0.191-0.281)	0.338 (0.280-0.414)	0.499 (0.411-0.612)	0.646 (0.528-0.798)	0.873 (0.690-1.12)	1.07 (0.830-1.40)	1.30 (0.981-1.73)	1.56 (1.15-2.14)	1.96 (1.39-2.81)	2.58 (1.76-3.81)
60-min	0.319 (0.264-0.389)	0.468 (0.387-0.572)	0.690 (0.568-0.846)	0.893 (0.730-1.10)	1.21 (0.954-1.54)	1.48 (1.15-1.93)	1.79 (1.36-2.40)	2.15 (1.59-2.96)	2.71 (1.92-3.88)	3.56 (2.43-5.27)
2-hr	0.437 (0.361-0.533)	0.615 (0.508-0.752)	0.874 (0.720-1.07)	1.11 (0.903-1.37)	1.45 (1.15-1.86)	1.75 (1.36-2.28)	2.08 (1.57-2.77)	2.44 (1.80-3.36)	3.00 (2.12-4.29)	3.60 (2.45-5.32)
3-hr	0.517 (0.428-0.631)	0.718 (0.593-0.878)	1.01 (0.829-1.23)	1.26 (1.03-1.56)	1.64 (1.30-2.10)	1.96 (1.52-2.56)	2.31 (1.75-3.09)	2.70 (1.99-3.71)	3.28 (2.31-4.69)	3.77 (2.57-5.58)
6-hr	0.672 (0.556-0.821)	0.924 (0.763-1.13)	1.28 (1.05-1.57)	1.59 (1.30-1.96)	2.04 (1.61-2.60)	2.41 (1.87-3.15)	2.82 (2.13-3.76)	3.26 (2.40-4.48)	3.91 (2.76-5.59)	4.44 (3.03-6.58)
12-hr	0.828 (0.685-1.01)	1.15 (0.947-1.40)	1.59 (1.31-1.95)	1.98 (1.62-2.45)	2.54 (2.01-3.25)	3.01 (2.33-3.92)	3.51 (2.65-4.69)	4.06 (2.98-5.57)	4.85 (3.42-6.94)	5.51 (3.76-8.16)
24-hr	1.03 (0.910-1.18)	1.45 (1.28-1.67)	2.04 (1.80-2.35)	2.55 (2.23-2.97)	3.31 (2.80-3.98)	3.93 (3.26-4.83)	4.61 (3.74-5.80)	5.35 (4.22-6.92)	6.44 (4.88-8.68)	7.36 (5.39-10.3)
2-day	1.14 (1.01-1.32)	1.64 (1.45-1.89)	2.35 (2.07-2.71)	2.97 (2.60-3.46)	3.88 (3.29-4.67)	4.64 (3.86-5.71)	5.48 (4.44-6.89)	6.40 (5.05-8.27)	7.75 (5.87-10.4)	8.89 (6.51-12.4)
3-day	1.23 (1.09-1.41)	1.78 (1.58-2.06)	2.58 (2.28-2.98)	3.28 (2.87-3.82)	4.32 (3.66-5.20)	5.19 (4.31-6.38)	6.15 (4.99-7.74)	7.21 (5.69-9.32)	8.77 (6.65-11.8)	10.1 (7.40-14.1)
4-day	1.28 (1.13-1.47)	1.88 (1.66-2.16)	2.73 (2.41-3.16)	3.48 (3.05-4.06)	4.61 (3.91-5.55)	5.55 (4.61-6.82)	6.59 (5.34-8.29)	7.74 (6.10-10.0)	9.44 (7.15-12.7)	10.9 (7.98-15.2)
7-day	1.41 (1.25-1.62)	2.09 (1.85-2.41)	3.08 (2.72-3.56)	3.96 (3.47-4.61)	5.26 (4.46-6.33)	6.36 (5.28-7.82)	7.57 (6.14-9.52)	8.91 (7.03-11.5)	10.9 (8.26-14.7)	12.6 (9.23-17.6)
10-day	1.50 (1.33-1.72)	2.24 (1.99-2.59)	3.32 (2.93-3.84)	4.27 (3.74-4.98)	5.69 (4.82-6.85)	6.89 (5.72-8.46)	8.20 (6.65-10.3)	9.66 (7.62-12.5)	11.8 (8.96-15.9)	13.7 (10.0-19.0)
20-day	1.69 (1.50-1.94)	2.55 (2.25-2.94)	3.78 (3.33-4.37)	4.86 (4.26-5.67)	6.48 (5.49-7.80)	7.83 (6.50-9.62)	9.31 (7.55-11.7)	11.0 (8.65-14.2)	13.4 (10.1-18.0)	15.4 (11.3-21.5)
30-day	1.89 (1.67-2.17)	2.85 (2.52-3.28)	4.22 (3.73-4.88)	5.43 (4.76-6.33)	7.23 (6.12-8.70)	8.72 (7.24-10.7)	10.4 (8.40-13.0)	12.2 (9.59-15.7)	14.8 (11.2-19.9)	17.0 (12.5-23.7)
45-day	2.18 (1.93-2.51)	3.27 (2.90-3.77)	4.82 (4.26-5.57)	6.18 (5.41-7.20)	8.18 (6.93-9.85)	9.85 (8.18-12.1)	11.7 (9.45-14.7)	13.6 (10.8-17.6)	16.5 (12.5-22.3)	19.0 (13.9-26.4)
60-day	2.47 (2.19-2.85)	3.68 (3.26-4.25)	5.39 (4.76-6.23)	6.89 (6.03-8.03)	9.08 (7.69-10.9)	10.9 (9.05-13.4)	12.9 (10.4-16.2)	15.0 (11.8-19.4)	18.1 (13.7-24.4)	20.7 (15.2-28.9)

[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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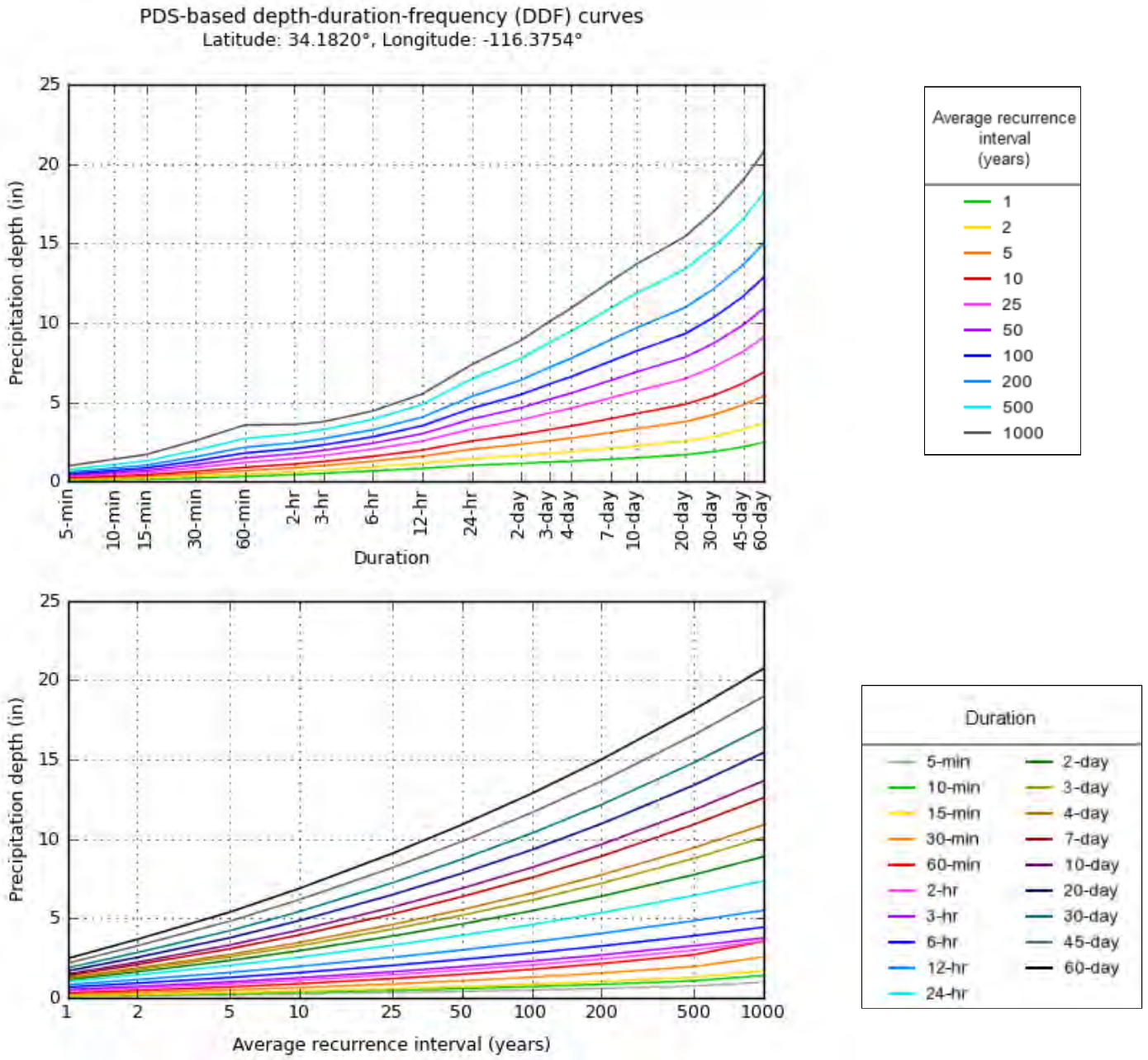
PF graphical



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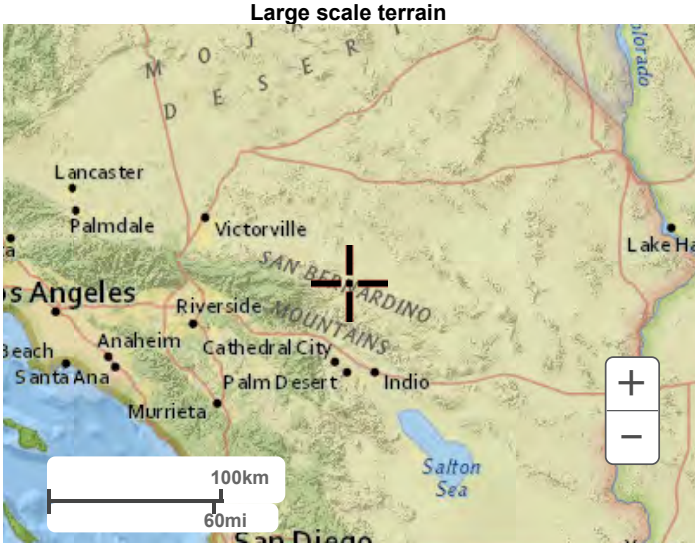
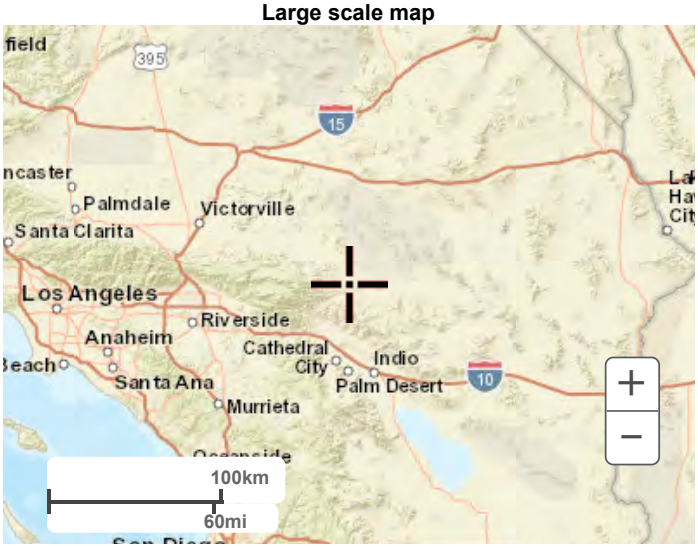
Maps & aerials

Small scale terrain

Large scale terrain



Large scale map



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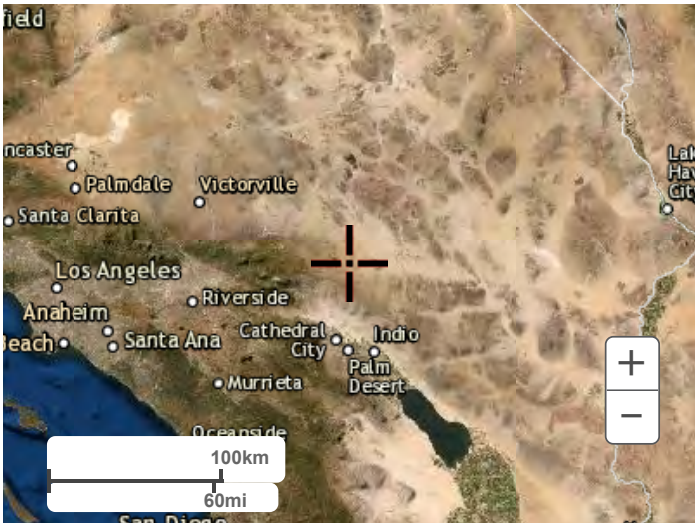

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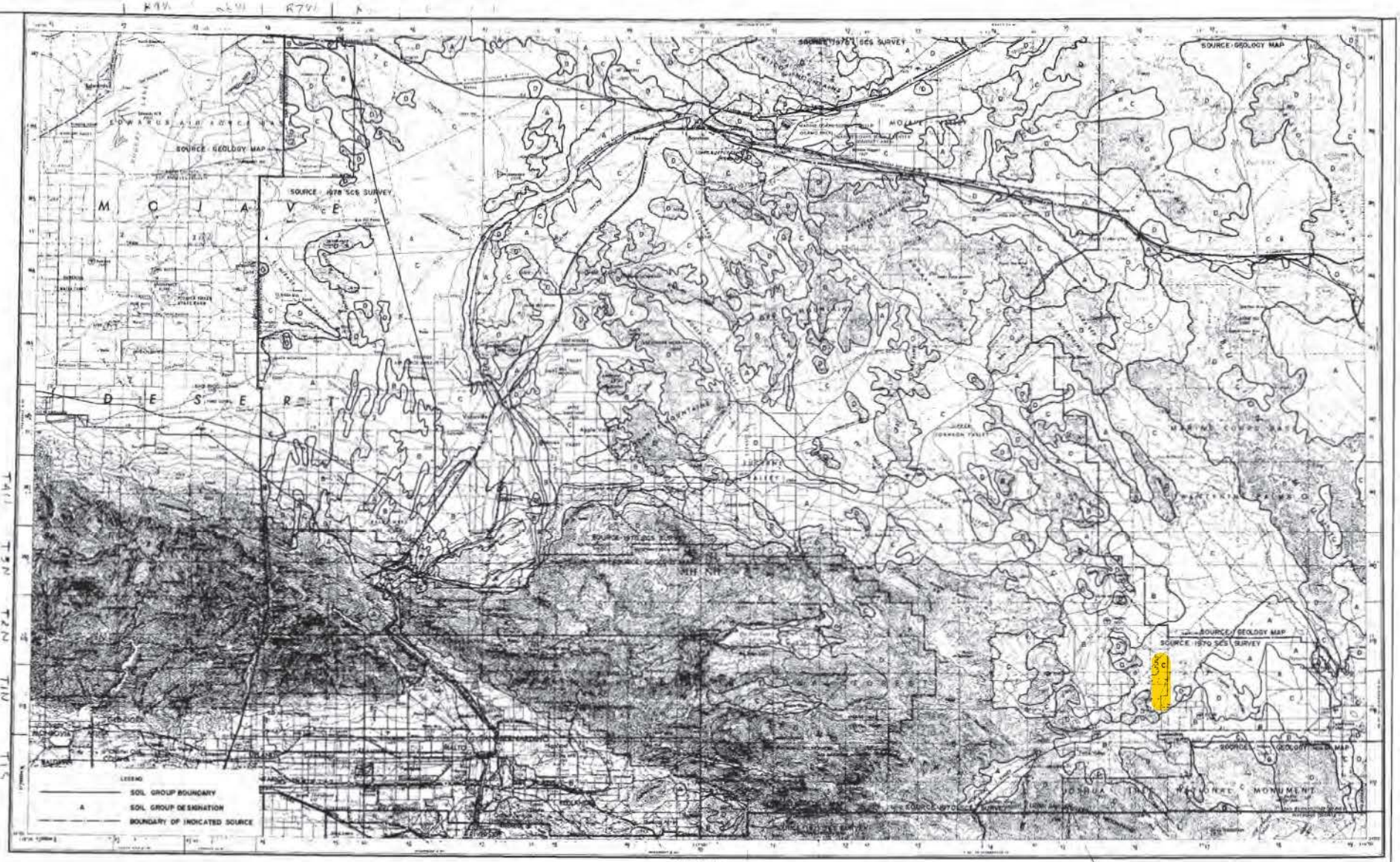


SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHCENTRAL AREA

FIGURE C-11

Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparral, 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	71	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	25	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
URBAN COVERS -					
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
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		77	86	91	94

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (1 of 2)

APPENDIX C

Hydrologic Results

UNIT HYDROGRAPH METHOD INPUT PARAMETERS												RESULT	
Basin Number	**Upstream Station**	**Downstream Station**	**Sub Basin Area**	**Sub Basin Area**	**Sub Basin Area**	**Upstream Elevation**	**Downstream Elevation**	**Elevation Difference**	**L**	**Lca**	**S-graph Zone**	**Peak Flow**	**Total Volume**
	\	\	**(ft^2)**	**(ac)**	**(mi^2)**	**(ft)**	**(ft)**	**(ft)**	**(ft)**	**(ft)**		**(cfs)**	**(ac.ft)**
102	104	102	64160956	1472.93	2.30	4,300	3,740	560	11228.10	5614.05	Mountain	5680	1920
104	106	102	33813999	776.26	1.21	4,270	3,740	530	10307.62	5153.81	Mountain		
100	102	100	111329712	2555.78	3.99	3,740	2,890	850	36640.60	18320.30	Desert		
200	202	200	79973436	1835.94	2.87	3,630	2,890	740	29904.06	14952.03	Desert	1965	677

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

Study date 02/17/22

++

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6360

Marmon Hydrology Analysis
100-Year Event
Basin 104

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
776.26	1	0.94
Rainfall data for year 2		
776.26	6	1.01
Rainfall data for year 2		
776.26	24	1.64
Rainfall data for year 100		

```
           776.26            1           1.85
------------------------------------------------------------------------
Rainfall data for year 100
           776.26            6           3.11
------------------------------------------------------------------------
Rainfall data for year 100
           776.26           24           5.18
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 91.0      98.2        776.26      1.000     0.036    1.000    0.036

Area-averaged adjusted loss rate Fm (In/Hr) =  0.036

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
   776.26   1.000         91.0      98.2       0.18     0.959

Area-averaged catchment yield fraction, Y =  0.959
Area-averaged low loss fraction, Yb =  0.041
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watercourse length =   10307.62(Ft.)
Length from concentration point to centroid =    5153.81(Ft.)
Elevation difference along watercourse =     530.00(Ft.)
Mannings friction factor along watercourse =  0.040
Watershed area =     776.26(Ac.)
Catchment Lag time =   0.423 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 19.7039
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.036(In/Hr)
Average low loss rate fraction (Yb) = 0.041 (decimal)
MOUNTAIN S-Graph Selected
Computed peak 5-minute rainfall =  0.503(In)
Computed peak 30-minute rainfall =  1.320(In)
Specified peak 1-hour rainfall =  1.850(In)
Computed peak 3-hour rainfall =  2.490(In)
Specified peak 6-hour rainfall =  3.110(In)
Specified peak 24-hour rainfall =  5.180(In)


Note: user specified rainfall values used.
Rainfall depth area reduction factors:
```

Using a total area of 776.26(Ac.) (Ref: fig. E-4)

5-minute factor = 0.964 Adjusted rainfall = 0.485(In)
30-minute factor = 0.964 Adjusted rainfall = 1.272(In)
1-hour factor = 0.964 Adjusted rainfall = 1.783(In)
3-hour factor = 0.995 Adjusted rainfall = 2.479(In)
6-hour factor = 0.998 Adjusted rainfall = 3.102(In)
24-hour factor = 0.999 Adjusted rainfall = 5.175(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 9387.89 (CFS))	
1	2.235	209.802
2	8.596	597.201
3	20.524	1119.725
4	35.287	1386.004
5	45.500	958.781
6	52.331	641.280
7	57.285	465.074
8	61.296	376.542
9	64.594	309.610
10	67.457	268.818
11	70.023	240.885
12	72.338	217.314
13	74.400	193.534
14	76.208	169.768
15	77.857	154.754
16	79.362	141.323
17	80.688	124.456
18	81.885	112.378
19	82.955	100.496
20	83.980	96.189
21	84.956	91.663
22	85.793	78.526
23	86.620	77.642
24	87.422	75.291
25	88.210	73.991
26	88.967	71.107
27	89.609	60.237
28	90.239	59.179
29	90.847	57.036
30	91.438	55.494
31	92.017	54.378
32	92.538	48.846
33	93.050	48.094

34	93.542	46.202
35	94.015	44.395
36	94.479	43.563
37	94.884	38.019
38	95.278	36.996
39	95.655	35.373
40	96.010	33.304
41	96.364	33.296
42	96.719	33.296
43	97.074	33.296
44	97.428	33.296
45	97.783	33.296
46	98.138	33.296
47	98.492	33.296
48	98.847	33.296
49	99.202	33.296
50	99.556	33.296
51	100.000	16.648

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4847	0.4847
2	0.7040	0.2193
3	0.8758	0.1718
4	1.0225	0.1467
5	1.1530	0.1305
6	1.2720	0.1189
7	1.3711	0.0992
8	1.4633	0.0921
9	1.5496	0.0864
10	1.6312	0.0816
11	1.7087	0.0775
12	1.7827	0.0740
13	1.8260	0.0433
14	1.8670	0.0410
15	1.9061	0.0390
16	1.9434	0.0373
17	1.9790	0.0357
18	2.0132	0.0342
19	2.0462	0.0329
20	2.0779	0.0317
21	2.1085	0.0306
22	2.1381	0.0296
23	2.1668	0.0287
24	2.1947	0.0278
25	2.2217	0.0270
26	2.2480	0.0263
27	2.2736	0.0256
28	2.2985	0.0249
29	2.3229	0.0243

30	2.3466	0.0237
31	2.3698	0.0232
32	2.3925	0.0227
33	2.4147	0.0222
34	2.4364	0.0217
35	2.4577	0.0213
36	2.4785	0.0209
37	2.5006	0.0221
38	2.5223	0.0217
39	2.5436	0.0213
40	2.5646	0.0209
41	2.5852	0.0206
42	2.6054	0.0203
43	2.6254	0.0199
44	2.6450	0.0196
45	2.6643	0.0193
46	2.6833	0.0190
47	2.7021	0.0188
48	2.7206	0.0185
49	2.7388	0.0182
50	2.7568	0.0180
51	2.7746	0.0177
52	2.7921	0.0175
53	2.8093	0.0173
54	2.8264	0.0171
55	2.8433	0.0168
56	2.8599	0.0166
57	2.8763	0.0164
58	2.8926	0.0163
59	2.9087	0.0161
60	2.9245	0.0159
61	2.9402	0.0157
62	2.9558	0.0155
63	2.9711	0.0154
64	2.9863	0.0152
65	3.0014	0.0150
66	3.0162	0.0149
67	3.0310	0.0147
68	3.0455	0.0146
69	3.0600	0.0144
70	3.0743	0.0143
71	3.0884	0.0142
72	3.1025	0.0140
73	3.1183	0.0158
74	3.1340	0.0157
75	3.1496	0.0156
76	3.1650	0.0154
77	3.1803	0.0153
78	3.1955	0.0152
79	3.2105	0.0151

80	3.2255	0.0149
81	3.2403	0.0148
82	3.2550	0.0147
83	3.2696	0.0146
84	3.2841	0.0145
85	3.2985	0.0144
86	3.3127	0.0143
87	3.3269	0.0142
88	3.3410	0.0141
89	3.3549	0.0140
90	3.3688	0.0139
91	3.3825	0.0138
92	3.3962	0.0137
93	3.4098	0.0136
94	3.4233	0.0135
95	3.4367	0.0134
96	3.4500	0.0133
97	3.4632	0.0132
98	3.4763	0.0131
99	3.4894	0.0131
100	3.5024	0.0130
101	3.5152	0.0129
102	3.5280	0.0128
103	3.5408	0.0127
104	3.5534	0.0126
105	3.5660	0.0126
106	3.5785	0.0125
107	3.5909	0.0124
108	3.6033	0.0123
109	3.6155	0.0123
110	3.6277	0.0122
111	3.6399	0.0121
112	3.6520	0.0121
113	3.6640	0.0120
114	3.6759	0.0119
115	3.6878	0.0119
116	3.6996	0.0118
117	3.7113	0.0117
118	3.7230	0.0117
119	3.7346	0.0116
120	3.7461	0.0116
121	3.7576	0.0115
122	3.7691	0.0114
123	3.7804	0.0114
124	3.7917	0.0113
125	3.8030	0.0113
126	3.8142	0.0112
127	3.8253	0.0111
128	3.8364	0.0111
129	3.8475	0.0110

130	3.8585	0.0110
131	3.8694	0.0109
132	3.8803	0.0109
133	3.8911	0.0108
134	3.9019	0.0108
135	3.9126	0.0107
136	3.9232	0.0107
137	3.9339	0.0106
138	3.9444	0.0106
139	3.9550	0.0105
140	3.9654	0.0105
141	3.9759	0.0104
142	3.9863	0.0104
143	3.9966	0.0103
144	4.0069	0.0103
145	4.0171	0.0102
146	4.0273	0.0102
147	4.0375	0.0102
148	4.0476	0.0101
149	4.0577	0.0101
150	4.0677	0.0100
151	4.0777	0.0100
152	4.0876	0.0099
153	4.0975	0.0099
154	4.1074	0.0099
155	4.1172	0.0098
156	4.1270	0.0098
157	4.1368	0.0097
158	4.1465	0.0097
159	4.1561	0.0097
160	4.1658	0.0096
161	4.1754	0.0096
162	4.1849	0.0096
163	4.1944	0.0095
164	4.2039	0.0095
165	4.2133	0.0094
166	4.2227	0.0094
167	4.2321	0.0094
168	4.2415	0.0093
169	4.2508	0.0093
170	4.2600	0.0093
171	4.2693	0.0092
172	4.2785	0.0092
173	4.2876	0.0092
174	4.2967	0.0091
175	4.3058	0.0091
176	4.3149	0.0091
177	4.3239	0.0090
178	4.3329	0.0090
179	4.3419	0.0090

180	4.3508	0.0089
181	4.3597	0.0089
182	4.3686	0.0089
183	4.3775	0.0088
184	4.3863	0.0088
185	4.3951	0.0088
186	4.4038	0.0088
187	4.4125	0.0087
188	4.4212	0.0087
189	4.4299	0.0087
190	4.4385	0.0086
191	4.4471	0.0086
192	4.4557	0.0086
193	4.4643	0.0086
194	4.4728	0.0085
195	4.4813	0.0085
196	4.4898	0.0085
197	4.4982	0.0084
198	4.5066	0.0084
199	4.5150	0.0084
200	4.5234	0.0084
201	4.5317	0.0083
202	4.5400	0.0083
203	4.5483	0.0083
204	4.5565	0.0083
205	4.5648	0.0082
206	4.5730	0.0082
207	4.5812	0.0082
208	4.5893	0.0082
209	4.5974	0.0081
210	4.6056	0.0081
211	4.6136	0.0081
212	4.6217	0.0081
213	4.6297	0.0080
214	4.6377	0.0080
215	4.6457	0.0080
216	4.6537	0.0080
217	4.6616	0.0079
218	4.6695	0.0079
219	4.6774	0.0079
220	4.6853	0.0079
221	4.6932	0.0078
222	4.7010	0.0078
223	4.7088	0.0078
224	4.7166	0.0078
225	4.7243	0.0078
226	4.7321	0.0077
227	4.7398	0.0077
228	4.7475	0.0077
229	4.7552	0.0077

230	4.7628	0.0077
231	4.7704	0.0076
232	4.7781	0.0076
233	4.7856	0.0076
234	4.7932	0.0076
235	4.8008	0.0075
236	4.8083	0.0075
237	4.8158	0.0075
238	4.8233	0.0075
239	4.8308	0.0075
240	4.8382	0.0074
241	4.8456	0.0074
242	4.8531	0.0074
243	4.8604	0.0074
244	4.8678	0.0074
245	4.8752	0.0074
246	4.8825	0.0073
247	4.8898	0.0073
248	4.8971	0.0073
249	4.9044	0.0073
250	4.9117	0.0073
251	4.9189	0.0072
252	4.9261	0.0072
253	4.9333	0.0072
254	4.9405	0.0072
255	4.9477	0.0072
256	4.9548	0.0072
257	4.9620	0.0071
258	4.9691	0.0071
259	4.9762	0.0071
260	4.9833	0.0071
261	4.9903	0.0071
262	4.9974	0.0070
263	5.0044	0.0070
264	5.0114	0.0070
265	5.0184	0.0070
266	5.0254	0.0070
267	5.0324	0.0070
268	5.0393	0.0069
269	5.0463	0.0069
270	5.0532	0.0069
271	5.0601	0.0069
272	5.0669	0.0069
273	5.0738	0.0069
274	5.0807	0.0069
275	5.0875	0.0068
276	5.0943	0.0068
277	5.1011	0.0068
278	5.1079	0.0068
279	5.1147	0.0068

280	5.1214	0.0068
281	5.1282	0.0067
282	5.1349	0.0067
283	5.1416	0.0067
284	5.1483	0.0067
285	5.1550	0.0067
286	5.1617	0.0067
287	5.1683	0.0067
288	5.1750	0.0066

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0066	0.0003	0.0064
2	0.0067	0.0003	0.0064
3	0.0067	0.0003	0.0064
4	0.0067	0.0003	0.0064
5	0.0067	0.0003	0.0065
6	0.0067	0.0003	0.0065
7	0.0068	0.0003	0.0065
8	0.0068	0.0003	0.0065
9	0.0068	0.0003	0.0065
10	0.0068	0.0003	0.0066
11	0.0069	0.0003	0.0066
12	0.0069	0.0003	0.0066
13	0.0069	0.0003	0.0066
14	0.0069	0.0003	0.0066
15	0.0070	0.0003	0.0067
16	0.0070	0.0003	0.0067
17	0.0070	0.0003	0.0067
18	0.0070	0.0003	0.0067
19	0.0071	0.0003	0.0068
20	0.0071	0.0003	0.0068
21	0.0071	0.0003	0.0068
22	0.0071	0.0003	0.0068
23	0.0072	0.0003	0.0069
24	0.0072	0.0003	0.0069
25	0.0072	0.0003	0.0069
26	0.0072	0.0003	0.0069
27	0.0073	0.0003	0.0070
28	0.0073	0.0003	0.0070
29	0.0073	0.0003	0.0070
30	0.0074	0.0003	0.0071
31	0.0074	0.0003	0.0071
32	0.0074	0.0003	0.0071
33	0.0074	0.0003	0.0071
34	0.0075	0.0003	0.0072
35	0.0075	0.0003	0.0072
36	0.0075	0.0003	0.0072

37	0.0076	0.0003	0.0073
38	0.0076	0.0003	0.0073
39	0.0076	0.0003	0.0073
40	0.0077	0.0003	0.0073
41	0.0077	0.0003	0.0074
42	0.0077	0.0003	0.0074
43	0.0078	0.0003	0.0074
44	0.0078	0.0003	0.0075
45	0.0078	0.0003	0.0075
46	0.0078	0.0003	0.0075
47	0.0079	0.0003	0.0076
48	0.0079	0.0003	0.0076
49	0.0080	0.0003	0.0076
50	0.0080	0.0003	0.0077
51	0.0080	0.0003	0.0077
52	0.0081	0.0003	0.0077
53	0.0081	0.0003	0.0078
54	0.0081	0.0003	0.0078
55	0.0082	0.0003	0.0078
56	0.0082	0.0003	0.0079
57	0.0083	0.0003	0.0079
58	0.0083	0.0003	0.0079
59	0.0083	0.0003	0.0080
60	0.0084	0.0003	0.0080
61	0.0084	0.0003	0.0081
62	0.0084	0.0003	0.0081
63	0.0085	0.0004	0.0081
64	0.0085	0.0004	0.0082
65	0.0086	0.0004	0.0082
66	0.0086	0.0004	0.0083
67	0.0087	0.0004	0.0083
68	0.0087	0.0004	0.0083
69	0.0088	0.0004	0.0084
70	0.0088	0.0004	0.0084
71	0.0088	0.0004	0.0085
72	0.0089	0.0004	0.0085
73	0.0089	0.0004	0.0086
74	0.0090	0.0004	0.0086
75	0.0090	0.0004	0.0087
76	0.0091	0.0004	0.0087
77	0.0091	0.0004	0.0088
78	0.0092	0.0004	0.0088
79	0.0092	0.0004	0.0089
80	0.0093	0.0004	0.0089
81	0.0093	0.0004	0.0090
82	0.0094	0.0004	0.0090
83	0.0094	0.0004	0.0091
84	0.0095	0.0004	0.0091
85	0.0096	0.0004	0.0092
86	0.0096	0.0004	0.0092

87	0.0097	0.0004	0.0093
88	0.0097	0.0004	0.0093
89	0.0098	0.0004	0.0094
90	0.0098	0.0004	0.0094
91	0.0099	0.0004	0.0095
92	0.0099	0.0004	0.0095
93	0.0100	0.0004	0.0096
94	0.0101	0.0004	0.0097
95	0.0102	0.0004	0.0097
96	0.0102	0.0004	0.0098
97	0.0103	0.0004	0.0099
98	0.0103	0.0004	0.0099
99	0.0104	0.0004	0.0100
100	0.0105	0.0004	0.0100
101	0.0106	0.0004	0.0101
102	0.0106	0.0004	0.0102
103	0.0107	0.0004	0.0103
104	0.0108	0.0004	0.0103
105	0.0109	0.0004	0.0104
106	0.0109	0.0005	0.0105
107	0.0110	0.0005	0.0106
108	0.0111	0.0005	0.0106
109	0.0112	0.0005	0.0107
110	0.0113	0.0005	0.0108
111	0.0114	0.0005	0.0109
112	0.0114	0.0005	0.0110
113	0.0116	0.0005	0.0111
114	0.0116	0.0005	0.0111
115	0.0117	0.0005	0.0113
116	0.0118	0.0005	0.0113
117	0.0119	0.0005	0.0114
118	0.0120	0.0005	0.0115
119	0.0121	0.0005	0.0116
120	0.0122	0.0005	0.0117
121	0.0123	0.0005	0.0118
122	0.0124	0.0005	0.0119
123	0.0126	0.0005	0.0121
124	0.0126	0.0005	0.0121
125	0.0128	0.0005	0.0123
126	0.0129	0.0005	0.0124
127	0.0131	0.0005	0.0125
128	0.0131	0.0005	0.0126
129	0.0133	0.0005	0.0128
130	0.0134	0.0006	0.0128
131	0.0136	0.0006	0.0130
132	0.0137	0.0006	0.0131
133	0.0139	0.0006	0.0133
134	0.0140	0.0006	0.0134
135	0.0142	0.0006	0.0136
136	0.0143	0.0006	0.0137

137	0.0145	0.0006	0.0139
138	0.0146	0.0006	0.0140
139	0.0148	0.0006	0.0142
140	0.0149	0.0006	0.0143
141	0.0152	0.0006	0.0146
142	0.0153	0.0006	0.0147
143	0.0156	0.0006	0.0149
144	0.0157	0.0006	0.0151
145	0.0140	0.0006	0.0134
146	0.0142	0.0006	0.0136
147	0.0144	0.0006	0.0138
148	0.0146	0.0006	0.0140
149	0.0149	0.0006	0.0143
150	0.0150	0.0006	0.0144
151	0.0154	0.0006	0.0147
152	0.0155	0.0006	0.0149
153	0.0159	0.0007	0.0152
154	0.0161	0.0007	0.0154
155	0.0164	0.0007	0.0158
156	0.0166	0.0007	0.0160
157	0.0171	0.0007	0.0164
158	0.0173	0.0007	0.0166
159	0.0177	0.0007	0.0170
160	0.0180	0.0007	0.0172
161	0.0185	0.0008	0.0177
162	0.0188	0.0008	0.0180
163	0.0193	0.0008	0.0185
164	0.0196	0.0008	0.0188
165	0.0203	0.0008	0.0194
166	0.0206	0.0008	0.0197
167	0.0213	0.0009	0.0204
168	0.0217	0.0009	0.0208
169	0.0209	0.0009	0.0200
170	0.0213	0.0009	0.0204
171	0.0222	0.0009	0.0213
172	0.0227	0.0009	0.0217
173	0.0237	0.0010	0.0228
174	0.0243	0.0010	0.0233
175	0.0256	0.0011	0.0245
176	0.0263	0.0011	0.0252
177	0.0278	0.0011	0.0267
178	0.0287	0.0012	0.0275
179	0.0306	0.0013	0.0294
180	0.0317	0.0013	0.0304
181	0.0342	0.0014	0.0328
182	0.0357	0.0015	0.0342
183	0.0390	0.0016	0.0374
184	0.0410	0.0017	0.0394
185	0.0740	0.0030	0.0710
186	0.0775	0.0030	0.0745

187	0.0864	0.0030	0.0834
188	0.0921	0.0030	0.0891
189	0.1189	0.0030	0.1160
190	0.1305	0.0030	0.1276
191	0.1718	0.0030	0.1688
192	0.2193	0.0030	0.2163
193	0.4847	0.0030	0.4817
194	0.1467	0.0030	0.1438
195	0.0992	0.0030	0.0962
196	0.0816	0.0030	0.0786
197	0.0433	0.0018	0.0415
198	0.0373	0.0015	0.0357
199	0.0329	0.0014	0.0316
200	0.0296	0.0012	0.0284
201	0.0270	0.0011	0.0259
202	0.0249	0.0010	0.0239
203	0.0232	0.0010	0.0222
204	0.0217	0.0009	0.0208
205	0.0221	0.0009	0.0212
206	0.0209	0.0009	0.0201
207	0.0199	0.0008	0.0191
208	0.0190	0.0008	0.0183
209	0.0182	0.0008	0.0175
210	0.0175	0.0007	0.0168
211	0.0168	0.0007	0.0162
212	0.0163	0.0007	0.0156
213	0.0157	0.0006	0.0151
214	0.0152	0.0006	0.0146
215	0.0147	0.0006	0.0141
216	0.0143	0.0006	0.0137
217	0.0158	0.0007	0.0152
218	0.0154	0.0006	0.0148
219	0.0151	0.0006	0.0144
220	0.0147	0.0006	0.0141
221	0.0144	0.0006	0.0138
222	0.0141	0.0006	0.0135
223	0.0138	0.0006	0.0132
224	0.0135	0.0006	0.0129
225	0.0132	0.0005	0.0127
226	0.0130	0.0005	0.0124
227	0.0127	0.0005	0.0122
228	0.0125	0.0005	0.0120
229	0.0123	0.0005	0.0118
230	0.0121	0.0005	0.0116
231	0.0119	0.0005	0.0114
232	0.0117	0.0005	0.0112
233	0.0115	0.0005	0.0110
234	0.0113	0.0005	0.0108
235	0.0111	0.0005	0.0107
236	0.0110	0.0005	0.0105

237	0.0108	0.0004	0.0104
238	0.0107	0.0004	0.0102
239	0.0105	0.0004	0.0101
240	0.0104	0.0004	0.0100
241	0.0102	0.0004	0.0098
242	0.0101	0.0004	0.0097
243	0.0100	0.0004	0.0096
244	0.0099	0.0004	0.0095
245	0.0097	0.0004	0.0093
246	0.0096	0.0004	0.0092
247	0.0095	0.0004	0.0091
248	0.0094	0.0004	0.0090
249	0.0093	0.0004	0.0089
250	0.0092	0.0004	0.0088
251	0.0091	0.0004	0.0087
252	0.0090	0.0004	0.0086
253	0.0089	0.0004	0.0085
254	0.0088	0.0004	0.0084
255	0.0087	0.0004	0.0084
256	0.0086	0.0004	0.0083
257	0.0086	0.0004	0.0082
258	0.0085	0.0003	0.0081
259	0.0084	0.0003	0.0080
260	0.0083	0.0003	0.0080
261	0.0082	0.0003	0.0079
262	0.0082	0.0003	0.0078
263	0.0081	0.0003	0.0077
264	0.0080	0.0003	0.0077
265	0.0079	0.0003	0.0076
266	0.0079	0.0003	0.0075
267	0.0078	0.0003	0.0075
268	0.0077	0.0003	0.0074
269	0.0077	0.0003	0.0074
270	0.0076	0.0003	0.0073
271	0.0075	0.0003	0.0072
272	0.0075	0.0003	0.0072
273	0.0074	0.0003	0.0071
274	0.0074	0.0003	0.0071
275	0.0073	0.0003	0.0070
276	0.0073	0.0003	0.0070
277	0.0072	0.0003	0.0069
278	0.0072	0.0003	0.0069
279	0.0071	0.0003	0.0068
280	0.0070	0.0003	0.0068
281	0.0070	0.0003	0.0067
282	0.0069	0.0003	0.0067
283	0.0069	0.0003	0.0066
284	0.0069	0.0003	0.0066
285	0.0068	0.0003	0.0065
286	0.0068	0.0003	0.0065

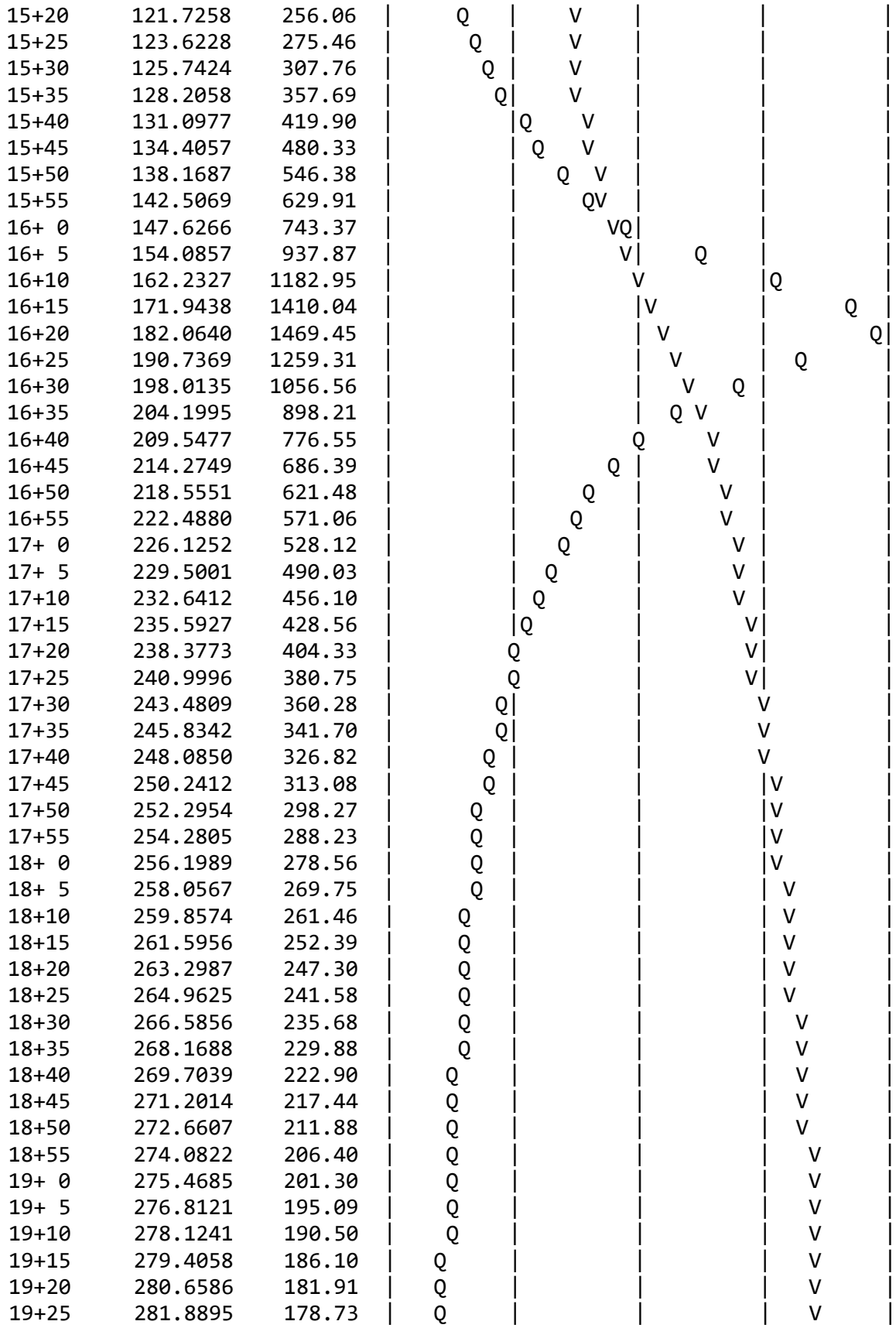
```
     287              0.0067          0.0003              0.0064
     288              0.0067          0.0003              0.0064
     ---------------------------------------------------------------------
     ---------------------------------------------------------------------
     Total soil rain loss =      0.18(In)
     Total effective rainfall =      5.00(In)
     Peak flow rate in flood hydrograph =   1469.45(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      375.0     750.0    1125.0    1500.0
-------------------------------------------------------------------------
  0+ 5       0.0092      1.34  Q         |         |         |         |
  0+10       0.0446      5.14  Q         |         |         |         |
  0+15       0.1292     12.28  Q         |         |         |         |
  0+20       0.2748     21.14  Q         |         |         |         |
  0+25       0.4628     27.31  Q         |         |         |         |
  0+30       0.6796     31.48  Q         |         |         |         |
  0+35       0.9175     34.54  Q         |         |         |         |
  0+40       1.1727     37.05  Q         |         |         |         |
  0+45       1.4423     39.15  VQ        |         |         |         |
  0+50       1.7246     40.99  VQ        |         |         |         |
  0+55       2.0184     42.66  VQ        |         |         |         |
  1+ 0       2.3227     44.19  VQ        |         |         |         |
  1+ 5       2.6366     45.57  VQ        |         |         |         |
  1+10       2.9589     46.81  VQ        |         |         |         |
  1+15       3.2892     47.95  VQ        |         |         |         |
  1+20       3.6268     49.02  VQ        |         |         |         |
  1+25       3.9710     49.98  VQ        |         |         |         |
  1+30       4.3214     50.87  VQ        |         |         |         |
  1+35       4.6774     51.69  VQ        |         |         |         |
  1+40       5.0388     52.49  VQ        |         |         |         |
  1+45       5.4056     53.25  VQ        |         |         |         |
  1+50       5.7771     53.94  VQ        |         |         |         |
  1+55       6.1534     54.63  VQ        |         |         |         |
  2+ 0       6.5343     55.31  VQ        |         |         |         |
  2+ 5       6.9198     55.98  VQ        |         |         |         |
  2+10       7.3098     56.63  VQ        |         |         |         |
  2+15       7.7040     57.22  VQ        |         |         |         |
  2+20       8.1021     57.81  |Q        |         |         |         |
  2+25       8.5042     58.39  |Q        |         |         |         |
  2+30       8.9103     58.96  |Q        |         |         |         |
  2+35       9.3202     59.52  |Q        |         |         |         |
  2+40       9.7339     60.06  |Q        |         |         |         |
  2+45      10.1512     60.59  |Q        |         |         |         |
```

2+50	10.5721	61.12	|Q	|	|	|	|
2+55	10.9965	61.63	|Q	|	|	|	|
3+ 0	11.4245	62.15	|Q	|	|	|	|
3+ 5	11.8558	62.63	|Q	|	|	|	|
3+10	12.2904	63.11	|Q	|	|	|	|
3+15	12.7283	63.58	|Q	|	|	|	|
3+20	13.1693	64.04	|Q	|	|	|	|
3+25	13.6136	64.50	|Q	|	|	|	|
3+30	14.0610	64.97	|Q	|	|	|	|
3+35	14.5117	65.44	|Q	|	|	|	|
3+40	14.9657	65.92	|Q	|	|	|	|
3+45	15.4229	66.39	|Q	|	|	|	|
3+50	15.8835	66.88	|Q	|	|	|	|
3+55	16.3474	67.36	|QV	|	|	|	|
4+ 0	16.8147	67.85	|QV	|	|	|	|
4+ 5	17.2854	68.34	|QV	|	|	|	|
4+10	17.7595	68.84	|QV	|	|	|	|
4+15	18.2363	69.23	|QV	|	|	|	|
4+20	18.7151	69.52	|QV	|	|	|	|
4+25	19.1959	69.82	|QV	|	|	|	|
4+30	19.6788	70.12	|QV	|	|	|	|
4+35	20.1638	70.42	|QV	|	|	|	|
4+40	20.6509	70.72	|QV	|	|	|	|
4+45	21.1400	71.03	|QV	|	|	|	|
4+50	21.6314	71.34	|QV	|	|	|	|
4+55	22.1249	71.66	|QV	|	|	|	|
5+ 0	22.6206	71.98	|QV	|	|	|	|
5+ 5	23.1185	72.30	|QV	|	|	|	|
5+10	23.6187	72.63	|QV	|	|	|	|
5+15	24.1212	72.96	|QV	|	|	|	|
5+20	24.6259	73.29	|Q V	|	|	|	|
5+25	25.1330	73.63	|Q V	|	|	|	|
5+30	25.6424	73.97	|Q V	|	|	|	|
5+35	26.1543	74.32	|Q V	|	|	|	|
5+40	26.6685	74.67	|Q V	|	|	|	|
5+45	27.1852	75.02	| QV	|	|	|	|
5+50	27.7044	75.38	| QV	|	|	|	|
5+55	28.2260	75.75	| QV	|	|	|	|
6+ 0	28.7503	76.12	| QV	|	|	|	|
6+ 5	29.2770	76.49	| QV	|	|	|	|
6+10	29.8064	76.87	| QV	|	|	|	|
6+15	30.3384	77.25	| QV	|	|	|	|
6+20	30.8731	77.64	| QV	|	|	|	|
6+25	31.4105	78.03	| QV	|	|	|	|
6+30	31.9507	78.43	| QV	|	|	|	|
6+35	32.4936	78.83	| Q V	|	|	|	|
6+40	33.0394	79.24	| Q V	|	|	|	|
6+45	33.5880	79.66	| Q V	|	|	|	|
6+50	34.1395	80.08	| Q V	|	|	|	|
6+55	34.6939	80.50	| Q V	|	|	|	|

7+ 0	35.2513	80.94	Q V			
7+ 5	35.8117	81.37	Q V			
7+10	36.3752	81.82	Q V			
7+15	36.9418	82.27	Q V			
7+20	37.5115	82.73	Q V			
7+25	38.0844	83.19	Q V			
7+30	38.6606	83.66	Q V			
7+35	39.2401	84.14	Q V			
7+40	39.8229	84.62	Q V			
7+45	40.4091	85.11	Q V			
7+50	40.9987	85.62	Q V			
7+55	41.5919	86.12	Q V			
8+ 0	42.1885	86.64	Q V			
8+ 5	42.7888	87.16	Q V			
8+10	43.3928	87.69	Q V			
8+15	44.0005	88.23	Q V			
8+20	44.6119	88.78	Q V			
8+25	45.2272	89.34	Q V			
8+30	45.8464	89.91	Q V			
8+35	46.4696	90.48	Q V			
8+40	47.0968	91.07	Q V			
8+45	47.7282	91.67	Q V			
8+50	48.3637	92.28	Q V			
8+55	49.0034	92.89	Q V			
9+ 0	49.6475	93.52	Q V			
9+ 5	50.2960	94.16	Q V			
9+10	50.9490	94.81	Q V			
9+15	51.6065	95.47	Q V			
9+20	52.2687	96.15	Q V			
9+25	52.9357	96.84	Q V			
9+30	53.6074	97.54	Q V			
9+35	54.2841	98.25	Q V			
9+40	54.9658	98.98	Q V			
9+45	55.6526	99.72	Q V			
9+50	56.3446	100.48	Q V			
9+55	57.0419	101.25	Q V			
10+ 0	57.7447	102.04	Q V			
10+ 5	58.4530	102.84	Q V			
10+10	59.1670	103.67	Q V			
10+15	59.8867	104.50	Q V			
10+20	60.6123	105.36	Q V			
10+25	61.3440	106.23	Q V			
10+30	62.0818	107.13	Q V			
10+35	62.8259	108.04	Q V			
10+40	63.5764	108.98	Q V			
10+45	64.3335	109.93	Q V			
10+50	65.0974	110.91	Q V			
10+55	65.8681	111.91	Q V			
11+ 0	66.6460	112.94	Q V			
11+ 5	67.4310	113.99	Q V			

11+10	68.2235	115.07	Q V				
11+15	69.0235	116.17	Q V				
11+20	69.8314	117.30	Q V				
11+25	70.6473	118.46	Q V				
11+30	71.4714	119.66	Q V				
11+35	72.3039	120.88	Q V				
11+40	73.1450	122.14	Q V				
11+45	73.9951	123.43	Q V				
11+50	74.8543	124.76	Q V				
11+55	75.7229	126.12	Q V				
12+ 0	76.6013	127.53	Q V				
12+ 5	77.4869	128.59	Q V				
12+10	78.3751	128.97	Q V				
12+15	79.2594	128.40	Q V				
12+20	80.1367	127.39	Q V				
12+25	81.0127	127.19	Q V				
12+30	81.8917	127.64	Q V				
12+35	82.7764	128.46	Q V				
12+40	83.6683	129.50	Q V				
12+45	84.5686	130.72	Q V				
12+50	85.4783	132.09	Q V				
12+55	86.3982	133.57	Q V				
13+ 0	87.3291	135.17	Q V				
13+ 5	88.2719	136.88	Q V				
13+10	89.2273	138.73	Q V				
13+15	90.1963	140.69	Q V				
13+20	91.1796	142.78	Q V				
13+25	92.1781	144.99	Q V				
13+30	93.1929	147.34	Q V				
13+35	94.2247	149.82	Q V				
13+40	95.2746	152.45	Q V				
13+45	96.3436	155.22	Q V				
13+50	97.4330	158.17	Q V				
13+55	98.5437	161.27	Q V				
14+ 0	99.6772	164.58	Q V				
14+ 5	100.8323	167.73	Q V				
14+10	102.0066	170.50	Q V				
14+15	103.1957	172.66	Q V				
14+20	104.3986	174.66	Q V				
14+25	105.6215	177.57	Q V				
14+30	106.8701	181.30	Q V				
14+35	108.1486	185.64	Q V				
14+40	109.4608	190.54	Q V				
14+45	110.8105	195.97	Q V				
14+50	112.2017	202.01	Q V				
14+55	113.6388	208.66	Q V				
15+ 0	115.1270	216.09	Q V				
15+ 5	116.6720	224.34	Q V				
15+10	118.2811	233.64	Q V				
15+15	119.9622	244.10	Q V				



19+30	283.0998	175.73	Q			V	
19+35	284.2868	172.36	Q			V	
19+40	285.4478	168.57	Q			V	
19+45	286.5819	164.68	Q			V	
19+50	287.6880	160.61	Q			V	
19+55	288.7628	156.07	Q			V	
20+ 0	289.8025	150.96	Q			V	
20+ 5	290.8013	145.02	Q			V	
20+10	291.7493	137.66	Q			V	
20+15	292.6111	125.12	Q			V	
20+20	293.3951	113.84	Q			V	
20+25	294.1458	109.01	Q			V	
20+30	294.8711	105.31	Q			V	
20+35	295.5774	102.56	Q			V	
20+40	296.2699	100.54	Q			V	
20+45	296.9498	98.73	Q			V	
20+50	297.6183	97.07	Q			V	
20+55	298.2763	95.53	Q			V	
21+ 0	298.9242	94.09	Q			V	
21+ 5	299.5629	92.73	Q			V	
21+10	300.1926	91.44	Q			V	
21+15	300.8138	90.19	Q			V	
21+20	301.4266	88.98	Q			V	
21+25	302.0313	87.82	Q			V	
21+30	302.6285	86.71	Q			V	
21+35	303.2183	85.64	Q			V	
21+40	303.8011	84.62	Q			V	
21+45	304.3772	83.64	Q			V	
21+50	304.9467	82.70	Q			V	
21+55	305.5100	81.79	Q			V	
22+ 0	306.0673	80.91	Q			V	
22+ 5	306.6187	80.06	Q			V	
22+10	307.1644	79.24	Q			V	
22+15	307.7045	78.42	Q			V	
22+20	308.2389	77.59	Q			V	
22+25	308.7677	76.79	Q			V	
22+30	309.2912	76.00	Q			V	
22+35	309.8094	75.24	Q			V	
22+40	310.3225	74.50	Q			V	
22+45	310.8307	73.79	Q			V	
22+50	311.3340	73.08	Q			V	
22+55	311.8326	72.40	Q			V	
23+ 0	312.3267	71.74	Q			V	
23+ 5	312.8163	71.09	Q			V	
23+10	313.3015	70.46	Q			V	
23+15	313.7825	69.84	Q			V	
23+20	314.2593	69.23	Q			V	
23+25	314.7321	68.65	Q			V	
23+30	315.2009	68.07	Q			V	
23+35	315.6658	67.51	Q			V	

23+40	316.1269	66.96	|Q	|	|	|	V|
23+45	316.5844	66.42	|Q	|	|	|	V|
23+50	317.0382	65.89	|Q	|	|	|	V|
23+55	317.4884	65.38	|Q	|	|	|	V|
24+ 0	317.9352	64.87	|Q	|	|	|	V|
24+ 5	318.3693	63.04	|Q	|	|	|	V|
24+10	318.7741	58.77	|Q	|	|	|	V|
24+15	319.1269	51.22	|Q	|	|	|	V|
24+20	319.4163	42.03	|Q	|	|	|	V|
24+25	319.6616	35.62	Q	|	|	|	V|
24+30	319.8770	31.27	Q	|	|	|	V|
24+35	320.0703	28.07	Q	|	|	|	V|
24+40	320.2457	25.46	Q	|	|	|	V|
24+45	320.4061	23.30	Q	|	|	|	V|
24+50	320.5535	21.41	Q	|	|	|	V|
24+55	320.6893	19.71	Q	|	|	|	V|
25+ 0	320.8144	18.17	Q	|	|	|	V|
25+ 5	320.9301	16.80	Q	|	|	|	V|
25+10	321.0375	15.59	Q	|	|	|	V|
25+15	321.1373	14.49	Q	|	|	|	V|
25+20	321.2301	13.48	Q	|	|	|	V|
25+25	321.3168	12.58	Q	|	|	|	V|
25+30	321.3978	11.77	Q	|	|	|	V|
25+35	321.4739	11.04	Q	|	|	|	V|
25+40	321.5452	10.35	Q	|	|	|	V|
25+45	321.6119	9.69	Q	|	|	|	V|
25+50	321.6746	9.11	Q	|	|	|	V|
25+55	321.7335	8.55	Q	|	|	|	V|
26+ 0	321.7887	8.01	Q	|	|	|	V|
26+ 5	321.8402	7.48	Q	|	|	|	V|
26+10	321.8882	6.97	Q	|	|	|	V|
26+15	321.9332	6.54	Q	|	|	|	V|
26+20	321.9753	6.11	Q	|	|	|	V|
26+25	322.0145	5.70	Q	|	|	|	V|
26+30	322.0511	5.31	Q	|	|	|	V|
26+35	322.0850	4.93	Q	|	|	|	V|
26+40	322.1166	4.58	Q	|	|	|	V|
26+45	322.1458	4.24	Q	|	|	|	V|
26+50	322.1728	3.92	Q	|	|	|	V|
26+55	322.1976	3.61	Q	|	|	|	V|
27+ 0	322.2204	3.30	Q	|	|	|	V|
27+ 5	322.2413	3.04	Q	|	|	|	V|
27+10	322.2605	2.78	Q	|	|	|	V|
27+15	322.2780	2.54	Q	|	|	|	V|
27+20	322.2939	2.31	Q	|	|	|	V|
27+25	322.3082	2.08	Q	|	|	|	V|
27+30	322.3210	1.86	Q	|	|	|	V|
27+35	322.3322	1.63	Q	|	|	|	V|
27+40	322.3420	1.41	Q	|	|	|	V|
27+45	322.3501	1.19	Q	|	|	|	V|

```
   27+50     322.3568      0.97  Q         |         |         |        V|
   27+55     322.3620      0.75  Q         |         |         |        V|
   28+ 0     322.3657      0.54  Q         |         |         |        V|
   28+ 5     322.3679      0.32  Q         |         |         |        V|
   28+10     322.3686      0.11  Q         |         |         |         V
-------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

Study date 02/17/22

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6360

Marmon Hydrology Analysis
100-Year Event
Basin 102

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
1472.93	1	0.97
Rainfall data for year 2		
1472.93	6	1.08
Rainfall data for year 2		
1472.93	24	1.79
Rainfall data for year 100		

```
          1472.93            1           1.83
------------------------------------------------------------------------
Rainfall data for year 100
          1472.93            6           3.35
------------------------------------------------------------------------
Rainfall data for year 100
          1472.93           24           5.57
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 91.0      98.2       1472.93      1.000     0.036    1.000    0.036

Area-averaged adjusted loss rate Fm (In/Hr) =  0.036

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
  1472.93   1.000         91.0      98.2       0.18     0.962

Area-averaged catchment yield fraction, Y =  0.962
Area-averaged low loss fraction, Yb =  0.038
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watercourse length =   11228.10(Ft.)
Length from concentration point to centroid =    5614.05(Ft.)
Elevation difference along watercourse =     560.00(Ft.)
Mannings friction factor along watercourse =  0.040
Watershed area =    1472.93(Ac.)
Catchment Lag time =   0.454 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 18.3572
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.036(In/Hr)
Average low loss rate fraction (Yb) = 0.038 (decimal)
MOUNTAIN S-Graph Selected
Computed peak 5-minute rainfall =  0.497(In)
Computed peak 30-minute rainfall =  1.310(In)
Specified peak 1-hour rainfall =  1.830(In)
Computed peak 3-hour rainfall =  2.620(In)
Specified peak 6-hour rainfall =  3.350(In)
Specified peak 24-hour rainfall =  5.570(In)


Note: user specified rainfall values used.
Rainfall depth area reduction factors:
```

Using a total area of 1472.93(Ac.) (Ref: fig. E-4)

5-minute factor = 0.931 Adjusted rainfall = 0.463(In)
30-minute factor = 0.931 Adjusted rainfall = 1.220(In)
1-hour factor = 0.931 Adjusted rainfall = 1.704(In)
3-hour factor = 0.991 Adjusted rainfall = 2.597(In)
6-hour factor = 0.995 Adjusted rainfall = 3.335(In)
24-hour factor = 0.998 Adjusted rainfall = 5.560(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 17813.25 (CFS))	
1	2.056	366.263
2	7.763	1016.517
3	17.965	1817.453
4	32.071	2512.679
5	42.831	1916.625
6	50.105	1295.729
7	55.247	915.961
8	59.312	724.122
9	62.755	613.354
10	65.655	516.562
11	68.212	455.582
12	70.533	413.352
13	72.655	377.951
14	74.552	338.002
15	76.224	297.768
16	77.763	274.176
17	79.184	253.116
18	80.439	223.516
19	81.576	202.688
20	82.614	184.793
21	83.569	170.098
22	84.519	169.318
23	85.348	147.540
24	86.119	137.340
25	86.885	136.567
26	87.624	131.663
27	88.359	130.800
28	89.050	123.192
29	89.642	105.377
30	90.229	104.635
31	90.797	101.120
32	91.348	98.100
33	91.895	97.450

34	92.389	88.087
35	92.866	85.020
36	93.337	83.876
37	93.781	79.026
38	94.221	78.480
39	94.634	73.555
40	95.002	65.515
41	95.369	65.332
42	95.713	61.256
43	96.043	58.860
44	96.374	58.860
45	96.704	58.860
46	97.035	58.860
47	97.365	58.860
48	97.695	58.860
49	98.026	58.860
50	98.356	58.860
51	98.687	58.860
52	99.017	58.860
53	99.348	58.860
54	99.678	58.860
55	100.000	57.365

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4627	0.4627
2	0.6732	0.2105
3	0.8382	0.1651
4	0.9794	0.1411
5	1.1050	0.1256
6	1.2196	0.1145
7	1.3137	0.0941
8	1.4011	0.0874
9	1.4829	0.0819
10	1.5602	0.0773
11	1.6336	0.0734
12	1.7037	0.0700
13	1.7568	0.0531
14	1.8075	0.0507
15	1.8560	0.0485
16	1.9025	0.0465
17	1.9473	0.0448
18	1.9905	0.0432
19	2.0322	0.0417
20	2.0726	0.0404
21	2.1118	0.0392
22	2.1498	0.0380
23	2.1868	0.0370
24	2.2228	0.0360
25	2.2579	0.0351

26	2.2922	0.0342
27	2.3256	0.0334
28	2.3583	0.0327
29	2.3903	0.0320
30	2.4216	0.0313
31	2.4522	0.0307
32	2.4823	0.0301
33	2.5118	0.0295
34	2.5407	0.0289
35	2.5692	0.0284
36	2.5971	0.0279
37	2.6229	0.0258
38	2.6482	0.0253
39	2.6731	0.0249
40	2.6977	0.0245
41	2.7218	0.0241
42	2.7455	0.0238
43	2.7689	0.0234
44	2.7920	0.0231
45	2.8147	0.0227
46	2.8371	0.0224
47	2.8592	0.0221
48	2.8810	0.0218
49	2.9025	0.0215
50	2.9237	0.0212
51	2.9447	0.0210
52	2.9654	0.0207
53	2.9858	0.0204
54	3.0060	0.0202
55	3.0259	0.0200
56	3.0457	0.0197
57	3.0652	0.0195
58	3.0845	0.0193
59	3.1035	0.0191
60	3.1224	0.0189
61	3.1411	0.0187
62	3.1595	0.0185
63	3.1778	0.0183
64	3.1959	0.0181
65	3.2138	0.0179
66	3.2316	0.0177
67	3.2491	0.0176
68	3.2666	0.0174
69	3.2838	0.0172
70	3.3009	0.0171
71	3.3178	0.0169
72	3.3346	0.0168
73	3.3516	0.0170
74	3.3684	0.0169
75	3.3852	0.0167

76	3.4017	0.0166
77	3.4182	0.0164
78	3.4345	0.0163
79	3.4506	0.0162
80	3.4667	0.0160
81	3.4826	0.0159
82	3.4984	0.0158
83	3.5141	0.0157
84	3.5296	0.0156
85	3.5451	0.0154
86	3.5604	0.0153
87	3.5756	0.0152
88	3.5907	0.0151
89	3.6057	0.0150
90	3.6206	0.0149
91	3.6354	0.0148
92	3.6500	0.0147
93	3.6646	0.0146
94	3.6791	0.0145
95	3.6935	0.0144
96	3.7078	0.0143
97	3.7220	0.0142
98	3.7361	0.0141
99	3.7501	0.0140
100	3.7640	0.0139
101	3.7778	0.0138
102	3.7916	0.0138
103	3.8053	0.0137
104	3.8188	0.0136
105	3.8323	0.0135
106	3.8458	0.0134
107	3.8591	0.0133
108	3.8724	0.0133
109	3.8855	0.0132
110	3.8987	0.0131
111	3.9117	0.0130
112	3.9246	0.0130
113	3.9375	0.0129
114	3.9503	0.0128
115	3.9631	0.0127
116	3.9758	0.0127
117	3.9884	0.0126
118	4.0009	0.0125
119	4.0134	0.0125
120	4.0258	0.0124
121	4.0381	0.0123
122	4.0504	0.0123
123	4.0626	0.0122
124	4.0747	0.0121
125	4.0868	0.0121

126	4.0989	0.0120
127	4.1108	0.0120
128	4.1227	0.0119
129	4.1346	0.0118
130	4.1464	0.0118
131	4.1581	0.0117
132	4.1698	0.0117
133	4.1814	0.0116
134	4.1930	0.0116
135	4.2045	0.0115
136	4.2159	0.0115
137	4.2273	0.0114
138	4.2387	0.0114
139	4.2500	0.0113
140	4.2612	0.0112
141	4.2724	0.0112
142	4.2836	0.0111
143	4.2947	0.0111
144	4.3057	0.0111
145	4.3167	0.0110
146	4.3277	0.0110
147	4.3386	0.0109
148	4.3495	0.0109
149	4.3603	0.0108
150	4.3710	0.0108
151	4.3818	0.0107
152	4.3924	0.0107
153	4.4031	0.0106
154	4.4137	0.0106
155	4.4242	0.0105
156	4.4347	0.0105
157	4.4452	0.0105
158	4.4556	0.0104
159	4.4660	0.0104
160	4.4763	0.0103
161	4.4866	0.0103
162	4.4969	0.0103
163	4.5071	0.0102
164	4.5173	0.0102
165	4.5274	0.0101
166	4.5375	0.0101
167	4.5476	0.0101
168	4.5576	0.0100
169	4.5676	0.0100
170	4.5775	0.0099
171	4.5874	0.0099
172	4.5973	0.0099
173	4.6071	0.0098
174	4.6169	0.0098
175	4.6267	0.0098

176	4.6364	0.0097
177	4.6461	0.0097
178	4.6558	0.0097
179	4.6654	0.0096
180	4.6750	0.0096
181	4.6846	0.0096
182	4.6941	0.0095
183	4.7036	0.0095
184	4.7131	0.0095
185	4.7225	0.0094
186	4.7319	0.0094
187	4.7413	0.0094
188	4.7506	0.0093
189	4.7599	0.0093
190	4.7692	0.0093
191	4.7784	0.0092
192	4.7876	0.0092
193	4.7968	0.0092
194	4.8060	0.0092
195	4.8151	0.0091
196	4.8242	0.0091
197	4.8332	0.0091
198	4.8423	0.0090
199	4.8513	0.0090
200	4.8602	0.0090
201	4.8692	0.0089
202	4.8781	0.0089
203	4.8870	0.0089
204	4.8959	0.0089
205	4.9047	0.0088
206	4.9135	0.0088
207	4.9223	0.0088
208	4.9310	0.0088
209	4.9398	0.0087
210	4.9485	0.0087
211	4.9572	0.0087
212	4.9658	0.0087
213	4.9744	0.0086
214	4.9830	0.0086
215	4.9916	0.0086
216	5.0001	0.0085
217	5.0087	0.0085
218	5.0172	0.0085
219	5.0256	0.0085
220	5.0341	0.0085
221	5.0425	0.0084
222	5.0509	0.0084
223	5.0593	0.0084
224	5.0677	0.0084
225	5.0760	0.0083

226	5.0843	0.0083
227	5.0926	0.0083
228	5.1008	0.0083
229	5.1091	0.0082
230	5.1173	0.0082
231	5.1255	0.0082
232	5.1337	0.0082
233	5.1418	0.0081
234	5.1499	0.0081
235	5.1580	0.0081
236	5.1661	0.0081
237	5.1742	0.0081
238	5.1822	0.0080
239	5.1902	0.0080
240	5.1982	0.0080
241	5.2062	0.0080
242	5.2142	0.0080
243	5.2221	0.0079
244	5.2300	0.0079
245	5.2379	0.0079
246	5.2458	0.0079
247	5.2536	0.0079
248	5.2615	0.0078
249	5.2693	0.0078
250	5.2771	0.0078
251	5.2849	0.0078
252	5.2926	0.0078
253	5.3003	0.0077
254	5.3081	0.0077
255	5.3158	0.0077
256	5.3234	0.0077
257	5.3311	0.0077
258	5.3387	0.0076
259	5.3464	0.0076
260	5.3540	0.0076
261	5.3615	0.0076
262	5.3691	0.0076
263	5.3767	0.0075
264	5.3842	0.0075
265	5.3917	0.0075
266	5.3992	0.0075
267	5.4067	0.0075
268	5.4141	0.0075
269	5.4216	0.0074
270	5.4290	0.0074
271	5.4364	0.0074
272	5.4438	0.0074
273	5.4512	0.0074
274	5.4585	0.0074
275	5.4658	0.0073

276	5.4732	0.0073
277	5.4805	0.0073
278	5.4878	0.0073
279	5.4950	0.0073
280	5.5023	0.0073
281	5.5095	0.0072
282	5.5167	0.0072
283	5.5240	0.0072
284	5.5311	0.0072
285	5.5383	0.0072
286	5.5455	0.0072
287	5.5526	0.0071
288	5.5597	0.0071

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0071	0.0003	0.0069
2	0.0071	0.0003	0.0069
3	0.0072	0.0003	0.0069
4	0.0072	0.0003	0.0069
5	0.0072	0.0003	0.0069
6	0.0072	0.0003	0.0070
7	0.0073	0.0003	0.0070
8	0.0073	0.0003	0.0070
9	0.0073	0.0003	0.0070
10	0.0073	0.0003	0.0071
11	0.0074	0.0003	0.0071
12	0.0074	0.0003	0.0071
13	0.0074	0.0003	0.0071
14	0.0074	0.0003	0.0072
15	0.0075	0.0003	0.0072
16	0.0075	0.0003	0.0072
17	0.0075	0.0003	0.0072
18	0.0075	0.0003	0.0073
19	0.0076	0.0003	0.0073
20	0.0076	0.0003	0.0073
21	0.0076	0.0003	0.0073
22	0.0077	0.0003	0.0074
23	0.0077	0.0003	0.0074
24	0.0077	0.0003	0.0074
25	0.0078	0.0003	0.0075
26	0.0078	0.0003	0.0075
27	0.0078	0.0003	0.0075
28	0.0078	0.0003	0.0075
29	0.0079	0.0003	0.0076
30	0.0079	0.0003	0.0076
31	0.0079	0.0003	0.0076
32	0.0080	0.0003	0.0076

33	0.0080	0.0003	0.0077
34	0.0080	0.0003	0.0077
35	0.0081	0.0003	0.0078
36	0.0081	0.0003	0.0078
37	0.0081	0.0003	0.0078
38	0.0081	0.0003	0.0078
39	0.0082	0.0003	0.0079
40	0.0082	0.0003	0.0079
41	0.0083	0.0003	0.0079
42	0.0083	0.0003	0.0080
43	0.0083	0.0003	0.0080
44	0.0084	0.0003	0.0080
45	0.0084	0.0003	0.0081
46	0.0084	0.0003	0.0081
47	0.0085	0.0003	0.0081
48	0.0085	0.0003	0.0082
49	0.0085	0.0003	0.0082
50	0.0086	0.0003	0.0082
51	0.0086	0.0003	0.0083
52	0.0087	0.0003	0.0083
53	0.0087	0.0003	0.0084
54	0.0087	0.0003	0.0084
55	0.0088	0.0003	0.0084
56	0.0088	0.0003	0.0085
57	0.0089	0.0003	0.0085
58	0.0089	0.0003	0.0085
59	0.0089	0.0003	0.0086
60	0.0090	0.0003	0.0086
61	0.0090	0.0003	0.0087
62	0.0091	0.0003	0.0087
63	0.0091	0.0004	0.0088
64	0.0092	0.0004	0.0088
65	0.0092	0.0004	0.0089
66	0.0092	0.0004	0.0089
67	0.0093	0.0004	0.0089
68	0.0093	0.0004	0.0090
69	0.0094	0.0004	0.0090
70	0.0094	0.0004	0.0091
71	0.0095	0.0004	0.0091
72	0.0095	0.0004	0.0092
73	0.0096	0.0004	0.0092
74	0.0096	0.0004	0.0093
75	0.0097	0.0004	0.0093
76	0.0097	0.0004	0.0094
77	0.0098	0.0004	0.0094
78	0.0098	0.0004	0.0095
79	0.0099	0.0004	0.0095
80	0.0099	0.0004	0.0096
81	0.0100	0.0004	0.0096
82	0.0101	0.0004	0.0097

83	0.0101	0.0004	0.0097
84	0.0102	0.0004	0.0098
85	0.0103	0.0004	0.0099
86	0.0103	0.0004	0.0099
87	0.0104	0.0004	0.0100
88	0.0104	0.0004	0.0100
89	0.0105	0.0004	0.0101
90	0.0105	0.0004	0.0101
91	0.0106	0.0004	0.0102
92	0.0107	0.0004	0.0103
93	0.0108	0.0004	0.0104
94	0.0108	0.0004	0.0104
95	0.0109	0.0004	0.0105
96	0.0110	0.0004	0.0105
97	0.0111	0.0004	0.0106
98	0.0111	0.0004	0.0107
99	0.0112	0.0004	0.0108
100	0.0112	0.0004	0.0108
101	0.0114	0.0004	0.0109
102	0.0114	0.0004	0.0110
103	0.0115	0.0004	0.0111
104	0.0116	0.0004	0.0111
105	0.0117	0.0004	0.0112
106	0.0117	0.0005	0.0113
107	0.0118	0.0005	0.0114
108	0.0119	0.0005	0.0114
109	0.0120	0.0005	0.0116
110	0.0121	0.0005	0.0116
111	0.0122	0.0005	0.0117
112	0.0123	0.0005	0.0118
113	0.0124	0.0005	0.0119
114	0.0125	0.0005	0.0120
115	0.0126	0.0005	0.0121
116	0.0127	0.0005	0.0122
117	0.0128	0.0005	0.0123
118	0.0129	0.0005	0.0124
119	0.0130	0.0005	0.0125
120	0.0131	0.0005	0.0126
121	0.0133	0.0005	0.0128
122	0.0133	0.0005	0.0128
123	0.0135	0.0005	0.0130
124	0.0136	0.0005	0.0131
125	0.0138	0.0005	0.0132
126	0.0138	0.0005	0.0133
127	0.0140	0.0005	0.0135
128	0.0141	0.0005	0.0136
129	0.0143	0.0005	0.0137
130	0.0144	0.0006	0.0138
131	0.0146	0.0006	0.0140
132	0.0147	0.0006	0.0141

133	0.0149	0.0006	0.0143
134	0.0150	0.0006	0.0144
135	0.0152	0.0006	0.0146
136	0.0153	0.0006	0.0147
137	0.0156	0.0006	0.0150
138	0.0157	0.0006	0.0151
139	0.0159	0.0006	0.0153
140	0.0160	0.0006	0.0154
141	0.0163	0.0006	0.0157
142	0.0164	0.0006	0.0158
143	0.0167	0.0006	0.0161
144	0.0169	0.0006	0.0162
145	0.0168	0.0006	0.0161
146	0.0169	0.0007	0.0163
147	0.0172	0.0007	0.0166
148	0.0174	0.0007	0.0167
149	0.0177	0.0007	0.0171
150	0.0179	0.0007	0.0172
151	0.0183	0.0007	0.0176
152	0.0185	0.0007	0.0178
153	0.0189	0.0007	0.0181
154	0.0191	0.0007	0.0183
155	0.0195	0.0007	0.0188
156	0.0197	0.0008	0.0190
157	0.0202	0.0008	0.0194
158	0.0204	0.0008	0.0197
159	0.0210	0.0008	0.0201
160	0.0212	0.0008	0.0204
161	0.0218	0.0008	0.0210
162	0.0221	0.0008	0.0212
163	0.0227	0.0009	0.0218
164	0.0231	0.0009	0.0222
165	0.0238	0.0009	0.0228
166	0.0241	0.0009	0.0232
167	0.0249	0.0010	0.0240
168	0.0253	0.0010	0.0244
169	0.0279	0.0011	0.0269
170	0.0284	0.0011	0.0273
171	0.0295	0.0011	0.0284
172	0.0301	0.0012	0.0289
173	0.0313	0.0012	0.0301
174	0.0320	0.0012	0.0307
175	0.0334	0.0013	0.0322
176	0.0342	0.0013	0.0329
177	0.0360	0.0014	0.0346
178	0.0370	0.0014	0.0356
179	0.0392	0.0015	0.0377
180	0.0404	0.0016	0.0388
181	0.0432	0.0017	0.0415
182	0.0448	0.0017	0.0431

183	0.0485	0.0019	0.0466
184	0.0507	0.0019	0.0487
185	0.0700	0.0027	0.0673
186	0.0734	0.0028	0.0706
187	0.0819	0.0030	0.0789
188	0.0874	0.0030	0.0844
189	0.1145	0.0030	0.1116
190	0.1256	0.0030	0.1227
191	0.1651	0.0030	0.1621
192	0.2105	0.0030	0.2075
193	0.4627	0.0030	0.4597
194	0.1411	0.0030	0.1382
195	0.0941	0.0030	0.0911
196	0.0773	0.0030	0.0743
197	0.0531	0.0020	0.0511
198	0.0465	0.0018	0.0448
199	0.0417	0.0016	0.0401
200	0.0380	0.0015	0.0366
201	0.0351	0.0013	0.0337
202	0.0327	0.0013	0.0314
203	0.0307	0.0012	0.0295
204	0.0289	0.0011	0.0278
205	0.0258	0.0010	0.0248
206	0.0245	0.0009	0.0236
207	0.0234	0.0009	0.0225
208	0.0224	0.0009	0.0215
209	0.0215	0.0008	0.0207
210	0.0207	0.0008	0.0199
211	0.0200	0.0008	0.0192
212	0.0193	0.0007	0.0185
213	0.0187	0.0007	0.0179
214	0.0181	0.0007	0.0174
215	0.0176	0.0007	0.0169
216	0.0171	0.0007	0.0164
217	0.0170	0.0007	0.0164
218	0.0166	0.0006	0.0159
219	0.0162	0.0006	0.0156
220	0.0158	0.0006	0.0152
221	0.0154	0.0006	0.0148
222	0.0151	0.0006	0.0145
223	0.0148	0.0006	0.0142
224	0.0145	0.0006	0.0139
225	0.0142	0.0005	0.0137
226	0.0139	0.0005	0.0134
227	0.0137	0.0005	0.0131
228	0.0134	0.0005	0.0129
229	0.0132	0.0005	0.0127
230	0.0130	0.0005	0.0125
231	0.0127	0.0005	0.0123
232	0.0125	0.0005	0.0121

233	0.0123	0.0005	0.0119
234	0.0121	0.0005	0.0117
235	0.0120	0.0005	0.0115
236	0.0118	0.0005	0.0113
237	0.0116	0.0004	0.0112
238	0.0115	0.0004	0.0110
239	0.0113	0.0004	0.0109
240	0.0111	0.0004	0.0107
241	0.0110	0.0004	0.0106
242	0.0109	0.0004	0.0104
243	0.0107	0.0004	0.0103
244	0.0106	0.0004	0.0102
245	0.0105	0.0004	0.0101
246	0.0103	0.0004	0.0099
247	0.0102	0.0004	0.0098
248	0.0101	0.0004	0.0097
249	0.0100	0.0004	0.0096
250	0.0099	0.0004	0.0095
251	0.0098	0.0004	0.0094
252	0.0097	0.0004	0.0093
253	0.0096	0.0004	0.0092
254	0.0095	0.0004	0.0091
255	0.0094	0.0004	0.0090
256	0.0093	0.0004	0.0089
257	0.0092	0.0004	0.0088
258	0.0091	0.0003	0.0087
259	0.0090	0.0003	0.0087
260	0.0089	0.0003	0.0086
261	0.0088	0.0003	0.0085
262	0.0088	0.0003	0.0084
263	0.0087	0.0003	0.0083
264	0.0086	0.0003	0.0083
265	0.0085	0.0003	0.0082
266	0.0085	0.0003	0.0081
267	0.0084	0.0003	0.0081
268	0.0083	0.0003	0.0080
269	0.0082	0.0003	0.0079
270	0.0082	0.0003	0.0079
271	0.0081	0.0003	0.0078
272	0.0080	0.0003	0.0077
273	0.0080	0.0003	0.0077
274	0.0079	0.0003	0.0076
275	0.0079	0.0003	0.0076
276	0.0078	0.0003	0.0075
277	0.0077	0.0003	0.0074
278	0.0077	0.0003	0.0074
279	0.0076	0.0003	0.0073
280	0.0076	0.0003	0.0073
281	0.0075	0.0003	0.0072
282	0.0075	0.0003	0.0072

283	0.0074	0.0003	0.0071
284	0.0074	0.0003	0.0071
285	0.0073	0.0003	0.0070
286	0.0073	0.0003	0.0070
287	0.0072	0.0003	0.0069
288	0.0072	0.0003	0.0069

Total soil rain loss = 0.18(In)
Total effective rainfall = 5.38(In)
Peak flow rate in flood hydrograph = 2642.49(CFS)

++

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

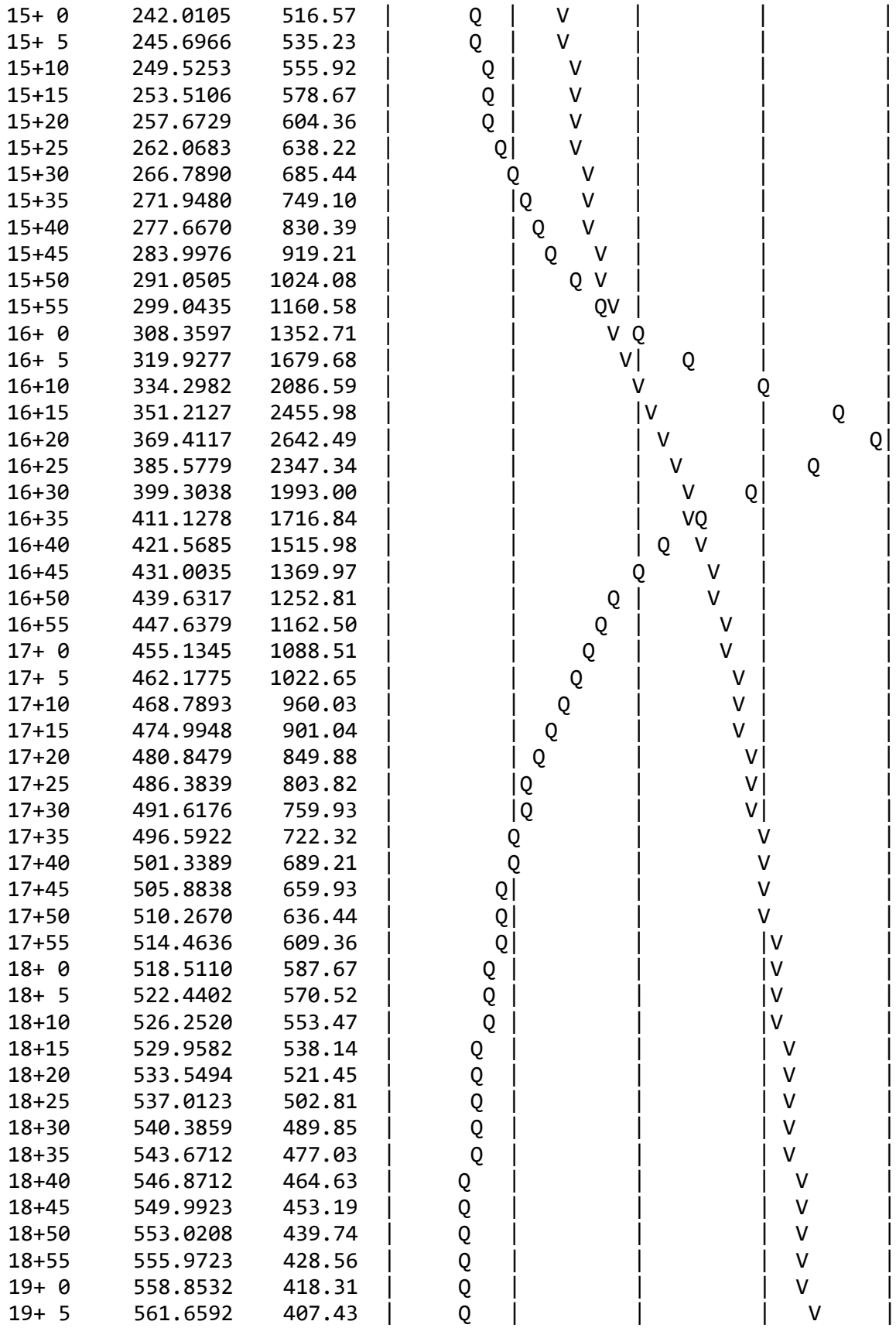
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	675.0	1350.0	2025.0	2700.0
0+ 5	0.0173	2.51	Q				
0+10	0.0826	9.48	Q				
0+15	0.2338	21.96	Q				
0+20	0.5041	39.24	Q				
0+25	0.8657	52.50	Q				
0+30	1.2896	61.55	Q				
0+35	1.7581	68.03	VQ				
0+40	2.2623	73.21	VQ				
0+45	2.7971	77.66	VQ				
0+50	3.3582	81.46	VQ				
0+55	3.9426	84.86	VQ				
1+ 0	4.5485	87.98	VQ				
1+ 5	5.1743	90.87	VQ				
1+10	5.8182	93.50	VQ				
1+15	6.4784	95.86	VQ				
1+20	7.1538	98.07	VQ				
1+25	7.8434	100.14	VQ				
1+30	8.5461	102.02	VQ				
1+35	9.2607	103.77	VQ				
1+40	9.9867	105.40	VQ				
1+45	10.7232	106.94	VQ				
1+50	11.4703	108.48	VQ				
1+55	12.2271	109.88	VQ				
2+ 0	12.9930	111.22	VQ				
2+ 5	13.7682	112.56	VQ				
2+10	14.5524	113.87	VQ				
2+15	15.3457	115.18	VQ				
2+20	16.1477	116.45	VQ				
2+25	16.9576	117.60	|Q				

2+30	17.7754	118.75	|Q	|	|	|	|
2+35	18.6011	119.89	|Q	|	|	|	|
2+40	19.4345	121.01	|Q	|	|	|	|
2+45	20.2757	122.13	|Q	|	|	|	|
2+50	21.1242	123.20	|Q	|	|	|	|
2+55	21.9799	124.25	|Q	|	|	|	|
3+ 0	22.8429	125.30	|Q	|	|	|	|
3+ 5	23.7129	126.33	|Q	|	|	|	|
3+10	24.5900	127.36	|Q	|	|	|	|
3+15	25.4740	128.35	|Q	|	|	|	|
3+20	26.3645	129.31	|Q	|	|	|	|
3+25	27.2617	130.26	|Q	|	|	|	|
3+30	28.1652	131.20	|Q	|	|	|	|
3+35	29.0752	132.13	|Q	|	|	|	|
3+40	29.9916	133.06	|Q	|	|	|	|
3+45	30.9144	134.00	|Q	|	|	|	|
3+50	31.8438	134.95	|Q	|	|	|	|
3+55	32.7798	135.90	|VQ	|	|	|	|
4+ 0	33.7223	136.86	| Q	|	|	|	|
4+ 5	34.6716	137.83	| Q	|	|	|	|
4+10	35.6275	138.81	| Q	|	|	|	|
4+15	36.5903	139.79	| Q	|	|	|	|
4+20	37.5598	140.78	| Q	|	|	|	|
4+25	38.5363	141.78	| Q	|	|	|	|
4+30	39.5197	142.79	| Q	|	|	|	|
4+35	40.5099	143.79	| Q	|	|	|	|
4+40	41.5045	144.41	| Q	|	|	|	|
4+45	42.5034	145.04	| Q	|	|	|	|
4+50	43.5066	145.67	| Q	|	|	|	|
4+55	44.5143	146.31	| Q	|	|	|	|
5+ 0	45.5264	146.96	| Q	|	|	|	|
5+ 5	46.5431	147.62	| Q	|	|	|	|
5+10	47.5643	148.28	| Q	|	|	|	|
5+15	48.5901	148.95	| Q	|	|	|	|
5+20	49.6207	149.63	| QV	|	|	|	|
5+25	50.6559	150.32	| QV	|	|	|	|
5+30	51.6960	151.02	| QV	|	|	|	|
5+35	52.7409	151.72	| QV	|	|	|	|
5+40	53.7907	152.43	| QV	|	|	|	|
5+45	54.8455	153.15	| QV	|	|	|	|
5+50	55.9053	153.89	| QV	|	|	|	|
5+55	56.9702	154.62	| QV	|	|	|	|
6+ 0	58.0403	155.38	| QV	|	|	|	|
6+ 5	59.1156	156.13	| QV	|	|	|	|
6+10	60.1962	156.90	| QV	|	|	|	|
6+15	61.2822	157.68	| QV	|	|	|	|
6+20	62.3735	158.47	| QV	|	|	|	|
6+25	63.4704	159.27	| QV	|	|	|	|
6+30	64.5729	160.08	| QV	|	|	|	|
6+35	65.6810	160.90	| QV	|	|	|	|

6+40	66.7948	161.73	Q V			
6+45	67.9145	162.57	Q V			
6+50	69.0400	163.43	Q V			
6+55	70.1714	164.29	Q V			
7+ 0	71.3090	165.17	Q V			
7+ 5	72.4526	166.06	Q V			
7+10	73.6025	166.96	Q V			
7+15	74.7586	167.87	Q V			
7+20	75.9212	168.81	Q V			
7+25	77.0903	169.74	Q V			
7+30	78.2659	170.70	Q V			
7+35	79.4482	171.67	Q V			
7+40	80.6373	172.66	Q V			
7+45	81.8333	173.65	Q V			
7+50	83.0363	174.67	Q V			
7+55	84.2463	175.70	Q V			
8+ 0	85.4636	176.75	Q V			
8+ 5	86.6882	177.81	Q V			
8+10	87.9202	178.89	Q V			
8+15	89.1598	179.98	Q V			
8+20	90.4070	181.10	Q V			
8+25	91.6621	182.23	Q V			
8+30	92.9250	183.39	Q V			
8+35	94.1961	184.55	Q V			
8+40	95.4753	185.75	Q V			
8+45	96.7628	186.95	Q V			
8+50	98.0589	188.19	Q V			
8+55	99.3635	189.43	Q V			
9+ 0	100.6770	190.71	Q V			
9+ 5	101.9993	192.01	Q V			
9+10	103.3308	193.33	Q V			
9+15	104.6715	194.67	Q V			
9+20	106.0217	196.04	Q V			
9+25	107.3814	197.43	Q V			
9+30	108.7509	198.86	Q V			
9+35	110.1304	200.30	Q V			
9+40	111.5201	201.78	Q V			
9+45	112.9201	203.28	Q V			
9+50	114.3307	204.82	Q V			
9+55	115.7520	206.38	Q V			
10+ 0	117.1843	207.98	Q V			
10+ 5	118.6279	209.60	Q V			
10+10	120.0829	211.27	Q V			
10+15	121.5496	212.96	Q V			
10+20	123.0282	214.70	Q V			
10+25	124.5190	216.46	Q V			
10+30	126.0223	218.28	Q V			
10+35	127.5383	220.12	Q V			
10+40	129.0674	222.02	Q V			
10+45	130.6097	223.95	Q V			

10+50	132.1658	225.94	| Q V |	|	|	|
10+55	133.7357	227.95	| Q V |	|	|	|
11+ 0	135.3199	230.04	| Q V |	|	|	|
11+ 5	136.9188	232.15	| Q V |	|	|	|
11+10	138.5327	234.34	| Q V |	|	|	|
11+15	140.1619	236.56	| Q V |	|	|	|
11+20	141.8069	238.86	| Q V |	|	|	|
11+25	143.4680	241.19	| Q V |	|	|	|
11+30	145.1458	243.61	| Q V |	|	|	|
11+35	146.8405	246.08	| Q V |	|	|	|
11+40	148.5528	248.63	| Q V|	|	|	|
11+45	150.2830	251.23	| Q V|	|	|	|
11+50	152.0318	253.92	| Q V|	|	|	|
11+55	153.7995	256.67	| Q V|	|	|	|
12+ 0	155.5868	259.52	| Q V|	|	|	|
12+ 5	157.3933	262.30	| Q V|	|	|	|
12+10	159.2181	264.96	| Q V|	|	|	|
12+15	161.0596	267.39	| Q V|	|	|	|
12+20	162.9170	269.69	| Q V|	|	|	|
12+25	164.7922	272.28	| Q V|	|	|	|
12+30	166.6876	275.22	| Q V	|	|	|
12+35	168.6049	278.39	| Q V	|	|	|
12+40	170.5454	281.77	| Q V	|	|	|
12+45	172.5102	285.29	| Q V	|	|	|
12+50	174.5007	289.01	| Q V	|	|	|
12+55	176.5176	292.86	| Q V	|	|	|
13+ 0	178.5625	296.91	| Q V	|	|	|
13+ 5	180.6362	301.10	| Q V	|	|	|
13+10	182.7403	305.52	| Q |V	|	|	|
13+15	184.8759	310.09	| Q |V	|	|	|
13+20	187.0447	314.91	| Q |V	|	|	|
13+25	189.2479	319.90	| Q |V	|	|	|
13+30	191.4874	325.18	| Q |V	|	|	|
13+35	193.7646	330.66	| Q |V	|	|	|
13+40	196.0818	336.45	| Q |V	|	|	|
13+45	198.4405	342.48	| Q | V	|	|	|
13+50	200.8432	348.87	| Q | V	|	|	|
13+55	203.2918	355.54	| Q | V	|	|	|
14+ 0	205.7894	362.64	| Q | V	|	|	|
14+ 5	208.3421	370.66	| Q | V	|	|	|
14+10	210.9609	380.24	| Q | V	|	|	|
14+15	213.6573	391.52	| Q | V	|	|	|
14+20	216.4435	404.56	| Q | V	|	|	|
14+25	219.3168	417.19	| Q | V	|	|	|
14+30	222.2754	429.59	| Q | V	|	|	|
14+35	225.3198	442.04	| Q | V	|	|	|
14+40	228.4542	455.12	| Q | V	|	|	|
14+45	231.6832	468.85	| Q | V	|	|	|
14+50	235.0137	483.60	| Q | V	|	|	|
14+55	238.4528	499.35	| Q | V	|	|	|



19+10	564.3990	397.82	Q			V	
19+15	567.0657	387.21	Q			V	
19+20	569.6571	376.27	Q			V	
19+25	572.1926	368.16	Q			V	
19+30	574.6689	359.55	Q			V	
19+35	577.0934	352.04	Q			V	
19+40	579.4746	345.75	Q			V	
19+45	581.8148	339.79	Q			V	
19+50	584.1148	333.97	Q			V	
19+55	586.3756	328.26	Q			V	
20+ 0	588.5910	321.67	Q			V	
20+ 5	590.7608	315.06	Q			V	
20+10	592.8827	308.10	Q			V	
20+15	594.9552	300.93	Q			V	
20+20	596.9684	292.31	Q			V	
20+25	598.9181	283.10	Q			V	
20+30	600.7891	271.67	Q			V	
20+35	602.5615	257.35	Q			V	
20+40	604.1395	229.12	Q			V	
20+45	605.6511	219.49	Q			V	
20+50	607.1156	212.65	Q			V	
20+55	608.5404	206.87	Q			V	
21+ 0	609.9350	202.51	Q			V	
21+ 5	611.3026	198.57	Q			V	
21+10	612.6452	194.95	Q			V	
21+15	613.9648	191.60	Q			V	
21+20	615.2627	188.46	Q			V	
21+25	616.5402	185.50	Q			V	
21+30	617.7985	182.70	Q			V	
21+35	619.0384	180.04	Q			V	
21+40	620.2614	177.59	Q			V	
21+45	621.4684	175.25	Q			V	
21+50	622.6600	173.02	Q			V	
21+55	623.8368	170.87	Q			V	
22+ 0	624.9994	168.81	Q			V	
22+ 5	626.1483	166.82	Q			V	
22+10	627.2841	164.91	Q			V	
22+15	628.4071	163.06	Q			V	
22+20	629.5178	161.27	Q			V	
22+25	630.6166	159.55	Q			V	
22+30	631.7039	157.87	Q			V	
22+35	632.7800	156.25	Q			V	
22+40	633.8451	154.65	Q			V	
22+45	634.8995	153.10	Q			V	
22+50	635.9436	151.60	Q			V	
22+55	636.9775	150.13	Q			V	
23+ 0	638.0017	148.71	Q			V	
23+ 5	639.0163	147.32	Q			V	
23+10	640.0216	145.97	Q			V	
23+15	641.0178	144.65	Q			V	

```
23+20     642.0051    143.36  | Q       |         |         |       V |
23+25     642.9839    142.11  | Q       |         |         |       V |
23+30     643.9541    140.89  | Q       |         |         |        V|
23+35     644.9162    139.69  | Q       |         |         |        V|
23+40     645.8702    138.52  | Q       |         |         |        V|
23+45     646.8163    137.38  | Q       |         |         |        V|
23+50     647.7548    136.26  | Q       |         |         |        V|
23+55     648.6857    135.17  | Q       |         |         |        V|
24+ 0     649.6093    134.10  |Q        |         |         |        V|
24+ 5     650.5084    130.55  |Q        |         |         |        V|
24+10     651.3527    122.59  |Q        |         |         |        V|
24+15     652.1049    109.23  |Q        |         |         |        V|
24+20     652.7331     91.20  |Q        |         |         |        V|
24+25     653.2660     77.39  |Q        |         |         |        V|
24+30     653.7337     67.91  |Q        |         |         |        V|
24+35     654.1546     61.11  Q         |         |         |        V|
24+40     654.5380     55.67  Q         |         |         |        V|
24+45     654.8894     51.03  Q         |         |         |        V|
24+50     655.2137     47.09  Q         |         |         |        V|
24+55     655.5139     43.59  Q         |         |         |        V|
25+ 0     655.7923     40.42  Q         |         |         |        V|
25+ 5     656.0506     37.51  Q         |         |         |        V|
25+10     656.2909     34.90  Q         |         |         |        V|
25+15     656.5153     32.58  Q         |         |         |        V|
25+20     656.7250     30.45  Q         |         |         |        V|
25+25     656.9211     28.47  Q         |         |         |        V|
25+30     657.1051     26.72  Q         |         |         |        V|
25+35     657.2781     25.12  Q         |         |         |        V|
25+40     657.4410     23.66  Q         |         |         |        V|
25+45     657.5947     22.31  Q         |         |         |        V|
25+50     657.7391     20.98  Q         |         |         |        V|
25+55     657.8755     19.81  Q         |         |         |        V|
26+ 0     658.0044     18.71  Q         |         |         |        V|
26+ 5     658.1259     17.63  Q         |         |         |        V|
26+10     658.2402     16.60  Q         |         |         |        V|
26+15     658.3475     15.58  Q         |         |         |        V|
26+20     658.4481     14.62  Q         |         |         |        V|
26+25     658.5431     13.79  Q         |         |         |        V|
26+30     658.6324     12.97  Q         |         |         |        V|
26+35     658.7162     12.18  Q         |         |         |        V|
26+40     658.7949     11.42  Q         |         |         |        V|
26+45     658.8683     10.67  Q         |         |         |        V|
26+50     658.9371      9.98  Q         |         |         |        V|
26+55     659.0013      9.33  Q         |         |         |        V|
27+ 0     659.0612      8.69  Q         |         |         |        V|
27+ 5     659.1168      8.08  Q         |         |         |        V|
27+10     659.1684      7.49  Q         |         |         |        V|
27+15     659.2162      6.93  Q         |         |         |        V|
27+20     659.2605      6.43  Q         |         |         |        V|
27+25     659.3014      5.94  Q         |         |         |        V|
```

27+30	659.3392	5.48	Q	|	|	|	V|
27+35	659.3739	5.04	Q	|	|	|	V|
27+40	659.4056	4.60	Q	|	|	|	V|
27+45	659.4343	4.17	Q	|	|	|	V|
27+50	659.4600	3.74	Q	|	|	|	V|
27+55	659.4828	3.31	Q	|	|	|	V|
28+ 0	659.5027	2.88	Q	|	|	|	V|
28+ 5	659.5196	2.46	Q	|	|	|	V|
28+10	659.5337	2.04	Q	|	|	|	V|
28+15	659.5449	1.63	Q	|	|	|	V|
28+20	659.5532	1.21	Q	|	|	|	V|
28+25	659.5588	0.80	Q	|	|	|	V|
28+30	659.5615	0.39	Q	|	|	|	V|

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

Study date 02/17/22

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6360

Marmon Hydrology Analysis
100-Year Event
Basin 100

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
2555.78	1	0.89
Rainfall data for year 2		
2555.78	6	0.92
Rainfall data for year 2		
2555.78	24	1.45
Rainfall data for year 100		

```
          2555.78            1           1.81
------------------------------------------------------------------------
Rainfall data for year 100
          2555.78            6           2.79
------------------------------------------------------------------------
Rainfall data for year 100
          2555.78           24           4.60
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 91.0      98.2       2555.78      1.000     0.036    1.000    0.036

Area-averaged adjusted loss rate Fm (In/Hr) =  0.036

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
  2555.78   1.000         91.0      98.2       0.18     0.954

Area-averaged catchment yield fraction, Y =  0.954
Area-averaged low loss fraction, Yb =  0.046
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watercourse length =   36640.60(Ft.)
Length from concentration point to centroid =   18320.30(Ft.)
Elevation difference along watercourse =     850.00(Ft.)
Mannings friction factor along watercourse =  0.040
Watershed area =    2555.78(Ac.)
Catchment Lag time =   1.290 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time =  6.4605
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.036(In/Hr)
Average low loss rate fraction (Yb) = 0.046 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.495(In)
Computed peak 30-minute rainfall =  1.310(In)
Specified peak 1-hour rainfall =  1.810(In)
Computed peak 3-hour rainfall =  2.300(In)
Specified peak 6-hour rainfall =  2.790(In)
Specified peak 24-hour rainfall =  4.600(In)


Note: user specified rainfall values used.
Rainfall depth area reduction factors:
```

Using a total area of 2555.78(Ac.) (Ref: fig. E-4)

5-minute factor = 0.880 Adjusted rainfall = 0.436(In)
30-minute factor = 0.880 Adjusted rainfall = 1.153(In)
1-hour factor = 0.880 Adjusted rainfall = 1.593(In)
3-hour factor = 0.985 Adjusted rainfall = 2.265(In)
6-hour factor = 0.992 Adjusted rainfall = 2.768(In)
24-hour factor = 0.997 Adjusted rainfall = 4.585(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 30908.96 (CFS))	
1	0.560	173.062
2	1.680	346.125
3	2.899	376.741
4	4.433	474.392
5	6.466	628.258
6	8.901	752.748
7	11.817	901.156
8	14.827	930.321
9	18.612	1170.088
10	22.704	1264.687
11	26.985	1323.360
12	31.517	1400.616
13	36.145	1430.343
14	40.796	1437.750
15	45.448	1437.750
16	49.929	1385.287
17	53.475	1095.916
18	56.863	1047.050
19	59.753	893.357
20	62.278	780.559
21	64.381	649.903
22	66.431	633.568
23	68.248	561.575
24	69.867	500.488
25	71.212	415.693
26	72.522	404.934
27	73.655	350.136
28	74.694	321.186
29	75.650	295.706
30	76.607	295.537
31	77.563	295.487
32	78.421	265.247
33	79.196	239.625

34	79.971	239.625
35	80.745	239.027
36	81.435	213.345
37	82.081	199.687
38	82.727	199.687
39	83.369	198.585
40	83.957	181.540
41	84.525	175.725
42	85.094	175.725
43	85.653	172.721
44	86.134	148.899
45	86.599	143.775
46	87.065	143.775
47	87.517	139.964
48	87.912	122.090
49	88.300	119.812
50	88.688	119.812
51	89.075	119.812
52	89.463	119.812
53	89.851	119.812
54	90.238	119.812
55	90.591	108.949
56	90.877	88.354
57	91.161	87.862
58	91.445	87.862
59	91.729	87.862
60	92.014	87.862
61	92.298	87.862
62	92.582	87.775
63	92.821	73.924
64	93.028	63.900
65	93.234	63.900
66	93.441	63.900
67	93.648	63.900
68	93.855	63.900
69	94.061	63.900
70	94.267	63.661
71	94.464	60.760
72	94.658	59.906
73	94.852	59.906
74	95.045	59.906
75	95.239	59.906
76	95.433	59.906
77	95.627	59.906
78	95.811	56.967
79	95.957	45.167
80	96.099	43.931
81	96.242	43.931
82	96.384	43.931
83	96.526	43.931

84	96.668	43.931
85	96.810	43.931
86	96.942	40.927
87	97.059	36.014
88	97.175	35.944
89	97.292	35.944
90	97.408	35.944
91	97.524	35.944
92	97.640	35.944
93	97.757	35.878
94	97.857	30.993
95	97.947	27.956
96	98.038	27.956
97	98.128	27.956
98	98.219	27.956
99	98.309	27.956
100	98.399	27.956
101	98.488	27.353
102	98.557	21.462
103	98.622	19.969
104	98.687	19.969
105	98.751	19.969
106	98.816	19.969
107	98.880	19.969
108	98.945	19.969
109	99.010	19.969
110	99.074	19.969
111	99.139	19.969
112	99.203	19.969
113	99.268	19.969
114	99.333	19.969
115	99.397	19.969
116	99.462	19.969
117	99.526	19.969
118	99.591	19.969
119	99.656	19.969
120	99.720	19.969
121	99.785	19.969
122	99.850	19.969
123	99.914	19.969
124	100.000	9.984

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4357	0.4357
2	0.6349	0.1992
3	0.7913	0.1564
4	0.9251	0.1338
5	1.0443	0.1192
6	1.1531	0.1087

7	1.2390	0.0860
8	1.3186	0.0796
9	1.3931	0.0745
10	1.4633	0.0702
11	1.5298	0.0665
12	1.5932	0.0634
13	1.6345	0.0414
14	1.6738	0.0393
15	1.7112	0.0374
16	1.7469	0.0357
17	1.7812	0.0343
18	1.8141	0.0329
19	1.8458	0.0317
20	1.8764	0.0306
21	1.9059	0.0296
22	1.9345	0.0286
23	1.9623	0.0277
24	1.9892	0.0269
25	2.0154	0.0262
26	2.0409	0.0255
27	2.0657	0.0248
28	2.0899	0.0242
29	2.1135	0.0236
30	2.1366	0.0231
31	2.1592	0.0226
32	2.1812	0.0221
33	2.2028	0.0216
34	2.2240	0.0212
35	2.2448	0.0207
36	2.2651	0.0203
37	2.2831	0.0180
38	2.3008	0.0177
39	2.3181	0.0173
40	2.3352	0.0170
41	2.3519	0.0167
42	2.3683	0.0164
43	2.3845	0.0162
44	2.4004	0.0159
45	2.4160	0.0156
46	2.4315	0.0154
47	2.4466	0.0152
48	2.4616	0.0149
49	2.4763	0.0147
50	2.4908	0.0145
51	2.5051	0.0143
52	2.5192	0.0141
53	2.5331	0.0139
54	2.5468	0.0137
55	2.5604	0.0135
56	2.5737	0.0134

57	2.5869	0.0132
58	2.6000	0.0130
59	2.6129	0.0129
60	2.6256	0.0127
61	2.6382	0.0126
62	2.6506	0.0124
63	2.6629	0.0123
64	2.6751	0.0122
65	2.6871	0.0120
66	2.6990	0.0119
67	2.7107	0.0118
68	2.7224	0.0116
69	2.7339	0.0115
70	2.7453	0.0114
71	2.7565	0.0113
72	2.7677	0.0112
73	2.7817	0.0139
74	2.7955	0.0138
75	2.8092	0.0137
76	2.8228	0.0136
77	2.8362	0.0135
78	2.8496	0.0134
79	2.8628	0.0133
80	2.8760	0.0131
81	2.8890	0.0130
82	2.9020	0.0129
83	2.9148	0.0128
84	2.9275	0.0127
85	2.9402	0.0126
86	2.9527	0.0125
87	2.9652	0.0125
88	2.9775	0.0124
89	2.9898	0.0123
90	3.0020	0.0122
91	3.0141	0.0121
92	3.0261	0.0120
93	3.0381	0.0119
94	3.0499	0.0119
95	3.0617	0.0118
96	3.0734	0.0117
97	3.0850	0.0116
98	3.0966	0.0115
99	3.1080	0.0115
100	3.1194	0.0114
101	3.1308	0.0113
102	3.1420	0.0113
103	3.1532	0.0112
104	3.1643	0.0111
105	3.1754	0.0110
106	3.1863	0.0110

107	3.1972	0.0109
108	3.2081	0.0108
109	3.2189	0.0108
110	3.2296	0.0107
111	3.2403	0.0107
112	3.2509	0.0106
113	3.2614	0.0105
114	3.2719	0.0105
115	3.2823	0.0104
116	3.2927	0.0104
117	3.3030	0.0103
118	3.3132	0.0103
119	3.3234	0.0102
120	3.3336	0.0101
121	3.3437	0.0101
122	3.3537	0.0100
123	3.3637	0.0100
124	3.3736	0.0099
125	3.3835	0.0099
126	3.3933	0.0098
127	3.4031	0.0098
128	3.4128	0.0097
129	3.4225	0.0097
130	3.4322	0.0096
131	3.4418	0.0096
132	3.4513	0.0095
133	3.4608	0.0095
134	3.4703	0.0095
135	3.4797	0.0094
136	3.4890	0.0094
137	3.4984	0.0093
138	3.5076	0.0093
139	3.5169	0.0092
140	3.5261	0.0092
141	3.5352	0.0092
142	3.5443	0.0091
143	3.5534	0.0091
144	3.5624	0.0090
145	3.5714	0.0090
146	3.5804	0.0089
147	3.5893	0.0089
148	3.5981	0.0089
149	3.6070	0.0088
150	3.6158	0.0088
151	3.6245	0.0088
152	3.6333	0.0087
153	3.6419	0.0087
154	3.6506	0.0087
155	3.6592	0.0086
156	3.6678	0.0086

157	3.6763	0.0085
158	3.6848	0.0085
159	3.6933	0.0085
160	3.7018	0.0084
161	3.7102	0.0084
162	3.7185	0.0084
163	3.7269	0.0083
164	3.7352	0.0083
165	3.7435	0.0083
166	3.7517	0.0082
167	3.7599	0.0082
168	3.7681	0.0082
169	3.7763	0.0082
170	3.7844	0.0081
171	3.7925	0.0081
172	3.8005	0.0081
173	3.8086	0.0080
174	3.8166	0.0080
175	3.8246	0.0080
176	3.8325	0.0079
177	3.8404	0.0079
178	3.8483	0.0079
179	3.8562	0.0079
180	3.8640	0.0078
181	3.8718	0.0078
182	3.8796	0.0078
183	3.8873	0.0077
184	3.8950	0.0077
185	3.9027	0.0077
186	3.9104	0.0077
187	3.9180	0.0076
188	3.9257	0.0076
189	3.9333	0.0076
190	3.9408	0.0076
191	3.9484	0.0075
192	3.9559	0.0075
193	3.9634	0.0075
194	3.9708	0.0075
195	3.9783	0.0074
196	3.9857	0.0074
197	3.9931	0.0074
198	4.0005	0.0074
199	4.0078	0.0073
200	4.0151	0.0073
201	4.0224	0.0073
202	4.0297	0.0073
203	4.0370	0.0073
204	4.0442	0.0072
205	4.0514	0.0072
206	4.0586	0.0072

207	4.0657	0.0072
208	4.0729	0.0071
209	4.0800	0.0071
210	4.0871	0.0071
211	4.0942	0.0071
212	4.1012	0.0071
213	4.1083	0.0070
214	4.1153	0.0070
215	4.1223	0.0070
216	4.1292	0.0070
217	4.1362	0.0070
218	4.1431	0.0069
219	4.1500	0.0069
220	4.1569	0.0069
221	4.1638	0.0069
222	4.1706	0.0069
223	4.1775	0.0068
224	4.1843	0.0068
225	4.1911	0.0068
226	4.1979	0.0068
227	4.2046	0.0068
228	4.2113	0.0067
229	4.2181	0.0067
230	4.2248	0.0067
231	4.2314	0.0067
232	4.2381	0.0067
233	4.2447	0.0066
234	4.2514	0.0066
235	4.2580	0.0066
236	4.2646	0.0066
237	4.2711	0.0066
238	4.2777	0.0066
239	4.2842	0.0065
240	4.2908	0.0065
241	4.2973	0.0065
242	4.3037	0.0065
243	4.3102	0.0065
244	4.3167	0.0065
245	4.3231	0.0064
246	4.3295	0.0064
247	4.3359	0.0064
248	4.3423	0.0064
249	4.3487	0.0064
250	4.3550	0.0064
251	4.3613	0.0063
252	4.3677	0.0063
253	4.3740	0.0063
254	4.3803	0.0063
255	4.3865	0.0063
256	4.3928	0.0063

257	4.3990	0.0062
258	4.4053	0.0062
259	4.4115	0.0062
260	4.4177	0.0062
261	4.4238	0.0062
262	4.4300	0.0062
263	4.4362	0.0061
264	4.4423	0.0061
265	4.4484	0.0061
266	4.4545	0.0061
267	4.4606	0.0061
268	4.4667	0.0061
269	4.4727	0.0061
270	4.4788	0.0060
271	4.4848	0.0060
272	4.4908	0.0060
273	4.4969	0.0060
274	4.5028	0.0060
275	4.5088	0.0060
276	4.5148	0.0060
277	4.5207	0.0060
278	4.5267	0.0059
279	4.5326	0.0059
280	4.5385	0.0059
281	4.5444	0.0059
282	4.5503	0.0059
283	4.5562	0.0059
284	4.5620	0.0059
285	4.5679	0.0058
286	4.5737	0.0058
287	4.5795	0.0058
288	4.5853	0.0058

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0058	0.0003	0.0055
2	0.0058	0.0003	0.0055
3	0.0058	0.0003	0.0056
4	0.0059	0.0003	0.0056
5	0.0059	0.0003	0.0056
6	0.0059	0.0003	0.0056
7	0.0059	0.0003	0.0056
8	0.0059	0.0003	0.0057
9	0.0060	0.0003	0.0057
10	0.0060	0.0003	0.0057
11	0.0060	0.0003	0.0057
12	0.0060	0.0003	0.0057
13	0.0060	0.0003	0.0058

14	0.0061	0.0003	0.0058
15	0.0061	0.0003	0.0058
16	0.0061	0.0003	0.0058
17	0.0061	0.0003	0.0059
18	0.0061	0.0003	0.0059
19	0.0062	0.0003	0.0059
20	0.0062	0.0003	0.0059
21	0.0062	0.0003	0.0059
22	0.0062	0.0003	0.0060
23	0.0063	0.0003	0.0060
24	0.0063	0.0003	0.0060
25	0.0063	0.0003	0.0060
26	0.0063	0.0003	0.0060
27	0.0064	0.0003	0.0061
28	0.0064	0.0003	0.0061
29	0.0064	0.0003	0.0061
30	0.0064	0.0003	0.0061
31	0.0065	0.0003	0.0062
32	0.0065	0.0003	0.0062
33	0.0065	0.0003	0.0062
34	0.0065	0.0003	0.0062
35	0.0066	0.0003	0.0063
36	0.0066	0.0003	0.0063
37	0.0066	0.0003	0.0063
38	0.0066	0.0003	0.0063
39	0.0067	0.0003	0.0064
40	0.0067	0.0003	0.0064
41	0.0067	0.0003	0.0064
42	0.0068	0.0003	0.0064
43	0.0068	0.0003	0.0065
44	0.0068	0.0003	0.0065
45	0.0069	0.0003	0.0065
46	0.0069	0.0003	0.0066
47	0.0069	0.0003	0.0066
48	0.0069	0.0003	0.0066
49	0.0070	0.0003	0.0066
50	0.0070	0.0003	0.0067
51	0.0070	0.0003	0.0067
52	0.0071	0.0003	0.0067
53	0.0071	0.0003	0.0068
54	0.0071	0.0003	0.0068
55	0.0072	0.0003	0.0068
56	0.0072	0.0003	0.0069
57	0.0072	0.0003	0.0069
58	0.0073	0.0003	0.0069
59	0.0073	0.0003	0.0070
60	0.0073	0.0003	0.0070
61	0.0074	0.0003	0.0070
62	0.0074	0.0003	0.0071
63	0.0074	0.0003	0.0071

64	0.0075	0.0003	0.0071
65	0.0075	0.0003	0.0072
66	0.0075	0.0003	0.0072
67	0.0076	0.0004	0.0072
68	0.0076	0.0004	0.0073
69	0.0077	0.0004	0.0073
70	0.0077	0.0004	0.0073
71	0.0077	0.0004	0.0074
72	0.0078	0.0004	0.0074
73	0.0078	0.0004	0.0075
74	0.0079	0.0004	0.0075
75	0.0079	0.0004	0.0075
76	0.0079	0.0004	0.0076
77	0.0080	0.0004	0.0076
78	0.0080	0.0004	0.0077
79	0.0081	0.0004	0.0077
80	0.0081	0.0004	0.0077
81	0.0082	0.0004	0.0078
82	0.0082	0.0004	0.0078
83	0.0083	0.0004	0.0079
84	0.0083	0.0004	0.0079
85	0.0084	0.0004	0.0080
86	0.0084	0.0004	0.0080
87	0.0085	0.0004	0.0081
88	0.0085	0.0004	0.0081
89	0.0086	0.0004	0.0082
90	0.0086	0.0004	0.0082
91	0.0087	0.0004	0.0083
92	0.0087	0.0004	0.0083
93	0.0088	0.0004	0.0084
94	0.0088	0.0004	0.0084
95	0.0089	0.0004	0.0085
96	0.0089	0.0004	0.0085
97	0.0090	0.0004	0.0086
98	0.0091	0.0004	0.0086
99	0.0092	0.0004	0.0087
100	0.0092	0.0004	0.0088
101	0.0093	0.0004	0.0088
102	0.0093	0.0004	0.0089
103	0.0094	0.0004	0.0090
104	0.0095	0.0004	0.0090
105	0.0095	0.0004	0.0091
106	0.0096	0.0004	0.0091
107	0.0097	0.0004	0.0092
108	0.0097	0.0005	0.0093
109	0.0098	0.0005	0.0094
110	0.0099	0.0005	0.0094
111	0.0100	0.0005	0.0095
112	0.0100	0.0005	0.0096
113	0.0101	0.0005	0.0097

114	0.0102	0.0005	0.0097
115	0.0103	0.0005	0.0098
116	0.0104	0.0005	0.0099
117	0.0105	0.0005	0.0100
118	0.0105	0.0005	0.0101
119	0.0107	0.0005	0.0102
120	0.0107	0.0005	0.0102
121	0.0108	0.0005	0.0103
122	0.0109	0.0005	0.0104
123	0.0110	0.0005	0.0105
124	0.0111	0.0005	0.0106
125	0.0113	0.0005	0.0107
126	0.0113	0.0005	0.0108
127	0.0115	0.0005	0.0109
128	0.0115	0.0005	0.0110
129	0.0117	0.0005	0.0112
130	0.0118	0.0005	0.0112
131	0.0119	0.0006	0.0114
132	0.0120	0.0006	0.0115
133	0.0122	0.0006	0.0116
134	0.0123	0.0006	0.0117
135	0.0125	0.0006	0.0119
136	0.0125	0.0006	0.0120
137	0.0127	0.0006	0.0122
138	0.0128	0.0006	0.0122
139	0.0130	0.0006	0.0124
140	0.0131	0.0006	0.0125
141	0.0134	0.0006	0.0127
142	0.0135	0.0006	0.0128
143	0.0137	0.0006	0.0131
144	0.0138	0.0006	0.0132
145	0.0112	0.0005	0.0107
146	0.0113	0.0005	0.0108
147	0.0115	0.0005	0.0110
148	0.0116	0.0005	0.0111
149	0.0119	0.0006	0.0113
150	0.0120	0.0006	0.0115
151	0.0123	0.0006	0.0117
152	0.0124	0.0006	0.0119
153	0.0127	0.0006	0.0121
154	0.0129	0.0006	0.0123
155	0.0132	0.0006	0.0126
156	0.0134	0.0006	0.0128
157	0.0137	0.0006	0.0131
158	0.0139	0.0006	0.0133
159	0.0143	0.0007	0.0136
160	0.0145	0.0007	0.0138
161	0.0149	0.0007	0.0142
162	0.0152	0.0007	0.0145
163	0.0156	0.0007	0.0149

164	0.0159	0.0007	0.0152
165	0.0164	0.0008	0.0157
166	0.0167	0.0008	0.0160
167	0.0173	0.0008	0.0165
168	0.0177	0.0008	0.0169
169	0.0203	0.0009	0.0194
170	0.0207	0.0010	0.0198
171	0.0216	0.0010	0.0206
172	0.0221	0.0010	0.0210
173	0.0231	0.0011	0.0220
174	0.0236	0.0011	0.0225
175	0.0248	0.0011	0.0237
176	0.0255	0.0012	0.0243
177	0.0269	0.0012	0.0257
178	0.0277	0.0013	0.0265
179	0.0296	0.0014	0.0282
180	0.0306	0.0014	0.0292
181	0.0329	0.0015	0.0314
182	0.0343	0.0016	0.0327
183	0.0374	0.0017	0.0357
184	0.0393	0.0018	0.0374
185	0.0634	0.0029	0.0604
186	0.0665	0.0030	0.0635
187	0.0745	0.0030	0.0715
188	0.0796	0.0030	0.0766
189	0.1087	0.0030	0.1057
190	0.1192	0.0030	0.1162
191	0.1564	0.0030	0.1534
192	0.1992	0.0030	0.1962
193	0.4357	0.0030	0.4327
194	0.1338	0.0030	0.1309
195	0.0860	0.0030	0.0830
196	0.0702	0.0030	0.0672
197	0.0414	0.0019	0.0395
198	0.0357	0.0017	0.0341
199	0.0317	0.0015	0.0302
200	0.0286	0.0013	0.0273
201	0.0262	0.0012	0.0250
202	0.0242	0.0011	0.0231
203	0.0226	0.0010	0.0215
204	0.0212	0.0010	0.0202
205	0.0180	0.0008	0.0172
206	0.0170	0.0008	0.0162
207	0.0162	0.0007	0.0154
208	0.0154	0.0007	0.0147
209	0.0147	0.0007	0.0140
210	0.0141	0.0007	0.0135
211	0.0135	0.0006	0.0129
212	0.0130	0.0006	0.0124
213	0.0126	0.0006	0.0120

214	0.0122	0.0006	0.0116
215	0.0118	0.0005	0.0112
216	0.0114	0.0005	0.0109
217	0.0139	0.0006	0.0133
218	0.0136	0.0006	0.0130
219	0.0133	0.0006	0.0126
220	0.0129	0.0006	0.0123
221	0.0126	0.0006	0.0121
222	0.0124	0.0006	0.0118
223	0.0121	0.0006	0.0115
224	0.0119	0.0005	0.0113
225	0.0116	0.0005	0.0111
226	0.0114	0.0005	0.0109
227	0.0112	0.0005	0.0107
228	0.0110	0.0005	0.0105
229	0.0108	0.0005	0.0103
230	0.0106	0.0005	0.0101
231	0.0104	0.0005	0.0099
232	0.0103	0.0005	0.0098
233	0.0101	0.0005	0.0096
234	0.0099	0.0005	0.0095
235	0.0098	0.0005	0.0093
236	0.0096	0.0004	0.0092
237	0.0095	0.0004	0.0091
238	0.0094	0.0004	0.0089
239	0.0092	0.0004	0.0088
240	0.0091	0.0004	0.0087
241	0.0090	0.0004	0.0086
242	0.0089	0.0004	0.0085
243	0.0088	0.0004	0.0084
244	0.0087	0.0004	0.0083
245	0.0085	0.0004	0.0081
246	0.0084	0.0004	0.0081
247	0.0083	0.0004	0.0080
248	0.0082	0.0004	0.0079
249	0.0082	0.0004	0.0078
250	0.0081	0.0004	0.0077
251	0.0080	0.0004	0.0076
252	0.0079	0.0004	0.0075
253	0.0078	0.0004	0.0074
254	0.0077	0.0004	0.0074
255	0.0076	0.0004	0.0073
256	0.0076	0.0004	0.0072
257	0.0075	0.0003	0.0071
258	0.0074	0.0003	0.0071
259	0.0073	0.0003	0.0070
260	0.0073	0.0003	0.0069
261	0.0072	0.0003	0.0069
262	0.0071	0.0003	0.0068
263	0.0071	0.0003	0.0067

264	0.0070	0.0003	0.0067
265	0.0070	0.0003	0.0066
266	0.0069	0.0003	0.0066
267	0.0068	0.0003	0.0065
268	0.0068	0.0003	0.0065
269	0.0067	0.0003	0.0064
270	0.0067	0.0003	0.0064
271	0.0066	0.0003	0.0063
272	0.0066	0.0003	0.0063
273	0.0065	0.0003	0.0062
274	0.0065	0.0003	0.0062
275	0.0064	0.0003	0.0061
276	0.0064	0.0003	0.0061
277	0.0063	0.0003	0.0060
278	0.0063	0.0003	0.0060
279	0.0062	0.0003	0.0059
280	0.0062	0.0003	0.0059
281	0.0061	0.0003	0.0058
282	0.0061	0.0003	0.0058
283	0.0060	0.0003	0.0058
284	0.0060	0.0003	0.0057
285	0.0060	0.0003	0.0057
286	0.0059	0.0003	0.0056
287	0.0059	0.0003	0.0056
288	0.0058	0.0003	0.0056

Total soil rain loss = 0.17(In)
Total effective rainfall = 4.41(In)
Peak flow rate in flood hydrograph = 2417.80(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

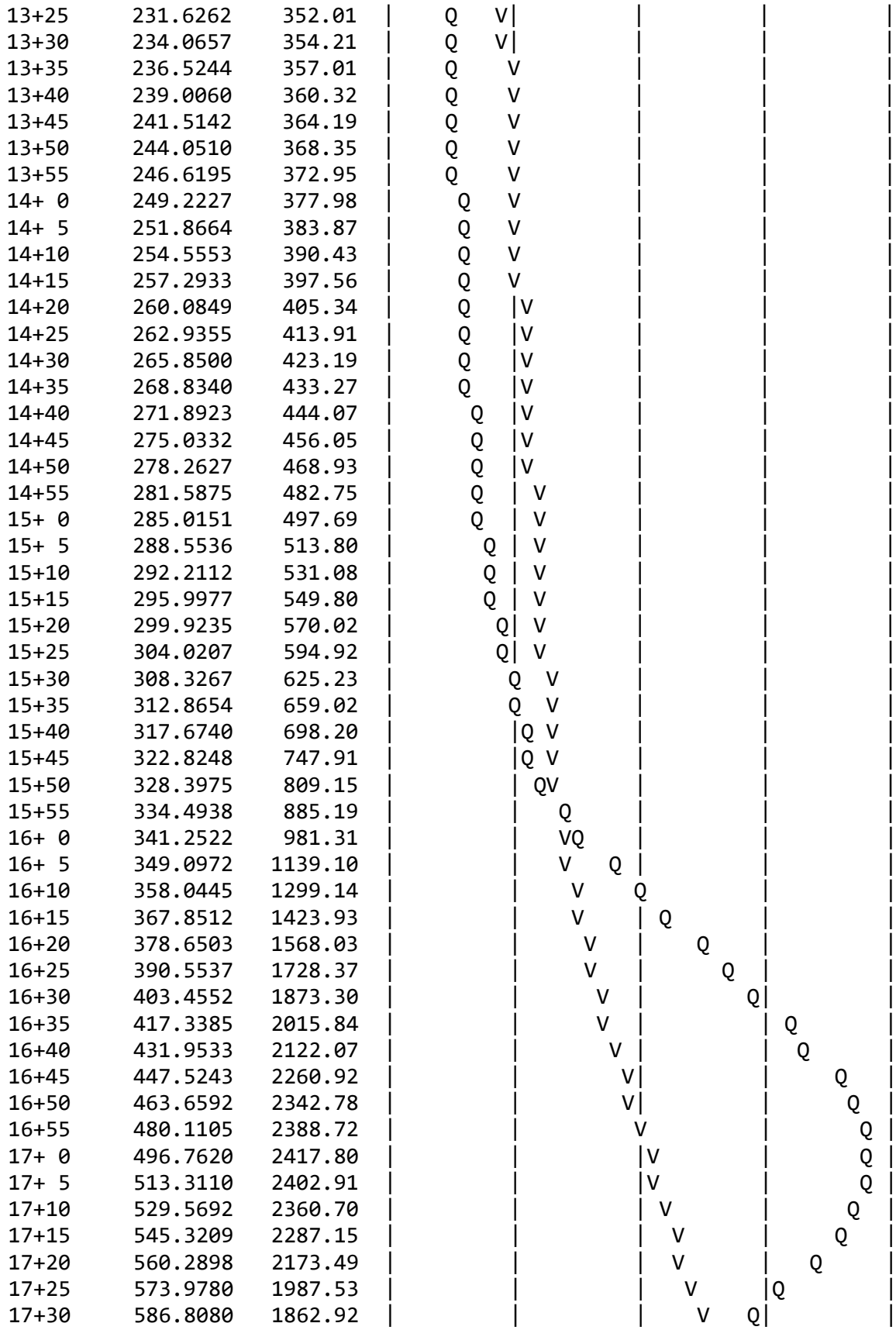
Hydrograph in 5 Minute intervals ((CFS))

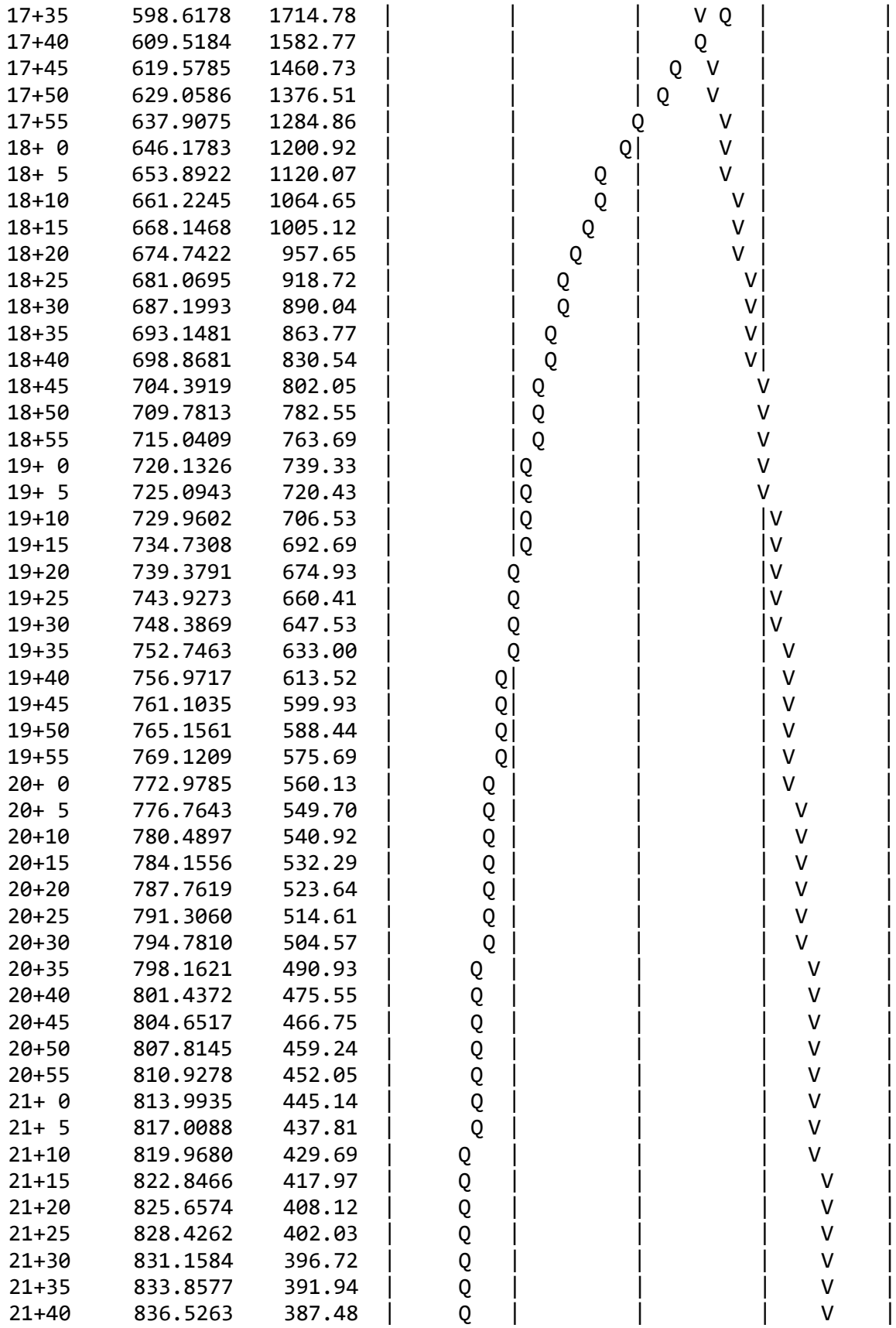
Time(h+m)	Volume Ac.Ft	Q(CFS)	0	625.0	1250.0	1875.0	2500.0
0+ 5	0.0066	0.96	Q	|	|	|	|
0+10	0.0264	2.88	Q	|	|	|	|
0+15	0.0606	4.97	Q	|	|	|	|
0+20	0.1131	7.61	Q	|	|	|	|
0+25	0.1896	11.11	Q	|	|	|	|
0+30	0.2951	15.32	Q	|	|	|	|
0+35	0.4352	20.35	Q	|	|	|	|
0+40	0.6113	25.57	Q	|	|	|	|
0+45	0.8326	32.13	Q	|	|	|	|
0+50	1.1028	39.23	Q	|	|	|	|

0+55	1.4244	46.69	Q	|	|	|	|
1+ 0	1.8004	54.60	Q	|	|	|	|
1+ 5	2.2322	62.70	VQ	|	|	|	|
1+10	2.7202	70.86	VQ	|	|	|	|
1+15	3.2647	79.06	VQ	|	|	|	|
1+20	3.8638	86.99	VQ	|	|	|	|
1+25	4.5068	93.36	VQ	|	|	|	|
1+30	5.1918	99.47	VQ	|	|	|	|
1+35	5.9133	104.76	VQ	|	|	|	|
1+40	6.6670	109.44	VQ	|	|	|	|
1+45	7.4481	113.41	VQ	|	|	|	|
1+50	8.2560	117.31	VQ	|	|	|	|
1+55	9.0882	120.83	VQ	|	|	|	|
2+ 0	9.9423	124.03	VQ	|	|	|	|
2+ 5	10.8154	126.76	V Q	|	|	|	|
2+10	11.7069	129.45	V Q	|	|	|	|
2+15	12.6150	131.85	V Q	|	|	|	|
2+20	13.5386	134.10	V Q	|	|	|	|
2+25	14.4767	136.22	V Q	|	|	|	|
2+30	15.4295	138.35	V Q	|	|	|	|
2+35	16.3971	140.49	V Q	|	|	|	|
2+40	17.3782	142.47	V Q	|	|	|	|
2+45	18.3721	144.31	V Q	|	|	|	|
2+50	19.3788	146.17	V Q	|	|	|	|
2+55	20.3983	148.03	V Q	|	|	|	|
3+ 0	21.4298	149.77	V Q	|	|	|	|
3+ 5	22.4727	151.43	V Q	|	|	|	|
3+10	23.5272	153.11	|VQ	|	|	|	|
3+15	24.5932	154.78	|VQ	|	|	|	|
3+20	25.6701	156.38	|VQ	|	|	|	|
3+25	26.7579	157.94	|VQ	|	|	|	|
3+30	27.8565	159.52	|VQ	|	|	|	|
3+35	28.9660	161.09	|VQ	|	|	|	|
3+40	30.0854	162.54	|VQ	|	|	|	|
3+45	31.2147	163.97	|VQ	|	|	|	|
3+50	32.3539	165.41	|VQ	|	|	|	|
3+55	33.5029	166.84	|VQ	|	|	|	|
4+ 0	34.6611	168.17	|VQ	|	|	|	|
4+ 5	35.8285	169.51	|VQ	|	|	|	|
4+10	37.0051	170.85	|VQ	|	|	|	|
4+15	38.1911	172.20	|VQ	|	|	|	|
4+20	39.3864	173.56	|VQ	|	|	|	|
4+25	40.5912	174.93	|VQ	|	|	|	|
4+30	41.8054	176.31	|VQ	|	|	|	|
4+35	43.0288	177.64	|VQ	|	|	|	|
4+40	44.2607	178.87	|VQ	|	|	|	|
4+45	45.5011	180.10	|VQ	|	|	|	|
4+50	46.7500	181.34	|VQ	|	|	|	|
4+55	48.0075	182.60	| Q	|	|	|	|
5+ 0	49.2738	183.86	| Q	|	|	|	|

5+ 5	50.5488	185.13	Q				
5+10	51.8326	186.41	Q				
5+15	53.1248	187.63	VQ				
5+20	54.4251	188.80	VQ				
5+25	55.7336	189.98	VQ				
5+30	57.0502	191.18	VQ				
5+35	58.3751	192.38	VQ				
5+40	59.7084	193.59	VQ				
5+45	61.0502	194.82	VQ				
5+50	62.4004	196.06	VQ				
5+55	63.7591	197.29	VQ				
6+ 0	65.1264	198.53	VQ				
6+ 5	66.5023	199.78	VQ				
6+10	67.8868	201.04	VQ				
6+15	69.2802	202.31	VQ				
6+20	70.6824	203.60	Q				
6+25	72.0936	204.90	Q				
6+30	73.5137	206.20	Q				
6+35	74.9424	207.45	Q				
6+40	76.3798	208.70	Q				
6+45	77.8258	209.97	Q				
6+50	79.2807	211.25	Q				
6+55	80.7444	212.54	Q				
7+ 0	82.2172	213.85	Q				
7+ 5	83.6991	215.17	Q				
7+10	85.1901	216.50	Q				
7+15	86.6902	217.80	Q				
7+20	88.1993	219.13	Q				
7+25	89.7177	220.47	Q				
7+30	91.2455	221.83	Q				
7+35	92.7827	223.20	Q				
7+40	94.3295	224.60	QV				
7+45	95.8860	226.00	QV				
7+50	97.4522	227.40	QV				
7+55	99.0280	228.80	QV				
8+ 0	100.6135	230.22	QV				
8+ 5	102.2090	231.66	QV				
8+10	103.8145	233.12	QV				
8+15	105.4302	234.60	QV				
8+20	107.0562	236.10	QV				
8+25	108.6926	237.61	QV				
8+30	110.3394	239.11	QV				
8+35	111.9967	240.63	QV				
8+40	113.6645	242.17	QV				
8+45	115.3431	243.73	QV				
8+50	117.0326	245.32	QV				
8+55	118.7332	246.93	Q V				
9+ 0	120.4451	248.56	Q V				
9+ 5	122.1684	250.22	QV				
9+10	123.9032	251.91	QV				

9+15	125.6499	253.62	QV				
9+20	127.4086	255.36	QV				
9+25	129.1794	257.12	QV				
9+30	130.9626	258.92	QV				
9+35	132.7584	260.75	QV				
9+40	134.5670	262.60	QV				
9+45	136.3885	264.49	QV				
9+50	138.2233	266.41	QV				
9+55	140.0715	268.36	QV				
10+ 0	141.9335	270.35	Q V				
10+ 5	143.8094	272.38	Q V				
10+10	145.6994	274.44	Q V				
10+15	147.6039	276.53	Q V				
10+20	149.5227	278.61	Q V				
10+25	151.4558	280.68	Q V				
10+30	153.4033	282.79	Q V				
10+35	155.3657	284.93	Q V				
10+40	157.3431	287.13	Q V				
10+45	159.3360	289.36	Q V				
10+50	161.3446	291.65	Q V				
10+55	163.3692	293.98	Q V				
11+ 0	165.4103	296.36	Q V				
11+ 5	167.4681	298.79	Q V				
11+10	169.5430	301.28	Q V				
11+15	171.6355	303.83	Q V				
11+20	173.7459	306.43	Q V				
11+25	175.8746	309.09	Q V				
11+30	178.0221	311.81	Q V				
11+35	180.1887	314.60	Q V				
11+40	182.3750	317.46	Q V				
11+45	184.5815	320.38	Q V				
11+50	186.8087	323.38	Q V				
11+55	189.0569	326.45	Q V				
12+ 0	191.3270	329.61	Q V				
12+ 5	193.6160	332.36	Q V				
12+10	195.9213	334.73	Q V				
12+15	198.2429	337.09	Q V				
12+20	200.5795	339.28	Q V				
12+25	202.9288	341.12	Q V				
12+30	205.2891	342.72	Q V				
12+35	207.6582	343.99	Q V				
12+40	210.0362	345.28	Q V				
12+45	212.4192	346.01	Q V				
12+50	214.8061	346.58	Q V				
12+55	217.1966	347.09	Q V				
13+ 0	219.5898	347.50	Q V				
13+ 5	221.9861	347.94	Q V				
13+10	224.3861	348.48	Q V				
13+15	226.7908	349.15	Q V				
13+20	229.2020	350.11	Q V				





21+45	839.1644	383.04	| Q |	|	|	| V |
21+50	841.7707	378.43	| Q |	|	|	| V |
21+55	844.3396	373.01	| Q |	|	|	| V |
22+ 0	846.8756	368.24	| Q |	|	|	| V |
22+ 5	849.3814	363.84	| Q |	|	|	| V |
22+10	851.8570	359.46	| Q |	|	|	| V |
22+15	854.3011	354.88	| Q |	|	|	| V |
22+20	856.7128	350.18	| Q |	|	|	| V |
22+25	859.0887	344.99	| Q |	|	|	| V |
22+30	861.4202	338.53	| Q |	|	|	| V |
22+35	863.6931	330.02	| Q |	|	|	| V |
22+40	865.9305	324.88	| Q |	|	|	| V |
22+45	868.1392	320.71	| Q |	|	|	| V |
22+50	870.3210	316.79	| Q |	|	|	| V |
22+55	872.4774	313.11	| Q |	|	|	| V |
23+ 0	874.6082	309.39	| Q |	|	|	| V |
23+ 5	876.7117	305.44	| Q |	|	|	| V |
23+10	878.7815	300.53	| Q |	|	|	| V |
23+15	880.8153	295.31	| Q |	|	|	| V |
23+20	882.8241	291.68	| Q |	|	|	| V |
23+25	884.8100	288.35	| Q |	|	|	| V |
23+30	886.7734	285.08	| Q |	|	|	| V |
23+35	888.7147	281.87	| Q |	|	|	| V |
23+40	890.6329	278.52	| Q |	|	|	| V |
23+45	892.5259	274.87	| Q |	|	|	| V |
23+50	894.3845	269.87	| Q |	|	|	| V |
23+55	896.2139	265.62	| Q |	|	|	| V |
24+ 0	898.0218	262.51	| Q |	|	|	| V |
24+ 5	899.8032	258.65	| Q |	|	|	| V |
24+10	901.5517	253.88	| Q |	|	|	| V |
24+15	903.2664	248.98	| Q |	|	|	| V |
24+20	904.9424	243.34	| Q |	|	|	| V |
24+25	906.5708	236.45	| Q |	|	|	| V |
24+30	908.1387	227.66	| Q |	|	|	| V |
24+35	909.6507	219.53	| Q |	|	|	| V |
24+40	911.1110	212.04	| Q |	|	|	| V |
24+45	912.5123	203.47	| Q |	|	|	| V |
24+50	913.8527	194.63	| Q |	|	|	| V |
24+55	915.1310	185.61	| Q |	|	|	| V |
25+ 0	916.3449	176.26	| Q |	|	|	| V |
25+ 5	917.4938	166.82	| Q |	|	|	| V |
25+10	918.5779	157.40	| Q |	|	|	| V |
25+15	919.5974	148.04	| Q |	|	|	| V |
25+20	920.5548	139.01	| Q |	|	|	| V |
25+25	921.4614	131.63	| Q |	|	|	| V |
25+30	922.3192	124.56	|Q |	|	|	| V |
25+35	923.1342	118.34	|Q |	|	|	| V |
25+40	923.9094	112.56	|Q |	|	|	| V |
25+45	924.6483	107.28	|Q |	|	|	| V |
25+50	925.3509	102.02	|Q |	|	|	| V |

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25+55     926.0192     97.04  |Q        |         |         |         V|
26+ 0     926.6535     92.10  |Q        |         |         |         V|
26+ 5     927.2545     87.26  |Q        |         |         |         V|
26+10     927.8195     82.03  |Q        |         |         |         V|
26+15     928.3452     76.34  |Q        |         |         |         V|
26+20     928.8138     68.03  |Q        |         |         |         V|
26+25     929.2307     60.54  Q         |         |         |         V|
26+30     929.6202     56.55  Q         |         |         |         V|
26+35     929.9866     53.20  Q         |         |         |         V|
26+40     930.3342     50.48  Q         |         |         |         V|
26+45     930.6664     48.24  Q         |         |         |         V|
26+50     930.9840     46.11  Q         |         |         |         V|
26+55     931.2875     44.07  Q         |         |         |         V|
27+ 0     931.5784     42.24  Q         |         |         |         V|
27+ 5     931.8576     40.53  Q         |         |         |         V|
27+10     932.1253     38.88  Q         |         |         |         V|
27+15     932.3820     37.27  Q         |         |         |         V|
27+20     932.6285     35.81  Q         |         |         |         V|
27+25     932.8656     34.43  Q         |         |         |         V|
27+30     933.0934     33.08  Q         |         |         |         V|
27+35     933.3122     31.77  Q         |         |         |         V|
27+40     933.5230     30.61  Q         |         |         |         V|
27+45     933.7262     29.51  Q         |         |         |         V|
27+50     933.9220     28.42  Q         |         |         |         V|
27+55     934.1105     27.37  Q         |         |         |         V|
28+ 0     934.2926     26.44  Q         |         |         |         V|
28+ 5     934.4684     25.53  Q         |         |         |         V|
28+10     934.6381     24.64  Q         |         |         |         V|
28+15     934.8018     23.76  Q         |         |         |         V|
28+20     934.9593     22.87  Q         |         |         |         V|
28+25     935.1106     21.96  Q         |         |         |         V|
28+30     935.2557     21.07  Q         |         |         |         V|
28+35     935.3951     20.25  Q         |         |         |         V|
28+40     935.5297     19.55  Q         |         |         |         V|
28+45     935.6596     18.86  Q         |         |         |         V|
28+50     935.7848     18.18  Q         |         |         |         V|
28+55     935.9054     17.51  Q         |         |         |         V|
29+ 0     936.0215     16.85  Q         |         |         |         V|
29+ 5     936.1330     16.20  Q         |         |         |         V|
29+10     936.2402     15.56  Q         |         |         |         V|
29+15     936.3434     14.99  Q         |         |         |         V|
29+20     936.4433     14.50  Q         |         |         |         V|
29+25     936.5397     14.01  Q         |         |         |         V|
29+30     936.6329     13.52  Q         |         |         |         V|
29+35     936.7227     13.04  Q         |         |         |         V|
29+40     936.8092     12.56  Q         |         |         |         V|
29+45     936.8925     12.10  Q         |         |         |         V|
29+50     936.9726     11.63  Q         |         |         |         V|
29+55     937.0497     11.19  Q         |         |         |         V|
30+ 0     937.1238     10.76  Q         |         |         |         V|
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30+ 5	937.1950	10.33	Q	|	|	|	V|
30+10	937.2632	9.91	Q	|	|	|	V|
30+15	937.3286	9.49	Q	|	|	|	V|
30+20	937.3911	9.08	Q	|	|	|	V|
30+25	937.4508	8.67	Q	|	|	|	V|
30+30	937.5078	8.28	Q	|	|	|	V|
30+35	937.5626	7.96	Q	|	|	|	V|
30+40	937.6152	7.64	Q	|	|	|	V|
30+45	937.6658	7.34	Q	|	|	|	V|
30+50	937.7142	7.03	Q	|	|	|	V|
30+55	937.7605	6.73	Q	|	|	|	V|
31+ 0	937.8048	6.43	Q	|	|	|	V|
31+ 5	937.8471	6.14	Q	|	|	|	V|
31+10	937.8874	5.86	Q	|	|	|	V|
31+15	937.9261	5.61	Q	|	|	|	V|
31+20	937.9631	5.37	Q	|	|	|	V|
31+25	937.9984	5.13	Q	|	|	|	V|
31+30	938.0320	4.89	Q	|	|	|	V|
31+35	938.0640	4.65	Q	|	|	|	V|
31+40	938.0944	4.41	Q	|	|	|	V|
31+45	938.1232	4.18	Q	|	|	|	V|
31+50	938.1506	3.98	Q	|	|	|	V|
31+55	938.1767	3.79	Q	|	|	|	V|
32+ 0	938.2015	3.61	Q	|	|	|	V|
32+ 5	938.2251	3.42	Q	|	|	|	V|
32+10	938.2474	3.24	Q	|	|	|	V|
32+15	938.2685	3.06	Q	|	|	|	V|
32+20	938.2884	2.89	Q	|	|	|	V|
32+25	938.3071	2.71	Q	|	|	|	V|
32+30	938.3248	2.57	Q	|	|	|	V|
32+35	938.3416	2.44	Q	|	|	|	V|
32+40	938.3576	2.32	Q	|	|	|	V|
32+45	938.3727	2.19	Q	|	|	|	V|
32+50	938.3869	2.06	Q	|	|	|	V|
32+55	938.4002	1.94	Q	|	|	|	V|
33+ 0	938.4127	1.81	Q	|	|	|	V|
33+ 5	938.4243	1.69	Q	|	|	|	V|
33+10	938.4351	1.57	Q	|	|	|	V|
33+15	938.4451	1.45	Q	|	|	|	V|
33+20	938.4542	1.32	Q	|	|	|	V|
33+25	938.4625	1.21	Q	|	|	|	V|
33+30	938.4700	1.09	Q	|	|	|	V|
33+35	938.4766	0.97	Q	|	|	|	V|
33+40	938.4825	0.85	Q	|	|	|	V|
33+45	938.4876	0.74	Q	|	|	|	V|
33+50	938.4918	0.62	Q	|	|	|	V|
33+55	938.4953	0.51	Q	|	|	|	V|
34+ 0	938.4980	0.39	Q	|	|	|	V|
34+ 5	938.4999	0.28	Q	|	|	|	V|
34+10	938.5011	0.17	Q	|	|	|	V|

```
   34+15     938.5015      0.06  Q         |         |         |        V|
-------------------------------------------------------------------------
```

FLOOD HYDROGRAPH ROUTING PROGRAM

Study date: 02/17/22

Marmon Hydrology Analysis
100-Year Event
Routing Basin 100

Program License Serial Number 6360

********** HYDROGRAPH INFORMATION **********

From study/file name: Marmon102.rte
**********HYDROGRAPH DATA**********
Number of intervals = 342
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 2642.494 (CFS)
Total volume = 659.561 (Ac.Ft)

Status of hydrographs being held in storage

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

****

++
Process from Point/Station 106.000 to Point/Station 102.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****

****
********** HYDROGRAPH INFORMATION **********

From study/file name: Marmon104.rte
++
P R I N T O F S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals (CFS)

Time(h+m)	Add q(CFS)	Tot. Q	0	1028.0	2056.0	3084.0	4111.9
0+ 5	1.3354	3.85	Q				
0+10	5.1396	14.62	Q				
0+15	12.2811	34.24	Q				
0+20	21.1388	60.38	Q				
0+25	27.3072	79.81	Q				
0+30	31.4778	93.03	Q				
0+35	34.5409	102.57	Q				
0+40	37.0526	110.27	qQ				
0+45	39.1463	116.81	qQ				
0+50	40.9893	122.45	qQ				
0+55	42.6603	127.52	qQ				
1+ 0	44.1888	132.17	qQ				
1+ 5	45.5707	136.44	qQ				
1+10	46.8080	140.30	qQ				
1+15	47.9536	143.81	qQ				
1+20	49.0196	147.09	qQ				
1+25	49.9816	150.12	qQ				
1+30	50.8721	152.90	qQ				
1+35	51.6898	155.46	qQ				
1+40	52.4851	157.89	qQ				
1+45	53.2540	160.20	qQ				
1+50	53.9443	162.43	qQ				
1+55	54.6311	164.51	qQ				
2+ 0	55.3077	166.53	qQ				
2+ 5	55.9781	168.53	qQ				
2+10	56.6349	170.50	qQ				
2+15	57.2247	172.40	qQ				
2+20	57.8123	174.26	qQ				
2+25	58.3882	175.99	qQ				
2+30	58.9590	177.71	qQ				
2+35	59.5245	179.41	qQ				
2+40	60.0594	181.07	qQ				
2+45	60.5915	182.72	qQ				
2+50	61.1161	184.32	qQ				
2+55	61.6311	185.88	qQ				
3+ 0	62.1454	187.45	qQ				
3+ 5	62.6263	188.95	qQ				
3+10	63.1054	190.46	qQ				
3+15	63.5759	191.93	qQ				
3+20	64.0380	193.35	qQ				
3+25	64.5018	194.76	qQ				
3+30	64.9704	196.17	qQ				
3+35	65.4408	197.57	qQ				
3+40	65.9162	198.98	qQ				
3+45	66.3935	200.39	qQ				
3+50	66.8758	201.82	qQ				
3+55	67.3601	203.26	qQ				

4+ 0	67.8497	204.71	qQ	|	|	|	|
4+ 5	68.3412	206.17	q Q	|	|	|	|
4+10	68.8382	207.64	q Q	|	|	|	|
4+15	69.2313	209.02	q Q	|	|	|	|
4+20	69.5238	210.31	q Q	|	|	|	|
4+25	69.8177	211.60	q Q	|	|	|	|
4+30	70.1167	212.90	q Q	|	|	|	|
4+35	70.4172	214.21	q Q	|	|	|	|
4+40	70.7229	215.13	q Q	|	|	|	|
4+45	71.0302	216.07	q Q	|	|	|	|
4+50	71.3429	217.02	q Q	|	|	|	|
4+55	71.6572	217.97	q Q	|	|	|	|
5+ 0	71.9772	218.94	q Q	|	|	|	|
5+ 5	72.2989	219.91	q Q	|	|	|	|
5+10	72.6263	220.91	q Q	|	|	|	|
5+15	72.9556	221.91	q Q	|	|	|	|
5+20	73.2909	222.92	q Q	|	|	|	|
5+25	73.6281	223.95	q Q	|	|	|	|
5+30	73.9715	224.99	q Q	|	|	|	|
5+35	74.3170	226.04	q Q	|	|	|	|
5+40	74.6687	227.10	q Q	|	|	|	|
5+45	75.0228	228.18	q Q	|	|	|	|
5+50	75.3833	229.27	q Q	|	|	|	|
5+55	75.7463	230.37	q Q	|	|	|	|
6+ 0	76.1160	231.49	q Q	|	|	|	|
6+ 5	76.4882	232.62	q Q	|	|	|	|
6+10	76.8674	233.77	q Q	|	|	|	|
6+15	77.2492	234.93	q Q	|	|	|	|
6+20	77.6384	236.11	q Q	|	|	|	|
6+25	78.0303	237.30	q Q	|	|	|	|
6+30	78.4298	238.51	q Q	|	|	|	|
6+35	78.8323	239.73	q Q	|	|	|	|
6+40	79.2426	240.97	q Q	|	|	|	|
6+45	79.6560	242.23	q Q	|	|	|	|
6+50	80.0776	243.50	q Q	|	|	|	|
6+55	80.5025	244.79	q Q	|	|	|	|
7+ 0	80.9358	246.11	q Q	|	|	|	|
7+ 5	81.3727	247.43	q Q	|	|	|	|
7+10	81.8185	248.78	q Q	|	|	|	|
7+15	82.2679	250.14	q Q	|	|	|	|
7+20	82.7265	251.53	q Q	|	|	|	|
7+25	83.1891	252.93	q Q	|	|	|	|
7+30	83.6613	254.37	q Q	|	|	|	|
7+35	84.1377	255.81	q Q	|	|	|	|
7+40	84.6241	257.28	q Q	|	|	|	|
7+45	85.1149	258.77	q Q	|	|	|	|
7+50	85.6162	260.29	q Q	|	|	|	|
7+55	86.1222	261.82	q Q	|	|	|	|
8+ 0	86.6392	263.39	q Q	|	|	|	|
8+ 5	87.1612	264.97	q Q	|	|	|	|

8+10	87.6947	266.59	q Q	|	|	|	|
8+15	88.2334	268.22	q Q	|	|	|	|
8+20	88.7842	269.89	q Q	|	|	|	|
8+25	89.3407	271.57	q Q	|	|	|	|
8+30	89.9098	273.30	q Q	|	|	|	|
8+35	90.4849	275.04	q Q	|	|	|	|
8+40	91.0733	276.82	q Q	|	|	|	|
8+45	91.6681	278.62	q Q	|	|	|	|
8+50	92.2769	280.46	q Q	|	|	|	|
8+55	92.8925	282.33	q Q	|	|	|	|
9+ 0	93.5228	284.24	q Q	|	|	|	|
9+ 5	94.1605	286.17	q Q	|	|	|	|
9+10	94.8135	288.14	q Q	|	|	|	|
9+15	95.4745	290.14	q Q	|	|	|	|
9+20	96.1518	292.20	q Q	|	|	|	|
9+25	96.8376	294.27	q Q	|	|	|	|
9+30	97.5405	296.40	q Q	|	|	|	|
9+35	98.2526	298.55	q Q	|	|	|	|
9+40	98.9828	300.76	q Q	|	|	|	|
9+45	99.7228	303.00	q Q	|	|	|	|
9+50	100.4821	305.30	q Q	|	|	|	|
9+55	101.2520	307.63	q Q	|	|	|	|
10+ 0	102.0422	310.02	q Q	|	|	|	|
10+ 5	102.8439	312.44	|q Q	|	|	|	|
10+10	103.6672	314.94	|q Q	|	|	|	|
10+15	104.5029	317.46	|q Q	|	|	|	|
10+20	105.3617	320.06	|q Q	|	|	|	|
10+25	106.2338	322.70	|q Q	|	|	|	|
10+30	107.1305	325.41	|q Q	|	|	|	|
10+35	108.0417	328.16	|q Q	|	|	|	|
10+40	108.9792	331.00	|q Q	|	|	|	|
10+45	109.9325	333.88	|q Q	|	|	|	|
10+50	110.9138	336.85	|q Q	|	|	|	|
10+55	111.9123	339.87	|q Q	|	|	|	|
11+ 0	112.9410	342.98	|q Q	|	|	|	|
11+ 5	113.9884	346.14	|q Q	|	|	|	|
11+10	115.0683	349.41	|q Q	|	|	|	|
11+15	116.1686	352.73	|q Q	|	|	|	|
11+20	117.3039	356.16	|q Q	|	|	|	|
11+25	118.4617	359.66	|q Q	|	|	|	|
11+30	119.6572	363.27	|q Q	|	|	|	|
11+35	120.8775	366.95	|q Q	|	|	|	|
11+40	122.1387	370.76	|q Q	|	|	|	|
11+45	123.4272	374.65	|q Q	|	|	|	|
11+50	124.7601	378.68	|q Q	|	|	|	|
11+55	126.1232	382.79	|q Q	|	|	|	|
12+ 0	127.5348	387.06	|q Q	|	|	|	|
12+ 5	128.5879	390.89	|q Q	|	|	|	|
12+10	128.9683	393.93	|q Q	|	|	|	|
12+15	128.4029	395.79	|q Q	|	|	|	|

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12+20     127.3859    397.08  |q Q      |          |          |          |
12+25     127.1914    399.47  |q Q      |          |          |          |
12+30     127.6409    402.86  |q Q      |          |          |          |
12+35     128.4579    406.84  |q Q      |          |          |          |
12+40     129.5038    411.27  |q  Q     |          |          |          |
12+45     130.7224    416.01  |q  Q     |          |          |          |
12+50     132.0904    421.10  |q  Q     |          |          |          |
12+55     133.5665    426.43  |q  Q     |          |          |          |
13+ 0     135.1699    432.08  |q  Q     |          |          |          |
13+ 5     136.8825    437.99  |q  Q     |          |          |          |
13+10     138.7342    444.25  |q  Q     |          |          |          |
13+15     140.6894    450.78  |q  Q     |          |          |          |
13+20     142.7781    457.69  |q  Q     |          |          |          |
13+25     144.9861    464.89  |q  Q     |          |          |          |
13+30     147.3411    472.52  |q  Q     |          |          |          |
13+35     149.8215    480.48  |q  Q     |          |          |          |
13+40     152.4540    488.90  |q  Q     |          |          |          |
13+45     155.2170    497.70  |q  Q     |          |          |          |
13+50     158.1724    507.04  |q  Q     |          |          |          |
13+55     161.2750    516.82  |q   Q    |          |          |          |
14+ 0     164.5799    527.22  |q   Q    |          |          |          |
14+ 5     167.7291    538.39  |q   Q    |          |          |          |
14+10     170.5001    550.74  |q   Q    |          |          |          |
14+15     172.6606    564.18  |q   Q    |          |          |          |
14+20     174.6585    579.22  |q   Q    |          |          |          |
14+25     177.5671    594.76  |q   Q    |          |          |          |
14+30     181.3028    610.90  |q   Q    |          |          |          |
14+35     185.6351    627.68  |q    Q   |          |          |          |
14+40     190.5379    645.66  |q    Q   |          |          |          |
14+45     195.9666    664.81  |q    Q   |          |          |          |
14+50     202.0104    685.61  |q    Q   |          |          |          |
14+55     208.6642    708.02  | q   Q   |          |          |          |
15+ 0     216.0869    732.66  | q    Q  |          |          |          |
15+ 5     224.3375    759.57  | q    Q  |          |          |          |
15+10     233.6392    789.56  | q    Q  |          |          |          |
15+15     244.0999    822.77  | q     Q |          |          |          |
15+20     256.0619    860.43  | q     Q |          |          |          |
15+25     275.4557    913.68  | q     Q |          |          |          |
15+30     307.7613    993.20  | q      Q|          |          |          |
15+35     357.6854   1106.78  |  q      Q          |          |          |
15+40     419.9018   1250.29  |   q     | Q        |          |          |
15+45     480.3287   1399.53  |   q     |  Q       |          |          |
15+50     546.3773   1570.46  |    q    |    Q     |          |          |
15+55     629.9143   1790.50  |     q   |      Q   |          |          |
16+ 0     743.3706   2096.08  |      q  |         Q|          |          |
16+ 5     937.8686   2617.55  |        q|          |    Q     |          |
16+10    1182.9497   3269.54  |         |q         |          |Q         |
16+15    1410.0449   3866.03  |         |  q       |          |      Q   |
16+20    1469.4545   4111.95  |         |   q      |          |         Q|
16+25    1259.3108   3606.65  |         | q        |          |    Q     |
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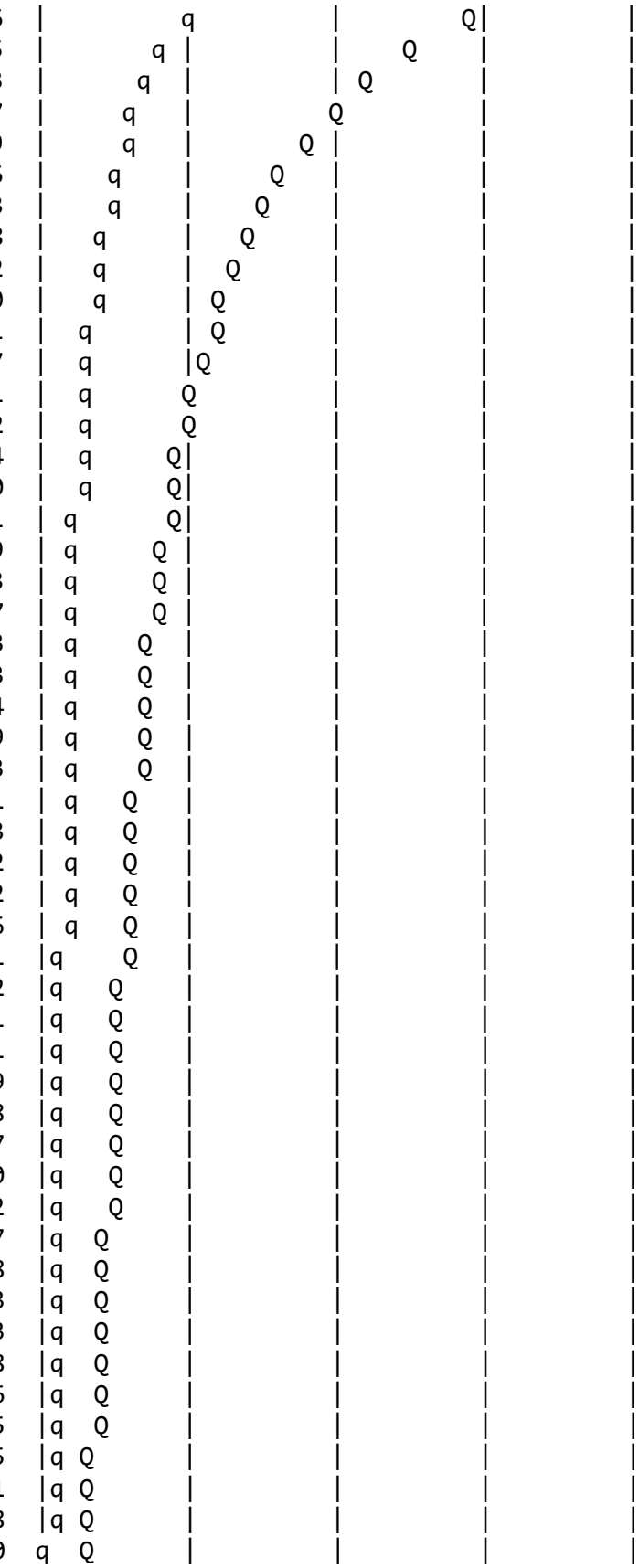
16+30	1056.5583	3049.56	
16+35	898.2113	2615.05	
16+40	776.5496	2292.53	
16+45	686.3945	2056.37	
16+50	621.4818	1874.29	
16+55	571.0568	1733.56	
17+ 0	528.1228	1616.63	
17+ 5	490.0316	1512.68	
17+10	456.0959	1416.12	
17+15	428.5551	1329.60	
17+20	404.3290	1254.21	
17+25	380.7514	1184.57	
17+30	360.2790	1120.21	
17+35	341.7025	1064.02	
17+40	326.8249	1016.04	
17+45	313.0758	973.00	
17+50	298.2705	934.71	
17+55	288.2282	897.59	
18+ 0	278.5563	866.23	
18+ 5	269.7488	840.27	
18+10	261.4635	814.93	
18+15	252.3865	790.53	
18+20	247.2981	768.74	
18+25	241.5807	744.39	
18+30	235.6798	725.53	
18+35	229.8757	706.91	
18+40	222.8976	687.53	
18+45	217.4370	670.62	
18+50	211.8825	651.62	
18+55	206.4023	634.96	
19+ 0	201.3021	619.61	
19+ 5	195.0883	602.52	
19+10	190.4987	588.31	
19+15	186.1005	573.31	
19+20	181.9134	558.19	
19+25	178.7256	546.88	
19+30	175.7254	535.27	
19+35	172.3563	524.40	
19+40	168.5717	514.32	
19+45	164.6780	504.47	
19+50	160.6055	494.58	
19+55	156.0678	484.33	
20+ 0	150.9573	472.63	
20+ 5	145.0215	460.08	
20+10	137.6607	445.76	
20+15	125.1218	426.05	
20+20	113.8358	406.15	
20+25	109.0106	392.11	
20+30	105.3099	376.98	
20+35	102.5568	359.90	

20+40	100.5444	329.67	q Q	|	|	|	|
20+45	98.7314	318.22	q Q	|	|	|	|
20+50	97.0691	309.72	q Q	|	|	|	|
20+55	95.5277	302.40	q Q	|	|	|	|
21+ 0	94.0883	296.59	q Q	|	|	|	|
21+ 5	92.7269	291.29	q Q	|	|	|	|
21+10	91.4405	286.39	q Q	|	|	|	|
21+15	90.1926	281.79	q Q	|	|	|	|
21+20	88.9761	277.43	q Q	|	|	|	|
21+25	87.8157	273.31	q Q	|	|	|	|
21+30	86.7062	269.40	q Q	|	|	|	|
21+35	85.6433	265.68	q Q	|	|	|	|
21+40	84.6233	262.21	q Q	|	|	|	|
21+45	83.6428	258.90	q Q	|	|	|	|
21+50	82.6991	255.72	q Q	|	|	|	|
21+55	81.7896	252.66	q Q	|	|	|	|
22+ 0	80.9120	249.72	q Q	|	|	|	|
22+ 5	80.0644	246.89	q Q	|	|	|	|
22+10	79.2449	244.15	q Q	|	|	|	|
22+15	78.4209	241.48	q Q	|	|	|	|
22+20	77.5913	238.87	q Q	|	|	|	|
22+25	76.7861	236.33	q Q	|	|	|	|
22+30	76.0040	233.88	q Q	|	|	|	|
22+35	75.2438	231.49	q Q	|	|	|	|
22+40	74.5046	229.16	q Q	|	|	|	|
22+45	73.7851	226.89	q Q	|	|	|	|
22+50	73.0847	224.68	q Q	|	|	|	|
22+55	72.4022	222.53	q Q	|	|	|	|
23+ 0	71.7371	220.44	q Q	|	|	|	|
23+ 5	71.0885	218.41	q Q	|	|	|	|
23+10	70.4556	216.42	q Q	|	|	|	|
23+15	69.8380	214.49	q Q	|	|	|	|
23+20	69.2348	212.60	q Q	|	|	|	|
23+25	68.6456	210.76	q Q	|	|	|	|
23+30	68.0699	208.96	q Q	|	|	|	|
23+35	67.5070	207.20	q Q	|	|	|	|
23+40	66.9565	205.48	qQ	|	|	|	|
23+45	66.4180	203.80	qQ	|	|	|	|
23+50	65.8910	202.15	qQ	|	|	|	|
23+55	65.3751	200.55	qQ	|	|	|	|
24+ 0	64.8698	198.97	qQ	|	|	|	|
24+ 5	63.0425	193.59	qQ	|	|	|	|
24+10	58.7733	181.37	qQ	|	|	|	|
24+15	51.2196	160.44	qQ	|	|	|	|
24+20	42.0298	133.23	qQ	|	|	|	|
24+25	35.6184	113.00	qQ	|	|	|	|
24+30	31.2696	99.18	Q	|	|	|	|
24+35	28.0720	89.18	Q	|	|	|	|
24+40	25.4610	81.13	Q	|	|	|	|
24+45	23.2952	74.32	Q	|	|	|	|

24+50	21.4053	68.49	Q	|	|	|	|
24+55	19.7076	63.30	Q	|	|	|	|
25+ 0	18.1731	58.59	Q	|	|	|	|
25+ 5	16.8018	54.31	Q	|	|	|	|
25+10	15.5923	50.49	Q	|	|	|	|
25+15	14.4878	47.07	Q	|	|	|	|
25+20	13.4775	43.92	Q	|	|	|	|
25+25	12.5824	41.05	Q	|	|	|	|
25+30	11.7713	38.49	Q	|	|	|	|
25+35	11.0423	36.16	Q	|	|	|	|
25+40	10.3466	34.01	Q	|	|	|	|
25+45	9.6853	32.00	Q	|	|	|	|
25+50	9.1128	30.09	Q	|	|	|	|
25+55	8.5506	28.36	Q	|	|	|	|
26+ 0	8.0079	26.72	Q	|	|	|	|
26+ 5	7.4778	25.11	Q	|	|	|	|
26+10	6.9702	23.57	Q	|	|	|	|
26+15	6.5357	22.11	Q	|	|	|	|
26+20	6.1114	20.73	Q	|	|	|	|
26+25	5.7041	19.49	Q	|	|	|	|
26+30	5.3098	18.28	Q	|	|	|	|
26+35	4.9257	17.10	Q	|	|	|	|
26+40	4.5796	16.00	Q	|	|	|	|
26+45	4.2411	14.91	Q	|	|	|	|
26+50	3.9171	13.90	Q	|	|	|	|
26+55	3.6071	12.94	Q	|	|	|	|
27+ 0	3.3047	11.99	Q	|	|	|	|
27+ 5	3.0398	11.12	Q	|	|	|	|
27+10	2.7835	10.27	Q	|	|	|	|
27+15	2.5393	9.47	Q	|	|	|	|
27+20	2.3101	8.74	Q	|	|	|	|
27+25	2.0826	8.02	Q	|	|	|	|
27+30	1.8568	7.34	Q	|	|	|	|
27+35	1.6326	6.67	Q	|	|	|	|
27+40	1.4100	6.01	Q	|	|	|	|
27+45	1.1890	5.36	Q	|	|	|	|
27+50	0.9695	4.71	Q	|	|	|	|
27+55	0.7515	4.06	Q	|	|	|	|
28+ 0	0.5350	3.42	Q	|	|	|	|
28+ 5	0.3200	2.78	Q	|	|	|	|
28+10	0.1064	2.15	Q	|	|	|	|
28+15	0.0000	1.63	Q	|	|	|	|
28+20	0.0000	1.21	Q	|	|	|	|
28+25	0.0000	0.80	Q	|	|	|	|
28+30	0.0000	0.39	Q	|	|	|	|

**********HYDROGRAPH DATA**********

Number of intervals = 342
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 4111.949 (CFS)

```
                Total volume =     981.930 (Ac.Ft)
          Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
          Peak (CFS)      0.000     0.000     0.000     0.000     0.000
          Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
     ************************************************************************

     ------------------------------------------------------------------------
```



```
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
     Process from Point/Station      102.000 to Point/Station      100.000
     **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
     ________________________________________________________________________
     ********************* HYDROGRAPH INFORMATION **********************

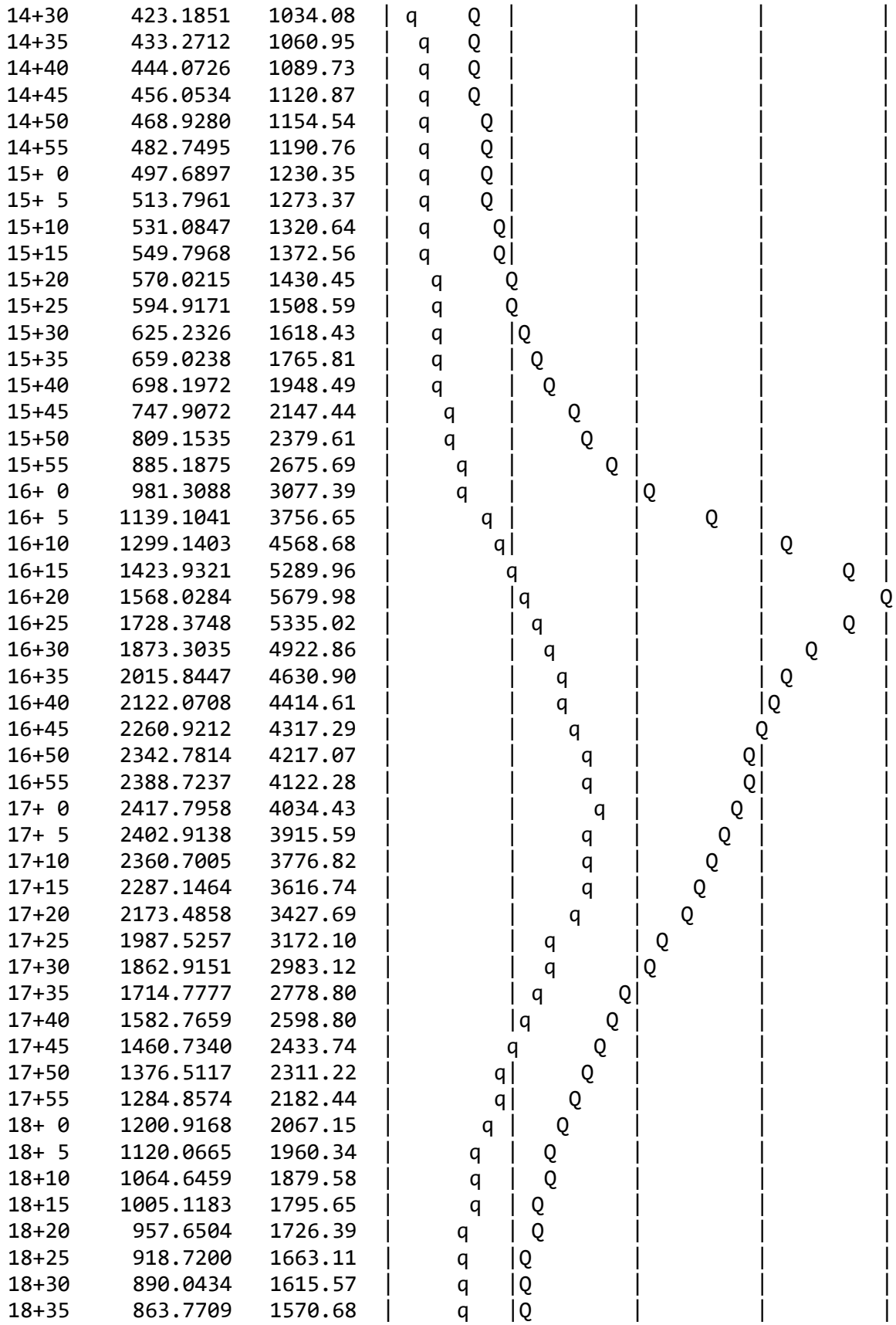
                  From study/file name: Marmon100.rte
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
     ------------------------------------------------------------------------
               Hydrograph in   5   Minute intervals (CFS)

     ------------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0     1420.0    2840.0    4260.0    5680.0
----------------------------------------------------------------------------
  0+ 5       0.9580      4.80  Q          |          |          |          |
  0+10       2.8762     17.50  Q          |          |          |          |
  0+15       4.9702     39.21  Q          |          |          |          |
  0+20       7.6117     67.99  Q          |          |          |          |
  0+25      11.1133     90.92  Q          |          |          |          |
  0+30      15.3154    108.34  Q          |          |          |          |
  0+35      20.3529    122.92  Q          |          |          |          |
  0+40      25.5683    135.83  Q          |          |          |          |
  0+45      32.1292    148.94  qQ         |          |          |          |
  0+50      39.2340    161.68  qQ         |          |          |          |
  0+55      46.6894    174.21  qQ         |          |          |          |
  1+ 0      54.5961    186.76  qQ         |          |          |          |
  1+ 5      62.6959    199.13  qQ         |          |          |          |
  1+10      70.8631    211.17  qQ         |          |          |          |
  1+15      79.0602    222.87  qQ         |          |          |          |
  1+20      86.9940    234.08  qQ         |          |          |          |
  1+25      93.3557    243.48  qQ         |          |          |          |
  1+30      99.4696    252.37  qQ         |          |          |          |
  1+35     104.7553    260.21  qQ         |          |          |          |
  1+40     109.4366    267.33  qQ         |          |          |          |
  1+45     113.4124    273.61  qQ         |          |          |          |
  1+50     117.3138    279.74  qQ         |          |          |          |
  1+55     120.8314    285.34  q Q        |          |          |          |
```

2+ 0	124.0259	290.55	q Q	|	|	|	|
2+ 5	126.7635	295.30	q Q	|	|	|	|
2+10	129.4543	299.96	q Q	|	|	|	|
2+15	131.8523	304.26	q Q	|	|	|	|
2+20	134.1022	308.36	q Q	|	|	|	|
2+25	136.2201	312.21	q Q	|	|	|	|
2+30	138.3484	316.06	q Q	|	|	|	|
2+35	140.4850	319.90	q Q	|	|	|	|
2+40	142.4659	323.54	|qQ	|	|	|	|
2+45	144.3134	327.04	|qQ	|	|	|	|
2+50	146.1717	330.49	|qQ	|	|	|	|
2+55	148.0347	333.92	|qQ	|	|	|	|
3+ 0	149.7667	337.22	|qQ	|	|	|	|
3+ 5	151.4309	340.38	|qQ	|	|	|	|
3+10	153.1057	343.57	|qQ	|	|	|	|
3+15	154.7822	346.71	|qQ	|	|	|	|
3+20	156.3751	349.72	|qQ	|	|	|	|
3+25	157.9436	352.71	|qQ	|	|	|	|
3+30	159.5226	355.69	|qQ	|	|	|	|
3+35	161.0929	358.66	|qQ	|	|	|	|
3+40	162.5421	361.52	|qQ	|	|	|	|
3+45	163.9706	364.36	|qQ	|	|	|	|
3+50	165.4096	367.23	|qQ	|	|	|	|
3+55	166.8353	370.09	|qQ	|	|	|	|
4+ 0	168.1727	372.88	|qQ	|	|	|	|
4+ 5	169.5053	375.67	|qQ	|	|	|	|
4+10	170.8483	378.49	|qQ	|	|	|	|
4+15	172.1993	381.22	|qQ	|	|	|	|
4+20	173.5610	383.87	|qQ	|	|	|	|
4+25	174.9310	386.53	|qQ	|	|	|	|
4+30	176.3120	389.22	|qQ	|	|	|	|
4+35	177.6414	391.85	|qQ	|	|	|	|
4+40	178.8680	394.00	|qQ	|	|	|	|
4+45	180.1002	396.17	|qQ	|	|	|	|
4+50	181.3435	398.36	|qQ	|	|	|	|
4+55	182.5952	400.56	|qQ	|	|	|	|
5+ 0	183.8584	402.80	|qQ	|	|	|	|
5+ 5	185.1304	405.05	|qQ	|	|	|	|
5+10	186.4138	407.32	|qQ	|	|	|	|
5+15	187.6296	409.54	|qQ	|	|	|	|
5+20	188.8019	411.73	|qQ	|	|	|	|
5+25	189.9832	413.93	|qQ	|	|	|	|
5+30	191.1766	416.17	|qQ	|	|	|	|
5+35	192.3794	418.42	|qQ	|	|	|	|
5+40	193.5948	420.70	|qQ	|	|	|	|
5+45	194.8198	423.00	|qQ	|	|	|	|
5+50	196.0565	425.33	|qQ	|	|	|	|
5+55	197.2872	427.66	|q Q	|	|	|	|
6+ 0	198.5266	430.02	|q Q	|	|	|	|
6+ 5	199.7764	432.40	|q Q	|	|	|	|

6+10	201.0400	434.81	|q Q	|	|	|	|
6+15	202.3144	437.24	|q Q	|	|	|	|
6+20	203.6032	439.71	|q Q	|	|	|	|
6+25	204.9032	442.20	|q Q	|	|	|	|
6+30	206.2019	444.71	|q Q	|	|	|	|
6+35	207.4468	447.17	|q Q	|	|	|	|
6+40	208.7002	449.67	|q Q	|	|	|	|
6+45	209.9654	452.19	|q Q	|	|	|	|
6+50	211.2464	454.75	|q Q	|	|	|	|
6+55	212.5398	457.33	|q Q	|	|	|	|
7+ 0	213.8496	459.95	|q Q	|	|	|	|
7+ 5	215.1722	462.60	|q Q	|	|	|	|
7+10	216.4954	465.28	|q Q	|	|	|	|
7+15	217.8047	467.95	|q Q	|	|	|	|
7+20	219.1313	470.66	|q Q	|	|	|	|
7+25	220.4719	473.41	|q Q	|	|	|	|
7+30	221.8308	476.20	|q Q	|	|	|	|
7+35	223.2042	479.01	|q Q	|	|	|	|
7+40	224.5969	481.88	|q Q	|	|	|	|
7+45	226.0044	484.77	|q Q	|	|	|	|
7+50	227.4049	487.69	|q Q	|	|	|	|
7+55	228.8045	490.63	|q Q	|	|	|	|
8+ 0	230.2249	493.61	|q Q	|	|	|	|
8+ 5	231.6619	496.63	|q Q	|	|	|	|
8+10	233.1205	499.71	|q Q	|	|	|	|
8+15	234.5966	502.81	|q Q	|	|	|	|
8+20	236.0954	505.98	|q Q	|	|	|	|
8+25	237.6093	509.18	|q Q	|	|	|	|
8+30	239.1142	512.41	|q Q	|	|	|	|
8+35	240.6302	515.67	|q Q	|	|	|	|
8+40	242.1708	518.99	|q Q	|	|	|	|
8+45	243.7317	522.35	|q Q	|	|	|	|
8+50	245.3185	525.78	|q Q	|	|	|	|
8+55	246.9268	529.25	|q Q	|	|	|	|
9+ 0	248.5621	532.80	|q Q	|	|	|	|
9+ 5	250.2202	536.39	|q Q	|	|	|	|
9+10	251.9068	540.05	|q Q	|	|	|	|
9+15	253.6174	543.76	|q Q	|	|	|	|
9+20	255.3579	547.55	|q Q	|	|	|	|
9+25	257.1239	551.39	|q Q	|	|	|	|
9+30	258.9215	555.32	|q Q	|	|	|	|
9+35	260.7460	559.30	|q Q	|	|	|	|
9+40	262.6039	563.37	|q Q	|	|	|	|
9+45	264.4904	567.49	|q Q	|	|	|	|
9+50	266.4120	571.71	|q Q	|	|	|	|
9+55	268.3642	575.99	|q Q	|	|	|	|
10+ 0	270.3535	580.37	|q Q	|	|	|	|
10+ 5	272.3752	584.82	|q Q	|	|	|	|
10+10	274.4363	589.37	|q Q	|	|	|	|
10+15	276.5320	593.99	|q Q	|	|	|	|

10+20	278.6142	598.68	q Q			
10+25	280.6779	603.38	q Q			
10+30	282.7856	608.20	q Q			
10+35	284.9324	613.10	q Q			
10+40	287.1261	618.13	q Q			
10+45	289.3617	623.24	q Q			
10+50	291.6472	628.50	q Q			
10+55	293.9778	633.84	q Q			
11+ 0	296.3617	639.34	q Q			
11+ 5	298.7941	644.93	q Q			
11+10	301.2835	650.69	q Q			
11+15	303.8252	656.55	q Q			
11+20	306.4281	662.59	q Q			
11+25	309.0875	668.74	q Q			
11+30	311.8126	675.08	q Q			
11+35	314.5989	681.55	q Q			
11+40	317.4561	688.22	q Q			
11+45	320.3796	695.03	q Q			
11+50	323.3798	702.06	q Q			
11+55	326.4521	709.24	q Q			
12+ 0	329.6074	716.66	q Q			
12+ 5	332.3642	723.25	q Q			
12+10	334.7316	728.66	q Q			
12+15	337.0937	732.89	q Q			
12+20	339.2771	736.35	q Q			
12+25	341.1213	740.59	q Q			
12+30	342.7168	745.58	q Q			
12+35	343.9916	750.84	q Q			
12+40	345.2849	756.56	q Q			
12+45	346.0114	762.02	q Q			
12+50	346.5830	767.68	q Q			
12+55	347.0912	773.52	q Q			
13+ 0	347.5014	779.58	q Q			
13+ 5	347.9388	785.92	q Q			
13+10	348.4830	792.73	q Q			
13+15	349.1511	799.93	q Q			
13+20	350.1079	807.80	q Q			
13+25	352.0059	816.90	q Q			
13+30	354.2083	826.73	q Q			
13+35	357.0087	837.49	q Q			
13+40	360.3176	849.22	q Q			
13+45	364.1944	861.89	q Q			
13+50	368.3482	875.39	q Q			
13+55	372.9459	889.77	q Q			
14+ 0	377.9818	905.20	q Q			
14+ 5	383.8676	922.26	q Q			
14+10	390.4302	941.17	q Q			
14+15	397.5584	961.74	q Q			
14+20	405.3383	984.56	q Q			
14+25	413.9089	1008.67	q Q			



18+40	830.5421	1518.07	q Q			
18+45	802.0527	1472.68	q Q			
18+50	782.5491	1434.17	q Q			
18+55	763.6867	1398.65	q Q			
19+ 0	739.3254	1358.94	q Q			
19+ 5	720.4314	1322.95	q Q			
19+10	706.5316	1294.85	q Q			
19+15	692.6924	1266.00	q Q			
19+20	674.9252	1233.11	q Q			
19+25	660.4064	1207.29	q Q			
19+30	647.5277	1182.80	q Q			
19+35	632.9960	1157.40	q Q			
19+40	613.5230	1127.85	q Q			
19+45	599.9303	1104.40	q Q			
19+50	588.4397	1083.02	q Q			
19+55	575.6905	1060.02	q Q			
20+ 0	560.1255	1032.75	q Q			
20+ 5	549.7000	1009.78	q Q			
20+10	540.9204	986.68	q Q			
20+15	532.2896	958.34	q Q			
20+20	523.6382	929.79	q Q			
20+25	514.6106	906.72	q Q			
20+30	504.5675	881.55	q Q			
20+35	490.9266	850.83	q Q			
20+40	475.5481	805.21	q Q			
20+45	466.7472	784.97	q Q			
20+50	459.2413	768.96	q Q			
20+55	452.0545	754.46	q Q			
21+ 0	445.1358	741.73	q Q			
21+ 5	437.8131	729.11	q Q			
21+10	429.6895	716.08	q Q			
21+15	417.9681	699.76	q Q			
21+20	408.1221	685.55	q Q			
21+25	402.0343	675.35	q Q			
21+30	396.7171	666.12	q Q			
21+35	391.9372	657.62	q Q			
21+40	387.4848	649.70	q Q			
21+45	383.0402	641.94	q Q			
21+50	378.4349	634.15	q Q			
21+55	373.0080	625.67	q Q			
22+ 0	368.2358	617.96	q Q			
22+ 5	363.8377	610.73	q Q			
22+10	359.4556	603.61	q Q			
22+15	354.8814	596.36	q Q			
22+20	350.1795	589.05	q Q			
22+25	344.9875	581.32	q Q			
22+30	338.5287	572.40	q Q			
22+35	330.0204	561.51	qQ			
22+40	324.8762	554.03	qQ			
22+45	320.7087	547.60	qQ			

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22+50     316.7931    541.48  | qQ      |         |         |         |
22+55     313.1062    535.64  | qQ      |         |         |         |
23+ 0     309.3881    529.83  | qQ      |         |         |         |
23+ 5     305.4400    523.85  | qQ      |         |         |         |
23+10     300.5308    516.95  | qQ      |         |         |         |
23+15     295.3096    509.80  | qQ      |         |         |         |
23+20     291.6791    504.28  | qQ      |         |         |         |
23+25     288.3531    499.11  | qQ      |         |         |         |
23+30     285.0783    494.03  | qQ      |         |         |         |
23+35     281.8744    489.07  |q Q      |         |         |         |
23+40     278.5206    484.00  |q Q      |         |         |         |
23+45     274.8701    478.67  |q Q      |         |         |         |
23+50     269.8729    472.03  |q Q      |         |         |         |
23+55     265.6219    466.17  |q Q      |         |         |         |
24+ 0     262.5119    461.48  |q Q      |         |         |         |
24+ 5     258.6520    452.25  |q Q      |         |         |         |
24+10     253.8835    435.25  |q Q      |         |         |         |
24+15     248.9839    409.43  |qQ       |         |         |         |
24+20     243.3439    376.58  |qQ       |         |         |         |
24+25     236.4545    349.46  |qQ       |         |         |         |
24+30     227.6595    326.84  |qQ       |         |         |         |
24+35     219.5297    308.71  |qQ       |         |         |         |
24+40     212.0402    293.17  |qQ       |         |         |         |
24+45     203.4662    277.79  |Q        |         |         |         |
24+50     194.6309    263.12  |Q        |         |         |         |
24+55     185.6133    248.91  |Q        |         |         |         |
25+ 0     176.2589    234.85  |Q        |         |         |         |
25+ 5     166.8208    221.13  |Q        |         |         |         |
25+10     157.4041    207.89  |Q        |         |         |         |
25+15     148.0368    195.10  |Q        |         |         |         |
25+20     139.0125    182.94  qQ       |         |         |         |
25+25     131.6321    172.69  qQ       |         |         |         |
25+30     124.5554    163.04  qQ       |         |         |         |
25+35     118.3435    154.51  qQ       |         |         |         |
25+40     112.5602    146.57  qQ       |         |         |         |
25+45     107.2845    139.28  Q        |         |         |         |
25+50     102.0155    132.11  Q        |         |         |         |
25+55      97.0432    125.40  Q        |         |         |         |
26+ 0      92.1009    118.82  Q        |         |         |         |
26+ 5      87.2628    112.38  Q        |         |         |         |
26+10      82.0348    105.60  Q        |         |         |         |
26+15      76.3366     98.45  Q        |         |         |         |
26+20      68.0326     88.76  Q        |         |         |         |
26+25      60.5411     80.03  Q        |         |         |         |
26+30      56.5457     74.82  Q        |         |         |         |
26+35      53.2011     70.30  Q        |         |         |         |
26+40      50.4764     66.47  Q        |         |         |         |
26+45      48.2405     63.15  Q        |         |         |         |
26+50      46.1121     60.01  Q        |         |         |         |
26+55      44.0697     57.01  Q        |         |         |         |
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27+ 0	42.2360	54.23	Q				
27+ 5	40.5328	51.66	Q				
27+10	38.8763	49.15	Q				
27+15	37.2665	46.74	Q				
27+20	35.8057	44.55	Q				
27+25	34.4268	42.45	Q				
27+30	33.0755	40.41	Q				
27+35	31.7661	38.44	Q				
27+40	30.6114	36.62	Q				
27+45	29.5057	34.86	Q				
27+50	28.4189	33.13	Q				
27+55	27.3710	31.43	Q				
28+ 0	26.4384	29.86	Q				
28+ 5	25.5333	28.32	Q				
28+10	24.6422	26.79	Q				
28+15	23.7645	25.39	Q				
28+20	22.8719	24.09	Q				
28+25	21.9643	22.77	Q				
28+30	21.0688	21.46	Q				
28+35	20.2451	20.25	Q				
28+40	19.5459	19.55	Q				
28+45	18.8589	18.86	Q				
28+50	18.1811	18.18	Q				
28+55	17.5122	17.51	Q				
29+ 0	16.8516	16.85	Q				
29+ 5	16.1992	16.20	Q				
29+10	15.5550	15.56	Q				
29+15	14.9950	14.99	Q				
29+20	14.4970	14.50	Q				
29+25	14.0053	14.01	Q				
29+30	13.5195	13.52	Q				
29+35	13.0395	13.04	Q				
29+40	12.5650	12.56	Q				
29+45	12.0959	12.10	Q				
29+50	11.6334	11.63	Q				
29+55	11.1919	11.19	Q				
30+ 0	10.7599	10.76	Q				
30+ 5	10.3326	10.33	Q				
30+10	9.9097	9.91	Q				
30+15	9.4912	9.49	Q				
30+20	9.0769	9.08	Q				
30+25	8.6667	8.67	Q				
30+30	8.2767	8.28	Q				
30+35	7.9557	7.96	Q				
30+40	7.6448	7.64	Q				
30+45	7.3371	7.34	Q				
30+50	7.0323	7.03	Q				
30+55	6.7306	6.73	Q				
31+ 0	6.4317	6.43	Q				
31+ 5	6.1356	6.14	Q				

31+10	5.8589	5.86	Q	|	|	|	|
31+15	5.6119	5.61	Q	|	|	|	|
31+20	5.3676	5.37	Q	|	|	|	|
31+25	5.1256	5.13	Q	|	|	|	|
31+30	4.8857	4.89	Q	|	|	|	|
31+35	4.6481	4.65	Q	|	|	|	|
31+40	4.4125	4.41	Q	|	|	|	|
31+45	4.1794	4.18	Q	|	|	|	|
31+50	3.9753	3.98	Q	|	|	|	|
31+55	3.7897	3.79	Q	|	|	|	|
32+ 0	3.6058	3.61	Q	|	|	|	|
32+ 5	3.4235	3.42	Q	|	|	|	|
32+10	3.2427	3.24	Q	|	|	|	|
32+15	3.0635	3.06	Q	|	|	|	|
32+20	2.8858	2.89	Q	|	|	|	|
32+25	2.7129	2.71	Q	|	|	|	|
32+30	2.5739	2.57	Q	|	|	|	|
32+35	2.4443	2.44	Q	|	|	|	|
32+40	2.3159	2.32	Q	|	|	|	|
32+45	2.1885	2.19	Q	|	|	|	|
32+50	2.0621	2.06	Q	|	|	|	|
32+55	1.9368	1.94	Q	|	|	|	|
33+ 0	1.8125	1.81	Q	|	|	|	|
33+ 5	1.6892	1.69	Q	|	|	|	|
33+10	1.5668	1.57	Q	|	|	|	|
33+15	1.4453	1.45	Q	|	|	|	|
33+20	1.3248	1.32	Q	|	|	|	|
33+25	1.2052	1.21	Q	|	|	|	|
33+30	1.0865	1.09	Q	|	|	|	|
33+35	0.9687	0.97	Q	|	|	|	|
33+40	0.8517	0.85	Q	|	|	|	|
33+45	0.7355	0.74	Q	|	|	|	|
33+50	0.6202	0.62	Q	|	|	|	|
33+55	0.5057	0.51	Q	|	|	|	|
34+ 0	0.3920	0.39	Q	|	|	|	|
34+ 5	0.2791	0.28	Q	|	|	|	|
34+10	0.1669	0.17	Q	|	|	|	|
34+15	0.0555	0.06	Q	|	|	|	|

**********HYDROGRAPH DATA**********

Number of intervals = 411
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 5679.977 (CFS)
Total volume = 1920.432 (Ac.Ft)

Status of hydrographs being held in storage

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

****

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

Study date 02/17/22

++

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6360

Marmon Hydrology Analysis
100-Year Event
Basin 200

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
1835.94	1	0.89
Rainfall data for year 2		
1835.94	6	0.92
Rainfall data for year 2		
1835.94	24	1.45

Rainfall data for year 100

```
          1835.94            1           1.79
------------------------------------------------------------------------
Rainfall data for year 100
          1835.94            6           2.82
------------------------------------------------------------------------
Rainfall data for year 100
          1835.94           24           4.61
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 91.0      98.2       1835.94      1.000     0.036    1.000    0.036

Area-averaged adjusted loss rate Fm (In/Hr) =  0.036

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
  1835.94   1.000         91.0      98.2       0.18     0.954

Area-averaged catchment yield fraction, Y =  0.954
Area-averaged low loss fraction, Yb =  0.046
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watercourse length =   29904.06(Ft.)
Length from concentration point to centroid =   14952.03(Ft.)
Elevation difference along watercourse =     740.00(Ft.)
Mannings friction factor along watercourse =  0.040
Watershed area =    1835.94(Ac.)
Catchment Lag time =   1.092 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time =  7.6322
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.036(In/Hr)
Average low loss rate fraction (Yb) = 0.046 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.494(In)
Computed peak 30-minute rainfall =  1.300(In)
Specified peak 1-hour rainfall =  1.790(In)
Computed peak 3-hour rainfall =  2.310(In)
Specified peak 6-hour rainfall =  2.820(In)
Specified peak 24-hour rainfall =  4.610(In)


Note: user specified rainfall values used.
Rainfall depth area reduction factors:
```

Using a total area of 1835.94(Ac.) (Ref: fig. E-4)

5-minute factor = 0.914 Adjusted rainfall = 0.451(In)
30-minute factor = 0.914 Adjusted rainfall = 1.188(In)
1-hour factor = 0.914 Adjusted rainfall = 1.636(In)
3-hour factor = 0.989 Adjusted rainfall = 2.285(In)
6-hour factor = 0.994 Adjusted rainfall = 2.804(In)
24-hour factor = 0.998 Adjusted rainfall = 4.599(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 22203.40 (CFS))	
1	0.661	146.867
2	1.985	293.801
3	3.579	354.067
4	5.651	460.066
5	8.430	616.875
6	11.810	750.445
7	15.454	809.110
8	20.086	1028.641
9	24.980	1086.460
10	30.257	1171.669
11	35.700	1208.540
12	41.195	1220.123
13	46.690	1220.123
14	51.591	1088.120
15	55.618	894.212
16	59.251	806.572
17	62.249	665.733
18	64.740	553.168
19	67.101	524.004
20	69.155	456.095
21	70.835	373.137
22	72.392	345.707
23	73.743	299.889
24	74.945	266.893
25	76.074	250.803
26	77.204	250.803
27	78.266	235.795
28	79.186	204.347
29	80.102	203.354
30	80.997	198.776
31	81.778	173.370
32	82.542	169.461
33	83.302	168.855

34	84.000	154.935
35	84.671	149.126
36	85.343	149.126
37	85.957	136.407
38	86.507	122.026
39	87.057	122.012
40	87.584	117.129
41	88.046	102.635
42	88.504	101.677
43	88.962	101.677
44	89.420	101.677
45	89.878	101.677
46	90.335	101.404
47	90.716	84.547
48	91.051	74.563
49	91.387	74.563
50	91.723	74.563
51	92.059	74.563
52	92.395	74.563
53	92.714	71.015
54	92.966	55.931
55	93.211	54.228
56	93.455	54.228
57	93.699	54.228
58	93.943	54.228
59	94.188	54.225
60	94.424	52.402
61	94.652	50.838
62	94.881	50.838
63	95.110	50.838
64	95.339	50.838
65	95.568	50.838
66	95.790	49.222
67	95.966	39.056
68	96.134	37.282
69	96.302	37.282
70	96.470	37.282
71	96.638	37.282
72	96.805	37.282
73	96.960	34.305
74	97.097	30.516
75	97.235	30.503
76	97.372	30.503
77	97.510	30.503
78	97.647	30.503
79	97.782	29.998
80	97.895	25.002
81	98.002	23.725
82	98.108	23.725
83	98.215	23.725

84	98.322	23.725
85	98.429	23.725
86	98.525	21.362
87	98.602	17.039
88	98.678	16.946
89	98.755	16.946
90	98.831	16.946
91	98.907	16.946
92	98.983	16.946
93	99.060	16.946
94	99.136	16.946
95	99.212	16.946
96	99.289	16.946
97	99.365	16.946
98	99.441	16.946
99	99.518	16.946
100	99.594	16.946
101	99.670	16.946
102	99.747	16.946
103	99.823	16.946
104	99.899	16.946
105	100.000	8.473

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4515	0.4515
2	0.6565	0.2050
3	0.8171	0.1607
4	0.9545	0.1373
5	1.0767	0.1222
6	1.1881	0.1114
7	1.2757	0.0876
8	1.3568	0.0811
9	1.4326	0.0758
10	1.5039	0.0714
11	1.5716	0.0676
12	1.6360	0.0644
13	1.6763	0.0403
14	1.7145	0.0382
15	1.7508	0.0363
16	1.7855	0.0347
17	1.8187	0.0332
18	1.8506	0.0319
19	1.8813	0.0307
20	1.9109	0.0296
21	1.9394	0.0286
22	1.9671	0.0276
23	1.9938	0.0268
24	2.0198	0.0260
25	2.0450	0.0252

26	2.0696	0.0245
27	2.0934	0.0239
28	2.1167	0.0233
29	2.1394	0.0227
30	2.1616	0.0222
31	2.1833	0.0217
32	2.2044	0.0212
33	2.2252	0.0207
34	2.2455	0.0203
35	2.2653	0.0199
36	2.2848	0.0195
37	2.3034	0.0186
38	2.3216	0.0182
39	2.3395	0.0179
40	2.3570	0.0176
41	2.3743	0.0173
42	2.3912	0.0170
43	2.4079	0.0167
44	2.4243	0.0164
45	2.4405	0.0161
46	2.4563	0.0159
47	2.4720	0.0157
48	2.4874	0.0154
49	2.5026	0.0152
50	2.5176	0.0150
51	2.5323	0.0148
52	2.5469	0.0146
53	2.5613	0.0144
54	2.5755	0.0142
55	2.5894	0.0140
56	2.6033	0.0138
57	2.6169	0.0136
58	2.6304	0.0135
59	2.6437	0.0133
60	2.6568	0.0132
61	2.6698	0.0130
62	2.6827	0.0129
63	2.6954	0.0127
64	2.7080	0.0126
65	2.7204	0.0124
66	2.7327	0.0123
67	2.7449	0.0122
68	2.7569	0.0120
69	2.7688	0.0119
70	2.7806	0.0118
71	2.7923	0.0117
72	2.8038	0.0116
73	2.8177	0.0138
74	2.8314	0.0137
75	2.8450	0.0136

76	2.8585	0.0135
77	2.8718	0.0134
78	2.8851	0.0133
79	2.8983	0.0132
80	2.9113	0.0130
81	2.9242	0.0129
82	2.9371	0.0128
83	2.9498	0.0127
84	2.9625	0.0126
85	2.9750	0.0125
86	2.9875	0.0124
87	2.9998	0.0124
88	3.0121	0.0123
89	3.0242	0.0122
90	3.0363	0.0121
91	3.0483	0.0120
92	3.0603	0.0119
93	3.0721	0.0118
94	3.0838	0.0118
95	3.0955	0.0117
96	3.1071	0.0116
97	3.1186	0.0115
98	3.1301	0.0114
99	3.1414	0.0114
100	3.1527	0.0113
101	3.1639	0.0112
102	3.1751	0.0111
103	3.1862	0.0111
104	3.1972	0.0110
105	3.2081	0.0109
106	3.2190	0.0109
107	3.2298	0.0108
108	3.2406	0.0107
109	3.2512	0.0107
110	3.2619	0.0106
111	3.2724	0.0106
112	3.2829	0.0105
113	3.2933	0.0104
114	3.3037	0.0104
115	3.3140	0.0103
116	3.3243	0.0103
117	3.3345	0.0102
118	3.3446	0.0101
119	3.3547	0.0101
120	3.3648	0.0100
121	3.3748	0.0100
122	3.3847	0.0099
123	3.3946	0.0099
124	3.4044	0.0098
125	3.4142	0.0098

126	3.4239	0.0097
127	3.4336	0.0097
128	3.4432	0.0096
129	3.4528	0.0096
130	3.4623	0.0095
131	3.4718	0.0095
132	3.4812	0.0094
133	3.4906	0.0094
134	3.5000	0.0093
135	3.5093	0.0093
136	3.5186	0.0093
137	3.5278	0.0092
138	3.5369	0.0092
139	3.5461	0.0091
140	3.5552	0.0091
141	3.5642	0.0090
142	3.5732	0.0090
143	3.5822	0.0090
144	3.5911	0.0089
145	3.6000	0.0089
146	3.6088	0.0088
147	3.6176	0.0088
148	3.6264	0.0088
149	3.6351	0.0087
150	3.6438	0.0087
151	3.6525	0.0087
152	3.6611	0.0086
153	3.6697	0.0086
154	3.6782	0.0085
155	3.6867	0.0085
156	3.6952	0.0085
157	3.7036	0.0084
158	3.7120	0.0084
159	3.7204	0.0084
160	3.7288	0.0083
161	3.7371	0.0083
162	3.7453	0.0083
163	3.7536	0.0082
164	3.7618	0.0082
165	3.7699	0.0082
166	3.7781	0.0081
167	3.7862	0.0081
168	3.7943	0.0081
169	3.8023	0.0080
170	3.8103	0.0080
171	3.8183	0.0080
172	3.8263	0.0080
173	3.8342	0.0079
174	3.8421	0.0079
175	3.8500	0.0079

176	3.8578	0.0078
177	3.8656	0.0078
178	3.8734	0.0078
179	3.8812	0.0078
180	3.8889	0.0077
181	3.8966	0.0077
182	3.9043	0.0077
183	3.9119	0.0076
184	3.9195	0.0076
185	3.9271	0.0076
186	3.9347	0.0076
187	3.9422	0.0075
188	3.9497	0.0075
189	3.9572	0.0075
190	3.9647	0.0075
191	3.9721	0.0074
192	3.9795	0.0074
193	3.9869	0.0074
194	3.9943	0.0074
195	4.0016	0.0073
196	4.0089	0.0073
197	4.0162	0.0073
198	4.0235	0.0073
199	4.0308	0.0072
200	4.0380	0.0072
201	4.0452	0.0072
202	4.0523	0.0072
203	4.0595	0.0072
204	4.0666	0.0071
205	4.0737	0.0071
206	4.0808	0.0071
207	4.0879	0.0071
208	4.0949	0.0070
209	4.1019	0.0070
210	4.1089	0.0070
211	4.1159	0.0070
212	4.1229	0.0070
213	4.1298	0.0069
214	4.1367	0.0069
215	4.1436	0.0069
216	4.1505	0.0069
217	4.1573	0.0069
218	4.1641	0.0068
219	4.1710	0.0068
220	4.1777	0.0068
221	4.1845	0.0068
222	4.1913	0.0068
223	4.1980	0.0067
224	4.2047	0.0067
225	4.2114	0.0067

226	4.2181	0.0067
227	4.2247	0.0067
228	4.2314	0.0066
229	4.2380	0.0066
230	4.2446	0.0066
231	4.2512	0.0066
232	4.2577	0.0066
233	4.2643	0.0065
234	4.2708	0.0065
235	4.2773	0.0065
236	4.2838	0.0065
237	4.2903	0.0065
238	4.2967	0.0065
239	4.3031	0.0064
240	4.3096	0.0064
241	4.3160	0.0064
242	4.3223	0.0064
243	4.3287	0.0064
244	4.3351	0.0064
245	4.3414	0.0063
246	4.3477	0.0063
247	4.3540	0.0063
248	4.3603	0.0063
249	4.3666	0.0063
250	4.3728	0.0063
251	4.3791	0.0062
252	4.3853	0.0062
253	4.3915	0.0062
254	4.3977	0.0062
255	4.4039	0.0062
256	4.4100	0.0062
257	4.4162	0.0061
258	4.4223	0.0061
259	4.4284	0.0061
260	4.4345	0.0061
261	4.4406	0.0061
262	4.4466	0.0061
263	4.4527	0.0061
264	4.4587	0.0060
265	4.4648	0.0060
266	4.4708	0.0060
267	4.4768	0.0060
268	4.4827	0.0060
269	4.4887	0.0060
270	4.4947	0.0060
271	4.5006	0.0059
272	4.5065	0.0059
273	4.5124	0.0059
274	4.5183	0.0059
275	4.5242	0.0059

276	4.5301	0.0059
277	4.5359	0.0059
278	4.5418	0.0058
279	4.5476	0.0058
280	4.5534	0.0058
281	4.5592	0.0058
282	4.5650	0.0058
283	4.5708	0.0058
284	4.5765	0.0058
285	4.5823	0.0057
286	4.5880	0.0057
287	4.5937	0.0057
288	4.5994	0.0057

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0057	0.0003	0.0054
2	0.0057	0.0003	0.0055
3	0.0057	0.0003	0.0055
4	0.0058	0.0003	0.0055
5	0.0058	0.0003	0.0055
6	0.0058	0.0003	0.0055
7	0.0058	0.0003	0.0056
8	0.0058	0.0003	0.0056
9	0.0059	0.0003	0.0056
10	0.0059	0.0003	0.0056
11	0.0059	0.0003	0.0056
12	0.0059	0.0003	0.0056
13	0.0060	0.0003	0.0057
14	0.0060	0.0003	0.0057
15	0.0060	0.0003	0.0057
16	0.0060	0.0003	0.0057
17	0.0060	0.0003	0.0058
18	0.0061	0.0003	0.0058
19	0.0061	0.0003	0.0058
20	0.0061	0.0003	0.0058
21	0.0061	0.0003	0.0058
22	0.0061	0.0003	0.0059
23	0.0062	0.0003	0.0059
24	0.0062	0.0003	0.0059
25	0.0062	0.0003	0.0059
26	0.0062	0.0003	0.0059
27	0.0063	0.0003	0.0060
28	0.0063	0.0003	0.0060
29	0.0063	0.0003	0.0060
30	0.0063	0.0003	0.0060
31	0.0064	0.0003	0.0061
32	0.0064	0.0003	0.0061

33	0.0064	0.0003	0.0061
34	0.0064	0.0003	0.0061
35	0.0065	0.0003	0.0062
36	0.0065	0.0003	0.0062
37	0.0065	0.0003	0.0062
38	0.0065	0.0003	0.0062
39	0.0066	0.0003	0.0063
40	0.0066	0.0003	0.0063
41	0.0066	0.0003	0.0063
42	0.0067	0.0003	0.0063
43	0.0067	0.0003	0.0064
44	0.0067	0.0003	0.0064
45	0.0068	0.0003	0.0064
46	0.0068	0.0003	0.0065
47	0.0068	0.0003	0.0065
48	0.0068	0.0003	0.0065
49	0.0069	0.0003	0.0066
50	0.0069	0.0003	0.0066
51	0.0069	0.0003	0.0066
52	0.0070	0.0003	0.0066
53	0.0070	0.0003	0.0067
54	0.0070	0.0003	0.0067
55	0.0071	0.0003	0.0067
56	0.0071	0.0003	0.0068
57	0.0071	0.0003	0.0068
58	0.0072	0.0003	0.0068
59	0.0072	0.0003	0.0069
60	0.0072	0.0003	0.0069
61	0.0073	0.0003	0.0069
62	0.0073	0.0003	0.0070
63	0.0073	0.0003	0.0070
64	0.0074	0.0003	0.0070
65	0.0074	0.0003	0.0071
66	0.0074	0.0003	0.0071
67	0.0075	0.0003	0.0071
68	0.0075	0.0003	0.0072
69	0.0076	0.0003	0.0072
70	0.0076	0.0004	0.0072
71	0.0076	0.0004	0.0073
72	0.0077	0.0004	0.0073
73	0.0077	0.0004	0.0074
74	0.0078	0.0004	0.0074
75	0.0078	0.0004	0.0075
76	0.0078	0.0004	0.0075
77	0.0079	0.0004	0.0075
78	0.0079	0.0004	0.0076
79	0.0080	0.0004	0.0076
80	0.0080	0.0004	0.0076
81	0.0081	0.0004	0.0077
82	0.0081	0.0004	0.0077

83	0.0082	0.0004	0.0078
84	0.0082	0.0004	0.0078
85	0.0083	0.0004	0.0079
86	0.0083	0.0004	0.0079
87	0.0084	0.0004	0.0080
88	0.0084	0.0004	0.0080
89	0.0085	0.0004	0.0081
90	0.0085	0.0004	0.0081
91	0.0086	0.0004	0.0082
92	0.0086	0.0004	0.0082
93	0.0087	0.0004	0.0083
94	0.0087	0.0004	0.0083
95	0.0088	0.0004	0.0084
96	0.0088	0.0004	0.0084
97	0.0089	0.0004	0.0085
98	0.0090	0.0004	0.0085
99	0.0090	0.0004	0.0086
100	0.0091	0.0004	0.0087
101	0.0092	0.0004	0.0087
102	0.0092	0.0004	0.0088
103	0.0093	0.0004	0.0089
104	0.0093	0.0004	0.0089
105	0.0094	0.0004	0.0090
106	0.0095	0.0004	0.0090
107	0.0096	0.0004	0.0091
108	0.0096	0.0004	0.0092
109	0.0097	0.0004	0.0093
110	0.0098	0.0005	0.0093
111	0.0099	0.0005	0.0094
112	0.0099	0.0005	0.0095
113	0.0100	0.0005	0.0096
114	0.0101	0.0005	0.0096
115	0.0102	0.0005	0.0097
116	0.0103	0.0005	0.0098
117	0.0104	0.0005	0.0099
118	0.0104	0.0005	0.0100
119	0.0106	0.0005	0.0101
120	0.0106	0.0005	0.0101
121	0.0107	0.0005	0.0102
122	0.0108	0.0005	0.0103
123	0.0109	0.0005	0.0104
124	0.0110	0.0005	0.0105
125	0.0111	0.0005	0.0106
126	0.0112	0.0005	0.0107
127	0.0114	0.0005	0.0108
128	0.0114	0.0005	0.0109
129	0.0116	0.0005	0.0111
130	0.0117	0.0005	0.0111
131	0.0118	0.0005	0.0113
132	0.0119	0.0006	0.0114

133	0.0121	0.0006	0.0115
134	0.0122	0.0006	0.0116
135	0.0124	0.0006	0.0118
136	0.0124	0.0006	0.0119
137	0.0126	0.0006	0.0121
138	0.0127	0.0006	0.0122
139	0.0129	0.0006	0.0123
140	0.0130	0.0006	0.0124
141	0.0133	0.0006	0.0126
142	0.0134	0.0006	0.0128
143	0.0136	0.0006	0.0130
144	0.0137	0.0006	0.0131
145	0.0116	0.0005	0.0110
146	0.0117	0.0005	0.0111
147	0.0119	0.0006	0.0114
148	0.0120	0.0006	0.0115
149	0.0123	0.0006	0.0117
150	0.0124	0.0006	0.0119
151	0.0127	0.0006	0.0121
152	0.0129	0.0006	0.0123
153	0.0132	0.0006	0.0125
154	0.0133	0.0006	0.0127
155	0.0136	0.0006	0.0130
156	0.0138	0.0006	0.0132
157	0.0142	0.0007	0.0135
158	0.0144	0.0007	0.0137
159	0.0148	0.0007	0.0141
160	0.0150	0.0007	0.0143
161	0.0154	0.0007	0.0147
162	0.0157	0.0007	0.0149
163	0.0161	0.0007	0.0154
164	0.0164	0.0008	0.0156
165	0.0170	0.0008	0.0162
166	0.0173	0.0008	0.0165
167	0.0179	0.0008	0.0171
168	0.0182	0.0008	0.0174
169	0.0195	0.0009	0.0186
170	0.0199	0.0009	0.0190
171	0.0207	0.0010	0.0198
172	0.0212	0.0010	0.0202
173	0.0222	0.0010	0.0211
174	0.0227	0.0010	0.0217
175	0.0239	0.0011	0.0228
176	0.0245	0.0011	0.0234
177	0.0260	0.0012	0.0248
178	0.0268	0.0012	0.0255
179	0.0286	0.0013	0.0272
180	0.0296	0.0014	0.0282
181	0.0319	0.0015	0.0304
182	0.0332	0.0015	0.0317

183	0.0363	0.0017	0.0347
184	0.0382	0.0018	0.0364
185	0.0644	0.0030	0.0614
186	0.0676	0.0030	0.0646
187	0.0758	0.0030	0.0728
188	0.0811	0.0030	0.0781
189	0.1114	0.0030	0.1084
190	0.1222	0.0030	0.1193
191	0.1607	0.0030	0.1577
192	0.2050	0.0030	0.2020
193	0.4515	0.0030	0.4485
194	0.1373	0.0030	0.1344
195	0.0876	0.0030	0.0846
196	0.0714	0.0030	0.0684
197	0.0403	0.0019	0.0384
198	0.0347	0.0016	0.0331
199	0.0307	0.0014	0.0293
200	0.0276	0.0013	0.0264
201	0.0252	0.0012	0.0241
202	0.0233	0.0011	0.0222
203	0.0217	0.0010	0.0207
204	0.0203	0.0009	0.0194
205	0.0186	0.0009	0.0177
206	0.0176	0.0008	0.0167
207	0.0167	0.0008	0.0159
208	0.0159	0.0007	0.0152
209	0.0152	0.0007	0.0145
210	0.0146	0.0007	0.0139
211	0.0140	0.0006	0.0133
212	0.0135	0.0006	0.0129
213	0.0130	0.0006	0.0124
214	0.0126	0.0006	0.0120
215	0.0122	0.0006	0.0116
216	0.0118	0.0005	0.0112
217	0.0138	0.0006	0.0132
218	0.0135	0.0006	0.0129
219	0.0132	0.0006	0.0125
220	0.0128	0.0006	0.0122
221	0.0125	0.0006	0.0120
222	0.0123	0.0006	0.0117
223	0.0120	0.0006	0.0114
224	0.0118	0.0005	0.0112
225	0.0115	0.0005	0.0110
226	0.0113	0.0005	0.0108
227	0.0111	0.0005	0.0106
228	0.0109	0.0005	0.0104
229	0.0107	0.0005	0.0102
230	0.0105	0.0005	0.0100
231	0.0103	0.0005	0.0098
232	0.0101	0.0005	0.0097

233	0.0100	0.0005	0.0095
234	0.0098	0.0005	0.0094
235	0.0097	0.0004	0.0092
236	0.0095	0.0004	0.0091
237	0.0094	0.0004	0.0090
238	0.0093	0.0004	0.0088
239	0.0091	0.0004	0.0087
240	0.0090	0.0004	0.0086
241	0.0089	0.0004	0.0085
242	0.0088	0.0004	0.0084
243	0.0087	0.0004	0.0083
244	0.0085	0.0004	0.0082
245	0.0084	0.0004	0.0080
246	0.0083	0.0004	0.0080
247	0.0082	0.0004	0.0079
248	0.0081	0.0004	0.0078
249	0.0080	0.0004	0.0077
250	0.0080	0.0004	0.0076
251	0.0079	0.0004	0.0075
252	0.0078	0.0004	0.0074
253	0.0077	0.0004	0.0073
254	0.0076	0.0004	0.0073
255	0.0075	0.0003	0.0072
256	0.0075	0.0003	0.0071
257	0.0074	0.0003	0.0070
258	0.0073	0.0003	0.0070
259	0.0072	0.0003	0.0069
260	0.0072	0.0003	0.0068
261	0.0071	0.0003	0.0068
262	0.0070	0.0003	0.0067
263	0.0070	0.0003	0.0067
264	0.0069	0.0003	0.0066
265	0.0069	0.0003	0.0065
266	0.0068	0.0003	0.0065
267	0.0067	0.0003	0.0064
268	0.0067	0.0003	0.0064
269	0.0066	0.0003	0.0063
270	0.0066	0.0003	0.0063
271	0.0065	0.0003	0.0062
272	0.0065	0.0003	0.0062
273	0.0064	0.0003	0.0061
274	0.0064	0.0003	0.0061
275	0.0063	0.0003	0.0060
276	0.0063	0.0003	0.0060
277	0.0062	0.0003	0.0059
278	0.0062	0.0003	0.0059
279	0.0061	0.0003	0.0058
280	0.0061	0.0003	0.0058
281	0.0060	0.0003	0.0057
282	0.0060	0.0003	0.0057

283	0.0059	0.0003	0.0057
284	0.0059	0.0003	0.0056
285	0.0059	0.0003	0.0056
286	0.0058	0.0003	0.0055
287	0.0058	0.0003	0.0055
288	0.0057	0.0003	0.0055

Total soil rain loss = 0.17(In)
Total effective rainfall = 4.43(In)
Peak flow rate in flood hydrograph = 1965.26(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

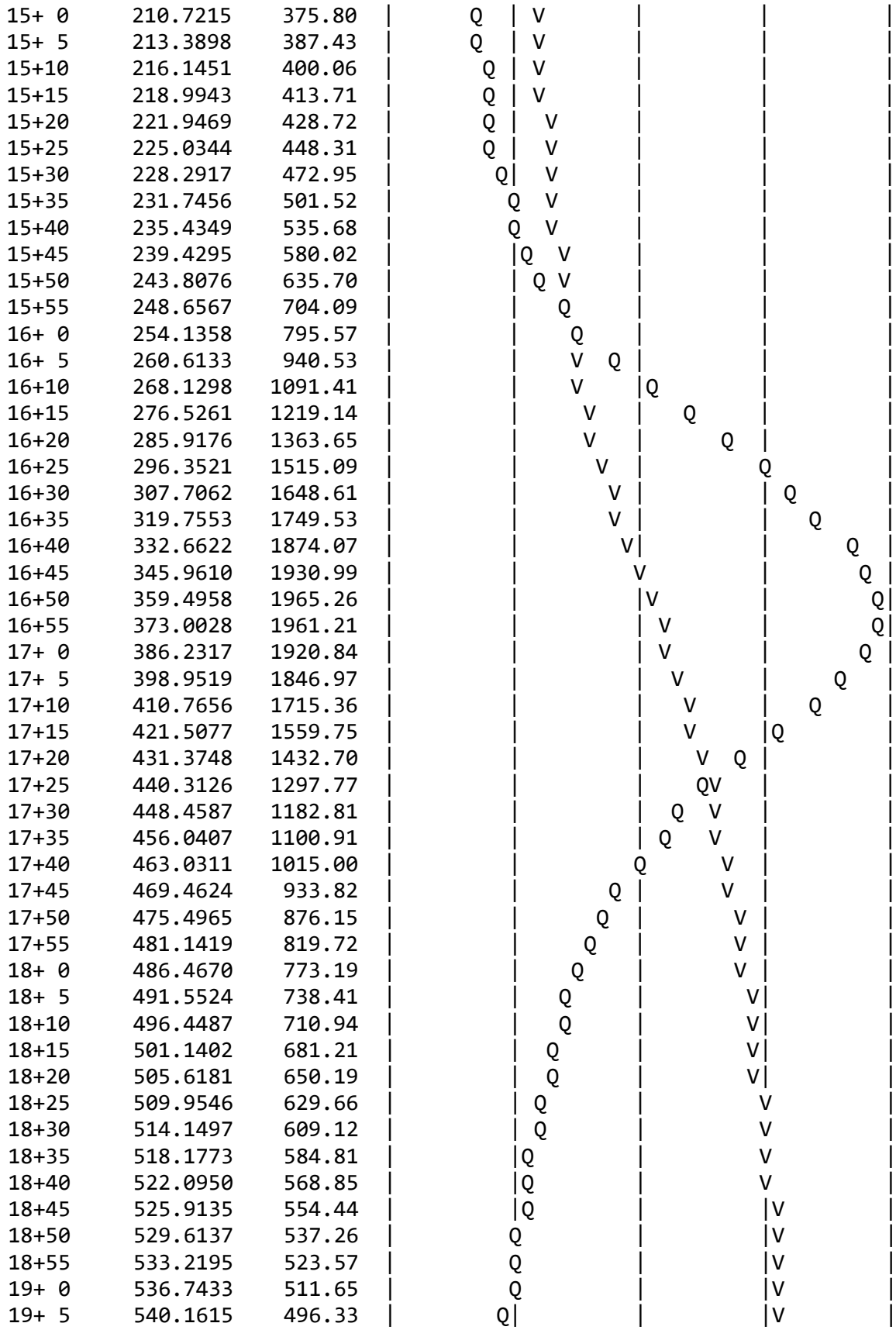
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	500.0	1000.0	1500.0	2000.0
0+ 5	0.0055	0.80	Q				
0+10	0.0220	2.40	Q				
0+15	0.0519	4.34	Q				
0+20	0.0991	6.85	Q				
0+25	0.1696	10.23	Q				
0+30	0.2684	14.35	Q				
0+35	0.3980	18.80	Q				
0+40	0.5665	24.47	Q				
0+45	0.7762	30.46	Q				
0+50	1.0307	36.94	Q				
0+55	1.3312	43.64	Q				
1+ 0	1.6786	50.43	VQ				
1+ 5	2.0728	57.25	VQ				
1+10	2.5092	63.36	VQ				
1+15	2.9806	68.45	VQ				
1+20	3.4839	73.08	VQ				
1+25	4.0139	76.95	VQ				
1+30	4.5664	80.23	VQ				
1+35	5.1405	83.36	VQ				
1+40	5.7338	86.14	VQ				
1+45	6.3431	88.47	VQ				
1+50	6.9675	90.67	VQ				
1+55	7.6054	92.62	VQ				
2+ 0	8.2556	94.41	VQ				
2+ 5	8.9175	96.11	VQ				
2+10	9.5912	97.82	VQ				
2+15	10.2762	99.46	VQ				
2+20	10.9713	100.93	V Q				
2+25	11.6766	102.41	V Q				

2+30	12.3920	103.87	V Q	|	|	|	|
2+35	13.1165	105.20	V Q	|	|	|	|
2+40	13.8500	106.51	V Q	|	|	|	|
2+45	14.5926	107.83	V Q	|	|	|	|
2+50	15.3438	109.07	V Q	|	|	|	|
2+55	16.1034	110.30	V Q	|	|	|	|
3+ 0	16.8715	111.53	V Q	|	|	|	|
3+ 5	17.6476	112.69	|VQ	|	|	|	|
3+10	18.4313	113.79	|VQ	|	|	|	|
3+15	19.2226	114.89	|VQ	|	|	|	|
3+20	20.0213	115.97	|VQ	|	|	|	|
3+25	20.8270	116.98	|VQ	|	|	|	|
3+30	21.6396	118.00	|VQ	|	|	|	|
3+35	22.4592	119.01	|VQ	|	|	|	|
3+40	23.2860	120.04	|VQ	|	|	|	|
3+45	24.1197	121.07	|VQ	|	|	|	|
3+50	24.9607	122.10	|VQ	|	|	|	|
3+55	25.8082	123.05	|VQ	|	|	|	|
4+ 0	26.6619	123.96	|VQ	|	|	|	|
4+ 5	27.5218	124.87	|VQ	|	|	|	|
4+10	28.3881	125.79	|VQ	|	|	|	|
4+15	29.2608	126.71	|VQ	|	|	|	|
4+20	30.1398	127.64	|VQ	|	|	|	|
4+25	31.0252	128.56	|VQ	|	|	|	|
4+30	31.9164	129.40	|VQ	|	|	|	|
4+35	32.8134	130.24	|VQ	|	|	|	|
4+40	33.7162	131.09	|VQ	|	|	|	|
4+45	34.6249	131.94	| Q	|	|	|	|
4+50	35.5395	132.80	| Q	|	|	|	|
4+55	36.4601	133.67	| Q	|	|	|	|
5+ 0	37.3867	134.54	| Q	|	|	|	|
5+ 5	38.3192	135.40	| Q	|	|	|	|
5+10	39.2578	136.28	| Q	|	|	|	|
5+15	40.2024	137.16	| Q	|	|	|	|
5+20	41.1531	138.05	| Q	|	|	|	|
5+25	42.1100	138.94	| Q	|	|	|	|
5+30	43.0731	139.84	| Q	|	|	|	|
5+35	44.0421	140.69	| Q	|	|	|	|
5+40	45.0168	141.54	| Q	|	|	|	|
5+45	45.9975	142.39	| Q	|	|	|	|
5+50	46.9841	143.26	| Q	|	|	|	|
5+55	47.9767	144.13	| Q	|	|	|	|
6+ 0	48.9754	145.01	| Q	|	|	|	|
6+ 5	49.9801	145.88	| Q	|	|	|	|
6+10	50.9908	146.75	| QV	|	|	|	|
6+15	52.0075	147.62	| QV	|	|	|	|
6+20	53.0302	148.50	| QV	|	|	|	|
6+25	54.0591	149.39	| QV	|	|	|	|
6+30	55.0942	150.29	| Q	|	|	|	|
6+35	56.1355	151.20	| Q	|	|	|	|

6+40	57.1830	152.09	Q				
6+45	58.2366	152.99	Q				
6+50	59.2965	153.89	Q				
6+55	60.3626	154.81	Q				
7+ 0	61.4352	155.73	Q				
7+ 5	62.5142	156.67	Q				
7+10	63.5996	157.61	Q				
7+15	64.6914	158.53	Q				
7+20	65.7897	159.47	Q				
7+25	66.8944	160.41	Q				
7+30	68.0058	161.37	QV				
7+35	69.1239	162.34	QV				
7+40	70.2487	163.33	QV				
7+45	71.3805	164.33	QV				
7+50	72.5191	165.34	QV				
7+55	73.6649	166.36	QV				
8+ 0	74.8178	167.40	QV				
8+ 5	75.9779	168.45	QV				
8+10	77.1455	169.52	QV				
8+15	78.3204	170.60	QV				
8+20	79.5030	171.71	QV				
8+25	80.6932	172.82	QV				
8+30	81.8912	173.95	QV				
8+35	83.0971	175.10	QV				
8+40	84.3110	176.26	QV				
8+45	85.5327	177.40	Q V				
8+50	86.7621	178.50	Q V				
8+55	87.9992	179.63	Q V				
9+ 0	89.2442	180.77	Q V				
9+ 5	90.4972	181.94	Q V				
9+10	91.7584	183.12	Q V				
9+15	93.0278	184.32	Q V				
9+20	94.3057	185.55	Q V				
9+25	95.5921	186.79	Q V				
9+30	96.8873	188.06	Q V				
9+35	98.1913	189.35	Q V				
9+40	99.5045	190.66	Q V				
9+45	100.8268	192.00	Q V				
9+50	102.1584	193.36	Q V				
9+55	103.4997	194.75	Q V				
10+ 0	104.8507	196.16	Q V				
10+ 5	106.2116	197.60	Q V				
10+10	107.5826	199.07	Q V				
10+15	108.9639	200.57	Q V				
10+20	110.3557	202.10	Q V				
10+25	111.7583	203.65	Q V				
10+30	113.1718	205.24	Q V				
10+35	114.5964	206.86	Q V				
10+40	116.0325	208.52	Q V				
10+45	117.4803	210.21	Q V				

10+50	118.9399	211.94	| Q V |	|	|	|
10+55	120.4117	213.70	| Q V |	|	|	|
11+ 0	121.8959	215.51	| Q V |	|	|	|
11+ 5	123.3928	217.35	| Q V |	|	|	|
11+10	124.9027	219.24	| Q V |	|	|	|
11+15	126.4258	221.16	| Q V |	|	|	|
11+20	127.9626	223.14	| Q V |	|	|	|
11+25	129.5133	225.16	| Q V |	|	|	|
11+30	131.0783	227.24	| Q V |	|	|	|
11+35	132.6579	229.35	| Q V |	|	|	|
11+40	134.2524	231.53	| Q V |	|	|	|
11+45	135.8623	233.76	| Q V |	|	|	|
11+50	137.4880	236.05	| Q V |	|	|	|
11+55	139.1298	238.39	| Q V |	|	|	|
12+ 0	140.7882	240.80	| Q V |	|	|	|
12+ 5	142.4613	242.93	| Q V |	|	|	|
12+10	144.1473	244.80	| Q V |	|	|	|
12+15	145.8455	246.59	| Q V |	|	|	|
12+20	147.5550	248.21	| Q V |	|	|	|
12+25	149.2736	249.54	| Q V |	|	|	|
12+30	150.9997	250.64	| Q V |	|	|	|
12+35	152.7330	251.66	| Q V|	|	|	|
12+40	154.4704	252.27	| Q V|	|	|	|
12+45	156.2115	252.81	| Q V|	|	|	|
12+50	157.9556	253.25	| Q V|	|	|	|
12+55	159.7027	253.68	| Q V|	|	|	|
13+ 0	161.4532	254.17	| Q V|	|	|	|
13+ 5	163.2077	254.75	| Q V|	|	|	|
13+10	164.9691	255.75	| Q V|	|	|	|
13+15	166.7411	257.29	| Q V|	|	|	|
13+20	168.5260	259.16	| Q V|	|	|	|
13+25	170.3268	261.48	| Q V	|	|	|
13+30	172.1463	264.20	| Q V	|	|	|
13+35	173.9861	267.13	| Q V	|	|	|
13+40	175.8484	270.40	| Q V	|	|	|
13+45	177.7356	274.02	| Q V	|	|	|
13+50	179.6496	277.92	| Q V	|	|	|
13+55	181.5925	282.11	| Q V	|	|	|
14+ 0	183.5665	286.62	| Q V	|	|	|
14+ 5	185.5739	291.47	| Q V	|	|	|
14+10	187.6172	296.69	| Q |V	|	|	|
14+15	189.6988	302.25	| Q |V	|	|	|
14+20	191.8219	308.28	| Q |V	|	|	|
14+25	193.9893	314.72	| Q |V	|	|	|
14+30	196.2046	321.66	| Q |V	|	|	|
14+35	198.4711	329.09	| Q |V	|	|	|
14+40	200.7930	337.15	| Q |V	|	|	|
14+45	203.1742	345.75	| Q | V	|	|	|
14+50	205.6195	355.05	| Q | V	|	|	|
14+55	208.1334	365.02	| Q | V	|	|	|



19+10	543.4779	481.54	| Q|	|	|	| V |
19+15	546.7201	470.77	| Q|	|	|	| V |
19+20	549.8803	458.85	| Q|	|	|	| V |
19+25	552.9465	445.22	| Q |	|	|	| V |
19+30	555.9521	436.41	| Q |	|	|	| V |
19+35	558.9023	428.37	| Q |	|	|	| V |
19+40	561.7971	420.32	| Q |	|	|	| V |
19+45	564.6338	411.89	| Q |	|	|	| V |
19+50	567.4033	402.14	| Q |	|	|	| V |
19+55	570.0747	387.88	| Q |	|	|	| V |
20+ 0	572.6674	376.46	| Q |	|	|	| V |
20+ 5	575.2083	368.94	| Q |	|	|	| V |
20+10	577.7004	361.85	| Q |	|	|	| V |
20+15	580.1464	355.16	| Q |	|	|	| V |
20+20	582.5438	348.10	| Q |	|	|	| V |
20+25	584.8827	339.60	| Q |	|	|	| V |
20+30	587.1455	328.57	| Q |	|	|	| V |
20+35	589.3637	322.08	| Q |	|	|	| V |
20+40	591.5466	316.97	| Q |	|	|	| V |
20+45	593.6976	312.33	| Q |	|	|	| V |
20+50	595.8197	308.12	| Q |	|	|	| V |
20+55	597.9116	303.75	| Q |	|	|	| V |
21+ 0	599.9703	298.92	| Q |	|	|	| V |
21+ 5	601.9971	294.29	| Q |	|	|	| V |
21+10	603.9956	290.18	| Q |	|	|	| V |
21+15	605.9648	285.94	| Q |	|	|	| V |
21+20	607.9043	281.61	| Q |	|	|	| V |
21+25	609.8107	276.81	| Q |	|	|	| V |
21+30	611.6777	271.09	| Q |	|	|	| V |
21+35	613.4912	263.32	| Q |	|	|	| V |
21+40	615.2708	258.40	| Q |	|	|	| V |
21+45	617.0237	254.52	| Q |	|	|	| V |
21+50	618.7511	250.82	| Q |	|	|	| V |
21+55	620.4543	247.30	| Q |	|	|	| V |
22+ 0	622.1314	243.51	| Q |	|	|	| V |
22+ 5	623.7764	238.86	| Q |	|	|	| V |
22+10	625.3895	234.23	| Q |	|	|	| V |
22+15	626.9801	230.95	| Q |	|	|	| V |
22+20	628.5490	227.80	| Q |	|	|	| V |
22+25	630.0967	224.72	| Q |	|	|	| V |
22+30	631.6222	221.50	| Q |	|	|	| V |
22+35	633.1225	217.84	| Q |	|	|	| V |
22+40	634.5900	213.08	| Q |	|	|	| V |
22+45	636.0336	209.61	| Q |	|	|	| V |
22+50	637.4574	206.74	| Q |	|	|	| V |
22+55	638.8618	203.92	| Q |	|	|	| V |
23+ 0	640.2472	201.16	| Q |	|	|	| V |
23+ 5	641.6124	198.23	| Q |	|	|	| V |
23+10	642.9525	194.58	| Q |	|	|	| V |
23+15	644.2655	190.65	| Q |	|	|	| V |

23+20	645.5617	188.21	| Q	|	|	|	V |
23+25	646.8432	186.08	| Q	|	|	|	V |
23+30	648.1112	184.11	| Q	|	|	|	V |
23+35	649.3666	182.29	| Q	|	|	|	V |
23+40	650.6098	180.51	| Q	|	|	|	V |
23+45	651.8410	178.77	| Q	|	|	|	V |
23+50	653.0604	177.05	| Q	|	|	|	V |
23+55	654.2679	175.33	| Q	|	|	|	V |
24+ 0	655.4636	173.62	| Q	|	|	|	V |
24+ 5	656.6407	170.91	| Q	|	|	|	V |
24+10	657.7923	167.20	| Q	|	|	|	V |
24+15	658.9156	163.11	| Q	|	|	|	V |
24+20	660.0063	158.37	| Q	|	|	|	V|
24+25	661.0568	152.53	| Q	|	|	|	V|
24+30	662.0599	145.65	| Q	|	|	|	V|
24+35	663.0109	138.09	| Q	|	|	|	V|
24+40	663.8971	128.68	| Q	|	|	|	V|
24+45	664.6997	116.54	| Q	|	|	|	V|
24+50	665.4199	104.57	| Q	|	|	|	V|
24+55	666.0779	95.54	|Q	|	|	|	V|
25+ 0	666.6776	87.07	|Q	|	|	|	V|
25+ 5	667.2220	79.05	|Q	|	|	|	V|
25+10	667.7186	72.10	|Q	|	|	|	V|
25+15	668.1754	66.32	|Q	|	|	|	V|
25+20	668.5963	61.12	|Q	|	|	|	V|
25+25	668.9872	56.76	|Q	|	|	|	V|
25+30	669.3528	53.08	|Q	|	|	|	V|
25+35	669.6945	49.62	Q	|	|	|	V|
25+40	670.0154	46.58	Q	|	|	|	V|
25+45	670.3187	44.04	Q	|	|	|	V|
25+50	670.6058	41.69	Q	|	|	|	V|
25+55	670.8787	39.62	Q	|	|	|	V|
26+ 0	671.1387	37.76	Q	|	|	|	V|
26+ 5	671.3867	36.01	Q	|	|	|	V|
26+10	671.6229	34.29	Q	|	|	|	V|
26+15	671.8479	32.67	Q	|	|	|	V|
26+20	672.0631	31.25	Q	|	|	|	V|
26+25	672.2687	29.85	Q	|	|	|	V|
26+30	672.4649	28.49	Q	|	|	|	V|
26+35	672.6528	27.29	Q	|	|	|	V|
26+40	672.8327	26.12	Q	|	|	|	V|
26+45	673.0045	24.95	Q	|	|	|	V|
26+50	673.1688	23.85	Q	|	|	|	V|
26+55	673.3258	22.80	Q	|	|	|	V|
27+ 0	673.4757	21.76	Q	|	|	|	V|
27+ 5	673.6189	20.80	Q	|	|	|	V|
27+10	673.7562	19.93	Q	|	|	|	V|
27+15	673.8875	19.07	Q	|	|	|	V|
27+20	674.0132	18.25	Q	|	|	|	V|
27+25	674.1337	17.51	Q	|	|	|	V|

27+30	674.2494	16.79	Q	|	|	|	V|
27+35	674.3601	16.08	Q	|	|	|	V|
27+40	674.4660	15.37	Q	|	|	|	V|
27+45	674.5670	14.67	Q	|	|	|	V|
27+50	674.6633	13.98	Q	|	|	|	V|
27+55	674.7556	13.39	Q	|	|	|	V|
28+ 0	674.8442	12.86	Q	|	|	|	V|
28+ 5	674.9292	12.34	Q	|	|	|	V|
28+10	675.0106	11.82	Q	|	|	|	V|
28+15	675.0885	11.31	Q	|	|	|	V|
28+20	675.1629	10.80	Q	|	|	|	V|
28+25	675.2340	10.32	Q	|	|	|	V|
28+30	675.3023	9.92	Q	|	|	|	V|
28+35	675.3680	9.54	Q	|	|	|	V|
28+40	675.4311	9.16	Q	|	|	|	V|
28+45	675.4917	8.79	Q	|	|	|	V|
28+50	675.5496	8.42	Q	|	|	|	V|
28+55	675.6051	8.05	Q	|	|	|	V|
29+ 0	675.6581	7.70	Q	|	|	|	V|
29+ 5	675.7087	7.36	Q	|	|	|	V|
29+10	675.7571	7.02	Q	|	|	|	V|
29+15	675.8031	6.68	Q	|	|	|	V|
29+20	675.8468	6.35	Q	|	|	|	V|
29+25	675.8883	6.02	Q	|	|	|	V|
29+30	675.9275	5.70	Q	|	|	|	V|
29+35	675.9650	5.44	Q	|	|	|	V|
29+40	676.0008	5.20	Q	|	|	|	V|
29+45	676.0349	4.95	Q	|	|	|	V|
29+50	676.0673	4.71	Q	|	|	|	V|
29+55	676.0981	4.47	Q	|	|	|	V|
30+ 0	676.1272	4.23	Q	|	|	|	V|
30+ 5	676.1549	4.01	Q	|	|	|	V|
30+10	676.1811	3.81	Q	|	|	|	V|
30+15	676.2060	3.62	Q	|	|	|	V|
30+20	676.2296	3.42	Q	|	|	|	V|
30+25	676.2518	3.23	Q	|	|	|	V|
30+30	676.2727	3.04	Q	|	|	|	V|
30+35	676.2924	2.85	Q	|	|	|	V|
30+40	676.3109	2.69	Q	|	|	|	V|
30+45	676.3285	2.54	Q	|	|	|	V|
30+50	676.3450	2.40	Q	|	|	|	V|
30+55	676.3605	2.25	Q	|	|	|	V|
31+ 0	676.3750	2.10	Q	|	|	|	V|
31+ 5	676.3885	1.96	Q	|	|	|	V|
31+10	676.4011	1.83	Q	|	|	|	V|
31+15	676.4129	1.72	Q	|	|	|	V|
31+20	676.4241	1.62	Q	|	|	|	V|
31+25	676.4345	1.51	Q	|	|	|	V|
31+30	676.4442	1.41	Q	|	|	|	V|
31+35	676.4532	1.31	Q	|	|	|	V|

31+40	676.4615	1.21	Q	|	|	|	V|
31+45	676.4691	1.11	Q	|	|	|	V|
31+50	676.4761	1.01	Q	|	|	|	V|
31+55	676.4823	0.91	Q	|	|	|	V|
32+ 0	676.4879	0.81	Q	|	|	|	V|
32+ 5	676.4928	0.71	Q	|	|	|	V|
32+10	676.4970	0.61	Q	|	|	|	V|
32+15	676.5006	0.52	Q	|	|	|	V|
32+20	676.5035	0.42	Q	|	|	|	V|
32+25	676.5057	0.33	Q	|	|	|	V|
32+30	676.5074	0.23	Q	|	|	|	V|
32+35	676.5083	0.14	Q	|	|	|	V|
32+40	676.5086	0.05	Q	|	|	|	V|

APPENDIX D

Hydraulic Results

HEC-RAS Plan: EX_Offsite_Rev2 River: River 1 Reach: Reach 1 Profile: 100-Year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	5870	100-Year	1965.00	2956.38	2959.05	2959.26	2960.18	0.030005	8.51	231.01	151.83	1.22
Reach 1	5632	100-Year	1965.00	2951.00	2954.28	2953.45	2954.56	0.005706	4.25	462.88	248.57	0.55
Reach 1	5455	100-Year	1965.00	2948.87	2951.64	2951.64	2952.46	0.026222	7.15	270.80	169.56	1.11
Reach 1	5367	100-Year	1965.00	2943.27	2944.52	2945.24	2947.72	0.293295	14.36	136.85	226.94	3.26
Reach 1	5311	100-Year	1965.00	2941.90	2943.51	2943.51	2944.07	0.022912	6.02	326.19	294.10	1.01
Reach 1	5225	100-Year	1965.00	2939.33	2941.00	2941.12	2941.70	0.033279	6.73	291.85	294.37	1.19
Reach 1	5142	100-Year	1965.00	2937.08	2938.83	2938.84	2939.43	0.023444	6.26	314.10	272.22	1.03
Reach 1	5057	100-Year	1965.00	2934.54	2936.50	2936.58	2937.29	0.026769	7.14	275.05	215.74	1.12
Reach 1	4981	100-Year	1965.00	2932.58	2934.75	2934.78	2935.49	0.022678	6.87	285.86	209.24	1.04
Reach 1	4881	100-Year	1965.00	2929.71	2932.02	2932.18	2932.95	0.027855	7.70	255.11	184.15	1.15
Reach 1	4796	100-Year	1965.00	2927.00	2929.67	2929.80	2930.51	0.029244	7.34	267.80	215.30	1.16
Reach 1	4669	100-Year	1965.00	2923.34	2925.75	2925.90	2926.56	0.032828	7.21	272.63	246.36	1.21
Reach 1	4553	100-Year	1965.00	2920.63	2922.30	2922.39	2923.04	0.028020	6.91	284.31	242.39	1.13
Reach 1	4413	100-Year	1965.00	2916.30	2918.38	2918.46	2919.08	0.028241	6.70	293.11	262.05	1.12
Reach 1	4258	100-Year	1965.00	2912.23	2914.17	2914.26	2914.84	0.026617	6.56	299.32	265.38	1.09
Reach 1	4144	100-Year	1965.00	2908.83	2910.75	2910.86	2911.41	0.033908	6.51	302.06	325.59	1.19

HEC-RAS Plan: EX_Offsite_Rev2 River: River 1 Reach: Reach 2 Profile: 100-Year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 2	5865	100-Year	5680.00	2962.49	2967.32	2967.91	2969.65	0.030010	12.24	464.06	176.51	1.33
Reach 2	5588	100-Year	5680.00	2953.61	2959.20	2959.72	2961.68	0.022996	12.64	449.49	133.13	1.21
Reach 2	5432	100-Year	5680.00	2946.96	2949.35	2950.85	2954.65	0.107915	18.46	307.74	165.25	2.38
Reach 2	5431.9		Lat Struct									
Reach 2	5324	100-Year	5680.00	2943.79	2947.66	2947.90	2949.30	0.019801	10.50	584.47	240.12	1.09
Reach 2	5236	100-Year	5680.00	2941.00	2944.64	2945.21	2946.86	0.038683	12.45	489.11	217.03	1.47
Reach 2	5151	100-Year	5680.00	2938.96	2942.69	2942.91	2944.20	0.021656	9.99	597.04	260.15	1.12
Reach 2	5053	100-Year	5680.00	2936.96	2939.41	2939.92	2941.38	0.038893	11.25	505.00	262.79	1.43
Reach 2	4970	100-Year	5680.00	2934.32	2937.72	2937.77	2938.96	0.019183	8.95	634.93	273.43	1.03
Reach 2	4870	100-Year	5680.00	2931.60	2934.82	2935.18	2936.47	0.031936	10.31	550.85	282.20	1.30
Reach 2	4779	100-Year	5680.00	2928.98	2932.98	2932.98	2934.17	0.018252	8.74	650.09	279.10	1.01
Reach 2	4652	100-Year	5680.00	2925.62	2929.83	2930.11	2931.31	0.028016	9.75	582.53	292.08	1.22
Reach 2	4627	100-Year	5680.00	2922.20	2925.30	2925.60	2926.77	0.029366	9.71	584.76	306.88	1.24
Reach 2	4461	100-Year	5680.00	2916.08	2919.69	2919.90	2920.93	0.029234	8.91	637.70	381.21	1.21
Reach 2	4203	100-Year	5680.00	2912.89	2916.83	2916.37	2917.45	0.009346	6.36	893.65	376.61	0.73
Reach 2	3859	100-Year	5680.00	2909.01	2912.50	2912.50	2913.53	0.018433	8.14	697.53	338.88	1.00

HEC-RAS Plan: EX_Offsite_Rev2 River: River 1 Reach: Reach 3 Profile: 100-Year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	3806	100-Year	7645.00	2902.02	2905.13	2905.62	2906.81	0.056158	10.37	737.11	576.09	1.62
Reach 3	3716	100-Year	7645.00	2899.28	2902.93	2903.01	2903.91	0.022709	7.94	962.71	569.59	1.08
Reach 3	3610	100-Year	7645.00	2896.02	2899.46	2899.83	2900.94	0.033881	9.73	785.38	462.16	1.32
Reach 3	3521	100-Year	7645.00	2893.38	2896.94	2897.24	2898.39	0.028334	9.67	790.23	410.35	1.23
Reach 3	3427	100-Year	7645.00	2890.84	2894.50	2894.69	2895.87	0.022021	9.39	814.54	366.37	1.11
Reach 3	3319	100-Year	7645.00	2887.92	2891.46	2891.94	2893.28	0.031281	10.82	706.78	334.25	1.31
Reach 3	3227	100-Year	7645.00	2884.76	2889.07	2889.27	2890.65	0.021550	10.09	757.76	300.59	1.12
Reach 3	3151	100-Year	7645.00	2882.68	2887.61	2887.62	2889.20	0.016322	10.13	757.35	255.49	1.01
Reach 3	3064	100-Year	7645.00	2882.00	2884.76	2885.40	2886.96	0.043033	11.88	643.75	335.99	1.51
Reach 3	2941	100-Year	7645.00	2878.64	2882.01	2882.08	2883.38	0.018772	9.39	813.84	324.08	1.05
Reach 3	2619	100-Year	7645.00	2870.02	2872.75	2873.27	2874.55	0.043180	10.75	711.18	432.60	1.48
Reach 3	2348	100-Year	7645.00	2863.49	2866.24	2866.24	2867.25	0.018883	8.05	949.14	478.79	1.01
Reach 3	2068	100-Year	7645.00	2855.24	2858.26	2858.75	2860.13	0.034846	10.98	696.42	349.52	1.37
Reach 3	1786	100-Year	7645.00	2846.58	2850.49	2850.67	2851.70	0.024891	8.81	867.46	470.33	1.14
Reach 3	1498	100-Year	7645.00	2840.46	2842.76	2843.00	2843.92	0.029181	8.66	883.29	554.45	1.21
Reach 3	1202	100-Year	7645.00	2831.13	2833.55	2833.90	2835.08	0.030470	9.91	771.15	407.84	1.27
Reach 3	985	100-Year	7645.00	2823.76	2826.78	2827.18	2828.49	0.029955	10.51	727.63	348.19	1.28
Reach 3	740	100-Year	7645.00	2816.36	2819.43	2819.82	2821.17	0.029749	10.59	721.94	339.66	1.28
Reach 3	493	100-Year	7645.00	2808.88	2812.34	2812.69	2814.01	0.028055	10.35	738.50	344.02	1.25
Reach 3	267	100-Year	7645.00	2802.75	2806.22	2806.52	2807.77	0.026813	9.99	765.22	363.45	1.21