PRELIMINARY DRAINAGE STUDY

FOR

Burrtec Waste Disposal Transfer Station
Town of Yucca Valley
County of San Bernardino

Job No. SDB096900
July 6, 2015

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SHAWNA BENNETTS, P.E., R.C.E. 74638 DATE

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I. INTRODUCTION

A. Purpose of Study

This study is prepared to accompany the site plan for the conditional use permit for the Town of Yucca Valley and proposes to analyze the existing undeveloped onsite hydrologic condition in accordance to the ***San Bernardino County Hydrology Manual*** (August 1986) and Addendum for Arid Regions (April 2010) and The Town of Yucca Valley Master Plan of Drainage. The existing site consists of an area of approximately 40 acres of undeveloped property. The study will address the impact on northwest corner of the property, at Indio Avenue and Sunnyslope Drive. The preliminary design of two proposed required onsite stormwater retention facilities on the north side of the property are analyzed in this study as well.

B. Scope

This study involves the hydrologic analyses of approximately 10 acres of onsite watershed that will impact Indio Avenue and Sunnyslope Drive. This study will also determine onsite runoff coming on to the existing property.

This site is currently bounded by two unimproved roads – Indio Avenue to the west and Sunnyslope Drive to the north. Unimproved Miramar Road is to the south, is approximately 600 feet from the south of the site. Approximately 700 feet to the east of the site lies Skypark Drive.

Offsite drainage analysis is limited by available topographic information. There is a developed area to the south that is assumed as the high point, but this area was excluded from that analysis. The existing undeveloped peak runoff values for the 100-year, 1 hour storm frequency have been determined using the Rational Method. The existing onsite runoff volume has been calculated using the Unit Hydrograph Method for the 100-year, 24 hour storm. These values are then compared with the onsite proposed runoff and volume values.

II. SITE AREA

A. Area Characteristics

The subject property (APN's 0601-551-09, 10 & 11) is located on the southeast corner of the intersection at Indio Avenue and Sunnyside Drive, in a portion of Township 1 North, Range 6 East, Section 32, San Bernardino Meridian, Town of Yucca Valley, in the State of California.

The site drains from south to north in the existing conditions with elevated areas on the east and west sides of the site. The gradual slope ranges from 3% to 5%. The existing

condition is barren and undeveloped. No soil data is readily available at this time.

B. Soils Group

According to the ***County of San Bernardino Hydrology Manual Addendum for Arid Regions*** (April 2010) (Addendum), the soil group information contained in Section C of the Hydrology Manual (1986) has been updated and now is accessed at http://websoilsurvey.sc.egov.usda.gov/app/webSoilSurvey.aspx. However, not all data is available for the entire county. The project site has no digital data available on Web Soil Survey. A site specific soils study is recommended for final design. In this preliminary report, hydrologic soil type B was used for calculations based on the 1986 ***San Bernardino County Hydrology Manual***.

C. Land Use

Per the Yucca Valley General Plan (February 2014), the Land Use Zoning classification for this study is Industrial Development.

D. Flood Insurance Rate Maps (FIRM)

The site is located in an unshaded Zone X on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), (San Bernardino County, California and incorporated areas), Map Number 06071C8120H dated August 28, 2008. A Zone X is designation as areas determined to be outside of the 0.2% annual chance floodplain. It should be noted that Covington Wash (Zone A) is approximately 500 feet to the east of the project site. The FIRM map for this project is located in Appendix I.

E. Drainage Master Plan

The Town of Yucca Valley has a Master Plan of Drainage (1999) that provides guidelines for orderly development of flood control facilities and adequate flood protection of property. Covington Wash is west of the site and drains to the northeast. Hydrologic soil types and rainfall data was obtained from the ***County of San Bernardino Hydrology Manual*** (1986).

III. HYDROLOGIC METHODOLOGY

A. Site Characteristics

Existing conditions include one drainage area that flows from south to north. This drainage basin was divided into 2 areas: offsite area (17.2 acres) and onsite area (10.5 acres). It should be noted that the offsite area (17.2 acres) was divided due to ***County of San Bernardino Hydrology Manual*** requirements that the initial subarea should be less than 10 acres. The offsite area is then collected in a proposed drainage swale and directed into proposed debris basin and diverted around the site.

Proposed conditions include two retention basins, one on the east and one on the west. There are 4 drainage basins for the proposed site, A through D. For routing purposes, Basin A drains to the West Basin while basins B, C and D drain to East Basin.

Per the County of San Bernardino Hydrology Manual Addendum for Arid Regions, studies need to consider all available rainfall data by identifying rain gages located near or in the vicinity of the study area and need to obtain and review the relevant rainfall data. Such additional rainfall information includes:
NOAA (http://www.nws.noaa.gov/)
CA-DWR (http://cdec.water.ca.gov/)
CIMIS (http://wwwcimis.water.ca.gov/cimis/welcome.jsp)
Gage data available from San Bernardino County
NOAA Atlas 14 was used to generate precipitation frequency estimates for the project site.
The following sources were reviewed and disregarded for the following reasons:

- CA-DWR data is limited to 2 years. As basin design criteria is set at the 100 year event, this data was data is irrelevant.
- CIMIS has a rain gauge station east of Joshua Tree, which is over 10 miles from the project site.
- Local San Bernardino County Yucca Valley rain gauge station data is not accessible online.

B. Rational Method

The materials included with this study are presented to satisfy the requirements set forth in the ***San Bernardino County Hydrology Manual*** and Town of Yucca Valley Master Plan of Drainage (MP). The MP defines criteria specific drainage courses that exceed 300 cfs. All other drainage courses are considered local facilities. For the flood control facilities (retention basins), a Manning's n of 0.025 was used. A design storm of 100-year was selected for generation of peak flows. All pre- and post-development watershed basin runoff values were generated by using the Rational Method. Applicable input and output files for this method can be found in the Appendix II of this report.

C. Synthetic Unit Hydrograph Method

The Synthetic Unit Hydrograph method was used to generate peak 100-year, 24 hour flow values (worst case scenario). The Synthetic Unit Hydrograph results are used to determine the total volume of watershed runoff for the existing and proposed conditions. The rainfall charts that were used to compute the Unit Hydrograph Method are located in Appendix I of this report.

The total volumes from existing and proposed were compared and presented in the results below.

C. Storm Frequency

Per ***San Bernardino County Hydrology Manual*** and Town of Yucca Valley Master Plan of Drainage criteria, the 100-year, 1-hour, and 24- hour storm frequencies were used to calculate peak flows using the Unit Hydrograph Method. The precipitation frequency estimates obtained from the NOAA Atlas 14 are 1.78 and 4.19 inches, respectively.

IV. HYDROLOGIC AND HYDRAULIC RESULTS

Under future development, onsite retention shall be designed to hold the incremental increase in storm volume plus 20% for the build out of the subject property, according to the Town of Yucca Valley Draft Conditional Use Permit. The findings of the geotechnical report could be used to compute the side walls and bottom areas of the retention basin(s). Percolation should be taken in account for additional storage volume to maximize the efficiency of the future onsite retention basin(s).

A. Rational Method – Existing Undeveloped Offsite and Onsite Conditions

Table 1 below illustrates the 100-year, 1-hour existing peak discharge values at the downstream points (See Figure 6). Detailed hydrologic calculations can be found in Appendix II of this report. It shall be noted that the upstream limits of this hydrologic analysis was based on available topographic information and aerial analysis.

TABLE 1
EXISTING UNDEVELOPED PEAK FLOW RATES

Basin	Area (acres)	100-year (cfs) 1-hour Peak Flow
Existing Offsite	17.2	49.2
Existing Onsite	10.5	22.9
Total	**27.7**	**72.1**

B. Rational Method – Proposed Developed Onsite Conditions

Table 2 below illustrates the 100-year, 1-hour offsite peak discharge values at the discharge points on the site. (Figure 7) Detailed hydrologic calculations can be found in Appendix II of this report.

Final conditions for this project include a debris basin to intercept the offsite flow. The interim condition includes a concept of this basin with a general hydrologic boundary to illustrate offsite flows.

TABLE 2
PROPOSED DEVELOPED ONSITE PEAK FLOW RATES

Basin	Area (acres)	100-year (cfs) 1-hour Peak Flow
East Basins	6.69	37.5
West Basin	3.39	19.6
Total	**10.1**	

C. Synthetic Unit Hydrograph Method

The results of the Rational Method peak flow rates are shown on Table 1 and Table 2. The total volume for the existing and proposed onsite runoff can be found in Table 3 below. A detailed hydrologic calculation can be found in the Appendix II of this report.

TABLE 3
ONSITE VOLUME RESULTS

Basin	Unit Hydrograph Total Volume (ac-ft)
Existing Onsite	2.57
East Basins	2.18
West Basin	1.11
Total Retention Needed	**0.86**

V. SUMMARY

A. Recommendations

The following recommendations have been provided to facilitate safety, both public and private, for the Subject Property:

1. Flow must be directed to and intercepted by the east retention basin. An additional catch basin and pipe is needed for the area draining the north parking area. The east access road will also need to be directed to the east retention basin. On the west, a drainage facility will be necessary to route the flow into that basin.

2. The retention basins will need an overflow weir or freeboard. If full retention of the 100-year 24-hour storm is required, the basins will need to be expanded.

B. Conclusions

The site is configured to meet the requirements of the Town of Yucca Valley Conditions of Approval. Per Town of Yucca Valley Conditions of Approval, the total volume to be retained on the site shall be the incremental 100-year 24-hr plus 20%. The difference has been calculated to be 0.86 acre-feet (37,462 cf). In the proposed conditions,

approximately two-thirds of the site drains to the north east. The incremental increase should be divided so that roughly two-thirds is directed of the flow to the east retention basin. That would be approximately a basin volume of 24,840 cf; the current basin configuration shown in the figures may need to be slightly expanded. The remaining volume (12,625 cf) can be captured in the small retention basin on the east side of the site.

C. References

1. *CivilDesign Engineering Software*, Rational Method Hydrology System Model, © 1989-2001, Version 6.4.

2. CivilDesign Engineering *Software*, Unit Hydrograph System Model, © 1989-2002, Version 6.1.

3. County of San Bernardino, *Hydrology Manual,* ©August 1986.

APPENDICES

Appendix I

1. **VICINITY MAP**
2. **FLOOD INSURANCE RATE MAP (FIRM)**
3. **HYDROLOGIC SOILS MAP**
4. **PRECIPITATION DATA**
5. **EXISTING SITE DRAINAGE MAP**
6. **PROPOSED SITE DRAINAGE MAP**

Appendix II

- **CIVILD RATIONAL METHOD EXISTING UNDEVELOPED ONSITE ANALYSIS**
- **CIVILD UNIT HYDROGRAPH METHOD EXISTING UNDEVELOPED ONSITE ANALYSIS**

APPENDIX I

Figures

1. VICINITY MAP
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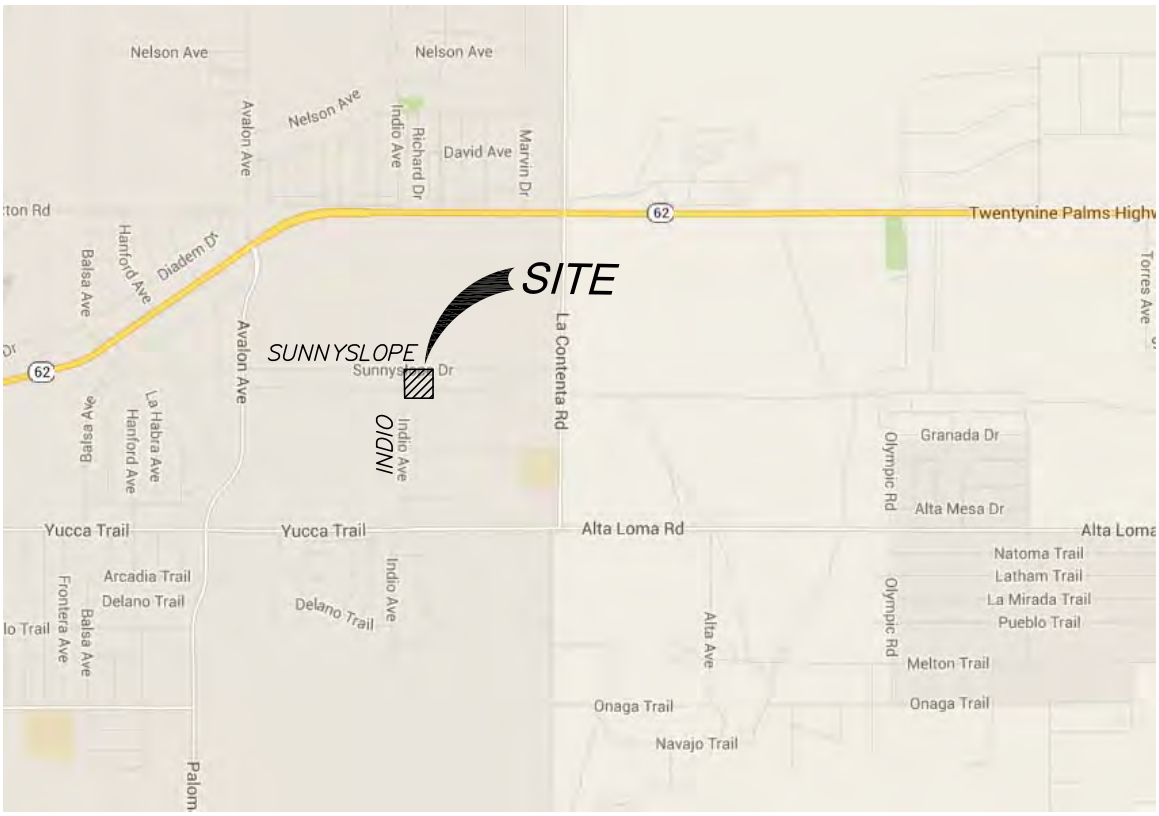
6. PROPOSED SITE DRAINAGE MAP



VICINITY MAP

NV5
BEYOND ENGINEERING

42-829 COOK STREET, SUITE 104
760.341.3101 TEL 760.3415999 FAX

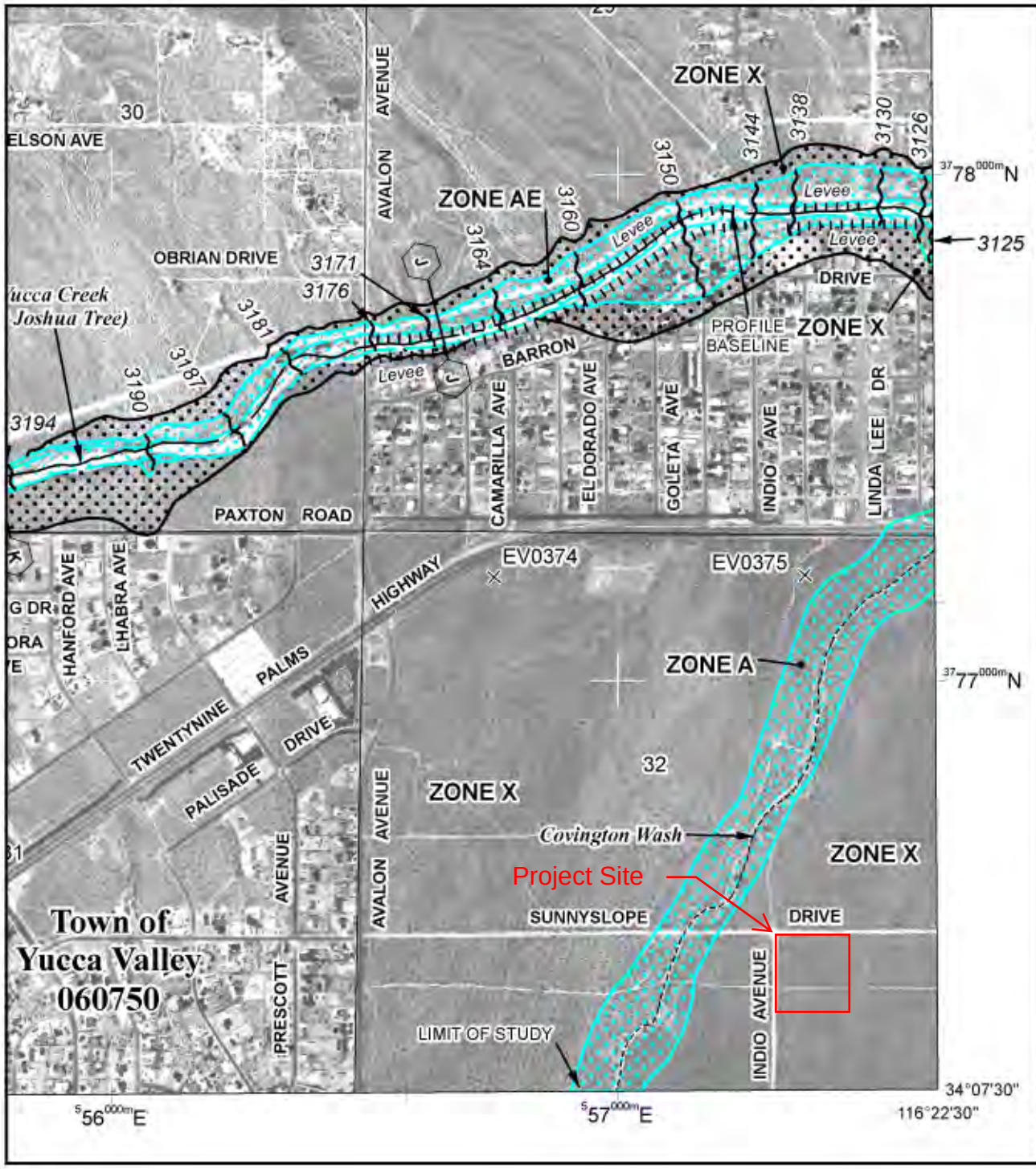
PALM DESERT, CA 92211
WWW.NV5.COM

YUCCA VALLEY WASTE
WASTE TRANSFER FACILITY

PREPARED FOR: BURRTEC

DATE SUBMITTED: 2-Jul-15

JOB NUMBER
SDB096900



ional Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

00 0 1000 2000 FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 8120H

FIRM

FLOOD INSURANCE RATE MAP

SAN BERNARDINO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 8120 OF 9400

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

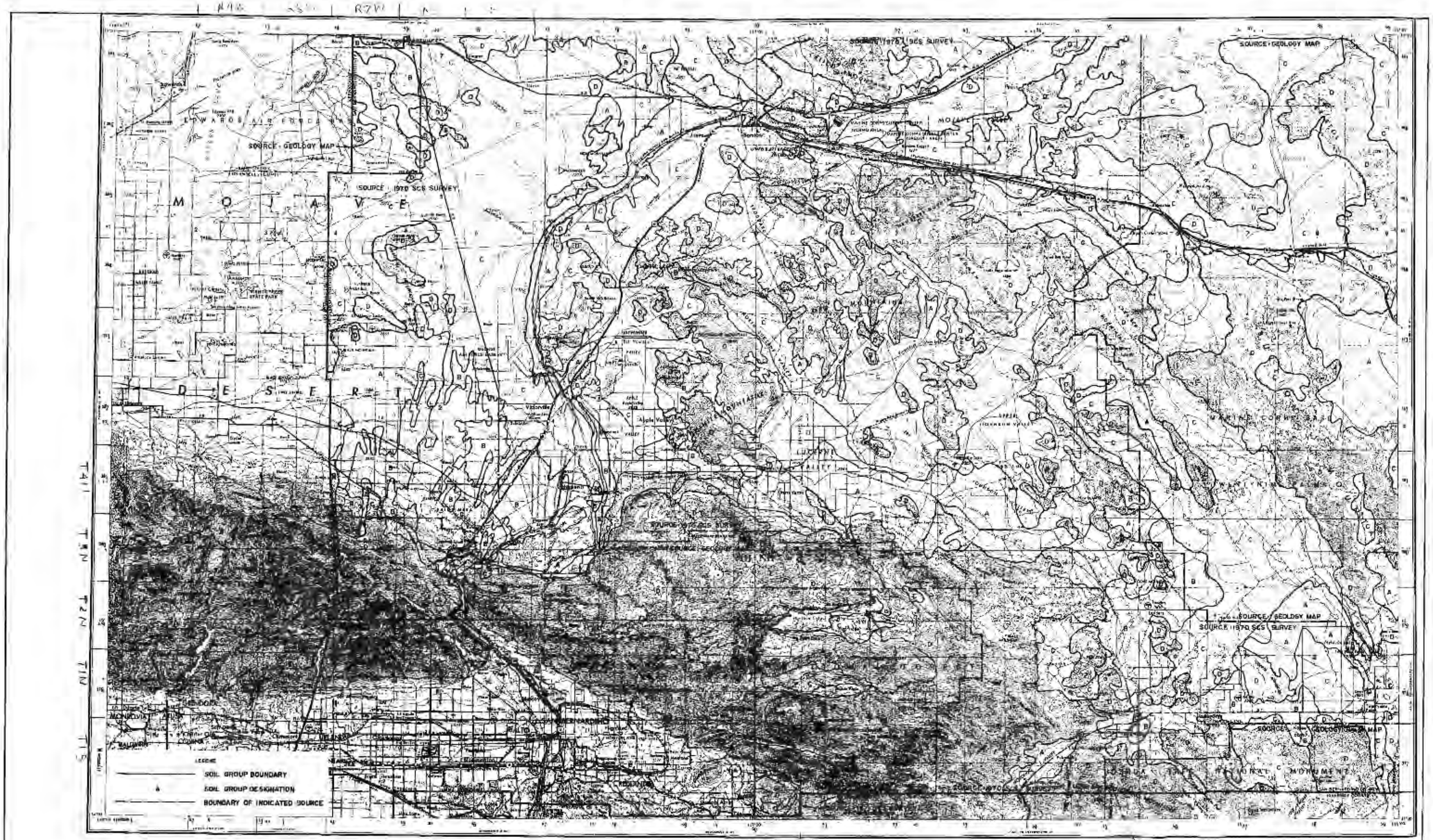
COMMUNITY	NUMBER	PANEL	SUFFIX
SAN BERNARDINO COUNTY	060270	8120	H
YUCCA VALLEY, TOWN OF	060750	8120	H

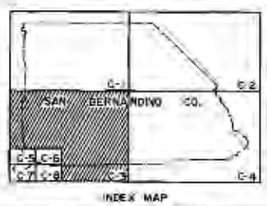
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06071C8120H

MAP REVISED
AUGUST 28, 2008

Federal Emergency Management Agency





Scale 1:250,000

CONTOUR INTERVAL 100 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS
TRANSVERSE MERCATOR PROJECTION

BASE MAP REPRODUCED FROM U.S.G.S. "SAN BERNARDINO" TOPOGRAPHIC MAP

SCALE REDUCED BY 1/2

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHCENTRAL AREA

FIGURE C-11

NOAA Atlas 14, Volume 6, Version 2
Location name: Yucca Valley, California, US*
Latitude: 34.1266°, Longitude: -116.3777°
Elevation: 3254 ft*
* source: Google Maps

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	0.080 (0.066–0.097)	0.118 (0.098–0.145)	0.178 (0.147–0.218)	0.233 (0.190–0.287)	0.320 (0.253–0.408)	0.398 (0.308–0.518)	0.487 (0.369–0.650)	0.592 (0.435–0.812)	0.833 (0.588–1.19)	1.12 (0.766–1.66)
10-min	0.114 (0.094–0.139)	0.170 (0.140–0.207)	0.255 (0.210–0.312)	0.334 (0.273–0.412)	0.459 (0.363–0.585)	0.570 (0.442–0.743)	0.698 (0.528–0.932)	0.848 (0.624–1.16)	1.19 (0.843–1.71)	1.61 (1.10–2.38)
15-min	0.138 (0.114–0.168)	0.205 (0.170–0.251)	0.308 (0.254–0.377)	0.404 (0.330–0.498)	0.555 (0.439–0.708)	0.689 (0.534–0.898)	0.844 (0.639–1.13)	1.03 (0.755–1.41)	1.44 (1.02–2.07)	1.95 (1.33–2.88)
30-min	0.211 (0.175–0.257)	0.314 (0.259–0.383)	0.470 (0.388–0.576)	0.616 (0.504–0.761)	0.847 (0.671–1.08)	1.05 (0.816–1.37)	1.29 (0.976–1.72)	1.57 (1.15–2.15)	2.21 (1.56–3.15)	2.97 (2.03–4.40)
60-min	0.291 (0.241–0.356)	0.434 (0.359–0.530)	0.650 (0.536–0.797)	0.852 (0.697–1.05)	1.17 (0.927–1.50)	1.46 (1.13–1.90)	1.78 (1.35–2.38)	2.17 (1.59–2.97)	3.05 (2.15–4.36)	4.11 (2.81–6.09)
2-hr	0.407 (0.337–0.497)	0.575 (0.476–0.702)	0.821 (0.677–1.01)	1.04 (0.854–1.29)	1.38 (1.09–1.76)	1.67 (1.30–2.18)	1.99 (1.51–2.66)	2.36 (1.74–3.24)	3.08 (2.18–4.41)	4.15 (2.83–6.15)
3-hr	0.483 (0.400–0.589)	0.670 (0.554–0.819)	0.940 (0.776–1.15)	1.18 (0.966–1.46)	1.54 (1.22–1.96)	1.84 (1.43–2.40)	2.18 (1.65–2.91)	2.55 (1.88–3.50)	3.10 (2.19–4.44)	4.19 (2.86–6.21)
6-hr	0.627 (0.519–0.765)	0.857 (0.709–1.05)	1.18 (0.975–1.45)	1.46 (1.20–1.81)	1.88 (1.49–2.39)	2.22 (1.72–2.89)	2.58 (1.95–3.45)	2.98 (2.20–4.10)	3.57 (2.52–5.10)	4.24 (2.89–6.27)
12-hr	0.766 (0.634–0.934)	1.05 (0.871–1.29)	1.46 (1.20–1.78)	1.81 (1.48–2.23)	2.32 (1.83–2.95)	2.73 (2.12–3.56)	3.19 (2.41–4.25)	3.68 (2.71–5.05)	4.39 (3.10–6.28)	4.98 (3.40–7.37)
24-hr	0.943 (0.836–1.09)	1.32 (1.17–1.52)	1.85 (1.63–2.14)	2.32 (2.03–2.70)	3.00 (2.54–3.61)	3.57 (2.97–4.39)	4.19 (3.40–5.27)	4.87 (3.84–6.30)	5.87 (4.45–7.90)	6.71 (4.91–9.34)
2-day	1.02 (0.905–1.18)	1.46 (1.29–1.68)	2.08 (1.83–2.40)	2.62 (2.29–3.05)	3.42 (2.90–4.12)	4.09 (3.40–5.03)	4.82 (3.91–6.07)	5.63 (4.44–7.28)	6.81 (5.16–9.17)	7.81 (5.72–10.9)
3-day	1.10 (0.973–1.26)	1.59 (1.40–1.83)	2.28 (2.01–2.64)	2.89 (2.53–3.37)	3.80 (3.22–4.57)	4.56 (3.78–5.60)	5.38 (4.36–6.77)	6.30 (4.97–8.14)	7.64 (5.79–10.3)	8.77 (6.43–12.2)
4-day	1.14 (1.01–1.32)	1.67 (1.48–1.92)	2.42 (2.13–2.80)	3.08 (2.69–3.59)	4.05 (3.44–4.88)	4.87 (4.04–5.98)	5.76 (4.67–7.25)	6.75 (5.33–8.73)	8.21 (6.22–11.1)	9.43 (6.91–13.1)
7-day	1.26 (1.11–1.45)	1.87 (1.65–2.15)	2.74 (2.42–3.17)	3.52 (3.08–4.10)	4.66 (3.95–5.61)	5.63 (4.67–6.91)	6.68 (5.42–8.41)	7.85 (6.19–10.1)	9.57 (7.25–12.9)	11.0 (8.08–15.4)
10-day	1.34 (1.19–1.54)	2.01 (1.78–2.31)	2.97 (2.62–3.43)	3.82 (3.34–4.45)	5.08 (4.30–6.11)	6.14 (5.10–7.54)	7.29 (5.91–9.17)	8.57 (6.76–11.1)	10.5 (7.93–14.1)	12.1 (8.83–16.8)
20-day	1.52 (1.35–1.75)	2.30 (2.03–2.65)	3.40 (3.00–3.94)	4.38 (3.83–5.10)	5.82 (4.94–7.01)	7.03 (5.84–8.64)	8.35 (6.77–10.5)	9.80 (7.73–12.7)	11.9 (9.03–16.1)	13.7 (10.0–19.1)
30-day	1.69 (1.50–1.95)	2.55 (2.26–2.94)	3.78 (3.34–4.38)	4.87 (4.26–5.67)	6.47 (5.48–7.79)	7.80 (6.48–9.58)	9.24 (7.49–11.6)	10.8 (8.54–14.0)	13.1 (9.94–17.7)	15.0 (11.0–20.9)
45-day	1.97 (1.75–2.27)	2.94 (2.61–3.40)	4.33 (3.82–5.01)	5.55 (4.86–6.47)	7.34 (6.22–8.83)	8.82 (7.32–10.8)	10.4 (8.45–13.1)	12.2 (9.59–15.7)	14.7 (11.1–19.8)	16.8 (12.3–23.3)
60-day	2.25 (1.99–2.59)	3.33 (2.95–3.84)	4.87 (4.30–5.63)	6.21 (5.44–7.24)	8.17 (6.93–9.84)	9.79 (8.13–12.0)	11.5 (9.35–14.5)	13.4 (10.6–17.4)	16.1 (12.2–21.7)	18.4 (13.4–25.6)

[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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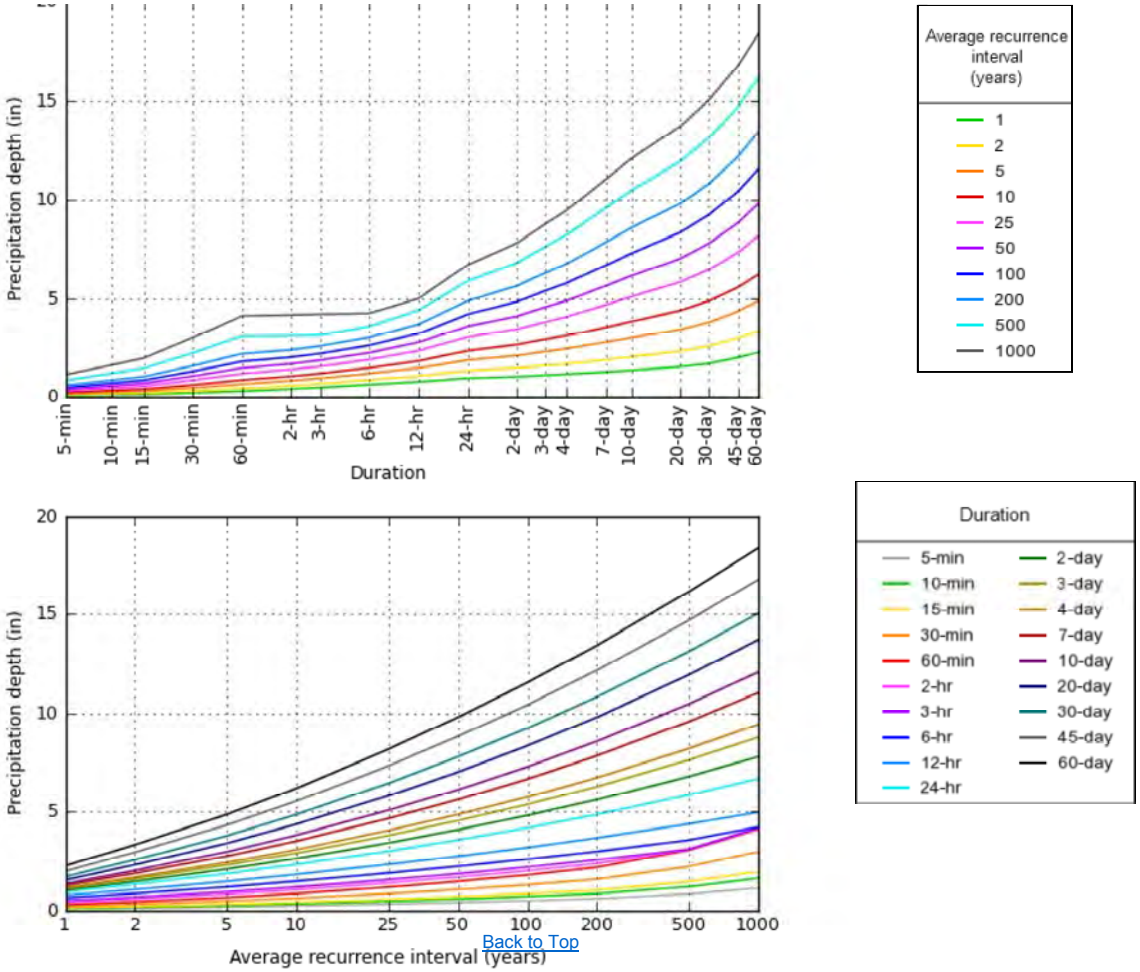
PF graphical



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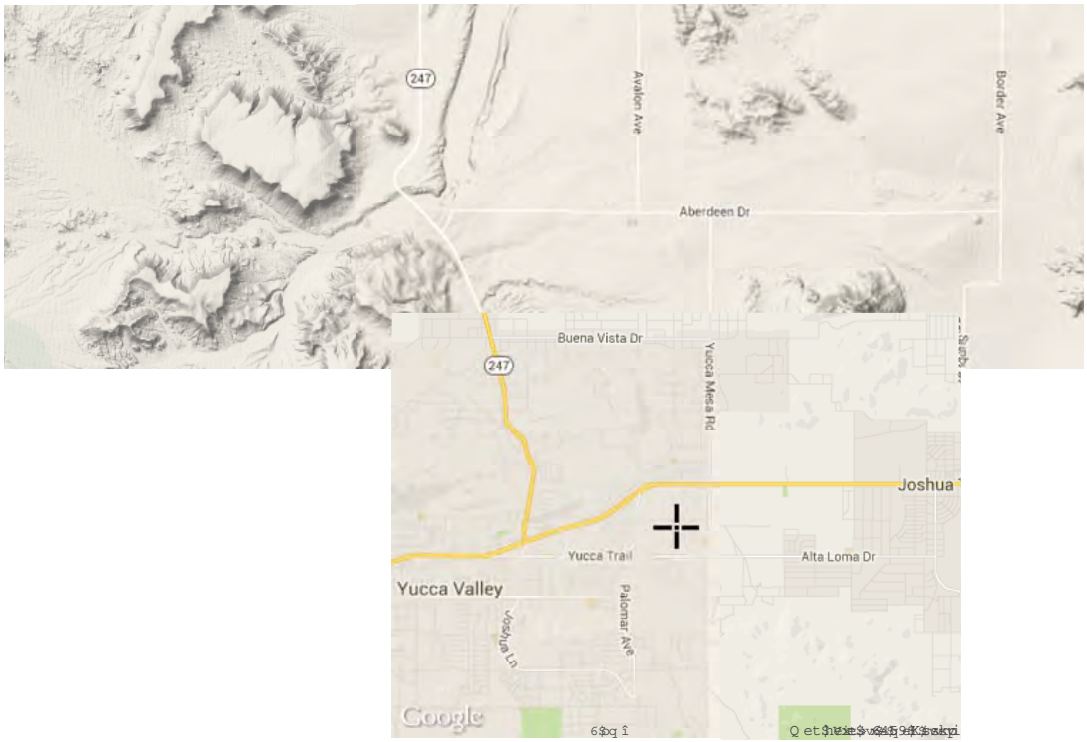
Maps & aerials

NOAA Atlas 14, Volume 6, Version 2

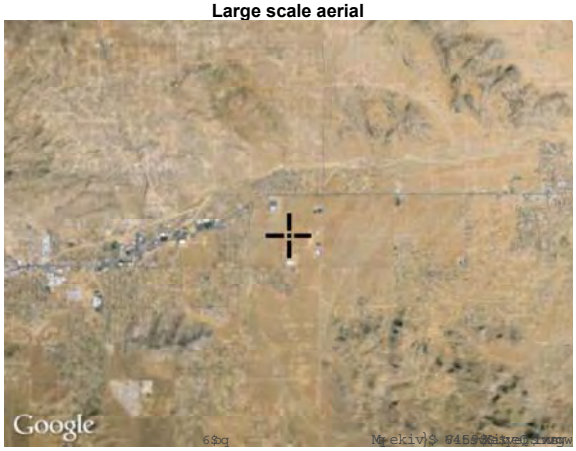
Created (GMT): Wed Jul 1 20:44:25 2015

Small scale terrain

Large scale terrain



Large scale aerial



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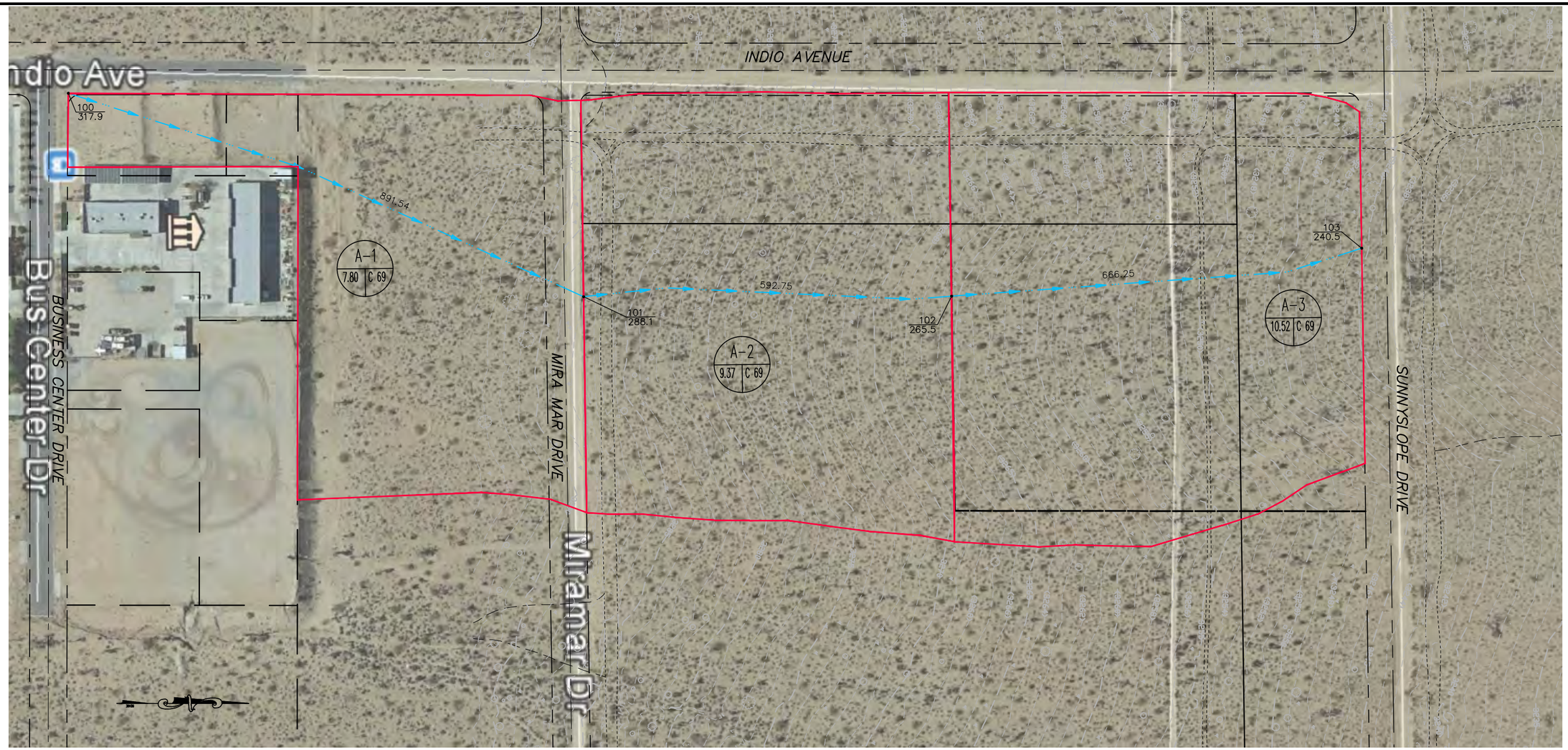
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Office of Hydrologic Development
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer



LEGEND

BASIN LIMITS

FLOW LINE

FLOW PATH LENGTH 399.2

NODE ELEVATION 103 / 48.0

RATIONAL METHOD NODE — XX (BASIN NUMBER); XXX | C XX (AREA IN ACRES | CURVE NUMBER)

N:\SDB096900\Cadd\H&H\Ex_Hydro.dwg Layout: Layout1 Jul 06, 2015 - 11:56am

REVISIONS					
MARK	DATE	INITIAL	DESCRIPTION	DATE	APP'VD

THIS PLAN PREPARED BY
NOLTE VERTICAL FIVE
42-829 COOK STREET, SUITE 104, PALM DESERT, CA 92211
760.341.3101 TEL 760.341.5999 FAX WWW.NV5.COM

GRAPHIC SCALE
0' 40' 80' 120' 160' 240' 320'
SCALE 1"= 80'

TOWN OF YUCCA VALLEY

BURRTEC WASTE & RECYCLING SERVICES

YUCCA VALLEY WASTE TRANSFER FACILITY
EXISTING SITE DRAINAGE MAP

SHEET FIG 5

DRAWING NO. SDB096900

SUNNYSLOPE DRIVE

INDIO AVENUE

DESILTING BASIN

D-1 | 0.23 | C 56

D-2 | 1.59 | C 56

A-1 | 0.14 | C 100

A-2 | 0.14 | C 100

A-3 | 3.11 | C 56

B-1 | 0.18 | C 100

B-2 | 0.19 | C 100

B-3 | 3.38 | C 56

C-1 | 0.08 | C 56

C-2 | 0.19 | C 100

C-3 | 0.85 | C 56

LEGEND

BASIN LIMITS

FLOW LINE

FLOW PATH LENGTH 399.2

NODE ELEVATION 103 / 48.0

RATIONAL METHOD NODE — XX (BASIN NUMBER); X.XX (AREA IN ACRES) | C XX (CURVE NUMBER)

N: \SDB096900\Cadd\H&H\Prop_Hydro.dwg Layout: Layout1 Jul 06, 2015 - 12:03pm

REVISIONS					
MARK	DATE	INITIAL	DESCRIPTION	DATE	APP'VD

THIS PLAN PREPARED BY
NOLTE VERTICAL FIVE
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NV5 NOLTE VERTICAL FIVE

GRAPHIC SCALE
0' 20' 40' 60' 80' 120' 160'
SCALE 1"= 40'

TOWN OF YUCCA VALLEY

BURRTEC WASTE & RECYCLING SERVICES

YUCCA VALLEY WASTE TRANSFER FACILITY
PROPOSED SITE DRAINAGE MAP

SHEET
FIG 6

DRAWING NO.
SDB096900

APPENDIX II

- **CIVILDESIGN RATIONAL METHOD ANALYSIS**
- **CIVILDESIGN UNIT HYDROGRAPH METHOD ANALYSIS**

CIVILDESIGN RATIONAL METHOD EXISTING ANALYSIS

CIVILDESIGN RATIONAL METHOD PROPOSED ANALYSIS

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

Study date 07/02/15

++

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

Program License Serial Number 6296

BURRTEC EXISTING CONDITIONS
100-YEAR, 24-HOUR

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 100		
10.00	1	1.78
Rainfall data for year 100		
10.00	6	2.58
Rainfall data for year 100		
10.00	24	4.19

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
69.0	86.2	10.00	1.000	0.262	1.000	0.262

Area-averaged adjusted loss rate Fm (In/Hr) = 0.262

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
10.00	1.000	69.0	86.2	1.60	0.653

Area-averaged catchment yield fraction, Y = 0.653
Area-averaged low loss fraction, Yb = 0.347
User entry of time of concentration = 0.306 (hours)
++
Watershed area = 10.00(Ac.)
Catchment Lag time = 0.245 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 34.0804
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.262(In/Hr)
Average low loss rate fraction (Yb) = 0.347 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.487(In)
Computed peak 30-minute rainfall = 1.290(In)
Specified peak 1-hour rainfall = 1.780(In)
Computed peak 3-hour rainfall = 2.180(In)
Specified peak 6-hour rainfall = 2.580(In)
Specified peak 24-hour rainfall = 4.190(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 10.00(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.487(In)
30-minute factor = 1.000 Adjusted rainfall = 1.289(In)
1-hour factor = 1.000 Adjusted rainfall = 1.779(In)
3-hour factor = 1.000 Adjusted rainfall = 2.180(In)
6-hour factor = 1.000 Adjusted rainfall = 2.580(In)
24-hour factor = 1.000 Adjusted rainfall = 4.190(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 = 120.94 (CFS))	
1	2.143	2.592
2	12.543	12.578
3	39.219	32.261
4	58.759	23.630
5	69.203	12.632
6	76.138	8.387
7	81.076	5.972
8	84.815	4.521
9	87.860	3.683
10	90.111	2.722
11	91.967	2.244
12	93.533	1.894
13	94.784	1.513
14	95.857	1.297
15	96.734	1.061
16	97.408	0.816
17	97.921	0.619
18	98.269	0.422
19	98.666	0.479
20	99.075	0.495

21	99.463	0.469
22	99.705	0.292
23	100.000	0.146

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4868	0.4868
2	0.7096	0.2228
3	0.8846	0.1750
4	1.0343	0.1498
5	1.1677	0.1334
6	1.2894	0.1217
7	1.3851	0.0957
8	1.4737	0.0886
9	1.5566	0.0829
10	1.6347	0.0781
11	1.7087	0.0740
12	1.7792	0.0705
13	1.8057	0.0265
14	1.8306	0.0249
15	1.8541	0.0235
16	1.8764	0.0223
17	1.8975	0.0212
18	1.9177	0.0202
19	1.9369	0.0193
20	1.9554	0.0185
21	1.9731	0.0177
22	1.9902	0.0170
23	2.0066	0.0164
24	2.0224	0.0159
25	2.0378	0.0153
26	2.0526	0.0148
27	2.0670	0.0144
28	2.0809	0.0139
29	2.0944	0.0135
30	2.1076	0.0132
31	2.1204	0.0128
32	2.1329	0.0125
33	2.1451	0.0122
34	2.1570	0.0119
35	2.1685	0.0116
36	2.1799	0.0113
37	2.1944	0.0146
38	2.2087	0.0143
39	2.2227	0.0140
40	2.2364	0.0137
41	2.2499	0.0135
42	2.2631	0.0132
43	2.2761	0.0130
44	2.2888	0.0128
45	2.3014	0.0125
46	2.3137	0.0123
47	2.3258	0.0121
48	2.3378	0.0119
49	2.3495	0.0117
50	2.3611	0.0116
51	2.3725	0.0114
52	2.3837	0.0112
53	2.3948	0.0111
54	2.4057	0.0109
55	2.4164	0.0108
56	2.4270	0.0106
57	2.4375	0.0105

58	2.4478	0.0103
59	2.4580	0.0102
60	2.4681	0.0101
61	2.4780	0.0099
62	2.4878	0.0098
63	2.4975	0.0097
64	2.5071	0.0096
65	2.5166	0.0095
66	2.5259	0.0094
67	2.5352	0.0093
68	2.5443	0.0091
69	2.5534	0.0090
70	2.5623	0.0089
71	2.5712	0.0089
72	2.5799	0.0088
73	2.5924	0.0125
74	2.6048	0.0124
75	2.6170	0.0123
76	2.6292	0.0122
77	2.6412	0.0120
78	2.6532	0.0119
79	2.6650	0.0118
80	2.6768	0.0118
81	2.6884	0.0117
82	2.7000	0.0116
83	2.7115	0.0115
84	2.7229	0.0114
85	2.7341	0.0113
86	2.7454	0.0112
87	2.7565	0.0111
88	2.7675	0.0110
89	2.7785	0.0110
90	2.7894	0.0109
91	2.8002	0.0108
92	2.8109	0.0107
93	2.8215	0.0107
94	2.8321	0.0106
95	2.8426	0.0105
96	2.8531	0.0104
97	2.8634	0.0104
98	2.8737	0.0103
99	2.8839	0.0102
100	2.8941	0.0102
101	2.9042	0.0101
102	2.9142	0.0100
103	2.9242	0.0100
104	2.9341	0.0099
105	2.9439	0.0098
106	2.9537	0.0098
107	2.9634	0.0097
108	2.9731	0.0097
109	2.9827	0.0096
110	2.9922	0.0095
111	3.0017	0.0095
112	3.0111	0.0094
113	3.0205	0.0094
114	3.0298	0.0093
115	3.0391	0.0093
116	3.0483	0.0092
117	3.0575	0.0092
118	3.0666	0.0091
119	3.0757	0.0091
120	3.0847	0.0090

121	3.0936	0.0090
122	3.1026	0.0089
123	3.1114	0.0089
124	3.1203	0.0088
125	3.1290	0.0088
126	3.1378	0.0087
127	3.1465	0.0087
128	3.1551	0.0086
129	3.1637	0.0086
130	3.1723	0.0086
131	3.1808	0.0085
132	3.1893	0.0085
133	3.1977	0.0084
134	3.2061	0.0084
135	3.2144	0.0083
136	3.2227	0.0083
137	3.2310	0.0083
138	3.2392	0.0082
139	3.2474	0.0082
140	3.2556	0.0082
141	3.2637	0.0081
142	3.2718	0.0081
143	3.2798	0.0080
144	3.2878	0.0080
145	3.2958	0.0080
146	3.3037	0.0079
147	3.3116	0.0079
148	3.3195	0.0079
149	3.3273	0.0078
150	3.3351	0.0078
151	3.3429	0.0078
152	3.3506	0.0077
153	3.3583	0.0077
154	3.3659	0.0077
155	3.3736	0.0076
156	3.3812	0.0076
157	3.3887	0.0076
158	3.3963	0.0075
159	3.4038	0.0075
160	3.4112	0.0075
161	3.4187	0.0074
162	3.4261	0.0074
163	3.4335	0.0074
164	3.4408	0.0074
165	3.4482	0.0073
166	3.4555	0.0073
167	3.4627	0.0073
168	3.4700	0.0072
169	3.4772	0.0072
170	3.4844	0.0072
171	3.4915	0.0072
172	3.4986	0.0071
173	3.5057	0.0071
174	3.5128	0.0071
175	3.5199	0.0070
176	3.5269	0.0070
177	3.5339	0.0070
178	3.5409	0.0070
179	3.5478	0.0069
180	3.5547	0.0069
181	3.5616	0.0069
182	3.5685	0.0069
183	3.5753	0.0068

184	3.5822	0.0068
185	3.5890	0.0068
186	3.5957	0.0068
187	3.6025	0.0068
188	3.6092	0.0067
189	3.6159	0.0067
190	3.6226	0.0067
191	3.6293	0.0067
192	3.6359	0.0066
193	3.6425	0.0066
194	3.6491	0.0066
195	3.6557	0.0066
196	3.6622	0.0065
197	3.6687	0.0065
198	3.6752	0.0065
199	3.6817	0.0065
200	3.6882	0.0065
201	3.6946	0.0064
202	3.7010	0.0064
203	3.7074	0.0064
204	3.7138	0.0064
205	3.7202	0.0064
206	3.7265	0.0063
207	3.7328	0.0063
208	3.7391	0.0063
209	3.7454	0.0063
210	3.7517	0.0063
211	3.7579	0.0062
212	3.7641	0.0062
213	3.7703	0.0062
214	3.7765	0.0062
215	3.7827	0.0062
216	3.7888	0.0061
217	3.7950	0.0061
218	3.8011	0.0061
219	3.8072	0.0061
220	3.8132	0.0061
221	3.8193	0.0061
222	3.8253	0.0060
223	3.8313	0.0060
224	3.8373	0.0060
225	3.8433	0.0060
226	3.8493	0.0060
227	3.8552	0.0059
228	3.8612	0.0059
229	3.8671	0.0059
230	3.8730	0.0059
231	3.8789	0.0059
232	3.8847	0.0059
233	3.8906	0.0058
234	3.8964	0.0058
235	3.9022	0.0058
236	3.9080	0.0058
237	3.9138	0.0058
238	3.9196	0.0058
239	3.9253	0.0058
240	3.9311	0.0057
241	3.9368	0.0057
242	3.9425	0.0057
243	3.9482	0.0057
244	3.9539	0.0057
245	3.9595	0.0057
246	3.9652	0.0056

247	3.9708	0.0056
248	3.9764	0.0056
249	3.9820	0.0056
250	3.9876	0.0056
251	3.9932	0.0056
252	3.9987	0.0056
253	4.0043	0.0055
254	4.0098	0.0055
255	4.0153	0.0055
256	4.0208	0.0055
257	4.0263	0.0055
258	4.0318	0.0055
259	4.0372	0.0055
260	4.0427	0.0054
261	4.0481	0.0054
262	4.0535	0.0054
263	4.0589	0.0054
264	4.0643	0.0054
265	4.0697	0.0054
266	4.0751	0.0054
267	4.0804	0.0054
268	4.0858	0.0053
269	4.0911	0.0053
270	4.0964	0.0053
271	4.1017	0.0053
272	4.1070	0.0053
273	4.1123	0.0053
274	4.1175	0.0053
275	4.1228	0.0053
276	4.1280	0.0052
277	4.1333	0.0052
278	4.1385	0.0052
279	4.1437	0.0052
280	4.1489	0.0052
281	4.1540	0.0052
282	4.1592	0.0052
283	4.1644	0.0052
284	4.1695	0.0051
285	4.1746	0.0051
286	4.1797	0.0051
287	4.1849	0.0051
288	4.1899	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0018	0.0033
2	0.0051	0.0018	0.0033
3	0.0051	0.0018	0.0034
4	0.0051	0.0018	0.0034
5	0.0052	0.0018	0.0034
6	0.0052	0.0018	0.0034
7	0.0052	0.0018	0.0034
8	0.0052	0.0018	0.0034
9	0.0052	0.0018	0.0034
10	0.0053	0.0018	0.0034
11	0.0053	0.0018	0.0034
12	0.0053	0.0018	0.0035
13	0.0053	0.0018	0.0035
14	0.0053	0.0018	0.0035
15	0.0054	0.0019	0.0035
16	0.0054	0.0019	0.0035

17	0.0054	0.0019	0.0035
18	0.0054	0.0019	0.0035
19	0.0054	0.0019	0.0035
20	0.0054	0.0019	0.0036
21	0.0055	0.0019	0.0036
22	0.0055	0.0019	0.0036
23	0.0055	0.0019	0.0036
24	0.0055	0.0019	0.0036
25	0.0056	0.0019	0.0036
26	0.0056	0.0019	0.0036
27	0.0056	0.0019	0.0037
28	0.0056	0.0019	0.0037
29	0.0056	0.0020	0.0037
30	0.0057	0.0020	0.0037
31	0.0057	0.0020	0.0037
32	0.0057	0.0020	0.0037
33	0.0057	0.0020	0.0037
34	0.0058	0.0020	0.0038
35	0.0058	0.0020	0.0038
36	0.0058	0.0020	0.0038
37	0.0058	0.0020	0.0038
38	0.0058	0.0020	0.0038
39	0.0059	0.0020	0.0038
40	0.0059	0.0020	0.0039
41	0.0059	0.0021	0.0039
42	0.0059	0.0021	0.0039
43	0.0060	0.0021	0.0039
44	0.0060	0.0021	0.0039
45	0.0060	0.0021	0.0039
46	0.0061	0.0021	0.0040
47	0.0061	0.0021	0.0040
48	0.0061	0.0021	0.0040
49	0.0061	0.0021	0.0040
50	0.0062	0.0021	0.0040
51	0.0062	0.0021	0.0041
52	0.0062	0.0022	0.0041
53	0.0063	0.0022	0.0041
54	0.0063	0.0022	0.0041
55	0.0063	0.0022	0.0041
56	0.0063	0.0022	0.0041
57	0.0064	0.0022	0.0042
58	0.0064	0.0022	0.0042
59	0.0064	0.0022	0.0042
60	0.0065	0.0022	0.0042
61	0.0065	0.0023	0.0042
62	0.0065	0.0023	0.0043
63	0.0066	0.0023	0.0043
64	0.0066	0.0023	0.0043
65	0.0066	0.0023	0.0043
66	0.0067	0.0023	0.0043
67	0.0067	0.0023	0.0044
68	0.0067	0.0023	0.0044
69	0.0068	0.0023	0.0044
70	0.0068	0.0024	0.0044
71	0.0068	0.0024	0.0045
72	0.0069	0.0024	0.0045
73	0.0069	0.0024	0.0045
74	0.0069	0.0024	0.0045
75	0.0070	0.0024	0.0046
76	0.0070	0.0024	0.0046
77	0.0071	0.0025	0.0046
78	0.0071	0.0025	0.0046
79	0.0072	0.0025	0.0047

80	0.0072	0.0025	0.0047
81	0.0072	0.0025	0.0047
82	0.0073	0.0025	0.0047
83	0.0073	0.0025	0.0048
84	0.0074	0.0025	0.0048
85	0.0074	0.0026	0.0048
86	0.0074	0.0026	0.0049
87	0.0075	0.0026	0.0049
88	0.0075	0.0026	0.0049
89	0.0076	0.0026	0.0050
90	0.0076	0.0026	0.0050
91	0.0077	0.0027	0.0050
92	0.0077	0.0027	0.0050
93	0.0078	0.0027	0.0051
94	0.0078	0.0027	0.0051
95	0.0079	0.0027	0.0052
96	0.0079	0.0028	0.0052
97	0.0080	0.0028	0.0052
98	0.0080	0.0028	0.0053
99	0.0081	0.0028	0.0053
100	0.0082	0.0028	0.0053
101	0.0082	0.0029	0.0054
102	0.0083	0.0029	0.0054
103	0.0083	0.0029	0.0055
104	0.0084	0.0029	0.0055
105	0.0085	0.0029	0.0055
106	0.0085	0.0030	0.0056
107	0.0086	0.0030	0.0056
108	0.0086	0.0030	0.0056
109	0.0087	0.0030	0.0057
110	0.0088	0.0030	0.0057
111	0.0089	0.0031	0.0058
112	0.0089	0.0031	0.0058
113	0.0090	0.0031	0.0059
114	0.0091	0.0031	0.0059
115	0.0092	0.0032	0.0060
116	0.0092	0.0032	0.0060
117	0.0093	0.0032	0.0061
118	0.0094	0.0033	0.0061
119	0.0095	0.0033	0.0062
120	0.0095	0.0033	0.0062
121	0.0097	0.0033	0.0063
122	0.0097	0.0034	0.0063
123	0.0098	0.0034	0.0064
124	0.0099	0.0034	0.0065
125	0.0100	0.0035	0.0066
126	0.0101	0.0035	0.0066
127	0.0102	0.0035	0.0067
128	0.0103	0.0036	0.0067
129	0.0104	0.0036	0.0068
130	0.0105	0.0036	0.0069
131	0.0107	0.0037	0.0070
132	0.0107	0.0037	0.0070
133	0.0109	0.0038	0.0071
134	0.0110	0.0038	0.0072
135	0.0111	0.0039	0.0073
136	0.0112	0.0039	0.0073
137	0.0114	0.0039	0.0074
138	0.0115	0.0040	0.0075
139	0.0117	0.0040	0.0076
140	0.0118	0.0041	0.0077
141	0.0119	0.0041	0.0078
142	0.0120	0.0042	0.0079

143	0.0123	0.0043	0.0080
144	0.0124	0.0043	0.0081
145	0.0088	0.0030	0.0057
146	0.0089	0.0031	0.0058
147	0.0090	0.0031	0.0059
148	0.0091	0.0032	0.0060
149	0.0094	0.0032	0.0061
150	0.0095	0.0033	0.0062
151	0.0097	0.0034	0.0063
152	0.0098	0.0034	0.0064
153	0.0101	0.0035	0.0066
154	0.0102	0.0035	0.0067
155	0.0105	0.0036	0.0068
156	0.0106	0.0037	0.0069
157	0.0109	0.0038	0.0071
158	0.0111	0.0038	0.0072
159	0.0114	0.0039	0.0074
160	0.0116	0.0040	0.0076
161	0.0119	0.0041	0.0078
162	0.0121	0.0042	0.0079
163	0.0125	0.0043	0.0082
164	0.0128	0.0044	0.0083
165	0.0132	0.0046	0.0086
166	0.0135	0.0047	0.0088
167	0.0140	0.0049	0.0091
168	0.0143	0.0049	0.0093
169	0.0113	0.0039	0.0074
170	0.0116	0.0040	0.0076
171	0.0122	0.0042	0.0080
172	0.0125	0.0043	0.0082
173	0.0132	0.0046	0.0086
174	0.0135	0.0047	0.0088
175	0.0144	0.0050	0.0094
176	0.0148	0.0051	0.0097
177	0.0159	0.0055	0.0104
178	0.0164	0.0057	0.0107
179	0.0177	0.0061	0.0116
180	0.0185	0.0064	0.0121
181	0.0202	0.0070	0.0132
182	0.0212	0.0073	0.0138
183	0.0235	0.0081	0.0154
184	0.0249	0.0086	0.0163
185	0.0705	0.0218	0.0487
186	0.0740	0.0218	0.0522
187	0.0829	0.0218	0.0611
188	0.0886	0.0218	0.0668
189	0.1217	0.0218	0.0999
190	0.1334	0.0218	0.1116
191	0.1750	0.0218	0.1532
192	0.2228	0.0218	0.2010
193	0.4868	0.0218	0.4650
194	0.1498	0.0218	0.1280
195	0.0957	0.0218	0.0739
196	0.0781	0.0218	0.0563
197	0.0265	0.0092	0.0173
198	0.0223	0.0077	0.0145
199	0.0193	0.0067	0.0126
200	0.0170	0.0059	0.0111
201	0.0153	0.0053	0.0100
202	0.0139	0.0048	0.0091
203	0.0128	0.0044	0.0084
204	0.0119	0.0041	0.0078
205	0.0146	0.0051	0.0095

206	0.0137	0.0048	0.0090
207	0.0130	0.0045	0.0085
208	0.0123	0.0043	0.0081
209	0.0117	0.0041	0.0077
210	0.0112	0.0039	0.0073
211	0.0108	0.0037	0.0070
212	0.0103	0.0036	0.0067
213	0.0099	0.0034	0.0065
214	0.0096	0.0033	0.0063
215	0.0093	0.0032	0.0060
216	0.0089	0.0031	0.0058
217	0.0125	0.0043	0.0082
218	0.0122	0.0042	0.0079
219	0.0118	0.0041	0.0077
220	0.0116	0.0040	0.0076
221	0.0113	0.0039	0.0074
222	0.0110	0.0038	0.0072
223	0.0108	0.0037	0.0071
224	0.0106	0.0037	0.0069
225	0.0104	0.0036	0.0068
226	0.0102	0.0035	0.0066
227	0.0100	0.0035	0.0065
228	0.0098	0.0034	0.0064
229	0.0096	0.0033	0.0063
230	0.0094	0.0033	0.0062
231	0.0093	0.0032	0.0061
232	0.0091	0.0032	0.0060
233	0.0090	0.0031	0.0059
234	0.0088	0.0031	0.0058
235	0.0087	0.0030	0.0057
236	0.0086	0.0030	0.0056
237	0.0084	0.0029	0.0055
238	0.0083	0.0029	0.0054
239	0.0082	0.0028	0.0054
240	0.0081	0.0028	0.0053
241	0.0080	0.0028	0.0052
242	0.0079	0.0027	0.0051
243	0.0078	0.0027	0.0051
244	0.0077	0.0027	0.0050
245	0.0076	0.0026	0.0049
246	0.0075	0.0026	0.0049
247	0.0074	0.0026	0.0048
248	0.0073	0.0025	0.0048
249	0.0072	0.0025	0.0047
250	0.0071	0.0025	0.0047
251	0.0070	0.0024	0.0046
252	0.0070	0.0024	0.0046
253	0.0069	0.0024	0.0045
254	0.0068	0.0024	0.0045
255	0.0068	0.0023	0.0044
256	0.0067	0.0023	0.0044
257	0.0066	0.0023	0.0043
258	0.0065	0.0023	0.0043
259	0.0065	0.0022	0.0042
260	0.0064	0.0022	0.0042
261	0.0064	0.0022	0.0042
262	0.0063	0.0022	0.0041
263	0.0062	0.0022	0.0041
264	0.0062	0.0021	0.0040
265	0.0061	0.0021	0.0040
266	0.0061	0.0021	0.0040
267	0.0060	0.0021	0.0039
268	0.0060	0.0021	0.0039

269	0.0059	0.0021	0.0039
270	0.0059	0.0020	0.0038
271	0.0058	0.0020	0.0038
272	0.0058	0.0020	0.0038
273	0.0057	0.0020	0.0037
274	0.0057	0.0020	0.0037
275	0.0056	0.0020	0.0037
276	0.0056	0.0019	0.0036
277	0.0055	0.0019	0.0036
278	0.0055	0.0019	0.0036
279	0.0055	0.0019	0.0036
280	0.0054	0.0019	0.0035
281	0.0054	0.0019	0.0035
282	0.0053	0.0019	0.0035
283	0.0053	0.0018	0.0035
284	0.0053	0.0018	0.0034
285	0.0052	0.0018	0.0034
286	0.0052	0.0018	0.0034
287	0.0052	0.0018	0.0034
288	0.0051	0.0018	0.0033

Total soil rain loss = 1.10(In)
Total effective rainfall = 3.09(In)
Peak flow rate in flood hydrograph = 25.92(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	7.5	15.0	22.5	30.0
0+ 5	0.0001	0.01 Q					
0+10	0.0004	0.05 Q					
0+15	0.0015	0.16 Q					
0+20	0.0031	0.24 Q					
0+25	0.0051	0.28 Q					
0+30	0.0072	0.31 Q					
0+35	0.0095	0.33 Q					
0+40	0.0118	0.35 Q					
0+45	0.0143	0.36 Q					
0+50	0.0169	0.37 Q					
0+55	0.0195	0.38 Q					
1+ 0	0.0221	0.39 Q					
1+ 5	0.0248	0.39 Q					
1+10	0.0276	0.40 Q					
1+15	0.0303	0.40 Q					
1+20	0.0332	0.41 Q					
1+25	0.0360	0.41 Q					
1+30	0.0388	0.41 Q					
1+35	0.0417	0.42 Q					
1+40	0.0446	0.42 Q					
1+45	0.0475	0.42 Q					
1+50	0.0504	0.43 Q					
1+55	0.0534	0.43 Q					
2+ 0	0.0563	0.43 Q					
2+ 5	0.0593	0.43 Q					
2+10	0.0623	0.43 Q					
2+15	0.0653	0.43 QV					
2+20	0.0683	0.44 QV					

2+25	0.0713	0.44	QV	|	|	|	|
2+30	0.0743	0.44	QV	|	|	|	|
2+35	0.0774	0.44	QV	|	|	|	|
2+40	0.0804	0.44	QV	|	|	|	|
2+45	0.0835	0.44	QV	|	|	|	|
2+50	0.0865	0.45	QV	|	|	|	|
2+55	0.0896	0.45	QV	|	|	|	|
3+ 0	0.0927	0.45	QV	|	|	|	|
3+ 5	0.0958	0.45	QV	|	|	|	|
3+10	0.0990	0.45	QV	|	|	|	|
3+15	0.1021	0.46	QV	|	|	|	|
3+20	0.1053	0.46	QV	|	|	|	|
3+25	0.1084	0.46	QV	|	|	|	|
3+30	0.1116	0.46	QV	|	|	|	|
3+35	0.1148	0.46	QV	|	|	|	|
3+40	0.1180	0.47	QV	|	|	|	|
3+45	0.1212	0.47	QV	|	|	|	|
3+50	0.1244	0.47	QV	|	|	|	|
3+55	0.1277	0.47	QV	|	|	|	|
4+ 0	0.1309	0.47	Q V	|	|	|	|
4+ 5	0.1342	0.48	Q V	|	|	|	|
4+10	0.1375	0.48	Q V	|	|	|	|
4+15	0.1408	0.48	Q V	|	|	|	|
4+20	0.1441	0.48	Q V	|	|	|	|
4+25	0.1475	0.48	Q V	|	|	|	|
4+30	0.1508	0.49	Q V	|	|	|	|
4+35	0.1542	0.49	Q V	|	|	|	|
4+40	0.1575	0.49	Q V	|	|	|	|
4+45	0.1609	0.49	Q V	|	|	|	|
4+50	0.1643	0.50	Q V	|	|	|	|
4+55	0.1678	0.50	Q V	|	|	|	|
5+ 0	0.1712	0.50	Q V	|	|	|	|
5+ 5	0.1747	0.50	Q V	|	|	|	|
5+10	0.1781	0.50	Q V	|	|	|	|
5+15	0.1816	0.51	Q V	|	|	|	|
5+20	0.1851	0.51	Q V	|	|	|	|
5+25	0.1887	0.51	Q V	|	|	|	|
5+30	0.1922	0.51	Q V	|	|	|	|
5+35	0.1958	0.52	Q V	|	|	|	|
5+40	0.1993	0.52	Q V	|	|	|	|
5+45	0.2029	0.52	Q V	|	|	|	|
5+50	0.2066	0.52	Q V	|	|	|	|
5+55	0.2102	0.53	Q V	|	|	|	|
6+ 0	0.2138	0.53	Q V	|	|	|	|
6+ 5	0.2175	0.53	Q V	|	|	|	|
6+10	0.2212	0.54	Q V	|	|	|	|
6+15	0.2249	0.54	Q V	|	|	|	|
6+20	0.2287	0.54	Q V	|	|	|	|
6+25	0.2324	0.54	Q V	|	|	|	|
6+30	0.2362	0.55	Q V	|	|	|	|
6+35	0.2400	0.55	Q V	|	|	|	|
6+40	0.2438	0.55	Q V	|	|	|	|
6+45	0.2476	0.56	Q V	|	|	|	|
6+50	0.2515	0.56	Q V	|	|	|	|
6+55	0.2554	0.56	Q V	|	|	|	|
7+ 0	0.2593	0.57	Q V	|	|	|	|
7+ 5	0.2632	0.57	Q V	|	|	|	|
7+10	0.2671	0.57	Q V	|	|	|	|
7+15	0.2711	0.58	Q V	|	|	|	|
7+20	0.2751	0.58	Q V	|	|	|	|
7+25	0.2791	0.58	Q V	|	|	|	|
7+30	0.2831	0.59	Q V	|	|	|	|
7+35	0.2872	0.59	Q V	|	|	|	|

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 7+40       0.2913      0.59  Q   V     |           |           |           |
 7+45       0.2954      0.60  Q   V     |           |           |           |
 7+50       0.2996      0.60  Q   V     |           |           |           |
 7+55       0.3037      0.61  Q   V     |           |           |           |
 8+ 0       0.3079      0.61  Q   V     |           |           |           |
 8+ 5       0.3122      0.61  Q   V     |           |           |           |
 8+10       0.3164      0.62  Q   V     |           |           |           |
 8+15       0.3207      0.62  Q   V     |           |           |           |
 8+20       0.3250      0.63  Q    V    |           |           |           |
 8+25       0.3293      0.63  Q    V    |           |           |           |
 8+30       0.3337      0.63  Q    V    |           |           |           |
 8+35       0.3381      0.64  Q    V    |           |           |           |
 8+40       0.3425      0.64  Q    V    |           |           |           |
 8+45       0.3470      0.65  Q    V    |           |           |           |
 8+50       0.3515      0.65  Q    V    |           |           |           |
 8+55       0.3560      0.66  Q    V    |           |           |           |
 9+ 0       0.3606      0.66  Q    V    |           |           |           |
 9+ 5       0.3651      0.67  Q    V    |           |           |           |
 9+10       0.3698      0.67  Q    V    |           |           |           |
 9+15       0.3744      0.68  Q    V    |           |           |           |
 9+20       0.3791      0.68  Q    V    |           |           |           |
 9+25       0.3839      0.69  Q    V    |           |           |           |
 9+30       0.3886      0.69  Q     V   |           |           |           |
 9+35       0.3934      0.70  Q     V   |           |           |           |
 9+40       0.3983      0.70  Q     V   |           |           |           |
 9+45       0.4032      0.71  Q     V   |           |           |           |
 9+50       0.4081      0.71  Q     V   |           |           |           |
 9+55       0.4130      0.72  Q     V   |           |           |           |
10+ 0       0.4180      0.73  Q     V   |           |           |           |
10+ 5       0.4231      0.73  Q     V   |           |           |           |
10+10       0.4282      0.74  Q     V   |           |           |           |
10+15       0.4333      0.75  Q     V   |           |           |           |
10+20       0.4385      0.75  |Q    V   |           |           |           |
10+25       0.4437      0.76  |Q    V   |           |           |           |
10+30       0.4490      0.77  |Q    V   |           |           |           |
10+35       0.4543      0.77  |Q     V  |           |           |           |
10+40       0.4597      0.78  |Q     V  |           |           |           |
10+45       0.4652      0.79  |Q     V  |           |           |           |
10+50       0.4706      0.80  |Q     V  |           |           |           |
10+55       0.4762      0.80  |Q     V  |           |           |           |
11+ 0       0.4818      0.81  |Q     V  |           |           |           |
11+ 5       0.4874      0.82  |Q     V  |           |           |           |
11+10       0.4931      0.83  |Q     V  |           |           |           |
11+15       0.4989      0.84  |Q     V  |           |           |           |
11+20       0.5047      0.85  |Q     V  |           |           |           |
11+25       0.5106      0.86  |Q     V  |           |           |           |
11+30       0.5166      0.86  |Q      V |           |           |           |
11+35       0.5226      0.87  |Q      V |           |           |           |
11+40       0.5287      0.88  |Q      V |           |           |           |
11+45       0.5348      0.89  |Q      V |           |           |           |
11+50       0.5411      0.91  |Q      V |           |           |           |
11+55       0.5474      0.92  |Q      V |           |           |           |
12+ 0       0.5538      0.93  |Q      V |           |           |           |
12+ 5       0.5602      0.93  |Q      V |           |           |           |
12+10       0.5665      0.91  |Q      V |           |           |           |
12+15       0.5723      0.84  |Q      V |           |           |           |
12+20       0.5778      0.80  |Q      V |           |           |           |
12+25       0.5831      0.78  |Q       V|           |           |           |
12+30       0.5884      0.77  |Q       V|           |           |           |
12+35       0.5937      0.77  |Q       V|           |           |           |
12+40       0.5990      0.77  |Q       V|           |           |           |
12+45       0.6043      0.77  |Q       V|           |           |           |
12+50       0.6096      0.78  |Q       V|           |           |           |
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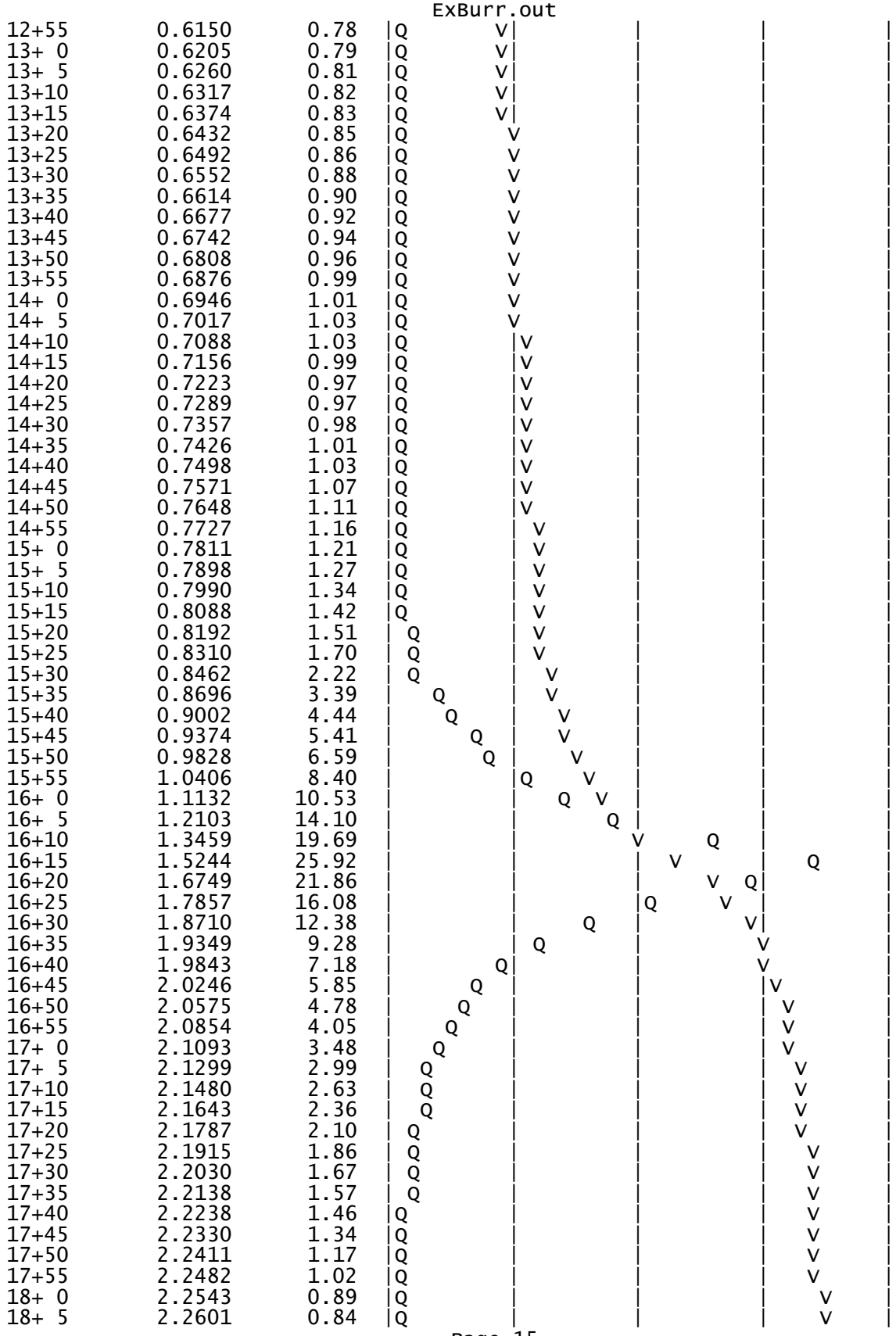

12+55	0.6150	0.78	
13+ 0	0.6205	0.79	
13+ 5	0.6260	0.81	
13+10	0.6317	0.82	
13+15	0.6374	0.83	
13+20	0.6432	0.85	
13+25	0.6492	0.86	
13+30	0.6552	0.88	
13+35	0.6614	0.90	
13+40	0.6677	0.92	
13+45	0.6742	0.94	
13+50	0.6808	0.96	
13+55	0.6876	0.99	
14+ 0	0.6946	1.01	
14+ 5	0.7017	1.03	
14+10	0.7088	1.03	
14+15	0.7156	0.99	
14+20	0.7223	0.97	
14+25	0.7289	0.97	
14+30	0.7357	0.98	
14+35	0.7426	1.01	
14+40	0.7498	1.03	
14+45	0.7571	1.07	
14+50	0.7648	1.11	
14+55	0.7727	1.16	
15+ 0	0.7811	1.21	
15+ 5	0.7898	1.27	
15+10	0.7990	1.34	
15+15	0.8088	1.42	
15+20	0.8192	1.51	
15+25	0.8310	1.70	
15+30	0.8462	2.22	
15+35	0.8696	3.39	
15+40	0.9002	4.44	
15+45	0.9374	5.41	
15+50	0.9828	6.59	
15+55	1.0406	8.40	
16+ 0	1.1132	10.53	
16+ 5	1.2103	14.10	
16+10	1.3459	19.69	
16+15	1.5244	25.92	
16+20	1.6749	21.86	
16+25	1.7857	16.08	
16+30	1.8710	12.38	
16+35	1.9349	9.28	
16+40	1.9843	7.18	
16+45	2.0246	5.85	
16+50	2.0575	4.78	
16+55	2.0854	4.05	
17+ 0	2.1093	3.48	
17+ 5	2.1299	2.99	
17+10	2.1480	2.63	
17+15	2.1643	2.36	
17+20	2.1787	2.10	
17+25	2.1915	1.86	
17+30	2.2030	1.67	
17+35	2.2138	1.57	
17+40	2.2238	1.46	
17+45	2.2330	1.34	
17+50	2.2411	1.17	
17+55	2.2482	1.02	
18+ 0	2.2543	0.89	
18+ 5	2.2601	0.84	

18+10	2.2658	0.82	|Q	|	|	|	V |
18+15	2.2718	0.87	|Q	|	|	|	V |
18+20	2.2780	0.90	|Q	|	|	|	V |
18+25	2.2842	0.91	|Q	|	|	|	V |
18+30	2.2904	0.90	|Q	|	|	|	V |
18+35	2.2965	0.89	|Q	|	|	|	V |
18+40	2.3026	0.88	|Q	|	|	|	V |
18+45	2.3086	0.87	|Q	|	|	|	V |
18+50	2.3145	0.86	|Q	|	|	|	V |
18+55	2.3203	0.84	|Q	|	|	|	V |
19+ 0	2.3260	0.83	|Q	|	|	|	V |
19+ 5	2.3316	0.81	|Q	|	|	|	V |
19+10	2.3371	0.80	|Q	|	|	|	V |
19+15	2.3425	0.79	|Q	|	|	|	V |
19+20	2.3479	0.77	|Q	|	|	|	V |
19+25	2.3531	0.76	|Q	|	|	|	V |
19+30	2.3583	0.75	Q	|	|	|	V |
19+35	2.3633	0.74	Q	|	|	|	V |
19+40	2.3683	0.72	Q	|	|	|	V |
19+45	2.3733	0.71	Q	|	|	|	V |
19+50	2.3781	0.70	Q	|	|	|	V |
19+55	2.3829	0.69	Q	|	|	|	V |
20+ 0	2.3876	0.68	Q	|	|	|	V |
20+ 5	2.3922	0.67	Q	|	|	|	V |
20+10	2.3967	0.66	Q	|	|	|	V |
20+15	2.4012	0.65	Q	|	|	|	V |
20+20	2.4057	0.64	Q	|	|	|	V |
20+25	2.4100	0.63	Q	|	|	|	V |
20+30	2.4143	0.63	Q	|	|	|	V |
20+35	2.4186	0.62	Q	|	|	|	V |
20+40	2.4228	0.61	Q	|	|	|	V |
20+45	2.4269	0.60	Q	|	|	|	V |
20+50	2.4310	0.59	Q	|	|	|	V |
20+55	2.4350	0.59	Q	|	|	|	V |
21+ 0	2.4390	0.58	Q	|	|	|	V |
21+ 5	2.4430	0.57	Q	|	|	|	V |
21+10	2.4469	0.57	Q	|	|	|	V |
21+15	2.4507	0.56	Q	|	|	|	V |
21+20	2.4545	0.55	Q	|	|	|	V |
21+25	2.4583	0.55	Q	|	|	|	V |
21+30	2.4620	0.54	Q	|	|	|	V |
21+35	2.4657	0.54	Q	|	|	|	V |
21+40	2.4693	0.53	Q	|	|	|	V |
21+45	2.4730	0.52	Q	|	|	|	V |
21+50	2.4765	0.52	Q	|	|	|	V |
21+55	2.4801	0.51	Q	|	|	|	V |
22+ 0	2.4836	0.51	Q	|	|	|	V |
22+ 5	2.4870	0.50	Q	|	|	|	V |
22+10	2.4905	0.50	Q	|	|	|	V |
22+15	2.4939	0.49	Q	|	|	|	V |
22+20	2.4973	0.49	Q	|	|	|	V |
22+25	2.5006	0.49	Q	|	|	|	V |
22+30	2.5039	0.48	Q	|	|	|	V |
22+35	2.5072	0.48	Q	|	|	|	V|
22+40	2.5105	0.47	Q	|	|	|	V|
22+45	2.5137	0.47	Q	|	|	|	V|
22+50	2.5169	0.46	Q	|	|	|	V|
22+55	2.5201	0.46	Q	|	|	|	V|
23+ 0	2.5232	0.46	Q	|	|	|	V|
23+ 5	2.5263	0.45	Q	|	|	|	V|
23+10	2.5294	0.45	Q	|	|	|	V|
23+15	2.5325	0.45	Q	|	|	|	V|
23+20	2.5355	0.44	Q	|	|	|	V|

23+25	2.5386	0.44	Q	|	|	|	V|
23+30	2.5416	0.44	Q	|	|	|	V|
23+35	2.5445	0.43	Q	|	|	|	V|
23+40	2.5475	0.43	Q	|	|	|	V|
23+45	2.5504	0.43	Q	|	|	|	V|
23+50	2.5533	0.42	Q	|	|	|	V|
23+55	2.5562	0.42	Q	|	|	|	V|
24+ 0	2.5591	0.42	Q	|	|	|	V|
24+ 5	2.5619	0.40	Q	|	|	|	V|
24+10	2.5644	0.36	Q	|	|	|	V|
24+15	2.5661	0.25	Q	|	|	|	V|
24+20	2.5672	0.17	Q	|	|	|	V|
24+25	2.5681	0.13	Q	|	|	|	V|
24+30	2.5688	0.10	Q	|	|	|	V|
24+35	2.5693	0.08	Q	|	|	|	V|
24+40	2.5698	0.06	Q	|	|	|	V|
24+45	2.5701	0.05	Q	|	|	|	V|
24+50	2.5704	0.04	Q	|	|	|	V|
24+55	2.5706	0.03	Q	|	|	|	V|
25+ 0	2.5708	0.03	Q	|	|	|	V|
25+ 5	2.5709	0.02	Q	|	|	|	V|
25+10	2.5710	0.02	Q	|	|	|	V|
25+15	2.5711	0.01	Q	|	|	|	V|
25+20	2.5712	0.01	Q	|	|	|	V|
25+25	2.5713	0.01	Q	|	|	|	V|
25+30	2.5713	0.01	Q	|	|	|	V|
25+35	2.5713	0.00	Q	|	|	|	V|
25+40	2.5714	0.00	Q	|	|	|	V|
25+45	2.5714	0.00	Q	|	|	|	V|
25+50	2.5714	0.00	Q	|	|	|	V

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2012 Version 7.2
Rational Hydrology Study Date: 07/01/15

BURRTEC WASTE TRANSFER STATION
100-YEAR, 1 HOUR
BASIN A
PROPOSED CONDITIONS

Program License Serial Number 6296

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.780 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

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

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2) = 100.00
Adjusted SCS curve number for AMC 3 = 100.00
Pervious ratio(Ap) = 0.0100 Max loss rate(Fm)= 0.000(In/Hr)
Initial subarea data:
Initial area flow distance = 120.500(Ft.)
Top (of initial area) elevation = 64.200(Ft.)
Bottom (of initial area) elevation = 64.000(Ft.)
Difference in elevation = 0.200(Ft.)
Slope = 0.00166 s(%)= 0.17
TC = k(0.277)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 6.773 min.
Rainfall intensity = 8.195(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.900
Subarea runoff = 1.033(CFS)
Total initial stream area = 0.140(Ac.)
Pervious area fraction = 0.010
Initial area Fm value = 0.000(In/Hr)

++
Process from Point/Station 101.000 to Point/Station 102.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 64.000(Ft.)
End of street segment elevation = 55.000(Ft.)
Length of street segment = 170.300(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 13.000(Ft.)
Distance from crown to crossfall grade break = 0.500(Ft.)

Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.025
Gutter width = 0.500(Ft.)
Gutter hike from flowline = 1.500(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 1.511(CFS)
Depth of flow = 0.239(Ft.), Average velocity = 3.647(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 6.210(Ft.)
Flow velocity = 3.65(Ft/s)
Travel time = 0.78 min. TC = 7.55 min.
Adding area flow to street
Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2) = 100.00
Adjusted SCS curve number for AMC 3 = 100.00
Pervious ratio(Ap) = 0.0100 Max loss rate(Fm)= 0.000(In/Hr)
Rainfall intensity = 7.594(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area,(total area with modified rational method)(Q=KCIA) is C = 0.900
Subarea runoff = 0.881(CFS) for 0.140(Ac.)
Total runoff = 1.914(CFS)
Effective area this stream = 0.28(Ac.)
Total Study Area (Main Stream No. 1) = 0.28(Ac.)
Area averaged Fm value = 0.000(In/Hr)
Street flow at end of street = 1.914(CFS)
Half street flow at end of street = 1.914(CFS)
Depth of flow = 0.252(Ft.), Average velocity = 3.861(Ft/s)
Flow width (from curb towards crown)= 6.833(Ft.)

++
Process from Point/Station 102.000 to Point/Station 103.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 55.000(Ft.)
End of street segment elevation = 45.800(Ft.)
Length of street segment = 501.900(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 13.000(Ft.)
Distance from crown to crossfall grade break = 0.500(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.025
Gutter width = 0.500(Ft.)
Gutter hike from flowline = 1.500(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 10.815(CFS)
Depth of flow = 0.434(Ft.), Average velocity = 4.351(Ft/s)
Note: depth of flow exceeds top of street crown.
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 13.000(Ft.)
Flow velocity = 4.35(Ft/s)
Travel time = 1.92 min. TC = 9.47 min.

```
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Adjusted SCS curve number for AMC 3 = 75.80
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.044(In/Hr)
Rainfall intensity =      6.480(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.894
Subarea runoff =     17.732(CFS) for    3.110(Ac.)
Total runoff =     19.646(CFS)
Effective area this stream =        3.39(Ac.)
Total Study Area (Main Stream No. 1) =        3.39(Ac.)
Area averaged Fm value =    0.040(In/Hr)
Street flow at end of street =     19.646(CFS)
Half street flow at end of street =     19.646(CFS)
Depth of flow =   0.523(Ft.), Average velocity =   5.368(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    0.94(Ft.)
Flow width (from curb towards crown)=  13.000(Ft.)
End of computations, Total Study Area =            3.39 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.093
Area averaged SCS curve number =  59.6
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2012 Version 7.2
Rational Hydrology Study Date: 07/02/15

BURRTEC WASTE TRANSFER STATION
100-YEAR, 1 HOUR
BASINS B, C & D
PROPOSED CONDITIONS

Program License Serial Number 6296

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.780 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

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

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2) = 100.00
Adjusted SCS curve number for AMC 3 = 100.00
Pervious ratio(Ap) = 0.0100 Max loss rate(Fm)= 0.000(In/Hr)
Initial subarea data:
Initial area flow distance = 149.500(Ft.)
Top (of initial area) elevation = 64.200(Ft.)
Bottom (of initial area) elevation = 64.000(Ft.)
Difference in elevation = 0.200(Ft.)
Slope = 0.00134 s(%)= 0.13
TC = k(0.277)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.709 min.
Rainfall intensity = 7.486(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.900
Subarea runoff = 1.213(CFS)
Total initial stream area = 0.180(Ac.)
Pervious area fraction = 0.010
Initial area Fm value = 0.000(In/Hr)

++
Process from Point/Station 101.000 to Point/Station 102.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 64.000(Ft.)
End of street segment elevation = 56.000(Ft.)
Length of street segment = 159.000(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 32.000(Ft.)
Distance from crown to crossfall grade break = 30.000(Ft.)

```
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.000
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =      1.817(CFS)
Depth of flow =   0.209(Ft.), Average velocity =   3.884(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   6.187(Ft.)
Flow velocity =   3.88(Ft/s)
Travel time =    0.68 min.     TC =    8.39  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 100.00
Adjusted SCS curve number for AMC 3 = 100.00
Pervious ratio(Ap) = 0.0100     Max loss rate(Fm)=     0.000(In/Hr)
Rainfall intensity =      7.054(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.900
Subarea runoff =      1.136(CFS) for    0.190(Ac.)
Total runoff =      2.349(CFS)
Effective area this stream =        0.37(Ac.)
Total Study Area (Main Stream No. 1) =        0.37(Ac.)
Area averaged Fm value =    0.000(In/Hr)
Street flow at end of street =      2.349(CFS)
Half street flow at end of street =      2.349(CFS)
Depth of flow =   0.225(Ft.), Average velocity =   4.104(Ft/s)
Flow width (from curb towards crown)=   6.981(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =    56.000(Ft.)
End of street segment elevation =    48.000(Ft.)
Length of street segment  =   360.200(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  13.000(Ft.)
Distance from crown to crossfall grade break  =  12.500(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   0.500(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     11.949(CFS)
Depth of flow =   0.434(Ft.), Average velocity =   4.797(Ft/s)
Note:  depth of flow exceeds top of street crown.
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.000(Ft.)
Flow velocity =   4.80(Ft/s)
Travel time =    1.25 min.     TC =    9.64  min.
```

```
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Adjusted SCS curve number for AMC 3 = 75.80
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.044(In/Hr)
Rainfall intensity =      6.400(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.894
Subarea runoff =     19.117(CFS) for    3.380(Ac.)
Total runoff =     21.466(CFS)
Effective area this stream =        3.75(Ac.)
Total Study Area (Main Stream No. 1) =        3.75(Ac.)
Area averaged Fm value =    0.040(In/Hr)
Street flow at end of street =     21.466(CFS)
Half street flow at end of street =     21.466(CFS)
Depth of flow =   0.522(Ft.), Average velocity =   5.902(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    0.87(Ft.)
Flow width (from curb towards crown)=  13.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.750(Ac.)
Runoff from this stream =     21.466(CFS)
Time of concentration =    9.64 min.
Rainfall intensity =     6.400(In/Hr)
Area averaged loss rate (Fm) =    0.0397(In/Hr)
Area averaged Pervious ratio (Ap) = 0.0911


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Adjusted SCS curve number for AMC 3 = 75.80
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.044(In/Hr)
Initial subarea data:
Initial area flow distance =   124.600(Ft.)
Top (of initial area) elevation =    64.200(Ft.)
Bottom (of initial area) elevation =    64.000(Ft.)
Difference in elevation =     0.200(Ft.)
Slope =    0.00161  s(%)=       0.16
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.585 min.
Rainfall intensity =      7.571(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.895
Subarea runoff =      0.542(CFS)
Total initial stream area =        0.080(Ac.)
```

Pervious area fraction = 0.100
Initial area Fm value = 0.044(In/Hr)

++
Process from Point/Station 101.000 to Point/Station 102.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 64.000(Ft.)
End of street segment elevation = 56.000(Ft.)
Length of street segment = 251.600(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 13.000(Ft.)
Distance from crown to crossfall grade break = 12.500(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.025
Gutter width = 0.500(Ft.)
Gutter hike from flowline = 1.500(In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 1.046(CFS)
Depth of flow = 0.234(Ft.), Average velocity = 2.753(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 5.926(Ft.)
Flow velocity = 2.75(Ft/s)
Travel time = 1.52 min. TC = 9.11 min.
 Adding area flow to street
Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2) = 100.00
Adjusted SCS curve number for AMC 3 = 100.00
Pervious ratio(Ap) = 0.0100 Max loss rate(Fm)= 0.000(In/Hr)
Rainfall intensity = 6.661(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.898
Subarea runoff = 1.073(CFS) for 0.190(Ac.)
Total runoff = 1.615(CFS)
Effective area this stream = 0.27(Ac.)
Total Study Area (Main Stream No. 1) = 4.02(Ac.)
Area averaged Fm value = 0.013(In/Hr)
Street flow at end of street = 1.615(CFS)
Half street flow at end of street = 1.615(CFS)
Depth of flow = 0.256(Ft.), Average velocity = 3.057(Ft/s)
Flow width (from curb towards crown)= 7.069(Ft.)

++
Process from Point/Station 102.000 to Point/Station 103.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 56.000(Ft.)
End of street segment elevation = 48.000(Ft.)
Length of street segment = 399.200(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 13.000(Ft.)
Distance from crown to crossfall grade break = 12.500(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [1] side(s) of the street

Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.025
Gutter width = 0.500(Ft.)
Gutter hike from flowline = 1.500(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 3.722(CFS)
Depth of flow = 0.330(Ft.), Average velocity = 3.152(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 10.733(Ft.)
Flow velocity = 3.15(Ft/s)
Travel time = 2.11 min. TC = 11.22 min.
Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 56.00
Adjusted SCS curve number for AMC 3 = 75.80
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.044(In/Hr)
Rainfall intensity = 5.756(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area,(total area with modified rational method)(Q=KCIA) is C = 0.894
Subarea runoff = 4.150(CFS) for 0.850(Ac.)
Total runoff = 5.766(CFS)
Effective area this stream = 1.12(Ac.)
Total Study Area (Main Stream No. 1) = 4.87(Ac.)
Area averaged Fm value = 0.037(In/Hr)
Street flow at end of street = 5.766(CFS)
Half street flow at end of street = 5.766(CFS)
Depth of flow = 0.369(Ft.), Average velocity = 3.514(Ft/s)
Flow width (from curb towards crown)= 12.697(Ft.)

++
Process from Point/Station 100.000 to Point/Station 103.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 1.120(Ac.)
Runoff from this stream = 5.766(CFS)
Time of concentration = 11.22 min.
Rainfall intensity = 5.756(In/Hr)
Area averaged loss rate (Fm) = 0.0365(In/Hr)
Area averaged Pervious ratio (Ap) = 0.0847

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

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 56.00
Adjusted SCS curve number for AMC 3 = 75.80
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.044(In/Hr)
Initial subarea data:
Initial area flow distance = 152.500(Ft.)

```
Top (of initial area) elevation =    48.000(Ft.)
Bottom (of initial area) elevation =    47.100(Ft.)
Difference in elevation =     0.900(Ft.)
Slope =    0.00590  s(%)=       0.59
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.339 min.
Rainfall intensity =      8.585(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.895
Subarea runoff =      1.768(CFS)
Total initial stream area =        0.230(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.044(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =    47.100(Ft.)
End of street segment elevation =    44.800(Ft.)
Length of street segment  =   236.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  13.000(Ft.)
Distance from crown to crossfall grade break  =  12.500(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   0.500(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =      7.052(CFS)
Depth of flow =   0.422(Ft.), Average velocity =   3.035(Ft/s)
Note:  depth of flow exceeds top of street crown.
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.000(Ft.)
Flow velocity =   3.04(Ft/s)
Travel time =    1.30 min.     TC =    7.63  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Adjusted SCS curve number for AMC 3 = 75.80
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.044(In/Hr)
Rainfall intensity =      7.537(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.895
Subarea runoff =     10.505(CFS) for    1.590(Ac.)
Total runoff =     12.273(CFS)
Effective area this stream =        1.82(Ac.)
Total Study Area (Main Stream No. 1) =        6.69(Ac.)
Area averaged Fm value =    0.044(In/Hr)
Street flow at end of street =     12.273(CFS)
Half street flow at end of street =     12.273(CFS)
Depth of flow =   0.493(Ft.), Average velocity =   3.780(Ft/s)
Note:  depth of flow exceeds top of street crown.
Flow width (from curb towards crown)=  13.000(Ft.)
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      102.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      1.820(Ac.)
Runoff from this stream =     12.273(CFS)
Time of concentration =    7.63 min.
Rainfall intensity =     7.537(In/Hr)
Area averaged loss rate (Fm) =    0.0440(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     21.47     3.750      9.64    0.040      6.400
2      5.77     1.120     11.22    0.037      5.756
3     12.27     1.820      7.63    0.044      7.537
Qmax(1) =
           1.000 *    1.000 *    21.466) +
           1.113 *    0.859 *     5.766) +
           0.848 *    1.000 *    12.273) + =      37.390
Qmax(2) =
           0.899 *    1.000 *    21.466) +
           1.000 *    1.000 *     5.766) +
           0.762 *    1.000 *    12.273) + =      34.416
Qmax(3) =
           1.179 *    0.792 *    21.466) +
           1.311 *    0.680 *     5.766) +
           1.000 *    1.000 *    12.273) + =      37.450

Total of 3 streams to confluence:
Flow rates before confluence point:
      21.466       5.766      12.273
Maximum flow rates at confluence using above data:
       37.390       34.416       37.450
Area of streams before confluence:
        3.750        1.120        1.820
Effective area values after confluence:
        6.533        6.690        5.551
Results of confluence:
Total flow rate =     37.450(CFS)
Time of concentration =     7.634 min.
Effective stream area after confluence =      5.551(Ac.)
Study area average Pervious fraction(Ap) =  0.092
Study area average soil loss rate(Fm) =    0.040(In/Hr)
Study area total (this main stream) =       6.69(Ac.)
End of computations, Total Study Area =            6.69 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.092
Area averaged SCS curve number =  59.7
```

CIVILDESIGN UNIT HYDROGRAPH METHOD EXISTING ONSITE ANALYSIS

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

Study date 07/02/15

++

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

Program License Serial Number 6296

BURRTEC EXISTING CONDITIONS
100-YEAR, 24-HOUR

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 100		
10.00	1	1.78
Rainfall data for year 100		
10.00	6	2.58
Rainfall data for year 100		
10.00	24	4.19

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
69.0	86.2	10.00	1.000	0.262	1.000	0.262

Area-averaged adjusted loss rate Fm (In/Hr) = 0.262

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
10.00	1.000	69.0	86.2	1.60	0.653

Area-averaged catchment yield fraction, Y = 0.653
Area-averaged low loss fraction, Yb = 0.347
User entry of time of concentration = 0.306 (hours)
++
Watershed area = 10.00(Ac.)
Catchment Lag time = 0.245 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 34.0804
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.262(In/Hr)
Average low loss rate fraction (Yb) = 0.347 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.487(In)
Computed peak 30-minute rainfall = 1.290(In)
Specified peak 1-hour rainfall = 1.780(In)
Computed peak 3-hour rainfall = 2.180(In)
Specified peak 6-hour rainfall = 2.580(In)
Specified peak 24-hour rainfall = 4.190(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 10.00(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.487(In)
30-minute factor = 1.000 Adjusted rainfall = 1.289(In)
1-hour factor = 1.000 Adjusted rainfall = 1.779(In)
3-hour factor = 1.000 Adjusted rainfall = 2.180(In)
6-hour factor = 1.000 Adjusted rainfall = 2.580(In)
24-hour factor = 1.000 Adjusted rainfall = 4.190(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 = 120.94 (CFS))	
1	2.143	2.592
2	12.543	12.578
3	39.219	32.261
4	58.759	23.630
5	69.203	12.632
6	76.138	8.387
7	81.076	5.972
8	84.815	4.521
9	87.860	3.683
10	90.111	2.722
11	91.967	2.244
12	93.533	1.894
13	94.784	1.513
14	95.857	1.297
15	96.734	1.061
16	97.408	0.816
17	97.921	0.619
18	98.269	0.422
19	98.666	0.479
20	99.075	0.495

21	99.463	0.469
22	99.705	0.292
23	100.000	0.146

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4868	0.4868
2	0.7096	0.2228
3	0.8846	0.1750
4	1.0343	0.1498
5	1.1677	0.1334
6	1.2894	0.1217
7	1.3851	0.0957
8	1.4737	0.0886
9	1.5566	0.0829
10	1.6347	0.0781
11	1.7087	0.0740
12	1.7792	0.0705
13	1.8057	0.0265
14	1.8306	0.0249
15	1.8541	0.0235
16	1.8764	0.0223
17	1.8975	0.0212
18	1.9177	0.0202
19	1.9369	0.0193
20	1.9554	0.0185
21	1.9731	0.0177
22	1.9902	0.0170
23	2.0066	0.0164
24	2.0224	0.0159
25	2.0378	0.0153
26	2.0526	0.0148
27	2.0670	0.0144
28	2.0809	0.0139
29	2.0944	0.0135
30	2.1076	0.0132
31	2.1204	0.0128
32	2.1329	0.0125
33	2.1451	0.0122
34	2.1570	0.0119
35	2.1685	0.0116
36	2.1799	0.0113
37	2.1944	0.0146
38	2.2087	0.0143
39	2.2227	0.0140
40	2.2364	0.0137
41	2.2499	0.0135
42	2.2631	0.0132
43	2.2761	0.0130
44	2.2888	0.0128
45	2.3014	0.0125
46	2.3137	0.0123
47	2.3258	0.0121
48	2.3378	0.0119
49	2.3495	0.0117
50	2.3611	0.0116
51	2.3725	0.0114
52	2.3837	0.0112
53	2.3948	0.0111
54	2.4057	0.0109
55	2.4164	0.0108
56	2.4270	0.0106
57	2.4375	0.0105

58	2.4478	0.0103
59	2.4580	0.0102
60	2.4681	0.0101
61	2.4780	0.0099
62	2.4878	0.0098
63	2.4975	0.0097
64	2.5071	0.0096
65	2.5166	0.0095
66	2.5259	0.0094
67	2.5352	0.0093
68	2.5443	0.0091
69	2.5534	0.0090
70	2.5623	0.0089
71	2.5712	0.0089
72	2.5799	0.0088
73	2.5924	0.0125
74	2.6048	0.0124
75	2.6170	0.0123
76	2.6292	0.0122
77	2.6412	0.0120
78	2.6532	0.0119
79	2.6650	0.0118
80	2.6768	0.0118
81	2.6884	0.0117
82	2.7000	0.0116
83	2.7115	0.0115
84	2.7229	0.0114
85	2.7341	0.0113
86	2.7454	0.0112
87	2.7565	0.0111
88	2.7675	0.0110
89	2.7785	0.0110
90	2.7894	0.0109
91	2.8002	0.0108
92	2.8109	0.0107
93	2.8215	0.0107
94	2.8321	0.0106
95	2.8426	0.0105
96	2.8531	0.0104
97	2.8634	0.0104
98	2.8737	0.0103
99	2.8839	0.0102
100	2.8941	0.0102
101	2.9042	0.0101
102	2.9142	0.0100
103	2.9242	0.0100
104	2.9341	0.0099
105	2.9439	0.0098
106	2.9537	0.0098
107	2.9634	0.0097
108	2.9731	0.0097
109	2.9827	0.0096
110	2.9922	0.0095
111	3.0017	0.0095
112	3.0111	0.0094
113	3.0205	0.0094
114	3.0298	0.0093
115	3.0391	0.0093
116	3.0483	0.0092
117	3.0575	0.0092
118	3.0666	0.0091
119	3.0757	0.0091
120	3.0847	0.0090

121	3.0936	0.0090
122	3.1026	0.0089
123	3.1114	0.0089
124	3.1203	0.0088
125	3.1290	0.0088
126	3.1378	0.0087
127	3.1465	0.0087
128	3.1551	0.0086
129	3.1637	0.0086
130	3.1723	0.0086
131	3.1808	0.0085
132	3.1893	0.0085
133	3.1977	0.0084
134	3.2061	0.0084
135	3.2144	0.0083
136	3.2227	0.0083
137	3.2310	0.0083
138	3.2392	0.0082
139	3.2474	0.0082
140	3.2556	0.0082
141	3.2637	0.0081
142	3.2718	0.0081
143	3.2798	0.0080
144	3.2878	0.0080
145	3.2958	0.0080
146	3.3037	0.0079
147	3.3116	0.0079
148	3.3195	0.0079
149	3.3273	0.0078
150	3.3351	0.0078
151	3.3429	0.0078
152	3.3506	0.0077
153	3.3583	0.0077
154	3.3659	0.0077
155	3.3736	0.0076
156	3.3812	0.0076
157	3.3887	0.0076
158	3.3963	0.0075
159	3.4038	0.0075
160	3.4112	0.0075
161	3.4187	0.0074
162	3.4261	0.0074
163	3.4335	0.0074
164	3.4408	0.0074
165	3.4482	0.0073
166	3.4555	0.0073
167	3.4627	0.0073
168	3.4700	0.0072
169	3.4772	0.0072
170	3.4844	0.0072
171	3.4915	0.0072
172	3.4986	0.0071
173	3.5057	0.0071
174	3.5128	0.0071
175	3.5199	0.0070
176	3.5269	0.0070
177	3.5339	0.0070
178	3.5409	0.0070
179	3.5478	0.0069
180	3.5547	0.0069
181	3.5616	0.0069
182	3.5685	0.0069
183	3.5753	0.0068

184	3.5822	0.0068
185	3.5890	0.0068
186	3.5957	0.0068
187	3.6025	0.0068
188	3.6092	0.0067
189	3.6159	0.0067
190	3.6226	0.0067
191	3.6293	0.0067
192	3.6359	0.0066
193	3.6425	0.0066
194	3.6491	0.0066
195	3.6557	0.0066
196	3.6622	0.0065
197	3.6687	0.0065
198	3.6752	0.0065
199	3.6817	0.0065
200	3.6882	0.0065
201	3.6946	0.0064
202	3.7010	0.0064
203	3.7074	0.0064
204	3.7138	0.0064
205	3.7202	0.0064
206	3.7265	0.0063
207	3.7328	0.0063
208	3.7391	0.0063
209	3.7454	0.0063
210	3.7517	0.0063
211	3.7579	0.0062
212	3.7641	0.0062
213	3.7703	0.0062
214	3.7765	0.0062
215	3.7827	0.0062
216	3.7888	0.0061
217	3.7950	0.0061
218	3.8011	0.0061
219	3.8072	0.0061
220	3.8132	0.0061
221	3.8193	0.0061
222	3.8253	0.0060
223	3.8313	0.0060
224	3.8373	0.0060
225	3.8433	0.0060
226	3.8493	0.0060
227	3.8552	0.0059
228	3.8612	0.0059
229	3.8671	0.0059
230	3.8730	0.0059
231	3.8789	0.0059
232	3.8847	0.0059
233	3.8906	0.0058
234	3.8964	0.0058
235	3.9022	0.0058
236	3.9080	0.0058
237	3.9138	0.0058
238	3.9196	0.0058
239	3.9253	0.0058
240	3.9311	0.0057
241	3.9368	0.0057
242	3.9425	0.0057
243	3.9482	0.0057
244	3.9539	0.0057
245	3.9595	0.0057
246	3.9652	0.0056

247	3.9708	0.0056
248	3.9764	0.0056
249	3.9820	0.0056
250	3.9876	0.0056
251	3.9932	0.0056
252	3.9987	0.0056
253	4.0043	0.0055
254	4.0098	0.0055
255	4.0153	0.0055
256	4.0208	0.0055
257	4.0263	0.0055
258	4.0318	0.0055
259	4.0372	0.0055
260	4.0427	0.0054
261	4.0481	0.0054
262	4.0535	0.0054
263	4.0589	0.0054
264	4.0643	0.0054
265	4.0697	0.0054
266	4.0751	0.0054
267	4.0804	0.0054
268	4.0858	0.0053
269	4.0911	0.0053
270	4.0964	0.0053
271	4.1017	0.0053
272	4.1070	0.0053
273	4.1123	0.0053
274	4.1175	0.0053
275	4.1228	0.0053
276	4.1280	0.0052
277	4.1333	0.0052
278	4.1385	0.0052
279	4.1437	0.0052
280	4.1489	0.0052
281	4.1540	0.0052
282	4.1592	0.0052
283	4.1644	0.0052
284	4.1695	0.0051
285	4.1746	0.0051
286	4.1797	0.0051
287	4.1849	0.0051
288	4.1899	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0018	0.0033
2	0.0051	0.0018	0.0033
3	0.0051	0.0018	0.0034
4	0.0051	0.0018	0.0034
5	0.0052	0.0018	0.0034
6	0.0052	0.0018	0.0034
7	0.0052	0.0018	0.0034
8	0.0052	0.0018	0.0034
9	0.0052	0.0018	0.0034
10	0.0053	0.0018	0.0034
11	0.0053	0.0018	0.0034
12	0.0053	0.0018	0.0035
13	0.0053	0.0018	0.0035
14	0.0053	0.0018	0.0035
15	0.0054	0.0019	0.0035
16	0.0054	0.0019	0.0035

17	0.0054	0.0019	0.0035
18	0.0054	0.0019	0.0035
19	0.0054	0.0019	0.0035
20	0.0054	0.0019	0.0036
21	0.0055	0.0019	0.0036
22	0.0055	0.0019	0.0036
23	0.0055	0.0019	0.0036
24	0.0055	0.0019	0.0036
25	0.0056	0.0019	0.0036
26	0.0056	0.0019	0.0036
27	0.0056	0.0019	0.0037
28	0.0056	0.0019	0.0037
29	0.0056	0.0020	0.0037
30	0.0057	0.0020	0.0037
31	0.0057	0.0020	0.0037
32	0.0057	0.0020	0.0037
33	0.0057	0.0020	0.0037
34	0.0058	0.0020	0.0038
35	0.0058	0.0020	0.0038
36	0.0058	0.0020	0.0038
37	0.0058	0.0020	0.0038
38	0.0058	0.0020	0.0038
39	0.0059	0.0020	0.0038
40	0.0059	0.0020	0.0039
41	0.0059	0.0021	0.0039
42	0.0059	0.0021	0.0039
43	0.0060	0.0021	0.0039
44	0.0060	0.0021	0.0039
45	0.0060	0.0021	0.0039
46	0.0061	0.0021	0.0040
47	0.0061	0.0021	0.0040
48	0.0061	0.0021	0.0040
49	0.0061	0.0021	0.0040
50	0.0062	0.0021	0.0040
51	0.0062	0.0021	0.0041
52	0.0062	0.0022	0.0041
53	0.0063	0.0022	0.0041
54	0.0063	0.0022	0.0041
55	0.0063	0.0022	0.0041
56	0.0063	0.0022	0.0041
57	0.0064	0.0022	0.0042
58	0.0064	0.0022	0.0042
59	0.0064	0.0022	0.0042
60	0.0065	0.0022	0.0042
61	0.0065	0.0023	0.0042
62	0.0065	0.0023	0.0043
63	0.0066	0.0023	0.0043
64	0.0066	0.0023	0.0043
65	0.0066	0.0023	0.0043
66	0.0067	0.0023	0.0043
67	0.0067	0.0023	0.0044
68	0.0067	0.0023	0.0044
69	0.0068	0.0023	0.0044
70	0.0068	0.0024	0.0044
71	0.0068	0.0024	0.0045
72	0.0069	0.0024	0.0045
73	0.0069	0.0024	0.0045
74	0.0069	0.0024	0.0045
75	0.0070	0.0024	0.0046
76	0.0070	0.0024	0.0046
77	0.0071	0.0025	0.0046
78	0.0071	0.0025	0.0046
79	0.0072	0.0025	0.0047

80	0.0072	0.0025	0.0047
81	0.0072	0.0025	0.0047
82	0.0073	0.0025	0.0047
83	0.0073	0.0025	0.0048
84	0.0074	0.0025	0.0048
85	0.0074	0.0026	0.0048
86	0.0074	0.0026	0.0049
87	0.0075	0.0026	0.0049
88	0.0075	0.0026	0.0049
89	0.0076	0.0026	0.0050
90	0.0076	0.0026	0.0050
91	0.0077	0.0027	0.0050
92	0.0077	0.0027	0.0050
93	0.0078	0.0027	0.0051
94	0.0078	0.0027	0.0051
95	0.0079	0.0027	0.0052
96	0.0079	0.0028	0.0052
97	0.0080	0.0028	0.0052
98	0.0080	0.0028	0.0053
99	0.0081	0.0028	0.0053
100	0.0082	0.0028	0.0053
101	0.0082	0.0029	0.0054
102	0.0083	0.0029	0.0054
103	0.0083	0.0029	0.0055
104	0.0084	0.0029	0.0055
105	0.0085	0.0029	0.0055
106	0.0085	0.0030	0.0056
107	0.0086	0.0030	0.0056
108	0.0086	0.0030	0.0056
109	0.0087	0.0030	0.0057
110	0.0088	0.0030	0.0057
111	0.0089	0.0031	0.0058
112	0.0089	0.0031	0.0058
113	0.0090	0.0031	0.0059
114	0.0091	0.0031	0.0059
115	0.0092	0.0032	0.0060
116	0.0092	0.0032	0.0060
117	0.0093	0.0032	0.0061
118	0.0094	0.0033	0.0061
119	0.0095	0.0033	0.0062
120	0.0095	0.0033	0.0062
121	0.0097	0.0033	0.0063
122	0.0097	0.0034	0.0063
123	0.0098	0.0034	0.0064
124	0.0099	0.0034	0.0065
125	0.0100	0.0035	0.0066
126	0.0101	0.0035	0.0066
127	0.0102	0.0035	0.0067
128	0.0103	0.0036	0.0067
129	0.0104	0.0036	0.0068
130	0.0105	0.0036	0.0069
131	0.0107	0.0037	0.0070
132	0.0107	0.0037	0.0070
133	0.0109	0.0038	0.0071
134	0.0110	0.0038	0.0072
135	0.0111	0.0039	0.0073
136	0.0112	0.0039	0.0073
137	0.0114	0.0039	0.0074
138	0.0115	0.0040	0.0075
139	0.0117	0.0040	0.0076
140	0.0118	0.0041	0.0077
141	0.0119	0.0041	0.0078
142	0.0120	0.0042	0.0079

143	0.0123	0.0043	0.0080
144	0.0124	0.0043	0.0081
145	0.0088	0.0030	0.0057
146	0.0089	0.0031	0.0058
147	0.0090	0.0031	0.0059
148	0.0091	0.0032	0.0060
149	0.0094	0.0032	0.0061
150	0.0095	0.0033	0.0062
151	0.0097	0.0034	0.0063
152	0.0098	0.0034	0.0064
153	0.0101	0.0035	0.0066
154	0.0102	0.0035	0.0067
155	0.0105	0.0036	0.0068
156	0.0106	0.0037	0.0069
157	0.0109	0.0038	0.0071
158	0.0111	0.0038	0.0072
159	0.0114	0.0039	0.0074
160	0.0116	0.0040	0.0076
161	0.0119	0.0041	0.0078
162	0.0121	0.0042	0.0079
163	0.0125	0.0043	0.0082
164	0.0128	0.0044	0.0083
165	0.0132	0.0046	0.0086
166	0.0135	0.0047	0.0088
167	0.0140	0.0049	0.0091
168	0.0143	0.0049	0.0093
169	0.0113	0.0039	0.0074
170	0.0116	0.0040	0.0076
171	0.0122	0.0042	0.0080
172	0.0125	0.0043	0.0082
173	0.0132	0.0046	0.0086
174	0.0135	0.0047	0.0088
175	0.0144	0.0050	0.0094
176	0.0148	0.0051	0.0097
177	0.0159	0.0055	0.0104
178	0.0164	0.0057	0.0107
179	0.0177	0.0061	0.0116
180	0.0185	0.0064	0.0121
181	0.0202	0.0070	0.0132
182	0.0212	0.0073	0.0138
183	0.0235	0.0081	0.0154
184	0.0249	0.0086	0.0163
185	0.0705	0.0218	0.0487
186	0.0740	0.0218	0.0522
187	0.0829	0.0218	0.0611
188	0.0886	0.0218	0.0668
189	0.1217	0.0218	0.0999
190	0.1334	0.0218	0.1116
191	0.1750	0.0218	0.1532
192	0.2228	0.0218	0.2010
193	0.4868	0.0218	0.4650
194	0.1498	0.0218	0.1280
195	0.0957	0.0218	0.0739
196	0.0781	0.0218	0.0563
197	0.0265	0.0092	0.0173
198	0.0223	0.0077	0.0145
199	0.0193	0.0067	0.0126
200	0.0170	0.0059	0.0111
201	0.0153	0.0053	0.0100
202	0.0139	0.0048	0.0091
203	0.0128	0.0044	0.0084
204	0.0119	0.0041	0.0078
205	0.0146	0.0051	0.0095

206	0.0137	0.0048	0.0090
207	0.0130	0.0045	0.0085
208	0.0123	0.0043	0.0081
209	0.0117	0.0041	0.0077
210	0.0112	0.0039	0.0073
211	0.0108	0.0037	0.0070
212	0.0103	0.0036	0.0067
213	0.0099	0.0034	0.0065
214	0.0096	0.0033	0.0063
215	0.0093	0.0032	0.0060
216	0.0089	0.0031	0.0058
217	0.0125	0.0043	0.0082
218	0.0122	0.0042	0.0079
219	0.0118	0.0041	0.0077
220	0.0116	0.0040	0.0076
221	0.0113	0.0039	0.0074
222	0.0110	0.0038	0.0072
223	0.0108	0.0037	0.0071
224	0.0106	0.0037	0.0069
225	0.0104	0.0036	0.0068
226	0.0102	0.0035	0.0066
227	0.0100	0.0035	0.0065
228	0.0098	0.0034	0.0064
229	0.0096	0.0033	0.0063
230	0.0094	0.0033	0.0062
231	0.0093	0.0032	0.0061
232	0.0091	0.0032	0.0060
233	0.0090	0.0031	0.0059
234	0.0088	0.0031	0.0058
235	0.0087	0.0030	0.0057
236	0.0086	0.0030	0.0056
237	0.0084	0.0029	0.0055
238	0.0083	0.0029	0.0054
239	0.0082	0.0028	0.0054
240	0.0081	0.0028	0.0053
241	0.0080	0.0028	0.0052
242	0.0079	0.0027	0.0051
243	0.0078	0.0027	0.0051
244	0.0077	0.0027	0.0050
245	0.0076	0.0026	0.0049
246	0.0075	0.0026	0.0049
247	0.0074	0.0026	0.0048
248	0.0073	0.0025	0.0048
249	0.0072	0.0025	0.0047
250	0.0071	0.0025	0.0047
251	0.0070	0.0024	0.0046
252	0.0070	0.0024	0.0046
253	0.0069	0.0024	0.0045
254	0.0068	0.0024	0.0045
255	0.0068	0.0023	0.0044
256	0.0067	0.0023	0.0044
257	0.0066	0.0023	0.0043
258	0.0065	0.0023	0.0043
259	0.0065	0.0022	0.0042
260	0.0064	0.0022	0.0042
261	0.0064	0.0022	0.0042
262	0.0063	0.0022	0.0041
263	0.0062	0.0022	0.0041
264	0.0062	0.0021	0.0040
265	0.0061	0.0021	0.0040
266	0.0061	0.0021	0.0040
267	0.0060	0.0021	0.0039
268	0.0060	0.0021	0.0039

269	0.0059	0.0021	0.0039
270	0.0059	0.0020	0.0038
271	0.0058	0.0020	0.0038
272	0.0058	0.0020	0.0038
273	0.0057	0.0020	0.0037
274	0.0057	0.0020	0.0037
275	0.0056	0.0020	0.0037
276	0.0056	0.0019	0.0036
277	0.0055	0.0019	0.0036
278	0.0055	0.0019	0.0036
279	0.0055	0.0019	0.0036
280	0.0054	0.0019	0.0035
281	0.0054	0.0019	0.0035
282	0.0053	0.0019	0.0035
283	0.0053	0.0018	0.0035
284	0.0053	0.0018	0.0034
285	0.0052	0.0018	0.0034
286	0.0052	0.0018	0.0034
287	0.0052	0.0018	0.0034
288	0.0051	0.0018	0.0033

Total soil rain loss = 1.10(In)
Total effective rainfall = 3.09(In)
Peak flow rate in flood hydrograph = 25.92(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	7.5	15.0	22.5	30.0
0+ 5	0.0001	0.01 Q					
0+10	0.0004	0.05 Q					
0+15	0.0015	0.16 Q					
0+20	0.0031	0.24 Q					
0+25	0.0051	0.28 Q					
0+30	0.0072	0.31 Q					
0+35	0.0095	0.33 Q					
0+40	0.0118	0.35 Q					
0+45	0.0143	0.36 Q					
0+50	0.0169	0.37 Q					
0+55	0.0195	0.38 Q					
1+ 0	0.0221	0.39 Q					
1+ 5	0.0248	0.39 Q					
1+10	0.0276	0.40 Q					
1+15	0.0303	0.40 Q					
1+20	0.0332	0.41 Q					
1+25	0.0360	0.41 Q					
1+30	0.0388	0.41 Q					
1+35	0.0417	0.42 Q					
1+40	0.0446	0.42 Q					
1+45	0.0475	0.42 Q					
1+50	0.0504	0.43 Q					
1+55	0.0534	0.43 Q					
2+ 0	0.0563	0.43 Q					
2+ 5	0.0593	0.43 Q					
2+10	0.0623	0.43 Q					
2+15	0.0653	0.43 QV					
2+20	0.0683	0.44 QV					

2+25	0.0713	0.44	QV	|	|	|	|
2+30	0.0743	0.44	QV	|	|	|	|
2+35	0.0774	0.44	QV	|	|	|	|
2+40	0.0804	0.44	QV	|	|	|	|
2+45	0.0835	0.44	QV	|	|	|	|
2+50	0.0865	0.45	QV	|	|	|	|
2+55	0.0896	0.45	QV	|	|	|	|
3+ 0	0.0927	0.45	QV	|	|	|	|
3+ 5	0.0958	0.45	QV	|	|	|	|
3+10	0.0990	0.45	QV	|	|	|	|
3+15	0.1021	0.46	QV	|	|	|	|
3+20	0.1053	0.46	QV	|	|	|	|
3+25	0.1084	0.46	QV	|	|	|	|
3+30	0.1116	0.46	QV	|	|	|	|
3+35	0.1148	0.46	QV	|	|	|	|
3+40	0.1180	0.47	QV	|	|	|	|
3+45	0.1212	0.47	QV	|	|	|	|
3+50	0.1244	0.47	QV	|	|	|	|
3+55	0.1277	0.47	QV	|	|	|	|
4+ 0	0.1309	0.47	Q V	|	|	|	|
4+ 5	0.1342	0.48	Q V	|	|	|	|
4+10	0.1375	0.48	Q V	|	|	|	|
4+15	0.1408	0.48	Q V	|	|	|	|
4+20	0.1441	0.48	Q V	|	|	|	|
4+25	0.1475	0.48	Q V	|	|	|	|
4+30	0.1508	0.49	Q V	|	|	|	|
4+35	0.1542	0.49	Q V	|	|	|	|
4+40	0.1575	0.49	Q V	|	|	|	|
4+45	0.1609	0.49	Q V	|	|	|	|
4+50	0.1643	0.50	Q V	|	|	|	|
4+55	0.1678	0.50	Q V	|	|	|	|
5+ 0	0.1712	0.50	Q V	|	|	|	|
5+ 5	0.1747	0.50	Q V	|	|	|	|
5+10	0.1781	0.50	Q V	|	|	|	|
5+15	0.1816	0.51	Q V	|	|	|	|
5+20	0.1851	0.51	Q V	|	|	|	|
5+25	0.1887	0.51	Q V	|	|	|	|
5+30	0.1922	0.51	Q V	|	|	|	|
5+35	0.1958	0.52	Q V	|	|	|	|
5+40	0.1993	0.52	Q V	|	|	|	|
5+45	0.2029	0.52	Q V	|	|	|	|
5+50	0.2066	0.52	Q V	|	|	|	|
5+55	0.2102	0.53	Q V	|	|	|	|
6+ 0	0.2138	0.53	Q V	|	|	|	|
6+ 5	0.2175	0.53	Q V	|	|	|	|
6+10	0.2212	0.54	Q V	|	|	|	|
6+15	0.2249	0.54	Q V	|	|	|	|
6+20	0.2287	0.54	Q V	|	|	|	|
6+25	0.2324	0.54	Q V	|	|	|	|
6+30	0.2362	0.55	Q V	|	|	|	|
6+35	0.2400	0.55	Q V	|	|	|	|
6+40	0.2438	0.55	Q V	|	|	|	|
6+45	0.2476	0.56	Q V	|	|	|	|
6+50	0.2515	0.56	Q V	|	|	|	|
6+55	0.2554	0.56	Q V	|	|	|	|
7+ 0	0.2593	0.57	Q V	|	|	|	|
7+ 5	0.2632	0.57	Q V	|	|	|	|
7+10	0.2671	0.57	Q V	|	|	|	|
7+15	0.2711	0.58	Q V	|	|	|	|
7+20	0.2751	0.58	Q V	|	|	|	|
7+25	0.2791	0.58	Q V	|	|	|	|
7+30	0.2831	0.59	Q V	|	|	|	|
7+35	0.2872	0.59	Q V	|	|	|	|

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 7+40       0.2913      0.59  Q   V     |           |           |           |
 7+45       0.2954      0.60  Q   V     |           |           |           |
 7+50       0.2996      0.60  Q   V     |           |           |           |
 7+55       0.3037      0.61  Q   V     |           |           |           |
 8+ 0       0.3079      0.61  Q   V     |           |           |           |
 8+ 5       0.3122      0.61  Q   V     |           |           |           |
 8+10       0.3164      0.62  Q   V     |           |           |           |
 8+15       0.3207      0.62  Q   V     |           |           |           |
 8+20       0.3250      0.63  Q    V    |           |           |           |
 8+25       0.3293      0.63  Q    V    |           |           |           |
 8+30       0.3337      0.63  Q    V    |           |           |           |
 8+35       0.3381      0.64  Q    V    |           |           |           |
 8+40       0.3425      0.64  Q    V    |           |           |           |
 8+45       0.3470      0.65  Q    V    |           |           |           |
 8+50       0.3515      0.65  Q    V    |           |           |           |
 8+55       0.3560      0.66  Q    V    |           |           |           |
 9+ 0       0.3606      0.66  Q    V    |           |           |           |
 9+ 5       0.3651      0.67  Q    V    |           |           |           |
 9+10       0.3698      0.67  Q    V    |           |           |           |
 9+15       0.3744      0.68  Q    V    |           |           |           |
 9+20       0.3791      0.68  Q    V    |           |           |           |
 9+25       0.3839      0.69  Q    V    |           |           |           |
 9+30       0.3886      0.69  Q     V   |           |           |           |
 9+35       0.3934      0.70  Q     V   |           |           |           |
 9+40       0.3983      0.70  Q     V   |           |           |           |
 9+45       0.4032      0.71  Q     V   |           |           |           |
 9+50       0.4081      0.71  Q     V   |           |           |           |
 9+55       0.4130      0.72  Q     V   |           |           |           |
10+ 0       0.4180      0.73  Q     V   |           |           |           |
10+ 5       0.4231      0.73  Q     V   |           |           |           |
10+10       0.4282      0.74  Q     V   |           |           |           |
10+15       0.4333      0.75  Q     V   |           |           |           |
10+20       0.4385      0.75  |Q    V   |           |           |           |
10+25       0.4437      0.76  |Q    V   |           |           |           |
10+30       0.4490      0.77  |Q    V   |           |           |           |
10+35       0.4543      0.77  |Q     V  |           |           |           |
10+40       0.4597      0.78  |Q     V  |           |           |           |
10+45       0.4652      0.79  |Q     V  |           |           |           |
10+50       0.4706      0.80  |Q     V  |           |           |           |
10+55       0.4762      0.80  |Q     V  |           |           |           |
11+ 0       0.4818      0.81  |Q     V  |           |           |           |
11+ 5       0.4874      0.82  |Q     V  |           |           |           |
11+10       0.4931      0.83  |Q     V  |           |           |           |
11+15       0.4989      0.84  |Q     V  |           |           |           |
11+20       0.5047      0.85  |Q     V  |           |           |           |
11+25       0.5106      0.86  |Q     V  |           |           |           |
11+30       0.5166      0.86  |Q      V |           |           |           |
11+35       0.5226      0.87  |Q      V |           |           |           |
11+40       0.5287      0.88  |Q      V |           |           |           |
11+45       0.5348      0.89  |Q      V |           |           |           |
11+50       0.5411      0.91  |Q      V |           |           |           |
11+55       0.5474      0.92  |Q      V |           |           |           |
12+ 0       0.5538      0.93  |Q      V |           |           |           |
12+ 5       0.5602      0.93  |Q      V |           |           |           |
12+10       0.5665      0.91  |Q      V |           |           |           |
12+15       0.5723      0.84  |Q      V |           |           |           |
12+20       0.5778      0.80  |Q      V |           |           |           |
12+25       0.5831      0.78  |Q       V|           |           |           |
12+30       0.5884      0.77  |Q       V|           |           |           |
12+35       0.5937      0.77  |Q       V|           |           |           |
12+40       0.5990      0.77  |Q       V|           |           |           |
12+45       0.6043      0.77  |Q       V|           |           |           |
12+50       0.6096      0.78  |Q       V|           |           |           |
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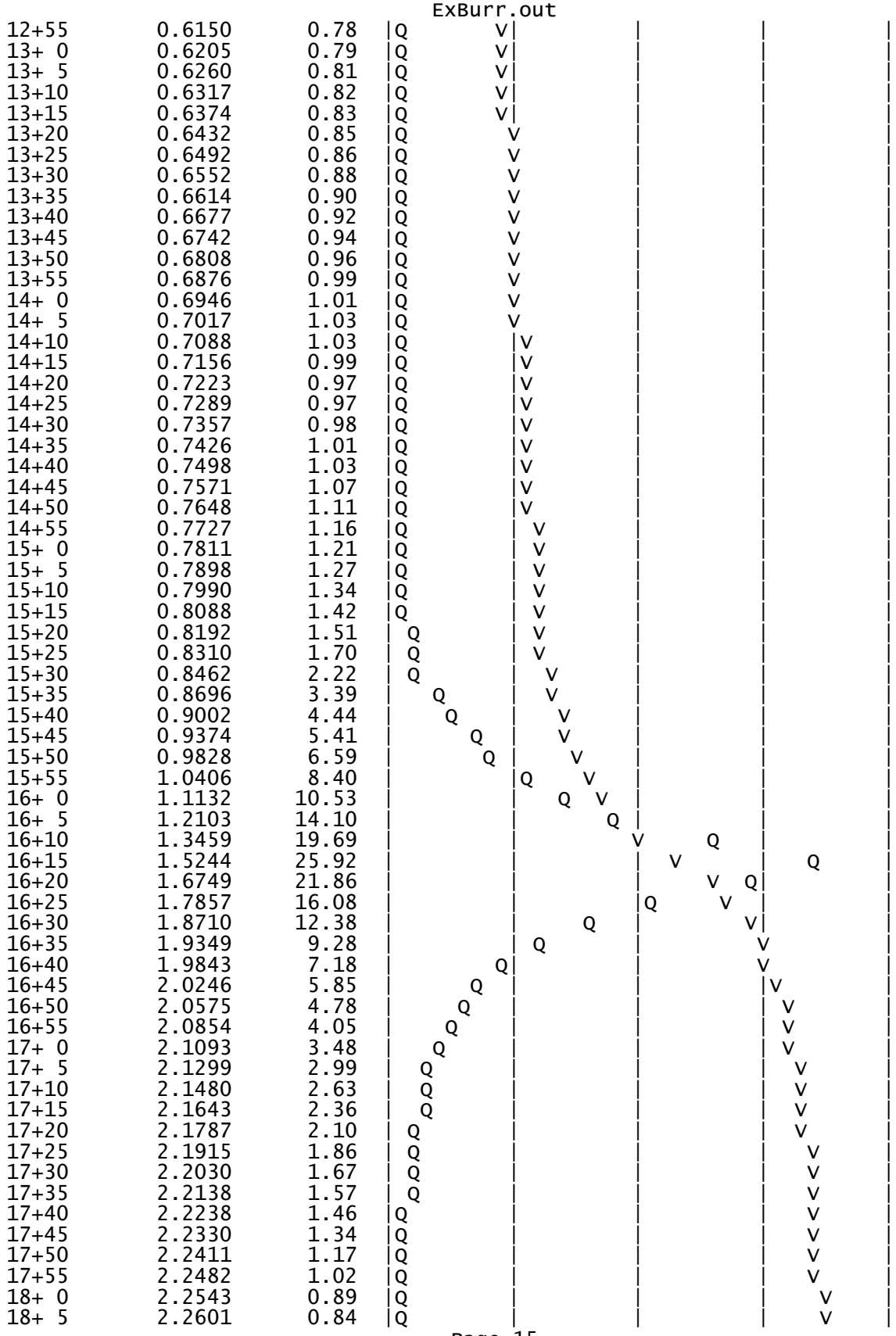

12+55	0.6150	0.78	
13+ 0	0.6205	0.79	
13+ 5	0.6260	0.81	
13+10	0.6317	0.82	
13+15	0.6374	0.83	
13+20	0.6432	0.85	
13+25	0.6492	0.86	
13+30	0.6552	0.88	
13+35	0.6614	0.90	
13+40	0.6677	0.92	
13+45	0.6742	0.94	
13+50	0.6808	0.96	
13+55	0.6876	0.99	
14+ 0	0.6946	1.01	
14+ 5	0.7017	1.03	
14+10	0.7088	1.03	
14+15	0.7156	0.99	
14+20	0.7223	0.97	
14+25	0.7289	0.97	
14+30	0.7357	0.98	
14+35	0.7426	1.01	
14+40	0.7498	1.03	
14+45	0.7571	1.07	
14+50	0.7648	1.11	
14+55	0.7727	1.16	
15+ 0	0.7811	1.21	
15+ 5	0.7898	1.27	
15+10	0.7990	1.34	
15+15	0.8088	1.42	
15+20	0.8192	1.51	
15+25	0.8310	1.70	
15+30	0.8462	2.22	
15+35	0.8696	3.39	
15+40	0.9002	4.44	
15+45	0.9374	5.41	
15+50	0.9828	6.59	
15+55	1.0406	8.40	
16+ 0	1.1132	10.53	
16+ 5	1.2103	14.10	
16+10	1.3459	19.69	
16+15	1.5244	25.92	
16+20	1.6749	21.86	
16+25	1.7857	16.08	
16+30	1.8710	12.38	
16+35	1.9349	9.28	
16+40	1.9843	7.18	
16+45	2.0246	5.85	
16+50	2.0575	4.78	
16+55	2.0854	4.05	
17+ 0	2.1093	3.48	
17+ 5	2.1299	2.99	
17+10	2.1480	2.63	
17+15	2.1643	2.36	
17+20	2.1787	2.10	
17+25	2.1915	1.86	
17+30	2.2030	1.67	
17+35	2.2138	1.57	
17+40	2.2238	1.46	
17+45	2.2330	1.34	
17+50	2.2411	1.17	
17+55	2.2482	1.02	
18+ 0	2.2543	0.89	
18+ 5	2.2601	0.84	

18+10	2.2658	0.82	|Q	|	|	|	V |
18+15	2.2718	0.87	|Q	|	|	|	V |
18+20	2.2780	0.90	|Q	|	|	|	V |
18+25	2.2842	0.91	|Q	|	|	|	V |
18+30	2.2904	0.90	|Q	|	|	|	V |
18+35	2.2965	0.89	|Q	|	|	|	V |
18+40	2.3026	0.88	|Q	|	|	|	V |
18+45	2.3086	0.87	|Q	|	|	|	V |
18+50	2.3145	0.86	|Q	|	|	|	V |
18+55	2.3203	0.84	|Q	|	|	|	V |
19+ 0	2.3260	0.83	|Q	|	|	|	V |
19+ 5	2.3316	0.81	|Q	|	|	|	V |
19+10	2.3371	0.80	|Q	|	|	|	V |
19+15	2.3425	0.79	|Q	|	|	|	V |
19+20	2.3479	0.77	|Q	|	|	|	V |
19+25	2.3531	0.76	|Q	|	|	|	V |
19+30	2.3583	0.75	Q	|	|	|	V |
19+35	2.3633	0.74	Q	|	|	|	V |
19+40	2.3683	0.72	Q	|	|	|	V |
19+45	2.3733	0.71	Q	|	|	|	V |
19+50	2.3781	0.70	Q	|	|	|	V |
19+55	2.3829	0.69	Q	|	|	|	V |
20+ 0	2.3876	0.68	Q	|	|	|	V |
20+ 5	2.3922	0.67	Q	|	|	|	V |
20+10	2.3967	0.66	Q	|	|	|	V |
20+15	2.4012	0.65	Q	|	|	|	V |
20+20	2.4057	0.64	Q	|	|	|	V |
20+25	2.4100	0.63	Q	|	|	|	V |
20+30	2.4143	0.63	Q	|	|	|	V |
20+35	2.4186	0.62	Q	|	|	|	V |
20+40	2.4228	0.61	Q	|	|	|	V |
20+45	2.4269	0.60	Q	|	|	|	V |
20+50	2.4310	0.59	Q	|	|	|	V |
20+55	2.4350	0.59	Q	|	|	|	V |
21+ 0	2.4390	0.58	Q	|	|	|	V |
21+ 5	2.4430	0.57	Q	|	|	|	V |
21+10	2.4469	0.57	Q	|	|	|	V |
21+15	2.4507	0.56	Q	|	|	|	V |
21+20	2.4545	0.55	Q	|	|	|	V |
21+25	2.4583	0.55	Q	|	|	|	V |
21+30	2.4620	0.54	Q	|	|	|	V |
21+35	2.4657	0.54	Q	|	|	|	V |
21+40	2.4693	0.53	Q	|	|	|	V |
21+45	2.4730	0.52	Q	|	|	|	V |
21+50	2.4765	0.52	Q	|	|	|	V |
21+55	2.4801	0.51	Q	|	|	|	V |
22+ 0	2.4836	0.51	Q	|	|	|	V |
22+ 5	2.4870	0.50	Q	|	|	|	V |
22+10	2.4905	0.50	Q	|	|	|	V |
22+15	2.4939	0.49	Q	|	|	|	V |
22+20	2.4973	0.49	Q	|	|	|	V |
22+25	2.5006	0.49	Q	|	|	|	V |
22+30	2.5039	0.48	Q	|	|	|	V |
22+35	2.5072	0.48	Q	|	|	|	V|
22+40	2.5105	0.47	Q	|	|	|	V|
22+45	2.5137	0.47	Q	|	|	|	V|
22+50	2.5169	0.46	Q	|	|	|	V|
22+55	2.5201	0.46	Q	|	|	|	V|
23+ 0	2.5232	0.46	Q	|	|	|	V|
23+ 5	2.5263	0.45	Q	|	|	|	V|
23+10	2.5294	0.45	Q	|	|	|	V|
23+15	2.5325	0.45	Q	|	|	|	V|
23+20	2.5355	0.44	Q	|	|	|	V|

23+25	2.5386	0.44	Q	|	|	|	V|
23+30	2.5416	0.44	Q	|	|	|	V|
23+35	2.5445	0.43	Q	|	|	|	V|
23+40	2.5475	0.43	Q	|	|	|	V|
23+45	2.5504	0.43	Q	|	|	|	V|
23+50	2.5533	0.42	Q	|	|	|	V|
23+55	2.5562	0.42	Q	|	|	|	V|
24+ 0	2.5591	0.42	Q	|	|	|	V|
24+ 5	2.5619	0.40	Q	|	|	|	V|
24+10	2.5644	0.36	Q	|	|	|	V|
24+15	2.5661	0.25	Q	|	|	|	V|
24+20	2.5672	0.17	Q	|	|	|	V|
24+25	2.5681	0.13	Q	|	|	|	V|
24+30	2.5688	0.10	Q	|	|	|	V|
24+35	2.5693	0.08	Q	|	|	|	V|
24+40	2.5698	0.06	Q	|	|	|	V|
24+45	2.5701	0.05	Q	|	|	|	V|
24+50	2.5704	0.04	Q	|	|	|	V|
24+55	2.5706	0.03	Q	|	|	|	V|
25+ 0	2.5708	0.03	Q	|	|	|	V|
25+ 5	2.5709	0.02	Q	|	|	|	V|
25+10	2.5710	0.02	Q	|	|	|	V|
25+15	2.5711	0.01	Q	|	|	|	V|
25+20	2.5712	0.01	Q	|	|	|	V|
25+25	2.5713	0.01	Q	|	|	|	V|
25+30	2.5713	0.01	Q	|	|	|	V|
25+35	2.5713	0.00	Q	|	|	|	V|
25+40	2.5714	0.00	Q	|	|	|	V|
25+45	2.5714	0.00	Q	|	|	|	V|
25+50	2.5714	0.00	Q	|	|	|	V

CIVILDESIGN UNIT HYDROGRAPH METHOD PROPOSED ANALYSIS

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

Study date 07/02/15

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

Program License Serial Number 6296

BURRTEC WASTE TRANSFER STATION
WEST BASIN - DRAINAGE A
100-YR, 24-HR

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 100		
3.39	1	1.78
Rainfall data for year 100		
3.39	6	2.58
Rainfall data for year 100		
3.39	24	4.19

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
59.6	78.7	3.39	1.000	0.392	0.093	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
0.32	0.093	59.6	78.7	2.71	0.500
3.07	0.907	98.0	98.0	0.20	0.944

Area-averaged catchment yield fraction, Y = 0.903
Area-averaged low loss fraction, Yb = 0.097
User entry of time of concentration = 0.158 (hours)
++
Watershed area = 3.39(Ac.)
Catchment Lag time = 0.126 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 66.0118
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.036(In/Hr)
Average low loss rate fraction (Yb) = 0.097 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.487(In)
Computed peak 30-minute rainfall = 1.290(In)
Specified peak 1-hour rainfall = 1.780(In)
Computed peak 3-hour rainfall = 2.180(In)
Specified peak 6-hour rainfall = 2.580(In)
Specified peak 24-hour rainfall = 4.190(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 3.39(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.487(In)
30-minute factor = 1.000 Adjusted rainfall = 1.290(In)
1-hour factor = 1.000 Adjusted rainfall = 1.780(In)
3-hour factor = 1.000 Adjusted rainfall = 2.180(In)
6-hour factor = 1.000 Adjusted rainfall = 2.580(In)
24-hour factor = 1.000 Adjusted rainfall = 4.190(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 = 41.00 (CFS))	
1	6.827	2.799
2	47.161	16.536
3	71.552	9.999
4	82.101	4.325
5	88.312	2.546
6	92.190	1.590
7	94.879	1.102
8	96.724	0.757
9	97.882	0.475
10	98.626	0.305
11	99.388	0.312
12	100.000	0.251

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4869	0.4869
2	0.7098	0.2229
3	0.8848	0.1750
4	1.0346	0.1498
5	1.1681	0.1334

6	1.2898	0.1217
7	1.3855	0.0957
8	1.4742	0.0887
9	1.5571	0.0829
10	1.6352	0.0781
11	1.7092	0.0740
12	1.7797	0.0705
13	1.8062	0.0265
14	1.8311	0.0249
15	1.8546	0.0235
16	1.8768	0.0222
17	1.8979	0.0211
18	1.9181	0.0201
19	1.9373	0.0192
20	1.9558	0.0184
21	1.9734	0.0177
22	1.9905	0.0170
23	2.0069	0.0164
24	2.0227	0.0158
25	2.0380	0.0153
26	2.0528	0.0148
27	2.0672	0.0144
28	2.0811	0.0139
29	2.0946	0.0135
30	2.1078	0.0132
31	2.1206	0.0128
32	2.1331	0.0125
33	2.1452	0.0122
34	2.1571	0.0119
35	2.1686	0.0116
36	2.1800	0.0113
37	2.1945	0.0146
38	2.2088	0.0143
39	2.2228	0.0140
40	2.2365	0.0137
41	2.2500	0.0135
42	2.2632	0.0132
43	2.2762	0.0130
44	2.2889	0.0128
45	2.3015	0.0125
46	2.3138	0.0123
47	2.3259	0.0121
48	2.3378	0.0119
49	2.3496	0.0117
50	2.3612	0.0116
51	2.3725	0.0114
52	2.3838	0.0112
53	2.3948	0.0111
54	2.4057	0.0109
55	2.4165	0.0108
56	2.4271	0.0106
57	2.4376	0.0105
58	2.4479	0.0103
59	2.4581	0.0102
60	2.4681	0.0101
61	2.4781	0.0099
62	2.4879	0.0098
63	2.4976	0.0097
64	2.5072	0.0096
65	2.5166	0.0095
66	2.5260	0.0094
67	2.5352	0.0092
68	2.5444	0.0091

69	2.5534	0.0090
70	2.5624	0.0089
71	2.5712	0.0088
72	2.5800	0.0088
73	2.5925	0.0125
74	2.6048	0.0124
75	2.6171	0.0123
76	2.6292	0.0122
77	2.6413	0.0120
78	2.6532	0.0119
79	2.6651	0.0118
80	2.6768	0.0118
81	2.6885	0.0117
82	2.7001	0.0116
83	2.7115	0.0115
84	2.7229	0.0114
85	2.7342	0.0113
86	2.7454	0.0112
87	2.7565	0.0111
88	2.7676	0.0110
89	2.7785	0.0110
90	2.7894	0.0109
91	2.8002	0.0108
92	2.8109	0.0107
93	2.8216	0.0106
94	2.8322	0.0106
95	2.8427	0.0105
96	2.8531	0.0104
97	2.8635	0.0104
98	2.8738	0.0103
99	2.8840	0.0102
100	2.8941	0.0102
101	2.9042	0.0101
102	2.9143	0.0100
103	2.9242	0.0100
104	2.9341	0.0099
105	2.9440	0.0098
106	2.9537	0.0098
107	2.9635	0.0097
108	2.9731	0.0097
109	2.9827	0.0096
110	2.9923	0.0095
111	3.0017	0.0095
112	3.0112	0.0094
113	3.0205	0.0094
114	3.0299	0.0093
115	3.0391	0.0093
116	3.0484	0.0092
117	3.0575	0.0092
118	3.0666	0.0091
119	3.0757	0.0091
120	3.0847	0.0090
121	3.0937	0.0090
122	3.1026	0.0089
123	3.1115	0.0089
124	3.1203	0.0088
125	3.1291	0.0088
126	3.1378	0.0087
127	3.1465	0.0087
128	3.1552	0.0086
129	3.1638	0.0086
130	3.1723	0.0086
131	3.1808	0.0085

132	3.1893	0.0085
133	3.1977	0.0084
134	3.2061	0.0084
135	3.2145	0.0083
136	3.2228	0.0083
137	3.2310	0.0083
138	3.2393	0.0082
139	3.2475	0.0082
140	3.2556	0.0082
141	3.2637	0.0081
142	3.2718	0.0081
143	3.2799	0.0080
144	3.2879	0.0080
145	3.2958	0.0080
146	3.3038	0.0079
147	3.3117	0.0079
148	3.3195	0.0079
149	3.3274	0.0078
150	3.3351	0.0078
151	3.3429	0.0078
152	3.3506	0.0077
153	3.3583	0.0077
154	3.3660	0.0077
155	3.3736	0.0076
156	3.3812	0.0076
157	3.3888	0.0076
158	3.3963	0.0075
159	3.4038	0.0075
160	3.4113	0.0075
161	3.4187	0.0074
162	3.4262	0.0074
163	3.4335	0.0074
164	3.4409	0.0074
165	3.4482	0.0073
166	3.4555	0.0073
167	3.4628	0.0073
168	3.4700	0.0072
169	3.4772	0.0072
170	3.4844	0.0072
171	3.4916	0.0072
172	3.4987	0.0071
173	3.5058	0.0071
174	3.5129	0.0071
175	3.5199	0.0070
176	3.5269	0.0070
177	3.5339	0.0070
178	3.5409	0.0070
179	3.5479	0.0069
180	3.5548	0.0069
181	3.5617	0.0069
182	3.5685	0.0069
183	3.5754	0.0068
184	3.5822	0.0068
185	3.5890	0.0068
186	3.5958	0.0068
187	3.6025	0.0068
188	3.6093	0.0067
189	3.6160	0.0067
190	3.6226	0.0067
191	3.6293	0.0067
192	3.6359	0.0066
193	3.6426	0.0066
194	3.6491	0.0066

195	3.6557	0.0066
196	3.6623	0.0065
197	3.6688	0.0065
198	3.6753	0.0065
199	3.6818	0.0065
200	3.6882	0.0065
201	3.6947	0.0064
202	3.7011	0.0064
203	3.7075	0.0064
204	3.7139	0.0064
205	3.7202	0.0064
206	3.7266	0.0063
207	3.7329	0.0063
208	3.7392	0.0063
209	3.7455	0.0063
210	3.7517	0.0063
211	3.7580	0.0062
212	3.7642	0.0062
213	3.7704	0.0062
214	3.7766	0.0062
215	3.7827	0.0062
216	3.7889	0.0061
217	3.7950	0.0061
218	3.8011	0.0061
219	3.8072	0.0061
220	3.8133	0.0061
221	3.8193	0.0061
222	3.8254	0.0060
223	3.8314	0.0060
224	3.8374	0.0060
225	3.8434	0.0060
226	3.8493	0.0060
227	3.8553	0.0059
228	3.8612	0.0059
229	3.8671	0.0059
230	3.8730	0.0059
231	3.8789	0.0059
232	3.8848	0.0059
233	3.8906	0.0058
234	3.8964	0.0058
235	3.9023	0.0058
236	3.9081	0.0058
237	3.9138	0.0058
238	3.9196	0.0058
239	3.9254	0.0058
240	3.9311	0.0057
241	3.9368	0.0057
242	3.9425	0.0057
243	3.9482	0.0057
244	3.9539	0.0057
245	3.9596	0.0057
246	3.9652	0.0056
247	3.9708	0.0056
248	3.9765	0.0056
249	3.9821	0.0056
250	3.9876	0.0056
251	3.9932	0.0056
252	3.9988	0.0056
253	4.0043	0.0055
254	4.0098	0.0055
255	4.0154	0.0055
256	4.0209	0.0055
257	4.0264	0.0055

258	4.0318	0.0055
259	4.0373	0.0055
260	4.0427	0.0054
261	4.0482	0.0054
262	4.0536	0.0054
263	4.0590	0.0054
264	4.0644	0.0054
265	4.0698	0.0054
266	4.0751	0.0054
267	4.0805	0.0054
268	4.0858	0.0053
269	4.0911	0.0053
270	4.0965	0.0053
271	4.1018	0.0053
272	4.1070	0.0053
273	4.1123	0.0053
274	4.1176	0.0053
275	4.1228	0.0053
276	4.1281	0.0052
277	4.1333	0.0052
278	4.1385	0.0052
279	4.1437	0.0052
280	4.1489	0.0052
281	4.1541	0.0052
282	4.1592	0.0052
283	4.1644	0.0052
284	4.1695	0.0051
285	4.1747	0.0051
286	4.1798	0.0051
287	4.1849	0.0051
288	4.1900	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0005	0.0046
2	0.0051	0.0005	0.0046
3	0.0051	0.0005	0.0046
4	0.0051	0.0005	0.0046
5	0.0052	0.0005	0.0047
6	0.0052	0.0005	0.0047
7	0.0052	0.0005	0.0047
8	0.0052	0.0005	0.0047
9	0.0052	0.0005	0.0047
10	0.0053	0.0005	0.0047
11	0.0053	0.0005	0.0048
12	0.0053	0.0005	0.0048
13	0.0053	0.0005	0.0048
14	0.0053	0.0005	0.0048
15	0.0054	0.0005	0.0048
16	0.0054	0.0005	0.0048
17	0.0054	0.0005	0.0049
18	0.0054	0.0005	0.0049
19	0.0054	0.0005	0.0049
20	0.0054	0.0005	0.0049
21	0.0055	0.0005	0.0049
22	0.0055	0.0005	0.0050
23	0.0055	0.0005	0.0050
24	0.0055	0.0005	0.0050
25	0.0056	0.0005	0.0050
26	0.0056	0.0005	0.0050
27	0.0056	0.0005	0.0051

28	0.0056	0.0005	0.0051
29	0.0056	0.0006	0.0051
30	0.0057	0.0006	0.0051
31	0.0057	0.0006	0.0051
32	0.0057	0.0006	0.0052
33	0.0057	0.0006	0.0052
34	0.0058	0.0006	0.0052
35	0.0058	0.0006	0.0052
36	0.0058	0.0006	0.0052
37	0.0058	0.0006	0.0053
38	0.0058	0.0006	0.0053
39	0.0059	0.0006	0.0053
40	0.0059	0.0006	0.0053
41	0.0059	0.0006	0.0054
42	0.0059	0.0006	0.0054
43	0.0060	0.0006	0.0054
44	0.0060	0.0006	0.0054
45	0.0060	0.0006	0.0054
46	0.0061	0.0006	0.0055
47	0.0061	0.0006	0.0055
48	0.0061	0.0006	0.0055
49	0.0061	0.0006	0.0055
50	0.0062	0.0006	0.0056
51	0.0062	0.0006	0.0056
52	0.0062	0.0006	0.0056
53	0.0063	0.0006	0.0056
54	0.0063	0.0006	0.0057
55	0.0063	0.0006	0.0057
56	0.0063	0.0006	0.0057
57	0.0064	0.0006	0.0058
58	0.0064	0.0006	0.0058
59	0.0064	0.0006	0.0058
60	0.0065	0.0006	0.0058
61	0.0065	0.0006	0.0059
62	0.0065	0.0006	0.0059
63	0.0066	0.0006	0.0059
64	0.0066	0.0006	0.0059
65	0.0066	0.0006	0.0060
66	0.0067	0.0006	0.0060
67	0.0067	0.0007	0.0061
68	0.0067	0.0007	0.0061
69	0.0068	0.0007	0.0061
70	0.0068	0.0007	0.0061
71	0.0068	0.0007	0.0062
72	0.0069	0.0007	0.0062
73	0.0069	0.0007	0.0062
74	0.0069	0.0007	0.0063
75	0.0070	0.0007	0.0063
76	0.0070	0.0007	0.0063
77	0.0071	0.0007	0.0064
78	0.0071	0.0007	0.0064
79	0.0072	0.0007	0.0065
80	0.0072	0.0007	0.0065
81	0.0072	0.0007	0.0065
82	0.0073	0.0007	0.0066
83	0.0073	0.0007	0.0066
84	0.0074	0.0007	0.0066
85	0.0074	0.0007	0.0067
86	0.0074	0.0007	0.0067
87	0.0075	0.0007	0.0068
88	0.0075	0.0007	0.0068
89	0.0076	0.0007	0.0069
90	0.0076	0.0007	0.0069

91	0.0077	0.0008	0.0069
92	0.0077	0.0008	0.0070
93	0.0078	0.0008	0.0070
94	0.0078	0.0008	0.0071
95	0.0079	0.0008	0.0071
96	0.0079	0.0008	0.0072
97	0.0080	0.0008	0.0072
98	0.0080	0.0008	0.0073
99	0.0081	0.0008	0.0073
100	0.0082	0.0008	0.0074
101	0.0082	0.0008	0.0074
102	0.0083	0.0008	0.0075
103	0.0083	0.0008	0.0075
104	0.0084	0.0008	0.0076
105	0.0085	0.0008	0.0076
106	0.0085	0.0008	0.0077
107	0.0086	0.0008	0.0078
108	0.0086	0.0008	0.0078
109	0.0087	0.0009	0.0079
110	0.0088	0.0009	0.0079
111	0.0089	0.0009	0.0080
112	0.0089	0.0009	0.0081
113	0.0090	0.0009	0.0081
114	0.0091	0.0009	0.0082
115	0.0092	0.0009	0.0083
116	0.0092	0.0009	0.0083
117	0.0093	0.0009	0.0084
118	0.0094	0.0009	0.0085
119	0.0095	0.0009	0.0086
120	0.0095	0.0009	0.0086
121	0.0097	0.0009	0.0087
122	0.0097	0.0009	0.0088
123	0.0098	0.0010	0.0089
124	0.0099	0.0010	0.0089
125	0.0100	0.0010	0.0090
126	0.0101	0.0010	0.0091
127	0.0102	0.0010	0.0092
128	0.0103	0.0010	0.0093
129	0.0104	0.0010	0.0094
130	0.0105	0.0010	0.0095
131	0.0106	0.0010	0.0096
132	0.0107	0.0010	0.0097
133	0.0109	0.0011	0.0098
134	0.0110	0.0011	0.0099
135	0.0111	0.0011	0.0100
136	0.0112	0.0011	0.0101
137	0.0114	0.0011	0.0103
138	0.0115	0.0011	0.0104
139	0.0117	0.0011	0.0105
140	0.0118	0.0011	0.0106
141	0.0119	0.0012	0.0108
142	0.0120	0.0012	0.0109
143	0.0123	0.0012	0.0111
144	0.0124	0.0012	0.0112
145	0.0088	0.0009	0.0079
146	0.0088	0.0009	0.0080
147	0.0090	0.0009	0.0082
148	0.0091	0.0009	0.0083
149	0.0094	0.0009	0.0084
150	0.0095	0.0009	0.0085
151	0.0097	0.0009	0.0087
152	0.0098	0.0010	0.0089
153	0.0101	0.0010	0.0091

154	0.0102	0.0010	0.0092
155	0.0105	0.0010	0.0094
156	0.0106	0.0010	0.0096
157	0.0109	0.0011	0.0098
158	0.0111	0.0011	0.0100
159	0.0114	0.0011	0.0103
160	0.0116	0.0011	0.0104
161	0.0119	0.0012	0.0108
162	0.0121	0.0012	0.0109
163	0.0125	0.0012	0.0113
164	0.0128	0.0012	0.0115
165	0.0132	0.0013	0.0119
166	0.0135	0.0013	0.0122
167	0.0140	0.0014	0.0126
168	0.0143	0.0014	0.0129
169	0.0113	0.0011	0.0102
170	0.0116	0.0011	0.0104
171	0.0122	0.0012	0.0110
172	0.0125	0.0012	0.0113
173	0.0132	0.0013	0.0119
174	0.0135	0.0013	0.0122
175	0.0144	0.0014	0.0130
176	0.0148	0.0014	0.0134
177	0.0158	0.0015	0.0143
178	0.0164	0.0016	0.0148
179	0.0177	0.0017	0.0160
180	0.0184	0.0018	0.0166
181	0.0201	0.0020	0.0182
182	0.0211	0.0021	0.0191
183	0.0235	0.0023	0.0212
184	0.0249	0.0024	0.0225
185	0.0705	0.0030	0.0675
186	0.0740	0.0030	0.0710
187	0.0829	0.0030	0.0799
188	0.0887	0.0030	0.0856
189	0.1217	0.0030	0.1187
190	0.1334	0.0030	0.1304
191	0.1750	0.0030	0.1720
192	0.2229	0.0030	0.2198
193	0.4869	0.0030	0.4839
194	0.1498	0.0030	0.1468
195	0.0957	0.0030	0.0927
196	0.0781	0.0030	0.0751
197	0.0265	0.0026	0.0239
198	0.0222	0.0022	0.0201
199	0.0192	0.0019	0.0174
200	0.0170	0.0017	0.0154
201	0.0153	0.0015	0.0138
202	0.0139	0.0014	0.0126
203	0.0128	0.0012	0.0116
204	0.0119	0.0012	0.0107
205	0.0146	0.0014	0.0131
206	0.0137	0.0013	0.0124
207	0.0130	0.0013	0.0117
208	0.0123	0.0012	0.0111
209	0.0117	0.0011	0.0106
210	0.0112	0.0011	0.0101
211	0.0108	0.0010	0.0097
212	0.0103	0.0010	0.0093
213	0.0099	0.0010	0.0090
214	0.0096	0.0009	0.0086
215	0.0092	0.0009	0.0083
216	0.0089	0.0009	0.0081

217	0.0125	0.0012	0.0113
218	0.0122	0.0012	0.0110
219	0.0118	0.0012	0.0107
220	0.0116	0.0011	0.0104
221	0.0113	0.0011	0.0102
222	0.0110	0.0011	0.0100
223	0.0108	0.0011	0.0097
224	0.0106	0.0010	0.0095
225	0.0104	0.0010	0.0094
226	0.0102	0.0010	0.0092
227	0.0100	0.0010	0.0090
228	0.0098	0.0010	0.0088
229	0.0096	0.0009	0.0087
230	0.0094	0.0009	0.0085
231	0.0093	0.0009	0.0084
232	0.0091	0.0009	0.0082
233	0.0090	0.0009	0.0081
234	0.0088	0.0009	0.0080
235	0.0087	0.0008	0.0078
236	0.0086	0.0008	0.0077
237	0.0084	0.0008	0.0076
238	0.0083	0.0008	0.0075
239	0.0082	0.0008	0.0074
240	0.0081	0.0008	0.0073
241	0.0080	0.0008	0.0072
242	0.0079	0.0008	0.0071
243	0.0078	0.0008	0.0070
244	0.0077	0.0007	0.0069
245	0.0076	0.0007	0.0068
246	0.0075	0.0007	0.0067
247	0.0074	0.0007	0.0067
248	0.0073	0.0007	0.0066
249	0.0072	0.0007	0.0065
250	0.0071	0.0007	0.0064
251	0.0070	0.0007	0.0064
252	0.0070	0.0007	0.0063
253	0.0069	0.0007	0.0062
254	0.0068	0.0007	0.0062
255	0.0068	0.0007	0.0061
256	0.0067	0.0007	0.0060
257	0.0066	0.0006	0.0060
258	0.0065	0.0006	0.0059
259	0.0065	0.0006	0.0059
260	0.0064	0.0006	0.0058
261	0.0064	0.0006	0.0057
262	0.0063	0.0006	0.0057
263	0.0062	0.0006	0.0056
264	0.0062	0.0006	0.0056
265	0.0061	0.0006	0.0055
266	0.0061	0.0006	0.0055
267	0.0060	0.0006	0.0054
268	0.0060	0.0006	0.0054
269	0.0059	0.0006	0.0053
270	0.0059	0.0006	0.0053
271	0.0058	0.0006	0.0052
272	0.0058	0.0006	0.0052
273	0.0057	0.0006	0.0052
274	0.0057	0.0006	0.0051
275	0.0056	0.0005	0.0051
276	0.0056	0.0005	0.0050
277	0.0055	0.0005	0.0050
278	0.0055	0.0005	0.0050
279	0.0055	0.0005	0.0049

280	0.0054	0.0005	0.0049
281	0.0054	0.0005	0.0049
282	0.0053	0.0005	0.0048
283	0.0053	0.0005	0.0048
284	0.0053	0.0005	0.0047
285	0.0052	0.0005	0.0047
286	0.0052	0.0005	0.0047
287	0.0052	0.0005	0.0047
288	0.0051	0.0005	0.0046

Total soil rain loss = 0.27(In)
Total effective rainfall = 3.92(In)
Peak flow rate in flood hydrograph = 12.10(CFS)

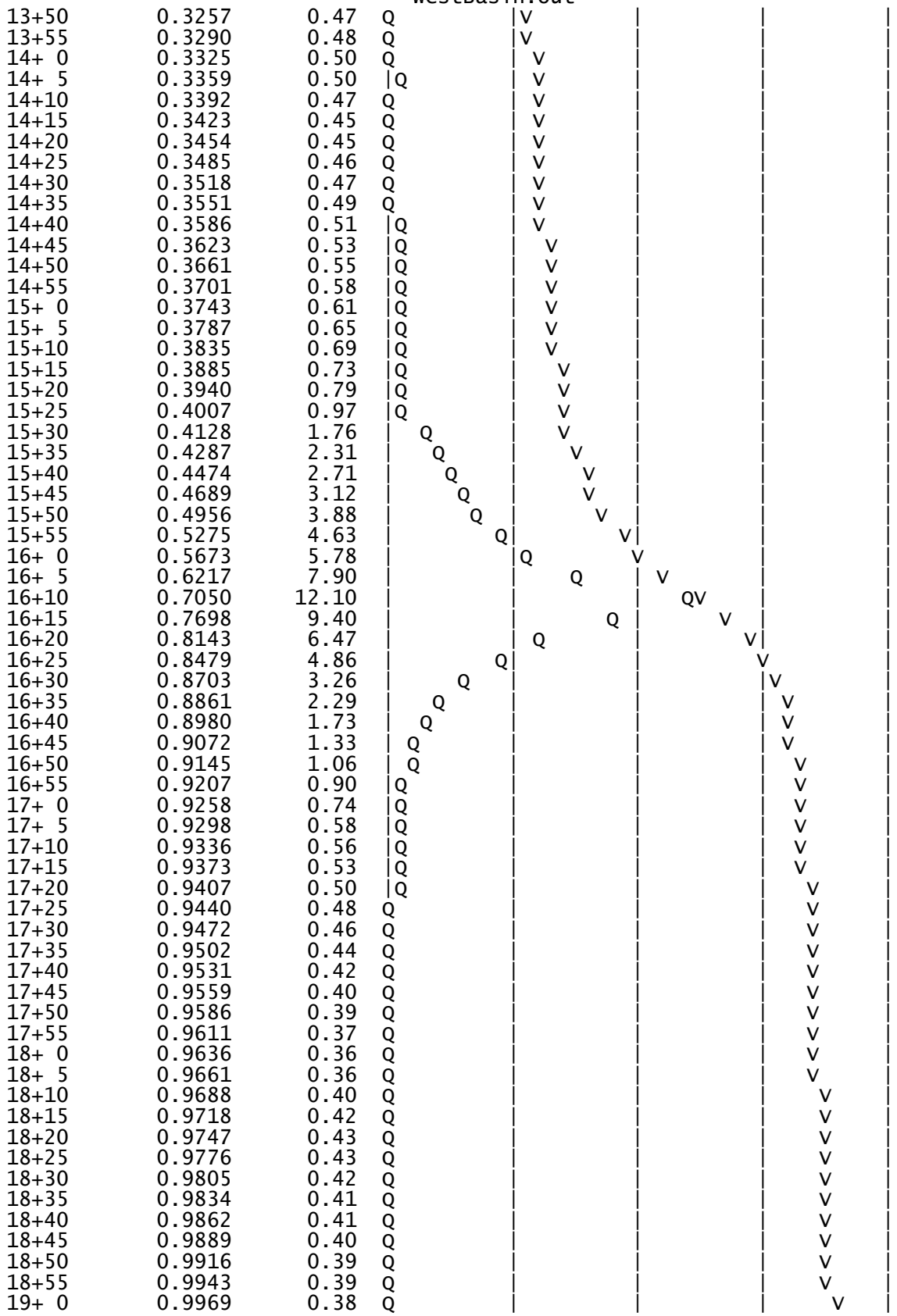
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0001	0.01	Q				
0+10	0.0007	0.09	Q				
0+15	0.0016	0.14	Q				
0+20	0.0027	0.16	Q				
0+25	0.0039	0.17	Q				
0+30	0.0051	0.18	Q				
0+35	0.0063	0.18	Q				
0+40	0.0076	0.19	Q				
0+45	0.0089	0.19	Q				
0+50	0.0102	0.19	Q				
0+55	0.0115	0.19	Q				
1+ 0	0.0129	0.19	Q				
1+ 5	0.0142	0.19	Q				
1+10	0.0156	0.20	Q				
1+15	0.0169	0.20	Q				
1+20	0.0183	0.20	Q				
1+25	0.0196	0.20	Q				
1+30	0.0210	0.20	Q				
1+35	0.0224	0.20	Q				
1+40	0.0237	0.20	Q				
1+45	0.0251	0.20	Q				
1+50	0.0265	0.20	Q				
1+55	0.0279	0.20	QV				
2+ 0	0.0293	0.20	QV				
2+ 5	0.0307	0.20	QV				
2+10	0.0321	0.20	QV				
2+15	0.0335	0.21	QV				
2+20	0.0349	0.21	QV				
2+25	0.0364	0.21	QV				
2+30	0.0378	0.21	QV				
2+35	0.0392	0.21	QV				
2+40	0.0407	0.21	QV				
2+45	0.0421	0.21	QV				
2+50	0.0436	0.21	QV				
2+55	0.0450	0.21	QV				
3+ 0	0.0465	0.21	QV				
3+ 5	0.0480	0.21	QV				
3+10	0.0495	0.21	QV				
3+15	0.0509	0.22	QV				

3+20	0.0524	0.22	QV	|	|	|	|
3+25	0.0539	0.22	QV	|	|	|	|
3+30	0.0554	0.22	Q V	|	|	|	|
3+35	0.0569	0.22	Q V	|	|	|	|
3+40	0.0585	0.22	Q V	|	|	|	|
3+45	0.0600	0.22	Q V	|	|	|	|
3+50	0.0615	0.22	Q V	|	|	|	|
3+55	0.0630	0.22	Q V	|	|	|	|
4+ 0	0.0646	0.22	Q V	|	|	|	|
4+ 5	0.0661	0.22	Q V	|	|	|	|
4+10	0.0677	0.23	Q V	|	|	|	|
4+15	0.0693	0.23	Q V	|	|	|	|
4+20	0.0708	0.23	Q V	|	|	|	|
4+25	0.0724	0.23	Q V	|	|	|	|
4+30	0.0740	0.23	Q V	|	|	|	|
4+35	0.0756	0.23	Q V	|	|	|	|
4+40	0.0772	0.23	Q V	|	|	|	|
4+45	0.0788	0.23	Q V	|	|	|	|
4+50	0.0804	0.23	Q V	|	|	|	|
4+55	0.0820	0.24	Q V	|	|	|	|
5+ 0	0.0837	0.24	Q V	|	|	|	|
5+ 5	0.0853	0.24	Q V	|	|	|	|
5+10	0.0869	0.24	Q V	|	|	|	|
5+15	0.0886	0.24	Q V	|	|	|	|
5+20	0.0903	0.24	Q V	|	|	|	|
5+25	0.0919	0.24	Q V	|	|	|	|
5+30	0.0936	0.24	Q V	|	|	|	|
5+35	0.0953	0.25	Q V	|	|	|	|
5+40	0.0970	0.25	Q V	|	|	|	|
5+45	0.0987	0.25	Q V	|	|	|	|
5+50	0.1004	0.25	Q V	|	|	|	|
5+55	0.1021	0.25	Q V	|	|	|	|
6+ 0	0.1039	0.25	Q V	|	|	|	|
6+ 5	0.1056	0.25	Q V	|	|	|	|
6+10	0.1074	0.25	Q V	|	|	|	|
6+15	0.1091	0.26	Q V	|	|	|	|
6+20	0.1109	0.26	Q V	|	|	|	|
6+25	0.1127	0.26	Q V	|	|	|	|
6+30	0.1144	0.26	Q V	|	|	|	|
6+35	0.1162	0.26	Q V	|	|	|	|
6+40	0.1181	0.26	Q V	|	|	|	|
6+45	0.1199	0.26	Q V	|	|	|	|
6+50	0.1217	0.27	Q V	|	|	|	|
6+55	0.1235	0.27	Q V	|	|	|	|
7+ 0	0.1254	0.27	Q V	|	|	|	|
7+ 5	0.1273	0.27	Q V	|	|	|	|
7+10	0.1291	0.27	Q V	|	|	|	|
7+15	0.1310	0.27	Q V	|	|	|	|
7+20	0.1329	0.28	Q V	|	|	|	|
7+25	0.1348	0.28	Q V	|	|	|	|
7+30	0.1367	0.28	Q V	|	|	|	|
7+35	0.1387	0.28	Q V	|	|	|	|
7+40	0.1406	0.28	Q V	|	|	|	|
7+45	0.1426	0.28	Q V	|	|	|	|
7+50	0.1445	0.29	Q V	|	|	|	|
7+55	0.1465	0.29	Q V	|	|	|	|
8+ 0	0.1485	0.29	Q V	|	|	|	|
8+ 5	0.1505	0.29	Q V	|	|	|	|
8+10	0.1525	0.29	Q V	|	|	|	|
8+15	0.1546	0.30	Q V	|	|	|	|
8+20	0.1566	0.30	Q V	|	|	|	|
8+25	0.1587	0.30	Q V	|	|	|	|
8+30	0.1608	0.30	Q V	|	|	|	|

8+35	0.1629	0.30	Q	V	|	|	|	|
8+40	0.1650	0.31	Q	V	|	|	|	|
8+45	0.1671	0.31	Q	V	|	|	|	|
8+50	0.1692	0.31	Q	V	|	|	|	|
8+55	0.1714	0.31	Q	V	|	|	|	|
9+ 0	0.1735	0.32	Q	V	|	|	|	|
9+ 5	0.1757	0.32	Q	V	|	|	|	|
9+10	0.1779	0.32	Q	V	|	|	|	|
9+15	0.1802	0.32	Q	V	|	|	|	|
9+20	0.1824	0.32	Q	V	|	|	|	|
9+25	0.1846	0.33	Q	V	|	|	|	|
9+30	0.1869	0.33	Q	V	|	|	|	|
9+35	0.1892	0.33	Q	V	|	|	|	|
9+40	0.1915	0.34	Q	V	|	|	|	|
9+45	0.1938	0.34	Q	V	|	|	|	|
9+50	0.1962	0.34	Q	V	|	|	|	|
9+55	0.1986	0.34	Q	V	|	|	|	|
10+ 0	0.2010	0.35	Q	V	|	|	|	|
10+ 5	0.2034	0.35	Q	V	|	|	|	|
10+10	0.2058	0.35	Q	V	|	|	|	|
10+15	0.2082	0.36	Q	V	|	|	|	|
10+20	0.2107	0.36	Q	V	|	|	|	|
10+25	0.2132	0.36	Q	V	|	|	|	|
10+30	0.2157	0.37	Q	V	|	|	|	|
10+35	0.2183	0.37	Q	V	|	|	|	|
10+40	0.2209	0.37	Q	V	|	|	|	|
10+45	0.2235	0.38	Q	V	|	|	|	|
10+50	0.2261	0.38	Q	V	|	|	|	|
10+55	0.2287	0.38	Q	V	|	|	|	|
11+ 0	0.2314	0.39	Q	V	|	|	|	|
11+ 5	0.2341	0.39	Q	V	|	|	|	|
11+10	0.2368	0.40	Q	V	|	|	|	|
11+15	0.2396	0.40	Q	V	|	|	|	|
11+20	0.2424	0.41	Q	V	|	|	|	|
11+25	0.2452	0.41	Q	V	|	|	|	|
11+30	0.2481	0.41	Q	V	|	|	|	|
11+35	0.2510	0.42	Q	V	|	|	|	|
11+40	0.2539	0.42	Q	V	|	|	|	|
11+45	0.2568	0.43	Q	V	|	|	|	|
11+50	0.2598	0.43	Q	V	|	|	|	|
11+55	0.2629	0.44	Q	V	|	|	|	|
12+ 0	0.2659	0.45	Q	V	|	|	|	|
12+ 5	0.2690	0.44	Q	V	|	|	|	|
12+10	0.2717	0.39	Q	V	|	|	|	|
12+15	0.2742	0.36	Q	V	|	|	|	|
12+20	0.2766	0.35	Q	V	|	|	|	|
12+25	0.2790	0.35	Q	V	|	|	|	|
12+30	0.2814	0.35	Q	V	|	|	|	|
12+35	0.2838	0.35	Q	V	|	|	|	|
12+40	0.2863	0.35	Q	V	|	|	|	|
12+45	0.2887	0.36	Q	V	|	|	|	|
12+50	0.2912	0.37	Q	V	|	|	|	|
12+55	0.2938	0.37	Q	V	|	|	|	|
13+ 0	0.2964	0.38	Q	V	|	|	|	|
13+ 5	0.2990	0.38	Q	V	|	|	|	|
13+10	0.3018	0.39	Q	V	|	|	|	|
13+15	0.3045	0.40	Q	|	V	|	|	|
13+20	0.3073	0.41	Q	|	V	|	|	|
13+25	0.3102	0.42	Q	|	V	|	|	|
13+30	0.3132	0.43	Q	|	V	|	|	|
13+35	0.3162	0.44	Q	|	V	|	|	|
13+40	0.3193	0.45	Q	|	V	|	|	|
13+45	0.3224	0.46	Q	|	V	|	|	|



13+50	0.3257	0.47	
13+55	0.3290	0.48	
14+ 0	0.3325	0.50	
14+ 5	0.3359	0.50	
14+10	0.3392	0.47	
14+15	0.3423	0.45	
14+20	0.3454	0.45	
14+25	0.3485	0.46	
14+30	0.3518	0.47	
14+35	0.3551	0.49	
14+40	0.3586	0.51	
14+45	0.3623	0.53	
14+50	0.3661	0.55	
14+55	0.3701	0.58	
15+ 0	0.3743	0.61	
15+ 5	0.3787	0.65	
15+10	0.3835	0.69	
15+15	0.3885	0.73	
15+20	0.3940	0.79	
15+25	0.4007	0.97	
15+30	0.4128	1.76	
15+35	0.4287	2.31	
15+40	0.4474	2.71	
15+45	0.4689	3.12	
15+50	0.4956	3.88	
15+55	0.5275	4.63	
16+ 0	0.5673	5.78	
16+ 5	0.6217	7.90	
16+10	0.7050	12.10	
16+15	0.7698	9.40	
16+20	0.8143	6.47	
16+25	0.8479	4.86	
16+30	0.8703	3.26	
16+35	0.8861	2.29	
16+40	0.8980	1.73	
16+45	0.9072	1.33	
16+50	0.9145	1.06	
16+55	0.9207	0.90	
17+ 0	0.9258	0.74	
17+ 5	0.9298	0.58	
17+10	0.9336	0.56	
17+15	0.9373	0.53	
17+20	0.9407	0.50	
17+25	0.9440	0.48	
17+30	0.9472	0.46	
17+35	0.9502	0.44	
17+40	0.9531	0.42	
17+45	0.9559	0.40	
17+50	0.9586	0.39	
17+55	0.9611	0.37	
18+ 0	0.9636	0.36	
18+ 5	0.9661	0.36	
18+10	0.9688	0.40	
18+15	0.9718	0.42	
18+20	0.9747	0.43	
18+25	0.9776	0.43	
18+30	0.9805	0.42	
18+35	0.9834	0.41	
18+40	0.9862	0.41	
18+45	0.9889	0.40	
18+50	0.9916	0.39	
18+55	0.9943	0.39	
19+ 0	0.9969	0.38	

19+ 5	0.9995	0.37	Q	|	|	|	V |
19+10	1.0020	0.36	Q	|	|	|	V |
19+15	1.0044	0.36	Q	|	|	|	V |
19+20	1.0069	0.35	Q	|	|	|	V |
19+25	1.0092	0.35	Q	|	|	|	V |
19+30	1.0116	0.34	Q	|	|	|	V |
19+35	1.0139	0.33	Q	|	|	|	V |
19+40	1.0161	0.33	Q	|	|	|	V |
19+45	1.0183	0.32	Q	|	|	|	V |
19+50	1.0205	0.32	Q	|	|	|	V |
19+55	1.0227	0.31	Q	|	|	|	V |
20+ 0	1.0248	0.31	Q	|	|	|	V |
20+ 5	1.0269	0.30	Q	|	|	|	V |
20+10	1.0290	0.30	Q	|	|	|	V |
20+15	1.0310	0.30	Q	|	|	|	V |
20+20	1.0330	0.29	Q	|	|	|	V |
20+25	1.0350	0.29	Q	|	|	|	V |
20+30	1.0370	0.28	Q	|	|	|	V |
20+35	1.0389	0.28	Q	|	|	|	V |
20+40	1.0408	0.28	Q	|	|	|	V |
20+45	1.0427	0.27	Q	|	|	|	V |
20+50	1.0446	0.27	Q	|	|	|	V |
20+55	1.0464	0.27	Q	|	|	|	V |
21+ 0	1.0483	0.26	Q	|	|	|	V |
21+ 5	1.0501	0.26	Q	|	|	|	V |
21+10	1.0518	0.26	Q	|	|	|	V |
21+15	1.0536	0.26	Q	|	|	|	V |
21+20	1.0553	0.25	Q	|	|	|	V |
21+25	1.0571	0.25	Q	|	|	|	V |
21+30	1.0588	0.25	Q	|	|	|	V |
21+35	1.0605	0.25	Q	|	|	|	V |
21+40	1.0621	0.24	Q	|	|	|	V |
21+45	1.0638	0.24	Q	|	|	|	V |
21+50	1.0654	0.24	Q	|	|	|	V |
21+55	1.0671	0.24	Q	|	|	|	V |
22+ 0	1.0687	0.23	Q	|	|	|	V |
22+ 5	1.0703	0.23	Q	|	|	|	V |
22+10	1.0718	0.23	Q	|	|	|	V |
22+15	1.0734	0.23	Q	|	|	|	V |
22+20	1.0750	0.23	Q	|	|	|	V |
22+25	1.0765	0.22	Q	|	|	|	V |
22+30	1.0780	0.22	Q	|	|	|	V |
22+35	1.0795	0.22	Q	|	|	|	V|
22+40	1.0810	0.22	Q	|	|	|	V|
22+45	1.0825	0.22	Q	|	|	|	V|
22+50	1.0840	0.21	Q	|	|	|	V|
22+55	1.0855	0.21	Q	|	|	|	V|
23+ 0	1.0869	0.21	Q	|	|	|	V|
23+ 5	1.0883	0.21	Q	|	|	|	V|
23+10	1.0898	0.21	Q	|	|	|	V|
23+15	1.0912	0.21	Q	|	|	|	V|
23+20	1.0926	0.20	Q	|	|	|	V|
23+25	1.0940	0.20	Q	|	|	|	V|
23+30	1.0954	0.20	Q	|	|	|	V|
23+35	1.0967	0.20	Q	|	|	|	V|
23+40	1.0981	0.20	Q	|	|	|	V|
23+45	1.0995	0.20	Q	|	|	|	V|
23+50	1.1008	0.20	Q	|	|	|	V|
23+55	1.1021	0.19	Q	|	|	|	V|
24+ 0	1.1035	0.19	Q	|	|	|	V|
24+ 5	1.1047	0.18	Q	|	|	|	V|
24+10	1.1054	0.10	Q	|	|	|	V|
24+15	1.1058	0.05	Q	|	|	|	V|

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   24+20       1.1060      0.03  Q          |          |          |         V|
   24+25       1.1062      0.02  Q          |          |          |         V|
   24+30       1.1063      0.01  Q          |          |          |         V|
   24+35       1.1063      0.01  Q          |          |          |         V|
   24+40       1.1064      0.01  Q          |          |          |         V|
   24+45       1.1064      0.00  Q          |          |          |         V|
   24+50       1.1064      0.00  Q          |          |          |         V|
   24+55       1.1064      0.00  Q          |          |          |          V
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U n i t H y d r o g r a p h A n a l y s i s

Study date 07/02/15

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

Program License Serial Number 6296

BURRTEC WASTE TRANSFER STATION
EAST BASIN
100-YR, 24-HR

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 100	6.69	1	1.78
Rainfall data for year 100	6.69	6	2.58
Rainfall data for year 100	6.69	24	4.19

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
59.7	78.8	6.69	1.000	0.391	0.092	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
0.62	0.092	59.7	78.8	2.70	0.501
6.07	0.908	98.0	98.0	0.20	0.944

Area-averaged catchment yield fraction, Y = 0.903
Area-averaged low loss fraction, Yb = 0.097
User entry of time of concentration = 0.127 (hours)
++
Watershed area = 6.69(Ac.)
Catchment Lag time = 0.102 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 81.8920
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.036(In/Hr)
Average low loss rate fraction (Yb) = 0.097 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.487(In)
Computed peak 30-minute rainfall = 1.290(In)
Specified peak 1-hour rainfall = 1.780(In)
Computed peak 3-hour rainfall = 2.180(In)
Specified peak 6-hour rainfall = 2.580(In)
Specified peak 24-hour rainfall = 4.190(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 6.69(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.487(In)
30-minute factor = 1.000 Adjusted rainfall = 1.290(In)
1-hour factor = 1.000 Adjusted rainfall = 1.779(In)
3-hour factor = 1.000 Adjusted rainfall = 2.180(In)
6-hour factor = 1.000 Adjusted rainfall = 2.580(In)
24-hour factor = 1.000 Adjusted rainfall = 4.190(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 80.91 (CFS))	
1	11.316	9.155
2	58.518	38.190
3	78.528	16.189
4	87.451	7.220
5	92.430	4.028
6	95.530	2.509
7	97.451	1.554
8	98.479	0.831
9	99.405	0.749
10	100.000	0.482

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4868	0.4868
2	0.7097	0.2228
3	0.8847	0.1750
4	1.0345	0.1498
5	1.1679	0.1334
6	1.2896	0.1217
7	1.3853	0.0957

8	1.4740	0.0886
9	1.5569	0.0829
10	1.6349	0.0781
11	1.7090	0.0740
12	1.7794	0.0705
13	1.8060	0.0265
14	1.8309	0.0249
15	1.8543	0.0235
16	1.8766	0.0222
17	1.8977	0.0211
18	1.9179	0.0201
19	1.9371	0.0193
20	1.9556	0.0184
21	1.9733	0.0177
22	1.9903	0.0170
23	2.0067	0.0164
24	2.0226	0.0158
25	2.0379	0.0153
26	2.0527	0.0148
27	2.0671	0.0144
28	2.0810	0.0139
29	2.0945	0.0135
30	2.1077	0.0132
31	2.1205	0.0128
32	2.1330	0.0125
33	2.1451	0.0122
34	2.1570	0.0119
35	2.1686	0.0116
36	2.1799	0.0113
37	2.1945	0.0146
38	2.2088	0.0143
39	2.2227	0.0140
40	2.2365	0.0137
41	2.2499	0.0135
42	2.2631	0.0132
43	2.2761	0.0130
44	2.2889	0.0128
45	2.3014	0.0125
46	2.3137	0.0123
47	2.3259	0.0121
48	2.3378	0.0119
49	2.3496	0.0117
50	2.3611	0.0116
51	2.3725	0.0114
52	2.3837	0.0112
53	2.3948	0.0111
54	2.4057	0.0109
55	2.4165	0.0108
56	2.4271	0.0106
57	2.4375	0.0105
58	2.4479	0.0103
59	2.4580	0.0102
60	2.4681	0.0101
61	2.4780	0.0099
62	2.4879	0.0098
63	2.4976	0.0097
64	2.5071	0.0096
65	2.5166	0.0095
66	2.5260	0.0094
67	2.5352	0.0092
68	2.5443	0.0091
69	2.5534	0.0090
70	2.5623	0.0089

71	2.5712	0.0088
72	2.5799	0.0088
73	2.5924	0.0125
74	2.6048	0.0124
75	2.6171	0.0123
76	2.6292	0.0122
77	2.6413	0.0120
78	2.6532	0.0119
79	2.6651	0.0118
80	2.6768	0.0118
81	2.6885	0.0117
82	2.7000	0.0116
83	2.7115	0.0115
84	2.7229	0.0114
85	2.7342	0.0113
86	2.7454	0.0112
87	2.7565	0.0111
88	2.7676	0.0110
89	2.7785	0.0110
90	2.7894	0.0109
91	2.8002	0.0108
92	2.8109	0.0107
93	2.8216	0.0107
94	2.8321	0.0106
95	2.8426	0.0105
96	2.8531	0.0104
97	2.8634	0.0104
98	2.8737	0.0103
99	2.8840	0.0102
100	2.8941	0.0102
101	2.9042	0.0101
102	2.9142	0.0100
103	2.9242	0.0100
104	2.9341	0.0099
105	2.9439	0.0098
106	2.9537	0.0098
107	2.9634	0.0097
108	2.9731	0.0097
109	2.9827	0.0096
110	2.9922	0.0095
111	3.0017	0.0095
112	3.0111	0.0094
113	3.0205	0.0094
114	3.0298	0.0093
115	3.0391	0.0093
116	3.0483	0.0092
117	3.0575	0.0092
118	3.0666	0.0091
119	3.0757	0.0091
120	3.0847	0.0090
121	3.0937	0.0090
122	3.1026	0.0089
123	3.1115	0.0089
124	3.1203	0.0088
125	3.1291	0.0088
126	3.1378	0.0087
127	3.1465	0.0087
128	3.1551	0.0086
129	3.1637	0.0086
130	3.1723	0.0086
131	3.1808	0.0085
132	3.1893	0.0085
133	3.1977	0.0084

134	3.2061	0.0084
135	3.2144	0.0083
136	3.2228	0.0083
137	3.2310	0.0083
138	3.2393	0.0082
139	3.2474	0.0082
140	3.2556	0.0082
141	3.2637	0.0081
142	3.2718	0.0081
143	3.2798	0.0080
144	3.2878	0.0080
145	3.2958	0.0080
146	3.3037	0.0079
147	3.3116	0.0079
148	3.3195	0.0079
149	3.3273	0.0078
150	3.3351	0.0078
151	3.3429	0.0078
152	3.3506	0.0077
153	3.3583	0.0077
154	3.3660	0.0077
155	3.3736	0.0076
156	3.3812	0.0076
157	3.3888	0.0076
158	3.3963	0.0075
159	3.4038	0.0075
160	3.4113	0.0075
161	3.4187	0.0074
162	3.4261	0.0074
163	3.4335	0.0074
164	3.4409	0.0074
165	3.4482	0.0073
166	3.4555	0.0073
167	3.4628	0.0073
168	3.4700	0.0072
169	3.4772	0.0072
170	3.4844	0.0072
171	3.4915	0.0072
172	3.4987	0.0071
173	3.5058	0.0071
174	3.5128	0.0071
175	3.5199	0.0070
176	3.5269	0.0070
177	3.5339	0.0070
178	3.5409	0.0070
179	3.5478	0.0069
180	3.5548	0.0069
181	3.5616	0.0069
182	3.5685	0.0069
183	3.5754	0.0068
184	3.5822	0.0068
185	3.5890	0.0068
186	3.5958	0.0068
187	3.6025	0.0068
188	3.6092	0.0067
189	3.6159	0.0067
190	3.6226	0.0067
191	3.6293	0.0067
192	3.6359	0.0066
193	3.6425	0.0066
194	3.6491	0.0066
195	3.6557	0.0066
196	3.6622	0.0065

197	3.6688	0.0065
198	3.6753	0.0065
199	3.6817	0.0065
200	3.6882	0.0065
201	3.6946	0.0064
202	3.7011	0.0064
203	3.7075	0.0064
204	3.7138	0.0064
205	3.7202	0.0064
206	3.7265	0.0063
207	3.7329	0.0063
208	3.7392	0.0063
209	3.7454	0.0063
210	3.7517	0.0063
211	3.7579	0.0062
212	3.7642	0.0062
213	3.7704	0.0062
214	3.7765	0.0062
215	3.7827	0.0062
216	3.7888	0.0061
217	3.7950	0.0061
218	3.8011	0.0061
219	3.8072	0.0061
220	3.8132	0.0061
221	3.8193	0.0061
222	3.8253	0.0060
223	3.8314	0.0060
224	3.8374	0.0060
225	3.8433	0.0060
226	3.8493	0.0060
227	3.8553	0.0059
228	3.8612	0.0059
229	3.8671	0.0059
230	3.8730	0.0059
231	3.8789	0.0059
232	3.8847	0.0059
233	3.8906	0.0058
234	3.8964	0.0058
235	3.9022	0.0058
236	3.9080	0.0058
237	3.9138	0.0058
238	3.9196	0.0058
239	3.9254	0.0058
240	3.9311	0.0057
241	3.9368	0.0057
242	3.9425	0.0057
243	3.9482	0.0057
244	3.9539	0.0057
245	3.9595	0.0057
246	3.9652	0.0056
247	3.9708	0.0056
248	3.9764	0.0056
249	3.9820	0.0056
250	3.9876	0.0056
251	3.9932	0.0056
252	3.9988	0.0056
253	4.0043	0.0055
254	4.0098	0.0055
255	4.0153	0.0055
256	4.0208	0.0055
257	4.0263	0.0055
258	4.0318	0.0055
259	4.0373	0.0055

260	4.0427	0.0054
261	4.0481	0.0054
262	4.0536	0.0054
263	4.0590	0.0054
264	4.0644	0.0054
265	4.0697	0.0054
266	4.0751	0.0054
267	4.0805	0.0054
268	4.0858	0.0053
269	4.0911	0.0053
270	4.0964	0.0053
271	4.1017	0.0053
272	4.1070	0.0053
273	4.1123	0.0053
274	4.1176	0.0053
275	4.1228	0.0053
276	4.1280	0.0052
277	4.1333	0.0052
278	4.1385	0.0052
279	4.1437	0.0052
280	4.1489	0.0052
281	4.1541	0.0052
282	4.1592	0.0052
283	4.1644	0.0052
284	4.1695	0.0051
285	4.1746	0.0051
286	4.1798	0.0051
287	4.1849	0.0051
288	4.1900	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0005	0.0046
2	0.0051	0.0005	0.0046
3	0.0051	0.0005	0.0046
4	0.0051	0.0005	0.0046
5	0.0052	0.0005	0.0047
6	0.0052	0.0005	0.0047
7	0.0052	0.0005	0.0047
8	0.0052	0.0005	0.0047
9	0.0052	0.0005	0.0047
10	0.0053	0.0005	0.0047
11	0.0053	0.0005	0.0048
12	0.0053	0.0005	0.0048
13	0.0053	0.0005	0.0048
14	0.0053	0.0005	0.0048
15	0.0054	0.0005	0.0048
16	0.0054	0.0005	0.0048
17	0.0054	0.0005	0.0049
18	0.0054	0.0005	0.0049
19	0.0054	0.0005	0.0049
20	0.0054	0.0005	0.0049
21	0.0055	0.0005	0.0049
22	0.0055	0.0005	0.0050
23	0.0055	0.0005	0.0050
24	0.0055	0.0005	0.0050
25	0.0056	0.0005	0.0050
26	0.0056	0.0005	0.0050
27	0.0056	0.0005	0.0051
28	0.0056	0.0005	0.0051
29	0.0056	0.0005	0.0051

30	0.0057	0.0005	0.0051
31	0.0057	0.0006	0.0051
32	0.0057	0.0006	0.0052
33	0.0057	0.0006	0.0052
34	0.0058	0.0006	0.0052
35	0.0058	0.0006	0.0052
36	0.0058	0.0006	0.0052
37	0.0058	0.0006	0.0053
38	0.0058	0.0006	0.0053
39	0.0059	0.0006	0.0053
40	0.0059	0.0006	0.0053
41	0.0059	0.0006	0.0054
42	0.0059	0.0006	0.0054
43	0.0060	0.0006	0.0054
44	0.0060	0.0006	0.0054
45	0.0060	0.0006	0.0055
46	0.0061	0.0006	0.0055
47	0.0061	0.0006	0.0055
48	0.0061	0.0006	0.0055
49	0.0061	0.0006	0.0055
50	0.0062	0.0006	0.0056
51	0.0062	0.0006	0.0056
52	0.0062	0.0006	0.0056
53	0.0063	0.0006	0.0057
54	0.0063	0.0006	0.0057
55	0.0063	0.0006	0.0057
56	0.0063	0.0006	0.0057
57	0.0064	0.0006	0.0058
58	0.0064	0.0006	0.0058
59	0.0064	0.0006	0.0058
60	0.0065	0.0006	0.0058
61	0.0065	0.0006	0.0059
62	0.0065	0.0006	0.0059
63	0.0066	0.0006	0.0059
64	0.0066	0.0006	0.0060
65	0.0066	0.0006	0.0060
66	0.0067	0.0006	0.0060
67	0.0067	0.0006	0.0061
68	0.0067	0.0007	0.0061
69	0.0068	0.0007	0.0061
70	0.0068	0.0007	0.0061
71	0.0068	0.0007	0.0062
72	0.0069	0.0007	0.0062
73	0.0069	0.0007	0.0062
74	0.0069	0.0007	0.0063
75	0.0070	0.0007	0.0063
76	0.0070	0.0007	0.0063
77	0.0071	0.0007	0.0064
78	0.0071	0.0007	0.0064
79	0.0072	0.0007	0.0065
80	0.0072	0.0007	0.0065
81	0.0072	0.0007	0.0065
82	0.0073	0.0007	0.0066
83	0.0073	0.0007	0.0066
84	0.0074	0.0007	0.0066
85	0.0074	0.0007	0.0067
86	0.0074	0.0007	0.0067
87	0.0075	0.0007	0.0068
88	0.0075	0.0007	0.0068
89	0.0076	0.0007	0.0069
90	0.0076	0.0007	0.0069
91	0.0077	0.0007	0.0069
92	0.0077	0.0007	0.0070

93	0.0078	0.0008	0.0070
94	0.0078	0.0008	0.0071
95	0.0079	0.0008	0.0071
96	0.0079	0.0008	0.0072
97	0.0080	0.0008	0.0072
98	0.0080	0.0008	0.0073
99	0.0081	0.0008	0.0073
100	0.0082	0.0008	0.0074
101	0.0082	0.0008	0.0074
102	0.0083	0.0008	0.0075
103	0.0083	0.0008	0.0075
104	0.0084	0.0008	0.0076
105	0.0085	0.0008	0.0077
106	0.0085	0.0008	0.0077
107	0.0086	0.0008	0.0078
108	0.0086	0.0008	0.0078
109	0.0087	0.0008	0.0079
110	0.0088	0.0009	0.0079
111	0.0089	0.0009	0.0080
112	0.0089	0.0009	0.0081
113	0.0090	0.0009	0.0081
114	0.0091	0.0009	0.0082
115	0.0092	0.0009	0.0083
116	0.0092	0.0009	0.0083
117	0.0093	0.0009	0.0084
118	0.0094	0.0009	0.0085
119	0.0095	0.0009	0.0086
120	0.0095	0.0009	0.0086
121	0.0097	0.0009	0.0087
122	0.0097	0.0009	0.0088
123	0.0098	0.0010	0.0089
124	0.0099	0.0010	0.0089
125	0.0100	0.0010	0.0091
126	0.0101	0.0010	0.0091
127	0.0102	0.0010	0.0092
128	0.0103	0.0010	0.0093
129	0.0104	0.0010	0.0094
130	0.0105	0.0010	0.0095
131	0.0107	0.0010	0.0096
132	0.0107	0.0010	0.0097
133	0.0109	0.0011	0.0098
134	0.0110	0.0011	0.0099
135	0.0111	0.0011	0.0100
136	0.0112	0.0011	0.0101
137	0.0114	0.0011	0.0103
138	0.0115	0.0011	0.0104
139	0.0117	0.0011	0.0105
140	0.0118	0.0011	0.0106
141	0.0119	0.0012	0.0108
142	0.0120	0.0012	0.0109
143	0.0123	0.0012	0.0111
144	0.0124	0.0012	0.0112
145	0.0088	0.0008	0.0079
146	0.0088	0.0009	0.0080
147	0.0090	0.0009	0.0082
148	0.0091	0.0009	0.0083
149	0.0094	0.0009	0.0084
150	0.0095	0.0009	0.0085
151	0.0097	0.0009	0.0088
152	0.0098	0.0010	0.0089
153	0.0101	0.0010	0.0091
154	0.0102	0.0010	0.0092
155	0.0105	0.0010	0.0095

156	0.0106	0.0010	0.0096
157	0.0109	0.0011	0.0098
158	0.0111	0.0011	0.0100
159	0.0114	0.0011	0.0103
160	0.0116	0.0011	0.0104
161	0.0119	0.0012	0.0108
162	0.0121	0.0012	0.0110
163	0.0125	0.0012	0.0113
164	0.0128	0.0012	0.0115
165	0.0132	0.0013	0.0119
166	0.0135	0.0013	0.0122
167	0.0140	0.0014	0.0126
168	0.0143	0.0014	0.0129
169	0.0113	0.0011	0.0102
170	0.0116	0.0011	0.0105
171	0.0122	0.0012	0.0110
172	0.0125	0.0012	0.0113
173	0.0132	0.0013	0.0119
174	0.0135	0.0013	0.0122
175	0.0144	0.0014	0.0130
176	0.0148	0.0014	0.0134
177	0.0158	0.0015	0.0143
178	0.0164	0.0016	0.0148
179	0.0177	0.0017	0.0160
180	0.0184	0.0018	0.0167
181	0.0201	0.0020	0.0182
182	0.0211	0.0020	0.0191
183	0.0235	0.0023	0.0212
184	0.0249	0.0024	0.0225
185	0.0705	0.0030	0.0675
186	0.0740	0.0030	0.0710
187	0.0829	0.0030	0.0799
188	0.0886	0.0030	0.0857
189	0.1217	0.0030	0.1187
190	0.1334	0.0030	0.1304
191	0.1750	0.0030	0.1720
192	0.2228	0.0030	0.2198
193	0.4868	0.0030	0.4839
194	0.1498	0.0030	0.1468
195	0.0957	0.0030	0.0927
196	0.0781	0.0030	0.0751
197	0.0265	0.0026	0.0239
198	0.0222	0.0022	0.0201
199	0.0193	0.0019	0.0174
200	0.0170	0.0017	0.0154
201	0.0153	0.0015	0.0138
202	0.0139	0.0014	0.0126
203	0.0128	0.0012	0.0116
204	0.0119	0.0011	0.0107
205	0.0146	0.0014	0.0132
206	0.0137	0.0013	0.0124
207	0.0130	0.0013	0.0117
208	0.0123	0.0012	0.0111
209	0.0117	0.0011	0.0106
210	0.0112	0.0011	0.0101
211	0.0108	0.0010	0.0097
212	0.0103	0.0010	0.0093
213	0.0099	0.0010	0.0090
214	0.0096	0.0009	0.0087
215	0.0092	0.0009	0.0084
216	0.0089	0.0009	0.0081
217	0.0125	0.0012	0.0113
218	0.0122	0.0012	0.0110

219	0.0118	0.0011	0.0107
220	0.0116	0.0011	0.0104
221	0.0113	0.0011	0.0102
222	0.0110	0.0011	0.0100
223	0.0108	0.0010	0.0098
224	0.0106	0.0010	0.0096
225	0.0104	0.0010	0.0094
226	0.0102	0.0010	0.0092
227	0.0100	0.0010	0.0090
228	0.0098	0.0009	0.0088
229	0.0096	0.0009	0.0087
230	0.0094	0.0009	0.0085
231	0.0093	0.0009	0.0084
232	0.0091	0.0009	0.0082
233	0.0090	0.0009	0.0081
234	0.0088	0.0009	0.0080
235	0.0087	0.0008	0.0078
236	0.0086	0.0008	0.0077
237	0.0084	0.0008	0.0076
238	0.0083	0.0008	0.0075
239	0.0082	0.0008	0.0074
240	0.0081	0.0008	0.0073
241	0.0080	0.0008	0.0072
242	0.0079	0.0008	0.0071
243	0.0078	0.0008	0.0070
244	0.0077	0.0007	0.0069
245	0.0076	0.0007	0.0068
246	0.0075	0.0007	0.0067
247	0.0074	0.0007	0.0067
248	0.0073	0.0007	0.0066
249	0.0072	0.0007	0.0065
250	0.0071	0.0007	0.0064
251	0.0070	0.0007	0.0064
252	0.0070	0.0007	0.0063
253	0.0069	0.0007	0.0062
254	0.0068	0.0007	0.0062
255	0.0068	0.0007	0.0061
256	0.0067	0.0006	0.0060
257	0.0066	0.0006	0.0060
258	0.0065	0.0006	0.0059
259	0.0065	0.0006	0.0059
260	0.0064	0.0006	0.0058
261	0.0064	0.0006	0.0057
262	0.0063	0.0006	0.0057
263	0.0062	0.0006	0.0056
264	0.0062	0.0006	0.0056
265	0.0061	0.0006	0.0055
266	0.0061	0.0006	0.0055
267	0.0060	0.0006	0.0054
268	0.0060	0.0006	0.0054
269	0.0059	0.0006	0.0053
270	0.0059	0.0006	0.0053
271	0.0058	0.0006	0.0053
272	0.0058	0.0006	0.0052
273	0.0057	0.0006	0.0052
274	0.0057	0.0005	0.0051
275	0.0056	0.0005	0.0051
276	0.0056	0.0005	0.0050
277	0.0055	0.0005	0.0050
278	0.0055	0.0005	0.0050
279	0.0055	0.0005	0.0049
280	0.0054	0.0005	0.0049
281	0.0054	0.0005	0.0049

282	0.0053	0.0005	0.0048
283	0.0053	0.0005	0.0048
284	0.0053	0.0005	0.0048
285	0.0052	0.0005	0.0047
286	0.0052	0.0005	0.0047
287	0.0052	0.0005	0.0047
288	0.0051	0.0005	0.0046

Total soil rain loss = 0.27(In)
Total effective rainfall = 3.92(In)
Peak flow rate in flood hydrograph = 25.73(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	7.5	15.0	22.5	30.0
0+ 5	0.0003	0.04	Q				
0+10	0.0018	0.22	Q				
0+15	0.0038	0.29	Q				
0+20	0.0061	0.33	Q				
0+25	0.0085	0.35	Q				
0+30	0.0109	0.36	Q				
0+35	0.0135	0.37	Q				
0+40	0.0160	0.37	Q				
0+45	0.0186	0.38	Q				
0+50	0.0213	0.38	Q				
0+55	0.0239	0.38	Q				
1+ 0	0.0265	0.38	Q				
1+ 5	0.0292	0.39	Q				
1+10	0.0319	0.39	Q				
1+15	0.0345	0.39	Q				
1+20	0.0372	0.39	Q				
1+25	0.0399	0.39	Q				
1+30	0.0426	0.39	Q				
1+35	0.0453	0.39	Q				
1+40	0.0481	0.40	Q				
1+45	0.0508	0.40	Q				
1+50	0.0535	0.40	Q				
1+55	0.0563	0.40	QV				
2+ 0	0.0591	0.40	QV				
2+ 5	0.0618	0.40	QV				
2+10	0.0646	0.40	QV				
2+15	0.0674	0.41	QV				
2+20	0.0702	0.41	QV				
2+25	0.0730	0.41	QV				
2+30	0.0759	0.41	QV				
2+35	0.0787	0.41	QV				
2+40	0.0816	0.41	QV				
2+45	0.0844	0.42	QV				
2+50	0.0873	0.42	QV				
2+55	0.0902	0.42	QV				
3+ 0	0.0931	0.42	QV				
3+ 5	0.0960	0.42	QV				
3+10	0.0989	0.42	QV				
3+15	0.1019	0.43	QV				
3+20	0.1048	0.43	QV				
3+25	0.1078	0.43	QV				

3+30	0.1107	0.43	Q V	|	|	|	|
3+35	0.1137	0.43	Q V	|	|	|	|
3+40	0.1167	0.44	Q V	|	|	|	|
3+45	0.1197	0.44	Q V	|	|	|	|
3+50	0.1228	0.44	Q V	|	|	|	|
3+55	0.1258	0.44	Q V	|	|	|	|
4+ 0	0.1289	0.44	Q V	|	|	|	|
4+ 5	0.1319	0.44	Q V	|	|	|	|
4+10	0.1350	0.45	Q V	|	|	|	|
4+15	0.1381	0.45	Q V	|	|	|	|
4+20	0.1412	0.45	Q V	|	|	|	|
4+25	0.1443	0.45	Q V	|	|	|	|
4+30	0.1475	0.46	Q V	|	|	|	|
4+35	0.1506	0.46	Q V	|	|	|	|
4+40	0.1538	0.46	Q V	|	|	|	|
4+45	0.1570	0.46	Q V	|	|	|	|
4+50	0.1601	0.46	Q V	|	|	|	|
4+55	0.1634	0.47	Q V	|	|	|	|
5+ 0	0.1666	0.47	Q V	|	|	|	|
5+ 5	0.1698	0.47	Q V	|	|	|	|
5+10	0.1731	0.47	Q V	|	|	|	|
5+15	0.1764	0.48	Q V	|	|	|	|
5+20	0.1796	0.48	Q V	|	|	|	|
5+25	0.1830	0.48	Q V	|	|	|	|
5+30	0.1863	0.48	Q V	|	|	|	|
5+35	0.1896	0.48	Q V	|	|	|	|
5+40	0.1930	0.49	Q V	|	|	|	|
5+45	0.1963	0.49	Q V	|	|	|	|
5+50	0.1997	0.49	Q V	|	|	|	|
5+55	0.2031	0.49	Q V	|	|	|	|
6+ 0	0.2066	0.50	Q V	|	|	|	|
6+ 5	0.2100	0.50	Q V	|	|	|	|
6+10	0.2135	0.50	Q V	|	|	|	|
6+15	0.2170	0.51	Q V	|	|	|	|
6+20	0.2205	0.51	Q V	|	|	|	|
6+25	0.2240	0.51	Q V	|	|	|	|
6+30	0.2275	0.51	Q V	|	|	|	|
6+35	0.2311	0.52	Q V	|	|	|	|
6+40	0.2347	0.52	Q V	|	|	|	|
6+45	0.2383	0.52	Q V	|	|	|	|
6+50	0.2419	0.53	Q V	|	|	|	|
6+55	0.2455	0.53	Q V	|	|	|	|
7+ 0	0.2492	0.53	Q V	|	|	|	|
7+ 5	0.2529	0.54	Q V	|	|	|	|
7+10	0.2566	0.54	Q V	|	|	|	|
7+15	0.2603	0.54	Q V	|	|	|	|
7+20	0.2641	0.55	Q V	|	|	|	|
7+25	0.2679	0.55	Q V	|	|	|	|
7+30	0.2717	0.55	Q V	|	|	|	|
7+35	0.2755	0.56	Q V	|	|	|	|
7+40	0.2793	0.56	Q V	|	|	|	|
7+45	0.2832	0.56	Q V	|	|	|	|
7+50	0.2871	0.57	Q V	|	|	|	|
7+55	0.2910	0.57	Q V	|	|	|	|
8+ 0	0.2950	0.57	Q V	|	|	|	|
8+ 5	0.2990	0.58	Q V	|	|	|	|
8+10	0.3030	0.58	Q V	|	|	|	|
8+15	0.3070	0.58	Q V	|	|	|	|
8+20	0.3111	0.59	Q V	|	|	|	|
8+25	0.3151	0.59	Q V	|	|	|	|
8+30	0.3192	0.60	Q V	|	|	|	|
8+35	0.3234	0.60	Q V	|	|	|	|
8+40	0.3276	0.61	Q V	|	|	|	|

8+45	0.3318	0.61	Q	V	|	|	|
8+50	0.3360	0.61	Q	V	|	|	|
8+55	0.3403	0.62	Q	V	|	|	|
9+ 0	0.3446	0.62	Q	V	|	|	|
9+ 5	0.3489	0.63	Q	V	|	|	|
9+10	0.3533	0.63	Q	V	|	|	|
9+15	0.3577	0.64	Q	V	|	|	|
9+20	0.3621	0.64	Q	V	|	|	|
9+25	0.3665	0.65	Q	V	|	|	|
9+30	0.3711	0.65	Q	V	|	|	|
9+35	0.3756	0.66	Q	V	|	|	|
9+40	0.3802	0.66	Q	V	|	|	|
9+45	0.3848	0.67	Q	V	|	|	|
9+50	0.3894	0.68	Q	V	|	|	|
9+55	0.3941	0.68	Q	V	|	|	|
10+ 0	0.3989	0.69	Q	V	|	|	|
10+ 5	0.4036	0.69	Q	V	|	|	|
10+10	0.4085	0.70	Q	V	|	|	|
10+15	0.4133	0.71	Q	V	|	|	|
10+20	0.4182	0.71	Q	V	|	|	|
10+25	0.4232	0.72	Q	V	|	|	|
10+30	0.4282	0.73	Q	V	|	|	|
10+35	0.4332	0.73	Q	V	|	|	|
10+40	0.4383	0.74	Q	V	|	|	|
10+45	0.4435	0.75	Q	V	|	|	|
10+50	0.4487	0.76	|Q	V	|	|	|
10+55	0.4539	0.76	|Q	V	|	|	|
11+ 0	0.4592	0.77	|Q	V	|	|	|
11+ 5	0.4646	0.78	|Q	V	|	|	|
11+10	0.4700	0.79	|Q	V	|	|	|
11+15	0.4755	0.80	|Q	V	|	|	|
11+20	0.4810	0.80	|Q	V	|	|	|
11+25	0.4866	0.81	|Q	V	|	|	|
11+30	0.4923	0.82	|Q	V	|	|	|
11+35	0.4980	0.83	|Q	V	|	|	|
11+40	0.5038	0.84	|Q	V	|	|	|
11+45	0.5097	0.85	|Q	V	|	|	|
11+50	0.5157	0.86	|Q	V	|	|	|
11+55	0.5217	0.87	|Q	V	|	|	|
12+ 0	0.5278	0.89	|Q	V	|	|	|
12+ 5	0.5337	0.86	|Q	V	|	|	|
12+10	0.5388	0.74	Q	V	|	|	|
12+15	0.5437	0.70	Q	V	|	|	|
12+20	0.5484	0.69	Q	V	|	|	|
12+25	0.5531	0.68	Q	V	|	|	|
12+30	0.5578	0.69	Q	V	|	|	|
12+35	0.5626	0.69	Q	V	|	|	|
12+40	0.5674	0.70	Q	V	|	|	|
12+45	0.5723	0.71	Q	V	|	|	|
12+50	0.5773	0.72	Q	V	|	|	|
12+55	0.5823	0.74	Q	V	|	|	|
13+ 0	0.5875	0.75	|Q	V	|	|	|
13+ 5	0.5928	0.77	|Q	V	|	|	|
13+10	0.5982	0.78	|Q	V	|	|	|
13+15	0.6037	0.80	|Q	|V	|	|	|
13+20	0.6093	0.82	|Q	|V	|	|	|
13+25	0.6150	0.83	|Q	|V	|	|	|
13+30	0.6209	0.85	|Q	|V	|	|	|
13+35	0.6269	0.87	|Q	|V	|	|	|
13+40	0.6331	0.90	|Q	|V	|	|	|
13+45	0.6394	0.92	|Q	|V	|	|	|
13+50	0.6459	0.94	|Q	|V	|	|	|
13+55	0.6526	0.97	|Q	|V	|	|	|

14+ 0	0.6594	1.00	
14+ 5	0.6663	0.99	
14+10	0.6725	0.91	
14+15	0.6786	0.88	
14+20	0.6847	0.89	
14+25	0.6910	0.91	
14+30	0.6975	0.94	
14+35	0.7042	0.97	
14+40	0.7112	1.02	
14+45	0.7185	1.06	
14+50	0.7261	1.11	
14+55	0.7341	1.16	
15+ 0	0.7426	1.24	
15+ 5	0.7516	1.30	
15+10	0.7612	1.40	
15+15	0.7715	1.49	
15+20	0.7826	1.61	
15+25	0.7973	2.13	
15+30	0.8243	3.92	
15+35	0.8580	4.89	
15+40	0.8971	5.68	
15+45	0.9423	6.56	
15+50	0.9989	8.22	
15+55	1.0661	9.74	
16+ 0	1.1507	12.29	
16+ 5	1.2711	17.49	
16+10	1.4484	25.73	
16+15	1.5671	17.24	
16+20	1.6485	11.82	
16+25	1.7081	8.65	
16+30	1.7455	5.43	
16+35	1.7712	3.72	
16+40	1.7899	2.72	
16+45	1.8047	2.16	
16+50	1.8164	1.70	
16+55	1.8252	1.28	
17+ 0	1.8328	1.10	
17+ 5	1.8397	1.00	
17+10	1.8468	1.02	
17+15	1.8537	1.01	
17+20	1.8604	0.97	
17+25	1.8667	0.93	
17+30	1.8729	0.89	
17+35	1.8787	0.85	
17+40	1.8843	0.82	
17+45	1.8897	0.78	
17+50	1.8949	0.75	
17+55	1.8999	0.72	
18+ 0	1.9047	0.70	
18+ 5	1.9096	0.71	
18+10	1.9152	0.81	
18+15	1.9210	0.85	
18+20	1.9269	0.85	
18+25	1.9327	0.84	
18+30	1.9384	0.83	
18+35	1.9440	0.82	
18+40	1.9495	0.80	
18+45	1.9549	0.79	
18+50	1.9602	0.77	
18+55	1.9654	0.76	
19+ 0	1.9705	0.74	
19+ 5	1.9755	0.73	
19+10	1.9804	0.71	

19+15	1.9853	0.70	Q	|	|	|	V |
19+20	1.9900	0.69	Q	|	|	|	V |
19+25	1.9947	0.68	Q	|	|	|	V |
19+30	1.9992	0.66	Q	|	|	|	V |
19+35	2.0037	0.65	Q	|	|	|	V |
19+40	2.0082	0.64	Q	|	|	|	V |
19+45	2.0125	0.63	Q	|	|	|	V |
19+50	2.0168	0.62	Q	|	|	|	V |
19+55	2.0211	0.61	Q	|	|	|	V |
20+ 0	2.0252	0.61	Q	|	|	|	V |
20+ 5	2.0293	0.60	Q	|	|	|	V |
20+10	2.0334	0.59	Q	|	|	|	V |
20+15	2.0374	0.58	Q	|	|	|	V |
20+20	2.0414	0.57	Q	|	|	|	V |
20+25	2.0453	0.57	Q	|	|	|	V |
20+30	2.0491	0.56	Q	|	|	|	V |
20+35	2.0529	0.55	Q	|	|	|	V |
20+40	2.0567	0.55	Q	|	|	|	V |
20+45	2.0604	0.54	Q	|	|	|	V |
20+50	2.0640	0.53	Q	|	|	|	V |
20+55	2.0677	0.53	Q	|	|	|	V |
21+ 0	2.0712	0.52	Q	|	|	|	V |
21+ 5	2.0748	0.51	Q	|	|	|	V |
21+10	2.0783	0.51	Q	|	|	|	V |
21+15	2.0817	0.50	Q	|	|	|	V |
21+20	2.0852	0.50	Q	|	|	|	V |
21+25	2.0886	0.49	Q	|	|	|	V |
21+30	2.0919	0.49	Q	|	|	|	V |
21+35	2.0952	0.48	Q	|	|	|	V |
21+40	2.0985	0.48	Q	|	|	|	V |
21+45	2.1018	0.47	Q	|	|	|	V |
21+50	2.1050	0.47	Q	|	|	|	V |
21+55	2.1082	0.46	Q	|	|	|	V |
22+ 0	2.1114	0.46	Q	|	|	|	V |
22+ 5	2.1145	0.46	Q	|	|	|	V |
22+10	2.1176	0.45	Q	|	|	|	V |
22+15	2.1207	0.45	Q	|	|	|	V |
22+20	2.1237	0.44	Q	|	|	|	V |
22+25	2.1268	0.44	Q	|	|	|	V |
22+30	2.1298	0.44	Q	|	|	|	V |
22+35	2.1327	0.43	Q	|	|	|	V|
22+40	2.1357	0.43	Q	|	|	|	V|
22+45	2.1386	0.42	Q	|	|	|	V|
22+50	2.1415	0.42	Q	|	|	|	V|
22+55	2.1444	0.42	Q	|	|	|	V|
23+ 0	2.1472	0.41	Q	|	|	|	V|
23+ 5	2.1501	0.41	Q	|	|	|	V|
23+10	2.1529	0.41	Q	|	|	|	V|
23+15	2.1557	0.40	Q	|	|	|	V|
23+20	2.1584	0.40	Q	|	|	|	V|
23+25	2.1612	0.40	Q	|	|	|	V|
23+30	2.1639	0.40	Q	|	|	|	V|
23+35	2.1666	0.39	Q	|	|	|	V|
23+40	2.1693	0.39	Q	|	|	|	V|
23+45	2.1719	0.39	Q	|	|	|	V|
23+50	2.1746	0.38	Q	|	|	|	V|
23+55	2.1772	0.38	Q	|	|	|	V|
24+ 0	2.1798	0.38	Q	|	|	|	V|
24+ 5	2.1821	0.33	Q	|	|	|	V|
24+10	2.1832	0.16	Q	|	|	|	V|
24+15	2.1838	0.08	Q	|	|	|	V|
24+20	2.1841	0.05	Q	|	|	|	V|
24+25	2.1843	0.03	Q	|	|	|	V|

```
   24+30       2.1844      0.02  Q          |          |          |         V|
   24+35       2.1845      0.01  Q          |          |          |         V|
   24+40       2.1845      0.01  Q          |          |          |         V|
   24+45       2.1845      0.00  Q          |          |          |          V
-------------------------------------------------------------------------------
```