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Apple Valley Industrial

S/E Corner of Johnson and Navajo Road
Town of Apple Valley, CA

Preliminary Hydrology Study Report

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TABLE OF CONTENTS

1. INTRODUCTION 1

2. EXISTING SITE DESCRIPTION 1

2.1. Existing Site Topography & Hydrologic Patterns ..... Error! Bookmark not defined.

3. PROJECT SITE DESCRIPTION 1

3.1. Project Description & Hydrologic Patterns ..... Error! Bookmark not defined.

4. RESULTS & ANALYSIS 2

4.1. Methodology **2**

4.2. Hydrology Results & Analysis **3**

5. CONCLUSION 4

6. REFERENCES 4

APPENDICIES

APPENDIX A ..... HYDROLOGY EXHIBITS

PRE-DEVELOPMENT DRAINAGE MAP

POST-DEVELOPMENT DRAINAGE MAP

APPENDIX B ..... CALCULATION TABLES

CALCULATION SUMMARY

WQMP CALCULATIONS

HYDROLOGY CALCULATION DATA

APPENDIX C ..... BASIN ANALYSIS

BASIN STAGING TABLE

UNDERGROUND INFILTRATION CHAMBER DETAILS

BASIN ROUTING CALCULATIONS (FOR FINAL ENGINEERING)

APPENDIX D ..... SUPPORTING DOCUMENTS

SOILS MAP

NOAA ATLAS 14 DATA

OFFSITE FLOW DATA (USGS)

APPENDIX E ..... INFILTRATION REPORT

APPENDIX F .....RATIONAL METHOD ANALYSIS (2/10/100-YEAR STORM)
PRE-DEVELOPMENT CONDITIONS
2-YEAR STORM RATIONAL METHOD
10-YEAR STORM RATIONAL METHOD
100-YEAR STORM RATIONAL METHOD
POST-DEVELOPMENT CONDITIONS
2-YEAR STORM RATIONAL METHOD
10-YEAR STORM RATIONAL METHOD
100-YEAR STORM RATIONAL METHOD

APPENDIX G.....UNIT HYDROGRAPH ANALYSIS (24-HOUR, 10/100-YEAR STORM)
PRE-DEVELOPMENT CONDITIONS
10-YEAR STORM UNIT HYDROGRAPH
100-YEAR STORM UNIT HYDROGRAPH
POST-DEVELOPMENT CONDITIONS
10-YEAR STORM UNIT HYDROGRAPH
100-YEAR STORM UNIT HYDROGRAPH

1. INTRODUCTION

The purpose of this study is to demonstrate that the proposed project site can be designed to provide adequate flood protection without adversely impacting existing off-site drainage systems or adjacent properties. The scope of this analysis includes the pre-developed and post-developed runoff analysis.

2. EXISTING SITE DESCRIPTION

The project site is located at the southeast corner of Johnson and Navajo Road in the Town of Apple Valley, County of San Bernardino. The Site is currently bounded to the north by Johnson Road, to the east by Central Road, the south by undeveloped land, and to the west by Navajo Road.

The total area, after dedication, of the project site is approximately 154 acres. There are currently 10 parcels within the project site, which will be combined into 1 parcel in the ultimate condition. All parcels are currently undeveloped. Surface elevations range from around 3150 ft to 3074 ft.

The natural drainage pattern for the existing condition of the site is northeast to southwest. Stormwater sheet flows southwest from the north edge of the project site and ultimately continues southwest and infiltrates into the ground or evaporates. There is no public storm drain systems around the project site. The site lies in the path of a blue line stream and takes on a flowrate of approximately 1040 cfs (±444).

3. PROJECT SITE DESCRIPTION

The project site is located at the southeast corner of Johnson and Navajo Road in the Town of Apple Valley, County of San Bernardino. The Site is currently bounded to the north by Johnson Road, to the east by Central Road, the south by undeveloped land, and to the west by Navajo Road. The total area, after dedication, of the project site is about 150 acres.

There are currently 10 parcels within the project site, which will be combined into 1 parcel in the ultimate condition. All parcels are currently undeveloped. Surface elevations range from around 3150 ft to 3074 ft. The natural drainage pattern for the existing condition of the site is northeast to southwest. Stormwater sheet flows southwest from the north edge of the project site and ultimately continues southwest and infiltrates into the ground or evaporates. There is no public storm drain system around the project site. The site lies in the path of a blue line stream and takes on a max flowrate of approximately 1040 cfs (±444).

The project proposes two separate industrial storage facilities with their own buildings. The proposed development will include parking/storage areas for trucks with landscaping along the perimeter of the site. The proposed development will maintain the same natural drainage pattern as the existing condition for each building. Stormwater will sheet flow from northeast to southwest and will be captured by proposed on-site catch basins and be routed to basins/chambers for retention. In the case of larger storm events, stormwater will escape via emergency spillway and be routed west along Johnson Road, south along Central Road, and south along Navajo Road. Stormwater will ultimately continue southwest and infiltrate into the ground or evaporate. See Appendix A for the prost-development drainage map.

The flow from the blue line stream will be accepted onto the proposed site and routed west along Johnson Road, then south along Navajo Road within a channel on-site. The flow will be allowed to continue to flow south via spillway from the channel, to maintain the natural drainage pattern of the existing condition.

4. RESULTS & ANALYSIS

4.1. METHODOLOGY

The proposed drainage areas were analyzed using the San Bernardino (SB) County Hydrology Manual for the 100-year storm event. The main methods used for this project were the Rational Method, Synthetic Unit Hydrograph Method, and Basin Routing Analysis. Civil Design software was used to compute the data. Solving for the Rational Method returns the peak flow rate. Unit Hydrograph analysis will determine the total volume generated from a storm event. Basin Routing analysis will analyze the storage volume and outflow flow rate for the proposed underground infiltration chambers.

According to the USDA Web Soil Survey, the site is entirely composed of type A soil (See Appendix E). The proposed land use was analyzed as undeveloped for the pre-development condition. According to the county's manual, Antecedent Moisture Condition (AMC) I is used for the 2-year storm event, AMC II for the 10-year storm event and AMC III was used for the 100-year storm event in order to give more confidence to mitigate any increase runoff, if needed.

For the rational method analysis, the runoff coefficient is determined by the land use for each condition. The rainfall intensities are based on the time of concentration for each drainage area and the intensity-duration curves provided in the county's manual. The flow lengths and terrain elevations were determined using existing topography for the pre-development condition and the conceptual grading plans for the post-development condition.
For the unit hydrograph analysis, the lag time was determined by using the time of concentration based on the rational method analysis. Rainfall depths were obtained from the National Oceanic and Atmospheric Administration (NOAA) Point Precipitation Frequency Estimates. The rainfall depth data are included in Appendix E. The rainfall used in the hydrology calculations are summarized on Table 4.1.

Table 4.1: Rainfall Depths

Storm Event & Duration	Rainfall Depth (inches)
2-Year, 1-Hour	0.345
2-Year, 6-Hour	0.758
2-Year, 24-Hour	1.30
10-Year, 1-Hour	0.605
10-Year, 6-Hour	1.22
10-Year, 24-Hour	2.11
100-Year, 1-Hour	1.08
100-Year, 6-Hour	2.01
100-Year, 24-Hour	3.42

For the basin routing analysis, the results from the unit hydrograph analysis were used to determine the amount of stormwater entering the proposed underground infiltration chamber at each time interval. The staging data table is provided in Appendix D. A complete routing analysis will be completed for final engineering.

4.2. HYDROLOGY RESULTS & ANALYSIS

The complete rational method analysis and results are included in Appendix B. The complete unit hydrograph analysis and results are included in Appendix C. The tables below provide a summary of the peak flow rate and runoff volume for the pre-developed and post-developed condition for the 2-, 10-, and 100-year storm.

Table 4.2.1: Pre-Development Hydrology Summary Table

Storm Event	Area (Acres)	Tc (min.)	Intensity (in/hr)	Flow Rate, Q (cfs) (Rational Method)	Volume (cf) (Unit Hydrograph)
2-Year	154.12	34.43	1.30	0.92	-
10-Year			2.11	79.08	419,391
100-Year			3.42	219.77	1,496,260

Table 4.2.2: Post-Development Hydrology Summary Table

Storm Event	Area (Acres)	Tc (min.)	Intensity (in/hr)	Flow Rate, Q (cfs) (Rational Method)	Volume (cf) (Unit Hydrograph)
2-Year	150.42	16.28	1.30	94.09	-
10-Year			2.11	176.41	859,373
100-Year			3.42	337.81	1,438,813

Table 4.2.3: Result Analysis Summary Table

Hydrology Results & Analysis Summary Table:	Project Site Disturbed Area **= 6,552,371 SF (150.42 Acres)** $Q_{100,\,PRE}$ = **219.77 CFS** $Q_{100,\,POST}$ = **361.09 CFS** ΔQ_{100} = **+ 141.32 CFS** ΔV_{100} = **-65,776 CF** Hydro-modification V_{10} = **397,013 CF** *(187,375 CF + 319,371 CF, See Appendix B WQMP Tables)* DCV = **334,081 CF** (See Water Quality Management Plan) Hydro-modification > DCV > ΔV_{100} | **397,013 CF = Site Design Storage Requirement** **Volume Provided = 1,552,534 CF** (Retention System)

Based on the 100-year rational method analysis, the post-development flow rate within the disturbed area increased compared to the pre-development flow rate. We also see the post-development runoff volume decreased compared to the pre-development runoff volume. The increase in flow rate was a result from a decrease in time of concentration, while the slight decrease in volume was because of a smaller site area in the proposed condition. Since the hydro-modification volume is greater than the ΔV_{100} and DCV, it will be used as the minimum treatment volume required (**397,013 cf**) to meet water quality standards, as indicated above in Table 4.2.3.

For the east building, the proposed on-site storm drain system will convey the runoff in the North to Chamber 1, runoff in the East to Basin 1, and runoff in the South to Chamber 2 and Basin 2. Basin 2 is intended to be used for the sump condition for the East Building and for emergency overflow. For the west building, the proposed on-site storm drain system will convey runoff in the North and West to Chamber 3 and Basin 3, and runoff in the South and East to Chamber 4.

The systems will be designed to meet the project's water quality requirements and provide sufficient storage to meet the 100-year storm hydrology requirement. In the case of larger storm events, stormwater will escape via emergency spillway and be routed west along Kensington Road for Basin 1 and Basin 2, and to the south along Navajo Road for Basin 3. Stormwater will ultimately continue southwest and infiltrate into the ground or evaporate. See Appendix A for the prost-development drainage map.

A basin routing analysis will be performed for final engineering to ensure outlet control for emergency overflow.

5. CONCLUSION

The proposed redevelopment of the disturbed area would not create or contribute runoff that would exceed the capacity of the existing downstream storm drain system. Furthermore, the underground infiltration system will be designed to accommodate the 100-year storm event and would not exceed the flow rates and runoff volumes generated by the existing condition. Once construction is complete, there will not be any substantial increase in flood boundaries, levels or frequencies in any areas outside the development. The hydrologic analyses and calculations were designed in accordance with the San Bernardino County Hydrology Manual. The results from the analysis will be the basis for the grading and on-site storm-drain construction documents for the project.
Evaluation of the appropriateness of guidelines and the accuracy of County data was beyond the scope of this study. Usage of this report is limited to addressing the purpose and scope previously defined by the project owner. The contents of this report are professional opinion and as such, are not to be considered a guaranty or warranty.

6. REFERENCES

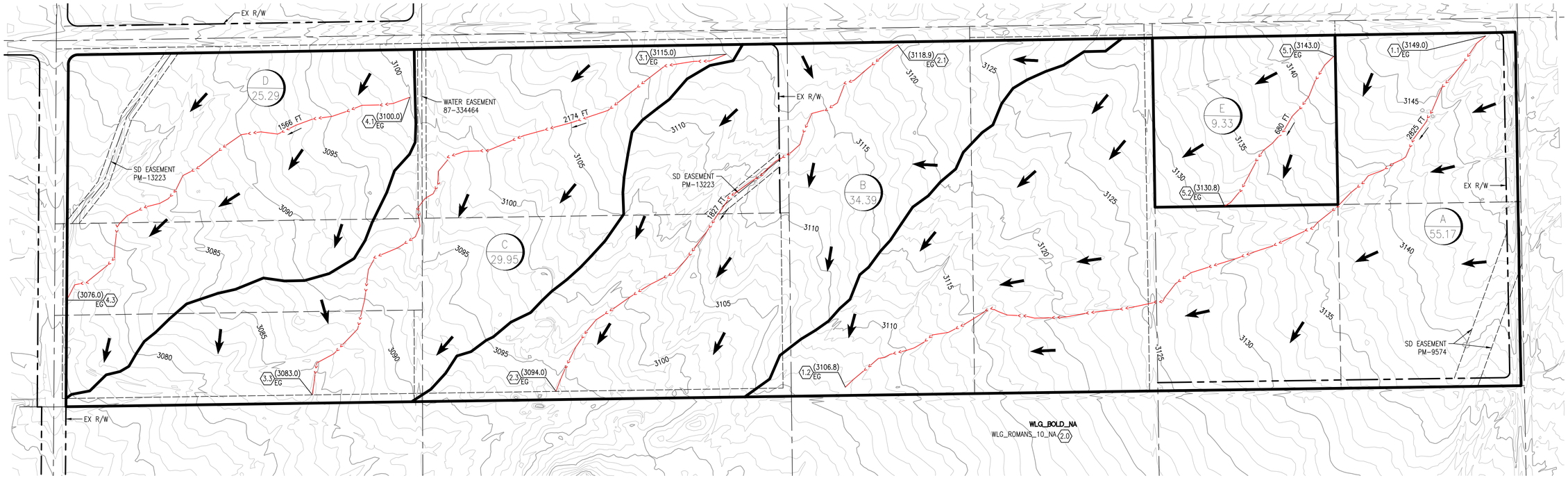
1. Town of Appley Valley "Requirements for WQMP"

2. National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Point Precipitation Frequency Estimates

3. San Bernardino County Hydrology Manual dated August 1986

APPENDIX A

EXHIBITS AND DETAILS



HYDROLOGY SUMMARY TABLE

SUBAREA ID	RUNOFF COEFFICIENT "C"$_{100}$	RAINFALL INTENSITY "I"$_{100}$ (INCH/HOUR)	TIME OF CONCENTRATION "Tc"$_{100}$ (MIN.)	DRAINAGE AREA (AC)	RUNOFF FLOW RATE "Q_{100}" (CFS)	RUNOFF VOLUME "V_{100}" (CFS)	RUNOFF FLOW RATE "Q_{10}" (CFS)	RUNOFF VOLUME "V_{10}" (CFS)	RUNOFF FLOW RATE "Q_2" (CFS)	RUNOFF VOLUME "V_2" (CFS)
A	0.821	1.600	34.23	55.17	69.95	528,744	23.61	148,213	0.00	14,144
B	0.829	1.784	29.29	34.39	49.66	333,752	18.00	93,545	0.00	8,925
C	0.826	1.702	31.32	29.95	40.88	288,864	14.39	80,978	0.00	7,732
D	0.833	1.894	26.90	25.29	39.92	251,694	14.96	70,541	0.00	6,730
A_{TOTAL}				144.80	200.41	1,403,055	70.96	393,277	0.00	37,531
E	0.848	2.445	18.67	9.33	19.36	93,205	8.11	26,114	0.92	2,487
TOTAL				154.12	219.77	1,496,260	79.08	419,391	0.92	40,019

DETAILS

LEGEND

- PROJECT DRAINAGE BOUNDARY
- SUB-AREA BOUNDARY
- FLOW PATH
- SUB-DRAINAGE AREA ID
- SUB-DRAINAGE AREA IDENTIFIER
- SUB-DRAINAGE SURFACE AREA (ACRE)
- FLOW ARROW
- SURFACE FLOW NODE

HYDROLOGY INFORMATION

SITE AREA:	144.80 ACRE	
SOIL GROUP:	A	(PER USDA WEB SOIL SURVEY)
IMPERVIOUS:	0.00%	
ISOHYETALS:	3.42"	(100-YEAR, 24-HOUR)
	2.11"	(25-YEAR, 24-HOUR)
	1.30"	(2-YEAR, 24-HOUR)
FREQUENCY:	100 YEAR	(FOR STORM DRAIN DESIGN)
	10 YEAR	(FOR WATER QUALITY)
METHOD:	SAN BERNARDINO COUNTY HYDROLOGY MANUAL	

GENERAL NOTES

1. SEE PRELIMINARY HYDROLOGY REPORT, PREPARED BY WESTLAND GROUP, FOR THE COMPLETE POST-DEVELOPMENT HYDROLOGY CALCULATIONS.
2. CALCULATIONS WERE BASED ON THE REQUIREMENTS ON THE LOS ANGELES COUNTY HYDROLOGY MANUAL FOR 50 YEAR STORM.
3. PROPOSED ON-SITE DRAINAGE SYSTEM LAYOUT IS PRELIMINARY.
4. ALL FINISH ELEVATIONS AND INVERT ELEVATIONS ARE APPROXIMATE.

ABBREVIATIONS

CF	CUBIC FEET
C&G	CURB AND GUTTER
CL OR ℄	CENTERLINE
CMP	CORRUGATED METAL PIPE
DA	DRAINAGE AREA
EX	EXISTING
FS	FINISHED SURFACE ELEVATION
HR	HOUR
IN	INCH/INCHES
INV	INVERT ELEVATION
L	LENGTH
R/W	RIGHT OF WAY
PL OR ℄	PROPERTY LINE
PROP	PROPOSED
SD	STORM DRAIN
TYP	TYPICAL
ULT	ULTIMATE
V	VOLUME
W	WIDTH

N

180' 0' 90' 180' 360'

SCALE: 1" = 180'

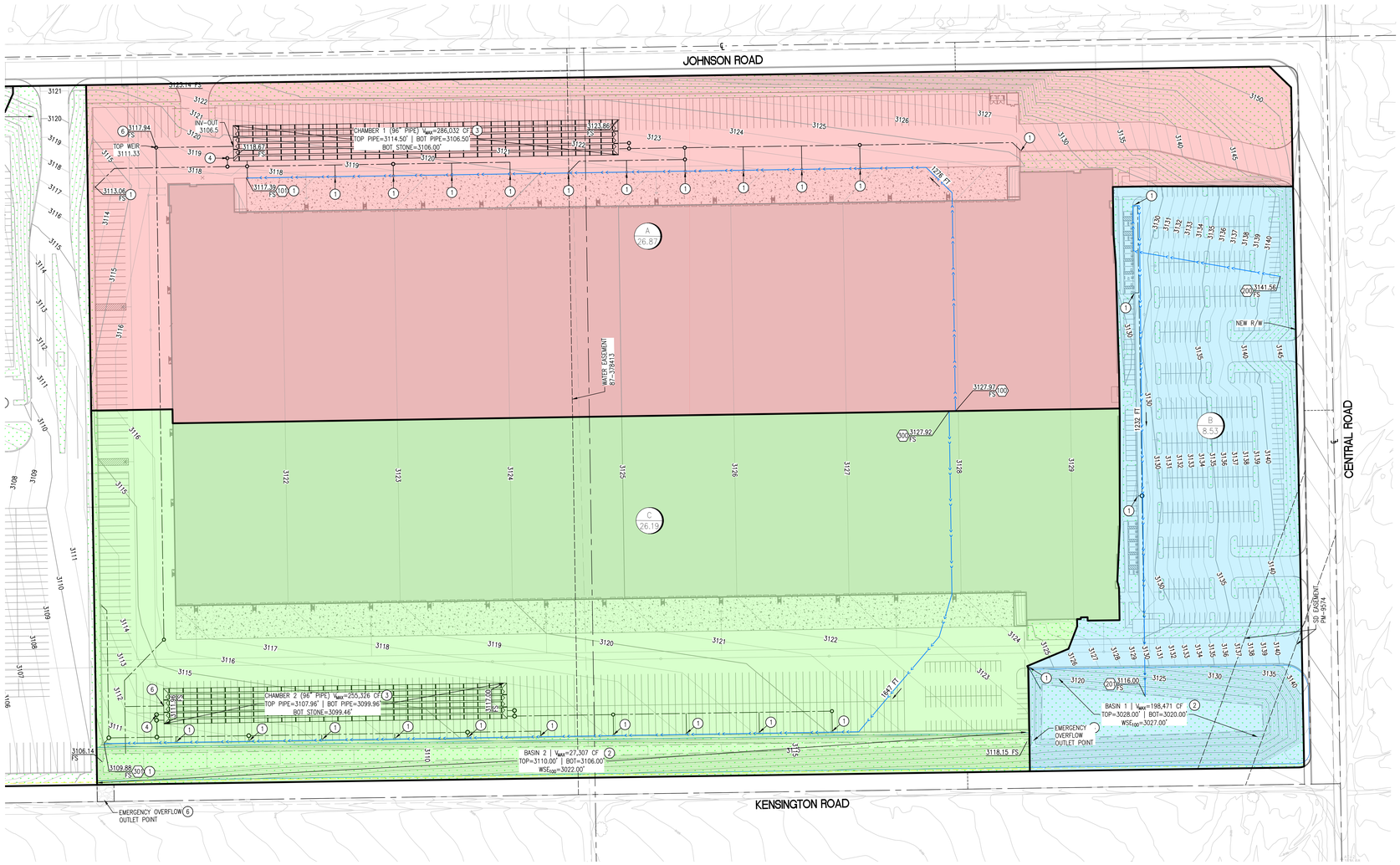
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JOB NO: 2021-181

INDUSTRIAL BUILDING HYDROLOGY EXHIBIT
EXISTING CONDITION
TOWN OF APPLE VALLEY

DATE: SEP 2022

SHEET 1 OF 1

09/15/2022



HYDROLOGY INFORMATION

SITE AREA:	144.80 ACRE	
SOIL GROUP:	A	(PER USDA WEB SOIL SURVEY)
IMPERVIOUS:	0.82%	
ISOHYETALS:	3.42" 2.11" 1.30"	(100-YEAR, 24-HOUR) (25-YEAR, 24-HOUR) (2-YEAR, 24-HOUR)
FREQUENCY:	100 YEAR 10 YEAR	(FOR STORM DRAIN DESIGN) (FOR WATER QUALITY)
METHOD:	SAN BERNARDINO COUNTY HYDROLOGY MANUAL	

GENERAL NOTES

1. SEE PRELIMINARY HYDROLOGY REPORT, PREPARED BY WESTLAND GROUP, FOR THE COMPLETE POST-DEVELOPMENT HYDROLOGY CALCULATIONS.
2. CALCULATIONS WERE BASED ON THE REQUIREMENTS ON THE SAN BERNARDINO COUNTY HYDROLOGY MANUAL FOR 100 YEAR STORM.
3. PROPOSED ON-SITE DRAINAGE SYSTEM LAYOUT IS PRELIMINARY.
4. ALL FINISH ELEVATIONS AND INVERT ELEVATIONS ARE APPROXIMATE.

BMP NOTES

1. PROPOSED STORM DRAIN INLET
2. PROPOSED ABOVE GROUND RETENTION BASIN
3. PROPOSED UNDERGROUND RETENTION CHAMBER
4. PROPOSED HYDRODYNAMIC SEPARATOR (CDS)
5. MANHOLE WITH HIGH FLOW BYPASS
6. EMERGENCY OVERFLOW

LEGEND

- DRAINAGE AREA BOUNDARY
- SUB-AREA BOUNDARY
- PROPOSED STORM DRAIN
- FLOW PATH
- SUB-DRAINAGE AREA ID
- SUB-DRAINAGE AREA IDENTIFIER
- SUB-DRAINAGE SURFACE AREA (ACRE)
- FLOW ARROW
- SURFACE FLOW NODE
- TRIBUTARY AREA – CHAMBER 1
- TRIBUTARY AREA – BASIN 1
- TRIBUTARY AREA – BASIN 2 AND CHAMBER 2

ABBREVIATIONS

AC	ACRES	INV	INVERT ELEVATION
CF	CUBIC FEET	L	LENGTH
CFS	CUBIC FEET PER SECOND	R/W	RIGHT OF WAY
C&G	CURB AND GUTTER	PL OR ℄	PROPERTY LINE
CL OR ℄	CENTERLINE	PROP	PROPOSED
DA	DRAINAGE AREA	SD	STORM DRAIN
EX	EXISTING	TYP	TYPICAL
FS	FINISHED SURFACE ELEVATION	V	VOLUME
HR	HOUR	W	WIDTH
IN	INCH/INCHES		

HYDROLOGY SUMMARY TABLE

SUBAREA ID	DRAINAGE AREA (AC)	RUNOFF COEFFICIENT "C_{100}"	RAINFALL INTENSITY "I_{100} (INCH/HOUR)	TIME OF CONCENTRATION "T_{C-100} (MIN.)	RUNOFF FLOW RATE "Q_{100}" (CFS)	RUNOFF VOLUME "V_{100}" (CFS)	RUNOFF FLOW RATE "Q_{10}" (CFS)	RUNOFF VOLUME "V_{10}" (CFS)	RUNOFF FLOW RATE "Q_2" (CFS)
A	26.87	0.872	3.015	13.84	70.65	285,179	38.03	171,679	20.52
B	8.88	0.792	2.863	14.90	20.15	68,289	9.41	38,603	4.12
C	27.33	0.863	2.871	14.85	67.73	282,334	35.97	169,248	19.20
A_{TOTAL}				43.59	158.53	635,802	83.41	379,530	43.84

CHAMBER 1 - Area A (V_{100} = 285,179)

MODEL	SURFACE AREA (SF)	SYSTEM DIMENSION	STORAGE VOLUME (CF)	TOTAL VOLUME (AC-FT)	OUTFLOW (CFS)
CONTECH 96" CMP	16,020	686' x 63'	286,032	6.57	0.00

BASIN 1 - Area B (V_{100} = 68,289)

ELEVATION	DEPTH (FT)	SURFACE AREA (SF)	VOLUME ENGINEERED SOIL (CF)	ABOVE GROUND VOLUME (CF)	UNDERGROUND STORAGE VOLUME (CF)	TOTAL VOLUME (CF)	TOTAL VOLUME (AC-FT)	OUTFLOW (CFS)
*3120	*0	17,485	24,478	0	0	24,478	0.56	0.00
3121	1	19,246	24,478	18,365	0	42,843	0.98	0.00
3122	2	21,039	24,478	38,507	0	62,985	1.45	0.00
3123	3	22,864	24,478	60,459	0	84,937	1.95	0.00
3124	4	24,721	24,478	84,251	0	108,729	2.50	0.00
3125	5	26,610	24,478	109,917	0	134,395	3.09	0.00
3126	6	28,531	24,478	137,487	0	161,965	3.72	0.00
3127	7	30,484	24,478	166,995	0	191,473	4.40	0.00
3128	8							0.00

100 YEAR WATER SURFACE ELEVATION (WSE) = 3,126 | 6FT DETPH | 2FT FREEBOARD

CHAMBER 2 (w/ BASIN 2)

MODEL	SURFACE AREA (SF)	SYSTEM DIMENSION	STORAGE VOLUME (CF)	TOTAL VOLUME (AC-FT)	OUTFLOW (CFS)
CONTECH 96" CMP	32,864	612' x 63'	255,326	5.86	0.00

BASIN 2 OVERFLOW BASIN - Area C (V_{100} = 282,334)

ELEVATION	DEPTH (FT)	SURFACE AREA (SF)	VOLUME ENGINEERED SOIL (CF)	ABOVE GROUND VOLUME (CF)	UNDERGROUND STORAGE VOLUME (CF)	TOTAL VOLUME (CF)	TOTAL VOLUME (AC-FT)	OUTFLOW (CFS)
*3106	*0	2,117	0	0	255,326	255,326	5.861	0.00
3107	1	6,118	0	4,117	255,326	259,443	5.956	0.00
3108	2	11,390	0	12,871	255,326	268,197	6.157	0.00
3109	3	17,484	0	27,307	255,326	282,633	6.488	0.00
3110	4							0.00

100 YEAR WATER SURFACE ELEVATION (WSE) = 3,109 | 3FT DETPH | 1FT FREEBOARD

DETAILS

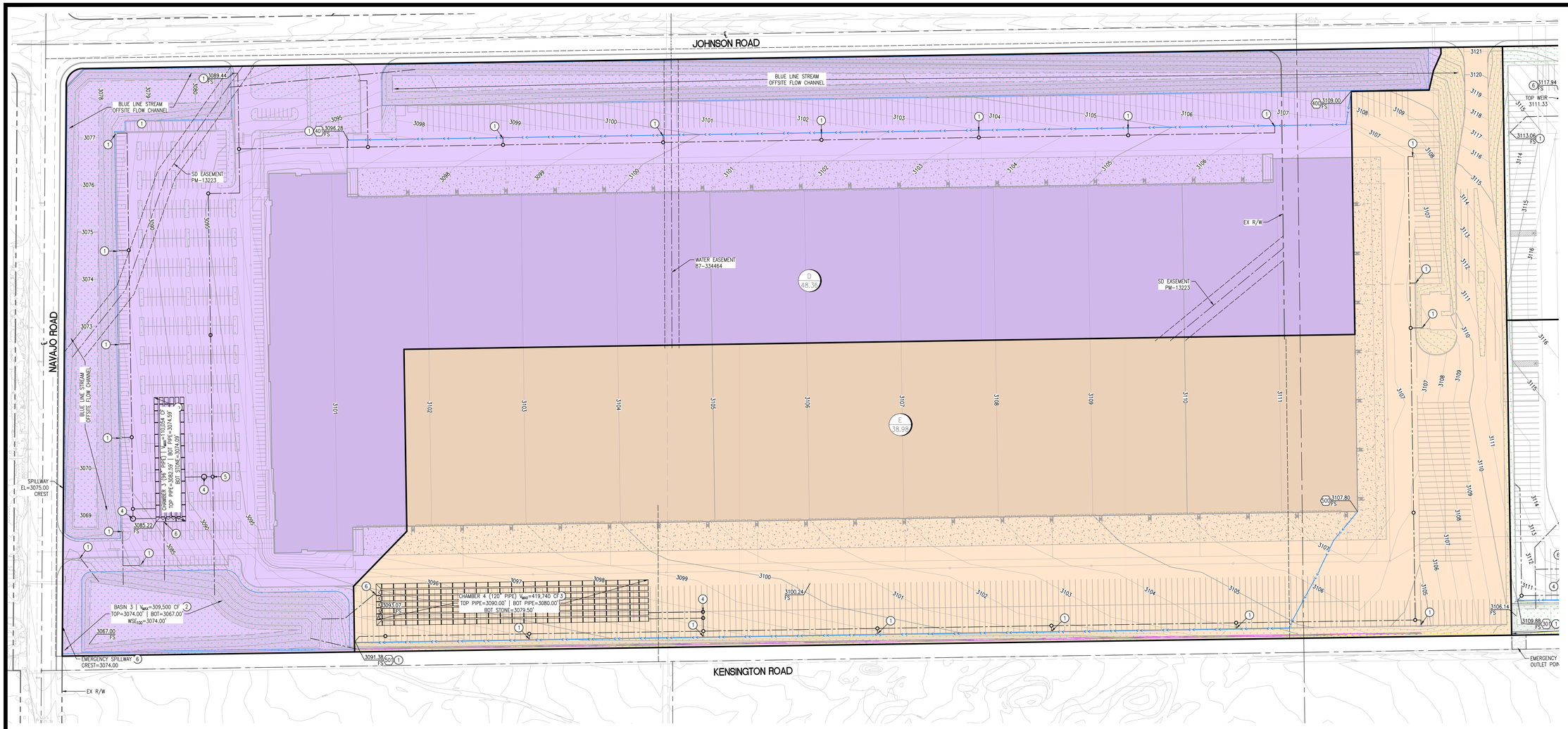
80' 0' 40' 80'
SCALE: 1" = 80'

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APPLE VALLEY INDUSTRIAL
HYDROLOGY EXHIBIT
PROPOSED CONDITION
TOWN OF APPLE VALLEY

DATE: SEP 2024
SHEET 1 OF 2

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HYDROLOGY INFORMATION

SITE AREA:	152.47 ACRE	
SOIL GROUP:	A	(PER USDA WEB SOIL SURVEY)
IMPERVIOUS:	0.90%	
ISOHYETALS:	3.42" 2.11" 1.30"	(100-YEAR, 24-HOUR) (25-YEAR, 24-HOUR) (2-YEAR, 24-HOUR)
FREQUENCY:	100 YEAR 10 YEAR	(FOR STORM DRAIN DESIGN) (FOR WATER QUALITY)
METHOD:	SAN BERNARDINO COUNTY HYDROLOGY MANUAL	

GENERAL NOTES

1. SEE PRELIMINARY HYDROLOGY REPORT, PREPARED BY WESTLAND GROUP, FOR THE COMPLETE POST-DEVELOPMENT HYDROLOGY CALCULATIONS.
2. CALCULATIONS WERE BASED ON THE REQUIREMENTS ON THE SAN BERNARDINO COUNTY HYDROLOGY MANUAL FOR 100 YEAR STORM.
3. PROPOSED ON-SITE DRAINAGE SYSTEM LAYOUT IS PRELIMINARY.
4. ALL FINISH ELEVATIONS AND INVERT ELEVATIONS ARE APPROXIMATE.

BMP NOTES

1. PROPOSED STORM DRAIN INLET
2. PROPOSED ABOVE GROUND RETENTION BASIN
3. PROPOSED UNDERGROUND RETENTION CHAMBER
4. PROPOSED HYDRODYNAMIC SEPARATOR (CDS)
5. MANHOLE WITH HIGH FLOW BYPASS
6. EMERGENCY OVERFLOW

LEGEND

- DRAINAGE AREA BOUNDARY
- SUB-AREA BOUNDARY
- PROPOSED STORM DRAIN
- FLOW PATH
- SUB-DRAINAGE AREA ID
- SUB-DRAINAGE AREA IDENTIFIER
- SUB-DRAINAGE SURFACE AREA (ACRE)
- FLOW ARROW
- SURFACE FLOW NODE
- TRIBUTARY AREA - BASIN 3 & CHAMBER 3
- TRIBUTARY AREA - CHAMBER 4

ABBREVIATIONS

AC	ACRES
CF	CUBIC FEET
CFS	CUBIC FEET PER SECOND
C&G	CURB AND GUTTER
CL OR ℄	CENTERLINE
DA	DRAINAGE AREA
EX	EXISTING
FS	FINISHED SURFACE ELEVATION
HR	HOUR
IN	INCH/INCHES
INV	INVERT ELEVATION
L	LENGTH
R/W	RIGHT OF WAY
PL OR ℄	PROPERTY LINE
PROP	PROPOSED
SD	STORM DRAIN
TYP	TYPICAL
V	VOLUME
W	WIDTH

DETAILS

HYDROLOGY SUMMARY TABLE

SUBAREA ID	DRAINAGE AREA (AC)	RUNOFF COEFFICIENT "C"$_{100}$	RAINFALL INTENSITY "I"$_{100}$ (INCH/HOUR)	TIME OF CONCENTRATION "Tc"$_{100}$ (MIN.)	RUNOFF FLOW RATE "Q$_{100}$" (CFS)	RUNOFF VOLUME "V$_{100}$" (CF)	RUNOFF FLOW RATE "Q$_{10}$" (CFS)	RUNOFF VOLUME "V$_{10}$" (CF)	RUNOFF FLOW RATE "Q$_{2}$" (CFS)
D	48.36	0.828	2.315	20.19	92.67	383,489	46.37	226,569	24.56
E	38.98	0.872	2.547	17.61	86.61	419,522	46.63	253,275	25.69
TOTAL	87.34				179.28	803,011	93.00	479,844	50.25

CHAMBER 3 (w/ BASIN3)

MODEL	SURFACE AREA (SF)	SYSTEM DIMENSION	STORAGE VOLUME (CF)	TOTAL VOLUME (AC-FT)	OUTFLOW (CFS)
CONTECH 96" CMP	16,569	263' x 63'	110,054	2.53	0.00

BASIN 3 - Area D (V_{100} = 383,489)

ELEVATION	DEPTH (FT)	SURFACE AREA (SF)	VOLUME ENGINEERED SOIL (CF)	ABOVE GROUND VOLUME (CF)	UNDERGROUND STORAGE VOLUME (CF)	TOTAL VOLUME (CF)	TOTAL VOLUME (AC-FT)	OUTFLOW (CFS)
3067*	0	29,928	41,899	0	110,054	151,953	3.49	0.00
3068	1	33,162	41,899	31,545	110,054	183,498	4.21	0.00
3069	2	36,318	41,899	66,285	110,054	218,238	5.01	0.00
3070	3	39,560	41,899	104,224	110,054	256,177	5.88	0.00
3071	4	42,889	41,899	145,448	110,054	297,401	6.83	0.00
3072	5	46,305	41,899	190,045	110,054	341,998	7.85	0.00
3073	6	51,089	41,899	238,742	110,054	390,695	8.97	0.00
3074	7							

100 YEAR WATER SURFACE ELEVATION (WSE) = 3,073 | 6FT DEPTH | 1FT FREEBOARD

CHAMBER 4 - Area E (V_{100} = 383,489)

MODEL	SURFACE AREA (SF)	SYSTEM DIMENSION	STORAGE VOLUME (CF)	TOTAL VOLUME (AC-FT)	OUTFLOW (CFS)
CONTECH 120" CMP	50,688	576' x 88'	419,740	9.64	0.00

N

80' 0' 40' 80'
SCALE: 1" = 80'

PREPARED BY:
WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
JOB NO: 2021-181

APPLE VALLEY INDUSTRIAL HYDROLOGY EXHIBIT
PROPOSED CONDITION
TOWN OF APPLE VALLEY

DATE: SEP 2024
SHEET 2 OF 2

09/03/2024

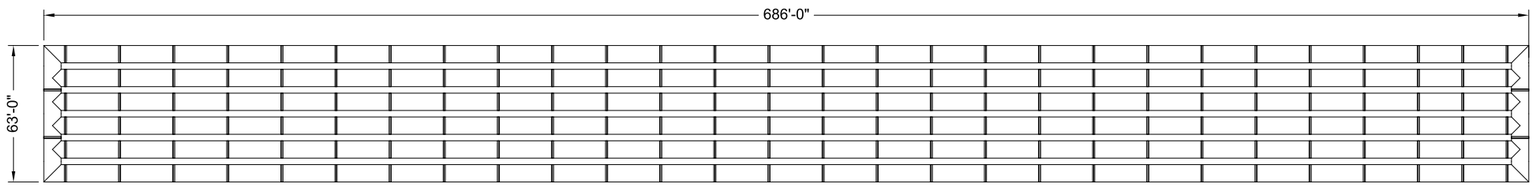
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 4,146 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 286,000 CF
- PIPE STORAGE VOLUME = 208,401 CF
- BACKFILL STORAGE VOLUME = 77,632 CF
- TOTAL STORAGE PROVIDED = 286,032 CF
- STONE VOID = 40%

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY
SCALE: 1" = 70'

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CONTECH® CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO21018 2021-181 WLC Apple Valley 145 ac
East Building, Chamber 1
Apple Valley, CA
DETENTION SYSTEM

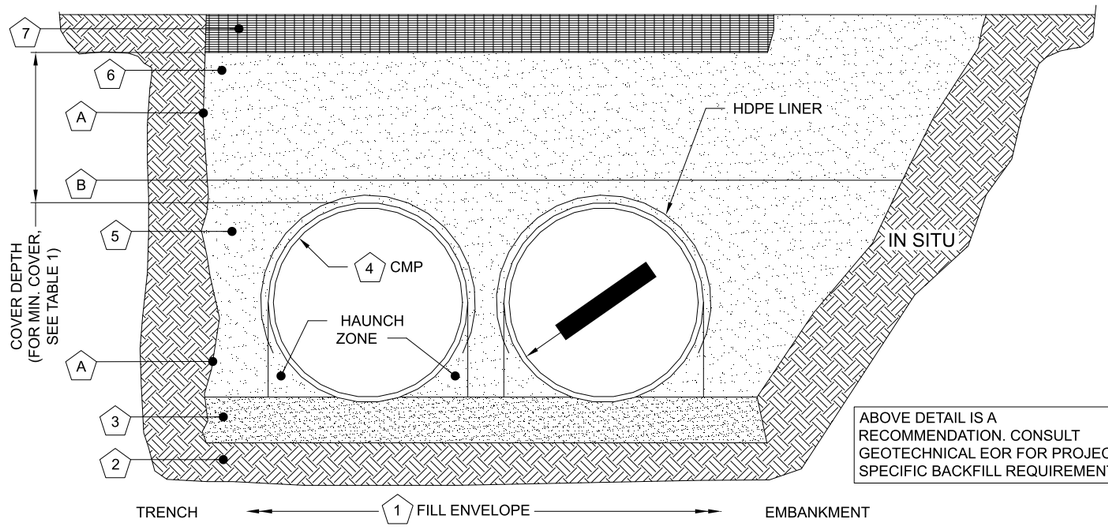
PROJECT No.:	SEQ. No.:	DATE:
13686	21018	8/8/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.



ABOVE DETAIL IS A RECOMMENDATION. CONSULT GEOTECHNICAL EOR FOR PROJECT SPECIFIC BACKFILL REQUIREMENTS.

MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT

INSTALLATION NOTES

1. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.
2. OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.
3. AN HDPE MEMBRANE LINER WILL BE PLACED ON THE CROWN OF EACH PIPE TO PROVIDE AN IMPERMEABLE BARRIER AGAINST ENVIRONMENTAL CHANGES THAT MAY ADVERSELY AFFECT THE SYSTEM OVER TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL TECHNICAL DETAILS.

TABLE 2: PERFORATED STANDARD

CMP RETENTION STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.0D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2** - PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE OPEN GRADED GRANULAR BEDDING CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4	CORRUGATED METAL PIPE			
5	BACKFILL	FREE-DRAINING, ANGULAR, NATURALLY OCCURRING WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** OR APPROVED EQUAL *	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION WITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. **IN AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A-3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	OPTIONAL SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.

* APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MIDOT 6AA, 6A, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL

NOT TO SCALE

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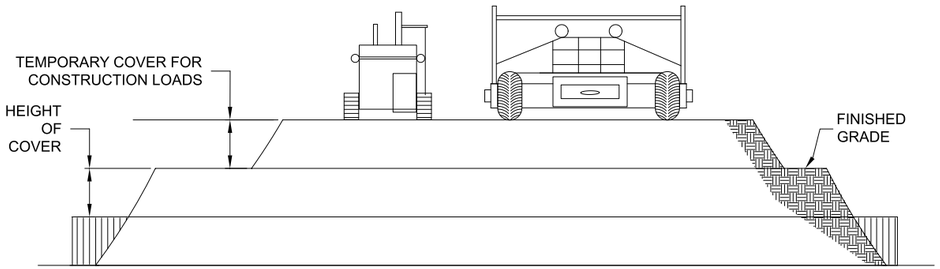
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CONTECH® CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO21018 2021-181 WLC Apple Valley 145 ac
East Building, Chamber 1
Apple Valley, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
13686	21018	8/8/2024
DESIGNED: DYO	DRAWN: DYO	
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SHEET NO.: 1		

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CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

NOTE:
THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

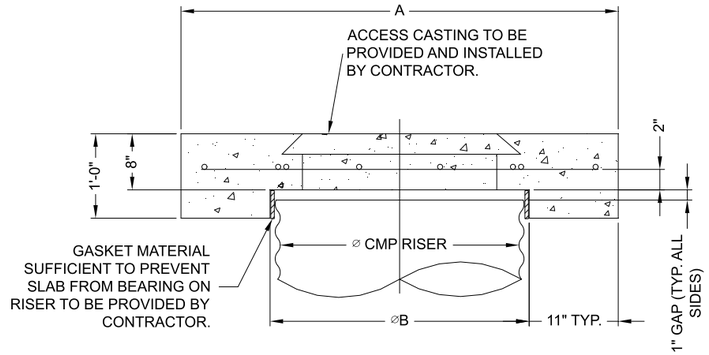
GALVANIZED: AASHTO M-36 OR ASTM A-760

APPLICABLE POLYMER COATED: AASHTO M-245 OR ASTM A-762

ALUMINUM: AASHTO M-196 OR ASTM B-745

APPLICABLE
HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSP'S (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.
REQUIREMENTS
INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

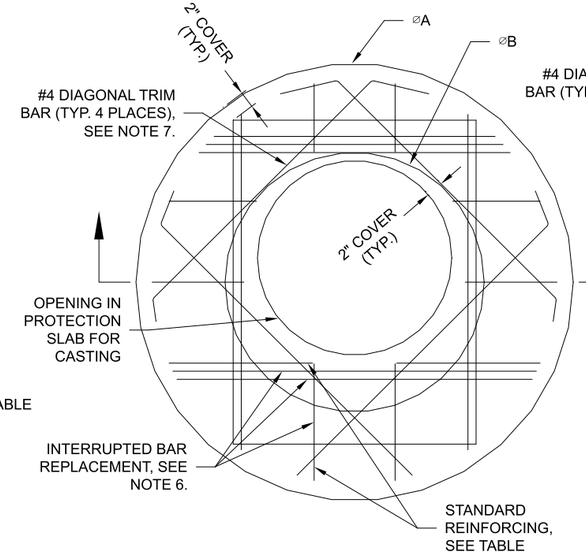
IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.



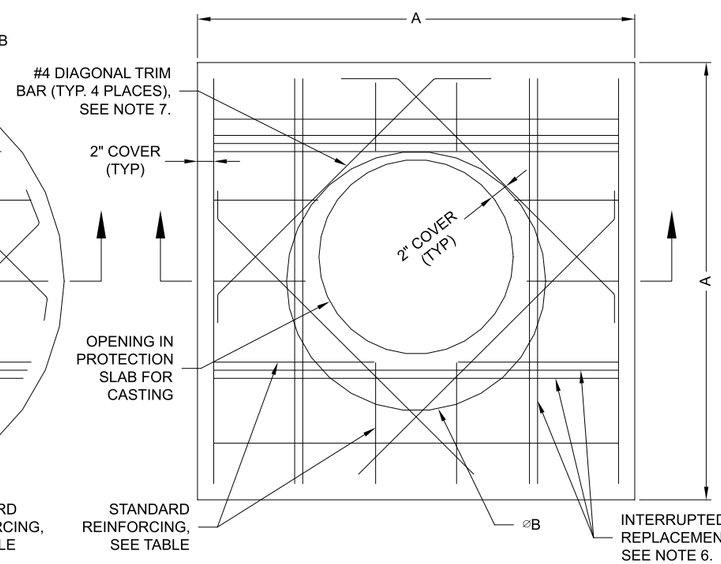
SECTION VIEW

REINFORCING TABLE				
⌀ CMP RISER	A	⌀ B	REINFORCING	**BEARING PRESSURE (PSF)
24"	⌀ 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	⌀ 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	⌀ 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	⌀ 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	⌀ 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

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CONTECH CMP DETENTION SYSTEMS
CONTECH **DYODS** DRAWING

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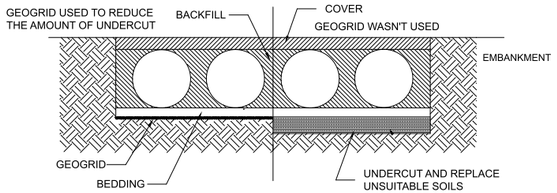
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.

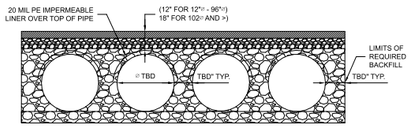


GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

GEOMEMBRANE BARRIER

A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

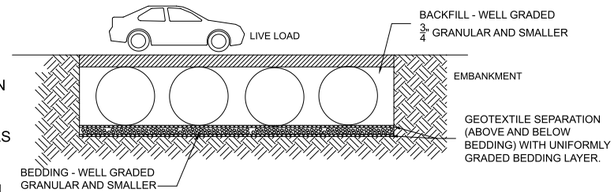
THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.



IN-SITU TRENCH WALL

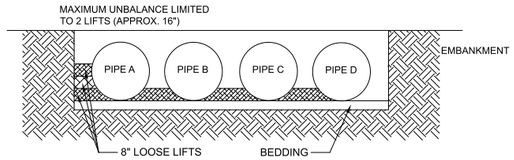
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



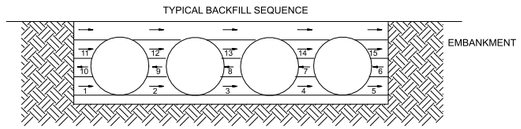
BACKFILL PLACEMENT

MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

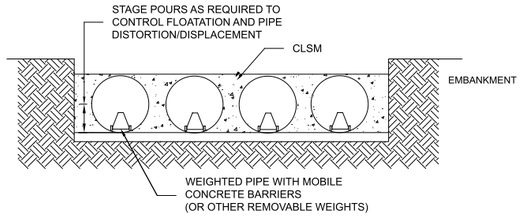


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.



WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

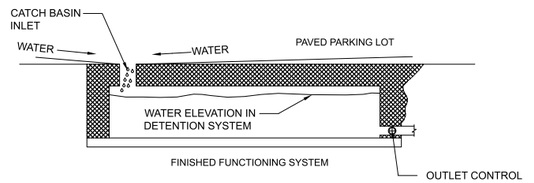


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION

INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASHDOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/ CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE

CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

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800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS

CONTECH **DYODS** DRAWING

DYO21018 2021-181 WLC Apple Valley 145 ac
East Building, Chamber 1
Apple Valley, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
13686	21018	8/8/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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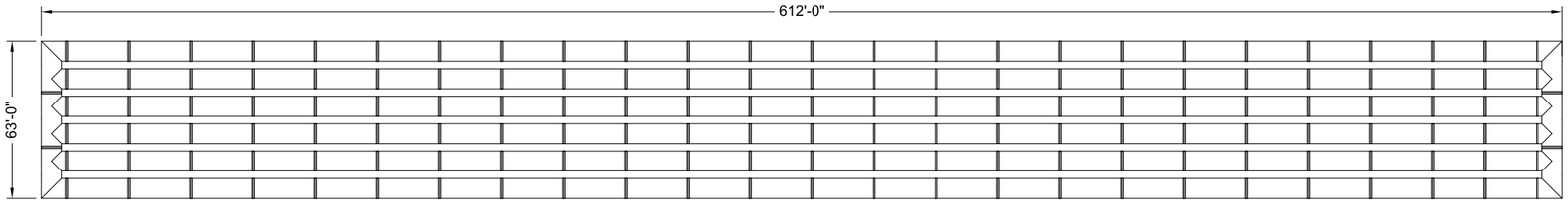
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 3,702 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 255,000 CF
- PIPE STORAGE VOLUME = 186,083 CF
- BACKFILL STORAGE VOLUME = 69,243 CF
- TOTAL STORAGE PROVIDED = 255,326 CF
- STONE VOID = 40%

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY
SCALE: 1" = 60'

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CONTECH® CMP DETENTION SYSTEMS
CONTECH **DYODS** DRAWING

DYO28049 2021-181 WLC Apple Valley 145 ac
East Building, Chamber 2
Apple Valley, CA
DETENTION SYSTEM

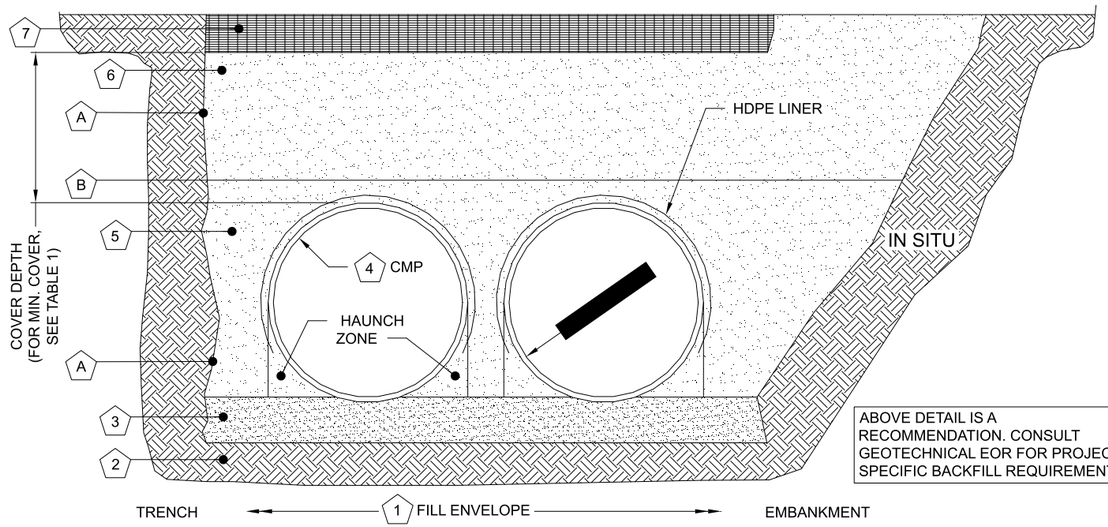
PROJECT No.:	SEQ. No.:	DATE:
13686	28049	8/9/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.



ABOVE DETAIL IS A RECOMMENDATION. CONSULT GEOTECHNICAL EOR FOR PROJECT SPECIFIC BACKFILL REQUIREMENTS.

MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT

INSTALLATION NOTES

1. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.
2. OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.
3. AN HDPE MEMBRANE LINER WILL BE PLACED ON THE CROWN OF EACH PIPE TO PROVIDE AN IMPERMEABLE BARRIER AGAINST ENVIRONMENTAL CHANGES THAT MAY ADVERSELY AFFECT THE SYSTEM OVER TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL TECHNICAL DETAILS.

TABLE 2: PERFORATED STANDARD

CMP RETENTION STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.0D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2** - PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE OPEN GRADED GRANULAR BEDDING CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4	CORRUGATED METAL PIPE			
5	BACKFILL	FREE-DRAINING, ANGULAR, NATURALLY OCCURRING WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** OR APPROVED EQUAL *	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION WITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. **IN AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A-3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	OPTIONAL SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.

* APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MIDOT 6AA, 6A, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL

NOT TO SCALE

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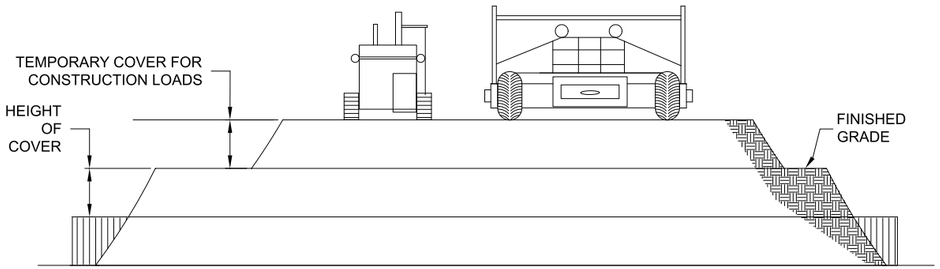
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DYO28049 2021-181 WLC Apple Valley 145 ac
East Building, Chamber 2
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DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
13686	28049	8/9/2024
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CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

GALVANIZED: AASHTO M-36 OR ASTM A-760

APPLICABLE POLYMER COATED: AASHTO M-245 OR ASTM A-762

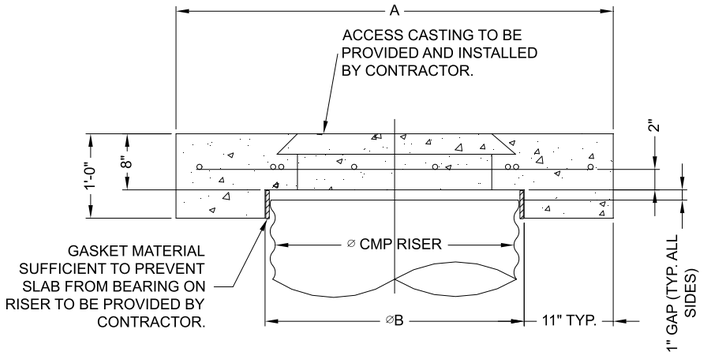
ALUMINUM: AASHTO M-196 OR ASTM B-745

APPLICABLE HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSP'S (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.

REQUIREMENTS INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

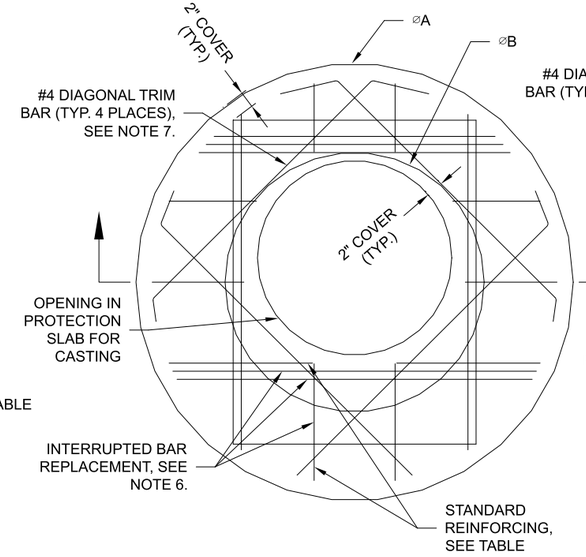
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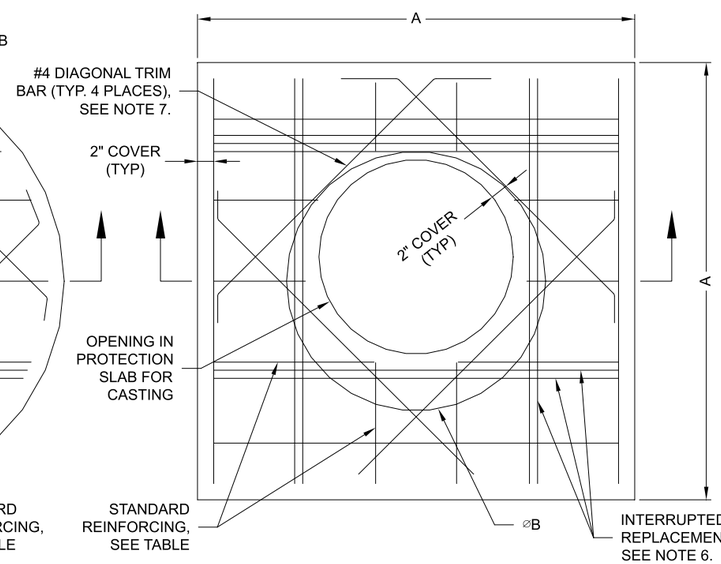
SECTION VIEW

REINFORCING TABLE				
⌀ CMP RISER	A	⌀ B	REINFORCING	**BEARING PRESSURE (PSF)
24"	⌀ 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	⌀ 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	⌀ 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	⌀ 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	⌀ 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

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CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO28049 2021-181 WLC Apple Valley 145 ac
East Building, Chamber 2
Apple Valley, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
13686	28049	8/9/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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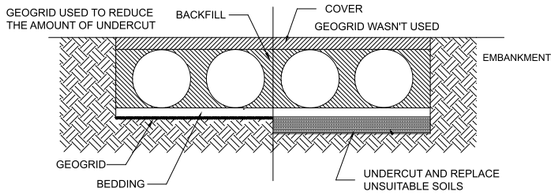
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.

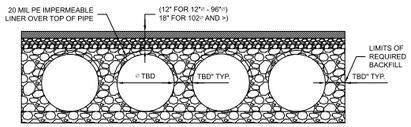


GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

GEOMEMBRANE BARRIER

A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

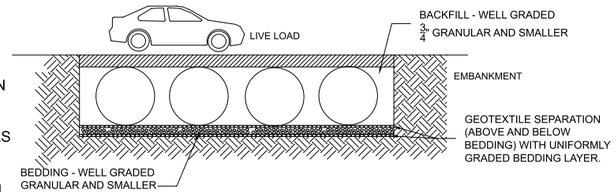
THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.



IN-SITU TRENCH WALL

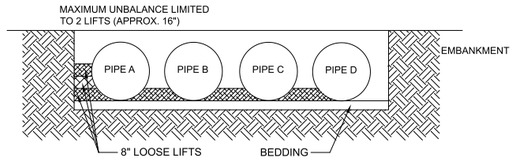
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



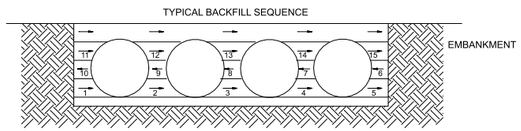
BACKFILL PLACEMENT

MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

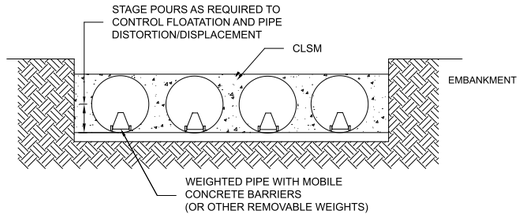


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.



WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

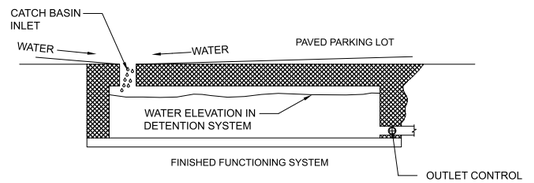


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION

INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASHDOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/ CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE

CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

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CONTECH CMP DETENTION SYSTEMS
CONTECH **DYODS** DRAWING

DYO28049 2021-181 WLC Apple Valley 145 ac
East Building, Chamber 2
Apple Valley, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
13686	28049	8/9/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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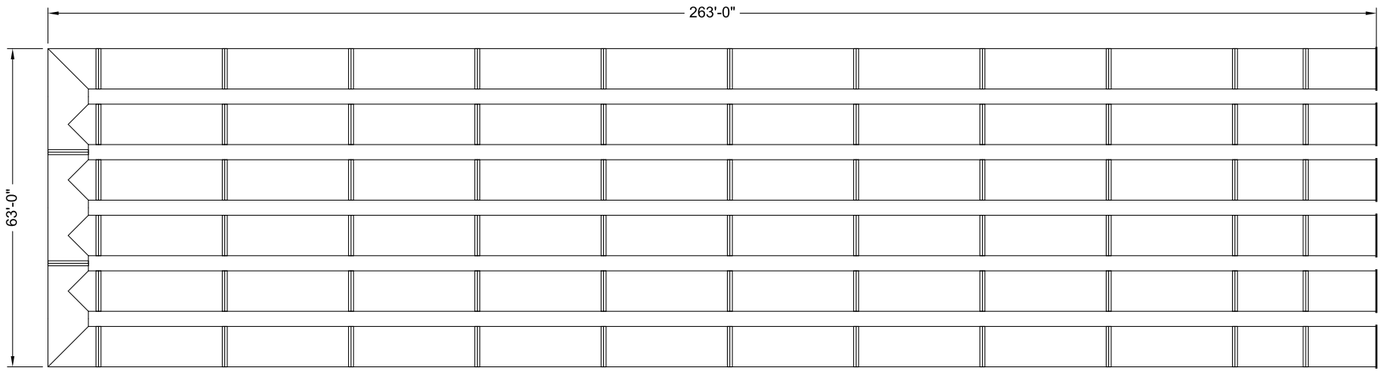
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 1,593 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 110,000 CF
- PIPE STORAGE VOLUME = 80,073 CF
- BACKFILL STORAGE VOLUME = 29,981 CF
- TOTAL STORAGE PROVIDED = 110,054 CF
- STONE VOID = 40%

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY
SCALE: 1" = 30'

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CONTECH **DYODS** DRAWING

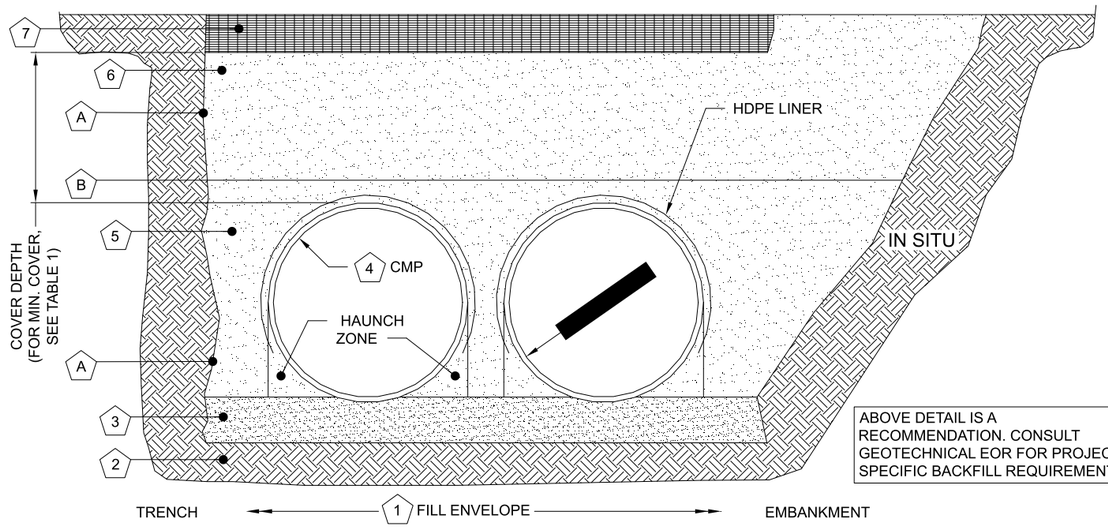
DYO28050 2021-181 WLC Apple Valley 145 ac
Chamber 3
Apple Valley, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
13686	28050	8/30/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.



ABOVE DETAIL IS A RECOMMENDATION. CONSULT GEOTECHNICAL EOR FOR PROJECT SPECIFIC BACKFILL REQUIREMENTS.

MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT

INSTALLATION NOTES

1. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.
2. OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.
3. AN HDPE MEMBRANE LINER WILL BE PLACED ON THE CROWN OF EACH PIPE TO PROVIDE AN IMPERMEABLE BARRIER AGAINST ENVIRONMENTAL CHANGES THAT MAY ADVERSELY AFFECT THE SYSTEM OVER TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL TECHNICAL DETAILS.

TABLE 2: PERFORATED STANDARD

CMP RETENTION STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.0D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2** - PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE OPEN GRADED GRANULAR BEDDING CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4	CORRUGATED METAL PIPE			
5	BACKFILL	FREE-DRAINING, ANGULAR, NATURALLY OCCURRING WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** OR APPROVED EQUAL *	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION WITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. **IN AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A-3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	OPTIONAL SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.

* APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MIDOT 6AA, 6A, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL

NOT TO SCALE

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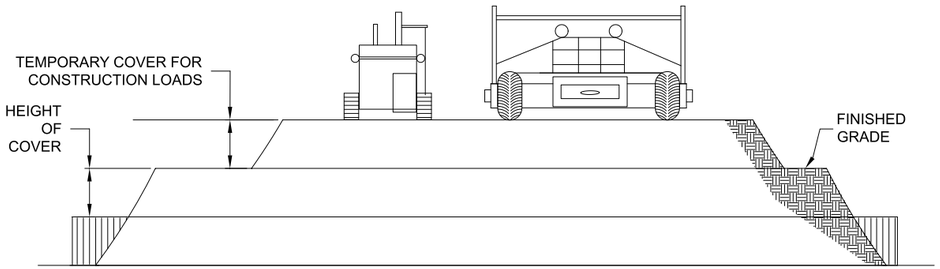
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CONTECH® CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO28050 2021-181 WLC Apple Valley 145 ac
Chamber 3
Apple Valley, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
13686	28050	8/30/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

GALVANIZED: AASHTO M-36 OR ASTM A-760

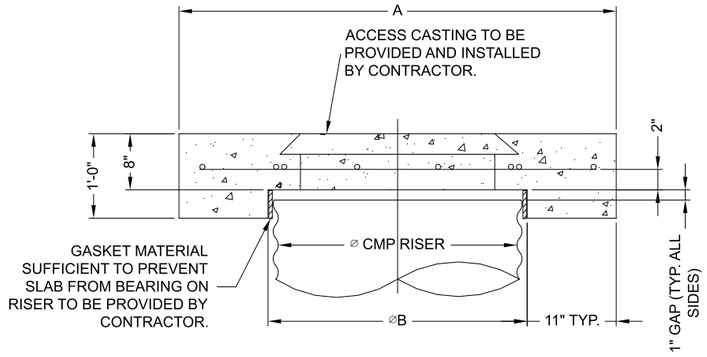
APPLICABLE POLYMER COATED: AASHTO M-245 OR ASTM A-762

ALUMINUM: AASHTO M-196 OR ASTM B-745

APPLICABLE
HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSP'S (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.
REQUIREMENTS
INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

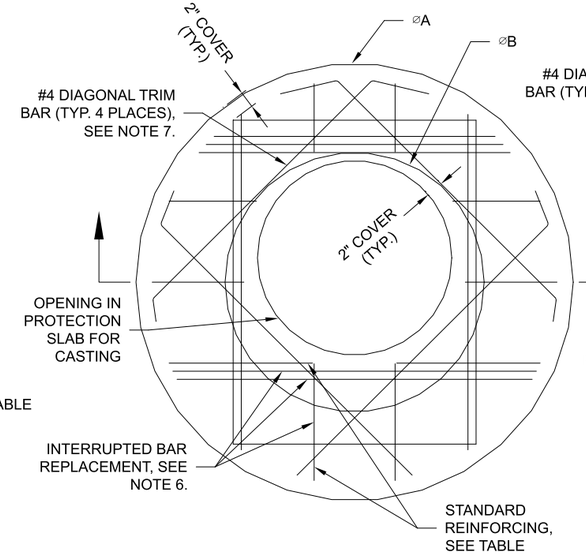
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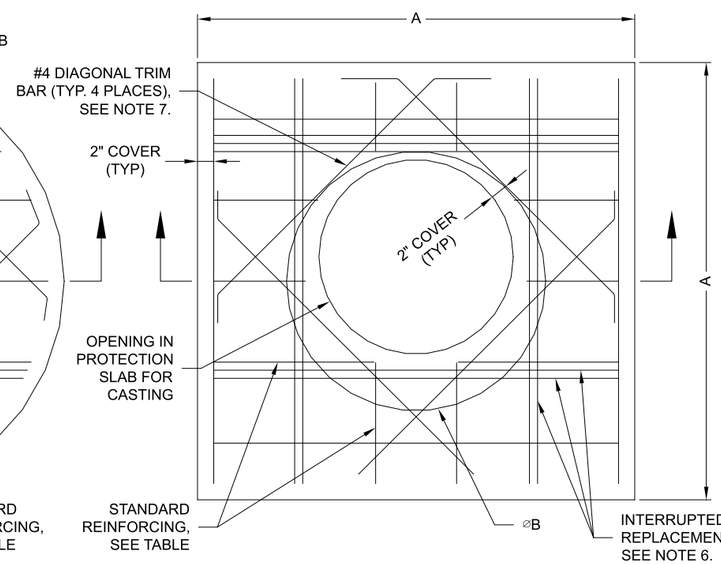
SECTION VIEW

REINFORCING TABLE				
⌀ CMP RISER	A	⌀ B	REINFORCING	**BEARING PRESSURE (PSF)
24"	⌀ 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	⌀ 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	⌀ 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	⌀ 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	⌀ 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

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CONTECH CMP DETENTION SYSTEMS
CONTECH **DYODS** DRAWING

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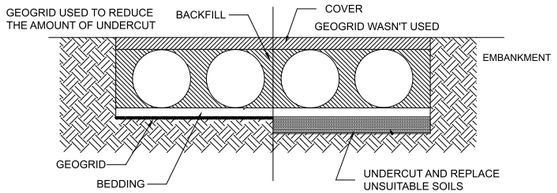
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.

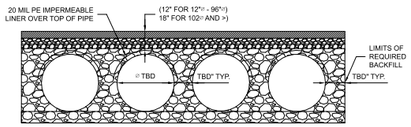


GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

GEOMEMBRANE BARRIER

A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

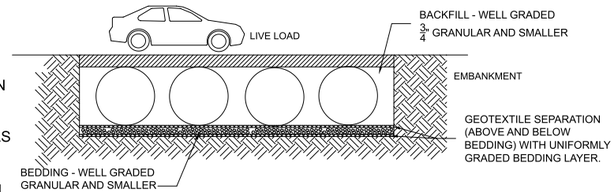
THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.



IN-SITU TRENCH WALL

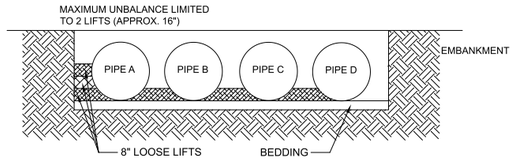
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



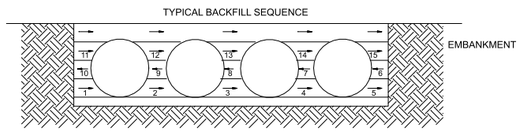
BACKFILL PLACEMENT

MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

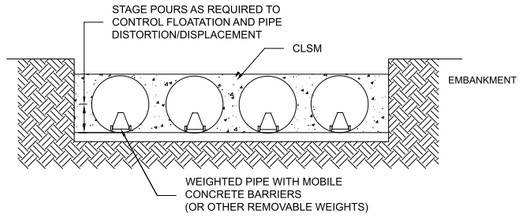


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.



WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

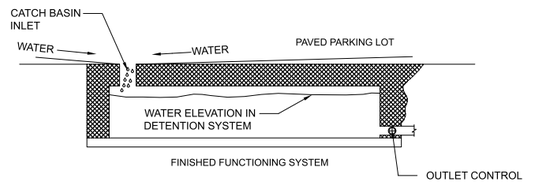


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION

INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASHDOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/ CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE

CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

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CONTECH CMP DETENTION SYSTEMS

CONTECH **DYODS** DRAWING

DYO28050 2021-181 WLC Apple Valley 145 ac
Chamber 3
Apple Valley, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
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DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

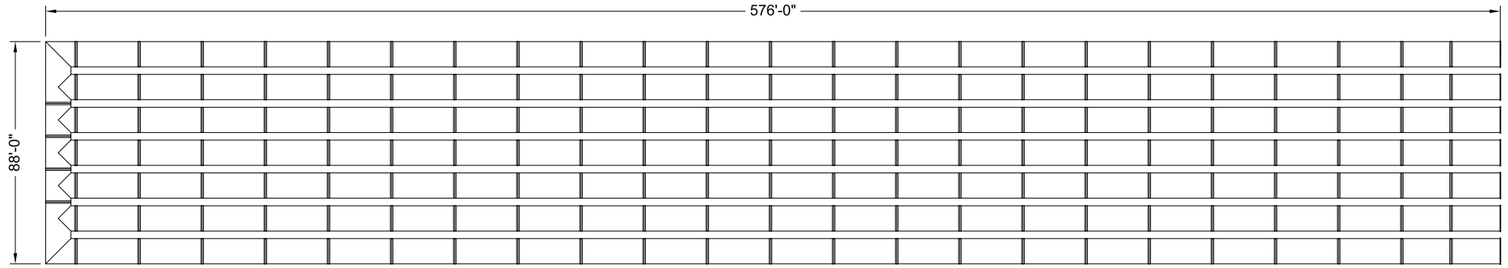
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 4,050 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 419,522 CF
- PIPE STORAGE VOLUME = 318,086 CF
- BACKFILL STORAGE VOLUME = 101,653 CF
- TOTAL STORAGE PROVIDED = 419,740 CF
- STONE VOID = 40%

PIPE DETAILS
- DIAMETER = 120"
- CORRUGATION = 5x1
- GAGE = 14
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
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ASSEMBLY
SCALE: 1" = 60'

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CONTECH® CMP DETENTION SYSTEMS
CONTECH **DYODS** DRAWING

DYO28051 2021-181 WLC Apple Valley 145 ac
Chamber 4
Apple Valley, CA
DETENTION SYSTEM

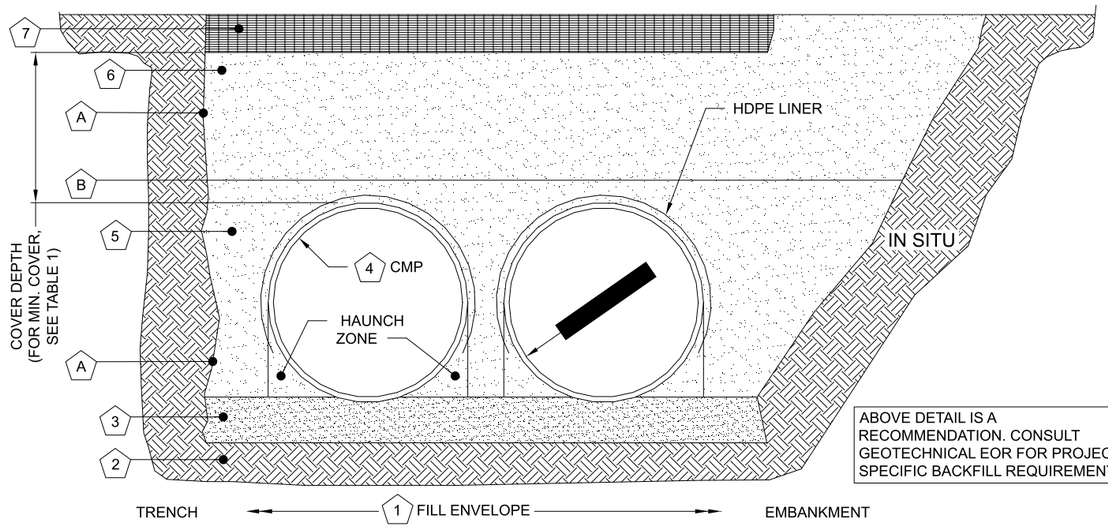
PROJECT No.:	SEQ. No.:	DATE:
13686	28051	8/30/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.



ABOVE DETAIL IS A RECOMMENDATION. CONSULT GEOTECHNICAL EOR FOR PROJECT SPECIFIC BACKFILL REQUIREMENTS.

MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT

INSTALLATION NOTES

1. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.
2. OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.
3. AN HDPE MEMBRANE LINER WILL BE PLACED ON THE CROWN OF EACH PIPE TO PROVIDE AN IMPERMEABLE BARRIER AGAINST ENVIRONMENTAL CHANGES THAT MAY ADVERSELY AFFECT THE SYSTEM OVER TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL TECHNICAL DETAILS.

TABLE 2: PERFORATED STANDARD

CMP RETENTION STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.0D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2** - PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE OPEN GRADED GRANULAR BEDDING CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4	CORRUGATED METAL PIPE			
5	BACKFILL	FREE-DRAINING, ANGULAR, NATURALLY OCCURRING WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** OR APPROVED EQUAL *	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION WITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. **IN AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A-3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	OPTIONAL SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.

* APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MIDOT 6AA, 6A, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL

NOT TO SCALE

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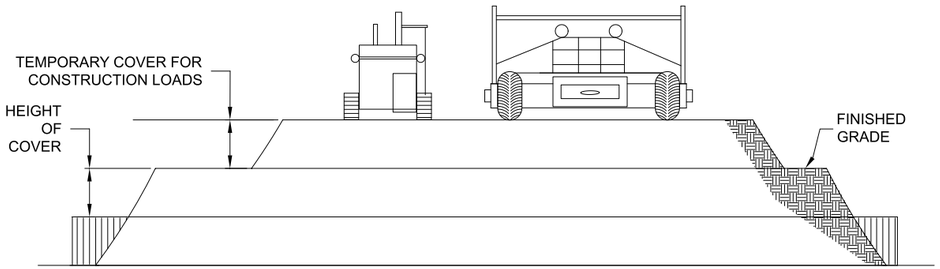
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CONTECH® CMP DETENTION SYSTEMS
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DYO28051 2021-181 WLC Apple Valley 145 ac
Chamber 4
Apple Valley, CA
DETENTION SYSTEM

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CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

GALVANIZED: AASHTO M-36 OR ASTM A-760

APPLICABLE POLYMER COATED: AASHTO M-245 OR ASTM A-762

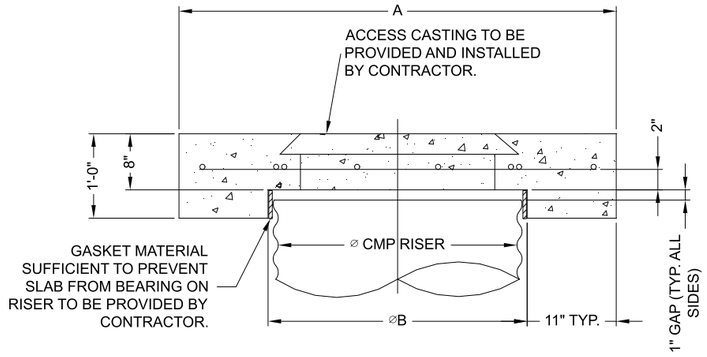
ALUMINUM: AASHTO M-196 OR ASTM B-745

APPLICABLE HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSP'S (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.

REQUIREMENTS INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

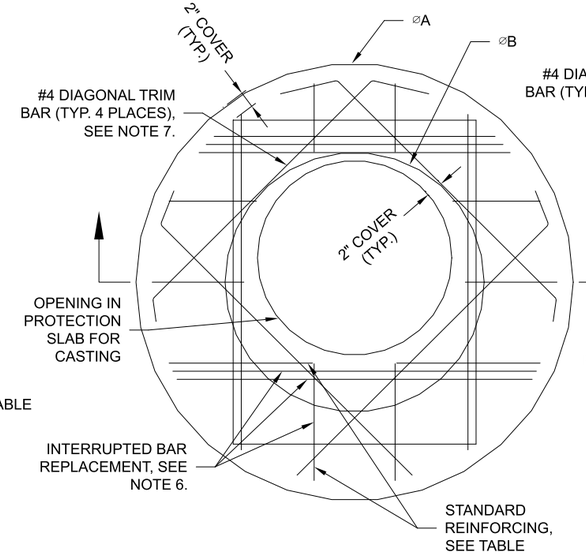
NOTE:
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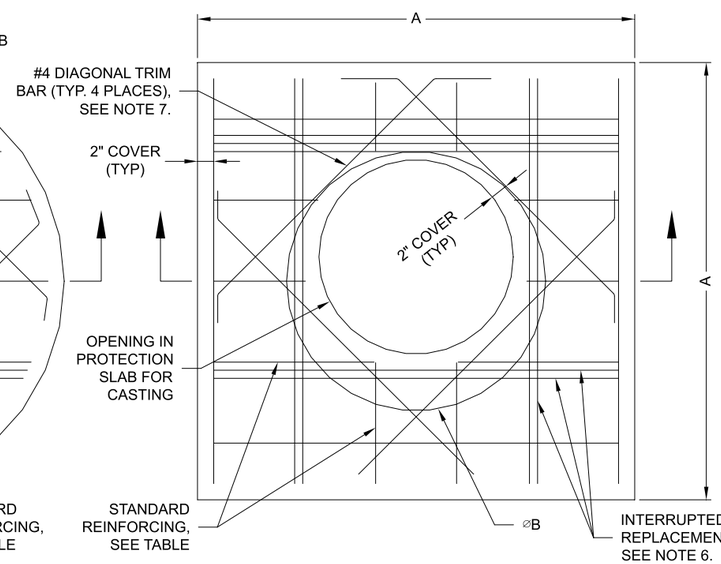
SECTION VIEW

REINFORCING TABLE				
⌀ CMP RISER	A	⌀ B	REINFORCING	**BEARING PRESSURE (PSF)
24"	⌀ 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	⌀ 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	⌀ 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	⌀ 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	⌀ 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

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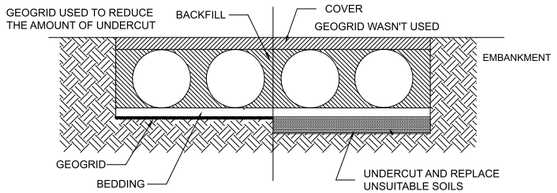
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.

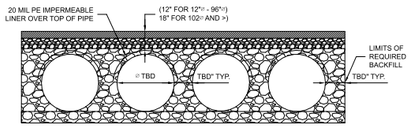


GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

GEOMEMBRANE BARRIER

A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

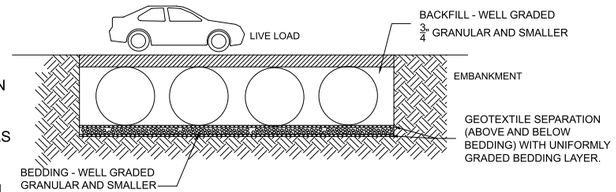
THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.



IN-SITU TRENCH WALL

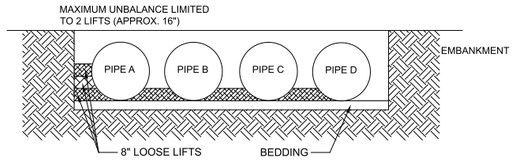
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



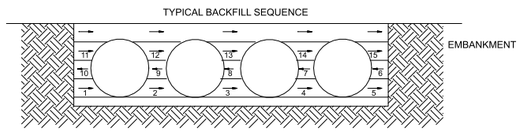
BACKFILL PLACEMENT

MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

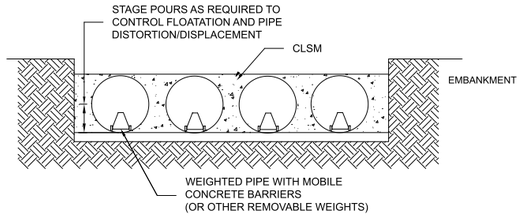


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.



WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

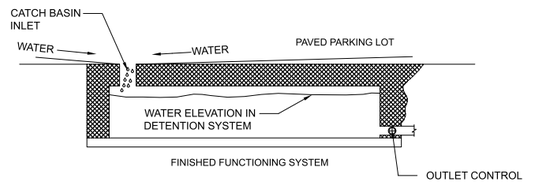


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION

INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASHDOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/ CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE

CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

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DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
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CONTECH CMP DETENTION SYSTEMS

CONTECH **DYODS** DRAWING

DYO28051 2021-181 WLC Apple Valley 145 ac
Chamber 4
Apple Valley, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
13686	28051	8/30/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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APPENDIX B

CALCULATION TABLES

2021-181 Apple Valley Industrial (Johnson and Navajo) Hydrology Summary Tables

9/3/2024

PRE

Area ID	Area (SF)	Area (AC)	Q100 (CFS)	V100 (CF)	V10 (CF)	Q2 (CFS)
SITE TOTAL	6,713,519	154.12	219.77	1,496,260	419,391	0.92

POST

Building	Area (SF)	Area (AC)	Q100 (CFS)	V100 (CF)	V10 (CF)	Q2 (CFS)	WATER QUALITY - HYDROMODIFICATION VOLUME (CF)
East	2,747,806	63.08	158.52	635,802	379,530	43.84	184,677
West	3,804,565	87.34	179.29	803,011	479,844	50.26	212,337
SITE TOTAL	6,552,371	150.42		**1,438,813**	859,373		397,013

Volume Provided (CF)		
East Building, Chamber 1 - Area A		286,032
East Building, Basin 1 - Area B		173,434
East Building, Chamber 2 w/ Basin 2, Area C		282,633
West Building, Chamber 3 w/ Basin 3, Area D		390,695
West Building, Chamber 4 - Area E		419,740
	SUM	**1,552,534**

2021-181 Apple Valley Industrial (Johnson and Navajo) Hydrology Calculations

9/3/2024

Pre

DA	Area (sf)	Area (ac)	Pervious Area	Pervious Ratio	HP	LP	Length	TC (min)	TC (hr)	Q100 (cfs)	V100 (ac-ft)	V100 (cf)	Q10 (cfs)	V10 (ac-ft)	V10 (cf)	Q2 (cfs)	V2 (ac-ft)	V2 (cf)
A	2,403,163	55.169	2,403,163	1.000	3149.00	3106.80	2825	34.23	0.57	69.953	12.1383	528,744	23.607	3.4025	148,213	0.000	0.3247	14,144
B	1,497,881	34.387	1,497,881	1.000	3118.90	3094.00	1827	29.29	0.49	49.661	7.6619	333,752	18.001	2.1475	93,545	0.000	0.2049	8,925
C	1,304,517	29.948	1,304,517	1.000	3115.00	3085.00	2174	31.32	0.52	40.876	6.6314	288,864	14.393	1.8590	80,978	0.000	0.1775	7,732
D	1,101,729	25.292	1,101,729	1.000	3100.00	3076.00	1566	26.90	0.45	39.917	5.7781	251,694	14.962	1.6194	70,541	0.000	0.1545	6,730
SubTotal	*6,307,289*	*144.80*	*6,307,289*							*200.41*	*32.2097*	*1,403,055*	*70.96*	*9.0284*	*393,277*	*0.00*	*0.8616*	*37,531*
E	406,230	9.326	406,230	1.000	3143.00	3130.80	680	30.43	0.51	19.358	2.1397	93,205	8.114	0.5995	26,114	0.922	0.0571	2,487
Total	**6,713,519**	**154.12**	**6,713,519**	**1.000**				*average**		**219.77**	**34.3494**	**1,496,260**	**79.08**	**9.6279**	**419,391**	**0.92**	**0.9187**	**40,019**

	NOAA Atlas 14 Rainfall Data			
	2Yr	**10 Yr**	**25 Yr**	**100 Yr**
1hr	*0.345*	*0.605*	*0.779*	*1.080*
6hr	*0.758*	*1.220*	*1.520*	*2.010*
24hr	*1.300*	*2.110*	*2.620*	*3.420*

Curve #	*78*	Pre
	32	Post

Post

DA	Area (sf)	Area (ac)	Pervious Area	Pervious Ratio	HP	LP	Length	TC (min)	TC (hr)	Q100 (cfs)	V100 (ac-ft)	V100 (cf)	Q10 (cfs)	V10 (ac-ft)	V10 (cf)	Q2 (cfs)	V2 (ac-ft)	V2 (cf)
A	1,170,462	26.87	138,977	0.119	3127.97	3117.39	1276	13.84	0.23	70.65	6.5468	285,179	38.03	3.9412	171,679	20.52	0.0000	0
B	386,887	8.88	168,641	0.436	3141.56	3119.00	1268	14.90	0.25	20.15	1.5677	68,289	9.41	0.8862	38,603	4.12	0.0000	0
C	1,190,458	27.33	177,094	0.149	3127.97	3109.88	1647	14.85	0.25	67.73	6.4815	282,334	35.97	3.8854	169,248	19.20	0.0000	0
Sub Total	*2,747,806*	*63.08*	*484,711*	*0.176*						*158.52*	*14.596*	*635,802*	*83.41*	*8.713*	*379,530*	*43.84*	*0.000*	*0*
D	2,106,772	48.36	499,568	0.237	3109.00	3096.28	2184	20.19	0.34	92.67	8.8037	383,489	46.37	5.2013	226,569	24.56	0.0000	0
E	1,697,793	38.98	104,707	0.062	3107.80	3091.38	2264	17.61	0.29	86.61	9.6309	419,522	46.63	5.8144	253,275	25.69	0.0000	0
Sub Total	*3,804,565*	*87.34*	*604,274*	*0.159*						*179.29*	*18.435*	*803,011*	*93.00*	*11.016*	*479,844*	*50.26*	*0.000*	*0*
Site Total	**6,552,371**	**150.42**	**1,088,985**	**0.166**				16.28		**337.81**	**33.031**	**1,438,813**	**176.41**	**19.7285**	**859,373**	**94.09**	**0**	**0**

APPENDIX C

BASIN ANALYSIS

2021-181 Apple Valley Industrial (Johnson and Navajo) Basin Summary Tables

9/3/2024

East Building, Chamber 1 - Area A		
	$V_{REQUIRED}$ =	**285,179**
	$V_{PROVIDED}$ =	**286,032**

East Building, Basin 1 - Area B

Elevation	Depth (Ft)	Surface Area (SF)	Volume Engineered Soil (CF)	Above Ground Volume (CF)	Underground Storage Volume (CF)	Total Volume (CF)	Total Volume (Ac-Ft)	Outflow (cfs)
*3119	0*	36,269	50,776	0	0	50,776	1.166	0.00
3120	1	39,307	50,776	37,788	0	88,564	2.033	0.00
3121	2	42,417	50,776	78,649	0	129,425	2.971	0.00
3122	3	45,600	50,776	122,658	0	173,434	3.981	0.00
3,123.00	4.00							0.00
3,122.00	*3.00*	*100-Yr WSE (ft)*			V_{100} =	**68,289**		
	1.00	*Freeboard (ft)*			$V_{PROVIDED}$ =	**173,434**		

East Building, Chamber 2 w/ Basin 2, Area C		
	$V_{REQUIRED}$ =	255,027
	$V_{PROVIDED}$ =	255,326

East Building, Basin 2 - Area C

Elevation	Depth (Ft)	Surface Area (SF)	Volume Engineered Soil (CF)	Above Ground Volume (CF)	Underground Storage Volume (CF)	Total Volume (CF)	Total Volume (Ac-Ft)	Outflow (cfs)
*3106	0*	2,117	0	0	0	0	0.000	0.00
3107	1	6,118	0	4,117	0	4,117	0.095	0.00
3108	2	11,390	0	12,871	0	12,871	0.295	0.00
3109	3	17,484	0	27,307	0	27,307	0.627	0.00
3,110	4							0.00
3,109	*3.00*	*100-Yr WSE (ft)*			V_{100} =	**282,334**		
	1.00	*Freeboard (ft)*			$V_{PROVIDED}$ =	**282,633**		

West Building, Chamber 3 w/ Basin 3, Area D		
	$V_{REQUIRED}$ =	102,848
	$V_{PROVIDED}$ =	110,054

West Building, Basin 3 w/ Chamber 3 - Area D

Elevation	Depth (Ft)	Surface Area (SF)	Volume Engineered Soil (CF)	Above Ground Volume (CF)	Underground Storage Volume (CF)	Total Volume (CF)	Total Volume (Ac-Ft)	Outflow (cfs)
*3067	0*	29,928	41,899	0	110,054	151,953	3.488	0.00
3068	1	33,162	41,899	31,545	110,054	183,498	4.213	0.00
3069	2	36,318	41,899	66,285	110,054	218,238	5.010	0.00
3070	3	39,560	41,899	104,224	110,054	256,177	5.881	0.00
3071	4	42,889	41,899	145,448	110,054	297,401	6.827	0.00
3072	5	46,305	41,899	190,045	110,054	341,998	7.851	0.00
3073	6	51,089	41,899	238,742	110,054	390,695	8.969	0.00
3074	7							0.00
3,073.00	*6.00*	*100-Yr WSE (ft)*			V_{100} =	**383,489**		
	1.00	*Freeboard (ft)*			$V_{PROVIDED}$ =	**390,695**		

West Building, Chamber 4 - Area E		
	V_{100} =	**419,522**
	$V_{PROVIDED}$ =	**419,740**

-218

Totals

V_{100} =	**1,438,813**
$V_{PROVIDED}$ =	**1,552,534**

CONTECH ENGINEERED SOLUTIONS

Date: 8/8/2024
Project Name: East Building, Chamber 1 - 21018 (8-8-2024 16-45-56)

City / County: Apple Valley
State: California

CMP: Underground Detention System
Storage Volume Estimation

Designed By: Joshua Park
Company: WestLAND Group, Inc.
Telephone: 661-977-8082

=Adjustable Input Cells

Contech Engineered Solutions, LLC is pleased to offer the following estimate of storage volume for the above named project. The results are submitted as an estimate only, without liability on the part of Contech Engineered Solutions, LLC for accuracy or suitability to any particular applicaton and are subject to verification of the Engineer of Record. **This tool is only applicable for rectangular shaped systems.**

Summary of Inputs

System Information		Backfill Information		Pipe & Analysis Information	
Out-to-out length (ft):	686.0	Backfill Porosity (%):	40%	System Diameter (in):	96
Out-to-out width (ft):	63.0	Depth Above Pipe (in):	6.0	Pipe Spacing (in):	36
Number of Manifolds (ea):	2.0	Depth Below Pipe (in):	6.0	Incremental Analysis (in):	2
Number of Barrels (ea):	6.0	Width At Ends (ft):	1.0	System Invert (Elevation):	3106
		Width At Sides (ft):	1.0		

Storage Volume Estimation

System		Pipe		Stone		Total System		Miscellaneous	
Depth (ft)	Elevation (ft)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Percent Open Storage (%)	Ave. Surface Area (sf)
0.00	3106.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	17,888.0
0.17	3106.16	0.0	0.0	2,981.3	2,981.3	2,981.3	2,981.3	0.0%	17,888.0
0.33	3106.33	0.0	0.0	2,981.3	5,962.7	2,981.3	5,962.7	0.0%	17,888.0
0.50	3106.50	0.0	0.0	2,981.3	8,944.0	2,981.3	8,944.0	0.0%	17,888.0
0.67	3106.66	1,057.2	1,057.2	2,558.5	11,502.5	3,615.6	12,559.6	8.4%	23,572.7
0.83	3106.83	1,914.0	2,971.2	2,215.7	13,718.2	4,129.7	16,689.4	17.8%	25,841.4
1.00	3107.00	2,452.0	5,423.2	2,000.5	15,718.7	4,452.5	21,141.9	25.7%	27,522.4
1.17	3107.16	2,871.7	8,294.9	1,832.7	17,551.4	4,704.4	25,846.3	32.1%	28,888.6
1.33	3107.33	3,220.6	11,515.5	1,693.1	19,244.5	4,913.7	30,759.9	37.4%	30,046.5
1.50	3107.50	3,520.0	15,035.4	1,573.3	20,817.8	5,093.3	35,853.3	41.9%	31,051.1
1.67	3107.66	3,781.8	18,817.2	1,468.6	22,286.5	5,250.4	41,103.7	45.8%	31,935.5
1.83	3107.83	4,013.3	22,830.5	1,376.0	23,662.5	5,389.3	46,493.0	49.1%	32,721.2
2.00	3108.00	4,219.6	27,050.1	1,293.5	24,956.0	5,513.1	52,006.1	52.0%	33,423.1
2.17	3108.16	4,404.2	31,454.4	1,219.6	26,175.6	5,623.9	57,629.9	54.6%	34,052.1
2.33	3108.33	4,569.8	36,024.2	1,153.4	27,329.0	5,723.2	63,353.2	56.9%	34,616.5
2.50	3108.50	4,718.4	40,742.6	1,094.0	28,423.0	5,812.4	69,165.5	58.9%	35,122.6
2.67	3108.66	4,851.5	45,594.0	1,040.7	29,463.7	5,892.2	75,057.8	60.7%	35,575.4
2.83	3108.83	4,970.3	50,564.4	993.2	30,456.9	5,963.5	81,021.3	62.4%	35,979.0
3.00	3109.00	5,076.0	55,640.3	950.9	31,407.9	6,026.9	87,048.2	63.9%	36,336.5
3.17	3109.16	5,169.2	60,809.5	913.7	32,321.5	6,082.9	93,131.1	65.3%	36,650.7
3.33	3109.33	5,250.7	66,060.2	881.1	33,202.6	6,131.7	99,262.8	66.6%	36,923.5
3.50	3109.50	5,320.9	71,381.2	853.0	34,055.5	6,173.9	105,436.7	67.7%	37,156.9
3.67	3109.66	5,380.5	76,761.6	829.2	34,884.7	6,209.6	111,646.3	68.8%	37,352.1
3.83	3109.83	5,429.5	82,191.1	809.5	35,694.2	6,239.1	117,885.4	69.7%	37,510.5
4.00	3110.00	5,468.5	87,659.6	793.9	36,488.1	6,262.4	124,147.8	70.6%	37,632.7
4.17	3110.16	5,497.5	93,157.2	782.3	37,270.5	6,279.8	130,427.6	71.4%	37,719.6
4.33	3110.33	5,516.8	98,673.9	774.6	38,045.1	6,291.4	136,719.0	72.2%	37,771.5
4.50	3110.50	5,526.4	104,200.3	770.8	38,815.9	6,297.2	143,016.2	72.9%	37,788.8
4.67	3110.66	5,526.4	109,726.7	770.8	39,586.6	6,297.2	149,313.4	73.5%	37,771.5
4.83	3110.83	5,516.8	115,243.5	774.6	40,361.3	6,291.4	155,604.8	74.1%	37,719.6
5.00	3111.00	5,497.5	120,741.1	782.3	41,143.6	6,279.8	161,884.6	74.6%	37,632.7
5.17	3111.16	5,468.5	126,209.5	793.9	41,937.5	6,262.4	168,147.1	75.1%	37,510.5
5.33	3111.33	5,429.5	131,639.1	809.5	42,747.0	6,239.1	174,386.1	75.5%	37,352.1
5.50	3111.50	5,380.5	137,019.5	829.2	43,576.2	6,209.6	180,595.7	75.9%	37,156.9
5.67	3111.66	5,320.9	142,340.5	853.0	44,429.1	6,173.9	186,769.6	76.2%	36,923.5
5.83	3111.83	5,250.7	147,591.2	881.1	45,310.2	6,131.7	192,901.4	76.5%	36,650.7
6.00	3112.00	5,169.2	152,760.4	913.7	46,223.9	6,082.9	198,984.2	76.8%	36,336.5

These results are submitted to you as a guideline only, without liability on the part of CONTECH Engineered Solutions, LLC for accuracy or suitability to any particular application, and are subject to your verification.

6.17	3112.16	5,076.0	157,836.3	950.9	47,174.8	6,026.9	205,011.1	77.0%	35,979.0
6.33	3112.33	4,970.3	162,806.7	993.2	48,168.0	5,963.5	210,974.7	77.2%	35,575.4
6.50	3112.50	4,851.5	167,658.1	1,040.7	49,208.8	5,892.2	216,866.9	77.3%	35,122.6
6.67	3112.66	4,718.4	172,376.5	1,094.0	50,302.7	5,812.4	222,679.2	77.4%	34,616.5
6.83	3112.83	4,569.8	176,946.3	1,153.4	51,456.1	5,723.2	228,402.5	77.5%	34,052.1
7.00	3113.00	4,404.2	181,350.6	1,219.6	52,675.8	5,623.9	234,026.3	77.5%	33,423.1
7.17	3113.16	4,219.6	185,570.2	1,293.5	53,969.3	5,513.1	239,539.4	77.5%	32,721.2
7.33	3113.33	4,013.3	189,583.5	1,376.0	55,345.3	5,389.3	244,928.8	77.4%	31,935.5
7.50	3113.50	3,781.8	193,365.2	1,468.6	56,813.9	5,250.4	250,179.1	77.3%	31,051.1
7.67	3113.66	3,520.0	196,885.2	1,573.3	58,387.2	5,093.3	255,272.5	77.1%	30,046.5
7.83	3113.83	3,220.6	200,105.8	1,693.1	60,080.3	4,913.7	260,186.2	76.9%	28,888.6
8.00	3114.00	2,871.7	202,977.5	1,832.7	61,913.0	4,704.4	264,890.5	76.6%	27,522.4
8.17	3114.16	2,452.0	205,429.5	2,000.5	63,913.5	4,452.5	269,343.0	76.3%	25,841.4
8.33	3114.33	1,914.0	207,343.5	2,215.7	66,129.3	4,129.7	273,472.8	75.8%	23,572.7
8.50	3114.50	1,057.2	208,400.7	2,558.5	68,687.7	3,615.6	277,088.4	75.2%	17,888.0
8.67	3114.66	0.0	208,400.7	2,981.3	71,669.1	2,981.3	280,069.7	74.4%	17,888.0
8.83	3114.83	0.0	208,400.7	2,981.3	74,650.4	2,981.3	283,051.1	73.6%	17,888.0
9.00	3115.00	0.0	208,400.7	2,981.3	77,631.7	2,981.3	286,032.4	72.9%	17,888.0

These results are submitted to you as a guideline only, without liability on the part of CONTECH Engineered Solutions, LLC for accuracy or suitability to any particular application, and are subject to your verification.

CONTECH ENGINEERED SOLUTIONS

Date: 8/9/2024
Project Name: East Building, Chamber 2 - 28049 (8-9-2024 21-27-43)

City / County:
State:

Designed By:
Company:
Telephone:

CMP: Underground Detention System
Storage Volume Estimation

=Adjustable Input Cells

Contech Engineered Solutions, LLC is pleased to offer the following estimate of storage volume for the above named project. The results are submitted as an estimate only, without liability on the part of Contech Engineered Solutions, LLC for accuracy or suitability to any particular applicaton and are subject to verification of the Engineer of Record. **This tool is only applicable for rectangular shaped systems.**

Summary of Inputs

System Information		Backfill Information		Pipe & Analysis Information	
Out-to-out length (ft):	612.0	Backfill Porosity (%):	40%	System Diameter (in):	96
Out-to-out width (ft):	63.0	Depth Above Pipe (in):	6.0	Pipe Spacing (in):	36
Number of Manifolds (ea):	2.0	Depth Below Pipe (in):	6.0	Incremental Analysis (in):	2
Number of Barrels (ea):	6.0	Width At Ends (ft):	1.0	System Invert (Elevation):	3099.96
		Width At Sides (ft):	1.0		

Storage Volume Estimation

System		Pipe		Stone		Total System		Miscellaneous	
Depth (ft)	Elevation (ft)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Percent Open Storage (%)	Ave. Surface Area (sf)
0.00	3099.96	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	15,964.0
0.17	3100.12	0.0	0.0	2,660.7	2,660.7	2,660.7	2,660.7	0.0%	15,964.0
0.33	3100.29	0.0	0.0	2,660.7	5,321.3	2,660.7	5,321.3	0.0%	15,964.0
0.50	3100.46	0.0	0.0	2,660.7	7,982.0	2,660.7	7,982.0	0.0%	15,964.0
0.67	3100.62	944.0	944.0	2,283.1	10,265.1	3,227.1	11,209.1	8.4%	21,039.9
0.83	3100.79	1,709.0	2,653.0	1,977.1	12,242.1	3,686.1	14,895.1	17.8%	23,065.7
1.00	3100.96	2,189.4	4,842.4	1,784.9	14,027.0	3,974.3	18,869.4	25.7%	24,566.7
1.17	3101.12	2,564.2	7,406.6	1,635.0	15,662.0	4,199.2	23,068.6	32.1%	25,786.5
1.33	3101.29	2,875.7	10,282.2	1,510.4	17,172.4	4,386.1	27,454.7	37.5%	26,820.4
1.50	3101.46	3,143.0	13,425.3	1,403.5	18,575.9	4,546.5	32,001.2	42.0%	27,717.5
1.67	3101.62	3,376.8	16,802.0	1,310.0	19,885.8	4,686.7	36,687.9	45.8%	28,507.2
1.83	3101.79	3,583.5	20,385.6	1,227.3	21,113.1	4,810.8	41,498.7	49.1%	29,208.7
2.00	3101.96	3,767.7	24,153.3	1,153.6	22,266.7	4,921.3	46,420.0	52.0%	29,835.4
2.17	3102.12	3,932.6	28,085.9	1,087.6	23,354.3	5,020.2	51,440.2	54.6%	30,397.1
2.33	3102.29	4,080.4	32,166.3	1,028.5	24,382.8	5,108.9	56,549.1	56.9%	30,901.0
2.50	3102.46	4,213.1	36,379.4	975.4	25,358.2	5,188.5	61,737.6	58.9%	31,352.9
2.67	3102.62	4,331.9	40,711.3	927.9	26,286.1	5,259.8	66,997.5	60.8%	31,757.3
2.83	3102.79	4,438.1	45,149.4	885.4	27,171.6	5,323.5	72,321.0	62.4%	32,117.6
3.00	3102.96	4,532.4	49,681.7	847.7	28,019.3	5,380.1	77,701.0	63.9%	32,436.9
3.17	3103.12	4,615.6	54,297.4	814.4	28,833.7	5,430.0	83,131.1	65.3%	32,717.3
3.33	3103.29	4,688.4	58,985.7	785.3	29,619.0	5,473.7	88,604.8	66.6%	32,961.0
3.50	3103.46	4,751.1	63,736.9	760.2	30,379.3	5,511.3	94,116.1	67.7%	33,169.3
3.67	3103.62	4,804.3	68,541.1	739.0	31,118.2	5,543.2	99,659.3	68.8%	33,343.7
3.83	3103.79	4,848.1	73,389.2	721.4	31,839.7	5,569.5	105,228.9	69.7%	33,485.1
4.00	3103.96	4,882.9	78,272.1	707.5	32,547.2	5,590.4	110,819.2	70.6%	33,594.2
4.17	3104.12	4,908.8	83,180.8	697.2	33,244.3	5,605.9	116,425.2	71.4%	33,671.8
4.33	3104.29	4,926.0	88,106.8	690.3	33,934.6	5,616.3	122,041.4	72.2%	33,718.2
4.50	3104.46	4,934.6	93,041.4	686.8	34,621.4	5,621.4	127,662.8	72.9%	33,733.6
4.67	3104.62	4,934.6	97,976.0	686.8	35,308.3	5,621.4	133,284.3	73.5%	33,718.2
4.83	3104.79	4,926.0	102,902.0	690.3	35,998.5	5,616.3	138,900.5	74.1%	33,671.8
5.00	3104.96	4,908.8	107,810.8	697.2	36,695.7	5,605.9	144,506.5	74.6%	33,594.2
5.17	3105.12	4,882.9	112,693.6	707.5	37,403.2	5,590.4	150,096.8	75.1%	33,485.1
5.33	3105.29	4,848.1	117,541.7	721.4	38,124.7	5,569.5	155,666.4	75.5%	33,343.7
5.50	3105.46	4,804.3	122,345.9	739.0	38,863.6	5,543.2	161,209.6	75.9%	33,169.3
5.67	3105.62	4,751.1	127,097.1	760.2	39,623.8	5,511.3	166,720.9	76.2%	32,961.0
5.83	3105.79	4,688.4	131,785.4	785.3	40,409.2	5,473.7	172,194.6	76.5%	32,717.3
6.00	3105.96	4,615.6	136,401.1	814.4	41,223.6	5,430.0	177,624.6	76.8%	32,436.9

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6.17	3106.12	4,532.4	140,933.5	847.7	42,071.3	5,380.1	183,004.7	77.0%	32,117.6
6.33	3106.29	4,438.1	145,371.5	885.4	42,956.7	5,323.5	188,328.2	77.2%	31,757.3
6.50	3106.46	4,331.9	149,703.4	927.9	43,884.6	5,259.8	193,588.1	77.3%	31,352.9
6.67	3106.62	4,213.1	153,916.5	975.4	44,860.1	5,188.5	198,776.6	77.4%	30,901.0
6.83	3106.79	4,080.4	157,996.9	1,028.5	45,888.6	5,108.9	203,885.5	77.5%	30,397.1
7.00	3106.96	3,932.6	161,929.5	1,087.6	46,976.2	5,020.2	208,905.7	77.5%	29,835.4
7.17	3107.12	3,767.7	165,697.3	1,153.6	48,129.8	4,921.3	213,827.0	77.5%	29,208.7
7.33	3107.29	3,583.5	169,280.8	1,227.3	49,357.0	4,810.8	218,637.8	77.4%	28,507.2
7.50	3107.46	3,376.8	172,657.5	1,310.0	50,667.0	4,686.7	223,324.5	77.3%	27,717.5
7.67	3107.62	3,143.0	175,800.6	1,403.5	52,070.4	4,546.5	227,871.0	77.1%	26,820.4
7.83	3107.79	2,875.7	178,676.3	1,510.4	53,580.8	4,386.1	232,257.1	76.9%	25,786.5
8.00	3107.96	2,564.2	181,240.4	1,635.0	55,215.8	4,199.2	236,456.3	76.6%	24,566.7
8.17	3108.12	2,189.4	183,429.8	1,784.9	57,000.7	3,974.3	240,430.6	76.3%	23,065.7
8.33	3108.29	1,709.0	185,138.8	1,977.1	58,977.8	3,686.1	244,116.6	75.8%	21,039.9
8.50	3108.46	944.0	186,082.8	2,283.1	61,260.9	3,227.1	247,343.7	75.2%	15,964.0
8.67	3108.62	0.0	186,082.8	2,660.7	63,921.5	2,660.7	250,004.4	74.4%	15,964.0
8.83	3108.79	0.0	186,082.8	2,660.7	66,582.2	2,660.7	252,665.0	73.6%	15,964.0
9.00	3108.96	0.0	186,082.8	2,660.7	69,242.9	2,660.7	255,325.7	72.9%	15,964.0

These results are submitted to you as a guideline only, without liability on the part of CONTECH Engineered Solutions, LLC for accuracy or suitability to any particular application, and are subject to your verification.

CONTECH ENGINEERED SOLUTIONS

Date: 8/30/2024
Project Name: Chamber 3 - 28050 (8-30-2024 19-1-13)

City / County:
State:

Designed By:
Company:
Telephone:

CMP: Underground Detention System
Storage Volume Estimation

=Adjustable Input Cells

Contech Engineered Solutions, LLC is pleased to offer the following estimate of storage volume for the above named project. The results are submitted as an estimate only, without liability on the part of Contech Engineered Solutions, LLC for accuracy or suitability to any particular applicaton and are subject to verification of the Engineer of Record. **This tool is only applicable for rectangular shaped systems.**

Summary of Inputs

System Information		Backfill Information		Pipe & Analysis Information	
Out-to-out length (ft):	263.0	Backfill Porosity (%):	40%	System Diameter (in):	96
Out-to-out width (ft):	63.0	Depth Above Pipe (in):	6.0	Pipe Spacing (in):	36
Number of Manifolds (ea):	1.0	Depth Below Pipe (in):	6.0	Incremental Analysis (in):	2
Number of Barrels (ea):	6.0	Width At Ends (ft):	1.0	System Invert (Elevation):	0
		Width At Sides (ft):	1.0		

Storage Volume Estimation

System		Pipe		Stone		Total System		Miscellaneous	
Depth (ft)	Elevation (ft)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Percent Open Storage (%)	Ave. Surface Area (sf)
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	6,890.0
0.17	0.16	0.0	0.0	1,148.3	1,148.3	1,148.3	1,148.3	0.0%	6,890.0
0.33	0.33	0.0	0.0	1,148.3	2,296.7	1,148.3	2,296.7	0.0%	6,890.0
0.50	0.50	0.0	0.0	1,148.3	3,445.0	1,148.3	3,445.0	0.0%	6,890.0
0.67	0.66	406.2	406.2	985.9	4,430.9	1,392.1	4,837.1	8.4%	9,074.2
0.83	0.83	735.4	1,141.6	854.2	5,285.0	1,589.6	6,426.6	17.8%	9,945.9
1.00	1.00	942.1	2,083.7	771.5	6,056.5	1,713.6	8,140.2	25.6%	10,591.8
1.17	1.16	1,103.4	3,187.1	707.0	6,763.5	1,810.4	9,950.6	32.0%	11,116.7
1.33	1.33	1,237.4	4,424.5	653.4	7,416.9	1,890.8	11,841.4	37.4%	11,561.6
1.50	1.50	1,352.5	5,777.0	607.3	8,024.2	1,959.8	13,801.2	41.9%	11,947.6
1.67	1.66	1,453.1	7,230.1	567.1	8,591.3	2,020.2	15,821.4	45.7%	12,287.4
1.83	1.83	1,542.0	8,772.1	531.5	9,122.8	2,073.5	17,894.9	49.0%	12,589.3
2.00	2.00	1,621.3	10,393.4	499.8	9,622.7	2,121.1	20,016.0	51.9%	12,859.0
2.17	2.16	1,692.2	12,085.6	471.4	10,094.1	2,163.7	22,179.7	54.5%	13,100.7
2.33	2.33	1,755.8	13,841.4	446.0	10,540.1	2,201.8	24,381.5	56.8%	13,317.5
2.50	2.50	1,812.9	15,654.3	423.2	10,963.3	2,236.1	26,617.6	58.8%	13,512.0
2.67	2.66	1,864.1	17,518.4	402.7	11,366.0	2,266.8	28,884.4	60.7%	13,686.0
2.83	2.83	1,909.7	19,428.1	384.4	11,750.4	2,294.2	31,178.5	62.3%	13,841.0
3.00	3.00	1,950.3	21,378.4	368.2	12,118.6	2,318.5	33,497.1	63.8%	13,978.4
3.17	3.16	1,986.1	23,364.6	353.9	12,472.5	2,340.0	35,837.1	65.2%	14,099.1
3.33	3.33	2,017.4	25,382.0	341.4	12,813.9	2,358.8	38,195.9	66.5%	14,203.9
3.50	3.50	2,044.4	27,426.5	330.6	13,144.4	2,375.0	40,570.9	67.6%	14,293.6
3.67	3.66	2,067.3	29,493.8	321.4	13,465.8	2,388.7	42,959.6	68.7%	14,368.6
3.83	3.83	2,086.2	31,580.0	313.9	13,779.7	2,400.0	45,359.6	69.6%	14,429.5
4.00	4.00	2,101.1	33,681.1	307.9	14,087.6	2,409.0	47,768.7	70.5%	14,476.4
4.17	4.16	2,112.3	35,793.4	303.4	14,391.0	2,415.7	50,184.4	71.3%	14,509.8
4.33	4.33	2,119.7	37,913.1	300.5	14,691.4	2,420.1	52,604.5	72.1%	14,529.8
4.50	4.50	2,123.4	40,036.5	299.0	14,990.4	2,422.4	55,026.9	72.8%	14,536.4
4.67	4.66	2,123.4	42,159.8	299.0	15,289.4	2,422.4	57,449.2	73.4%	14,529.8
4.83	4.83	2,119.7	44,279.5	300.5	15,589.9	2,420.1	59,869.4	74.0%	14,509.8
5.00	5.00	2,112.3	46,391.8	303.4	15,893.3	2,415.7	62,285.1	74.5%	14,476.4
5.17	5.16	2,101.1	48,493.0	307.9	16,201.2	2,409.0	64,694.1	75.0%	14,429.5
5.33	5.33	2,086.2	50,579.1	313.9	16,515.0	2,400.0	67,094.1	75.4%	14,368.6
5.50	5.50	2,067.3	52,646.4	321.4	16,836.4	2,388.7	69,482.9	75.8%	14,293.6
5.67	5.66	2,044.4	54,690.9	330.6	17,167.0	2,375.0	71,857.9	76.1%	14,203.9
5.83	5.83	2,017.4	56,708.3	341.4	17,508.3	2,358.8	74,216.7	76.4%	14,099.1
6.00	6.00	1,986.1	58,694.5	353.9	17,862.2	2,340.0	76,556.7	76.7%	13,978.4

These results are submitted to you as a guideline only, without liability on the part of CONTECH Engineered Solutions, LLC for accuracy or suitability to any particular application, and are subject to your verification.

6.17	6.16	1,950.3	60,644.8	368.2	18,230.4	2,318.5	78,875.2	76.9%	13,841.0
6.33	6.33	1,909.7	62,554.5	384.4	18,614.9	2,294.2	81,169.4	77.1%	13,686.0
6.50	6.50	1,864.1	64,418.6	402.7	19,017.6	2,266.8	83,436.1	77.2%	13,512.0
6.67	6.66	1,812.9	66,231.5	423.2	19,440.7	2,236.1	85,672.2	77.3%	13,317.5
6.83	6.83	1,755.8	67,987.3	446.0	19,886.7	2,201.8	87,874.1	77.4%	13,100.7
7.00	7.00	1,692.2	69,679.6	471.4	20,358.2	2,163.7	90,037.7	77.4%	12,859.0
7.17	7.16	1,621.3	71,300.8	499.8	20,858.0	2,121.1	92,158.8	77.4%	12,589.3
7.33	7.33	1,542.0	72,842.9	531.5	21,389.5	2,073.5	94,232.4	77.3%	12,287.4
7.50	7.50	1,453.1	74,295.9	567.1	21,956.6	2,020.2	96,252.5	77.2%	11,947.6
7.67	7.66	1,352.5	75,648.4	607.3	22,564.0	1,959.8	98,212.4	77.0%	11,561.6
7.83	7.83	1,237.4	76,885.8	653.4	23,217.3	1,890.8	100,103.2	76.8%	11,116.7
8.00	8.00	1,103.4	77,989.2	707.0	23,924.3	1,810.4	101,913.5	76.5%	10,591.8
8.17	8.16	942.1	78,931.3	771.5	24,695.8	1,713.6	103,627.1	76.2%	9,945.9
8.33	8.33	735.4	79,666.7	854.2	25,550.0	1,589.6	105,216.7	75.7%	9,074.2
8.50	8.50	406.2	80,072.9	985.9	26,535.8	1,392.1	106,608.7	75.1%	6,890.0
8.67	8.66	0.0	80,072.9	1,148.3	27,684.2	1,148.3	107,757.1	74.3%	6,890.0
8.83	8.83	0.0	80,072.9	1,148.3	28,832.5	1,148.3	108,905.4	73.5%	6,890.0
9.00	9.00	0.0	80,072.9	1,148.3	29,980.8	1,148.3	110,053.7	72.8%	6,890.0

These results are submitted to you as a guideline only, without liability on the part of CONTECH Engineered Solutions, LLC for accuracy or suitability to any particular application, and are subject to your verification.

CONTECH ENGINEERED SOLUTIONS

Date: 8/30/2024
Project Name: Chamber 4 - 28051 (8-30-2024 19-16-30)

City / County:
State:

Designed By:
Company:
Telephone:

CMP: Underground Detention System
Storage Volume Estimation

=Adjustable Input Cells

Contech Engineered Solutions, LLC is pleased to offer the following estimate of storage volume for the above named project. The results are submitted as an estimate only, without liability on the part of Contech Engineered Solutions, LLC for accuracy or suitability to any particular applicaton and are subject to verification of the Engineer of Record. **This tool is only applicable for rectangular shaped systems.**

Summary of Inputs

System Information		Backfill Information		Pipe & Analysis Information	
Out-to-out length (ft):	576.0	Backfill Porosity (%):	40%	System Diameter (in):	120
Out-to-out width (ft):	88.0	Depth Above Pipe (in):	6.0	Pipe Spacing (in):	36
Number of Manifolds (ea):	1.0	Depth Below Pipe (in):	6.0	Incremental Analysis (in):	2
Number of Barrels (ea):	7.0	Width At Ends (ft):	1.0	System Invert (Elevation):	0
		Width At Sides (ft):	1.0		

Storage Volume Estimation

System		Pipe		Stone		Total System		Miscellaneous	
Depth (ft)	Elevation (ft)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Percent Open Storage (%)	Ave. Surface Area (sf)
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	20,808.0
0.17	0.16	0.0	0.0	3,468.0	3,468.0	3,468.0	3,468.0	0.0%	20,808.0
0.33	0.33	0.0	0.0	3,468.0	6,936.0	3,468.0	6,936.0	0.0%	20,808.0
0.50	0.50	0.0	0.0	3,468.0	10,404.0	3,468.0	10,404.0	0.0%	20,808.0
0.67	0.66	1,156.1	1,156.1	3,005.6	13,409.6	4,161.6	14,565.6	7.9%	27,029.7
0.83	0.83	2,097.2	3,253.3	2,629.1	16,038.7	4,726.3	19,292.0	16.9%	29,532.0
1.00	1.00	2,692.7	5,946.0	2,390.9	18,429.6	5,083.6	24,375.6	24.4%	31,400.1
1.17	1.16	3,161.0	9,107.0	2,203.6	20,633.2	5,364.6	29,740.2	30.6%	32,931.0
1.33	1.33	3,553.6	12,660.6	2,046.5	22,679.7	5,600.2	35,340.4	35.8%	34,240.3
1.50	1.50	3,893.9	16,554.5	1,910.5	24,590.2	5,804.3	41,144.7	40.2%	35,388.0
1.67	1.66	4,194.5	20,749.0	1,790.2	26,380.4	5,984.7	47,129.4	44.0%	36,409.7
1.83	1.83	4,463.6	25,212.6	1,682.6	28,063.0	6,146.2	53,275.6	47.3%	37,328.8
2.00	2.00	4,706.6	29,919.3	1,585.3	29,648.3	6,292.0	59,567.6	50.2%	38,161.7
2.17	2.16	4,927.4	34,846.7	1,497.0	31,145.3	6,424.4	65,992.0	52.8%	38,920.2
2.33	2.33	5,128.8	39,975.5	1,416.5	32,561.8	6,545.3	72,537.3	55.1%	39,613.3
2.50	2.50	5,313.1	45,288.6	1,342.8	33,904.5	6,655.9	79,193.2	57.2%	40,248.0
2.67	2.66	5,482.0	50,770.6	1,275.2	35,179.7	6,757.2	85,950.4	59.1%	40,829.9
2.83	2.83	5,636.8	56,407.5	1,213.3	36,393.0	6,850.1	92,800.5	60.8%	41,363.5
3.00	3.00	5,778.8	62,186.2	1,156.5	37,549.5	6,935.3	99,735.7	62.4%	41,852.4
3.17	3.16	5,908.7	68,094.9	1,104.5	38,654.0	7,013.2	106,749.0	63.8%	42,299.7
3.33	3.33	6,027.5	74,122.4	1,057.0	39,711.0	7,084.5	113,833.5	65.1%	42,708.0
3.50	3.50	6,135.7	80,258.2	1,013.7	40,724.7	7,149.4	120,982.9	66.3%	43,079.3
3.67	3.66	6,234.0	86,492.2	974.4	41,699.1	7,208.4	128,191.3	67.5%	43,415.6
3.83	3.83	6,322.7	92,814.8	938.9	42,638.1	7,261.6	135,452.9	68.5%	43,718.3
4.00	4.00	6,402.3	99,217.1	907.1	43,545.2	7,309.4	142,762.3	69.5%	43,988.7
4.17	4.16	6,473.0	105,690.1	878.8	44,423.9	7,351.8	150,114.1	70.4%	44,228.1
4.33	4.33	6,535.3	112,225.4	853.9	45,277.8	7,389.2	157,503.3	71.3%	44,437.2
4.50	4.50	6,589.3	118,814.8	832.3	46,110.1	7,421.6	164,924.9	72.0%	44,617.0
4.67	4.66	6,635.3	125,450.0	813.9	46,924.0	7,449.2	172,374.0	72.8%	44,768.1
4.83	4.83	6,673.3	132,123.3	798.7	47,722.7	7,472.0	179,846.0	73.5%	44,891.0
5.00	5.00	6,703.6	138,826.9	786.6	48,509.2	7,490.2	187,336.2	74.1%	44,986.2
5.17	5.16	6,726.2	145,553.1	777.5	49,286.7	7,503.7	194,839.9	74.7%	45,053.9
5.33	5.33	6,741.2	152,294.4	771.5	50,058.2	7,512.7	202,352.6	75.3%	45,094.5
5.50	5.50	6,748.7	159,043.1	768.5	50,826.7	7,517.2	209,869.9	75.8%	45,108.0
5.67	5.66	6,748.7	165,791.9	768.5	51,595.2	7,517.2	217,387.1	76.3%	45,094.5
5.83	5.83	6,741.2	172,533.1	771.5	52,366.8	7,512.7	224,899.9	76.7%	45,053.9
6.00	6.00	6,726.2	179,259.3	777.5	53,144.3	7,503.7	232,403.6	77.1%	44,986.2

These results are submitted to you as a guideline only, without liability on the part of CONTECH Engineered Solutions, LLC for accuracy or suitability to any particular application, and are subject to your verification.

6.17	6.16	6,703.6	185,962.9	786.6	53,930.8	7,490.2	239,893.7	77.5%	44,891.0
6.33	6.33	6,673.3	192,636.2	798.7	54,729.5	7,472.0	247,365.7	77.9%	44,768.1
6.50	6.50	6,635.3	199,271.5	813.9	55,543.4	7,449.2	254,814.9	78.2%	44,617.0
6.67	6.66	6,589.3	205,860.8	832.3	56,375.7	7,421.6	262,236.5	78.5%	44,437.2
6.83	6.83	6,535.3	212,396.1	853.9	57,229.6	7,389.2	269,625.7	78.8%	44,228.1
7.00	7.00	6,473.0	218,869.2	878.8	58,108.3	7,351.8	276,977.5	79.0%	43,988.7
7.17	7.16	6,402.3	225,271.4	907.1	59,015.4	7,309.4	284,286.9	79.2%	43,718.3
7.33	7.33	6,322.7	231,594.1	938.9	59,954.4	7,261.6	291,548.5	79.4%	43,415.6
7.50	7.50	6,234.0	237,828.1	974.4	60,928.8	7,208.4	298,756.8	79.6%	43,079.3
7.67	7.66	6,135.7	243,963.8	1,013.7	61,942.5	7,149.4	305,906.3	79.8%	42,708.0
7.83	7.83	6,027.5	249,991.3	1,057.0	62,999.5	7,084.5	312,990.8	79.9%	42,299.7
8.00	8.00	5,908.7	255,900.0	1,104.5	64,104.0	7,013.2	320,004.0	80.0%	41,852.4
8.17	8.16	5,778.8	261,678.8	1,156.5	65,260.5	6,935.3	326,939.3	80.0%	41,363.5
8.33	8.33	5,636.8	267,315.6	1,213.3	66,473.7	6,850.1	333,789.4	80.1%	40,829.9
8.50	8.50	5,482.0	272,797.6	1,275.2	67,749.0	6,757.2	340,546.6	80.1%	40,248.0
8.67	8.66	5,313.1	278,110.7	1,342.8	69,091.7	6,655.9	347,202.4	80.1%	39,613.3
8.83	8.83	5,128.8	283,239.6	1,416.5	70,508.2	6,545.3	353,747.7	80.1%	38,920.2
9.00	9.00	4,927.4	288,167.0	1,497.0	72,005.2	6,424.4	360,172.2	80.0%	38,161.7
9.17	9.16	4,706.6	292,873.6	1,585.3	73,590.5	6,292.0	366,464.2	79.9%	37,328.8
9.33	9.33	4,463.6	297,337.3	1,682.6	75,273.1	6,146.2	372,610.4	79.8%	36,409.7
9.50	9.50	4,194.5	301,531.8	1,790.2	77,063.3	5,984.7	378,595.1	79.6%	35,388.0
9.67	9.66	3,893.9	305,425.6	1,910.5	78,973.7	5,804.3	384,399.4	79.5%	34,240.3
9.83	9.83	3,553.6	308,979.3	2,046.5	81,020.3	5,600.2	389,999.6	79.2%	32,931.0
10.00	10.00	3,161.0	312,140.3	2,203.6	83,223.9	5,364.6	395,364.2	79.0%	31,400.1
10.17	10.16	2,692.7	314,833.0	2,390.9	85,614.8	5,083.6	400,447.8	78.6%	29,532.0
10.33	10.33	2,097.2	316,930.2	2,629.1	88,243.9	4,726.3	405,174.1	78.2%	27,029.7
10.50	10.50	1,156.1	318,086.3	3,005.6	91,249.5	4,161.6	409,335.8	77.7%	20,808.0
10.67	10.66	0.0	318,086.3	3,468.0	94,717.5	3,468.0	412,803.8	77.1%	20,808.0
10.83	10.83	0.0	318,086.3	3,468.0	98,185.5	3,468.0	416,271.8	76.4%	20,808.0
11.00	11.00	0.0	318,086.3	3,468.0	101,653.5	3,468.0	419,739.8	75.8%	20,808.0

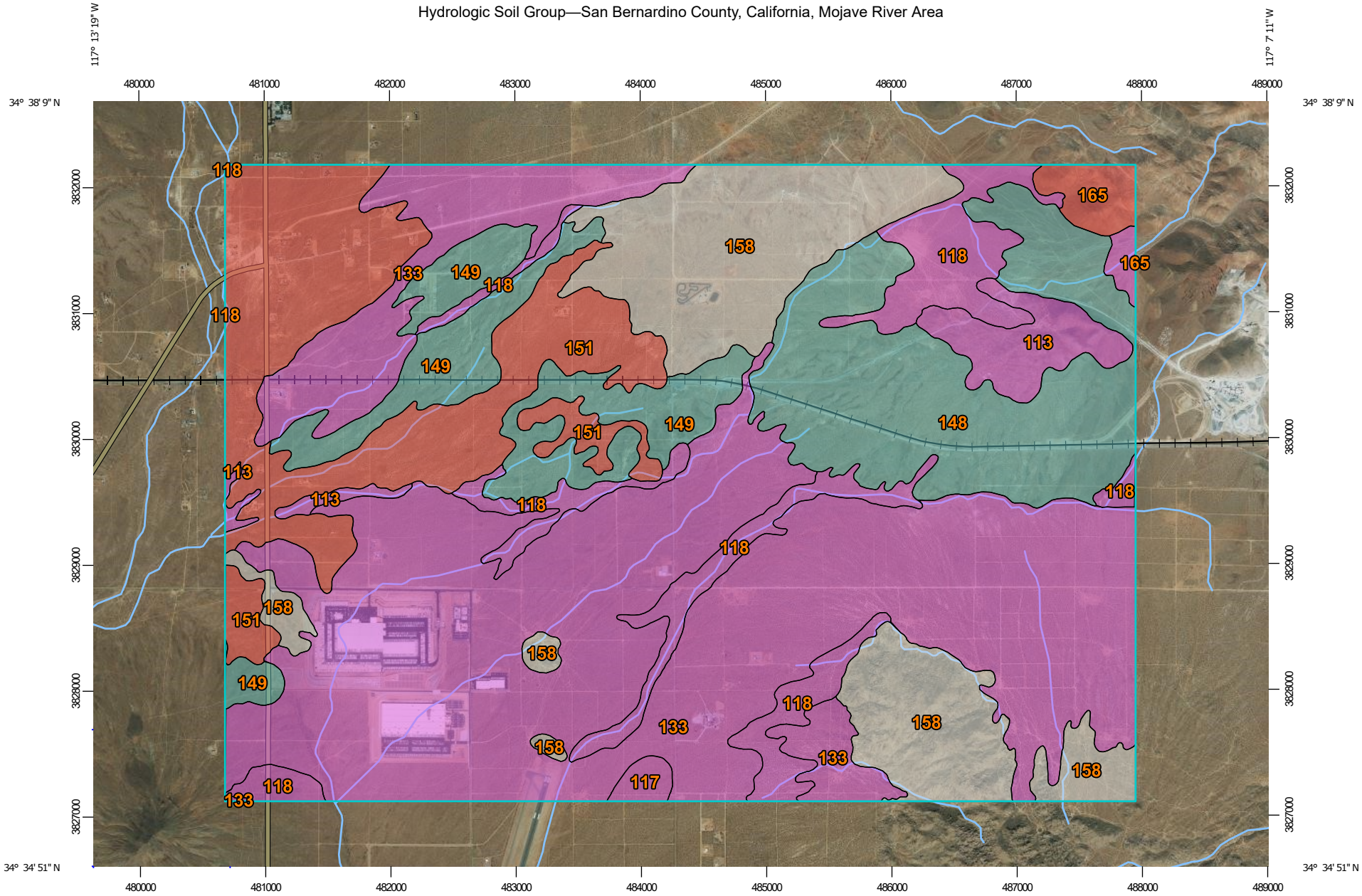
These results are submitted to you as a guideline only, without liability on the part of CONTECH Engineered Solutions, LLC for accuracy or suitability to any particular application, and are subject to your verification.

APPENDIX D

SUPPORTING DOCUMENTS

SOILS MAP

Hydrologic Soil Group—San Bernardino County, California, Mojave River Area



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

Soil Survey Area: San Bernardino County, California, Mojave River Area
Survey Area Data: Version 13, Sep 13, 2021

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

Date(s) aerial images were photographed: Mar 27, 2021—May 24, 2021

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
113	CAJON SAND, 2 TO 9 PERCENT SLOPES	A	229.5	2.5%
117	CAJON LOAMY SAND, LOAMY SUBSTRATUM, 0 TO 2 PERCENT SLOPES	A	34.1	0.4%
118	CAJON-ARIZO COMPLEX, 2 TO 15 PERCENT SLOPES*	A	700.4	7.7%
133	HELENDALE-BRYMAN LOAMY SANDS, 2 TO 5 PERCENT SLOPES*	A	3,916.9	42.9%
148	MIRAGE SANDY LOAM, 2 TO 5 PERCENT SLOPES*	C	1,081.3	11.9%
149	MIRAGE-JOSHUA COMPLEX, 2 TO 5 PERCENT SLOPES*	C	651.2	7.1%
151	NEBONA-CUDDEBACK COMPLEX, 2 TO 9 PERCENT SLOPES*	D	1,211.6	13.3%
158	ROCK OUTCROP-LITHIC TORRIORTHENTS COMPLEX, 15 TO 50 PERCENT SLOPES*		1,208.4	13.2%
165	TRIGGER-SPARKHULE-ROCK OUTCROP ASSOCIATION, STEEP*	D	87.3	1.0%
Totals for Area of Interest			**9,121.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

NOAA ATLAS 14 DATA

NOAA Atlas 14, Volume 6, Version 2
Location name: Apple Valley, California, USA*
Latitude: 34.5989°, Longitude: -117.1848°
Elevation: 3097.57 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.082 (0.067-0.100)	0.115 (0.095-0.141)	0.162 (0.133-0.199)	0.202 (0.164-0.251)	0.260 (0.205-0.334)	0.308 (0.238-0.403)	0.359 (0.271-0.481)	0.415 (0.304-0.571)	0.495 (0.348-0.710)	0.561 (0.382-0.833)
10-min	0.117 (0.096-0.144)	0.165 (0.136-0.203)	0.232 (0.190-0.286)	0.290 (0.236-0.359)	0.373 (0.294-0.478)	0.441 (0.341-0.578)	0.515 (0.388-0.690)	0.595 (0.436-0.819)	0.710 (0.499-1.02)	0.805 (0.548-1.19)
15-min	0.142 (0.117-0.174)	0.200 (0.164-0.245)	0.280 (0.230-0.345)	0.350 (0.285-0.435)	0.451 (0.356-0.578)	0.534 (0.412-0.699)	0.623 (0.469-0.834)	0.719 (0.527-0.990)	0.858 (0.604-1.23)	0.973 (0.662-1.45)
30-min	0.194 (0.160-0.238)	0.273 (0.225-0.336)	0.384 (0.315-0.473)	0.480 (0.390-0.595)	0.618 (0.487-0.792)	0.731 (0.564-0.957)	0.853 (0.643-1.14)	0.985 (0.722-1.36)	1.18 (0.827-1.69)	1.33 (0.907-1.98)
60-min	0.245 (0.202-0.300)	0.345 (0.284-0.423)	0.485 (0.398-0.597)	0.605 (0.492-0.751)	0.779 (0.614-0.999)	0.922 (0.712-1.21)	1.08 (0.811-1.44)	1.24 (0.911-1.71)	1.48 (1.04-2.13)	1.68 (1.14-2.50)
2-hr	0.347 (0.286-0.426)	0.470 (0.387-0.577)	0.640 (0.525-0.788)	0.786 (0.640-0.975)	0.994 (0.784-1.27)	1.16 (0.898-1.52)	1.34 (1.01-1.80)	1.54 (1.13-2.12)	1.81 (1.28-2.60)	2.04 (1.39-3.02)
3-hr	0.421 (0.347-0.517)	0.563 (0.463-0.691)	0.758 (0.622-0.933)	0.923 (0.751-1.15)	1.16 (0.913-1.49)	1.35 (1.04-1.77)	1.55 (1.17-2.08)	1.77 (1.30-2.43)	2.07 (1.46-2.97)	2.32 (1.58-3.44)
6-hr	0.574 (0.473-0.704)	0.758 (0.624-0.931)	1.01 (0.828-1.24)	1.22 (0.993-1.51)	1.52 (1.20-1.95)	1.76 (1.36-2.30)	2.01 (1.51-2.69)	2.27 (1.67-3.13)	2.64 (1.86-3.79)	2.94 (2.00-4.37)
12-hr	0.738 (0.608-0.904)	0.978 (0.805-1.20)	1.30 (1.07-1.60)	1.57 (1.28-1.95)	1.95 (1.54-2.50)	2.25 (1.73-2.94)	2.56 (1.93-3.43)	2.88 (2.11-3.97)	3.33 (2.35-4.78)	3.69 (2.51-5.48)
24-hr	0.969 (0.860-1.12)	1.30 (1.15-1.50)	1.74 (1.54-2.01)	2.11 (1.85-2.46)	2.62 (2.22-3.15)	3.01 (2.50-3.70)	3.42 (2.77-4.30)	3.84 (3.03-4.98)	4.43 (3.35-5.98)	4.89 (3.57-6.83)
2-day	1.15 (1.02-1.32)	1.57 (1.39-1.81)	2.13 (1.88-2.46)	2.58 (2.26-3.01)	3.21 (2.72-3.86)	3.70 (3.07-4.54)	4.19 (3.40-5.28)	4.71 (3.71-6.10)	5.42 (4.10-7.32)	5.98 (4.36-8.35)
3-day	1.25 (1.11-1.44)	1.72 (1.53-1.99)	2.35 (2.08-2.72)	2.86 (2.51-3.34)	3.57 (3.02-4.29)	4.11 (3.41-5.05)	4.66 (3.78-5.87)	5.24 (4.13-6.78)	6.03 (4.56-8.13)	6.64 (4.85-9.28)
4-day	1.32 (1.18-1.52)	1.83 (1.62-2.11)	2.51 (2.21-2.89)	3.06 (2.68-3.56)	3.81 (3.23-4.58)	4.38 (3.64-5.39)	4.98 (4.03-6.27)	5.59 (4.41-7.24)	6.43 (4.86-8.68)	7.09 (5.18-9.90)
7-day	1.44 (1.28-1.66)	1.98 (1.76-2.28)	2.70 (2.38-3.12)	3.29 (2.88-3.83)	4.10 (3.47-4.93)	4.72 (3.92-5.81)	5.37 (4.35-6.76)	6.04 (4.76-7.82)	6.95 (5.26-9.38)	7.67 (5.60-10.7)
10-day	1.53 (1.35-1.76)	2.09 (1.85-2.40)	2.84 (2.51-3.28)	3.46 (3.03-4.02)	4.31 (3.65-5.19)	4.98 (4.13-6.12)	5.66 (4.59-7.13)	6.37 (5.02-8.26)	7.36 (5.56-9.93)	8.13 (5.94-11.4)
20-day	1.75 (1.55-2.01)	2.40 (2.12-2.76)	3.28 (2.89-3.78)	4.01 (3.51-4.67)	5.03 (4.26-6.05)	5.83 (4.84-7.17)	6.66 (5.40-8.39)	7.53 (5.93-9.75)	8.73 (6.60-11.8)	9.69 (7.08-13.5)
30-day	1.97 (1.75-2.27)	2.72 (2.41-3.13)	3.73 (3.29-4.31)	4.58 (4.01-5.33)	5.77 (4.89-6.95)	6.72 (5.58-8.26)	7.70 (6.24-9.70)	8.74 (6.89-11.3)	10.2 (7.69-13.7)	11.3 (8.27-15.8)
45-day	2.32 (2.06-2.67)	3.21 (2.84-3.69)	4.42 (3.91-5.11)	5.45 (4.78-6.35)	6.92 (5.86-8.33)	8.09 (6.72-9.94)	9.32 (7.55-11.7)	10.6 (8.36-13.7)	12.4 (9.40-16.8)	13.9 (10.1-19.4)
60-day	2.54 (2.26-2.93)	3.50 (3.10-4.04)	4.83 (4.27-5.58)	5.97 (5.23-6.95)	7.60 (6.44-9.15)	8.91 (7.40-11.0)	10.3 (8.35-13.0)	11.8 (9.29-15.3)	13.9 (10.5-18.7)	15.6 (11.4-21.8)

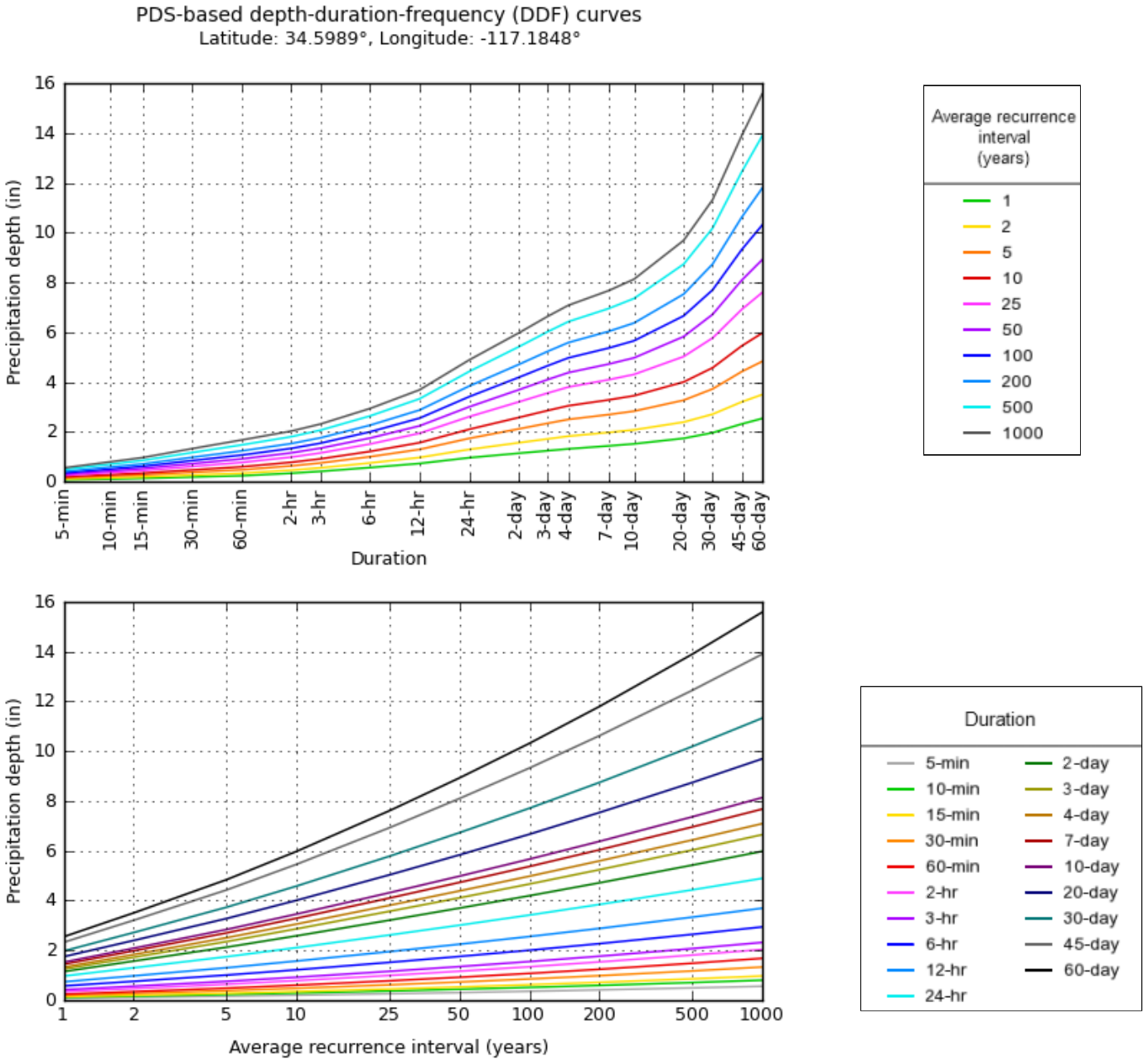
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



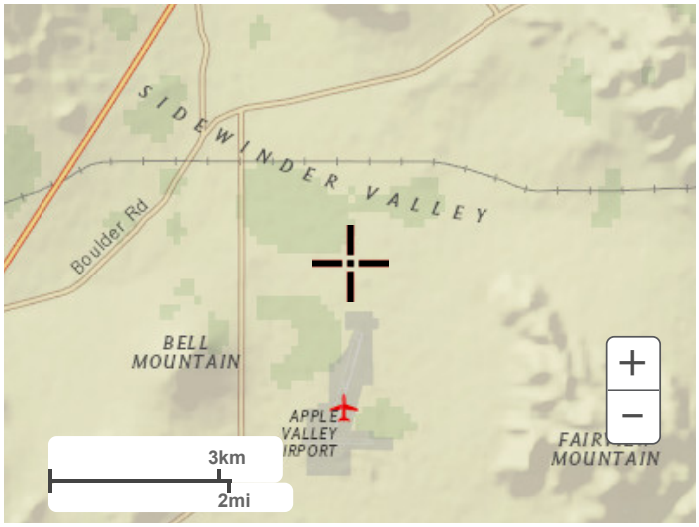
NOAA Atlas 14, Volume 6, Version 2

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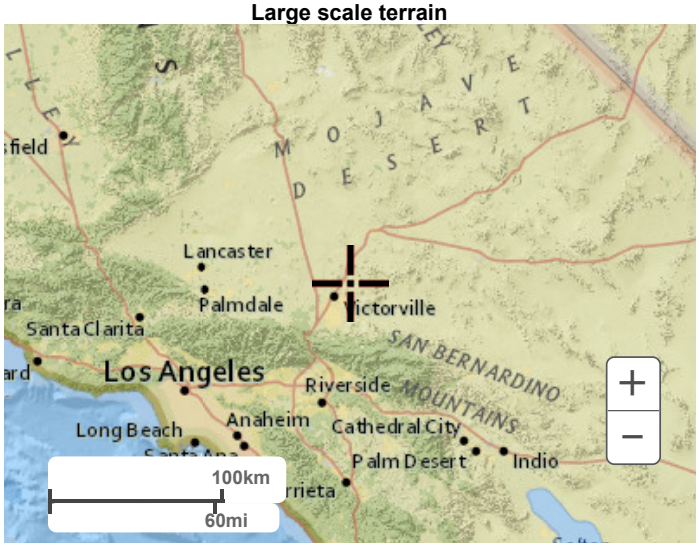
Back to Top

Maps & aerials

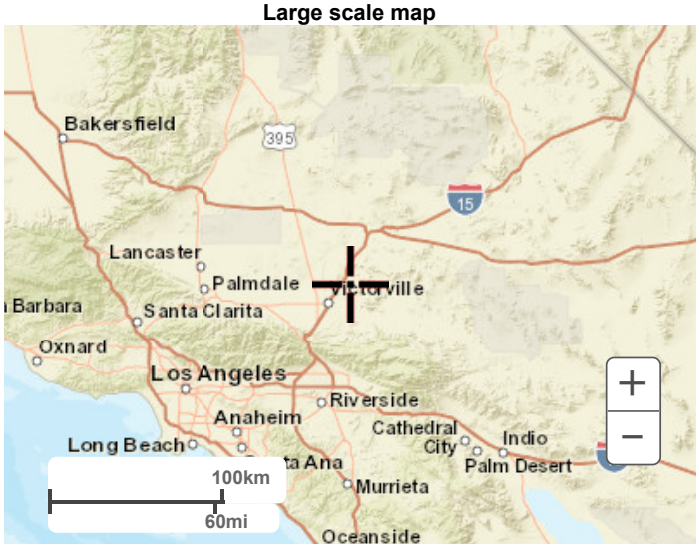
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



Back to Top

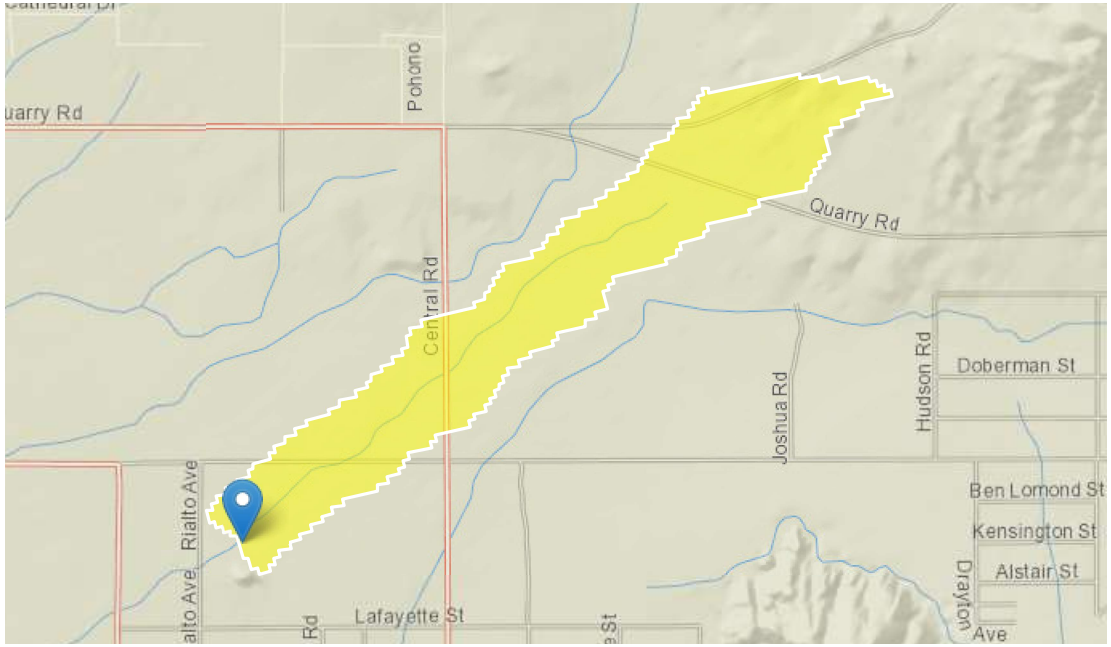
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

OFFSITE FLOW DATA (USGS)

2021-181 Site Blue Line Stream

Region ID: CA
Workspace ID: CA20220912174907632000
Clicked Point (Latitude, Longitude): 34.59732, -117.18266
Time: 2022-09-12 10:49:27 -0700



Stream directly flowing into propose project site

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.6	square miles

Peak-Flow Statistics

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.6	square miles	0.04	173

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

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

Statistic	Value	Unit	ASEp
50-percent AEP flood	7.95	ft^3/s	214
20-percent AEP flood	46.3	ft^3/s	226
10-percent AEP flood	117	ft^3/s	248
4-percent AEP flood	311	ft^3/s	298
2-percent AEP flood	587	ft^3/s	357
1-percent AEP flood	1040	ft^3/s	444
0.5-percent AEP flood	1750	ft^3/s	575
0.2-percent AEP flood	3310	ft^3/s	856

Peak-Flow Statistics Citations

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

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Application Version: 4.10.1

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1

APPENDIX E

INFILTRATION REPORT

July 1, 2022

Watson Land Development
22010 Wilmington Avenue
Carson, California 90745

Attention: Mr. Craig B. Halverson
Executive Vice President

Project No.: **22G196-1**

Subject: **Results of Infiltration Testing**
Proposed Industrial Building
SEC Johnson Road and Navajo Road
Apple Valley, California

Mr. Halverson:

In accordance with your request, we have conducted infiltration testing at the subject site. We are pleased to present this report summarizing the results of the infiltration testing and our design recommendations.

Scope of Services

The scope of services performed for this project was in general accordance with our Proposal No. 22P243, dated May 24, 2022. The scope of services included site reconnaissance, subsurface exploration, field testing, and engineering analysis to determine the infiltration rates of the on-site soils. The infiltration testing was performed in general accordance with the guidelines published in the Riverside County – Low Impact Development BMP Design Handbook – Section 2.3 of Appendix A, prepared for the Riverside County Department of Environmental Health (RCDEH), dated December, 2013. The San Bernardino County standards defer to the guidelines published by the RCDEH.

Site and Project Description

The subject site is located at the southeast corner of Johnson Road and Navajo Road in Apple Valley, California. The site is bounded to the north by Johnson Road, to the west by Navajo Road, to the south by Kensington Street and vacant land, and to the east by Central Road. The general location of the site is illustrated on the Site Location Map, included as Plate 1 of this report.

The site consists of several parcels, which total 142± acres in size. The site is presently vacant and undeveloped. The ground surface cover consists of exposed soil with sparse native weed and shrub growth. Several dirt roads transect the site.

Detailed topographic information was not available at the time of this report. Based on visual observations made at the time of the subsurface investigation, the overall site slopes to the southwest at a gradient of 2± percent. The site possesses hilly topography, with north-south trending drainage channels. The approximate elevation difference between the lowest point in the channels and highest point on the crests throughout the site varies from about 5 to 20 feet.

Proposed Development

Based on the conceptual site plan provided to our office by the client, the site will be developed with one (1) warehouse, 2,220,000± ft^2 in size, located in the western and central areas of the site. Dock-high doors will be constructed along a portion of at least one building wall. The building is expected to be surrounded by asphaltic concrete pavements in the parking and drive lanes, Portland cement concrete pavements in the loading dock areas, and limited areas of concrete flatwork and landscape planters throughout.

Based on the site plan, the proposed development will include on-site stormwater infiltration. The infiltration system will consist of several basins located in the western and southern areas of the site. Based on an exhibit provided by the client, we expected the bottom of the infiltration basins to be 12± feet below ground surface.

Subsurface Exploration

Scope of Exploration

The subsurface exploration conducted for the infiltration testing consisted of three (3) infiltration test borings, advanced to depths of 12± feet below the existing site grades. In addition to the infiltration testing, one (1) exploratory boring was extended to a depth of 22± feet below site grades to verify the underlying soil types and verify that groundwater was at a depth greater than 10± feet below the bottom of the proposed infiltration chamber system. The infiltration borings were advanced using a truck-mounted drilling rig, equipped with 8-inch-diameter hollow-stem augers and were logged during drilling by a member of our staff. The approximate locations of the infiltration test borings (identified as I-1 through I-3) and the exploratory boring (identified as B-1) are indicated on the Infiltration Test Location Plan, enclosed as Plate 2 of this report.

Upon the completion of the infiltration borings, the bottom of each test boring was covered with 2± inches of clean ¾-inch gravel. A sufficient length of 3-inch-diameter perforated PVC casing was then placed into each test hole so that the PVC casing extended from the bottom of the test hole to the ground surface. Clean ¾-inch gravel was then installed in the annulus surrounding the PVC casing.

Geotechnical Conditions

Native alluvium was encountered at the ground surface at each boring location, extending to at least the maximum depth explored of 22± feet below ground surface. The alluvial soils generally consist of loose to very dense silty fine to medium sand and silty fine to coarse sand with trace fine Gravel. Occasional samples possess slight cementation and trace to little calcareous nodules.

Infiltration Testing

As previously mentioned, the infiltration testing was performed in general accordance with the guidelines published in Riverside County – Low Impact Development BMP Design Handbook – Section 2.3 of Appendix A, which apply to San Bernardino County.

Pre-soaking

In accordance with the county infiltration standards for sandy soils, all infiltration test borings were pre-soaked 2 hours prior to the infiltration testing or until all of the water had percolated through the test holes. The pre-soaking process consisted of filling test borings by inverting a full 5-gallon bottle of clear water supported over each hole so that the water flow into the hole holds constant at a level at least 5 times the hole's radius above the gravel at the bottom of each hole. Pre-soaking was completed after all of the water had percolated through the test holes.

Infiltration Testing

Following the pre-soaking process of the infiltration test borings, SCG performed the infiltration testing. Each test hole was filled with water to a depth of at least 5 times the hole's radius above the gravel at the bottom of each test hole. In accordance with the Riverside County guidelines, in areas where "sandy soils" were encountered at the bottom of the infiltration test borings (where 6 inches of water infiltrated into the surrounding soils in less than 25 minutes for two (2) consecutive readings), readings were taken at 10-minute intervals for 1 hour at the test locations. The water level readings are presented on the spreadsheets enclosed with this report. The infiltration rates for each of the timed intervals are also tabulated on the spreadsheets.

The infiltration rates from the tests are tabulated in inches per hour. In accordance with the typically accepted practice, it is recommended that the most conservative reading from the latter part of the infiltration tests be used as the design infiltration rate. The rates are summarized below:

Infiltration Test No.	Depth (feet)	Soil Description	Infiltration Rate (inches/hour)
I-1	12	Silty fine to medium Sand, little coarse Sand	3.7
I-2	12	Silty fine to coarse Sand, trace fine Gravel	1.4
I-3	12	Silty fine to coarse Sand, trace fine Gravel	2.5

Laboratory Testing

Moisture Content

The moisture contents for the recovered soil samples within the borings were determined in accordance with ASTM D-2216 and are expressed as a percentage of the dry weight. These test results are presented on the Boring Logs.

Grain Size Analysis

The grain size distribution of selected soils collected from the base of each infiltration test boring have been determined using a range of wire mesh screens. These tests were performed in general accordance with ASTM D-422 and/or ASTM D-1140. The weight of the portion of the sample retained on each screen is recorded and the percentage finer or coarser of the total weight is calculated. The results of these tests are presented on Plates C-1 through C-3 of this report.

Design Recommendations

Three (3) infiltration tests were performed at the subject site. As noted above, the infiltration rates at these locations vary from 1.4 to 3.7 inches per hour. **Based on the results of the infiltration testing, we recommend the following infiltration rates for the proposed infiltration systems:**

Infiltration System	Depth (ft.)	Infiltration Rate (Inches per Hour)
"A"	12	2.5*
"B"	12	2.5

*Note: This value is an average of Infiltration Test Nos. I-1 and I-2.

The design of the storm water infiltration systems should be performed by the project civil engineer, in accordance with the City of Apple Valley and/or County of San Bernardino guidelines. It is recommended that the system be constructed so as to facilitate removal of silt and clay, or other deleterious materials from any water that may enter the systems. The presence of such materials would decrease the effective infiltration rates. **It is recommended that the project civil engineer apply an appropriate factor of safety. The infiltration rates recommended above is based on the assumption that only clean water will be introduced to the subsurface profile. Any fines, debris, or organic materials could significantly impact the infiltration rate.** It should be noted that the recommended infiltration rates are based on infiltration testing at three (3) discrete locations and that the overall infiltration rates of the proposed infiltration systems could vary considerably.

Infiltration Rate Considerations

The infiltration rates presented herein was determined in accordance with the San Bernardino County guidelines and are considered valid only for the time and place of the actual test. Varying subsurface conditions will exist in other areas of the site, which could alter the recommended infiltration rates presented above. The infiltration rates will decline over time between maintenance cycles as silt or clay particles accumulate on the BMP surface. The infiltration rate is highly dependent upon a number of factors, including density, silt and clay content, grainsize distribution throughout the range of particle sizes, and particle shape. Small changes in these factors can cause large changes in the infiltration rates.

Infiltration rates are based on unsaturated flow. As water is introduced into soils by infiltration, the soils become saturated and the wetting front advances from the unsaturated zone to the saturated zone. Once the soils become saturated, infiltration rates become zero, and water can only move through soils by hydraulic conductivity at a rate determined by pressure head and soil permeability. Changes in soil moisture content will affect the infiltration rate. Infiltration rates should be expected to decrease until the soils become saturated. Soil permeability values will then govern groundwater movement. Permeability values may be on the order of 10 to 20 times less than infiltration rates. The system designer should incorporate adequate factors of safety and allow for overflow design into appropriate traditional storm drain systems, which would transport storm water off-site.

Construction Considerations

The infiltration rates presented in this report are specific to the tested locations and tested depths. Infiltration rates can be significantly reduced if the soils are exposed to excessive disturbance or compaction during construction. Compaction of the soils at the bottom of the infiltration system can significantly reduce the infiltration ability of the basins. Therefore, the subgrade soils within proposed infiltration system areas should not be over-excavated, undercut or compacted in any significant manner. **It is recommended that a note to this effect be added to the project plans and/or specifications.**

We recommend that a representative from the geotechnical engineer be on-site during the construction of the proposed infiltration systems to identify the soil classification at the base of each system. It should be confirmed that the soils at the base of the proposed infiltration systems correspond with those presented in this report to ensure that the performance of the systems will be consistent with the rates reported herein.

We recommend that scrapers and other rubber-tired heavy equipment not be operated on the basin bottom, or at levels lower than 2 feet above the bottom of the system, particularly within basins. As such, the bottom 24 inches of the infiltration systems should be excavated with non-rubber-tired equipment, such as excavators.

Basin Maintenance

The proposed project may include infiltration basins. Water flowing into these basins will carry some level of sediment. Wind-blown sediments and erosion of the basin side walls will also contribute to sediment deposition at the bottom of the basin. This layer has the potential to significantly reduce the infiltration rate of the basin subgrade soils. Therefore, a formal basin maintenance program should be established to ensure that these silt and clay deposits are removed from the basin on a regular basis. Appropriate vegetation on the basin sidewalls and bottom may reduce erosion and sediment deposition.

Basin maintenance should also include measures to prevent animal burrows, and to repair any burrows or damage caused by such. Animal burrows in the basin sidewalls can significantly increase the risk of erosion and piping failures.

Location of Infiltration Systems

The use of on-site storm water infiltration systems carries a risk of creating adverse geotechnical conditions. Increasing the moisture content of the soil can cause the soil to lose internal shear strength and increase its compressibility, resulting in a change in the designed engineering properties. Overlying structures and pavements in the infiltration area could potentially be damaged due to saturation of the subgrade soils. **The proposed infiltration systems for this site should be located at least 25 feet away from any structures, including retaining walls.** Even with this provision of locating the infiltration system at least 25 feet from the building, it is possible that infiltrating water into the subsurface soils could have an adverse effect on the proposed or existing structures. It should also be noted that utility trenches which happen to collect storm water can also serve as conduits to transmit storm water toward the structure,

depending on the slope of the utility trench. Therefore, consideration should also be given to the proposed locations of underground utilities which may pass near the proposed infiltration system.

The infiltration system designer should also give special consideration to the effect that the proposed infiltration systems may have on nearby subterranean structures, open excavations, or descending slopes. In particular, infiltration systems should not be located near the crest of descending slopes, particularly where the slopes are comprised of granular soils. Such systems will require specialized design and analysis to evaluate the potential for slope instability, piping failures and other phenomena that typically apply to earthen dam design. This type of analysis is beyond the scope of this infiltration test report, but these factors should be considered by the infiltration system designer when locating the infiltration systems.

General Comments

This report has been prepared as an instrument of service for use by the client in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. This report may be provided to the contractor(s) and other design consultants to disclose information relative to the project. However, this report is not intended to be utilized as a specification in and of itself, without appropriate interpretation by the project architect, structural engineer, and/or civil engineer. The design of the proposed storm water infiltration system is the responsibility of the civil engineer. The role of the geotechnical engineer is limited to determination of infiltration rate only. By using the design infiltration rate contained herein, the civil engineer agrees to indemnify, defend, and hold harmless the geotechnical engineer for all aspects of the design and performance of the proposed storm water infiltration system. The reproduction and distribution of this report must be authorized by the client and Southern California Geotechnical, Inc. Furthermore, any reliance on this report by an unauthorized third party is at such party's sole risk, and we accept no responsibility for damage or loss which may occur.

The analysis of this site was based on a subsurface profile interpolated from limited discrete soil samples. While the materials encountered in the project area are considered to be representative of the total area, some variations should be expected between boring locations and testing depths. If the conditions encountered during construction vary significantly from those detailed herein, we should be contacted immediately to determine if the conditions alter the recommendations contained herein.
This report has been based on assumed or provided characteristics of the proposed development. It is recommended that the owner, client, architect, structural engineer, and civil engineer carefully review these assumptions to ensure that they are consistent with the characteristics of the proposed development. If discrepancies exist, they should be brought to our attention to verify that they do not affect the conclusions and recommendations contained herein. We also recommend that the project plans and specifications be submitted to our office for review to verify that our recommendations have been correctly interpreted. The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed.

Closure

We sincerely appreciate the opportunity to be of service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

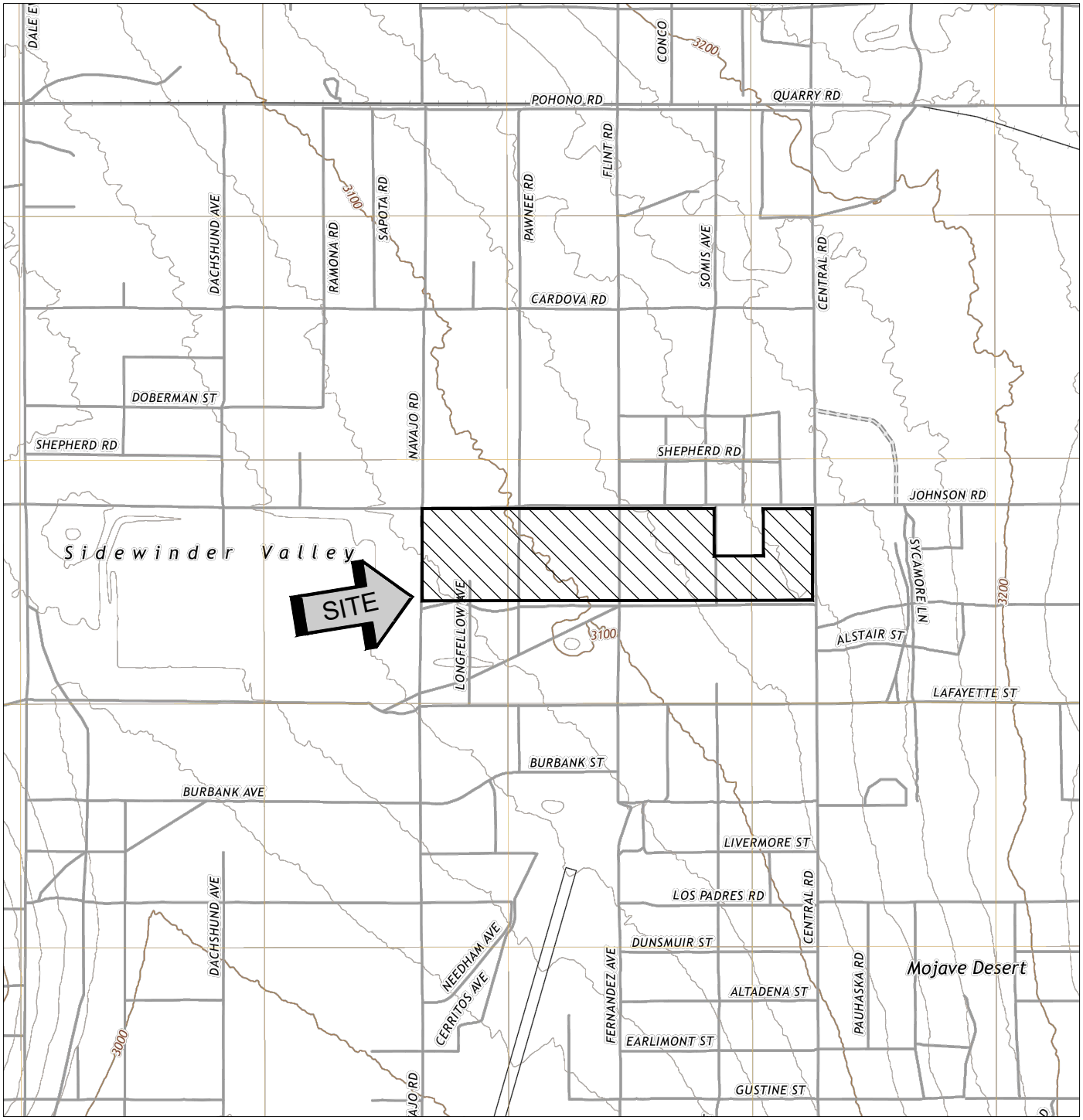
Jamie Hayward
Staff Geologist

Robert G. Trazo, GE 2655
Principal Engineer



Distribution: (1) Addressee

Enclosures: Plate 1 - Site Location Map
Plate 2 - Infiltration Test Location Plan
Boring Log Legend and Logs (6 pages)
Infiltration Test Results Spreadsheets (3 pages)
Grain Size Distribution Graphs (3 pages)



SOURCE: USGS TOPOGRAPHIC MAPS OF THE APPLE VALLEY NORTH QUADRANGLE, SAN BERNARDINO COUNTY, CALIFORNIA, 2022.

SITE LOCATION MAP

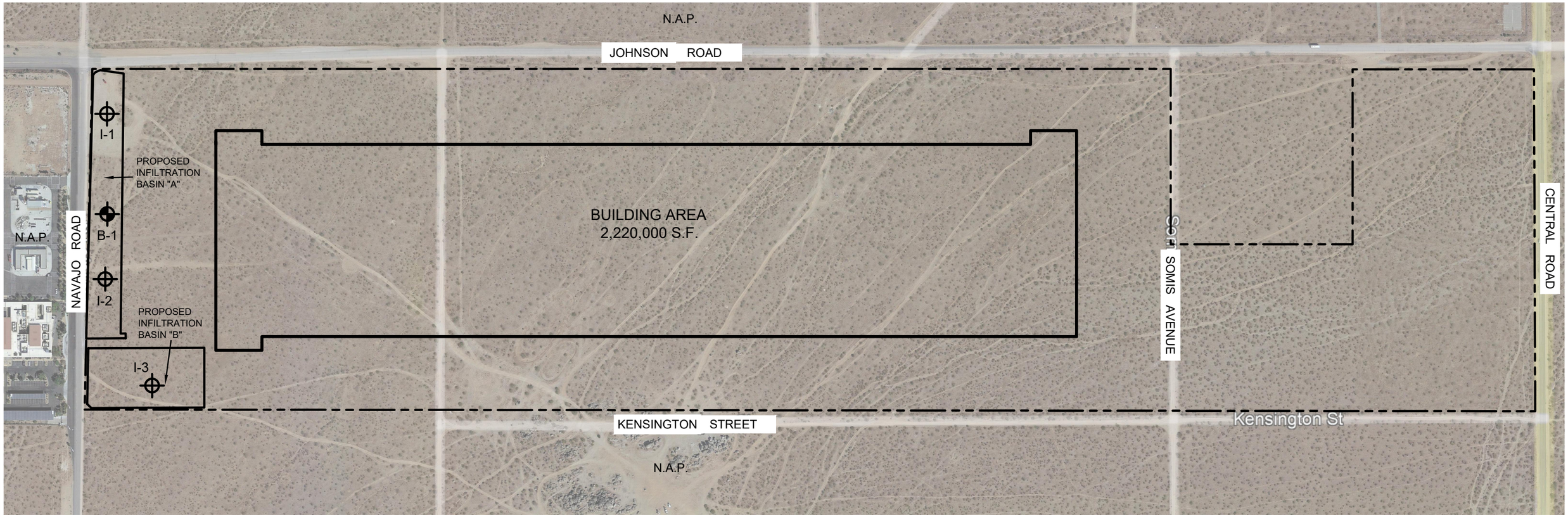
PROPOSED INDUSTRIAL BUILDING

APPLE VALLEY, CALIFORNIA

SCALE: 1" = 2000'	
DRAWN: MD CHKD: RGT	
SCG PROJECT 22G196-1	
PLATE 1	

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



GEOTECHNICAL LEGEND

- APPROXIMATE INFILTRATION BORING LOCATION
- APPROXIMATE BORING LOCATION
- PROPERTY LINE
- BUILDING OUTLINE

NORTH

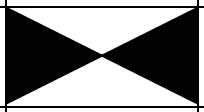
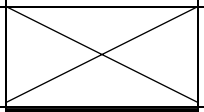
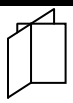
NOTE: CONCEPTUAL SITE PLAN PREPARED BY RGA ARCHITECTS.
AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH.

PROPOSED BORING LOCATION PLAN
PROPOSED INDUSTRIAL BUILDING
APPLE VALLEY, CALIFORNIA

SCALE: 1" = 350'
DRAWN: JAH
CHKD: GKM
SCG PROJECT 22G196-1
PLATE 2

SOUTHERN CALIFORNIA GEOTECHNICAL

BORING LOG LEGEND

SAMPLE TYPE	GRAPHICAL SYMBOL	SAMPLE DESCRIPTION
AUGER		SAMPLE COLLECTED FROM AUGER CUTTINGS, NO FIELD MEASUREMENT OF SOIL STRENGTH. (DISTURBED)
CORE		ROCK CORE SAMPLE: TYPICALLY TAKEN WITH A DIAMOND-TIPPED CORE BARREL. TYPICALLY USED ONLY IN HIGHLY CONSOLIDATED BEDROCK.
GRAB		SOIL SAMPLE TAKEN WITH NO SPECIALIZED EQUIPMENT, SUCH AS FROM A STOCKPILE OR THE GROUND SURFACE. (DISTURBED)
CS		CALIFORNIA SAMPLER: 2-1/2 INCH I.D. SPLIT BARREL SAMPLER, LINED WITH 1-INCH HIGH BRASS RINGS. DRIVEN WITH SPT HAMMER. (RELATIVELY UNDISTURBED)
NSR		NO RECOVERY: THE SAMPLING ATTEMPT DID NOT RESULT IN RECOVERY OF ANY SIGNIFICANT SOIL OR ROCK MATERIAL.
SPT		STANDARD PENETRATION TEST: SAMPLER IS A 1.4 INCH INSIDE DIAMETER SPLIT BARREL, DRIVEN 18 INCHES WITH THE SPT HAMMER. (DISTURBED)
SH		SHELBY TUBE: TAKEN WITH A THIN WALL SAMPLE TUBE, PUSHED INTO THE SOIL AND THEN EXTRACTED. (UNDISTURBED)
VANE		VANE SHEAR TEST: SOIL STRENGTH OBTAINED USING A 4 BLADED SHEAR DEVICE. TYPICALLY USED IN SOFT CLAYS-NO SAMPLE RECOVERED.

COLUMN DESCRIPTIONS

DEPTH: Distance in feet below the ground surface.

SAMPLE: Sample Type as depicted above.

BLOW COUNT: Number of blows required to advance the sampler 12 inches using a 140 lb hammer with a 30-inch drop. 50/3" indicates penetration refusal (>50 blows) at 3 inches. WH indicates that the weight of the hammer was sufficient to push the sampler 6 inches or more.

POCKET PEN.: Approximate shear strength of a cohesive soil sample as measured by pocket penetrometer.

GRAPHIC LOG: Graphic Soil Symbol as depicted on the following page.

DRY DENSITY: Dry density of an undisturbed or relatively undisturbed sample in lbs/ft^3.

MOISTURE CONTENT: Moisture content of a soil sample, expressed as a percentage of the dry weight.

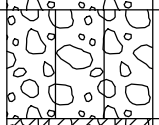
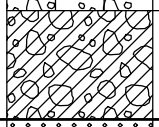
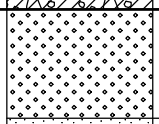
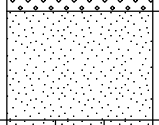
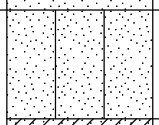
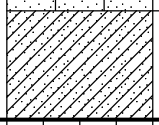
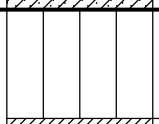
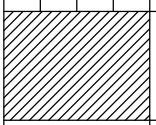
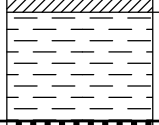
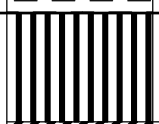
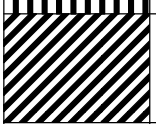
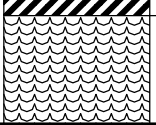
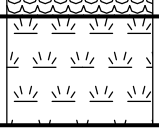
LIQUID LIMIT: The moisture content above which a soil behaves as a liquid.

PLASTIC LIMIT: The moisture content above which a soil behaves as a plastic.

PASSING #200 SIEVE: The percentage of the sample finer than the #200 standard sieve.

UNCONFINED SHEAR: The shear strength of a cohesive soil sample, as measured in the unconfined state.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-1

JOB NO.: 22G196-1
PROJECT: Proposed Industrial Building
LOCATION: Apple Valley, California

DRILLING DATE: 6/6/22
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Esparza

WATER DEPTH: Dry
CAVE DEPTH: 13 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
		7			ALLUVIUM: Light Brown Silty fine to coarse Sand, trace Calcareous veining, trace fine Gravel, loose to very dense-dry to damp		1					
		56			@ 3½ feet, trace fine to coarse Gravel		3					
5		79/9"					4					
		50/4"					3					
10					Light Brown Silty fine to medium Sand, little coarse Sand, trace fine Gravel, very dense-damp							
		50/5"					3					
15												
		50/3"					3					
20												
					Boring Terminated at 22'							

TBL 22G196-1.GPJ SOCALGEO.GDT 7/1/22

TEST BORING LOG

PLATE B-1

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-1

JOB NO.: 22G196-1
PROJECT: Proposed Industrial Building
LOCATION: Apple Valley, California

DRILLING DATE: 6/6/22
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Esparza

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					ALLUVIUM: Red Brown Silty fine to medim Sand, little coarse Sand, trace Calcareous veining and nodules, slightly cemented, dense to very dense-damp							
5		44					3					
10		50/5"					3					
		50/3"					3			28		
					Boring Terminated at 12'							

TBL 22G196-1.GPJ SOCALGEO.GDT 7/1/22

TEST BORING LOG

PLATE B-2

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-2

JOB NO.: 22G196-1
PROJECT: Proposed Industrial Building
LOCATION: Apple Valley, California

DRILLING DATE: 6/6/22
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Esparza

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					ALLUVIUM: Light Red Brown Silty fine to coarse Sand, trace fine Gravel, trace fine root fibers, trace to little Calcareous nodules, dense to very dense-damp							
5		30					2					
		50/5"			@ 8½ feet, little fine Gravel		4					
10		50/3"					4			20		
					Boring Terminated at 12'							

TBL 22G196-1.GPJ SOCALGEO.GDT 7/1/22

TEST BORING LOG **PLATE B-3**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-3

JOB NO.: 22G196-1
PROJECT: Proposed Industrial Building
LOCATION: Apple Valley, California

DRILLING DATE: 6/6/22
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Esparza

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
5		50			ALLUVIUM: Red Brown Silty fine to medium Sand, trace Clay, trace to little coarse Sand, little Calcareous nodules, dense to very dense-damp		3					
10		47					4					
		50/5"			Light Brown Silty fine to coarse Sand, trace fine Gravel, very dense-damp		3			20		
					Boring Terminated at 12'							

TBL 22G196-1.GPJ SOCALGEO.GDT 7/1/22

TEST BORING LOG **PLATE B-4**

INFILTRATION CALCULATIONS

Project Name	Proposed Industrial Building
Project Location	Apple Valley, California
Project Number	22G196-1
Engineer	Caleb Brackett

Test Hole Radius	4	(in)
Test Depth	12.20	(ft)

Infiltration Test Hole: I-1

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	9:20 AM	25.00	10.00	25.20	YES	SANDY SOILS
	Final	9:45 AM		12.10			
2	Initial	9:45 AM	25.00	10.00	14.76	YES	SANDY SOILS
	Final	10:10 AM		11.23			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	10:11 AM	10.00	10.00	1.05	1.68	6.84
	Final	10:21 AM		11.05			
2	Initial	10:22 AM	10.00	10.00	0.85	1.78	5.25
	Final	10:32 AM		10.85			
3	Initial	10:32 AM	10.00	10.00	0.65	1.88	3.82
	Final	10:42 AM		10.65			
4	Initial	10:42 AM	10.00	10.00	0.65	1.88	3.82
	Final	10:52 AM		10.65			
5	Initial	10:52 AM	10.00	10.00	0.64	1.88	3.75
	Final	11:02 AM		10.64			
6	Initial	11:02 AM	10.00	10.00	0.63	1.89	3.68
	Final	11:12 AM		10.63			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

- Q = Infiltration Rate (in inches per hour)
- ΔH = Change in Height (Water Level) over the time interval
- r = Test Hole (Borehole) Radius
- Δt = Time Interval
- H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Industrial Building
Project Location	Apple Valley, California
Project Number	22G196-1
Engineer	Caleb Brackett

Test Hole Radius	4	(in)
Test Depth	12.00	(ft)

Infiltration Test Hole	I-2

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	9:09 AM	25.00	10.00	24.00	YES	SANDY SOILS
	Final	9:34 AM		12.00			
2	Initial	9:35 AM	25.00	10.00	15.00	YES	SANDY SOILS
	Final	10:00 AM		11.25			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	10:05 AM	10.00	10.00	0.28	1.86	1.66
	Final	10:15 AM		10.28			
2	Initial	10:15 AM	10.00	10.00	0.26	1.87	1.53
	Final	10:25 AM		10.26			
3	Initial	10:25 AM	10.00	10.00	0.25	1.88	1.47
	Final	10:35 AM		10.25			
4	Initial	10:35 AM	10.00	10.00	0.25	1.88	1.47
	Final	10:45 AM		10.25			
5	Initial	10:45 AM	10.00	10.00	0.24	1.88	1.41
	Final	10:55 AM		10.24			
6	Initial	10:55 AM	10.00	10.00	0.24	1.88	1.41
	Final	11:05 AM		10.24			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

- Q = Infiltration Rate (in inches per hour)
- ΔH = Change in Height (Water Level) over the time interval
- r = Test Hole (Borehole) Radius
- Δt = Time Interval
- H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Industrial Building
Project Location	Apple Valley, California
Project Number	22G196-1
Engineer	Caleb Brackett

Test Hole Radius	4	(in)
Test Depth	12.00	(ft)

Infiltration Test Hole	I-3

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	11:00 AM	25.00	10.00	12.00	YES	SANDY SOILS
	Final	11:25 AM		11.00			
2	Initial	11:25 AM	25.00	10.00	10.32	YES	SANDY SOILS
	Final	11:50 AM		10.86			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	11:50 AM	10.00	10.00	0.45	1.78	2.78
	Final	12:00 PM		10.45			
2	Initial	12:00 PM	10.00	10.00	0.42	1.79	2.58
	Final	12:10 PM		10.42			
3	Initial	12:10 PM	10.00	10.00	0.42	1.79	2.58
	Final	12:20 PM		10.42			
4	Initial	12:20 PM	10.00	10.00	0.42	1.79	2.58
	Final	12:30 PM		10.42			
5	Initial	12:30 PM	10.00	10.00	0.41	1.80	2.51
	Final	12:40 PM		10.41			
6	Initial	12:40 PM	10.00	10.00	0.41	1.80	2.51
	Final	12:50 PM		10.41			

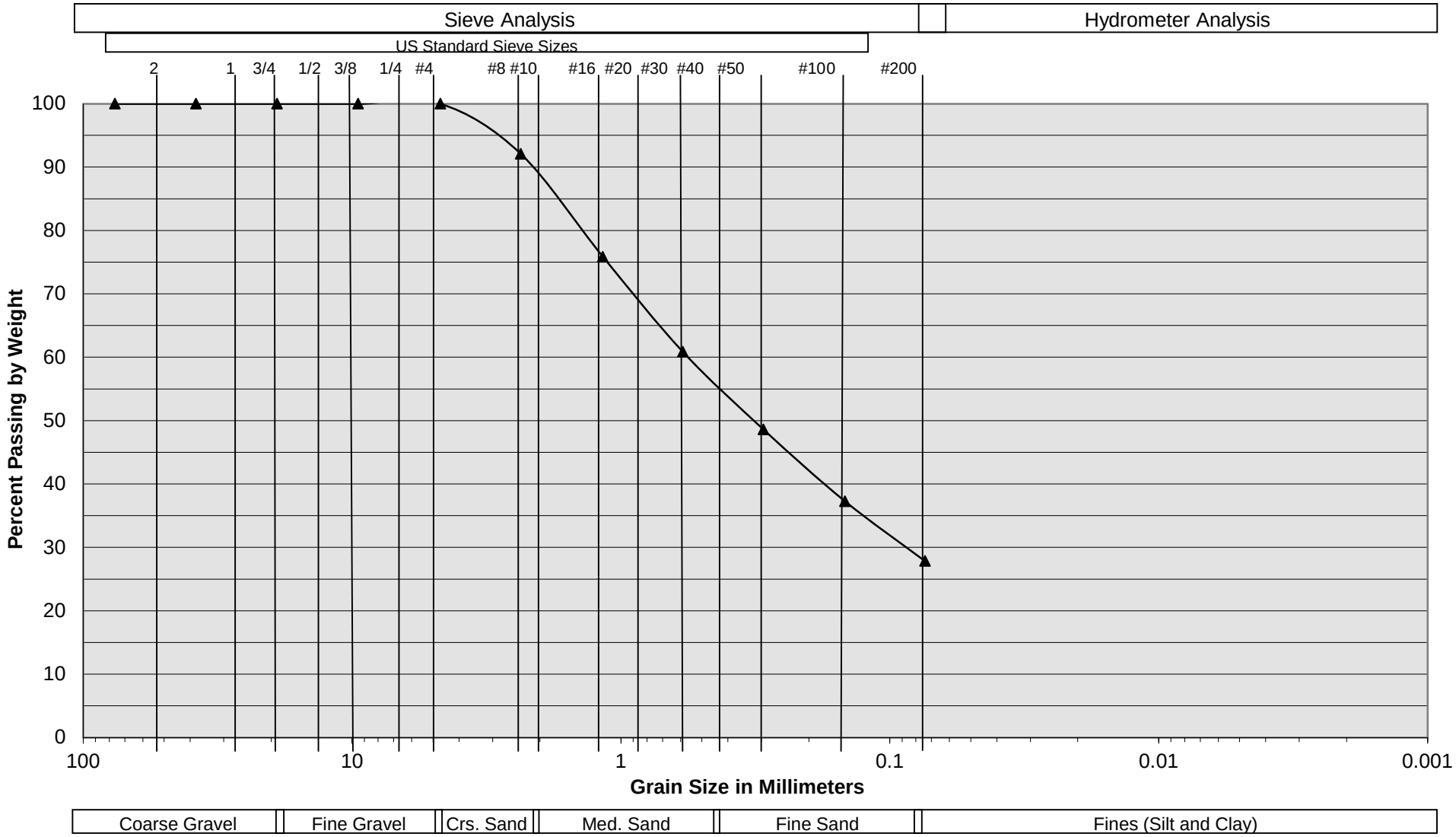
Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

- Q = Infiltration Rate (in inches per hour)
- ΔH = Change in Height (Water Level) over the time interval
- r = Test Hole (Borehole) Radius
- Δt = Time Interval
- H_{avg} = Average Head Height over the time interval

Grain Size Distribution

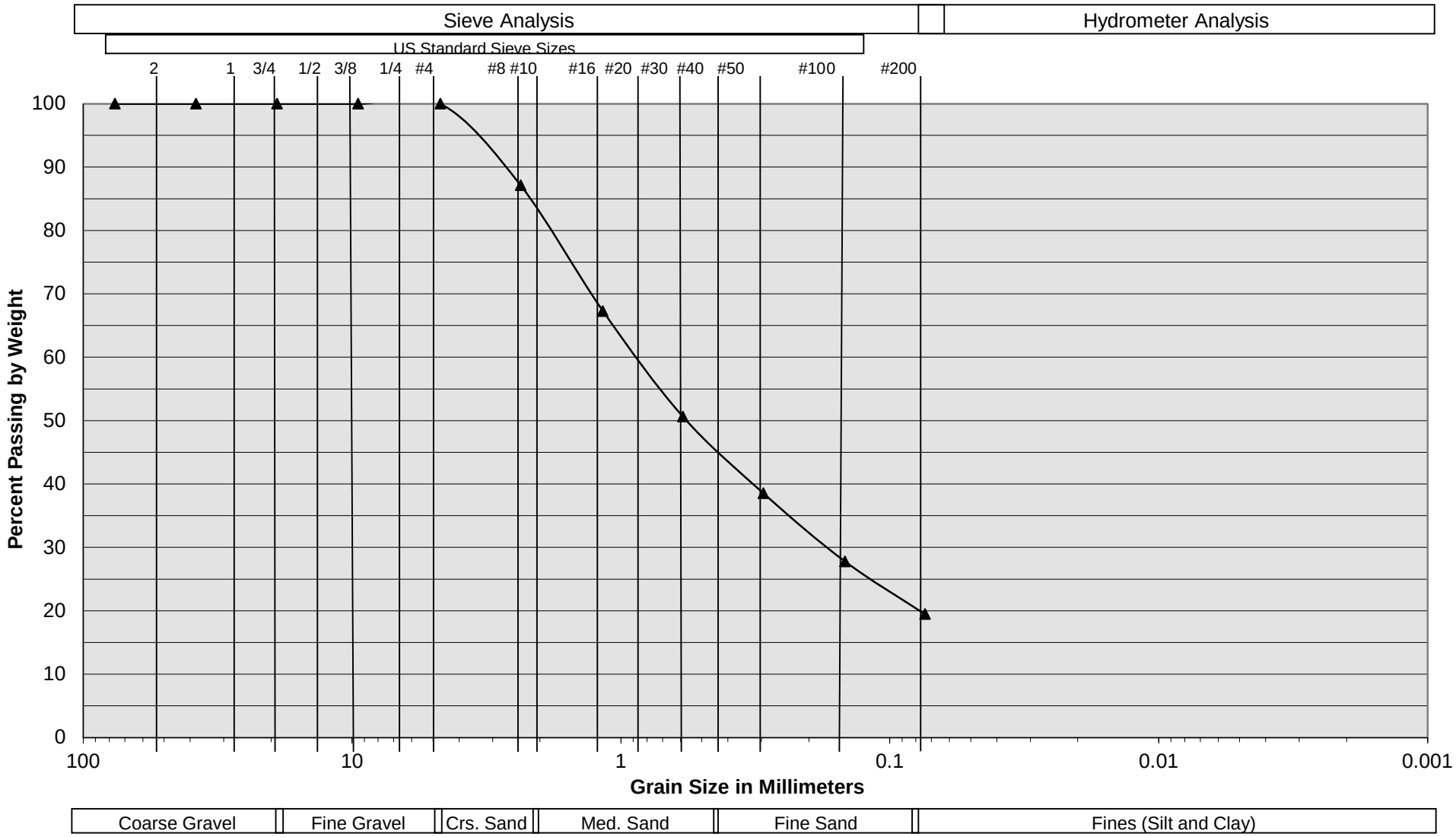


Sample Description	I-1 @ 10½ feet
Soil Classification	Silty fine to medium Sand, little coarse Sand

Proposed Industrial Building
Apple Valley, CA
Project No. 22G196-1
PLATE C- 1

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution



Sample Description	I-2 @ 10½ feet
Soil Classification	Silty fine to coarse Sand, trace fine Gravel

Proposed Industrial Building
Apple Valley, CA
Project No. 22G196-1
PLATE C- 2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution



Sample Description	I-3 @ 10½ feet
Soil Classification	Silty fine to coarse Sand, trace fine Gravel

Proposed Industrial Building
Apple Valley, CA
Project No. 22G196-1
PLATE C- 3

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

APPENDIX F

RATIONAL METHOD ANALYSIS (2/10/100 YEAR STORM)

RATIONAL METHOD ANALYSIS

PRE-DEVELOPMENT CONDITIONS 2-YEAR STORM

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/24/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
2 YR STORM RATIONAL METHOD, PRE CONDITION
AREA A

Program License Serial Number 6277

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.345 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 1

++
Process from Point/Station 1.100 to Point/Station 1.200
**** 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) = 78.00
Adjusted SCS curve number for AMC 1 = 60.60
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.671(In/Hr)
Initial subarea data:
Initial area flow distance = 2825.000(Ft.)
Top (of initial area) elevation = 3149.000(Ft.)
Bottom (of initial area) elevation = 3106.800(Ft.)
Difference in elevation = 42.200(Ft.)
Slope = 0.01494 s(%)= 1.49
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 34.232 min.
Rainfall intensity = 0.511(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.000
Subarea runoff = 0.000(CFS)
Total initial stream area = 53.250(Ac.)
Pervious area fraction = 1.000

Initial area Fm value = 0.671(In/Hr)
End of computations, Total Study Area = 53.25 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/24/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
2 YR STORM RATIONAL METHOD, PRE CONDITION
AREA B

Program License Serial Number 6277

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.345 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 1

++
Process from Point/Station 2.100 to Point/Station 2.200
**** 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) = 78.00
Adjusted SCS curve number for AMC 1 = 60.60
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.671(In/Hr)
Initial subarea data:
Initial area flow distance = 1827.000(Ft.)
Top (of initial area) elevation = 3118.900(Ft.)
Bottom (of initial area) elevation = 3094.000(Ft.)
Difference in elevation = 24.900(Ft.)
Slope = 0.01363 s(%)= 1.36
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 29.288 min.
Rainfall intensity = 0.570(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.000
Subarea runoff = 0.000(CFS)
Total initial stream area = 33.560(Ac.)
Pervious area fraction = 1.000

Initial area Fm value = 0.671(In/Hr)
End of computations, Total Study Area = 33.56 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/25/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
2 YR STORM RATIONAL METHOD, PRE CONDITION
AREA C

Program License Serial Number 6277

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.345 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 1

++
Process from Point/Station 3.100 to Point/Station 3.200
**** 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) = 78.00
Adjusted SCS curve number for AMC 1 = 60.60
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.671(In/Hr)
Initial subarea data:
Initial area flow distance = 2174.000(Ft.)
Top (of initial area) elevation = 3115.000(Ft.)
Bottom (of initial area) elevation = 3085.000(Ft.)
Difference in elevation = 30.000(Ft.)
Slope = 0.01380 s(%)= 1.38
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 31.320 min.
Rainfall intensity = 0.544(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.000
Subarea runoff = 0.000(CFS)
Total initial stream area = 29.070(Ac.)
Pervious area fraction = 1.000

Initial area Fm value = 0.671(In/Hr)
End of computations, Total Study Area = 29.07 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/25/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
2 YR STORM RATIONAL METHOD, PRE CONDITION
AREA D

Program License Serial Number 6277

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.345 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 1

++
Process from Point/Station 4.100 to Point/Station 4.200
**** 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) = 78.00
Adjusted SCS curve number for AMC 1 = 60.60
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.671(In/Hr)
Initial subarea data:
Initial area flow distance = 1566.000(Ft.)
Top (of initial area) elevation = 3100.000(Ft.)
Bottom (of initial area) elevation = 3076.000(Ft.)
Difference in elevation = 24.000(Ft.)
Slope = 0.01533 s(%)= 1.53
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 26.898 min.
Rainfall intensity = 0.605(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.000
Subarea runoff = 0.000(CFS)
Total initial stream area = 25.290(Ac.)
Pervious area fraction = 1.000

Initial area Fm value = 0.671(In/Hr)
End of computations, Total Study Area = 25.29 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/25/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
2 YR STORM RATIONAL METHOD, PRE CONDITION
AREA E (OFFSITE)

Program License Serial Number 6277

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.345 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 1

++
Process from Point/Station 5.100 to Point/Station 5.200
**** 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) = 78.00
Adjusted SCS curve number for AMC 1 = 60.60
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.671(In/Hr)
Initial subarea data:
Initial area flow distance = 680.000(Ft.)
Top (of initial area) elevation = 3143.000(Ft.)
Bottom (of initial area) elevation = 3130.800(Ft.)
Difference in elevation = 12.200(Ft.)
Slope = 0.01794 s(%)= 1.79
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.669 min.
Rainfall intensity = 0.781(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.127
Subarea runoff = 0.922(CFS)
Total initial stream area = 9.330(Ac.)
Pervious area fraction = 1.000

Initial area Fm value = 0.671(In/Hr)
End of computations, Total Study Area = 9.33 (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) = 1.000
Area averaged SCS curve number = 78.0

RATIONAL METHOD ANALYSIS

PRE-DEVELOPMENT CONDITIONS 10-YEAR STORM

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/30/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
10 YR STORM RATIONAL METHOD, PRE CONDITION
AREA A

Program License Serial Number 6277

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.605 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 1.100 to Point/Station 1.200
**** 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) = 78.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.404(In/Hr)
Initial subarea data:
Initial area flow distance = 2825.000(Ft.)
Top (of initial area) elevation = 3149.000(Ft.)
Bottom (of initial area) elevation = 3106.800(Ft.)
Difference in elevation = 42.200(Ft.)
Slope = 0.01494 s(%)= 1.49
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 34.232 min.
Rainfall intensity = 0.896(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.495
Subarea runoff = 23.607(CFS)
Total initial stream area = 53.250(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.404(In/Hr)

End of computations, Total Study Area = 53.25 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/30/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
10 YR STORM RATIONAL METHOD, PRE CONDITION
AREA B

Program License Serial Number 6277

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.605 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 2.100 to Point/Station 2.200
**** 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) = 78.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.404(In/Hr)
Initial subarea data:
Initial area flow distance = 1827.000(Ft.)
Top (of initial area) elevation = 3118.900(Ft.)
Bottom (of initial area) elevation = 3094.000(Ft.)
Difference in elevation = 24.900(Ft.)
Slope = 0.01363 s(%)= 1.36
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 29.288 min.
Rainfall intensity = 0.999(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.537
Subarea runoff = 18.001(CFS)
Total initial stream area = 33.560(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.404(In/Hr)

End of computations, Total Study Area = 33.56 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/30/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
10 YR STORM RATIONAL METHOD, PRE CONDITION
AREA C

Program License Serial Number 6277

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.605 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 3.100 to Point/Station 3.200
**** 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) = 78.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.404(In/Hr)
Initial subarea data:
Initial area flow distance = 2174.000(Ft.)
Top (of initial area) elevation = 3115.000(Ft.)
Bottom (of initial area) elevation = 3085.000(Ft.)
Difference in elevation = 30.000(Ft.)
Slope = 0.01380 s(%)= 1.38
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 31.320 min.
Rainfall intensity = 0.954(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.519
Subarea runoff = 14.393(CFS)
Total initial stream area = 29.070(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.404(In/Hr)

End of computations, Total Study Area = 29.07 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/30/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
10 YR STORM RATIONAL METHOD, PRE CONDITION
AREA D

Program License Serial Number 6277

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.605 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 4.100 to Point/Station 4.200
**** 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) = 78.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.404(In/Hr)
Initial subarea data:
Initial area flow distance = 1566.000(Ft.)
Top (of initial area) elevation = 3100.000(Ft.)
Bottom (of initial area) elevation = 3076.000(Ft.)
Difference in elevation = 24.000(Ft.)
Slope = 0.01533 s(%)= 1.53
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 26.898 min.
Rainfall intensity = 1.061(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.558
Subarea runoff = 14.962(CFS)
Total initial stream area = 25.290(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.404(In/Hr)

End of computations, Total Study Area = 25.29 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/30/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
10 YR STORM RATIONAL METHOD, PRE CONDITION
AREA E (OFFSITE)

Program License Serial Number 6277

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.605 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 5.100 to Point/Station 5.200
**** 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) = 78.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.404(In/Hr)
Initial subarea data:
Initial area flow distance = 680.000(Ft.)
Top (of initial area) elevation = 3143.000(Ft.)
Bottom (of initial area) elevation = 3130.800(Ft.)
Difference in elevation = 12.200(Ft.)
Slope = 0.01794 s(%)= 1.79
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.669 min.
Rainfall intensity = 1.370(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.635
Subarea runoff = 8.114(CFS)
Total initial stream area = 9.330(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.404(In/Hr)

End of computations, Total Study Area = 9.33 (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) = 1.000
Area averaged SCS curve number = 78.0

RATIONAL METHOD ANALYSIS

PRE-DEVELOPMENT CONDITIONS 100-YEAR STORM

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/24/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
100 YR STORM RATIONAL METHOD, PRE CONDITION
AREA A

Program License Serial Number 6277

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 1.100 to Point/Station 1.200
**** 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) = 78.00
Adjusted SCS curve number for AMC 3 = 92.80
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.140(In/Hr)
Initial subarea data:
Initial area flow distance = 2825.000(Ft.)
Top (of initial area) elevation = 3149.000(Ft.)
Bottom (of initial area) elevation = 3106.800(Ft.)
Difference in elevation = 42.200(Ft.)
Slope = 0.01494 s(%)= 1.49
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 34.232 min.
Rainfall intensity = 1.600(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.821
Subarea runoff = 69.953(CFS)
Total initial stream area = 53.250(Ac.)
Pervious area fraction = 1.000

Initial area Fm value = 0.140(In/Hr)
End of computations, Total Study Area = 53.25 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/24/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
100 YR STORM RATIONAL METHOD, PRE CONDITION
AREA B

Program License Serial Number 6277

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 2.100 to Point/Station 2.200
**** 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) = 78.00
Adjusted SCS curve number for AMC 3 = 92.80
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.140(In/Hr)
Initial subarea data:
Initial area flow distance = 1827.000(Ft.)
Top (of initial area) elevation = 3118.900(Ft.)
Bottom (of initial area) elevation = 3094.000(Ft.)
Difference in elevation = 24.900(Ft.)
Slope = 0.01363 s(%)= 1.36
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 29.288 min.
Rainfall intensity = 1.784(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.829
Subarea runoff = 49.661(CFS)
Total initial stream area = 33.560(Ac.)
Pervious area fraction = 1.000

Initial area Fm value = 0.140(In/Hr)
End of computations, Total Study Area = 33.56 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/24/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
100 YR STORM RATIONAL METHOD, PRE CONDITION
AREA C

Program License Serial Number 6277

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 3.100 to Point/Station 3.200
**** 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) = 78.00
Adjusted SCS curve number for AMC 3 = 92.80
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.140(In/Hr)
Initial subarea data:
Initial area flow distance = 2174.000(Ft.)
Top (of initial area) elevation = 3115.000(Ft.)
Bottom (of initial area) elevation = 3085.000(Ft.)
Difference in elevation = 30.000(Ft.)
Slope = 0.01380 s(%)= 1.38
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 31.320 min.
Rainfall intensity = 1.702(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.826
Subarea runoff = 40.876(CFS)
Total initial stream area = 29.070(Ac.)
Pervious area fraction = 1.000

Initial area Fm value = 0.140(In/Hr)
End of computations, Total Study Area = 29.07 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/24/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
100 YR STORM RATIONAL METHOD, PRE CONDITION
AREA D

Program License Serial Number 6277

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 4.100 to Point/Station 4.200
**** 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) = 78.00
Adjusted SCS curve number for AMC 3 = 92.80
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.140(In/Hr)
Initial subarea data:
Initial area flow distance = 1566.000(Ft.)
Top (of initial area) elevation = 3100.000(Ft.)
Bottom (of initial area) elevation = 3076.000(Ft.)
Difference in elevation = 24.000(Ft.)
Slope = 0.01533 s(%)= 1.53
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 26.898 min.
Rainfall intensity = 1.894(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.833
Subarea runoff = 39.917(CFS)
Total initial stream area = 25.290(Ac.)
Pervious area fraction = 1.000

Initial area Fm value = 0.140(In/Hr)
End of computations, Total Study Area = 25.29 (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) = 1.000
Area averaged SCS curve number = 78.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/24/22

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
100 YR STORM RATIONAL METHOD, PRE CONDITION
AREA E (OFFSITE)

Program License Serial Number 6277

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 5.100 to Point/Station 5.200
**** 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) = 78.00
Adjusted SCS curve number for AMC 3 = 92.80
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.140(In/Hr)
Initial subarea data:
Initial area flow distance = 680.000(Ft.)
Top (of initial area) elevation = 3143.000(Ft.)
Bottom (of initial area) elevation = 3130.800(Ft.)
Difference in elevation = 12.200(Ft.)
Slope = 0.01794 s(%)= 1.79
TC = k(0.615)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.669 min.
Rainfall intensity = 2.445(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.848
Subarea runoff = 19.358(CFS)
Total initial stream area = 9.330(Ac.)
Pervious area fraction = 1.000

Initial area Fm value = 0.140(In/Hr)
End of computations, Total Study Area = 9.33 (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) = 1.000
Area averaged SCS curve number = 78.0

RATIONAL METHOD ANALYSIS

POST-DEVELOPMENT CONDITIONS 2-YEAR STORM

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/09/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
2 YEAR RATIONAL METHOD
POST, AREA A

Program License Serial Number 6277

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.345 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 1

++
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) = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.1190 Max loss rate(Fm)= 0.119(In/Hr)
Initial subarea data:
Initial area flow distance = 1276.000(Ft.)
Top (of initial area) elevation = 3127.970(Ft.)
Bottom (of initial area) elevation = 3117.390(Ft.)
Difference in elevation = 10.580(Ft.)
Slope = 0.00829 s(%)= 0.83
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.844 min.
Rainfall intensity = 0.963(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.793
Subarea runoff = 20.518(CFS)
Total initial stream area = 26.870(Ac.)
Pervious area fraction = 0.119
Initial area Fm value = 0.119(In/Hr)
End of computations, Total Study Area = 26.87 (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) = 0.119
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/09/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
2 YEAR RATIONAL METHOD
POST, AREA B

Program License Serial Number 6277

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.345 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 1

++
Process from Point/Station 200.000 to Point/Station 201.000
**** 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) = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.4360 Max loss rate(Fm)= 0.436(In/Hr)
Initial subarea data:
Initial area flow distance = 1268.000(Ft.)
Top (of initial area) elevation = 3141.560(Ft.)
Bottom (of initial area) elevation = 3119.000(Ft.)
Difference in elevation = 22.560(Ft.)
Slope = 0.01779 s(%)= 1.78
TC = k(0.382)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.903 min.
Rainfall intensity = 0.915(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.508
Subarea runoff = 4.122(CFS)
Total initial stream area = 8.880(Ac.)
Pervious area fraction = 0.436
Initial area Fm value = 0.436(In/Hr)
End of computations, Total Study Area = 8.88 (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) = 0.436
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/09/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
2 YEAR RATIONAL METHOD
POST, AREA C

Program License Serial Number 6277

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.345 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 1

++
Process from Point/Station 300.000 to Point/Station 301.000
**** 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) = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.1490 Max loss rate(Fm)= 0.149(In/Hr)
Initial subarea data:
Initial area flow distance = 1647.000(Ft.)
Top (of initial area) elevation = 3127.970(Ft.)
Bottom (of initial area) elevation = 3109.880(Ft.)
Difference in elevation = 18.090(Ft.)
Slope = 0.01098 s(%)= 1.10
TC = k(0.311)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.847 min.
Rainfall intensity = 0.917(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.766
Subarea runoff = 19.195(CFS)
Total initial stream area = 27.330(Ac.)
Pervious area fraction = 0.149
Initial area Fm value = 0.149(In/Hr)
End of computations, Total Study Area = 27.33 (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) = 0.149
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/30/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
2 YEAR RATIONAL METHOD
POST, AREA D

Program License Serial Number 6277

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.345 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 1

++

Process from Point/Station 400.000 to Point/Station 401.000
**** 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) = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.2370 Max loss rate(Fm)= 0.237(In/Hr)
Initial subarea data:
Initial area flow distance = 2184.000(Ft.)
Top (of initial area) elevation = 3109.000(Ft.)
Bottom (of initial area) elevation = 3096.280(Ft.)
Difference in elevation = 12.720(Ft.)
Slope = 0.00582 s(%)= 0.58
TC = k(0.333)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 20.185 min.
Rainfall intensity = 0.740(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.687
Subarea runoff = 24.562(CFS)
Total initial stream area = 48.360(Ac.)
Pervious area fraction = 0.237
Initial area Fm value = 0.237(In/Hr)
End of computations, Total Study Area = 48.36 (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) = 0.237
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/30/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
2 YEAR RATIONAL METHOD
POST, AREA E

Program License Serial Number 6277

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.345 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 1

++
Process from Point/Station 500.000 to Point/Station 501.000
**** 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) = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.100(In/Hr)
Initial subarea data:
Initial area flow distance = 2264.000(Ft.)
Top (of initial area) elevation = 3107.800(Ft.)
Bottom (of initial area) elevation = 3091.380(Ft.)
Difference in elevation = 16.420(Ft.)
Slope = 0.00725 s(%)= 0.73
TC = k(0.299)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.610 min.
Rainfall intensity = 0.814(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.810
Subarea runoff = 25.694(CFS)
Total initial stream area = 38.980(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.100(In/Hr)
End of computations, Total Study Area = 38.98 (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) = 0.100
Area averaged SCS curve number = 32.0

RATIONAL METHOD ANALYSIS

POST-DEVELOPMENT CONDITIONS 10-YEAR STORM

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/09/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
10 YEAR RATIONAL METHOD
POST, AREA A

Program License Serial Number 6277

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.605 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

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) = 32.00
Pervious ratio(Ap) = 0.1190 Max loss rate(Fm)= 0.116(In/Hr)
Initial subarea data:
Initial area flow distance = 1276.000(Ft.)
Top (of initial area) elevation = 3127.970(Ft.)
Bottom (of initial area) elevation = 3117.390(Ft.)
Difference in elevation = 10.580(Ft.)
Slope = 0.00829 s(%)= 0.83
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.844 min.
Rainfall intensity = 1.689(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.838
Subarea runoff = 38.026(CFS)
Total initial stream area = 26.870(Ac.)
Pervious area fraction = 0.119
Initial area Fm value = 0.116(In/Hr)
End of computations, Total Study Area = 26.87 (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) = 0.119
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/09/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
100 YEAR RATIONAL METHOD
POST, AREA B

Program License Serial Number 6277

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.605 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 200.000 to Point/Station 201.000
**** 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) = 32.00
Pervious ratio(Ap) = 0.4360 Max loss rate(Fm)= 0.426(In/Hr)
Initial subarea data:
Initial area flow distance = 1268.000(Ft.)
Top (of initial area) elevation = 3141.560(Ft.)
Bottom (of initial area) elevation = 3119.000(Ft.)
Difference in elevation = 22.560(Ft.)
Slope = 0.01779 s(%)= 1.78
TC = k(0.382)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.903 min.
Rainfall intensity = 1.604(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.661
Subarea runoff = 9.411(CFS)
Total initial stream area = 8.880(Ac.)
Pervious area fraction = 0.436
Initial area Fm value = 0.426(In/Hr)
End of computations, Total Study Area = 8.88 (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) = 0.436
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/09/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
100 YEAR RATIONAL METHOD
POST, AREA C

Program License Serial Number 6277

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.605 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 300.000 to Point/Station 301.000
**** 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) = 32.00
Pervious ratio(Ap) = 0.1490 Max loss rate(Fm)= 0.146(In/Hr)
Initial subarea data:
Initial area flow distance = 1647.000(Ft.)
Top (of initial area) elevation = 3127.970(Ft.)
Bottom (of initial area) elevation = 3109.880(Ft.)
Difference in elevation = 18.090(Ft.)
Slope = 0.01098 s(%)= 1.10
TC = k(0.311)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.847 min.
Rainfall intensity = 1.608(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.818
Subarea runoff = 35.972(CFS)
Total initial stream area = 27.330(Ac.)
Pervious area fraction = 0.149
Initial area Fm value = 0.146(In/Hr)
End of computations, Total Study Area = 27.33 (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) = 0.149
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/30/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
10 YEAR RATIONAL METHOD
POST, AREA D

Program License Serial Number 6277

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.605 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 400.000 to Point/Station 401.000
**** 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) = 32.00
Pervious ratio(Ap) = 0.2370 Max loss rate(Fm)= 0.232(In/Hr)
Initial subarea data:
Initial area flow distance = 2184.000(Ft.)
Top (of initial area) elevation = 3109.000(Ft.)
Bottom (of initial area) elevation = 3096.280(Ft.)
Difference in elevation = 12.720(Ft.)
Slope = 0.00582 s(%)= 0.58
TC = k(0.333)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 20.185 min.
Rainfall intensity = 1.297(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.739
Subarea runoff = 46.365(CFS)
Total initial stream area = 48.360(Ac.)
Pervious area fraction = 0.237
Initial area Fm value = 0.232(In/Hr)
End of computations, Total Study Area = 48.36 (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) = 0.237
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/30/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
10 YEAR RATIONAL METHOD
POST, AREA E

Program License Serial Number 6277

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.605 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 500.000 to Point/Station 501.000
**** 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) = 32.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.098(In/Hr)
Initial subarea data:
Initial area flow distance = 2264.000(Ft.)
Top (of initial area) elevation = 3107.800(Ft.)
Bottom (of initial area) elevation = 3091.380(Ft.)
Difference in elevation = 16.420(Ft.)
Slope = 0.00725 s(%)= 0.73
TC = k(0.299)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.610 min.
Rainfall intensity = 1.427(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.838
Subarea runoff = 46.633(CFS)
Total initial stream area = 38.980(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.098(In/Hr)
End of computations, Total Study Area = 38.98 (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) = 0.100
Area averaged SCS curve number = 32.0

RATIONAL METHOD ANALYSIS

POST-DEVELOPMENT CONDITIONS 100-YEAR STORM

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/09/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
100 YEAR RATIONAL METHOD
POST, AREA A

Program License Serial Number 6277

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (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) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.1190 Max loss rate(Fm)= 0.093(In/Hr)
Initial subarea data:
Initial area flow distance = 1276.000(Ft.)
Top (of initial area) elevation = 3127.970(Ft.)
Bottom (of initial area) elevation = 3117.390(Ft.)
Difference in elevation = 10.580(Ft.)
Slope = 0.00829 s(%)= 0.83
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.844 min.
Rainfall intensity = 3.015(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.872
Subarea runoff = 70.645(CFS)
Total initial stream area = 26.870(Ac.)
Pervious area fraction = 0.119
Initial area Fm value = 0.093(In/Hr)
End of computations, Total Study Area = 26.87 (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) = 0.119
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/09/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
100 YEAR RATIONAL METHOD
POST, AREA B

Program License Serial Number 6277

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 200.000 to Point/Station 201.000
**** 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) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.4360 Max loss rate(Fm)= 0.342(In/Hr)
Initial subarea data:
Initial area flow distance = 1268.000(Ft.)
Top (of initial area) elevation = 3141.560(Ft.)
Bottom (of initial area) elevation = 3119.000(Ft.)
Difference in elevation = 22.560(Ft.)
Slope = 0.01779 s(%)= 1.78
TC = k(0.382)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.903 min.
Rainfall intensity = 2.863(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.792
Subarea runoff = 20.146(CFS)
Total initial stream area = 8.880(Ac.)
Pervious area fraction = 0.436
Initial area Fm value = 0.342(In/Hr)
End of computations, Total Study Area = 8.88 (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) = 0.436
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/09/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
100 YEAR RATIONAL METHOD
POST, AREA C

Program License Serial Number 6277

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 300.000 to Point/Station 301.000
**** 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) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.1490 Max loss rate(Fm)= 0.117(In/Hr)
Initial subarea data:
Initial area flow distance = 1647.000(Ft.)
Top (of initial area) elevation = 3127.970(Ft.)
Bottom (of initial area) elevation = 3109.880(Ft.)
Difference in elevation = 18.090(Ft.)
Slope = 0.01098 s(%)= 1.10
TC = k(0.311)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.847 min.
Rainfall intensity = 2.871(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.863
Subarea runoff = 67.733(CFS)
Total initial stream area = 27.330(Ac.)
Pervious area fraction = 0.149
Initial area Fm value = 0.117(In/Hr)
End of computations, Total Study Area = 27.33 (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) = 0.149
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/30/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
100 YEAR RATIONAL METHOD
POST, AREA D

Program License Serial Number 6277

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++
Process from Point/Station 400.000 to Point/Station 401.000
**** 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) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.2370 Max loss rate(Fm)= 0.186(In/Hr)
Initial subarea data:
Initial area flow distance = 2184.000(Ft.)
Top (of initial area) elevation = 3109.000(Ft.)
Bottom (of initial area) elevation = 3096.280(Ft.)
Difference in elevation = 12.720(Ft.)
Slope = 0.00582 s(%)= 0.58
TC = k(0.333)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 20.185 min.
Rainfall intensity = 2.315(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.828
Subarea runoff = 92.673(CFS)
Total initial stream area = 48.360(Ac.)
Pervious area fraction = 0.237
Initial area Fm value = 0.186(In/Hr)
End of computations, Total Study Area = 48.36 (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) = 0.237
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 08/30/24

JOB NO 2021-181
WATSON APPLE VALLEY 145
100 YEAR RATIONAL METHOD
POST, AREA E

Program License Serial Number 6277

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

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Process from Point/Station 500.000 to Point/Station 501.000
**** 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) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.079(In/Hr)
Initial subarea data:
Initial area flow distance = 2264.000(Ft.)
Top (of initial area) elevation = 3107.800(Ft.)
Bottom (of initial area) elevation = 3091.380(Ft.)
Difference in elevation = 16.420(Ft.)
Slope = 0.00725 s(%)= 0.73
TC = k(0.299)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.610 min.
Rainfall intensity = 2.547(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.872
Subarea runoff = 86.614(CFS)
Total initial stream area = 38.980(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.079(In/Hr)
End of computations, Total Study Area = 38.98 (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) = 0.100
Area averaged SCS curve number = 32.0

APPENDIX G

UNIT HYDROGRAPH ANALYSIS (24 HOUR, 10/100-YEAR STORM)

UNIT HYDROGRAPH ANALYSIS

PRE-DEVELOPMENT CONDITION 10 YEAR, 24 HOUR STORM

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

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Study date 08/30/22

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

Program License Serial Number 6277

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
10 YR STORM UNIT HYDROGRAPH, PRE CONDITION
AREA A

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
53.25	1	0.60
Rainfall data for year 2		
53.25	6	0.76
Rainfall data for year 2		
53.25	24	1.30
Rainfall data for year 100		

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            53.25            1            1.08
------------------------------------------------------------------------
Rainfall data for year 100
            53.25            6            2.01
------------------------------------------------------------------------
Rainfall data for year 100
            53.25           24            3.42
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 78.0      78.0         53.25      1.000     0.404    1.000    0.404

Area-averaged adjusted loss rate Fm (In/Hr) =  0.404

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
    53.25   1.000         78.0      78.0       2.82     0.269

Area-averaged catchment yield fraction, Y =  0.269
Area-averaged low loss fraction, Yb =  0.731
User entry of time of concentration  =   0.570 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =      53.25(Ac.)
Catchment Lag time =   0.456 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 18.2749
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.404(In/Hr)
Average low loss rate fraction (Yb) = 0.731 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.287(In)
Computed peak 30-minute rainfall =  0.491(In)
Specified peak 1-hour rainfall =  0.605(In)
Computed peak 3-hour rainfall =  0.955(In)
Specified peak 6-hour rainfall =  1.273(In)
Specified peak 24-hour rainfall =  2.172(In)


Rainfall depth area reduction factors:
Using a total area of      53.25(Ac.) (Ref: fig. E-4)

5-minute factor = 0.998     Adjusted rainfall =  0.286(In)
30-minute factor = 0.998    Adjusted rainfall =  0.490(In)
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1-hour factor = 0.998 Adjusted rainfall = 0.603(In)
3-hour factor = 1.000 Adjusted rainfall = 0.954(In)
6-hour factor = 1.000 Adjusted rainfall = 1.273(In)
24-hour factor = 1.000 Adjusted rainfall = 2.172(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 = 643.99 (CFS))	
1	0.877	5.648
2	3.897	19.450
3	9.247	34.450
4	20.616	73.218
5	37.389	108.019
6	50.022	81.351
7	58.867	56.962
8	64.964	39.263
9	69.767	30.932
10	73.683	25.218
11	76.931	20.917
12	79.641	17.455
13	81.950	14.866
14	83.934	12.776
15	85.739	11.625
16	87.360	10.445
17	88.760	9.016
18	89.887	7.254
19	90.933	6.735
20	91.904	6.252
21	92.774	5.606
22	93.587	5.235
23	94.280	4.465
24	94.902	4.001
25	95.513	3.935
26	96.016	3.243
27	96.491	3.060
28	96.937	2.867
29	97.275	2.179
30	97.604	2.118
31	97.873	1.734
32	98.057	1.181
33	98.240	1.180
34	98.446	1.331
35	98.666	1.412
36	98.885	1.412
37	99.104	1.412

38	99.324	1.412
39	99.518	1.248
40	99.637	0.767
41	99.751	0.736
42	99.865	0.736
43	100.000	0.368

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2864	0.2864
2	0.3526	0.0662
3	0.3982	0.0456
4	0.4340	0.0359
5	0.4641	0.0301
6	0.4902	0.0261
7	0.5134	0.0232
8	0.5344	0.0210
9	0.5536	0.0192
10	0.5714	0.0178
11	0.5879	0.0166
12	0.6035	0.0155
13	0.6240	0.0205
14	0.6436	0.0196
15	0.6624	0.0188
16	0.6804	0.0181
17	0.6979	0.0174
18	0.7147	0.0168
19	0.7310	0.0163
20	0.7468	0.0158
21	0.7622	0.0154
22	0.7771	0.0149
23	0.7917	0.0145
24	0.8059	0.0142
25	0.8197	0.0138
26	0.8332	0.0135
27	0.8465	0.0132
28	0.8594	0.0129
29	0.8721	0.0127
30	0.8845	0.0124
31	0.8967	0.0122
32	0.9086	0.0120
33	0.9204	0.0117
34	0.9319	0.0115
35	0.9432	0.0113
36	0.9544	0.0112
37	0.9653	0.0109
38	0.9761	0.0108
39	0.9867	0.0106
40	0.9971	0.0104
41	1.0074	0.0103

42	1.0175	0.0101
43	1.0275	0.0100
44	1.0374	0.0099
45	1.0471	0.0097
46	1.0567	0.0096
47	1.0662	0.0095
48	1.0755	0.0094
49	1.0848	0.0093
50	1.0939	0.0091
51	1.1030	0.0090
52	1.1119	0.0089
53	1.1207	0.0088
54	1.1295	0.0087
55	1.1381	0.0086
56	1.1467	0.0086
57	1.1551	0.0085
58	1.1635	0.0084
59	1.1718	0.0083
60	1.1800	0.0082
61	1.1882	0.0081
62	1.1962	0.0081
63	1.2042	0.0080
64	1.2121	0.0079
65	1.2199	0.0078
66	1.2277	0.0078
67	1.2354	0.0077
68	1.2430	0.0076
69	1.2506	0.0076
70	1.2581	0.0075
71	1.2655	0.0074
72	1.2729	0.0074
73	1.2797	0.0068
74	1.2864	0.0067
75	1.2931	0.0067
76	1.2997	0.0066
77	1.3062	0.0066
78	1.3128	0.0065
79	1.3192	0.0065
80	1.3256	0.0064
81	1.3320	0.0064
82	1.3383	0.0063
83	1.3446	0.0063
84	1.3508	0.0062
85	1.3570	0.0062
86	1.3631	0.0061
87	1.3692	0.0061
88	1.3752	0.0060
89	1.3812	0.0060
90	1.3872	0.0060
91	1.3931	0.0059

92	1.3990	0.0059
93	1.4049	0.0058
94	1.4107	0.0058
95	1.4164	0.0058
96	1.4222	0.0057
97	1.4278	0.0057
98	1.4335	0.0057
99	1.4391	0.0056
100	1.4447	0.0056
101	1.4503	0.0056
102	1.4558	0.0055
103	1.4613	0.0055
104	1.4667	0.0055
105	1.4721	0.0054
106	1.4775	0.0054
107	1.4829	0.0054
108	1.4882	0.0053
109	1.4935	0.0053
110	1.4988	0.0053
111	1.5040	0.0052
112	1.5092	0.0052
113	1.5144	0.0052
114	1.5196	0.0052
115	1.5247	0.0051
116	1.5298	0.0051
117	1.5348	0.0051
118	1.5399	0.0050
119	1.5449	0.0050
120	1.5499	0.0050
121	1.5549	0.0050
122	1.5598	0.0049
123	1.5647	0.0049
124	1.5696	0.0049
125	1.5745	0.0049
126	1.5793	0.0048
127	1.5841	0.0048
128	1.5889	0.0048
129	1.5937	0.0048
130	1.5985	0.0048
131	1.6032	0.0047
132	1.6079	0.0047
133	1.6126	0.0047
134	1.6172	0.0047
135	1.6219	0.0046
136	1.6265	0.0046
137	1.6311	0.0046
138	1.6357	0.0046
139	1.6402	0.0046
140	1.6448	0.0045
141	1.6493	0.0045

142	1.6538	0.0045
143	1.6583	0.0045
144	1.6627	0.0045
145	1.6672	0.0044
146	1.6716	0.0044
147	1.6760	0.0044
148	1.6804	0.0044
149	1.6848	0.0044
150	1.6891	0.0043
151	1.6935	0.0043
152	1.6978	0.0043
153	1.7021	0.0043
154	1.7063	0.0043
155	1.7106	0.0043
156	1.7149	0.0042
157	1.7191	0.0042
158	1.7233	0.0042
159	1.7275	0.0042
160	1.7317	0.0042
161	1.7358	0.0042
162	1.7400	0.0041
163	1.7441	0.0041
164	1.7482	0.0041
165	1.7523	0.0041
166	1.7564	0.0041
167	1.7605	0.0041
168	1.7645	0.0041
169	1.7686	0.0040
170	1.7726	0.0040
171	1.7766	0.0040
172	1.7806	0.0040
173	1.7846	0.0040
174	1.7886	0.0040
175	1.7925	0.0040
176	1.7965	0.0039
177	1.8004	0.0039
178	1.8043	0.0039
179	1.8082	0.0039
180	1.8121	0.0039
181	1.8160	0.0039
182	1.8198	0.0039
183	1.8237	0.0038
184	1.8275	0.0038
185	1.8313	0.0038
186	1.8352	0.0038
187	1.8390	0.0038
188	1.8427	0.0038
189	1.8465	0.0038
190	1.8503	0.0038
191	1.8540	0.0037

192	1.8578	0.0037
193	1.8615	0.0037
194	1.8652	0.0037
195	1.8689	0.0037
196	1.8726	0.0037
197	1.8763	0.0037
198	1.8799	0.0037
199	1.8836	0.0037
200	1.8872	0.0036
201	1.8908	0.0036
202	1.8945	0.0036
203	1.8981	0.0036
204	1.9017	0.0036
205	1.9053	0.0036
206	1.9088	0.0036
207	1.9124	0.0036
208	1.9160	0.0036
209	1.9195	0.0035
210	1.9230	0.0035
211	1.9266	0.0035
212	1.9301	0.0035
213	1.9336	0.0035
214	1.9371	0.0035
215	1.9406	0.0035
216	1.9440	0.0035
217	1.9475	0.0035
218	1.9510	0.0035
219	1.9544	0.0034
220	1.9578	0.0034
221	1.9613	0.0034
222	1.9647	0.0034
223	1.9681	0.0034
224	1.9715	0.0034
225	1.9749	0.0034
226	1.9783	0.0034
227	1.9816	0.0034
228	1.9850	0.0034
229	1.9883	0.0034
230	1.9917	0.0033
231	1.9950	0.0033
232	1.9983	0.0033
233	2.0017	0.0033
234	2.0050	0.0033
235	2.0083	0.0033
236	2.0116	0.0033
237	2.0148	0.0033
238	2.0181	0.0033
239	2.0214	0.0033
240	2.0246	0.0033
241	2.0279	0.0032

242	2.0311	0.0032	
243	2.0343	0.0032	
244	2.0376	0.0032	
245	2.0408	0.0032	
246	2.0440	0.0032	
247	2.0472	0.0032	
248	2.0504	0.0032	
249	2.0536	0.0032	
250	2.0567	0.0032	
251	2.0599	0.0032	
252	2.0631	0.0032	
253	2.0662	0.0032	
254	2.0694	0.0031	
255	2.0725	0.0031	
256	2.0756	0.0031	
257	2.0787	0.0031	
258	2.0819	0.0031	
259	2.0850	0.0031	
260	2.0881	0.0031	
261	2.0912	0.0031	
262	2.0942	0.0031	
263	2.0973	0.0031	
264	2.1004	0.0031	
265	2.1035	0.0031	
266	2.1065	0.0031	
267	2.1096	0.0030	
268	2.1126	0.0030	
269	2.1156	0.0030	
270	2.1187	0.0030	
271	2.1217	0.0030	
272	2.1247	0.0030	
273	2.1277	0.0030	
274	2.1307	0.0030	
275	2.1337	0.0030	
276	2.1367	0.0030	
277	2.1397	0.0030	
278	2.1427	0.0030	
279	2.1456	0.0030	
280	2.1486	0.0030	
281	2.1515	0.0030	
282	2.1545	0.0029	
283	2.1574	0.0029	
284	2.1604	0.0029	
285	2.1633	0.0029	
286	2.1662	0.0029	
287	2.1691	0.0029	
288	2.1720	0.0029	

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0029	0.0021	0.0008
2	0.0029	0.0021	0.0008
3	0.0029	0.0021	0.0008
4	0.0029	0.0021	0.0008
5	0.0029	0.0022	0.0008
6	0.0030	0.0022	0.0008
7	0.0030	0.0022	0.0008
8	0.0030	0.0022	0.0008
9	0.0030	0.0022	0.0008
10	0.0030	0.0022	0.0008
11	0.0030	0.0022	0.0008
12	0.0030	0.0022	0.0008
13	0.0030	0.0022	0.0008
14	0.0030	0.0022	0.0008
15	0.0030	0.0022	0.0008
16	0.0031	0.0022	0.0008
17	0.0031	0.0022	0.0008
18	0.0031	0.0023	0.0008
19	0.0031	0.0023	0.0008
20	0.0031	0.0023	0.0008
21	0.0031	0.0023	0.0008
22	0.0031	0.0023	0.0008
23	0.0031	0.0023	0.0008
24	0.0031	0.0023	0.0008
25	0.0032	0.0023	0.0008
26	0.0032	0.0023	0.0009
27	0.0032	0.0023	0.0009
28	0.0032	0.0023	0.0009
29	0.0032	0.0023	0.0009
30	0.0032	0.0024	0.0009
31	0.0032	0.0024	0.0009
32	0.0032	0.0024	0.0009
33	0.0033	0.0024	0.0009
34	0.0033	0.0024	0.0009
35	0.0033	0.0024	0.0009
36	0.0033	0.0024	0.0009
37	0.0033	0.0024	0.0009
38	0.0033	0.0024	0.0009
39	0.0033	0.0024	0.0009
40	0.0033	0.0024	0.0009
41	0.0034	0.0025	0.0009
42	0.0034	0.0025	0.0009
43	0.0034	0.0025	0.0009
44	0.0034	0.0025	0.0009
45	0.0034	0.0025	0.0009
46	0.0034	0.0025	0.0009
47	0.0034	0.0025	0.0009
48	0.0035	0.0025	0.0009

49	0.0035	0.0025	0.0009
50	0.0035	0.0025	0.0009
51	0.0035	0.0026	0.0009
52	0.0035	0.0026	0.0009
53	0.0035	0.0026	0.0010
54	0.0035	0.0026	0.0010
55	0.0036	0.0026	0.0010
56	0.0036	0.0026	0.0010
57	0.0036	0.0026	0.0010
58	0.0036	0.0026	0.0010
59	0.0036	0.0027	0.0010
60	0.0036	0.0027	0.0010
61	0.0037	0.0027	0.0010
62	0.0037	0.0027	0.0010
63	0.0037	0.0027	0.0010
64	0.0037	0.0027	0.0010
65	0.0037	0.0027	0.0010
66	0.0037	0.0027	0.0010
67	0.0038	0.0028	0.0010
68	0.0038	0.0028	0.0010
69	0.0038	0.0028	0.0010
70	0.0038	0.0028	0.0010
71	0.0038	0.0028	0.0010
72	0.0039	0.0028	0.0010
73	0.0039	0.0028	0.0010
74	0.0039	0.0029	0.0010
75	0.0039	0.0029	0.0011
76	0.0039	0.0029	0.0011
77	0.0040	0.0029	0.0011
78	0.0040	0.0029	0.0011
79	0.0040	0.0029	0.0011
80	0.0040	0.0029	0.0011
81	0.0041	0.0030	0.0011
82	0.0041	0.0030	0.0011
83	0.0041	0.0030	0.0011
84	0.0041	0.0030	0.0011
85	0.0041	0.0030	0.0011
86	0.0042	0.0030	0.0011
87	0.0042	0.0031	0.0011
88	0.0042	0.0031	0.0011
89	0.0042	0.0031	0.0011
90	0.0043	0.0031	0.0011
91	0.0043	0.0031	0.0012
92	0.0043	0.0032	0.0012
93	0.0043	0.0032	0.0012
94	0.0044	0.0032	0.0012
95	0.0044	0.0032	0.0012
96	0.0044	0.0032	0.0012
97	0.0045	0.0033	0.0012
98	0.0045	0.0033	0.0012

99	0.0045	0.0033	0.0012
100	0.0045	0.0033	0.0012
101	0.0046	0.0033	0.0012
102	0.0046	0.0034	0.0012
103	0.0046	0.0034	0.0012
104	0.0047	0.0034	0.0013
105	0.0047	0.0034	0.0013
106	0.0047	0.0035	0.0013
107	0.0048	0.0035	0.0013
108	0.0048	0.0035	0.0013
109	0.0048	0.0035	0.0013
110	0.0049	0.0036	0.0013
111	0.0049	0.0036	0.0013
112	0.0049	0.0036	0.0013
113	0.0050	0.0036	0.0013
114	0.0050	0.0037	0.0013
115	0.0051	0.0037	0.0014
116	0.0051	0.0037	0.0014
117	0.0052	0.0038	0.0014
118	0.0052	0.0038	0.0014
119	0.0052	0.0038	0.0014
120	0.0053	0.0039	0.0014
121	0.0053	0.0039	0.0014
122	0.0054	0.0039	0.0014
123	0.0054	0.0040	0.0015
124	0.0055	0.0040	0.0015
125	0.0055	0.0040	0.0015
126	0.0056	0.0041	0.0015
127	0.0056	0.0041	0.0015
128	0.0057	0.0041	0.0015
129	0.0057	0.0042	0.0015
130	0.0058	0.0042	0.0016
131	0.0058	0.0043	0.0016
132	0.0059	0.0043	0.0016
133	0.0060	0.0044	0.0016
134	0.0060	0.0044	0.0016
135	0.0061	0.0045	0.0016
136	0.0061	0.0045	0.0016
137	0.0062	0.0045	0.0017
138	0.0063	0.0046	0.0017
139	0.0064	0.0047	0.0017
140	0.0064	0.0047	0.0017
141	0.0065	0.0048	0.0018
142	0.0066	0.0048	0.0018
143	0.0067	0.0049	0.0018
144	0.0067	0.0049	0.0018
145	0.0074	0.0054	0.0020
146	0.0074	0.0054	0.0020
147	0.0076	0.0055	0.0020
148	0.0076	0.0056	0.0021

149	0.0078	0.0057	0.0021
150	0.0078	0.0057	0.0021
151	0.0080	0.0058	0.0021
152	0.0081	0.0059	0.0022
153	0.0082	0.0060	0.0022
154	0.0083	0.0061	0.0022
155	0.0085	0.0062	0.0023
156	0.0086	0.0063	0.0023
157	0.0087	0.0064	0.0023
158	0.0088	0.0065	0.0024
159	0.0090	0.0066	0.0024
160	0.0091	0.0067	0.0025
161	0.0094	0.0068	0.0025
162	0.0095	0.0069	0.0025
163	0.0097	0.0071	0.0026
164	0.0099	0.0072	0.0027
165	0.0101	0.0074	0.0027
166	0.0103	0.0075	0.0028
167	0.0106	0.0077	0.0028
168	0.0108	0.0079	0.0029
169	0.0112	0.0082	0.0030
170	0.0113	0.0083	0.0030
171	0.0117	0.0086	0.0032
172	0.0120	0.0087	0.0032
173	0.0124	0.0091	0.0033
174	0.0127	0.0093	0.0034
175	0.0132	0.0097	0.0036
176	0.0135	0.0099	0.0036
177	0.0142	0.0104	0.0038
178	0.0145	0.0106	0.0039
179	0.0154	0.0112	0.0041
180	0.0158	0.0116	0.0043
181	0.0168	0.0123	0.0045
182	0.0174	0.0127	0.0047
183	0.0188	0.0137	0.0051
184	0.0196	0.0143	0.0053
185	0.0155	0.0114	0.0042
186	0.0166	0.0121	0.0045
187	0.0192	0.0141	0.0052
188	0.0210	0.0153	0.0056
189	0.0261	0.0191	0.0070
190	0.0301	0.0220	0.0081
191	0.0456	0.0333	0.0123
192	0.0662	0.0336	0.0326
193	0.2864	0.0336	0.2527
194	0.0359	0.0262	0.0096
195	0.0232	0.0170	0.0062
196	0.0178	0.0130	0.0048
197	0.0205	0.0150	0.0055
198	0.0181	0.0132	0.0049

199	0.0163	0.0119	0.0044
200	0.0149	0.0109	0.0040
201	0.0138	0.0101	0.0037
202	0.0129	0.0095	0.0035
203	0.0122	0.0089	0.0033
204	0.0115	0.0084	0.0031
205	0.0109	0.0080	0.0029
206	0.0104	0.0076	0.0028
207	0.0100	0.0073	0.0027
208	0.0096	0.0070	0.0026
209	0.0093	0.0068	0.0025
210	0.0089	0.0065	0.0024
211	0.0086	0.0063	0.0023
212	0.0084	0.0061	0.0023
213	0.0081	0.0059	0.0022
214	0.0079	0.0058	0.0021
215	0.0077	0.0056	0.0021
216	0.0075	0.0055	0.0020
217	0.0068	0.0050	0.0018
218	0.0066	0.0048	0.0018
219	0.0065	0.0047	0.0017
220	0.0063	0.0046	0.0017
221	0.0062	0.0045	0.0017
222	0.0060	0.0044	0.0016
223	0.0059	0.0043	0.0016
224	0.0058	0.0042	0.0016
225	0.0057	0.0042	0.0015
226	0.0056	0.0041	0.0015
227	0.0055	0.0040	0.0015
228	0.0054	0.0039	0.0014
229	0.0053	0.0039	0.0014
230	0.0052	0.0038	0.0014
231	0.0051	0.0037	0.0014
232	0.0050	0.0037	0.0014
233	0.0050	0.0036	0.0013
234	0.0049	0.0036	0.0013
235	0.0048	0.0035	0.0013
236	0.0048	0.0035	0.0013
237	0.0047	0.0034	0.0013
238	0.0046	0.0034	0.0012
239	0.0046	0.0033	0.0012
240	0.0045	0.0033	0.0012
241	0.0044	0.0032	0.0012
242	0.0044	0.0032	0.0012
243	0.0043	0.0032	0.0012
244	0.0043	0.0031	0.0012
245	0.0042	0.0031	0.0011
246	0.0042	0.0031	0.0011
247	0.0041	0.0030	0.0011
248	0.0041	0.0030	0.0011

249	0.0040	0.0030	0.0011
250	0.0040	0.0029	0.0011
251	0.0040	0.0029	0.0011
252	0.0039	0.0029	0.0011
253	0.0039	0.0028	0.0010
254	0.0038	0.0028	0.0010
255	0.0038	0.0028	0.0010
256	0.0038	0.0027	0.0010
257	0.0037	0.0027	0.0010
258	0.0037	0.0027	0.0010
259	0.0037	0.0027	0.0010
260	0.0036	0.0026	0.0010
261	0.0036	0.0026	0.0010
262	0.0036	0.0026	0.0010
263	0.0035	0.0026	0.0009
264	0.0035	0.0026	0.0009
265	0.0035	0.0025	0.0009
266	0.0034	0.0025	0.0009
267	0.0034	0.0025	0.0009
268	0.0034	0.0025	0.0009
269	0.0034	0.0025	0.0009
270	0.0033	0.0024	0.0009
271	0.0033	0.0024	0.0009
272	0.0033	0.0024	0.0009
273	0.0032	0.0024	0.0009
274	0.0032	0.0024	0.0009
275	0.0032	0.0023	0.0009
276	0.0032	0.0023	0.0009
277	0.0032	0.0023	0.0008
278	0.0031	0.0023	0.0008
279	0.0031	0.0023	0.0008
280	0.0031	0.0023	0.0008
281	0.0031	0.0022	0.0008
282	0.0030	0.0022	0.0008
283	0.0030	0.0022	0.0008
284	0.0030	0.0022	0.0008
285	0.0030	0.0022	0.0008
286	0.0030	0.0022	0.0008
287	0.0029	0.0022	0.0008
288	0.0029	0.0021	0.0008

Total soil rain loss = 1.40(In)
Total effective rainfall = 0.77(In)
Peak flow rate in flood hydrograph = 33.08(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

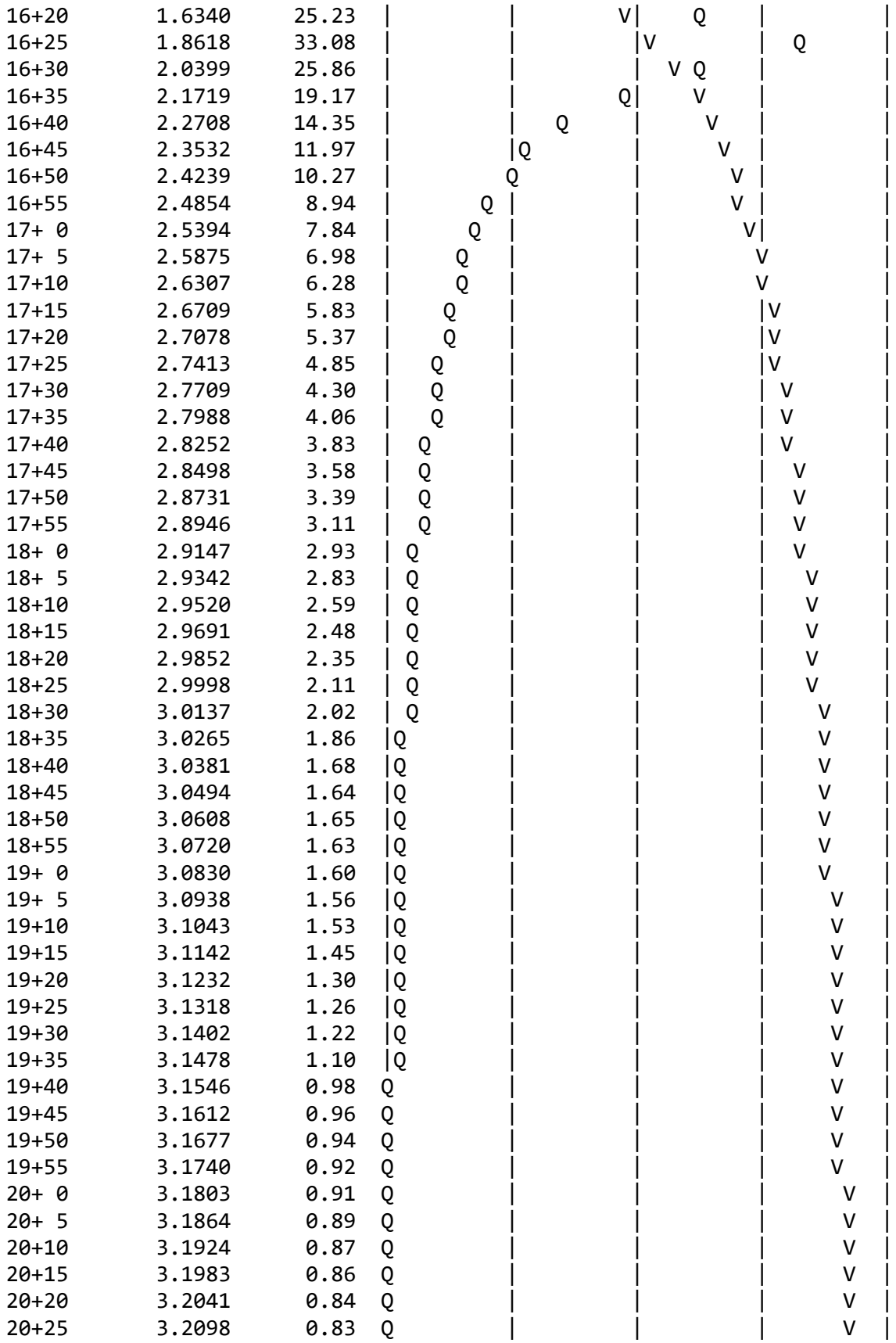
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0000	0.00	Q				
0+10	0.0002	0.02	Q				
0+15	0.0005	0.05	Q				
0+20	0.0012	0.10	Q				
0+25	0.0025	0.19	Q				
0+30	0.0042	0.25	Q				
0+35	0.0063	0.30	Q				
0+40	0.0086	0.33	Q				
0+45	0.0110	0.36	Q				
0+50	0.0136	0.38	Q				
0+55	0.0163	0.39	Q				
1+ 0	0.0191	0.41	Q				
1+ 5	0.0220	0.42	Q				
1+10	0.0250	0.43	Q				
1+15	0.0281	0.44	Q				
1+20	0.0312	0.45	Q				
1+25	0.0344	0.46	Q				
1+30	0.0376	0.47	Q				
1+35	0.0409	0.48	Q				
1+40	0.0442	0.48	Q				
1+45	0.0476	0.49	Q				
1+50	0.0510	0.49	Q				
1+55	0.0544	0.50	Q				
2+ 0	0.0579	0.50	Q				
2+ 5	0.0614	0.51	Q				
2+10	0.0650	0.51	Q				
2+15	0.0685	0.52	Q				
2+20	0.0721	0.52	Q				
2+25	0.0757	0.53	Q				
2+30	0.0794	0.53	Q				
2+35	0.0830	0.53	Q				
2+40	0.0867	0.54	QV				
2+45	0.0904	0.54	QV				
2+50	0.0942	0.54	QV				
2+55	0.0979	0.54	QV				
3+ 0	0.1017	0.55	QV				
3+ 5	0.1055	0.55	QV				
3+10	0.1093	0.55	QV				
3+15	0.1131	0.56	QV				
3+20	0.1170	0.56	QV				
3+25	0.1209	0.56	QV				
3+30	0.1247	0.57	QV				
3+35	0.1287	0.57	QV				
3+40	0.1326	0.57	QV				
3+45	0.1365	0.57	QV				

3+50	0.1405	0.57	QV	|	|	|	|
3+55	0.1444	0.58	QV	|	|	|	|
4+ 0	0.1484	0.58	QV	|	|	|	|
4+ 5	0.1524	0.58	QV	|	|	|	|
4+10	0.1565	0.58	QV	|	|	|	|
4+15	0.1605	0.59	QV	|	|	|	|
4+20	0.1645	0.59	QV	|	|	|	|
4+25	0.1686	0.59	QV	|	|	|	|
4+30	0.1727	0.59	Q V	|	|	|	|
4+35	0.1768	0.60	Q V	|	|	|	|
4+40	0.1809	0.60	Q V	|	|	|	|
4+45	0.1851	0.60	Q V	|	|	|	|
4+50	0.1892	0.60	Q V	|	|	|	|
4+55	0.1934	0.61	Q V	|	|	|	|
5+ 0	0.1976	0.61	Q V	|	|	|	|
5+ 5	0.2018	0.61	Q V	|	|	|	|
5+10	0.2060	0.61	Q V	|	|	|	|
5+15	0.2103	0.62	Q V	|	|	|	|
5+20	0.2146	0.62	Q V	|	|	|	|
5+25	0.2188	0.62	Q V	|	|	|	|
5+30	0.2231	0.63	Q V	|	|	|	|
5+35	0.2275	0.63	Q V	|	|	|	|
5+40	0.2318	0.63	Q V	|	|	|	|
5+45	0.2362	0.63	Q V	|	|	|	|
5+50	0.2406	0.64	Q V	|	|	|	|
5+55	0.2450	0.64	Q V	|	|	|	|
6+ 0	0.2494	0.64	Q V	|	|	|	|
6+ 5	0.2539	0.65	Q V	|	|	|	|
6+10	0.2583	0.65	Q V	|	|	|	|
6+15	0.2628	0.65	Q V	|	|	|	|
6+20	0.2674	0.66	Q V	|	|	|	|
6+25	0.2719	0.66	Q V	|	|	|	|
6+30	0.2765	0.66	Q V	|	|	|	|
6+35	0.2810	0.67	Q V	|	|	|	|
6+40	0.2856	0.67	Q V	|	|	|	|
6+45	0.2903	0.67	Q V	|	|	|	|
6+50	0.2949	0.68	Q V	|	|	|	|
6+55	0.2996	0.68	Q V	|	|	|	|
7+ 0	0.3043	0.68	Q V	|	|	|	|
7+ 5	0.3091	0.69	Q V	|	|	|	|
7+10	0.3138	0.69	Q V	|	|	|	|
7+15	0.3186	0.69	Q V	|	|	|	|
7+20	0.3234	0.70	Q V	|	|	|	|
7+25	0.3282	0.70	Q V	|	|	|	|
7+30	0.3331	0.71	Q V	|	|	|	|
7+35	0.3380	0.71	Q V	|	|	|	|
7+40	0.3429	0.71	Q V	|	|	|	|
7+45	0.3478	0.72	Q V	|	|	|	|
7+50	0.3528	0.72	Q V	|	|	|	|
7+55	0.3578	0.73	Q V	|	|	|	|

8+ 0	0.3629	0.73	Q	V	|	|	|	|
8+ 5	0.3679	0.73	Q	V	|	|	|	|
8+10	0.3730	0.74	Q	V	|	|	|	|
8+15	0.3781	0.74	Q	V	|	|	|	|
8+20	0.3833	0.75	Q	V	|	|	|	|
8+25	0.3885	0.75	Q	V	|	|	|	|
8+30	0.3937	0.76	Q	V	|	|	|	|
8+35	0.3989	0.76	Q	V	|	|	|	|
8+40	0.4042	0.77	Q	V	|	|	|	|
8+45	0.4095	0.77	Q	V	|	|	|	|
8+50	0.4149	0.78	Q	V	|	|	|	|
8+55	0.4203	0.78	Q	V	|	|	|	|
9+ 0	0.4257	0.79	Q	V	|	|	|	|
9+ 5	0.4312	0.79	Q	V	|	|	|	|
9+10	0.4367	0.80	Q	V	|	|	|	|
9+15	0.4422	0.80	Q	V	|	|	|	|
9+20	0.4478	0.81	Q	V	|	|	|	|
9+25	0.4534	0.82	Q	V	|	|	|	|
9+30	0.4590	0.82	Q	V	|	|	|	|
9+35	0.4647	0.83	Q	V	|	|	|	|
9+40	0.4705	0.83	Q	V	|	|	|	|
9+45	0.4762	0.84	Q	V	|	|	|	|
9+50	0.4821	0.85	Q	V	|	|	|	|
9+55	0.4879	0.85	Q	V	|	|	|	|
10+ 0	0.4938	0.86	Q	V	|	|	|	|
10+ 5	0.4998	0.86	Q	V	|	|	|	|
10+10	0.5058	0.87	Q	V	|	|	|	|
10+15	0.5118	0.88	Q	V	|	|	|	|
10+20	0.5179	0.89	Q	V	|	|	|	|
10+25	0.5241	0.89	Q	V	|	|	|	|
10+30	0.5303	0.90	Q	V	|	|	|	|
10+35	0.5365	0.91	Q	V	|	|	|	|
10+40	0.5428	0.92	Q	V	|	|	|	|
10+45	0.5492	0.92	Q	V	|	|	|	|
10+50	0.5556	0.93	Q	V	|	|	|	|
10+55	0.5621	0.94	Q	V	|	|	|	|
11+ 0	0.5686	0.95	Q	V	|	|	|	|
11+ 5	0.5752	0.96	Q	V	|	|	|	|
11+10	0.5819	0.97	Q	V	|	|	|	|
11+15	0.5886	0.97	Q	V	|	|	|	|
11+20	0.5953	0.98	Q	V	|	|	|	|
11+25	0.6022	0.99	Q	V	|	|	|	|
11+30	0.6091	1.00	|Q	V	|	|	|	|
11+35	0.6161	1.01	|Q	V	|	|	|	|
11+40	0.6231	1.02	|Q	V	|	|	|	|
11+45	0.6303	1.03	|Q	V	|	|	|	|
11+50	0.6375	1.05	|Q	V	|	|	|	|
11+55	0.6447	1.06	|Q	V	|	|	|	|
12+ 0	0.6521	1.07	|Q	V	|	|	|	|
12+ 5	0.6595	1.08	|Q	V	|	|	|	|

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12+10       0.6671      1.10  |Q     V  |          |          |          |
12+15       0.6748      1.11  |Q     V  |          |          |          |
12+20       0.6826      1.14  |Q     V  |          |          |          |
12+25       0.6906      1.17  |Q      V |          |          |          |
12+30       0.6988      1.19  |Q      V |          |          |          |
12+35       0.7072      1.21  |Q      V |          |          |          |
12+40       0.7157      1.24  |Q      V |          |          |          |
12+45       0.7244      1.26  |Q      V |          |          |          |
12+50       0.7331      1.28  |Q      V |          |          |          |
12+55       0.7421      1.30  |Q      V |          |          |          |
13+ 0       0.7511      1.32  |Q      V |          |          |          |
13+ 5       0.7603      1.34  |Q      V |          |          |          |
13+10       0.7697      1.36  |Q      V |          |          |          |
13+15       0.7791      1.38  |Q       V|          |          |          |
13+20       0.7888      1.40  |Q       V|          |          |          |
13+25       0.7986      1.42  |Q       V|          |          |          |
13+30       0.8085      1.44  |Q       V|          |          |          |
13+35       0.8186      1.47  |Q       V|          |          |          |
13+40       0.8289      1.49  |Q       V|          |          |          |
13+45       0.8394      1.52  |Q       V|          |          |          |
13+50       0.8501      1.55  |Q       V|          |          |          |
13+55       0.8609      1.58  |Q        V          |          |          |
14+ 0       0.8720      1.61  |Q        V          |          |          |
14+ 5       0.8832      1.64  |Q        V          |          |          |
14+10       0.8947      1.67  |Q        V          |          |          |
14+15       0.9065      1.71  |Q        V          |          |          |
14+20       0.9185      1.74  |Q        V          |          |          |
14+25       0.9308      1.78  |Q        V          |          |          |
14+30       0.9434      1.83  |Q        V          |          |          |
14+35       0.9563      1.87  |Q        |V         |          |          |
14+40       0.9695      1.92  |Q        |V         |          |          |
14+45       0.9830      1.97  |Q        |V         |          |          |
14+50       0.9970      2.03  | Q       |V         |          |          |
14+55       1.0114      2.09  | Q       |V         |          |          |
15+ 0       1.0262      2.15  | Q       |V         |          |          |
15+ 5       1.0415      2.22  | Q       | V        |          |          |
15+10       1.0573      2.30  | Q       | V        |          |          |
15+15       1.0737      2.38  | Q       | V        |          |          |
15+20       1.0908      2.48  | Q       | V        |          |          |
15+25       1.1085      2.58  | Q       | V        |          |          |
15+30       1.1269      2.67  | Q       |  V       |          |          |
15+35       1.1459      2.75  | Q       |  V       |          |          |
15+40       1.1652      2.80  | Q       |  V       |          |          |
15+45       1.1845      2.82  | Q       |  V       |          |          |
15+50       1.2046      2.91  | Q       |   V      |          |          |
15+55       1.2261      3.12  |  Q      |   V      |          |          |
16+ 0       1.2508      3.58  |  Q      |   V      |          |          |
16+ 5       1.2898      5.67  |    Q    |    V     |          |          |
16+10       1.3579      9.88  |         Q|    V     |          |          |
16+15       1.4603     14.87  |          |   Q  V   |          |          |
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20+30	3.2155	0.82	Q	|	|	|	V |
20+35	3.2210	0.81	Q	|	|	|	V |
20+40	3.2265	0.79	Q	|	|	|	V |
20+45	3.2319	0.78	Q	|	|	|	V |
20+50	3.2372	0.77	Q	|	|	|	V |
20+55	3.2425	0.76	Q	|	|	|	V |
21+ 0	3.2476	0.75	Q	|	|	|	V |
21+ 5	3.2527	0.74	Q	|	|	|	V |
21+10	3.2578	0.73	Q	|	|	|	V |
21+15	3.2628	0.72	Q	|	|	|	V |
21+20	3.2677	0.72	Q	|	|	|	V |
21+25	3.2726	0.71	Q	|	|	|	V |
21+30	3.2774	0.70	Q	|	|	|	V |
21+35	3.2822	0.69	Q	|	|	|	V |
21+40	3.2869	0.68	Q	|	|	|	V |
21+45	3.2915	0.68	Q	|	|	|	V |
21+50	3.2962	0.67	Q	|	|	|	V |
21+55	3.3007	0.66	Q	|	|	|	V |
22+ 0	3.3052	0.66	Q	|	|	|	V |
22+ 5	3.3097	0.65	Q	|	|	|	V |
22+10	3.3141	0.64	Q	|	|	|	V |
22+15	3.3185	0.64	Q	|	|	|	V |
22+20	3.3229	0.63	Q	|	|	|	V |
22+25	3.3272	0.63	Q	|	|	|	V |
22+30	3.3315	0.62	Q	|	|	|	V |
22+35	3.3357	0.61	Q	|	|	|	V |
22+40	3.3399	0.61	Q	|	|	|	V |
22+45	3.3440	0.60	Q	|	|	|	V |
22+50	3.3481	0.60	Q	|	|	|	V|
22+55	3.3522	0.59	Q	|	|	|	V|
23+ 0	3.3563	0.59	Q	|	|	|	V|
23+ 5	3.3603	0.58	Q	|	|	|	V|
23+10	3.3643	0.58	Q	|	|	|	V|
23+15	3.3682	0.57	Q	|	|	|	V|
23+20	3.3722	0.57	Q	|	|	|	V|
23+25	3.3760	0.56	Q	|	|	|	V|
23+30	3.3799	0.56	Q	|	|	|	V|
23+35	3.3837	0.56	Q	|	|	|	V|
23+40	3.3875	0.55	Q	|	|	|	V|
23+45	3.3913	0.55	Q	|	|	|	V|
23+50	3.3951	0.54	Q	|	|	|	V|
23+55	3.3988	0.54	Q	|	|	|	V|
24+ 0	3.4025	0.54	Q	|	|	|	V|

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

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Study date 08/30/22

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

Program License Serial Number 6277

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
10 YR STORM UNIT HYDROGRAPH, PRE CONDITION
AREA B

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
33.56	1	0.60
Rainfall data for year 2		
33.56	6	0.76
Rainfall data for year 2		
33.56	24	1.30
Rainfall data for year 100		

```
            33.56            1           1.08
------------------------------------------------------------------------
Rainfall data for year 100
            33.56            6           2.01
------------------------------------------------------------------------
Rainfall data for year 100
            33.56           24           3.42
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 78.0      78.0         33.56      1.000     0.404    1.000    0.404

Area-averaged adjusted loss rate Fm (In/Hr) =  0.404

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
    33.56   1.000         78.0      78.0       2.82     0.269

Area-averaged catchment yield fraction, Y =  0.269
Area-averaged low loss fraction, Yb =  0.731
User entry of time of concentration  =   0.490 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =      33.56(Ac.)
Catchment Lag time =   0.392 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 21.2585
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.404(In/Hr)
Average low loss rate fraction (Yb) = 0.731 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.287(In)
Computed peak 30-minute rainfall =  0.491(In)
Specified peak 1-hour rainfall =  0.605(In)
Computed peak 3-hour rainfall =  0.955(In)
Specified peak 6-hour rainfall =  1.273(In)
Specified peak 24-hour rainfall =  2.172(In)


Rainfall depth area reduction factors:
Using a total area of      33.56(Ac.) (Ref: fig. E-4)

5-minute factor = 0.998     Adjusted rainfall =  0.287(In)
30-minute factor = 0.998    Adjusted rainfall =  0.491(In)
```

1-hour factor = 0.998 Adjusted rainfall = 0.604(In)
3-hour factor = 1.000 Adjusted rainfall = 0.955(In)
6-hour factor = 1.000 Adjusted rainfall = 1.273(In)
24-hour factor = 1.000 Adjusted rainfall = 2.172(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 = 405.87 (CFS))	
1	1.080	4.382
2	4.987	15.857
3	12.929	32.234
4	30.293	70.475
5	47.082	68.142
6	58.064	44.572
7	65.268	29.239
8	70.711	22.090
9	74.986	17.353
10	78.494	14.239
11	81.320	11.468
12	83.696	9.642
13	85.810	8.579
14	87.659	7.507
15	89.192	6.222
16	90.449	5.100
17	91.618	4.747
18	92.652	4.193
19	93.601	3.852
20	94.394	3.221
21	95.117	2.934
22	95.781	2.695
23	96.336	2.253
24	96.869	2.164
25	97.275	1.646
26	97.656	1.547
27	97.934	1.125
28	98.146	0.863
29	98.371	0.915
30	98.626	1.031
31	98.881	1.035
32	99.136	1.035
33	99.390	1.034
34	99.576	0.753
35	99.709	0.539
36	99.842	0.539
37	100.000	0.270

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2866	0.2866
2	0.3529	0.0663
3	0.3985	0.0456
4	0.4344	0.0359
5	0.4645	0.0301
6	0.4906	0.0261
7	0.5139	0.0232
8	0.5349	0.0210
9	0.5541	0.0192
10	0.5719	0.0178
11	0.5885	0.0166
12	0.6040	0.0156
13	0.6245	0.0205
14	0.6441	0.0196
15	0.6629	0.0188
16	0.6809	0.0181
17	0.6983	0.0174
18	0.7152	0.0168
19	0.7315	0.0163
20	0.7472	0.0158
21	0.7626	0.0153
22	0.7775	0.0149
23	0.7920	0.0145
24	0.8062	0.0142
25	0.8200	0.0138
26	0.8335	0.0135
27	0.8467	0.0132
28	0.8597	0.0129
29	0.8723	0.0127
30	0.8847	0.0124
31	0.8969	0.0122
32	0.9088	0.0119
33	0.9205	0.0117
34	0.9321	0.0115
35	0.9434	0.0113
36	0.9545	0.0111
37	0.9654	0.0109
38	0.9762	0.0108
39	0.9868	0.0106
40	0.9972	0.0104
41	1.0075	0.0103
42	1.0176	0.0101
43	1.0276	0.0100
44	1.0375	0.0099
45	1.0472	0.0097
46	1.0568	0.0096
47	1.0663	0.0095

48	1.0757	0.0094
49	1.0849	0.0093
50	1.0940	0.0091
51	1.1031	0.0090
52	1.1120	0.0089
53	1.1208	0.0088
54	1.1296	0.0087
55	1.1382	0.0086
56	1.1468	0.0086
57	1.1552	0.0085
58	1.1636	0.0084
59	1.1719	0.0083
60	1.1801	0.0082
61	1.1882	0.0081
62	1.1963	0.0081
63	1.2043	0.0080
64	1.2122	0.0079
65	1.2200	0.0078
66	1.2278	0.0078
67	1.2355	0.0077
68	1.2431	0.0076
69	1.2506	0.0076
70	1.2581	0.0075
71	1.2656	0.0074
72	1.2729	0.0074
73	1.2797	0.0068
74	1.2865	0.0067
75	1.2931	0.0067
76	1.2998	0.0066
77	1.3063	0.0066
78	1.3128	0.0065
79	1.3193	0.0065
80	1.3257	0.0064
81	1.3321	0.0064
82	1.3384	0.0063
83	1.3447	0.0063
84	1.3509	0.0062
85	1.3571	0.0062
86	1.3632	0.0061
87	1.3693	0.0061
88	1.3753	0.0060
89	1.3813	0.0060
90	1.3873	0.0060
91	1.3932	0.0059
92	1.3991	0.0059
93	1.4049	0.0058
94	1.4107	0.0058
95	1.4165	0.0058
96	1.4222	0.0057
97	1.4279	0.0057

98	1.4336	0.0057
99	1.4392	0.0056
100	1.4448	0.0056
101	1.4503	0.0056
102	1.4559	0.0055
103	1.4613	0.0055
104	1.4668	0.0055
105	1.4722	0.0054
106	1.4776	0.0054
107	1.4830	0.0054
108	1.4883	0.0053
109	1.4936	0.0053
110	1.4989	0.0053
111	1.5041	0.0052
112	1.5093	0.0052
113	1.5145	0.0052
114	1.5196	0.0052
115	1.5248	0.0051
116	1.5299	0.0051
117	1.5349	0.0051
118	1.5400	0.0050
119	1.5450	0.0050
120	1.5500	0.0050
121	1.5549	0.0050
122	1.5599	0.0049
123	1.5648	0.0049
124	1.5697	0.0049
125	1.5746	0.0049
126	1.5794	0.0048
127	1.5842	0.0048
128	1.5890	0.0048
129	1.5938	0.0048
130	1.5985	0.0048
131	1.6033	0.0047
132	1.6080	0.0047
133	1.6127	0.0047
134	1.6173	0.0047
135	1.6220	0.0046
136	1.6266	0.0046
137	1.6312	0.0046
138	1.6358	0.0046
139	1.6403	0.0046
140	1.6449	0.0045
141	1.6494	0.0045
142	1.6539	0.0045
143	1.6584	0.0045
144	1.6628	0.0045
145	1.6673	0.0044
146	1.6717	0.0044
147	1.6761	0.0044

148	1.6805	0.0044
149	1.6848	0.0044
150	1.6892	0.0043
151	1.6935	0.0043
152	1.6978	0.0043
153	1.7021	0.0043
154	1.7064	0.0043
155	1.7107	0.0043
156	1.7149	0.0042
157	1.7192	0.0042
158	1.7234	0.0042
159	1.7276	0.0042
160	1.7317	0.0042
161	1.7359	0.0042
162	1.7401	0.0041
163	1.7442	0.0041
164	1.7483	0.0041
165	1.7524	0.0041
166	1.7565	0.0041
167	1.7606	0.0041
168	1.7646	0.0041
169	1.7687	0.0040
170	1.7727	0.0040
171	1.7767	0.0040
172	1.7807	0.0040
173	1.7847	0.0040
174	1.7886	0.0040
175	1.7926	0.0040
176	1.7965	0.0039
177	1.8005	0.0039
178	1.8044	0.0039
179	1.8083	0.0039
180	1.8122	0.0039
181	1.8160	0.0039
182	1.8199	0.0039
183	1.8238	0.0038
184	1.8276	0.0038
185	1.8314	0.0038
186	1.8352	0.0038
187	1.8390	0.0038
188	1.8428	0.0038
189	1.8466	0.0038
190	1.8503	0.0038
191	1.8541	0.0037
192	1.8578	0.0037
193	1.8615	0.0037
194	1.8653	0.0037
195	1.8690	0.0037
196	1.8726	0.0037
197	1.8763	0.0037

198	1.8800	0.0037
199	1.8836	0.0037
200	1.8873	0.0036
201	1.8909	0.0036
202	1.8945	0.0036
203	1.8981	0.0036
204	1.9017	0.0036
205	1.9053	0.0036
206	1.9089	0.0036
207	1.9125	0.0036
208	1.9160	0.0036
209	1.9196	0.0035
210	1.9231	0.0035
211	1.9266	0.0035
212	1.9302	0.0035
213	1.9337	0.0035
214	1.9371	0.0035
215	1.9406	0.0035
216	1.9441	0.0035
217	1.9476	0.0035
218	1.9510	0.0035
219	1.9545	0.0034
220	1.9579	0.0034
221	1.9613	0.0034
222	1.9647	0.0034
223	1.9682	0.0034
224	1.9716	0.0034
225	1.9749	0.0034
226	1.9783	0.0034
227	1.9817	0.0034
228	1.9850	0.0034
229	1.9884	0.0034
230	1.9917	0.0033
231	1.9951	0.0033
232	1.9984	0.0033
233	2.0017	0.0033
234	2.0050	0.0033
235	2.0083	0.0033
236	2.0116	0.0033
237	2.0149	0.0033
238	2.0182	0.0033
239	2.0214	0.0033
240	2.0247	0.0033
241	2.0279	0.0032
242	2.0312	0.0032
243	2.0344	0.0032
244	2.0376	0.0032
245	2.0408	0.0032
246	2.0440	0.0032
247	2.0472	0.0032

248	2.0504	0.0032
249	2.0536	0.0032
250	2.0568	0.0032
251	2.0600	0.0032
252	2.0631	0.0032
253	2.0663	0.0032
254	2.0694	0.0031
255	2.0726	0.0031
256	2.0757	0.0031
257	2.0788	0.0031
258	2.0819	0.0031
259	2.0850	0.0031
260	2.0881	0.0031
261	2.0912	0.0031
262	2.0943	0.0031
263	2.0974	0.0031
264	2.1005	0.0031
265	2.1035	0.0031
266	2.1066	0.0031
267	2.1096	0.0030
268	2.1127	0.0030
269	2.1157	0.0030
270	2.1187	0.0030
271	2.1217	0.0030
272	2.1248	0.0030
273	2.1278	0.0030
274	2.1308	0.0030
275	2.1338	0.0030
276	2.1368	0.0030
277	2.1397	0.0030
278	2.1427	0.0030
279	2.1457	0.0030
280	2.1486	0.0030
281	2.1516	0.0030
282	2.1545	0.0029
283	2.1575	0.0029
284	2.1604	0.0029
285	2.1633	0.0029
286	2.1663	0.0029
287	2.1692	0.0029
288	2.1721	0.0029

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0029	0.0021	0.0008
2	0.0029	0.0021	0.0008
3	0.0029	0.0021	0.0008
4	0.0029	0.0021	0.0008

5	0.0029	0.0022	0.0008
6	0.0030	0.0022	0.0008
7	0.0030	0.0022	0.0008
8	0.0030	0.0022	0.0008
9	0.0030	0.0022	0.0008
10	0.0030	0.0022	0.0008
11	0.0030	0.0022	0.0008
12	0.0030	0.0022	0.0008
13	0.0030	0.0022	0.0008
14	0.0030	0.0022	0.0008
15	0.0030	0.0022	0.0008
16	0.0031	0.0022	0.0008
17	0.0031	0.0022	0.0008
18	0.0031	0.0023	0.0008
19	0.0031	0.0023	0.0008
20	0.0031	0.0023	0.0008
21	0.0031	0.0023	0.0008
22	0.0031	0.0023	0.0008
23	0.0031	0.0023	0.0008
24	0.0031	0.0023	0.0008
25	0.0032	0.0023	0.0008
26	0.0032	0.0023	0.0009
27	0.0032	0.0023	0.0009
28	0.0032	0.0023	0.0009
29	0.0032	0.0023	0.0009
30	0.0032	0.0024	0.0009
31	0.0032	0.0024	0.0009
32	0.0032	0.0024	0.0009
33	0.0033	0.0024	0.0009
34	0.0033	0.0024	0.0009
35	0.0033	0.0024	0.0009
36	0.0033	0.0024	0.0009
37	0.0033	0.0024	0.0009
38	0.0033	0.0024	0.0009
39	0.0033	0.0024	0.0009
40	0.0033	0.0024	0.0009
41	0.0034	0.0025	0.0009
42	0.0034	0.0025	0.0009
43	0.0034	0.0025	0.0009
44	0.0034	0.0025	0.0009
45	0.0034	0.0025	0.0009
46	0.0034	0.0025	0.0009
47	0.0034	0.0025	0.0009
48	0.0035	0.0025	0.0009
49	0.0035	0.0025	0.0009
50	0.0035	0.0025	0.0009
51	0.0035	0.0026	0.0009
52	0.0035	0.0026	0.0009
53	0.0035	0.0026	0.0010
54	0.0035	0.0026	0.0010

55	0.0036	0.0026	0.0010
56	0.0036	0.0026	0.0010
57	0.0036	0.0026	0.0010
58	0.0036	0.0026	0.0010
59	0.0036	0.0027	0.0010
60	0.0036	0.0027	0.0010
61	0.0037	0.0027	0.0010
62	0.0037	0.0027	0.0010
63	0.0037	0.0027	0.0010
64	0.0037	0.0027	0.0010
65	0.0037	0.0027	0.0010
66	0.0037	0.0027	0.0010
67	0.0038	0.0028	0.0010
68	0.0038	0.0028	0.0010
69	0.0038	0.0028	0.0010
70	0.0038	0.0028	0.0010
71	0.0038	0.0028	0.0010
72	0.0039	0.0028	0.0010
73	0.0039	0.0028	0.0010
74	0.0039	0.0029	0.0010
75	0.0039	0.0029	0.0011
76	0.0039	0.0029	0.0011
77	0.0040	0.0029	0.0011
78	0.0040	0.0029	0.0011
79	0.0040	0.0029	0.0011
80	0.0040	0.0029	0.0011
81	0.0041	0.0030	0.0011
82	0.0041	0.0030	0.0011
83	0.0041	0.0030	0.0011
84	0.0041	0.0030	0.0011
85	0.0041	0.0030	0.0011
86	0.0042	0.0030	0.0011
87	0.0042	0.0031	0.0011
88	0.0042	0.0031	0.0011
89	0.0042	0.0031	0.0011
90	0.0043	0.0031	0.0011
91	0.0043	0.0031	0.0012
92	0.0043	0.0032	0.0012
93	0.0043	0.0032	0.0012
94	0.0044	0.0032	0.0012
95	0.0044	0.0032	0.0012
96	0.0044	0.0032	0.0012
97	0.0045	0.0033	0.0012
98	0.0045	0.0033	0.0012
99	0.0045	0.0033	0.0012
100	0.0045	0.0033	0.0012
101	0.0046	0.0033	0.0012
102	0.0046	0.0034	0.0012
103	0.0046	0.0034	0.0012
104	0.0047	0.0034	0.0013

105	0.0047	0.0034	0.0013
106	0.0047	0.0035	0.0013
107	0.0048	0.0035	0.0013
108	0.0048	0.0035	0.0013
109	0.0048	0.0035	0.0013
110	0.0049	0.0036	0.0013
111	0.0049	0.0036	0.0013
112	0.0049	0.0036	0.0013
113	0.0050	0.0036	0.0013
114	0.0050	0.0037	0.0013
115	0.0051	0.0037	0.0014
116	0.0051	0.0037	0.0014
117	0.0052	0.0038	0.0014
118	0.0052	0.0038	0.0014
119	0.0052	0.0038	0.0014
120	0.0053	0.0039	0.0014
121	0.0053	0.0039	0.0014
122	0.0054	0.0039	0.0014
123	0.0054	0.0040	0.0015
124	0.0055	0.0040	0.0015
125	0.0055	0.0040	0.0015
126	0.0056	0.0041	0.0015
127	0.0056	0.0041	0.0015
128	0.0057	0.0041	0.0015
129	0.0057	0.0042	0.0015
130	0.0058	0.0042	0.0016
131	0.0058	0.0043	0.0016
132	0.0059	0.0043	0.0016
133	0.0060	0.0044	0.0016
134	0.0060	0.0044	0.0016
135	0.0061	0.0045	0.0016
136	0.0061	0.0045	0.0016
137	0.0062	0.0045	0.0017
138	0.0063	0.0046	0.0017
139	0.0064	0.0047	0.0017
140	0.0064	0.0047	0.0017
141	0.0065	0.0048	0.0018
142	0.0066	0.0048	0.0018
143	0.0067	0.0049	0.0018
144	0.0067	0.0049	0.0018
145	0.0074	0.0054	0.0020
146	0.0074	0.0054	0.0020
147	0.0076	0.0055	0.0020
148	0.0076	0.0056	0.0020
149	0.0078	0.0057	0.0021
150	0.0078	0.0057	0.0021
151	0.0080	0.0058	0.0021
152	0.0081	0.0059	0.0022
153	0.0082	0.0060	0.0022
154	0.0083	0.0061	0.0022

155	0.0085	0.0062	0.0023
156	0.0086	0.0063	0.0023
157	0.0087	0.0064	0.0023
158	0.0088	0.0065	0.0024
159	0.0090	0.0066	0.0024
160	0.0091	0.0067	0.0025
161	0.0094	0.0068	0.0025
162	0.0095	0.0069	0.0025
163	0.0097	0.0071	0.0026
164	0.0099	0.0072	0.0027
165	0.0101	0.0074	0.0027
166	0.0103	0.0075	0.0028
167	0.0106	0.0077	0.0028
168	0.0108	0.0079	0.0029
169	0.0111	0.0081	0.0030
170	0.0113	0.0083	0.0030
171	0.0117	0.0086	0.0032
172	0.0119	0.0087	0.0032
173	0.0124	0.0091	0.0033
174	0.0127	0.0093	0.0034
175	0.0132	0.0097	0.0035
176	0.0135	0.0099	0.0036
177	0.0142	0.0104	0.0038
178	0.0145	0.0106	0.0039
179	0.0153	0.0112	0.0041
180	0.0158	0.0115	0.0042
181	0.0168	0.0123	0.0045
182	0.0174	0.0127	0.0047
183	0.0188	0.0137	0.0050
184	0.0196	0.0143	0.0053
185	0.0156	0.0114	0.0042
186	0.0166	0.0121	0.0045
187	0.0192	0.0141	0.0052
188	0.0210	0.0154	0.0056
189	0.0261	0.0191	0.0070
190	0.0301	0.0220	0.0081
191	0.0456	0.0334	0.0123
192	0.0663	0.0336	0.0326
193	0.2866	0.0336	0.2530
194	0.0359	0.0263	0.0097
195	0.0232	0.0170	0.0062
196	0.0178	0.0130	0.0048
197	0.0205	0.0150	0.0055
198	0.0181	0.0132	0.0049
199	0.0163	0.0119	0.0044
200	0.0149	0.0109	0.0040
201	0.0138	0.0101	0.0037
202	0.0129	0.0094	0.0035
203	0.0122	0.0089	0.0033
204	0.0115	0.0084	0.0031

205	0.0109	0.0080	0.0029
206	0.0104	0.0076	0.0028
207	0.0100	0.0073	0.0027
208	0.0096	0.0070	0.0026
209	0.0093	0.0068	0.0025
210	0.0089	0.0065	0.0024
211	0.0086	0.0063	0.0023
212	0.0084	0.0061	0.0023
213	0.0081	0.0059	0.0022
214	0.0079	0.0058	0.0021
215	0.0077	0.0056	0.0021
216	0.0075	0.0055	0.0020
217	0.0068	0.0050	0.0018
218	0.0066	0.0048	0.0018
219	0.0065	0.0047	0.0017
220	0.0063	0.0046	0.0017
221	0.0062	0.0045	0.0017
222	0.0060	0.0044	0.0016
223	0.0059	0.0043	0.0016
224	0.0058	0.0042	0.0016
225	0.0057	0.0042	0.0015
226	0.0056	0.0041	0.0015
227	0.0055	0.0040	0.0015
228	0.0054	0.0039	0.0014
229	0.0053	0.0039	0.0014
230	0.0052	0.0038	0.0014
231	0.0051	0.0037	0.0014
232	0.0050	0.0037	0.0014
233	0.0050	0.0036	0.0013
234	0.0049	0.0036	0.0013
235	0.0048	0.0035	0.0013
236	0.0048	0.0035	0.0013
237	0.0047	0.0034	0.0013
238	0.0046	0.0034	0.0012
239	0.0046	0.0033	0.0012
240	0.0045	0.0033	0.0012
241	0.0044	0.0032	0.0012
242	0.0044	0.0032	0.0012
243	0.0043	0.0032	0.0012
244	0.0043	0.0031	0.0012
245	0.0042	0.0031	0.0011
246	0.0042	0.0031	0.0011
247	0.0041	0.0030	0.0011
248	0.0041	0.0030	0.0011
249	0.0040	0.0030	0.0011
250	0.0040	0.0029	0.0011
251	0.0040	0.0029	0.0011
252	0.0039	0.0029	0.0011
253	0.0039	0.0028	0.0010
254	0.0038	0.0028	0.0010

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      255              0.0038          0.0028              0.0010
      256              0.0038          0.0027              0.0010
      257              0.0037          0.0027              0.0010
      258              0.0037          0.0027              0.0010
      259              0.0037          0.0027              0.0010
      260              0.0036          0.0026              0.0010
      261              0.0036          0.0026              0.0010
      262              0.0036          0.0026              0.0010
      263              0.0035          0.0026              0.0009
      264              0.0035          0.0026              0.0009
      265              0.0035          0.0025              0.0009
      266              0.0034          0.0025              0.0009
      267              0.0034          0.0025              0.0009
      268              0.0034          0.0025              0.0009
      269              0.0034          0.0025              0.0009
      270              0.0033          0.0024              0.0009
      271              0.0033          0.0024              0.0009
      272              0.0033          0.0024              0.0009
      273              0.0032          0.0024              0.0009
      274              0.0032          0.0024              0.0009
      275              0.0032          0.0023              0.0009
      276              0.0032          0.0023              0.0009
      277              0.0032          0.0023              0.0008
      278              0.0031          0.0023              0.0008
      279              0.0031          0.0023              0.0008
      280              0.0031          0.0023              0.0008
      281              0.0031          0.0022              0.0008
      282              0.0030          0.0022              0.0008
      283              0.0030          0.0022              0.0008
      284              0.0030          0.0022              0.0008
      285              0.0030          0.0022              0.0008
      286              0.0030          0.0022              0.0008
      287              0.0029          0.0022              0.0008
      288              0.0029          0.0021              0.0008
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Total soil rain loss =      1.40(In)
      Total effective rainfall =      0.77(In)
      Peak flow rate in flood hydrograph =     21.96(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       0.0000      0.00  Q         |         |         |         |
```

0+10	0.0001	0.02	Q				
0+15	0.0004	0.04	Q				
0+20	0.0011	0.10	Q				
0+25	0.0021	0.15	Q				
0+30	0.0034	0.19	Q				
0+35	0.0048	0.21	Q				
0+40	0.0064	0.23	Q				
0+45	0.0080	0.24	Q				
0+50	0.0098	0.25	Q				
0+55	0.0116	0.26	Q				
1+ 0	0.0135	0.27	Q				
1+ 5	0.0154	0.28	Q				
1+10	0.0174	0.29	Q				
1+15	0.0194	0.29	Q				
1+20	0.0214	0.30	Q				
1+25	0.0235	0.30	Q				
1+30	0.0256	0.31	Q				
1+35	0.0277	0.31	Q				
1+40	0.0299	0.31	Q				
1+45	0.0320	0.32	Q				
1+50	0.0342	0.32	Q				
1+55	0.0365	0.32	Q				
2+ 0	0.0387	0.33	Q				
2+ 5	0.0410	0.33	Q				
2+10	0.0432	0.33	Q				
2+15	0.0455	0.33	Q				
2+20	0.0478	0.33	Q				
2+25	0.0501	0.34	Q				
2+30	0.0525	0.34	Q				
2+35	0.0548	0.34	QV				
2+40	0.0572	0.34	QV				
2+45	0.0595	0.34	QV				
2+50	0.0619	0.35	QV				
2+55	0.0643	0.35	QV				
3+ 0	0.0667	0.35	QV				
3+ 5	0.0691	0.35	QV				
3+10	0.0716	0.35	QV				
3+15	0.0740	0.35	QV				
3+20	0.0764	0.35	QV				
3+25	0.0789	0.36	QV				
3+30	0.0814	0.36	QV				
3+35	0.0838	0.36	QV				
3+40	0.0863	0.36	QV				
3+45	0.0888	0.36	QV				
3+50	0.0913	0.36	QV				
3+55	0.0938	0.36	QV				
4+ 0	0.0963	0.37	QV				
4+ 5	0.0989	0.37	QV				
4+10	0.1014	0.37	QV				
4+15	0.1040	0.37	QV				

4+20	0.1065	0.37	QV	|	|	|	|
4+25	0.1091	0.37	Q V	|	|	|	|
4+30	0.1117	0.38	Q V	|	|	|	|
4+35	0.1143	0.38	Q V	|	|	|	|
4+40	0.1169	0.38	Q V	|	|	|	|
4+45	0.1195	0.38	Q V	|	|	|	|
4+50	0.1222	0.38	Q V	|	|	|	|
4+55	0.1248	0.38	Q V	|	|	|	|
5+ 0	0.1275	0.39	Q V	|	|	|	|
5+ 5	0.1301	0.39	Q V	|	|	|	|
5+10	0.1328	0.39	Q V	|	|	|	|
5+15	0.1355	0.39	Q V	|	|	|	|
5+20	0.1382	0.39	Q V	|	|	|	|
5+25	0.1409	0.39	Q V	|	|	|	|
5+30	0.1436	0.40	Q V	|	|	|	|
5+35	0.1464	0.40	Q V	|	|	|	|
5+40	0.1491	0.40	Q V	|	|	|	|
5+45	0.1519	0.40	Q V	|	|	|	|
5+50	0.1547	0.40	Q V	|	|	|	|
5+55	0.1575	0.41	Q V	|	|	|	|
6+ 0	0.1603	0.41	Q V	|	|	|	|
6+ 5	0.1631	0.41	Q V	|	|	|	|
6+10	0.1659	0.41	Q V	|	|	|	|
6+15	0.1688	0.41	Q V	|	|	|	|
6+20	0.1716	0.42	Q V	|	|	|	|
6+25	0.1745	0.42	Q V	|	|	|	|
6+30	0.1774	0.42	Q V	|	|	|	|
6+35	0.1803	0.42	Q V	|	|	|	|
6+40	0.1832	0.42	Q V	|	|	|	|
6+45	0.1862	0.43	Q V	|	|	|	|
6+50	0.1891	0.43	Q V	|	|	|	|
6+55	0.1921	0.43	Q V	|	|	|	|
7+ 0	0.1951	0.43	Q V	|	|	|	|
7+ 5	0.1981	0.44	Q V	|	|	|	|
7+10	0.2011	0.44	Q V	|	|	|	|
7+15	0.2041	0.44	Q V	|	|	|	|
7+20	0.2072	0.44	Q V	|	|	|	|
7+25	0.2102	0.44	Q V	|	|	|	|
7+30	0.2133	0.45	Q V	|	|	|	|
7+35	0.2164	0.45	Q V	|	|	|	|
7+40	0.2195	0.45	Q V	|	|	|	|
7+45	0.2226	0.46	Q V	|	|	|	|
7+50	0.2258	0.46	Q V	|	|	|	|
7+55	0.2290	0.46	Q V	|	|	|	|
8+ 0	0.2322	0.46	Q V	|	|	|	|
8+ 5	0.2354	0.47	Q V	|	|	|	|
8+10	0.2386	0.47	Q V	|	|	|	|
8+15	0.2418	0.47	Q V	|	|	|	|
8+20	0.2451	0.47	Q V	|	|	|	|
8+25	0.2484	0.48	Q V	|	|	|	|

8+30	0.2517	0.48	Q	V	|	|	|	|
8+35	0.2550	0.48	Q	V	|	|	|	|
8+40	0.2584	0.49	Q	V	|	|	|	|
8+45	0.2618	0.49	Q	V	|	|	|	|
8+50	0.2652	0.49	Q	V	|	|	|	|
8+55	0.2686	0.50	Q	V	|	|	|	|
9+ 0	0.2720	0.50	Q	V	|	|	|	|
9+ 5	0.2755	0.50	Q	V	|	|	|	|
9+10	0.2790	0.51	Q	V	|	|	|	|
9+15	0.2825	0.51	Q	V	|	|	|	|
9+20	0.2860	0.51	Q	V	|	|	|	|
9+25	0.2896	0.52	Q	V	|	|	|	|
9+30	0.2932	0.52	Q	V	|	|	|	|
9+35	0.2968	0.52	Q	V	|	|	|	|
9+40	0.3004	0.53	Q	V	|	|	|	|
9+45	0.3041	0.53	Q	V	|	|	|	|
9+50	0.3078	0.54	Q	V	|	|	|	|
9+55	0.3115	0.54	Q	V	|	|	|	|
10+ 0	0.3153	0.55	Q	V	|	|	|	|
10+ 5	0.3191	0.55	Q	V	|	|	|	|
10+10	0.3229	0.55	Q	V	|	|	|	|
10+15	0.3267	0.56	Q	V	|	|	|	|
10+20	0.3306	0.56	Q	V	|	|	|	|
10+25	0.3345	0.57	Q	V	|	|	|	|
10+30	0.3384	0.57	Q	V	|	|	|	|
10+35	0.3424	0.58	Q	V	|	|	|	|
10+40	0.3464	0.58	Q	V	|	|	|	|
10+45	0.3505	0.59	Q	V	|	|	|	|
10+50	0.3545	0.59	Q	V	|	|	|	|
10+55	0.3587	0.60	Q	V	|	|	|	|
11+ 0	0.3628	0.60	Q	V	|	|	|	|
11+ 5	0.3670	0.61	Q	V	|	|	|	|
11+10	0.3712	0.61	Q	V	|	|	|	|
11+15	0.3755	0.62	Q	V	|	|	|	|
11+20	0.3798	0.63	Q	V	|	|	|	|
11+25	0.3842	0.63	Q	V	|	|	|	|
11+30	0.3886	0.64	Q	V	|	|	|	|
11+35	0.3930	0.65	Q	V	|	|	|	|
11+40	0.3975	0.65	Q	V	|	|	|	|
11+45	0.4020	0.66	Q	V	|	|	|	|
11+50	0.4066	0.67	Q	V	|	|	|	|
11+55	0.4113	0.67	Q	V	|	|	|	|
12+ 0	0.4160	0.68	Q	V	|	|	|	|
12+ 5	0.4207	0.69	Q	V	|	|	|	|
12+10	0.4255	0.70	Q	V	|	|	|	|
12+15	0.4304	0.71	Q	V	|	|	|	|
12+20	0.4355	0.73	Q	V	|	|	|	|
12+25	0.4406	0.75	Q	V	|	|	|	|
12+30	0.4459	0.76	|Q	V	|	|	|	|
12+35	0.4512	0.78	|Q	V	|	|	|	|

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12+40       0.4567      0.79  |Q      V |          |          |          |
12+45       0.4622      0.80  |Q      V |          |          |          |
12+50       0.4679      0.82  |Q      V |          |          |          |
12+55       0.4736      0.83  |Q      V |          |          |          |
13+ 0       0.4794      0.84  |Q      V |          |          |          |
13+ 5       0.4853      0.85  |Q      V |          |          |          |
13+10       0.4912      0.87  |Q       V|          |          |          |
13+15       0.4973      0.88  |Q       V|          |          |          |
13+20       0.5035      0.90  |Q       V|          |          |          |
13+25       0.5097      0.91  |Q       V|          |          |          |
13+30       0.5161      0.93  |Q       V|          |          |          |
13+35       0.5226      0.94  |Q       V|          |          |          |
13+40       0.5292      0.96  |Q       V|          |          |          |
13+45       0.5359      0.97  |Q       V|          |          |          |
13+50       0.5427      0.99  |Q        V          |          |          |
13+55       0.5497      1.01  |Q        V          |          |          |
14+ 0       0.5568      1.03  |Q        V          |          |          |
14+ 5       0.5640      1.05  |Q        V          |          |          |
14+10       0.5714      1.07  |Q        V          |          |          |
14+15       0.5790      1.10  |Q        V          |          |          |
14+20       0.5867      1.12  |Q        V          |          |          |
14+25       0.5946      1.15  |Q        V          |          |          |
14+30       0.6027      1.18  |Q        |V         |          |          |
14+35       0.6110      1.20  |Q        |V         |          |          |
14+40       0.6195      1.24  |Q        |V         |          |          |
14+45       0.6283      1.27  |Q        |V         |          |          |
14+50       0.6373      1.31  |Q        |V         |          |          |
14+55       0.6465      1.35  |Q        |V         |          |          |
15+ 0       0.6561      1.39  |Q        | V        |          |          |
15+ 5       0.6660      1.44  |Q        | V        |          |          |
15+10       0.6763      1.49  |Q        | V        |          |          |
15+15       0.6870      1.55  | Q       | V        |          |          |
15+20       0.6981      1.61  | Q       | V        |          |          |
15+25       0.7096      1.68  | Q       |  V       |          |          |
15+30       0.7216      1.74  | Q       |  V       |          |          |
15+35       0.7339      1.78  | Q       |  V       |          |          |
15+40       0.7462      1.78  | Q       |  V       |          |          |
15+45       0.7586      1.81  | Q       |   V      |          |          |
15+50       0.7717      1.90  | Q       |   V      |          |          |
15+55       0.7859      2.07  | Q       |   V      |          |          |
16+ 0       0.8026      2.42  |  Q      |   V      |          |          |
16+ 5       0.8306      4.06  |    Q    |    V     |          |          |
16+10       0.8830      7.61  |         Q     V    |          |          |
16+15       0.9702     12.67  |         |     QV   |          |          |
16+20       1.1215     21.96  |         |          V        Q|          |
16+25       1.2646     20.79  |         |          |  V   Q   |          |
16+30       1.3644     14.49  |         |         Q|    V     |          |
16+35       1.4356     10.33  |         |  Q       |     V    |          |
16+40       1.4928      8.30  |         |Q         |      V   |          |
16+45       1.5405      6.94  |        Q|          |       V  |          |
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16+50       1.5817      5.97  |      Q  |         |        V|         |
16+55       1.6169      5.12  |     Q   |         |        V|         |
17+ 0       1.6481      4.52  |     Q   |         |         V         |
17+ 5       1.6765      4.13  |    Q    |         |         V         |
17+10       1.7022      3.73  |   Q     |         |         |V        |
17+15       1.7250      3.30  |   Q     |         |         |V        |
17+20       1.7452      2.93  |  Q      |         |         | V       |
17+25       1.7641      2.76  |  Q      |         |         | V       |
17+30       1.7817      2.55  |  Q      |         |         | V       |
17+35       1.7981      2.38  |  Q      |         |         |  V      |
17+40       1.8130      2.16  | Q       |         |         |  V      |
17+45       1.8270      2.03  | Q       |         |         |  V      |
17+50       1.8402      1.91  | Q       |         |         |   V     |
17+55       1.8523      1.76  | Q       |         |         |   V     |
18+ 0       1.8638      1.68  | Q       |         |         |   V     |
18+ 5       1.8742      1.51  | Q       |         |         |   V     |
18+10       1.8841      1.43  |Q        |         |         |   V     |
18+15       1.8929      1.28  |Q        |         |         |   V     |
18+20       1.9011      1.18  |Q        |         |         |    V    |
18+25       1.9090      1.16  |Q        |         |         |    V    |
18+30       1.9170      1.15  |Q        |         |         |    V    |
18+35       1.9247      1.13  |Q        |         |         |    V    |
18+40       1.9323      1.10  |Q        |         |         |    V    |
18+45       1.9396      1.06  |Q        |         |         |    V    |
18+50       1.9463      0.97  |Q        |         |         |    V    |
18+55       1.9524      0.89  |Q        |         |         |     V   |
19+ 0       1.9583      0.86  |Q        |         |         |     V   |
19+ 5       1.9636      0.77  |Q        |         |         |     V   |
19+10       1.9682      0.68  Q         |         |         |     V   |
19+15       1.9728      0.66  Q         |         |         |     V   |
19+20       1.9773      0.65  Q         |         |         |     V   |
19+25       1.9816      0.63  Q         |         |         |     V   |
19+30       1.9859      0.62  Q         |         |         |     V   |
19+35       1.9900      0.61  Q         |         |         |     V   |
19+40       1.9941      0.59  Q         |         |         |     V   |
19+45       1.9981      0.58  Q         |         |         |     V   |
19+50       2.0021      0.57  Q         |         |         |      V  |
19+55       2.0060      0.56  Q         |         |         |      V  |
20+ 0       2.0098      0.55  Q         |         |         |      V  |
20+ 5       2.0135      0.54  Q         |         |         |      V  |
20+10       2.0172      0.53  Q         |         |         |      V  |
20+15       2.0208      0.53  Q         |         |         |      V  |
20+20       2.0244      0.52  Q         |         |         |      V  |
20+25       2.0279      0.51  Q         |         |         |      V  |
20+30       2.0313      0.50  Q         |         |         |      V  |
20+35       2.0348      0.50  Q         |         |         |      V  |
20+40       2.0381      0.49  Q         |         |         |      V  |
20+45       2.0415      0.48  Q         |         |         |      V  |
20+50       2.0447      0.48  Q         |         |         |      V  |
20+55       2.0480      0.47  Q         |         |         |      V  |
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21+ 0	2.0512	0.46	Q	|	|	|	V |
21+ 5	2.0543	0.46	Q	|	|	|	V |
21+10	2.0575	0.45	Q	|	|	|	V |
21+15	2.0606	0.45	Q	|	|	|	V |
21+20	2.0636	0.44	Q	|	|	|	V |
21+25	2.0666	0.44	Q	|	|	|	V |
21+30	2.0696	0.43	Q	|	|	|	V |
21+35	2.0726	0.43	Q	|	|	|	V |
21+40	2.0755	0.42	Q	|	|	|	V |
21+45	2.0784	0.42	Q	|	|	|	V |
21+50	2.0813	0.42	Q	|	|	|	V |
21+55	2.0841	0.41	Q	|	|	|	V |
22+ 0	2.0869	0.41	Q	|	|	|	V |
22+ 5	2.0897	0.40	Q	|	|	|	V |
22+10	2.0925	0.40	Q	|	|	|	V |
22+15	2.0952	0.40	Q	|	|	|	V |
22+20	2.0979	0.39	Q	|	|	|	V |
22+25	2.1006	0.39	Q	|	|	|	V |
22+30	2.1032	0.39	Q	|	|	|	V |
22+35	2.1059	0.38	Q	|	|	|	V |
22+40	2.1085	0.38	Q	|	|	|	V |
22+45	2.1111	0.38	Q	|	|	|	V|
22+50	2.1136	0.37	Q	|	|	|	V|
22+55	2.1162	0.37	Q	|	|	|	V|
23+ 0	2.1187	0.37	Q	|	|	|	V|
23+ 5	2.1212	0.36	Q	|	|	|	V|
23+10	2.1237	0.36	Q	|	|	|	V|
23+15	2.1261	0.36	Q	|	|	|	V|
23+20	2.1286	0.36	Q	|	|	|	V|
23+25	2.1310	0.35	Q	|	|	|	V|
23+30	2.1334	0.35	Q	|	|	|	V|
23+35	2.1358	0.35	Q	|	|	|	V|
23+40	2.1382	0.34	Q	|	|	|	V|
23+45	2.1405	0.34	Q	|	|	|	V|
23+50	2.1429	0.34	Q	|	|	|	V|
23+55	2.1452	0.34	Q	|	|	|	V|
24+ 0	2.1475	0.33	Q	|	|	|	V|

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

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Study date 08/30/22

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

Program License Serial Number 6277

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
10 YR STORM UNIT HYDROGRAPH, PRE CONDITION
AREA C

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
29.07	1	0.60
Rainfall data for year 2		
29.07	6	0.76
Rainfall data for year 2		
29.07	24	1.30
Rainfall data for year 100		

```
            29.07            1            1.08
------------------------------------------------------------------------
Rainfall data for year 100
            29.07            6            2.01
------------------------------------------------------------------------
Rainfall data for year 100
            29.07           24            3.42
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 78.0      78.0         29.07      1.000     0.404    1.000    0.404

Area-averaged adjusted loss rate Fm (In/Hr) =  0.404

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
    29.07   1.000         78.0      78.0       2.82     0.269

Area-averaged catchment yield fraction, Y =  0.269
Area-averaged low loss fraction, Yb =  0.731
User entry of time of concentration  =   0.520 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =      29.07(Ac.)
Catchment Lag time =   0.416 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 20.0321
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.404(In/Hr)
Average low loss rate fraction (Yb) = 0.731 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.287(In)
Computed peak 30-minute rainfall =  0.491(In)
Specified peak 1-hour rainfall =  0.605(In)
Computed peak 3-hour rainfall =  0.955(In)
Specified peak 6-hour rainfall =  1.273(In)
Specified peak 24-hour rainfall =  2.172(In)


Rainfall depth area reduction factors:
Using a total area of      29.07(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999     Adjusted rainfall =  0.287(In)
30-minute factor = 0.999    Adjusted rainfall =  0.491(In)
```

1-hour factor = 0.999 Adjusted rainfall = 0.604(In)
3-hour factor = 1.000 Adjusted rainfall = 0.955(In)
6-hour factor = 1.000 Adjusted rainfall = 1.273(In)
24-hour factor = 1.000 Adjusted rainfall = 2.172(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 = 351.57 (CFS))	
1	0.995	3.497
2	4.516	12.378
3	11.300	23.853
4	26.240	52.522
5	43.399	60.326
6	55.091	41.103
7	62.875	27.365
8	68.500	19.779
9	73.033	15.934
10	76.661	12.755
11	79.664	10.560
12	82.167	8.798
13	84.311	7.537
14	86.250	6.817
15	87.937	5.932
16	89.330	4.896
17	90.508	4.141
18	91.609	3.872
19	92.585	3.432
20	93.487	3.171
21	94.262	2.724
22	94.943	2.394
23	95.601	2.314
24	96.140	1.892
25	96.660	1.831
26	97.095	1.527
27	97.455	1.268
28	97.792	1.184
29	98.009	0.763
30	98.210	0.704
31	98.432	0.781
32	98.672	0.845
33	98.913	0.845
34	99.153	0.845
35	99.393	0.844
36	99.570	0.621
37	99.695	0.440

38	99.820	0.440
39	100.000	0.220

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2867	0.2867
2	0.3530	0.0663
3	0.3986	0.0457
4	0.4345	0.0359
5	0.4646	0.0301
6	0.4907	0.0261
7	0.5140	0.0232
8	0.5350	0.0210
9	0.5542	0.0192
10	0.5720	0.0178
11	0.5886	0.0166
12	0.6042	0.0156
13	0.6246	0.0205
14	0.6442	0.0196
15	0.6630	0.0188
16	0.6810	0.0181
17	0.6985	0.0174
18	0.7153	0.0168
19	0.7316	0.0163
20	0.7473	0.0158
21	0.7627	0.0153
22	0.7776	0.0149
23	0.7921	0.0145
24	0.8063	0.0142
25	0.8201	0.0138
26	0.8336	0.0135
27	0.8468	0.0132
28	0.8597	0.0129
29	0.8724	0.0127
30	0.8848	0.0124
31	0.8969	0.0122
32	0.9089	0.0119
33	0.9206	0.0117
34	0.9321	0.0115
35	0.9434	0.0113
36	0.9545	0.0111
37	0.9655	0.0109
38	0.9762	0.0108
39	0.9868	0.0106
40	0.9972	0.0104
41	1.0075	0.0103
42	1.0176	0.0101
43	1.0276	0.0100
44	1.0375	0.0099
45	1.0472	0.0097

46	1.0568	0.0096
47	1.0663	0.0095
48	1.0757	0.0094
49	1.0849	0.0093
50	1.0941	0.0091
51	1.1031	0.0090
52	1.1120	0.0089
53	1.1209	0.0088
54	1.1296	0.0087
55	1.1382	0.0086
56	1.1468	0.0086
57	1.1553	0.0085
58	1.1636	0.0084
59	1.1719	0.0083
60	1.1801	0.0082
61	1.1883	0.0081
62	1.1963	0.0081
63	1.2043	0.0080
64	1.2122	0.0079
65	1.2200	0.0078
66	1.2278	0.0078
67	1.2355	0.0077
68	1.2431	0.0076
69	1.2507	0.0076
70	1.2582	0.0075
71	1.2656	0.0074
72	1.2730	0.0074
73	1.2798	0.0068
74	1.2865	0.0067
75	1.2932	0.0067
76	1.2998	0.0066
77	1.3063	0.0066
78	1.3129	0.0065
79	1.3193	0.0065
80	1.3257	0.0064
81	1.3321	0.0064
82	1.3384	0.0063
83	1.3447	0.0063
84	1.3509	0.0062
85	1.3571	0.0062
86	1.3632	0.0061
87	1.3693	0.0061
88	1.3753	0.0060
89	1.3813	0.0060
90	1.3873	0.0060
91	1.3932	0.0059
92	1.3991	0.0059
93	1.4049	0.0058
94	1.4108	0.0058
95	1.4165	0.0058

96	1.4222	0.0057
97	1.4279	0.0057
98	1.4336	0.0057
99	1.4392	0.0056
100	1.4448	0.0056
101	1.4504	0.0056
102	1.4559	0.0055
103	1.4614	0.0055
104	1.4668	0.0055
105	1.4722	0.0054
106	1.4776	0.0054
107	1.4830	0.0054
108	1.4883	0.0053
109	1.4936	0.0053
110	1.4989	0.0053
111	1.5041	0.0052
112	1.5093	0.0052
113	1.5145	0.0052
114	1.5196	0.0052
115	1.5248	0.0051
116	1.5299	0.0051
117	1.5349	0.0051
118	1.5400	0.0050
119	1.5450	0.0050
120	1.5500	0.0050
121	1.5550	0.0050
122	1.5599	0.0049
123	1.5648	0.0049
124	1.5697	0.0049
125	1.5746	0.0049
126	1.5794	0.0048
127	1.5842	0.0048
128	1.5890	0.0048
129	1.5938	0.0048
130	1.5986	0.0048
131	1.6033	0.0047
132	1.6080	0.0047
133	1.6127	0.0047
134	1.6173	0.0047
135	1.6220	0.0046
136	1.6266	0.0046
137	1.6312	0.0046
138	1.6358	0.0046
139	1.6403	0.0046
140	1.6449	0.0045
141	1.6494	0.0045
142	1.6539	0.0045
143	1.6584	0.0045
144	1.6628	0.0045
145	1.6673	0.0044

146	1.6717	0.0044
147	1.6761	0.0044
148	1.6805	0.0044
149	1.6849	0.0044
150	1.6892	0.0043
151	1.6935	0.0043
152	1.6979	0.0043
153	1.7021	0.0043
154	1.7064	0.0043
155	1.7107	0.0043
156	1.7149	0.0042
157	1.7192	0.0042
158	1.7234	0.0042
159	1.7276	0.0042
160	1.7318	0.0042
161	1.7359	0.0042
162	1.7401	0.0041
163	1.7442	0.0041
164	1.7483	0.0041
165	1.7524	0.0041
166	1.7565	0.0041
167	1.7606	0.0041
168	1.7646	0.0041
169	1.7687	0.0040
170	1.7727	0.0040
171	1.7767	0.0040
172	1.7807	0.0040
173	1.7847	0.0040
174	1.7887	0.0040
175	1.7926	0.0040
176	1.7966	0.0039
177	1.8005	0.0039
178	1.8044	0.0039
179	1.8083	0.0039
180	1.8122	0.0039
181	1.8161	0.0039
182	1.8199	0.0039
183	1.8238	0.0038
184	1.8276	0.0038
185	1.8314	0.0038
186	1.8352	0.0038
187	1.8390	0.0038
188	1.8428	0.0038
189	1.8466	0.0038
190	1.8503	0.0038
191	1.8541	0.0037
192	1.8578	0.0037
193	1.8616	0.0037
194	1.8653	0.0037
195	1.8690	0.0037

196	1.8727	0.0037
197	1.8763	0.0037
198	1.8800	0.0037
199	1.8837	0.0037
200	1.8873	0.0036
201	1.8909	0.0036
202	1.8945	0.0036
203	1.8982	0.0036
204	1.9018	0.0036
205	1.9053	0.0036
206	1.9089	0.0036
207	1.9125	0.0036
208	1.9160	0.0036
209	1.9196	0.0035
210	1.9231	0.0035
211	1.9267	0.0035
212	1.9302	0.0035
213	1.9337	0.0035
214	1.9372	0.0035
215	1.9406	0.0035
216	1.9441	0.0035
217	1.9476	0.0035
218	1.9510	0.0035
219	1.9545	0.0034
220	1.9579	0.0034
221	1.9613	0.0034
222	1.9648	0.0034
223	1.9682	0.0034
224	1.9716	0.0034
225	1.9750	0.0034
226	1.9783	0.0034
227	1.9817	0.0034
228	1.9851	0.0034
229	1.9884	0.0034
230	1.9918	0.0033
231	1.9951	0.0033
232	1.9984	0.0033
233	2.0017	0.0033
234	2.0050	0.0033
235	2.0083	0.0033
236	2.0116	0.0033
237	2.0149	0.0033
238	2.0182	0.0033
239	2.0214	0.0033
240	2.0247	0.0033
241	2.0279	0.0032
242	2.0312	0.0032
243	2.0344	0.0032
244	2.0376	0.0032
245	2.0409	0.0032

246	2.0441	0.0032
247	2.0473	0.0032
248	2.0505	0.0032
249	2.0536	0.0032
250	2.0568	0.0032
251	2.0600	0.0032
252	2.0631	0.0032
253	2.0663	0.0032
254	2.0694	0.0031
255	2.0726	0.0031
256	2.0757	0.0031
257	2.0788	0.0031
258	2.0819	0.0031
259	2.0850	0.0031
260	2.0881	0.0031
261	2.0912	0.0031
262	2.0943	0.0031
263	2.0974	0.0031
264	2.1005	0.0031
265	2.1035	0.0031
266	2.1066	0.0031
267	2.1096	0.0030
268	2.1127	0.0030
269	2.1157	0.0030
270	2.1187	0.0030
271	2.1218	0.0030
272	2.1248	0.0030
273	2.1278	0.0030
274	2.1308	0.0030
275	2.1338	0.0030
276	2.1368	0.0030
277	2.1397	0.0030
278	2.1427	0.0030
279	2.1457	0.0030
280	2.1486	0.0030
281	2.1516	0.0030
282	2.1546	0.0029
283	2.1575	0.0029
284	2.1604	0.0029
285	2.1634	0.0029
286	2.1663	0.0029
287	2.1692	0.0029
288	2.1721	0.0029

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0029	0.0021	0.0008
2	0.0029	0.0021	0.0008

3	0.0029	0.0021	0.0008
4	0.0029	0.0021	0.0008
5	0.0029	0.0022	0.0008
6	0.0030	0.0022	0.0008
7	0.0030	0.0022	0.0008
8	0.0030	0.0022	0.0008
9	0.0030	0.0022	0.0008
10	0.0030	0.0022	0.0008
11	0.0030	0.0022	0.0008
12	0.0030	0.0022	0.0008
13	0.0030	0.0022	0.0008
14	0.0030	0.0022	0.0008
15	0.0030	0.0022	0.0008
16	0.0031	0.0022	0.0008
17	0.0031	0.0022	0.0008
18	0.0031	0.0023	0.0008
19	0.0031	0.0023	0.0008
20	0.0031	0.0023	0.0008
21	0.0031	0.0023	0.0008
22	0.0031	0.0023	0.0008
23	0.0031	0.0023	0.0008
24	0.0031	0.0023	0.0008
25	0.0032	0.0023	0.0008
26	0.0032	0.0023	0.0009
27	0.0032	0.0023	0.0009
28	0.0032	0.0023	0.0009
29	0.0032	0.0023	0.0009
30	0.0032	0.0024	0.0009
31	0.0032	0.0024	0.0009
32	0.0032	0.0024	0.0009
33	0.0033	0.0024	0.0009
34	0.0033	0.0024	0.0009
35	0.0033	0.0024	0.0009
36	0.0033	0.0024	0.0009
37	0.0033	0.0024	0.0009
38	0.0033	0.0024	0.0009
39	0.0033	0.0024	0.0009
40	0.0033	0.0024	0.0009
41	0.0034	0.0025	0.0009
42	0.0034	0.0025	0.0009
43	0.0034	0.0025	0.0009
44	0.0034	0.0025	0.0009
45	0.0034	0.0025	0.0009
46	0.0034	0.0025	0.0009
47	0.0034	0.0025	0.0009
48	0.0035	0.0025	0.0009
49	0.0035	0.0025	0.0009
50	0.0035	0.0025	0.0009
51	0.0035	0.0026	0.0009
52	0.0035	0.0026	0.0009

53	0.0035	0.0026	0.0010
54	0.0035	0.0026	0.0010
55	0.0036	0.0026	0.0010
56	0.0036	0.0026	0.0010
57	0.0036	0.0026	0.0010
58	0.0036	0.0026	0.0010
59	0.0036	0.0027	0.0010
60	0.0036	0.0027	0.0010
61	0.0037	0.0027	0.0010
62	0.0037	0.0027	0.0010
63	0.0037	0.0027	0.0010
64	0.0037	0.0027	0.0010
65	0.0037	0.0027	0.0010
66	0.0037	0.0027	0.0010
67	0.0038	0.0028	0.0010
68	0.0038	0.0028	0.0010
69	0.0038	0.0028	0.0010
70	0.0038	0.0028	0.0010
71	0.0038	0.0028	0.0010
72	0.0039	0.0028	0.0010
73	0.0039	0.0028	0.0010
74	0.0039	0.0029	0.0010
75	0.0039	0.0029	0.0011
76	0.0039	0.0029	0.0011
77	0.0040	0.0029	0.0011
78	0.0040	0.0029	0.0011
79	0.0040	0.0029	0.0011
80	0.0040	0.0029	0.0011
81	0.0041	0.0030	0.0011
82	0.0041	0.0030	0.0011
83	0.0041	0.0030	0.0011
84	0.0041	0.0030	0.0011
85	0.0041	0.0030	0.0011
86	0.0042	0.0030	0.0011
87	0.0042	0.0031	0.0011
88	0.0042	0.0031	0.0011
89	0.0042	0.0031	0.0011
90	0.0043	0.0031	0.0011
91	0.0043	0.0031	0.0012
92	0.0043	0.0032	0.0012
93	0.0043	0.0032	0.0012
94	0.0044	0.0032	0.0012
95	0.0044	0.0032	0.0012
96	0.0044	0.0032	0.0012
97	0.0045	0.0033	0.0012
98	0.0045	0.0033	0.0012
99	0.0045	0.0033	0.0012
100	0.0045	0.0033	0.0012
101	0.0046	0.0033	0.0012
102	0.0046	0.0034	0.0012

103	0.0046	0.0034	0.0012
104	0.0047	0.0034	0.0013
105	0.0047	0.0034	0.0013
106	0.0047	0.0035	0.0013
107	0.0048	0.0035	0.0013
108	0.0048	0.0035	0.0013
109	0.0048	0.0035	0.0013
110	0.0049	0.0036	0.0013
111	0.0049	0.0036	0.0013
112	0.0049	0.0036	0.0013
113	0.0050	0.0036	0.0013
114	0.0050	0.0037	0.0013
115	0.0051	0.0037	0.0014
116	0.0051	0.0037	0.0014
117	0.0052	0.0038	0.0014
118	0.0052	0.0038	0.0014
119	0.0052	0.0038	0.0014
120	0.0053	0.0039	0.0014
121	0.0053	0.0039	0.0014
122	0.0054	0.0039	0.0014
123	0.0054	0.0040	0.0015
124	0.0055	0.0040	0.0015
125	0.0055	0.0040	0.0015
126	0.0056	0.0041	0.0015
127	0.0056	0.0041	0.0015
128	0.0057	0.0041	0.0015
129	0.0057	0.0042	0.0015
130	0.0058	0.0042	0.0015
131	0.0058	0.0043	0.0016
132	0.0059	0.0043	0.0016
133	0.0060	0.0044	0.0016
134	0.0060	0.0044	0.0016
135	0.0061	0.0045	0.0016
136	0.0061	0.0045	0.0016
137	0.0062	0.0045	0.0017
138	0.0063	0.0046	0.0017
139	0.0064	0.0047	0.0017
140	0.0064	0.0047	0.0017
141	0.0065	0.0048	0.0018
142	0.0066	0.0048	0.0018
143	0.0067	0.0049	0.0018
144	0.0067	0.0049	0.0018
145	0.0074	0.0054	0.0020
146	0.0074	0.0054	0.0020
147	0.0076	0.0055	0.0020
148	0.0076	0.0056	0.0020
149	0.0078	0.0057	0.0021
150	0.0078	0.0057	0.0021
151	0.0080	0.0058	0.0021
152	0.0081	0.0059	0.0022

153	0.0082	0.0060	0.0022
154	0.0083	0.0061	0.0022
155	0.0085	0.0062	0.0023
156	0.0086	0.0063	0.0023
157	0.0087	0.0064	0.0023
158	0.0088	0.0065	0.0024
159	0.0090	0.0066	0.0024
160	0.0091	0.0067	0.0025
161	0.0094	0.0068	0.0025
162	0.0095	0.0069	0.0025
163	0.0097	0.0071	0.0026
164	0.0099	0.0072	0.0027
165	0.0101	0.0074	0.0027
166	0.0103	0.0075	0.0028
167	0.0106	0.0077	0.0028
168	0.0108	0.0079	0.0029
169	0.0111	0.0081	0.0030
170	0.0113	0.0083	0.0030
171	0.0117	0.0086	0.0031
172	0.0119	0.0087	0.0032
173	0.0124	0.0091	0.0033
174	0.0127	0.0093	0.0034
175	0.0132	0.0097	0.0035
176	0.0135	0.0099	0.0036
177	0.0142	0.0104	0.0038
178	0.0145	0.0106	0.0039
179	0.0153	0.0112	0.0041
180	0.0158	0.0115	0.0042
181	0.0168	0.0123	0.0045
182	0.0174	0.0127	0.0047
183	0.0188	0.0137	0.0050
184	0.0196	0.0143	0.0053
185	0.0156	0.0114	0.0042
186	0.0166	0.0121	0.0045
187	0.0192	0.0141	0.0052
188	0.0210	0.0154	0.0056
189	0.0261	0.0191	0.0070
190	0.0301	0.0220	0.0081
191	0.0457	0.0334	0.0123
192	0.0663	0.0336	0.0326
193	0.2867	0.0336	0.2531
194	0.0359	0.0263	0.0097
195	0.0232	0.0170	0.0062
196	0.0178	0.0130	0.0048
197	0.0205	0.0150	0.0055
198	0.0181	0.0132	0.0049
199	0.0163	0.0119	0.0044
200	0.0149	0.0109	0.0040
201	0.0138	0.0101	0.0037
202	0.0129	0.0094	0.0035

203	0.0122	0.0089	0.0033
204	0.0115	0.0084	0.0031
205	0.0109	0.0080	0.0029
206	0.0104	0.0076	0.0028
207	0.0100	0.0073	0.0027
208	0.0096	0.0070	0.0026
209	0.0093	0.0068	0.0025
210	0.0089	0.0065	0.0024
211	0.0086	0.0063	0.0023
212	0.0084	0.0061	0.0023
213	0.0081	0.0059	0.0022
214	0.0079	0.0058	0.0021
215	0.0077	0.0056	0.0021
216	0.0075	0.0055	0.0020
217	0.0068	0.0050	0.0018
218	0.0066	0.0048	0.0018
219	0.0065	0.0047	0.0017
220	0.0063	0.0046	0.0017
221	0.0062	0.0045	0.0017
222	0.0060	0.0044	0.0016
223	0.0059	0.0043	0.0016
224	0.0058	0.0042	0.0016
225	0.0057	0.0042	0.0015
226	0.0056	0.0041	0.0015
227	0.0055	0.0040	0.0015
228	0.0054	0.0039	0.0014
229	0.0053	0.0039	0.0014
230	0.0052	0.0038	0.0014
231	0.0051	0.0037	0.0014
232	0.0050	0.0037	0.0014
233	0.0050	0.0036	0.0013
234	0.0049	0.0036	0.0013
235	0.0048	0.0035	0.0013
236	0.0048	0.0035	0.0013
237	0.0047	0.0034	0.0013
238	0.0046	0.0034	0.0012
239	0.0046	0.0033	0.0012
240	0.0045	0.0033	0.0012
241	0.0044	0.0032	0.0012
242	0.0044	0.0032	0.0012
243	0.0043	0.0032	0.0012
244	0.0043	0.0031	0.0012
245	0.0042	0.0031	0.0011
246	0.0042	0.0031	0.0011
247	0.0041	0.0030	0.0011
248	0.0041	0.0030	0.0011
249	0.0040	0.0030	0.0011
250	0.0040	0.0029	0.0011
251	0.0040	0.0029	0.0011
252	0.0039	0.0029	0.0011

253	0.0039	0.0028	0.0010
254	0.0038	0.0028	0.0010
255	0.0038	0.0028	0.0010
256	0.0038	0.0027	0.0010
257	0.0037	0.0027	0.0010
258	0.0037	0.0027	0.0010
259	0.0037	0.0027	0.0010
260	0.0036	0.0026	0.0010
261	0.0036	0.0026	0.0010
262	0.0036	0.0026	0.0010
263	0.0035	0.0026	0.0009
264	0.0035	0.0026	0.0009
265	0.0035	0.0025	0.0009
266	0.0034	0.0025	0.0009
267	0.0034	0.0025	0.0009
268	0.0034	0.0025	0.0009
269	0.0034	0.0025	0.0009
270	0.0033	0.0024	0.0009
271	0.0033	0.0024	0.0009
272	0.0033	0.0024	0.0009
273	0.0032	0.0024	0.0009
274	0.0032	0.0024	0.0009
275	0.0032	0.0023	0.0009
276	0.0032	0.0023	0.0009
277	0.0032	0.0023	0.0008
278	0.0031	0.0023	0.0008
279	0.0031	0.0023	0.0008
280	0.0031	0.0023	0.0008
281	0.0031	0.0022	0.0008
282	0.0030	0.0022	0.0008
283	0.0030	0.0022	0.0008
284	0.0030	0.0022	0.0008
285	0.0030	0.0022	0.0008
286	0.0030	0.0022	0.0008
287	0.0029	0.0022	0.0008
288	0.0029	0.0021	0.0008

Total soil rain loss = 1.40(In)
Total effective rainfall = 0.77(In)
Peak flow rate in flood hydrograph = 18.37(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 5.0 10.0 15.0 20.0

0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.01	Q				
0+15	0.0003	0.03	Q				
0+20	0.0008	0.07	Q				
0+25	0.0016	0.12	Q				
0+30	0.0027	0.15	Q				
0+35	0.0039	0.17	Q				
0+40	0.0052	0.19	Q				
0+45	0.0066	0.20	Q				
0+50	0.0081	0.21	Q				
0+55	0.0096	0.22	Q				
1+ 0	0.0112	0.23	Q				
1+ 5	0.0128	0.24	Q				
1+10	0.0145	0.24	Q				
1+15	0.0162	0.25	Q				
1+20	0.0180	0.25	Q				
1+25	0.0197	0.26	Q				
1+30	0.0215	0.26	Q				
1+35	0.0234	0.26	Q				
1+40	0.0252	0.27	Q				
1+45	0.0271	0.27	Q				
1+50	0.0290	0.27	Q				
1+55	0.0309	0.28	Q				
2+ 0	0.0328	0.28	Q				
2+ 5	0.0347	0.28	Q				
2+10	0.0367	0.28	Q				
2+15	0.0387	0.29	Q				
2+20	0.0406	0.29	Q				
2+25	0.0426	0.29	Q				
2+30	0.0446	0.29	Q				
2+35	0.0467	0.29	Q				
2+40	0.0487	0.29	QV				
2+45	0.0507	0.30	QV				
2+50	0.0528	0.30	QV				
2+55	0.0548	0.30	QV				
3+ 0	0.0569	0.30	QV				
3+ 5	0.0590	0.30	QV				
3+10	0.0611	0.30	QV				
3+15	0.0632	0.31	QV				
3+20	0.0653	0.31	QV				
3+25	0.0674	0.31	QV				
3+30	0.0696	0.31	QV				
3+35	0.0717	0.31	QV				
3+40	0.0739	0.31	QV				
3+45	0.0760	0.31	QV				
3+50	0.0782	0.31	QV				
3+55	0.0804	0.32	QV				
4+ 0	0.0825	0.32	QV				
4+ 5	0.0847	0.32	QV				

4+10	0.0869	0.32	QV	|	|	|	|
4+15	0.0891	0.32	QV	|	|	|	|
4+20	0.0914	0.32	QV	|	|	|	|
4+25	0.0936	0.32	QV	|	|	|	|
4+30	0.0958	0.32	Q V	|	|	|	|
4+35	0.0981	0.33	Q V	|	|	|	|
4+40	0.1003	0.33	Q V	|	|	|	|
4+45	0.1026	0.33	Q V	|	|	|	|
4+50	0.1049	0.33	Q V	|	|	|	|
4+55	0.1071	0.33	Q V	|	|	|	|
5+ 0	0.1094	0.33	Q V	|	|	|	|
5+ 5	0.1117	0.33	Q V	|	|	|	|
5+10	0.1141	0.34	Q V	|	|	|	|
5+15	0.1164	0.34	Q V	|	|	|	|
5+20	0.1187	0.34	Q V	|	|	|	|
5+25	0.1211	0.34	Q V	|	|	|	|
5+30	0.1234	0.34	Q V	|	|	|	|
5+35	0.1258	0.34	Q V	|	|	|	|
5+40	0.1282	0.35	Q V	|	|	|	|
5+45	0.1306	0.35	Q V	|	|	|	|
5+50	0.1330	0.35	Q V	|	|	|	|
5+55	0.1354	0.35	Q V	|	|	|	|
6+ 0	0.1378	0.35	Q V	|	|	|	|
6+ 5	0.1402	0.35	Q V	|	|	|	|
6+10	0.1427	0.36	Q V	|	|	|	|
6+15	0.1452	0.36	Q V	|	|	|	|
6+20	0.1476	0.36	Q V	|	|	|	|
6+25	0.1501	0.36	Q V	|	|	|	|
6+30	0.1526	0.36	Q V	|	|	|	|
6+35	0.1551	0.36	Q V	|	|	|	|
6+40	0.1576	0.37	Q V	|	|	|	|
6+45	0.1602	0.37	Q V	|	|	|	|
6+50	0.1627	0.37	Q V	|	|	|	|
6+55	0.1653	0.37	Q V	|	|	|	|
7+ 0	0.1679	0.37	Q V	|	|	|	|
7+ 5	0.1705	0.38	Q V	|	|	|	|
7+10	0.1731	0.38	Q V	|	|	|	|
7+15	0.1757	0.38	Q V	|	|	|	|
7+20	0.1783	0.38	Q V	|	|	|	|
7+25	0.1810	0.38	Q V	|	|	|	|
7+30	0.1836	0.39	Q V	|	|	|	|
7+35	0.1863	0.39	Q V	|	|	|	|
7+40	0.1890	0.39	Q V	|	|	|	|
7+45	0.1917	0.39	Q V	|	|	|	|
7+50	0.1944	0.40	Q V	|	|	|	|
7+55	0.1972	0.40	Q V	|	|	|	|
8+ 0	0.1999	0.40	Q V	|	|	|	|
8+ 5	0.2027	0.40	Q V	|	|	|	|
8+10	0.2055	0.41	Q V	|	|	|	|
8+15	0.2083	0.41	Q V	|	|	|	|

8+20	0.2111	0.41	Q	V	|	|	|	|
8+25	0.2140	0.41	Q	V	|	|	|	|
8+30	0.2168	0.42	Q	V	|	|	|	|
8+35	0.2197	0.42	Q	V	|	|	|	|
8+40	0.2226	0.42	Q	V	|	|	|	|
8+45	0.2255	0.42	Q	V	|	|	|	|
8+50	0.2284	0.43	Q	V	|	|	|	|
8+55	0.2314	0.43	Q	V	|	|	|	|
9+ 0	0.2344	0.43	Q	V	|	|	|	|
9+ 5	0.2374	0.43	Q	V	|	|	|	|
9+10	0.2404	0.44	Q	V	|	|	|	|
9+15	0.2434	0.44	Q	V	|	|	|	|
9+20	0.2465	0.44	Q	V	|	|	|	|
9+25	0.2495	0.45	Q	V	|	|	|	|
9+30	0.2526	0.45	Q	V	|	|	|	|
9+35	0.2558	0.45	Q	V	|	|	|	|
9+40	0.2589	0.46	Q	V	|	|	|	|
9+45	0.2621	0.46	Q	V	|	|	|	|
9+50	0.2653	0.46	Q	V	|	|	|	|
9+55	0.2685	0.47	Q	V	|	|	|	|
10+ 0	0.2717	0.47	Q	V	|	|	|	|
10+ 5	0.2750	0.47	Q	V	|	|	|	|
10+10	0.2783	0.48	Q	V	|	|	|	|
10+15	0.2816	0.48	Q	V	|	|	|	|
10+20	0.2849	0.49	Q	V	|	|	|	|
10+25	0.2883	0.49	Q	V	|	|	|	|
10+30	0.2917	0.49	Q	V	|	|	|	|
10+35	0.2951	0.50	Q	V	|	|	|	|
10+40	0.2986	0.50	|Q	V	|	|	|	|
10+45	0.3021	0.51	|Q	V	|	|	|	|
10+50	0.3056	0.51	|Q	V	|	|	|	|
10+55	0.3092	0.52	|Q	V	|	|	|	|
11+ 0	0.3127	0.52	|Q	V	|	|	|	|
11+ 5	0.3164	0.53	|Q	V	|	|	|	|
11+10	0.3200	0.53	|Q	V	|	|	|	|
11+15	0.3237	0.54	|Q	V	|	|	|	|
11+20	0.3274	0.54	|Q	V	|	|	|	|
11+25	0.3312	0.55	|Q	V	|	|	|	|
11+30	0.3350	0.55	|Q	V	|	|	|	|
11+35	0.3388	0.56	|Q	V	|	|	|	|
11+40	0.3427	0.56	|Q	V	|	|	|	|
11+45	0.3466	0.57	|Q	V	|	|	|	|
11+50	0.3506	0.57	|Q	V	|	|	|	|
11+55	0.3546	0.58	|Q	V	|	|	|	|
12+ 0	0.3586	0.59	|Q	V	|	|	|	|
12+ 5	0.3627	0.59	|Q	V	|	|	|	|
12+10	0.3668	0.60	|Q	V	|	|	|	|
12+15	0.3711	0.61	|Q	V	|	|	|	|
12+20	0.3754	0.63	|Q	V	|	|	|	|
12+25	0.3798	0.64	|Q	V	|	|	|	|

12+30	0.3844	0.66	Q V				
12+35	0.3890	0.67	Q V				
12+40	0.3937	0.68	Q V				
12+45	0.3984	0.69	Q V				
12+50	0.4033	0.70	Q V				
12+55	0.4082	0.71	Q V				
13+ 0	0.4132	0.72	Q V				
13+ 5	0.4182	0.74	Q V				
13+10	0.4234	0.75	Q V				
13+15	0.4286	0.76	Q V				
13+20	0.4339	0.77	Q V				
13+25	0.4393	0.78	Q V				
13+30	0.4448	0.80	Q V				
13+35	0.4504	0.81	Q V				
13+40	0.4561	0.82	Q V				
13+45	0.4618	0.84	Q V				
13+50	0.4677	0.85	Q V				
13+55	0.4737	0.87	Q V				
14+ 0	0.4798	0.89	Q V				
14+ 5	0.4860	0.90	Q V				
14+10	0.4924	0.92	Q V				
14+15	0.4989	0.94	Q V				
14+20	0.5055	0.96	Q V				
14+25	0.5123	0.99	Q V				
14+30	0.5193	1.01	Q V				
14+35	0.5264	1.03	Q V				
14+40	0.5337	1.06	Q V				
14+45	0.5412	1.09	Q V				
14+50	0.5489	1.12	Q V				
14+55	0.5569	1.15	Q V				
15+ 0	0.5651	1.19	Q V				
15+ 5	0.5736	1.23	Q V				
15+10	0.5823	1.28	Q V				
15+15	0.5915	1.32	Q V				
15+20	0.6010	1.38	Q V				
15+25	0.6109	1.44	Q V				
15+30	0.6211	1.49	Q V				
15+35	0.6316	1.53	Q V				
15+40	0.6422	1.54	Q V				
15+45	0.6529	1.55	Q V				
15+50	0.6641	1.62	Q V				
15+55	0.6762	1.76	Q V				
16+ 0	0.6902	2.04	Q V				
16+ 5	0.7133	3.34	Q V				
16+10	0.7551	6.08	Q V				
16+15	0.8222	9.74	V Q				
16+20	0.9389	16.94	V			Q	
16+25	1.0654	18.37	V			Q	
16+30	1.1565	13.23	V Q				
16+35	1.2219	9.49	Q V				

16+40	1.2727	7.39	| Q |	| |	| V |	| |
16+45	1.3158	6.26	| Q |	| |	| V |	| |
16+50	1.3524	5.31	| Q |	| |	| V |	| |
16+55	1.3843	4.62	| Q |	| |	| V |	| |
17+ 0	1.4122	4.05	| Q |	| |	| V |	| |
17+ 5	1.4372	3.63	| Q |	| |	| V |	| |
17+10	1.4602	3.35	| Q |	| |	| | V |	| |
17+15	1.4811	3.03	| Q |	| |	| | V |	| |
17+20	1.4995	2.68	| Q |	| |	| | V |	| |
17+25	1.5162	2.42	| Q |	| |	| | V |	| |
17+30	1.5320	2.29	| Q |	| |	| | V |	| |
17+35	1.5465	2.12	| Q |	| |	| | V |	| |
17+40	1.5603	1.99	| Q |	| |	| | V |	| |
17+45	1.5729	1.83	| Q |	| |	| | V |	| |
17+50	1.5846	1.70	| Q |	| |	| | V |	| |
17+55	1.5958	1.63	| Q |	| |	| | V |	| |
18+ 0	1.6061	1.49	| Q |	| |	| | V |	| |
18+ 5	1.6159	1.43	| Q |	| |	| | V |	| |
18+10	1.6249	1.31	| Q |	| |	| | V |	| |
18+15	1.6333	1.21	| Q |	| |	| | V |	| |
18+20	1.6412	1.14	| Q |	| |	| | V |	| |
18+25	1.6481	1.01	| Q |	| |	| | V |	| |
18+30	1.6547	0.96	|Q |	| |	| | V |	| |
18+35	1.6613	0.96	|Q |	| |	| | V |	| |
18+40	1.6679	0.95	|Q |	| |	| | V |	| |
18+45	1.6743	0.93	|Q |	| |	| | V |	| |
18+50	1.6805	0.91	|Q |	| |	| | V |	| |
18+55	1.6866	0.88	|Q |	| |	| | V |	| |
19+ 0	1.6921	0.80	|Q |	| |	| | V |	| |
19+ 5	1.6972	0.74	|Q |	| |	| | V |	| |
19+10	1.7022	0.72	|Q |	| |	| | V |	| |
19+15	1.7066	0.64	|Q |	| |	| | V |	| |
19+20	1.7105	0.57	|Q |	| |	| | V |	| |
19+25	1.7143	0.56	|Q |	| |	| | V |	| |
19+30	1.7181	0.54	|Q |	| |	| | V |	| |
19+35	1.7217	0.53	|Q |	| |	| | V |	| |
19+40	1.7253	0.52	|Q |	| |	| | V |	| |
19+45	1.7289	0.51	|Q |	| |	| | V |	| |
19+50	1.7323	0.50	|Q |	| |	| | V |	| |
19+55	1.7357	0.49	| Q |	| |	| | V |	| |
20+ 0	1.7390	0.48	| Q |	| |	| | V |	| |
20+ 5	1.7423	0.47	| Q |	| |	| | V |	| |
20+10	1.7455	0.47	| Q |	| |	| | V |	| |
20+15	1.7487	0.46	| Q |	| |	| | V |	| |
20+20	1.7518	0.45	| Q |	| |	| | V |	| |
20+25	1.7549	0.45	| Q |	| |	| | V |	| |
20+30	1.7579	0.44	| Q |	| |	| | V |	| |
20+35	1.7609	0.43	| Q |	| |	| | V |	| |
20+40	1.7638	0.43	| Q |	| |	| | V |	| |
20+45	1.7667	0.42	| Q |	| |	| | V |	| |

20+50	1.7696	0.42	Q	|	|	|	V |
20+55	1.7724	0.41	Q	|	|	|	V |
21+ 0	1.7752	0.41	Q	|	|	|	V |
21+ 5	1.7780	0.40	Q	|	|	|	V |
21+10	1.7807	0.40	Q	|	|	|	V |
21+15	1.7834	0.39	Q	|	|	|	V |
21+20	1.7860	0.39	Q	|	|	|	V |
21+25	1.7887	0.38	Q	|	|	|	V |
21+30	1.7913	0.38	Q	|	|	|	V |
21+35	1.7938	0.37	Q	|	|	|	V |
21+40	1.7964	0.37	Q	|	|	|	V |
21+45	1.7989	0.37	Q	|	|	|	V |
21+50	1.8014	0.36	Q	|	|	|	V |
21+55	1.8039	0.36	Q	|	|	|	V |
22+ 0	1.8063	0.35	Q	|	|	|	V |
22+ 5	1.8087	0.35	Q	|	|	|	V |
22+10	1.8111	0.35	Q	|	|	|	V |
22+15	1.8135	0.34	Q	|	|	|	V |
22+20	1.8159	0.34	Q	|	|	|	V |
22+25	1.8182	0.34	Q	|	|	|	V |
22+30	1.8205	0.34	Q	|	|	|	V |
22+35	1.8228	0.33	Q	|	|	|	V |
22+40	1.8251	0.33	Q	|	|	|	V |
22+45	1.8273	0.33	Q	|	|	|	V|
22+50	1.8295	0.32	Q	|	|	|	V|
22+55	1.8318	0.32	Q	|	|	|	V|
23+ 0	1.8339	0.32	Q	|	|	|	V|
23+ 5	1.8361	0.32	Q	|	|	|	V|
23+10	1.8383	0.31	Q	|	|	|	V|
23+15	1.8404	0.31	Q	|	|	|	V|
23+20	1.8425	0.31	Q	|	|	|	V|
23+25	1.8447	0.31	Q	|	|	|	V|
23+30	1.8468	0.30	Q	|	|	|	V|
23+35	1.8488	0.30	Q	|	|	|	V|
23+40	1.8509	0.30	Q	|	|	|	V|
23+45	1.8529	0.30	Q	|	|	|	V|
23+50	1.8550	0.29	Q	|	|	|	V|
23+55	1.8570	0.29	Q	|	|	|	V|
24+ 0	1.8590	0.29	Q	|	|	|	V|

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

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Study date 08/30/22

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

Program License Serial Number 6277

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
10 YR STORM UNIT HYDROGRAPH, PRE CONDITION
AREA D

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
25.29	1	0.60
Rainfall data for year 2		
25.29	6	0.76
Rainfall data for year 2		
25.29	24	1.30

Rainfall data for year 100

```
            25.29            1            1.08
------------------------------------------------------------------------
Rainfall data for year 100
            25.29            6            2.01
------------------------------------------------------------------------
Rainfall data for year 100
            25.29           24            3.42
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 78.0      78.0         25.29      1.000     0.404    1.000    0.404

Area-averaged adjusted loss rate Fm (In/Hr) =  0.404

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
    25.29   1.000         78.0      78.0       2.82     0.269

Area-averaged catchment yield fraction, Y =  0.269
Area-averaged low loss fraction, Yb =  0.731
User entry of time of concentration  =   0.450 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =      25.29(Ac.)
Catchment Lag time =   0.360 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 23.1481
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.404(In/Hr)
Average low loss rate fraction (Yb) = 0.731 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.287(In)
Computed peak 30-minute rainfall =  0.491(In)
Specified peak 1-hour rainfall =  0.605(In)
Computed peak 3-hour rainfall =  0.955(In)
Specified peak 6-hour rainfall =  1.273(In)
Specified peak 24-hour rainfall =  2.172(In)


Rainfall depth area reduction factors:
Using a total area of      25.29(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999     Adjusted rainfall =  0.287(In)
30-minute factor = 0.999    Adjusted rainfall =  0.491(In)
```

1-hour factor = 0.999 Adjusted rainfall = 0.604(In)
3-hour factor = 1.000 Adjusted rainfall = 0.955(In)
6-hour factor = 1.000 Adjusted rainfall = 1.273(In)
24-hour factor = 1.000 Adjusted rainfall = 2.172(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 = 305.85 (CFS))	
1	1.214	3.714
2	5.764	13.915
3	16.027	31.389
4	36.219	61.757
5	51.994	48.247
6	61.887	30.259
7	68.547	20.370
8	73.668	15.663
9	77.701	12.333
10	80.906	9.804
11	83.544	8.070
12	85.853	7.060
13	87.848	6.101
14	89.450	4.900
15	90.796	4.117
16	92.021	3.746
17	93.104	3.312
18	94.064	2.937
19	94.860	2.435
20	95.618	2.318
21	96.238	1.896
22	96.825	1.795
23	97.275	1.376
24	97.686	1.258
25	97.971	0.872
26	98.203	0.708
27	98.461	0.790
28	98.739	0.850
29	99.017	0.850
30	99.294	0.850
31	99.534	0.732
32	99.682	0.454
33	99.827	0.442
34	100.000	0.221

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)

1	0.2867	0.2867
2	0.3530	0.0663
3	0.3987	0.0457
4	0.4346	0.0359
5	0.4647	0.0301
6	0.4908	0.0261
7	0.5141	0.0232
8	0.5351	0.0210
9	0.5543	0.0192
10	0.5721	0.0178
11	0.5887	0.0166
12	0.6043	0.0156
13	0.6248	0.0205
14	0.6443	0.0196
15	0.6631	0.0188
16	0.6811	0.0181
17	0.6985	0.0174
18	0.7154	0.0168
19	0.7316	0.0163
20	0.7474	0.0158
21	0.7628	0.0153
22	0.7777	0.0149
23	0.7922	0.0145
24	0.8063	0.0142
25	0.8202	0.0138
26	0.8336	0.0135
27	0.8468	0.0132
28	0.8598	0.0129
29	0.8724	0.0126
30	0.8848	0.0124
31	0.8970	0.0122
32	0.9089	0.0119
33	0.9206	0.0117
34	0.9321	0.0115
35	0.9434	0.0113
36	0.9546	0.0111
37	0.9655	0.0109
38	0.9762	0.0108
39	0.9868	0.0106
40	0.9972	0.0104
41	1.0075	0.0103
42	1.0177	0.0101
43	1.0277	0.0100
44	1.0375	0.0099
45	1.0472	0.0097
46	1.0568	0.0096
47	1.0663	0.0095
48	1.0757	0.0094
49	1.0849	0.0093
50	1.0941	0.0091

51	1.1031	0.0090
52	1.1121	0.0089
53	1.1209	0.0088
54	1.1296	0.0087
55	1.1383	0.0086
56	1.1468	0.0086
57	1.1553	0.0085
58	1.1636	0.0084
59	1.1719	0.0083
60	1.1801	0.0082
61	1.1883	0.0081
62	1.1963	0.0081
63	1.2043	0.0080
64	1.2122	0.0079
65	1.2200	0.0078
66	1.2278	0.0078
67	1.2355	0.0077
68	1.2431	0.0076
69	1.2507	0.0076
70	1.2582	0.0075
71	1.2656	0.0074
72	1.2730	0.0074
73	1.2798	0.0068
74	1.2865	0.0067
75	1.2932	0.0067
76	1.2998	0.0066
77	1.3064	0.0066
78	1.3129	0.0065
79	1.3193	0.0065
80	1.3257	0.0064
81	1.3321	0.0064
82	1.3384	0.0063
83	1.3447	0.0063
84	1.3509	0.0062
85	1.3571	0.0062
86	1.3632	0.0061
87	1.3693	0.0061
88	1.3754	0.0060
89	1.3814	0.0060
90	1.3873	0.0060
91	1.3932	0.0059
92	1.3991	0.0059
93	1.4050	0.0058
94	1.4108	0.0058
95	1.4165	0.0058
96	1.4223	0.0057
97	1.4280	0.0057
98	1.4336	0.0057
99	1.4392	0.0056
100	1.4448	0.0056

101	1.4504	0.0056
102	1.4559	0.0055
103	1.4614	0.0055
104	1.4668	0.0055
105	1.4722	0.0054
106	1.4776	0.0054
107	1.4830	0.0054
108	1.4883	0.0053
109	1.4936	0.0053
110	1.4989	0.0053
111	1.5041	0.0052
112	1.5093	0.0052
113	1.5145	0.0052
114	1.5197	0.0052
115	1.5248	0.0051
116	1.5299	0.0051
117	1.5350	0.0051
118	1.5400	0.0050
119	1.5450	0.0050
120	1.5500	0.0050
121	1.5550	0.0050
122	1.5599	0.0049
123	1.5648	0.0049
124	1.5697	0.0049
125	1.5746	0.0049
126	1.5794	0.0048
127	1.5842	0.0048
128	1.5890	0.0048
129	1.5938	0.0048
130	1.5986	0.0048
131	1.6033	0.0047
132	1.6080	0.0047
133	1.6127	0.0047
134	1.6174	0.0047
135	1.6220	0.0046
136	1.6266	0.0046
137	1.6312	0.0046
138	1.6358	0.0046
139	1.6404	0.0046
140	1.6449	0.0045
141	1.6494	0.0045
142	1.6539	0.0045
143	1.6584	0.0045
144	1.6628	0.0045
145	1.6673	0.0044
146	1.6717	0.0044
147	1.6761	0.0044
148	1.6805	0.0044
149	1.6849	0.0044
150	1.6892	0.0043

151	1.6936	0.0043
152	1.6979	0.0043
153	1.7022	0.0043
154	1.7064	0.0043
155	1.7107	0.0043
156	1.7150	0.0042
157	1.7192	0.0042
158	1.7234	0.0042
159	1.7276	0.0042
160	1.7318	0.0042
161	1.7359	0.0042
162	1.7401	0.0041
163	1.7442	0.0041
164	1.7483	0.0041
165	1.7524	0.0041
166	1.7565	0.0041
167	1.7606	0.0041
168	1.7646	0.0041
169	1.7687	0.0040
170	1.7727	0.0040
171	1.7767	0.0040
172	1.7807	0.0040
173	1.7847	0.0040
174	1.7887	0.0040
175	1.7926	0.0040
176	1.7966	0.0039
177	1.8005	0.0039
178	1.8044	0.0039
179	1.8083	0.0039
180	1.8122	0.0039
181	1.8161	0.0039
182	1.8199	0.0039
183	1.8238	0.0038
184	1.8276	0.0038
185	1.8314	0.0038
186	1.8352	0.0038
187	1.8390	0.0038
188	1.8428	0.0038
189	1.8466	0.0038
190	1.8504	0.0038
191	1.8541	0.0037
192	1.8578	0.0037
193	1.8616	0.0037
194	1.8653	0.0037
195	1.8690	0.0037
196	1.8727	0.0037
197	1.8763	0.0037
198	1.8800	0.0037
199	1.8837	0.0037
200	1.8873	0.0036

201	1.8909	0.0036
202	1.8946	0.0036
203	1.8982	0.0036
204	1.9018	0.0036
205	1.9054	0.0036
206	1.9089	0.0036
207	1.9125	0.0036
208	1.9161	0.0036
209	1.9196	0.0035
210	1.9231	0.0035
211	1.9267	0.0035
212	1.9302	0.0035
213	1.9337	0.0035
214	1.9372	0.0035
215	1.9407	0.0035
216	1.9441	0.0035
217	1.9476	0.0035
218	1.9511	0.0035
219	1.9545	0.0034
220	1.9579	0.0034
221	1.9614	0.0034
222	1.9648	0.0034
223	1.9682	0.0034
224	1.9716	0.0034
225	1.9750	0.0034
226	1.9783	0.0034
227	1.9817	0.0034
228	1.9851	0.0034
229	1.9884	0.0034
230	1.9918	0.0033
231	1.9951	0.0033
232	1.9984	0.0033
233	2.0017	0.0033
234	2.0050	0.0033
235	2.0083	0.0033
236	2.0116	0.0033
237	2.0149	0.0033
238	2.0182	0.0033
239	2.0215	0.0033
240	2.0247	0.0033
241	2.0280	0.0032
242	2.0312	0.0032
243	2.0344	0.0032
244	2.0377	0.0032
245	2.0409	0.0032
246	2.0441	0.0032
247	2.0473	0.0032
248	2.0505	0.0032
249	2.0536	0.0032
250	2.0568	0.0032

251	2.0600	0.0032
252	2.0631	0.0032
253	2.0663	0.0032
254	2.0694	0.0031
255	2.0726	0.0031
256	2.0757	0.0031
257	2.0788	0.0031
258	2.0819	0.0031
259	2.0851	0.0031
260	2.0882	0.0031
261	2.0912	0.0031
262	2.0943	0.0031
263	2.0974	0.0031
264	2.1005	0.0031
265	2.1035	0.0031
266	2.1066	0.0031
267	2.1096	0.0030
268	2.1127	0.0030
269	2.1157	0.0030
270	2.1187	0.0030
271	2.1218	0.0030
272	2.1248	0.0030
273	2.1278	0.0030
274	2.1308	0.0030
275	2.1338	0.0030
276	2.1368	0.0030
277	2.1398	0.0030
278	2.1427	0.0030
279	2.1457	0.0030
280	2.1487	0.0030
281	2.1516	0.0030
282	2.1546	0.0029
283	2.1575	0.0029
284	2.1604	0.0029
285	2.1634	0.0029
286	2.1663	0.0029
287	2.1692	0.0029
288	2.1721	0.0029

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0029	0.0021	0.0008
2	0.0029	0.0021	0.0008
3	0.0029	0.0021	0.0008
4	0.0029	0.0021	0.0008
5	0.0029	0.0022	0.0008
6	0.0030	0.0022	0.0008
7	0.0030	0.0022	0.0008

8	0.0030	0.0022	0.0008
9	0.0030	0.0022	0.0008
10	0.0030	0.0022	0.0008
11	0.0030	0.0022	0.0008
12	0.0030	0.0022	0.0008
13	0.0030	0.0022	0.0008
14	0.0030	0.0022	0.0008
15	0.0030	0.0022	0.0008
16	0.0031	0.0022	0.0008
17	0.0031	0.0022	0.0008
18	0.0031	0.0023	0.0008
19	0.0031	0.0023	0.0008
20	0.0031	0.0023	0.0008
21	0.0031	0.0023	0.0008
22	0.0031	0.0023	0.0008
23	0.0031	0.0023	0.0008
24	0.0031	0.0023	0.0008
25	0.0032	0.0023	0.0008
26	0.0032	0.0023	0.0009
27	0.0032	0.0023	0.0009
28	0.0032	0.0023	0.0009
29	0.0032	0.0023	0.0009
30	0.0032	0.0024	0.0009
31	0.0032	0.0024	0.0009
32	0.0032	0.0024	0.0009
33	0.0033	0.0024	0.0009
34	0.0033	0.0024	0.0009
35	0.0033	0.0024	0.0009
36	0.0033	0.0024	0.0009
37	0.0033	0.0024	0.0009
38	0.0033	0.0024	0.0009
39	0.0033	0.0024	0.0009
40	0.0033	0.0024	0.0009
41	0.0034	0.0025	0.0009
42	0.0034	0.0025	0.0009
43	0.0034	0.0025	0.0009
44	0.0034	0.0025	0.0009
45	0.0034	0.0025	0.0009
46	0.0034	0.0025	0.0009
47	0.0034	0.0025	0.0009
48	0.0035	0.0025	0.0009
49	0.0035	0.0025	0.0009
50	0.0035	0.0025	0.0009
51	0.0035	0.0026	0.0009
52	0.0035	0.0026	0.0009
53	0.0035	0.0026	0.0010
54	0.0035	0.0026	0.0010
55	0.0036	0.0026	0.0010
56	0.0036	0.0026	0.0010
57	0.0036	0.0026	0.0010

58	0.0036	0.0026	0.0010
59	0.0036	0.0027	0.0010
60	0.0036	0.0027	0.0010
61	0.0037	0.0027	0.0010
62	0.0037	0.0027	0.0010
63	0.0037	0.0027	0.0010
64	0.0037	0.0027	0.0010
65	0.0037	0.0027	0.0010
66	0.0037	0.0027	0.0010
67	0.0038	0.0028	0.0010
68	0.0038	0.0028	0.0010
69	0.0038	0.0028	0.0010
70	0.0038	0.0028	0.0010
71	0.0038	0.0028	0.0010
72	0.0039	0.0028	0.0010
73	0.0039	0.0028	0.0010
74	0.0039	0.0029	0.0010
75	0.0039	0.0029	0.0011
76	0.0039	0.0029	0.0011
77	0.0040	0.0029	0.0011
78	0.0040	0.0029	0.0011
79	0.0040	0.0029	0.0011
80	0.0040	0.0029	0.0011
81	0.0041	0.0030	0.0011
82	0.0041	0.0030	0.0011
83	0.0041	0.0030	0.0011
84	0.0041	0.0030	0.0011
85	0.0041	0.0030	0.0011
86	0.0042	0.0030	0.0011
87	0.0042	0.0031	0.0011
88	0.0042	0.0031	0.0011
89	0.0042	0.0031	0.0011
90	0.0043	0.0031	0.0011
91	0.0043	0.0031	0.0012
92	0.0043	0.0032	0.0012
93	0.0043	0.0032	0.0012
94	0.0044	0.0032	0.0012
95	0.0044	0.0032	0.0012
96	0.0044	0.0032	0.0012
97	0.0045	0.0033	0.0012
98	0.0045	0.0033	0.0012
99	0.0045	0.0033	0.0012
100	0.0045	0.0033	0.0012
101	0.0046	0.0033	0.0012
102	0.0046	0.0034	0.0012
103	0.0046	0.0034	0.0012
104	0.0047	0.0034	0.0013
105	0.0047	0.0034	0.0013
106	0.0047	0.0035	0.0013
107	0.0048	0.0035	0.0013

108	0.0048	0.0035	0.0013
109	0.0048	0.0035	0.0013
110	0.0049	0.0036	0.0013
111	0.0049	0.0036	0.0013
112	0.0049	0.0036	0.0013
113	0.0050	0.0036	0.0013
114	0.0050	0.0037	0.0013
115	0.0051	0.0037	0.0014
116	0.0051	0.0037	0.0014
117	0.0052	0.0038	0.0014
118	0.0052	0.0038	0.0014
119	0.0052	0.0038	0.0014
120	0.0053	0.0039	0.0014
121	0.0053	0.0039	0.0014
122	0.0054	0.0039	0.0014
123	0.0054	0.0040	0.0015
124	0.0055	0.0040	0.0015
125	0.0055	0.0040	0.0015
126	0.0056	0.0041	0.0015
127	0.0056	0.0041	0.0015
128	0.0057	0.0041	0.0015
129	0.0057	0.0042	0.0015
130	0.0058	0.0042	0.0015
131	0.0058	0.0043	0.0016
132	0.0059	0.0043	0.0016
133	0.0060	0.0044	0.0016
134	0.0060	0.0044	0.0016
135	0.0061	0.0045	0.0016
136	0.0061	0.0045	0.0016
137	0.0062	0.0045	0.0017
138	0.0063	0.0046	0.0017
139	0.0064	0.0047	0.0017
140	0.0064	0.0047	0.0017
141	0.0065	0.0048	0.0018
142	0.0066	0.0048	0.0018
143	0.0067	0.0049	0.0018
144	0.0067	0.0049	0.0018
145	0.0074	0.0054	0.0020
146	0.0074	0.0054	0.0020
147	0.0076	0.0055	0.0020
148	0.0076	0.0056	0.0020
149	0.0078	0.0057	0.0021
150	0.0078	0.0057	0.0021
151	0.0080	0.0058	0.0021
152	0.0081	0.0059	0.0022
153	0.0082	0.0060	0.0022
154	0.0083	0.0061	0.0022
155	0.0085	0.0062	0.0023
156	0.0086	0.0063	0.0023
157	0.0087	0.0064	0.0023

158	0.0088	0.0065	0.0024
159	0.0090	0.0066	0.0024
160	0.0091	0.0067	0.0025
161	0.0094	0.0068	0.0025
162	0.0095	0.0069	0.0025
163	0.0097	0.0071	0.0026
164	0.0099	0.0072	0.0027
165	0.0101	0.0074	0.0027
166	0.0103	0.0075	0.0028
167	0.0106	0.0077	0.0028
168	0.0108	0.0079	0.0029
169	0.0111	0.0081	0.0030
170	0.0113	0.0083	0.0030
171	0.0117	0.0086	0.0031
172	0.0119	0.0087	0.0032
173	0.0124	0.0091	0.0033
174	0.0126	0.0092	0.0034
175	0.0132	0.0096	0.0035
176	0.0135	0.0099	0.0036
177	0.0142	0.0104	0.0038
178	0.0145	0.0106	0.0039
179	0.0153	0.0112	0.0041
180	0.0158	0.0115	0.0042
181	0.0168	0.0123	0.0045
182	0.0174	0.0127	0.0047
183	0.0188	0.0137	0.0050
184	0.0196	0.0143	0.0053
185	0.0156	0.0114	0.0042
186	0.0166	0.0121	0.0045
187	0.0192	0.0141	0.0052
188	0.0210	0.0154	0.0056
189	0.0261	0.0191	0.0070
190	0.0301	0.0220	0.0081
191	0.0457	0.0334	0.0123
192	0.0663	0.0336	0.0327
193	0.2867	0.0336	0.2531
194	0.0359	0.0263	0.0097
195	0.0232	0.0170	0.0062
196	0.0178	0.0130	0.0048
197	0.0205	0.0150	0.0055
198	0.0181	0.0132	0.0049
199	0.0163	0.0119	0.0044
200	0.0149	0.0109	0.0040
201	0.0138	0.0101	0.0037
202	0.0129	0.0094	0.0035
203	0.0122	0.0089	0.0033
204	0.0115	0.0084	0.0031
205	0.0109	0.0080	0.0029
206	0.0104	0.0076	0.0028
207	0.0100	0.0073	0.0027

208	0.0096	0.0070	0.0026
209	0.0093	0.0068	0.0025
210	0.0089	0.0065	0.0024
211	0.0086	0.0063	0.0023
212	0.0084	0.0061	0.0023
213	0.0081	0.0059	0.0022
214	0.0079	0.0058	0.0021
215	0.0077	0.0056	0.0021
216	0.0075	0.0055	0.0020
217	0.0068	0.0050	0.0018
218	0.0066	0.0048	0.0018
219	0.0065	0.0047	0.0017
220	0.0063	0.0046	0.0017
221	0.0062	0.0045	0.0017
222	0.0060	0.0044	0.0016
223	0.0059	0.0043	0.0016
224	0.0058	0.0042	0.0016
225	0.0057	0.0042	0.0015
226	0.0056	0.0041	0.0015
227	0.0055	0.0040	0.0015
228	0.0054	0.0039	0.0014
229	0.0053	0.0039	0.0014
230	0.0052	0.0038	0.0014
231	0.0051	0.0037	0.0014
232	0.0050	0.0037	0.0014
233	0.0050	0.0036	0.0013
234	0.0049	0.0036	0.0013
235	0.0048	0.0035	0.0013
236	0.0048	0.0035	0.0013
237	0.0047	0.0034	0.0013
238	0.0046	0.0034	0.0012
239	0.0046	0.0033	0.0012
240	0.0045	0.0033	0.0012
241	0.0044	0.0032	0.0012
242	0.0044	0.0032	0.0012
243	0.0043	0.0032	0.0012
244	0.0043	0.0031	0.0012
245	0.0042	0.0031	0.0011
246	0.0042	0.0031	0.0011
247	0.0041	0.0030	0.0011
248	0.0041	0.0030	0.0011
249	0.0040	0.0030	0.0011
250	0.0040	0.0029	0.0011
251	0.0040	0.0029	0.0011
252	0.0039	0.0029	0.0011
253	0.0039	0.0028	0.0010
254	0.0038	0.0028	0.0010
255	0.0038	0.0028	0.0010
256	0.0038	0.0027	0.0010
257	0.0037	0.0027	0.0010

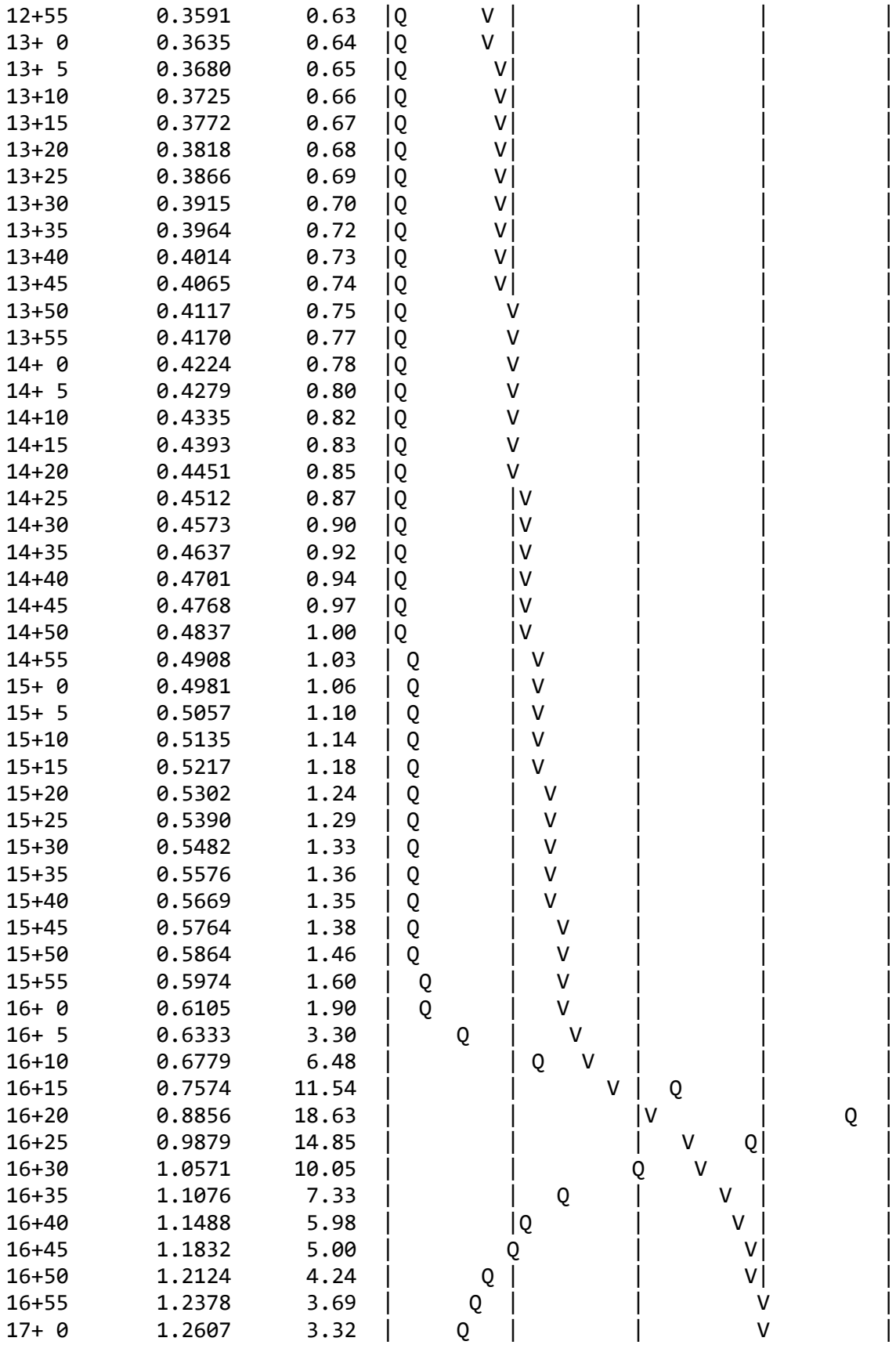
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      258              0.0037          0.0027              0.0010
      259              0.0037          0.0027              0.0010
      260              0.0036          0.0026              0.0010
      261              0.0036          0.0026              0.0010
      262              0.0036          0.0026              0.0010
      263              0.0035          0.0026              0.0009
      264              0.0035          0.0026              0.0009
      265              0.0035          0.0025              0.0009
      266              0.0034          0.0025              0.0009
      267              0.0034          0.0025              0.0009
      268              0.0034          0.0025              0.0009
      269              0.0034          0.0025              0.0009
      270              0.0033          0.0024              0.0009
      271              0.0033          0.0024              0.0009
      272              0.0033          0.0024              0.0009
      273              0.0032          0.0024              0.0009
      274              0.0032          0.0024              0.0009
      275              0.0032          0.0023              0.0009
      276              0.0032          0.0023              0.0009
      277              0.0032          0.0023              0.0008
      278              0.0031          0.0023              0.0008
      279              0.0031          0.0023              0.0008
      280              0.0031          0.0023              0.0008
      281              0.0031          0.0022              0.0008
      282              0.0030          0.0022              0.0008
      283              0.0030          0.0022              0.0008
      284              0.0030          0.0022              0.0008
      285              0.0030          0.0022              0.0008
      286              0.0030          0.0022              0.0008
      287              0.0029          0.0022              0.0008
      288              0.0029          0.0021              0.0008
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Total soil rain loss =      1.40(In)
      Total effective rainfall =      0.77(In)
      Peak flow rate in flood hydrograph =     18.63(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       0.0000      0.00  Q         |         |         |         |
  0+10       0.0001      0.01  Q         |         |         |         |
  0+15       0.0004      0.04  Q         |         |         |         |
  0+20       0.0010      0.09  Q         |         |         |         |
```

0+25	0.0018	0.12	Q				
0+30	0.0029	0.15	Q				
0+35	0.0040	0.17	Q				
0+40	0.0052	0.18	Q				
0+45	0.0065	0.19	Q				
0+50	0.0079	0.20	Q				
0+55	0.0093	0.20	Q				
1+ 0	0.0107	0.21	Q				
1+ 5	0.0122	0.22	Q				
1+10	0.0137	0.22	Q				
1+15	0.0153	0.22	Q				
1+20	0.0168	0.23	Q				
1+25	0.0184	0.23	Q				
1+30	0.0200	0.23	Q				
1+35	0.0217	0.24	Q				
1+40	0.0233	0.24	Q				
1+45	0.0250	0.24	Q				
1+50	0.0266	0.24	Q				
1+55	0.0283	0.25	Q				
2+ 0	0.0300	0.25	Q				
2+ 5	0.0318	0.25	Q				
2+10	0.0335	0.25	Q				
2+15	0.0352	0.25	Q				
2+20	0.0370	0.25	Q				
2+25	0.0387	0.26	Q				
2+30	0.0405	0.26	Q				
2+35	0.0423	0.26	QV				
2+40	0.0441	0.26	QV				
2+45	0.0458	0.26	QV				
2+50	0.0477	0.26	QV				
2+55	0.0495	0.26	QV				
3+ 0	0.0513	0.26	QV				
3+ 5	0.0531	0.26	QV				
3+10	0.0549	0.27	QV				
3+15	0.0568	0.27	QV				
3+20	0.0586	0.27	QV				
3+25	0.0605	0.27	QV				
3+30	0.0623	0.27	QV				
3+35	0.0642	0.27	QV				
3+40	0.0661	0.27	QV				
3+45	0.0680	0.27	QV				
3+50	0.0699	0.27	QV				
3+55	0.0718	0.28	QV				
4+ 0	0.0737	0.28	QV				
4+ 5	0.0756	0.28	QV				
4+10	0.0775	0.28	QV				
4+15	0.0794	0.28	QV				
4+20	0.0814	0.28	QV				
4+25	0.0833	0.28	Q V				
4+30	0.0853	0.28	Q V				

4+35	0.0872	0.28	Q	V	|	|	|
4+40	0.0892	0.29	Q	V	|	|	|
4+45	0.0912	0.29	Q	V	|	|	|
4+50	0.0932	0.29	Q	V	|	|	|
4+55	0.0952	0.29	Q	V	|	|	|
5+ 0	0.0972	0.29	Q	V	|	|	|
5+ 5	0.0992	0.29	Q	V	|	|	|
5+10	0.1012	0.29	Q	V	|	|	|
5+15	0.1032	0.30	Q	V	|	|	|
5+20	0.1053	0.30	Q	V	|	|	|
5+25	0.1073	0.30	Q	V	|	|	|
5+30	0.1094	0.30	Q	V	|	|	|
5+35	0.1115	0.30	Q	V	|	|	|
5+40	0.1135	0.30	Q	V	|	|	|
5+45	0.1156	0.30	Q	V	|	|	|
5+50	0.1177	0.30	Q	V	|	|	|
5+55	0.1198	0.31	Q	V	|	|	|
6+ 0	0.1219	0.31	Q	V	|	|	|
6+ 5	0.1241	0.31	Q	V	|	|	|
6+10	0.1262	0.31	Q	V	|	|	|
6+15	0.1284	0.31	Q	V	|	|	|
6+20	0.1305	0.31	Q	V	|	|	|
6+25	0.1327	0.32	Q	V	|	|	|
6+30	0.1349	0.32	Q	V	|	|	|
6+35	0.1371	0.32	Q	V	|	|	|
6+40	0.1393	0.32	Q	V	|	|	|
6+45	0.1415	0.32	Q	V	|	|	|
6+50	0.1437	0.32	Q	V	|	|	|
6+55	0.1460	0.33	Q	V	|	|	|
7+ 0	0.1482	0.33	Q	V	|	|	|
7+ 5	0.1505	0.33	Q	V	|	|	|
7+10	0.1528	0.33	Q	V	|	|	|
7+15	0.1551	0.33	Q	V	|	|	|
7+20	0.1574	0.33	Q	V	|	|	|
7+25	0.1597	0.34	Q	V	|	|	|
7+30	0.1620	0.34	Q	V	|	|	|
7+35	0.1644	0.34	Q	V	|	|	|
7+40	0.1667	0.34	Q	V	|	|	|
7+45	0.1691	0.34	Q	V	|	|	|
7+50	0.1715	0.35	Q	V	|	|	|
7+55	0.1739	0.35	Q	V	|	|	|
8+ 0	0.1763	0.35	Q	V	|	|	|
8+ 5	0.1787	0.35	Q	V	|	|	|
8+10	0.1811	0.35	Q	V	|	|	|
8+15	0.1836	0.36	Q	V	|	|	|
8+20	0.1861	0.36	Q	V	|	|	|
8+25	0.1885	0.36	Q	V	|	|	|
8+30	0.1911	0.36	Q	V	|	|	|
8+35	0.1936	0.37	Q	V	|	|	|
8+40	0.1961	0.37	Q	V	|	|	|

8+45	0.1987	0.37	Q	V	|	|	|	|
8+50	0.2012	0.37	Q	V	|	|	|	|
8+55	0.2038	0.38	Q	V	|	|	|	|
9+ 0	0.2064	0.38	Q	V	|	|	|	|
9+ 5	0.2090	0.38	Q	V	|	|	|	|
9+10	0.2117	0.38	Q	V	|	|	|	|
9+15	0.2143	0.39	Q	V	|	|	|	|
9+20	0.2170	0.39	Q	V	|	|	|	|
9+25	0.2197	0.39	Q	V	|	|	|	|
9+30	0.2224	0.39	Q	V	|	|	|	|
9+35	0.2251	0.40	Q	V	|	|	|	|
9+40	0.2279	0.40	Q	V	|	|	|	|
9+45	0.2307	0.40	Q	V	|	|	|	|
9+50	0.2335	0.41	Q	V	|	|	|	|
9+55	0.2363	0.41	Q	V	|	|	|	|
10+ 0	0.2391	0.41	Q	V	|	|	|	|
10+ 5	0.2420	0.42	Q	V	|	|	|	|
10+10	0.2449	0.42	Q	V	|	|	|	|
10+15	0.2478	0.42	Q	V	|	|	|	|
10+20	0.2507	0.43	Q	V	|	|	|	|
10+25	0.2537	0.43	Q	V	|	|	|	|
10+30	0.2567	0.43	Q	V	|	|	|	|
10+35	0.2597	0.44	Q	V	|	|	|	|
10+40	0.2627	0.44	Q	V	|	|	|	|
10+45	0.2658	0.44	Q	V	|	|	|	|
10+50	0.2688	0.45	Q	V	|	|	|	|
10+55	0.2720	0.45	Q	V	|	|	|	|
11+ 0	0.2751	0.46	Q	V	|	|	|	|
11+ 5	0.2783	0.46	Q	V	|	|	|	|
11+10	0.2815	0.47	Q	V	|	|	|	|
11+15	0.2847	0.47	Q	V	|	|	|	|
11+20	0.2880	0.47	Q	V	|	|	|	|
11+25	0.2913	0.48	Q	V	|	|	|	|
11+30	0.2946	0.48	Q	V	|	|	|	|
11+35	0.2980	0.49	Q	V	|	|	|	|
11+40	0.3014	0.49	Q	V	|	|	|	|
11+45	0.3048	0.50	Q	V	|	|	|	|
11+50	0.3083	0.50	|Q	V	|	|	|	|
11+55	0.3118	0.51	|Q	V	|	|	|	|
12+ 0	0.3154	0.52	|Q	V	|	|	|	|
12+ 5	0.3190	0.52	|Q	V	|	|	|	|
12+10	0.3226	0.53	|Q	V	|	|	|	|
12+15	0.3263	0.54	|Q	V	|	|	|	|
12+20	0.3302	0.56	|Q	V	|	|	|	|
12+25	0.3341	0.57	|Q	V	|	|	|	|
12+30	0.3381	0.58	|Q	V	|	|	|	|
12+35	0.3422	0.59	|Q	V	|	|	|	|
12+40	0.3463	0.60	|Q	V	|	|	|	|
12+45	0.3505	0.61	|Q	V	|	|	|	|
12+50	0.3548	0.62	|Q	V	|	|	|	|


12+55 0.3591 0.63
13+ 0 0.3635 0.64
13+ 5 0.3680 0.65
13+10 0.3725 0.66
13+15 0.3772 0.67
13+20 0.3818 0.68
13+25 0.3866 0.69
13+30 0.3915 0.70
13+35 0.3964 0.72
13+40 0.4014 0.73
13+45 0.4065 0.74
13+50 0.4117 0.75
13+55 0.4170 0.77
14+ 0 0.4224 0.78
14+ 5 0.4279 0.80
14+10 0.4335 0.82
14+15 0.4393 0.83
14+20 0.4451 0.85
14+25 0.4512 0.87
14+30 0.4573 0.90
14+35 0.4637 0.92
14+40 0.4701 0.94
14+45 0.4768 0.97
14+50 0.4837 1.00
14+55 0.4908 1.03
15+ 0 0.4981 1.06
15+ 5 0.5057 1.10
15+10 0.5135 1.14
15+15 0.5217 1.18
15+20 0.5302 1.24
15+25 0.5390 1.29
15+30 0.5482 1.33
15+35 0.5576 1.36
15+40 0.5669 1.35
15+45 0.5764 1.38
15+50 0.5864 1.46
15+55 0.5974 1.60
16+ 0 0.6105 1.90
16+ 5 0.6333 3.30
16+10 0.6779 6.48
16+15 0.7574 11.54
16+20 0.8856 18.63
16+25 0.9879 14.85
16+30 1.0571 10.05
16+35 1.1076 7.33
16+40 1.1488 5.98
16+45 1.1832 5.00
16+50 1.2124 4.24
16+55 1.2378 3.69
17+ 0 1.2607 3.32

17+ 5	1.2811	2.97	| Q |	|	|	V |
17+10	1.2990	2.59	| Q |	|	|	V |
17+15	1.3149	2.32	| Q |	|	|	V |
17+20	1.3297	2.15	| Q |	|	|	V |
17+25	1.3434	1.98	| Q |	|	|	V |
17+30	1.3560	1.83	| Q |	|	|	V |
17+35	1.3673	1.65	| Q |	|	|	V |
17+40	1.3782	1.57	| Q |	|	|	V |
17+45	1.3880	1.42	| Q |	|	|	V |
17+50	1.3973	1.35	| Q |	|	|	V |
17+55	1.4056	1.21	| Q |	|	|	V |
18+ 0	1.4134	1.14	| Q |	|	|	V |
18+ 5	1.4204	1.01	| Q |	|	|	V |
18+10	1.4269	0.95	|Q |	|	|	V |
18+15	1.4334	0.94	|Q |	|	|	V |
18+20	1.4398	0.92	|Q |	|	|	V |
18+25	1.4459	0.89	|Q |	|	|	V |
18+30	1.4519	0.87	|Q |	|	|	V |
18+35	1.4575	0.81	|Q |	|	|	V |
18+40	1.4624	0.72	|Q |	|	|	V |
18+45	1.4671	0.69	|Q |	|	|	V |
18+50	1.4714	0.61	|Q |	|	|	V |
18+55	1.4751	0.54	|Q |	|	|	V |
19+ 0	1.4787	0.53	|Q |	|	|	V |
19+ 5	1.4822	0.51	|Q |	|	|	V |
19+10	1.4857	0.50	Q |	|	|	V |
19+15	1.4890	0.49	Q |	|	|	V |
19+20	1.4923	0.48	Q |	|	|	V |
19+25	1.4955	0.47	Q |	|	|	V |
19+30	1.4987	0.46	Q |	|	|	V |
19+35	1.5018	0.45	Q |	|	|	V |
19+40	1.5048	0.44	Q |	|	|	V |
19+45	1.5078	0.43	Q |	|	|	V |
19+50	1.5107	0.42	Q |	|	|	V |
19+55	1.5136	0.42	Q |	|	|	V |
20+ 0	1.5164	0.41	Q |	|	|	V |
20+ 5	1.5192	0.40	Q |	|	|	V |
20+10	1.5219	0.40	Q |	|	|	V |
20+15	1.5246	0.39	Q |	|	|	V |
20+20	1.5273	0.39	Q |	|	|	V |
20+25	1.5299	0.38	Q |	|	|	V |
20+30	1.5325	0.38	Q |	|	|	V |
20+35	1.5350	0.37	Q |	|	|	V |
20+40	1.5375	0.37	Q |	|	|	V |
20+45	1.5400	0.36	Q |	|	|	V |
20+50	1.5425	0.36	Q |	|	|	V |
20+55	1.5449	0.35	Q |	|	|	V |
21+ 0	1.5473	0.35	Q |	|	|	V |
21+ 5	1.5496	0.34	Q |	|	|	V |
21+10	1.5520	0.34	Q |	|	|	V |

21+15	1.5543	0.34	Q	|	|	|	V |
21+20	1.5566	0.33	Q	|	|	|	V |
21+25	1.5588	0.33	Q	|	|	|	V |
21+30	1.5611	0.32	Q	|	|	|	V |
21+35	1.5633	0.32	Q	|	|	|	V |
21+40	1.5655	0.32	Q	|	|	|	V |
21+45	1.5676	0.31	Q	|	|	|	V |
21+50	1.5698	0.31	Q	|	|	|	V |
21+55	1.5719	0.31	Q	|	|	|	V |
22+ 0	1.5740	0.31	Q	|	|	|	V |
22+ 5	1.5761	0.30	Q	|	|	|	V |
22+10	1.5781	0.30	Q	|	|	|	V |
22+15	1.5802	0.30	Q	|	|	|	V |
22+20	1.5822	0.29	Q	|	|	|	V |
22+25	1.5842	0.29	Q	|	|	|	V |
22+30	1.5862	0.29	Q	|	|	|	V |
22+35	1.5882	0.29	Q	|	|	|	V |
22+40	1.5901	0.28	Q	|	|	|	V|
22+45	1.5921	0.28	Q	|	|	|	V|
22+50	1.5940	0.28	Q	|	|	|	V|
22+55	1.5959	0.28	Q	|	|	|	V|
23+ 0	1.5978	0.27	Q	|	|	|	V|
23+ 5	1.5997	0.27	Q	|	|	|	V|
23+10	1.6015	0.27	Q	|	|	|	V|
23+15	1.6034	0.27	Q	|	|	|	V|
23+20	1.6052	0.27	Q	|	|	|	V|
23+25	1.6070	0.26	Q	|	|	|	V|
23+30	1.6088	0.26	Q	|	|	|	V|
23+35	1.6106	0.26	Q	|	|	|	V|
23+40	1.6124	0.26	Q	|	|	|	V|
23+45	1.6142	0.26	Q	|	|	|	V|
23+50	1.6159	0.25	Q	|	|	|	V|
23+55	1.6177	0.25	Q	|	|	|	V|
24+ 0	1.6194	0.25	Q	|	|	|	V|

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

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Study date 08/30/22

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

Program License Serial Number 6277

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
10 YR STORM UNIT HYDROGRAPH, PRE CONDITION
AREA E

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
9.33	1	0.60
Rainfall data for year 2		
9.33	6	0.76
Rainfall data for year 2		
9.33	24	1.30
Rainfall data for year 100		

```
             9.33            1           1.08
------------------------------------------------------------------------
Rainfall data for year 100
             9.33            6           2.01
------------------------------------------------------------------------
Rainfall data for year 100
             9.33           24           3.42
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 78.0      78.0          9.33      1.000     0.404    1.000    0.404

Area-averaged adjusted loss rate Fm (In/Hr) =  0.404

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     9.33   1.000         78.0      78.0       2.82     0.269

Area-averaged catchment yield fraction, Y =  0.269
Area-averaged low loss fraction, Yb =  0.731
User entry of time of concentration  =   0.310 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       9.33(Ac.)
Catchment Lag time =   0.248 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 33.6022
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.404(In/Hr)
Average low loss rate fraction (Yb) = 0.731 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.287(In)
Computed peak 30-minute rainfall =  0.491(In)
Specified peak 1-hour rainfall =  0.605(In)
Computed peak 3-hour rainfall =  0.955(In)
Specified peak 6-hour rainfall =  1.273(In)
Specified peak 24-hour rainfall =  2.172(In)


Rainfall depth area reduction factors:
Using a total area of       9.33(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.287(In)
30-minute factor = 1.000    Adjusted rainfall =  0.491(In)
```

1-hour factor = 1.000 Adjusted rainfall = 0.605(In)
3-hour factor = 1.000 Adjusted rainfall = 0.955(In)
6-hour factor = 1.000 Adjusted rainfall = 1.273(In)
24-hour factor = 1.000 Adjusted rainfall = 2.172(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 = 112.83 (CFS))	
1	2.097	2.366
2	12.121	11.311
3	38.286	29.524
4	58.090	22.345
5	68.679	11.948
6	75.684	7.905
7	80.693	5.652
8	84.455	4.244
9	87.539	3.480
10	89.846	2.604
11	91.712	2.106
12	93.299	1.791
13	94.581	1.446
14	95.674	1.233
15	96.566	1.007
16	97.275	0.800
17	97.826	0.622
18	98.181	0.400
19	98.560	0.427
20	98.963	0.455
21	99.363	0.452
22	99.640	0.312
23	99.850	0.237
24	100.000	0.169

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2870	0.2870
2	0.3533	0.0663
3	0.3990	0.0457
4	0.4349	0.0360
5	0.4651	0.0301
6	0.4912	0.0261
7	0.5144	0.0232
8	0.5355	0.0210
9	0.5547	0.0193
10	0.5725	0.0178

11	0.5892	0.0166
12	0.6047	0.0156
13	0.6252	0.0205
14	0.6447	0.0196
15	0.6635	0.0188
16	0.6815	0.0180
17	0.6989	0.0174
18	0.7157	0.0168
19	0.7320	0.0163
20	0.7478	0.0158
21	0.7631	0.0153
22	0.7780	0.0149
23	0.7925	0.0145
24	0.8066	0.0141
25	0.8204	0.0138
26	0.8339	0.0135
27	0.8471	0.0132
28	0.8600	0.0129
29	0.8726	0.0126
30	0.8850	0.0124
31	0.8971	0.0121
32	0.9090	0.0119
33	0.9207	0.0117
34	0.9322	0.0115
35	0.9435	0.0113
36	0.9546	0.0111
37	0.9656	0.0109
38	0.9763	0.0108
39	0.9869	0.0106
40	0.9973	0.0104
41	1.0076	0.0103
42	1.0177	0.0101
43	1.0277	0.0100
44	1.0376	0.0099
45	1.0473	0.0097
46	1.0569	0.0096
47	1.0664	0.0095
48	1.0758	0.0094
49	1.0850	0.0093
50	1.0942	0.0091
51	1.1032	0.0090
52	1.1121	0.0089
53	1.1210	0.0088
54	1.1297	0.0087
55	1.1383	0.0086
56	1.1469	0.0085
57	1.1553	0.0085
58	1.1637	0.0084
59	1.1720	0.0083
60	1.1802	0.0082

61	1.1884	0.0081
62	1.1964	0.0081
63	1.2044	0.0080
64	1.2123	0.0079
65	1.2201	0.0078
66	1.2279	0.0078
67	1.2356	0.0077
68	1.2432	0.0076
69	1.2507	0.0076
70	1.2582	0.0075
71	1.2657	0.0074
72	1.2730	0.0074
73	1.2798	0.0068
74	1.2866	0.0067
75	1.2932	0.0067
76	1.2999	0.0066
77	1.3064	0.0066
78	1.3129	0.0065
79	1.3194	0.0065
80	1.3258	0.0064
81	1.3322	0.0064
82	1.3385	0.0063
83	1.3448	0.0063
84	1.3510	0.0062
85	1.3571	0.0062
86	1.3633	0.0061
87	1.3694	0.0061
88	1.3754	0.0060
89	1.3814	0.0060
90	1.3874	0.0060
91	1.3933	0.0059
92	1.3992	0.0059
93	1.4050	0.0058
94	1.4108	0.0058
95	1.4166	0.0058
96	1.4223	0.0057
97	1.4280	0.0057
98	1.4337	0.0057
99	1.4393	0.0056
100	1.4449	0.0056
101	1.4504	0.0056
102	1.4559	0.0055
103	1.4614	0.0055
104	1.4669	0.0055
105	1.4723	0.0054
106	1.4777	0.0054
107	1.4831	0.0054
108	1.4884	0.0053
109	1.4937	0.0053
110	1.4989	0.0053

111	1.5042	0.0052
112	1.5094	0.0052
113	1.5146	0.0052
114	1.5197	0.0052
115	1.5248	0.0051
116	1.5299	0.0051
117	1.5350	0.0051
118	1.5401	0.0050
119	1.5451	0.0050
120	1.5501	0.0050
121	1.5550	0.0050
122	1.5600	0.0049
123	1.5649	0.0049
124	1.5698	0.0049
125	1.5746	0.0049
126	1.5795	0.0048
127	1.5843	0.0048
128	1.5891	0.0048
129	1.5939	0.0048
130	1.5986	0.0048
131	1.6034	0.0047
132	1.6081	0.0047
133	1.6127	0.0047
134	1.6174	0.0047
135	1.6221	0.0046
136	1.6267	0.0046
137	1.6313	0.0046
138	1.6359	0.0046
139	1.6404	0.0046
140	1.6449	0.0045
141	1.6495	0.0045
142	1.6540	0.0045
143	1.6584	0.0045
144	1.6629	0.0045
145	1.6673	0.0044
146	1.6718	0.0044
147	1.6762	0.0044
148	1.6806	0.0044
149	1.6849	0.0044
150	1.6893	0.0043
151	1.6936	0.0043
152	1.6979	0.0043
153	1.7022	0.0043
154	1.7065	0.0043
155	1.7108	0.0043
156	1.7150	0.0042
157	1.7192	0.0042
158	1.7234	0.0042
159	1.7276	0.0042
160	1.7318	0.0042

161	1.7360	0.0042
162	1.7401	0.0041
163	1.7443	0.0041
164	1.7484	0.0041
165	1.7525	0.0041
166	1.7566	0.0041
167	1.7606	0.0041
168	1.7647	0.0041
169	1.7687	0.0040
170	1.7728	0.0040
171	1.7768	0.0040
172	1.7808	0.0040
173	1.7848	0.0040
174	1.7887	0.0040
175	1.7927	0.0040
176	1.7966	0.0039
177	1.8006	0.0039
178	1.8045	0.0039
179	1.8084	0.0039
180	1.8123	0.0039
181	1.8161	0.0039
182	1.8200	0.0039
183	1.8238	0.0038
184	1.8277	0.0038
185	1.8315	0.0038
186	1.8353	0.0038
187	1.8391	0.0038
188	1.8429	0.0038
189	1.8467	0.0038
190	1.8504	0.0038
191	1.8542	0.0037
192	1.8579	0.0037
193	1.8616	0.0037
194	1.8653	0.0037
195	1.8690	0.0037
196	1.8727	0.0037
197	1.8764	0.0037
198	1.8801	0.0037
199	1.8837	0.0037
200	1.8874	0.0036
201	1.8910	0.0036
202	1.8946	0.0036
203	1.8982	0.0036
204	1.9018	0.0036
205	1.9054	0.0036
206	1.9090	0.0036
207	1.9126	0.0036
208	1.9161	0.0036
209	1.9197	0.0035
210	1.9232	0.0035

211	1.9267	0.0035
212	1.9302	0.0035
213	1.9337	0.0035
214	1.9372	0.0035
215	1.9407	0.0035
216	1.9442	0.0035
217	1.9476	0.0035
218	1.9511	0.0035
219	1.9545	0.0034
220	1.9580	0.0034
221	1.9614	0.0034
222	1.9648	0.0034
223	1.9682	0.0034
224	1.9716	0.0034
225	1.9750	0.0034
226	1.9784	0.0034
227	1.9818	0.0034
228	1.9851	0.0034
229	1.9885	0.0034
230	1.9918	0.0033
231	1.9952	0.0033
232	1.9985	0.0033
233	2.0018	0.0033
234	2.0051	0.0033
235	2.0084	0.0033
236	2.0117	0.0033
237	2.0150	0.0033
238	2.0182	0.0033
239	2.0215	0.0033
240	2.0248	0.0033
241	2.0280	0.0032
242	2.0312	0.0032
243	2.0345	0.0032
244	2.0377	0.0032
245	2.0409	0.0032
246	2.0441	0.0032
247	2.0473	0.0032
248	2.0505	0.0032
249	2.0537	0.0032
250	2.0569	0.0032
251	2.0600	0.0032
252	2.0632	0.0032
253	2.0663	0.0032
254	2.0695	0.0031
255	2.0726	0.0031
256	2.0758	0.0031
257	2.0789	0.0031
258	2.0820	0.0031
259	2.0851	0.0031
260	2.0882	0.0031

261	2.0913	0.0031
262	2.0944	0.0031
263	2.0975	0.0031
264	2.1005	0.0031
265	2.1036	0.0031
266	2.1066	0.0031
267	2.1097	0.0030
268	2.1127	0.0030
269	2.1158	0.0030
270	2.1188	0.0030
271	2.1218	0.0030
272	2.1248	0.0030
273	2.1278	0.0030
274	2.1308	0.0030
275	2.1338	0.0030
276	2.1368	0.0030
277	2.1398	0.0030
278	2.1428	0.0030
279	2.1457	0.0030
280	2.1487	0.0030
281	2.1517	0.0030
282	2.1546	0.0029
283	2.1575	0.0029
284	2.1605	0.0029
285	2.1634	0.0029
286	2.1663	0.0029
287	2.1692	0.0029
288	2.1722	0.0029

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0029	0.0021	0.0008
2	0.0029	0.0021	0.0008
3	0.0029	0.0021	0.0008
4	0.0029	0.0021	0.0008
5	0.0029	0.0022	0.0008
6	0.0030	0.0022	0.0008
7	0.0030	0.0022	0.0008
8	0.0030	0.0022	0.0008
9	0.0030	0.0022	0.0008
10	0.0030	0.0022	0.0008
11	0.0030	0.0022	0.0008
12	0.0030	0.0022	0.0008
13	0.0030	0.0022	0.0008
14	0.0030	0.0022	0.0008
15	0.0030	0.0022	0.0008
16	0.0031	0.0022	0.0008
17	0.0031	0.0022	0.0008

18	0.0031	0.0023	0.0008
19	0.0031	0.0023	0.0008
20	0.0031	0.0023	0.0008
21	0.0031	0.0023	0.0008
22	0.0031	0.0023	0.0008
23	0.0031	0.0023	0.0008
24	0.0031	0.0023	0.0008
25	0.0032	0.0023	0.0008
26	0.0032	0.0023	0.0009
27	0.0032	0.0023	0.0009
28	0.0032	0.0023	0.0009
29	0.0032	0.0023	0.0009
30	0.0032	0.0024	0.0009
31	0.0032	0.0024	0.0009
32	0.0032	0.0024	0.0009
33	0.0033	0.0024	0.0009
34	0.0033	0.0024	0.0009
35	0.0033	0.0024	0.0009
36	0.0033	0.0024	0.0009
37	0.0033	0.0024	0.0009
38	0.0033	0.0024	0.0009
39	0.0033	0.0024	0.0009
40	0.0033	0.0024	0.0009
41	0.0034	0.0025	0.0009
42	0.0034	0.0025	0.0009
43	0.0034	0.0025	0.0009
44	0.0034	0.0025	0.0009
45	0.0034	0.0025	0.0009
46	0.0034	0.0025	0.0009
47	0.0034	0.0025	0.0009
48	0.0035	0.0025	0.0009
49	0.0035	0.0025	0.0009
50	0.0035	0.0025	0.0009
51	0.0035	0.0026	0.0009
52	0.0035	0.0026	0.0009
53	0.0035	0.0026	0.0010
54	0.0035	0.0026	0.0010
55	0.0036	0.0026	0.0010
56	0.0036	0.0026	0.0010
57	0.0036	0.0026	0.0010
58	0.0036	0.0026	0.0010
59	0.0036	0.0027	0.0010
60	0.0036	0.0027	0.0010
61	0.0037	0.0027	0.0010
62	0.0037	0.0027	0.0010
63	0.0037	0.0027	0.0010
64	0.0037	0.0027	0.0010
65	0.0037	0.0027	0.0010
66	0.0037	0.0027	0.0010
67	0.0038	0.0028	0.0010

68	0.0038	0.0028	0.0010
69	0.0038	0.0028	0.0010
70	0.0038	0.0028	0.0010
71	0.0038	0.0028	0.0010
72	0.0039	0.0028	0.0010
73	0.0039	0.0028	0.0010
74	0.0039	0.0029	0.0010
75	0.0039	0.0029	0.0011
76	0.0039	0.0029	0.0011
77	0.0040	0.0029	0.0011
78	0.0040	0.0029	0.0011
79	0.0040	0.0029	0.0011
80	0.0040	0.0029	0.0011
81	0.0041	0.0030	0.0011
82	0.0041	0.0030	0.0011
83	0.0041	0.0030	0.0011
84	0.0041	0.0030	0.0011
85	0.0041	0.0030	0.0011
86	0.0042	0.0030	0.0011
87	0.0042	0.0031	0.0011
88	0.0042	0.0031	0.0011
89	0.0042	0.0031	0.0011
90	0.0043	0.0031	0.0011
91	0.0043	0.0031	0.0012
92	0.0043	0.0032	0.0012
93	0.0043	0.0032	0.0012
94	0.0044	0.0032	0.0012
95	0.0044	0.0032	0.0012
96	0.0044	0.0032	0.0012
97	0.0045	0.0033	0.0012
98	0.0045	0.0033	0.0012
99	0.0045	0.0033	0.0012
100	0.0045	0.0033	0.0012
101	0.0046	0.0033	0.0012
102	0.0046	0.0034	0.0012
103	0.0046	0.0034	0.0012
104	0.0047	0.0034	0.0013
105	0.0047	0.0034	0.0013
106	0.0047	0.0035	0.0013
107	0.0048	0.0035	0.0013
108	0.0048	0.0035	0.0013
109	0.0048	0.0035	0.0013
110	0.0049	0.0036	0.0013
111	0.0049	0.0036	0.0013
112	0.0049	0.0036	0.0013
113	0.0050	0.0036	0.0013
114	0.0050	0.0037	0.0013
115	0.0051	0.0037	0.0014
116	0.0051	0.0037	0.0014
117	0.0052	0.0038	0.0014

118	0.0052	0.0038	0.0014
119	0.0052	0.0038	0.0014
120	0.0053	0.0039	0.0014
121	0.0053	0.0039	0.0014
122	0.0054	0.0039	0.0014
123	0.0054	0.0040	0.0015
124	0.0055	0.0040	0.0015
125	0.0055	0.0040	0.0015
126	0.0056	0.0041	0.0015
127	0.0056	0.0041	0.0015
128	0.0057	0.0041	0.0015
129	0.0057	0.0042	0.0015
130	0.0058	0.0042	0.0015
131	0.0058	0.0043	0.0016
132	0.0059	0.0043	0.0016
133	0.0060	0.0044	0.0016
134	0.0060	0.0044	0.0016
135	0.0061	0.0045	0.0016
136	0.0061	0.0045	0.0016
137	0.0062	0.0045	0.0017
138	0.0063	0.0046	0.0017
139	0.0064	0.0047	0.0017
140	0.0064	0.0047	0.0017
141	0.0065	0.0048	0.0018
142	0.0066	0.0048	0.0018
143	0.0067	0.0049	0.0018
144	0.0067	0.0049	0.0018
145	0.0074	0.0054	0.0020
146	0.0074	0.0054	0.0020
147	0.0076	0.0055	0.0020
148	0.0076	0.0056	0.0020
149	0.0078	0.0057	0.0021
150	0.0078	0.0057	0.0021
151	0.0080	0.0058	0.0021
152	0.0081	0.0059	0.0022
153	0.0082	0.0060	0.0022
154	0.0083	0.0061	0.0022
155	0.0085	0.0062	0.0023
156	0.0085	0.0063	0.0023
157	0.0087	0.0064	0.0023
158	0.0088	0.0065	0.0024
159	0.0090	0.0066	0.0024
160	0.0091	0.0067	0.0025
161	0.0094	0.0068	0.0025
162	0.0095	0.0069	0.0025
163	0.0097	0.0071	0.0026
164	0.0099	0.0072	0.0027
165	0.0101	0.0074	0.0027
166	0.0103	0.0075	0.0028
167	0.0106	0.0077	0.0028

168	0.0108	0.0079	0.0029
169	0.0111	0.0081	0.0030
170	0.0113	0.0083	0.0030
171	0.0117	0.0086	0.0031
172	0.0119	0.0087	0.0032
173	0.0124	0.0091	0.0033
174	0.0126	0.0092	0.0034
175	0.0132	0.0096	0.0035
176	0.0135	0.0099	0.0036
177	0.0141	0.0103	0.0038
178	0.0145	0.0106	0.0039
179	0.0153	0.0112	0.0041
180	0.0158	0.0115	0.0042
181	0.0168	0.0123	0.0045
182	0.0174	0.0127	0.0047
183	0.0188	0.0137	0.0050
184	0.0196	0.0143	0.0053
185	0.0156	0.0114	0.0042
186	0.0166	0.0121	0.0045
187	0.0193	0.0141	0.0052
188	0.0210	0.0154	0.0057
189	0.0261	0.0191	0.0070
190	0.0301	0.0220	0.0081
191	0.0457	0.0334	0.0123
192	0.0663	0.0336	0.0327
193	0.2870	0.0336	0.2533
194	0.0360	0.0263	0.0097
195	0.0232	0.0170	0.0062
196	0.0178	0.0130	0.0048
197	0.0205	0.0150	0.0055
198	0.0180	0.0132	0.0048
199	0.0163	0.0119	0.0044
200	0.0149	0.0109	0.0040
201	0.0138	0.0101	0.0037
202	0.0129	0.0094	0.0035
203	0.0121	0.0089	0.0033
204	0.0115	0.0084	0.0031
205	0.0109	0.0080	0.0029
206	0.0104	0.0076	0.0028
207	0.0100	0.0073	0.0027
208	0.0096	0.0070	0.0026
209	0.0093	0.0068	0.0025
210	0.0089	0.0065	0.0024
211	0.0086	0.0063	0.0023
212	0.0084	0.0061	0.0023
213	0.0081	0.0059	0.0022
214	0.0079	0.0058	0.0021
215	0.0077	0.0056	0.0021
216	0.0075	0.0055	0.0020
217	0.0068	0.0050	0.0018

218	0.0066	0.0048	0.0018
219	0.0065	0.0047	0.0017
220	0.0063	0.0046	0.0017
221	0.0062	0.0045	0.0017
222	0.0060	0.0044	0.0016
223	0.0059	0.0043	0.0016
224	0.0058	0.0042	0.0016
225	0.0057	0.0042	0.0015
226	0.0056	0.0041	0.0015
227	0.0055	0.0040	0.0015
228	0.0054	0.0039	0.0014
229	0.0053	0.0039	0.0014
230	0.0052	0.0038	0.0014
231	0.0051	0.0037	0.0014
232	0.0050	0.0037	0.0014
233	0.0050	0.0036	0.0013
234	0.0049	0.0036	0.0013
235	0.0048	0.0035	0.0013
236	0.0048	0.0035	0.0013
237	0.0047	0.0034	0.0013
238	0.0046	0.0034	0.0012
239	0.0046	0.0033	0.0012
240	0.0045	0.0033	0.0012
241	0.0044	0.0032	0.0012
242	0.0044	0.0032	0.0012
243	0.0043	0.0032	0.0012
244	0.0043	0.0031	0.0012
245	0.0042	0.0031	0.0011
246	0.0042	0.0031	0.0011
247	0.0041	0.0030	0.0011
248	0.0041	0.0030	0.0011
249	0.0040	0.0030	0.0011
250	0.0040	0.0029	0.0011
251	0.0040	0.0029	0.0011
252	0.0039	0.0029	0.0011
253	0.0039	0.0028	0.0010
254	0.0038	0.0028	0.0010
255	0.0038	0.0028	0.0010
256	0.0038	0.0027	0.0010
257	0.0037	0.0027	0.0010
258	0.0037	0.0027	0.0010
259	0.0037	0.0027	0.0010
260	0.0036	0.0026	0.0010
261	0.0036	0.0026	0.0010
262	0.0036	0.0026	0.0010
263	0.0035	0.0026	0.0009
264	0.0035	0.0026	0.0009
265	0.0035	0.0025	0.0009
266	0.0034	0.0025	0.0009
267	0.0034	0.0025	0.0009

268	0.0034	0.0025	0.0009
269	0.0034	0.0025	0.0009
270	0.0033	0.0024	0.0009
271	0.0033	0.0024	0.0009
272	0.0033	0.0024	0.0009
273	0.0032	0.0024	0.0009
274	0.0032	0.0024	0.0009
275	0.0032	0.0023	0.0009
276	0.0032	0.0023	0.0009
277	0.0032	0.0023	0.0008
278	0.0031	0.0023	0.0008
279	0.0031	0.0023	0.0008
280	0.0031	0.0023	0.0008
281	0.0031	0.0022	0.0008
282	0.0030	0.0022	0.0008
283	0.0030	0.0022	0.0008
284	0.0030	0.0022	0.0008
285	0.0030	0.0022	0.0008
286	0.0030	0.0022	0.0008
287	0.0029	0.0022	0.0008
288	0.0029	0.0021	0.0008

Total soil rain loss = 1.40(In)
Total effective rainfall = 0.77(In)
Peak flow rate in flood hydrograph = 8.69(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q	|	|	|	|
0+10	0.0001	0.01	Q	|	|	|	|
0+15	0.0003	0.03	Q	|	|	|	|
0+20	0.0007	0.05	Q	|	|	|	|
0+25	0.0011	0.06	Q	|	|	|	|
0+30	0.0016	0.07	Q	|	|	|	|
0+35	0.0021	0.07	Q	|	|	|	|
0+40	0.0026	0.08	Q	|	|	|	|
0+45	0.0031	0.08	Q	|	|	|	|
0+50	0.0037	0.08	Q	|	|	|	|
0+55	0.0042	0.08	Q	|	|	|	|
1+ 0	0.0048	0.08	Q	|	|	|	|
1+ 5	0.0054	0.09	Q	|	|	|	|
1+10	0.0060	0.09	Q	|	|	|	|

1+15	0.0066	0.09	Q				
1+20	0.0072	0.09	Q				
1+25	0.0078	0.09	Q				
1+30	0.0085	0.09	Q				
1+35	0.0091	0.09	Q				
1+40	0.0097	0.09	Q				
1+45	0.0104	0.09	Q				
1+50	0.0110	0.09	Q				
1+55	0.0116	0.09	Q				
2+ 0	0.0123	0.09	Q				
2+ 5	0.0129	0.09	Q				
2+10	0.0136	0.09	Q				
2+15	0.0142	0.09	Q				
2+20	0.0149	0.10	Q				
2+25	0.0156	0.10	QV				
2+30	0.0162	0.10	QV				
2+35	0.0169	0.10	QV				
2+40	0.0176	0.10	QV				
2+45	0.0182	0.10	QV				
2+50	0.0189	0.10	QV				
2+55	0.0196	0.10	QV				
3+ 0	0.0202	0.10	QV				
3+ 5	0.0209	0.10	QV				
3+10	0.0216	0.10	QV				
3+15	0.0223	0.10	QV				
3+20	0.0230	0.10	QV				
3+25	0.0237	0.10	QV				
3+30	0.0244	0.10	QV				
3+35	0.0251	0.10	QV				
3+40	0.0257	0.10	QV				
3+45	0.0265	0.10	QV				
3+50	0.0272	0.10	QV				
3+55	0.0279	0.10	QV				
4+ 0	0.0286	0.10	QV				
4+ 5	0.0293	0.10	QV				
4+10	0.0300	0.10	QV				
4+15	0.0307	0.10	Q V				
4+20	0.0314	0.10	Q V				
4+25	0.0322	0.11	Q V				
4+30	0.0329	0.11	Q V				
4+35	0.0336	0.11	Q V				
4+40	0.0344	0.11	Q V				
4+45	0.0351	0.11	Q V				
4+50	0.0358	0.11	Q V				
4+55	0.0366	0.11	Q V				
5+ 0	0.0373	0.11	Q V				
5+ 5	0.0381	0.11	Q V				
5+10	0.0388	0.11	Q V				
5+15	0.0396	0.11	Q V				
5+20	0.0403	0.11	Q V				

5+25	0.0411	0.11	Q V	|	|	|	|
5+30	0.0419	0.11	Q V	|	|	|	|
5+35	0.0426	0.11	Q V	|	|	|	|
5+40	0.0434	0.11	Q V	|	|	|	|
5+45	0.0442	0.11	Q V	|	|	|	|
5+50	0.0450	0.11	Q V	|	|	|	|
5+55	0.0458	0.11	Q V	|	|	|	|
6+ 0	0.0466	0.11	Q V	|	|	|	|
6+ 5	0.0473	0.12	Q V	|	|	|	|
6+10	0.0481	0.12	Q V	|	|	|	|
6+15	0.0489	0.12	Q V	|	|	|	|
6+20	0.0498	0.12	Q V	|	|	|	|
6+25	0.0506	0.12	Q V	|	|	|	|
6+30	0.0514	0.12	Q V	|	|	|	|
6+35	0.0522	0.12	Q V	|	|	|	|
6+40	0.0530	0.12	Q V	|	|	|	|
6+45	0.0538	0.12	Q V	|	|	|	|
6+50	0.0547	0.12	Q V	|	|	|	|
6+55	0.0555	0.12	Q V	|	|	|	|
7+ 0	0.0564	0.12	Q V	|	|	|	|
7+ 5	0.0572	0.12	Q V	|	|	|	|
7+10	0.0580	0.12	Q V	|	|	|	|
7+15	0.0589	0.12	Q V	|	|	|	|
7+20	0.0598	0.12	Q V	|	|	|	|
7+25	0.0606	0.13	Q V	|	|	|	|
7+30	0.0615	0.13	Q V	|	|	|	|
7+35	0.0624	0.13	Q V	|	|	|	|
7+40	0.0632	0.13	Q V	|	|	|	|
7+45	0.0641	0.13	Q V	|	|	|	|
7+50	0.0650	0.13	Q V	|	|	|	|
7+55	0.0659	0.13	Q V	|	|	|	|
8+ 0	0.0668	0.13	Q V	|	|	|	|
8+ 5	0.0677	0.13	Q V	|	|	|	|
8+10	0.0686	0.13	Q V	|	|	|	|
8+15	0.0696	0.13	Q V	|	|	|	|
8+20	0.0705	0.13	Q V	|	|	|	|
8+25	0.0714	0.13	Q V	|	|	|	|
8+30	0.0723	0.14	Q V	|	|	|	|
8+35	0.0733	0.14	Q V	|	|	|	|
8+40	0.0742	0.14	Q V	|	|	|	|
8+45	0.0752	0.14	Q V	|	|	|	|
8+50	0.0761	0.14	Q V	|	|	|	|
8+55	0.0771	0.14	Q V	|	|	|	|
9+ 0	0.0781	0.14	Q V	|	|	|	|
9+ 5	0.0791	0.14	Q V	|	|	|	|
9+10	0.0800	0.14	Q V	|	|	|	|
9+15	0.0810	0.14	Q V	|	|	|	|
9+20	0.0820	0.15	Q V	|	|	|	|
9+25	0.0831	0.15	Q V	|	|	|	|
9+30	0.0841	0.15	Q V	|	|	|	|

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 9+35       0.0851      0.15  Q    V    |          |          |          |
 9+40       0.0861      0.15  Q    V    |          |          |          |
 9+45       0.0872      0.15  Q    V    |          |          |          |
 9+50       0.0882      0.15  Q    V    |          |          |          |
 9+55       0.0893      0.15  Q    V    |          |          |          |
10+ 0       0.0903      0.15  Q    V    |          |          |          |
10+ 5       0.0914      0.16  Q     V   |          |          |          |
10+10       0.0925      0.16  Q     V   |          |          |          |
10+15       0.0936      0.16  Q     V   |          |          |          |
10+20       0.0947      0.16  Q     V   |          |          |          |
10+25       0.0958      0.16  Q     V   |          |          |          |
10+30       0.0969      0.16  Q     V   |          |          |          |
10+35       0.0980      0.16  Q     V   |          |          |          |
10+40       0.0992      0.17  Q     V   |          |          |          |
10+45       0.1003      0.17  Q     V   |          |          |          |
10+50       0.1015      0.17  Q     V   |          |          |          |
10+55       0.1026      0.17  Q     V   |          |          |          |
11+ 0       0.1038      0.17  Q     V   |          |          |          |
11+ 5       0.1050      0.17  Q     V   |          |          |          |
11+10       0.1062      0.17  Q      V  |          |          |          |
11+15       0.1074      0.18  Q      V  |          |          |          |
11+20       0.1087      0.18  Q      V  |          |          |          |
11+25       0.1099      0.18  Q      V  |          |          |          |
11+30       0.1112      0.18  Q      V  |          |          |          |
11+35       0.1124      0.18  Q      V  |          |          |          |
11+40       0.1137      0.19  Q      V  |          |          |          |
11+45       0.1150      0.19  Q      V  |          |          |          |
11+50       0.1163      0.19  Q      V  |          |          |          |
11+55       0.1176      0.19  Q      V  |          |          |          |
12+ 0       0.1190      0.19  Q      V  |          |          |          |
12+ 5       0.1203      0.20  Q      V  |          |          |          |
12+10       0.1217      0.20  Q       V |          |          |          |
12+15       0.1231      0.21  Q       V |          |          |          |
12+20       0.1246      0.21  Q       V |          |          |          |
12+25       0.1261      0.22  Q       V |          |          |          |
12+30       0.1276      0.22  Q       V |          |          |          |
12+35       0.1292      0.23  Q       V |          |          |          |
12+40       0.1308      0.23  Q       V |          |          |          |
12+45       0.1324      0.23  Q       V |          |          |          |
12+50       0.1340      0.24  Q       V |          |          |          |
12+55       0.1356      0.24  Q        V|          |          |          |
13+ 0       0.1373      0.24  Q        V|          |          |          |
13+ 5       0.1390      0.25  Q        V|          |          |          |
13+10       0.1407      0.25  |Q       V|          |          |          |
13+15       0.1425      0.25  |Q       V|          |          |          |
13+20       0.1443      0.26  |Q       V|          |          |          |
13+25       0.1461      0.26  |Q       V|          |          |          |
13+30       0.1479      0.27  |Q       V|          |          |          |
13+35       0.1498      0.27  |Q       V|          |          |          |
13+40       0.1517      0.28  |Q        V          |          |          |
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13+45       0.1537      0.28  |Q        V         |          |          |
13+50       0.1557      0.29  |Q        V         |          |          |
13+55       0.1577      0.29  |Q        V         |          |          |
14+ 0       0.1597      0.30  |Q        V         |          |          |
14+ 5       0.1618      0.31  |Q        V         |          |          |
14+10       0.1640      0.31  |Q        V         |          |          |
14+15       0.1662      0.32  |Q        |V        |          |          |
14+20       0.1685      0.33  |Q        |V        |          |          |
14+25       0.1708      0.34  |Q        |V        |          |          |
14+30       0.1731      0.34  |Q        |V        |          |          |
14+35       0.1756      0.35  |Q        |V        |          |          |
14+40       0.1781      0.36  |Q        |V        |          |          |
14+45       0.1806      0.37  |Q        |V        |          |          |
14+50       0.1833      0.39  |Q        | V       |          |          |
14+55       0.1861      0.40  |Q        | V       |          |          |
15+ 0       0.1889      0.41  |Q        | V       |          |          |
15+ 5       0.1918      0.43  |Q        | V       |          |          |
15+10       0.1949      0.45  |Q        | V       |          |          |
15+15       0.1981      0.47  |Q        |  V      |          |          |
15+20       0.2015      0.49  |Q        |  V      |          |          |
15+25       0.2050      0.51  | Q       |  V      |          |          |
15+30       0.2086      0.52  | Q       |  V      |          |          |
15+35       0.2121      0.51  | Q       |   V     |          |          |
15+40       0.2156      0.51  | Q       |   V     |          |          |
15+45       0.2193      0.54  | Q       |   V     |          |          |
15+50       0.2234      0.59  | Q       |   V     |          |          |
15+55       0.2280      0.67  | Q       |    V    |          |          |
16+ 0       0.2338      0.84  |  Q      |    V    |          |          |
16+ 5       0.2460      1.77  |      Q  |     V   |          |          |
16+10       0.2763      4.41  |         |      QV |          |          |
16+15       0.3362      8.69  |         |         | V        |   Q      |
16+20       0.3822      6.68  |         |         |    VQ    |          |
16+25       0.4093      3.95  |         |    Q    |      V   |          |
16+30       0.4287      2.81  |         |Q        |       V  |          |
16+35       0.4437      2.18  |       Q |         |        V |          |
16+40       0.4559      1.77  |      Q  |         |         V          |
16+45       0.4664      1.52  |     Q   |         |         V          |
16+50       0.4750      1.25  |   Q     |         |         |V         |
16+55       0.4824      1.08  |   Q     |         |         | V        |
17+ 0       0.4891      0.96  |  Q      |         |         | V        |
17+ 5       0.4948      0.84  |  Q      |         |         | V        |
17+10       0.5000      0.76  |  Q      |         |         |  V       |
17+15       0.5047      0.67  | Q       |         |         |  V       |
17+20       0.5088      0.59  | Q       |         |         |  V       |
17+25       0.5124      0.53  | Q       |         |         |   V      |
17+30       0.5155      0.45  |Q        |         |         |   V      |
17+35       0.5186      0.45  |Q        |         |         |   V      |
17+40       0.5216      0.44  |Q        |         |         |   V      |
17+45       0.5245      0.42  |Q        |         |         |   V      |
17+50       0.5271      0.37  |Q        |         |         |    V     |
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17+55       0.5294      0.34  |Q        |         |         |    V    |
18+ 0       0.5315      0.31  |Q        |         |         |    V    |
18+ 5       0.5333      0.26  |Q        |         |         |    V    |
18+10       0.5350      0.25  Q         |         |         |    V    |
18+15       0.5366      0.24  Q         |         |         |    V    |
18+20       0.5382      0.23  Q         |         |         |    V    |
18+25       0.5397      0.22  Q         |         |         |    V    |
18+30       0.5412      0.21  Q         |         |         |    V    |
18+35       0.5426      0.20  Q         |         |         |     V   |
18+40       0.5439      0.20  Q         |         |         |     V   |
18+45       0.5453      0.19  Q         |         |         |     V   |
18+50       0.5466      0.19  Q         |         |         |     V   |
18+55       0.5478      0.18  Q         |         |         |     V   |
19+ 0       0.5491      0.18  Q         |         |         |     V   |
19+ 5       0.5503      0.18  Q         |         |         |     V   |
19+10       0.5515      0.17  Q         |         |         |     V   |
19+15       0.5527      0.17  Q         |         |         |     V   |
19+20       0.5538      0.17  Q         |         |         |     V   |
19+25       0.5549      0.16  Q         |         |         |     V   |
19+30       0.5560      0.16  Q         |         |         |     V   |
19+35       0.5571      0.16  Q         |         |         |      V  |
19+40       0.5582      0.16  Q         |         |         |      V  |
19+45       0.5592      0.15  Q         |         |         |      V  |
19+50       0.5603      0.15  Q         |         |         |      V  |
19+55       0.5613      0.15  Q         |         |         |      V  |
20+ 0       0.5623      0.15  Q         |         |         |      V  |
20+ 5       0.5633      0.14  Q         |         |         |      V  |
20+10       0.5643      0.14  Q         |         |         |      V  |
20+15       0.5652      0.14  Q         |         |         |      V  |
20+20       0.5662      0.14  Q         |         |         |      V  |
20+25       0.5671      0.14  Q         |         |         |      V  |
20+30       0.5680      0.13  Q         |         |         |      V  |
20+35       0.5689      0.13  Q         |         |         |      V  |
20+40       0.5698      0.13  Q         |         |         |      V  |
20+45       0.5707      0.13  Q         |         |         |      V  |
20+50       0.5716      0.13  Q         |         |         |      V  |
20+55       0.5725      0.13  Q         |         |         |       V |
21+ 0       0.5734      0.12  Q         |         |         |       V |
21+ 5       0.5742      0.12  Q         |         |         |       V |
21+10       0.5750      0.12  Q         |         |         |       V |
21+15       0.5759      0.12  Q         |         |         |       V |
21+20       0.5767      0.12  Q         |         |         |       V |
21+25       0.5775      0.12  Q         |         |         |       V |
21+30       0.5783      0.12  Q         |         |         |       V |
21+35       0.5791      0.12  Q         |         |         |       V |
21+40       0.5799      0.11  Q         |         |         |       V |
21+45       0.5807      0.11  Q         |         |         |       V |
21+50       0.5815      0.11  Q         |         |         |       V |
21+55       0.5822      0.11  Q         |         |         |       V |
22+ 0       0.5830      0.11  Q         |         |         |       V |
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   22+ 5       0.5837      0.11  Q         |          |          |       V |
   22+10       0.5845      0.11  Q         |          |          |       V |
   22+15       0.5852      0.11  Q         |          |          |       V |
   22+20       0.5860      0.11  Q         |          |          |       V |
   22+25       0.5867      0.11  Q         |          |          |       V |
   22+30       0.5874      0.10  Q         |          |          |        V|
   22+35       0.5881      0.10  Q         |          |          |        V|
   22+40       0.5888      0.10  Q         |          |          |        V|
   22+45       0.5895      0.10  Q         |          |          |        V|
   22+50       0.5902      0.10  Q         |          |          |        V|
   22+55       0.5909      0.10  Q         |          |          |        V|
   23+ 0       0.5916      0.10  Q         |          |          |        V|
   23+ 5       0.5923      0.10  Q         |          |          |        V|
   23+10       0.5930      0.10  Q         |          |          |        V|
   23+15       0.5936      0.10  Q         |          |          |        V|
   23+20       0.5943      0.10  Q         |          |          |        V|
   23+25       0.5950      0.10  Q         |          |          |        V|
   23+30       0.5956      0.10  Q         |          |          |        V|
   23+35       0.5963      0.09  Q         |          |          |        V|
   23+40       0.5969      0.09  Q         |          |          |        V|
   23+45       0.5976      0.09  Q         |          |          |        V|
   23+50       0.5982      0.09  Q         |          |          |        V|
   23+55       0.5988      0.09  Q         |          |          |        V|
   24+ 0       0.5995      0.09  Q         |          |          |        V|
-------------------------------------------------------------------------
```

UNIT HYDROGRAPH ANALYSIS

PRE-DEVELOPMENT CONDITION 100 YEAR, 24 HOUR STORM

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

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Study date 08/25/22

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

Program License Serial Number 6277

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
100 YR STORM UNIT HYDROGRAPH, PRE CONDITION
AREA A

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
53.25	1	0.60
Rainfall data for year 2		
53.25	6	0.76
Rainfall data for year 2		
53.25	24	1.30
Rainfall data for year 100		

```
            53.25            1           1.08
------------------------------------------------------------------------
Rainfall data for year 100
            53.25            6           2.01
------------------------------------------------------------------------
Rainfall data for year 100
            53.25           24           3.42
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 78.0      92.8         53.25      1.000     0.140    1.000    0.140

Area-averaged adjusted loss rate Fm (In/Hr) =  0.140

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
    53.25   1.000         78.0      92.8       0.78     0.771

Area-averaged catchment yield fraction, Y =  0.771
Area-averaged low loss fraction, Yb =  0.229
User entry of time of concentration  =   0.570 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =      53.25(Ac.)
Catchment Lag time =   0.456 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 18.2749
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.140(In/Hr)
Average low loss rate fraction (Yb) = 0.229 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.512(In)
Computed peak 30-minute rainfall =  0.877(In)
Specified peak 1-hour rainfall =  1.080(In)
Computed peak 3-hour rainfall =  1.581(In)
Specified peak 6-hour rainfall =  2.010(In)
Specified peak 24-hour rainfall =  3.420(In)


Rainfall depth area reduction factors:
Using a total area of      53.25(Ac.) (Ref: fig. E-4)

5-minute factor = 0.998     Adjusted rainfall =  0.511(In)
30-minute factor = 0.998    Adjusted rainfall =  0.875(In)
```

1-hour factor = 0.998 Adjusted rainfall = 1.077(In)
3-hour factor = 1.000 Adjusted rainfall = 1.580(In)
6-hour factor = 1.000 Adjusted rainfall = 2.010(In)
24-hour factor = 1.000 Adjusted rainfall = 3.420(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 = 643.99 (CFS))	
1	0.877	5.648
2	3.897	19.450
3	9.247	34.450
4	20.616	73.218
5	37.389	108.019
6	50.022	81.351
7	58.867	56.962
8	64.964	39.263
9	69.767	30.932
10	73.683	25.218
11	76.931	20.917
12	79.641	17.455
13	81.950	14.866
14	83.934	12.776
15	85.739	11.625
16	87.360	10.445
17	88.760	9.016
18	89.887	7.254
19	90.933	6.735
20	91.904	6.252
21	92.774	5.606
22	93.587	5.235
23	94.280	4.465
24	94.902	4.001
25	95.513	3.935
26	96.016	3.243
27	96.491	3.060
28	96.937	2.867
29	97.275	2.179
30	97.604	2.118
31	97.873	1.734
32	98.057	1.181
33	98.240	1.180
34	98.446	1.331
35	98.666	1.412
36	98.885	1.412
37	99.104	1.412

38	99.324	1.412
39	99.518	1.248
40	99.637	0.767
41	99.751	0.736
42	99.865	0.736
43	100.000	0.368

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5112	0.5112
2	0.6294	0.1182
3	0.7108	0.0814
4	0.7748	0.0641
5	0.8285	0.0536
6	0.8750	0.0466
7	0.9165	0.0414
8	0.9539	0.0375
9	0.9882	0.0343
10	1.0200	0.0317
11	1.0495	0.0296
12	1.0773	0.0278
13	1.1078	0.0305
14	1.1368	0.0290
15	1.1645	0.0277
16	1.1910	0.0265
17	1.2164	0.0254
18	1.2409	0.0245
19	1.2645	0.0236
20	1.2873	0.0228
21	1.3094	0.0221
22	1.3308	0.0214
23	1.3516	0.0208
24	1.3718	0.0202
25	1.3915	0.0197
26	1.4106	0.0192
27	1.4293	0.0187
28	1.4476	0.0182
29	1.4654	0.0178
30	1.4828	0.0174
31	1.4999	0.0171
32	1.5166	0.0167
33	1.5329	0.0164
34	1.5490	0.0160
35	1.5647	0.0157
36	1.5801	0.0154
37	1.5952	0.0151
38	1.6101	0.0148
39	1.6246	0.0146
40	1.6390	0.0143
41	1.6531	0.0141

42	1.6669	0.0139
43	1.6806	0.0137
44	1.6941	0.0135
45	1.7073	0.0133
46	1.7204	0.0131
47	1.7333	0.0129
48	1.7460	0.0127
49	1.7585	0.0125
50	1.7709	0.0124
51	1.7831	0.0122
52	1.7951	0.0121
53	1.8070	0.0119
54	1.8188	0.0118
55	1.8304	0.0116
56	1.8419	0.0115
57	1.8532	0.0113
58	1.8644	0.0112
59	1.8755	0.0111
60	1.8865	0.0110
61	1.8973	0.0108
62	1.9081	0.0107
63	1.9187	0.0106
64	1.9292	0.0105
65	1.9396	0.0104
66	1.9499	0.0103
67	1.9601	0.0102
68	1.9702	0.0101
69	1.9802	0.0100
70	1.9901	0.0099
71	1.9999	0.0098
72	2.0097	0.0097
73	2.0203	0.0107
74	2.0309	0.0106
75	2.0414	0.0105
76	2.0518	0.0104
77	2.0621	0.0103
78	2.0723	0.0102
79	2.0825	0.0101
80	2.0925	0.0101
81	2.1025	0.0100
82	2.1124	0.0099
83	2.1223	0.0098
84	2.1320	0.0098
85	2.1417	0.0097
86	2.1514	0.0096
87	2.1609	0.0096
88	2.1704	0.0095
89	2.1798	0.0094
90	2.1892	0.0094
91	2.1985	0.0093

92	2.2077	0.0092
93	2.2169	0.0092
94	2.2260	0.0091
95	2.2351	0.0091
96	2.2441	0.0090
97	2.2530	0.0089
98	2.2619	0.0089
99	2.2707	0.0088
100	2.2795	0.0088
101	2.2882	0.0087
102	2.2968	0.0087
103	2.3054	0.0086
104	2.3140	0.0086
105	2.3225	0.0085
106	2.3310	0.0085
107	2.3394	0.0084
108	2.3477	0.0084
109	2.3561	0.0083
110	2.3643	0.0083
111	2.3725	0.0082
112	2.3807	0.0082
113	2.3888	0.0081
114	2.3969	0.0081
115	2.4050	0.0080
116	2.4130	0.0080
117	2.4209	0.0080
118	2.4288	0.0079
119	2.4367	0.0079
120	2.4445	0.0078
121	2.4523	0.0078
122	2.4601	0.0078
123	2.4678	0.0077
124	2.4755	0.0077
125	2.4831	0.0076
126	2.4907	0.0076
127	2.4983	0.0076
128	2.5058	0.0075
129	2.5133	0.0075
130	2.5207	0.0075
131	2.5282	0.0074
132	2.5355	0.0074
133	2.5429	0.0073
134	2.5502	0.0073
135	2.5575	0.0073
136	2.5647	0.0072
137	2.5719	0.0072
138	2.5791	0.0072
139	2.5863	0.0072
140	2.5934	0.0071
141	2.6005	0.0071

142	2.6075	0.0071
143	2.6146	0.0070
144	2.6216	0.0070
145	2.6285	0.0070
146	2.6355	0.0069
147	2.6424	0.0069
148	2.6493	0.0069
149	2.6561	0.0069
150	2.6629	0.0068
151	2.6697	0.0068
152	2.6765	0.0068
153	2.6832	0.0067
154	2.6899	0.0067
155	2.6966	0.0067
156	2.7033	0.0067
157	2.7099	0.0066
158	2.7165	0.0066
159	2.7231	0.0066
160	2.7297	0.0066
161	2.7362	0.0065
162	2.7427	0.0065
163	2.7492	0.0065
164	2.7556	0.0065
165	2.7621	0.0064
166	2.7685	0.0064
167	2.7748	0.0064
168	2.7812	0.0064
169	2.7875	0.0063
170	2.7939	0.0063
171	2.8001	0.0063
172	2.8064	0.0063
173	2.8127	0.0062
174	2.8189	0.0062
175	2.8251	0.0062
176	2.8313	0.0062
177	2.8374	0.0062
178	2.8436	0.0061
179	2.8497	0.0061
180	2.8558	0.0061
181	2.8618	0.0061
182	2.8679	0.0061
183	2.8739	0.0060
184	2.8799	0.0060
185	2.8859	0.0060
186	2.8919	0.0060
187	2.8979	0.0060
188	2.9038	0.0059
189	2.9097	0.0059
190	2.9156	0.0059
191	2.9215	0.0059

192	2.9273	0.0059
193	2.9332	0.0058
194	2.9390	0.0058
195	2.9448	0.0058
196	2.9506	0.0058
197	2.9563	0.0058
198	2.9621	0.0057
199	2.9678	0.0057
200	2.9735	0.0057
201	2.9792	0.0057
202	2.9849	0.0057
203	2.9905	0.0057
204	2.9962	0.0056
205	3.0018	0.0056
206	3.0074	0.0056
207	3.0130	0.0056
208	3.0186	0.0056
209	3.0241	0.0056
210	3.0297	0.0055
211	3.0352	0.0055
212	3.0407	0.0055
213	3.0462	0.0055
214	3.0517	0.0055
215	3.0571	0.0055
216	3.0626	0.0054
217	3.0680	0.0054
218	3.0734	0.0054
219	3.0788	0.0054
220	3.0842	0.0054
221	3.0896	0.0054
222	3.0949	0.0054
223	3.1003	0.0053
224	3.1056	0.0053
225	3.1109	0.0053
226	3.1162	0.0053
227	3.1215	0.0053
228	3.1267	0.0053
229	3.1320	0.0053
230	3.1372	0.0052
231	3.1424	0.0052
232	3.1477	0.0052
233	3.1529	0.0052
234	3.1580	0.0052
235	3.1632	0.0052
236	3.1684	0.0052
237	3.1735	0.0051
238	3.1786	0.0051
239	3.1837	0.0051
240	3.1888	0.0051
241	3.1939	0.0051

242	3.1990	0.0051	
243	3.2041	0.0051	
244	3.2091	0.0050	
245	3.2142	0.0050	
246	3.2192	0.0050	
247	3.2242	0.0050	
248	3.2292	0.0050	
249	3.2342	0.0050	
250	3.2392	0.0050	
251	3.2441	0.0050	
252	3.2491	0.0050	
253	3.2540	0.0049	
254	3.2589	0.0049	
255	3.2638	0.0049	
256	3.2687	0.0049	
257	3.2736	0.0049	
258	3.2785	0.0049	
259	3.2834	0.0049	
260	3.2882	0.0049	
261	3.2931	0.0048	
262	3.2979	0.0048	
263	3.3027	0.0048	
264	3.3075	0.0048	
265	3.3123	0.0048	
266	3.3171	0.0048	
267	3.3219	0.0048	
268	3.3267	0.0048	
269	3.3314	0.0048	
270	3.3362	0.0047	
271	3.3409	0.0047	
272	3.3456	0.0047	
273	3.3503	0.0047	
274	3.3550	0.0047	
275	3.3597	0.0047	
276	3.3644	0.0047	
277	3.3691	0.0047	
278	3.3737	0.0047	
279	3.3784	0.0046	
280	3.3830	0.0046	
281	3.3877	0.0046	
282	3.3923	0.0046	
283	3.3969	0.0046	
284	3.4015	0.0046	
285	3.4061	0.0046	
286	3.4106	0.0046	
287	3.4152	0.0046	
288	3.4198	0.0046	

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0046	0.0010	0.0035
2	0.0046	0.0010	0.0035
3	0.0046	0.0010	0.0035
4	0.0046	0.0011	0.0035
5	0.0046	0.0011	0.0036
6	0.0046	0.0011	0.0036
7	0.0046	0.0011	0.0036
8	0.0047	0.0011	0.0036
9	0.0047	0.0011	0.0036
10	0.0047	0.0011	0.0036
11	0.0047	0.0011	0.0036
12	0.0047	0.0011	0.0036
13	0.0047	0.0011	0.0037
14	0.0048	0.0011	0.0037
15	0.0048	0.0011	0.0037
16	0.0048	0.0011	0.0037
17	0.0048	0.0011	0.0037
18	0.0048	0.0011	0.0037
19	0.0048	0.0011	0.0037
20	0.0049	0.0011	0.0037
21	0.0049	0.0011	0.0038
22	0.0049	0.0011	0.0038
23	0.0049	0.0011	0.0038
24	0.0049	0.0011	0.0038
25	0.0050	0.0011	0.0038
26	0.0050	0.0011	0.0038
27	0.0050	0.0011	0.0038
28	0.0050	0.0011	0.0039
29	0.0050	0.0011	0.0039
30	0.0050	0.0012	0.0039
31	0.0051	0.0012	0.0039
32	0.0051	0.0012	0.0039
33	0.0051	0.0012	0.0039
34	0.0051	0.0012	0.0039
35	0.0051	0.0012	0.0040
36	0.0052	0.0012	0.0040
37	0.0052	0.0012	0.0040
38	0.0052	0.0012	0.0040
39	0.0052	0.0012	0.0040
40	0.0052	0.0012	0.0040
41	0.0053	0.0012	0.0041
42	0.0053	0.0012	0.0041
43	0.0053	0.0012	0.0041
44	0.0053	0.0012	0.0041
45	0.0054	0.0012	0.0041
46	0.0054	0.0012	0.0041
47	0.0054	0.0012	0.0042
48	0.0054	0.0012	0.0042

49	0.0054	0.0012	0.0042
50	0.0055	0.0012	0.0042
51	0.0055	0.0013	0.0042
52	0.0055	0.0013	0.0042
53	0.0055	0.0013	0.0043
54	0.0056	0.0013	0.0043
55	0.0056	0.0013	0.0043
56	0.0056	0.0013	0.0043
57	0.0056	0.0013	0.0044
58	0.0057	0.0013	0.0044
59	0.0057	0.0013	0.0044
60	0.0057	0.0013	0.0044
61	0.0057	0.0013	0.0044
62	0.0058	0.0013	0.0044
63	0.0058	0.0013	0.0045
64	0.0058	0.0013	0.0045
65	0.0059	0.0013	0.0045
66	0.0059	0.0013	0.0045
67	0.0059	0.0014	0.0046
68	0.0059	0.0014	0.0046
69	0.0060	0.0014	0.0046
70	0.0060	0.0014	0.0046
71	0.0060	0.0014	0.0047
72	0.0061	0.0014	0.0047
73	0.0061	0.0014	0.0047
74	0.0061	0.0014	0.0047
75	0.0062	0.0014	0.0047
76	0.0062	0.0014	0.0048
77	0.0062	0.0014	0.0048
78	0.0062	0.0014	0.0048
79	0.0063	0.0014	0.0049
80	0.0063	0.0014	0.0049
81	0.0064	0.0015	0.0049
82	0.0064	0.0015	0.0049
83	0.0064	0.0015	0.0050
84	0.0065	0.0015	0.0050
85	0.0065	0.0015	0.0050
86	0.0065	0.0015	0.0050
87	0.0066	0.0015	0.0051
88	0.0066	0.0015	0.0051
89	0.0067	0.0015	0.0051
90	0.0067	0.0015	0.0052
91	0.0067	0.0015	0.0052
92	0.0068	0.0015	0.0052
93	0.0068	0.0016	0.0053
94	0.0069	0.0016	0.0053
95	0.0069	0.0016	0.0053
96	0.0069	0.0016	0.0054
97	0.0070	0.0016	0.0054
98	0.0070	0.0016	0.0054

99	0.0071	0.0016	0.0055
100	0.0071	0.0016	0.0055
101	0.0072	0.0016	0.0055
102	0.0072	0.0016	0.0056
103	0.0073	0.0017	0.0056
104	0.0073	0.0017	0.0056
105	0.0074	0.0017	0.0057
106	0.0074	0.0017	0.0057
107	0.0075	0.0017	0.0058
108	0.0075	0.0017	0.0058
109	0.0076	0.0017	0.0059
110	0.0076	0.0017	0.0059
111	0.0077	0.0018	0.0059
112	0.0078	0.0018	0.0060
113	0.0078	0.0018	0.0060
114	0.0079	0.0018	0.0061
115	0.0080	0.0018	0.0061
116	0.0080	0.0018	0.0062
117	0.0081	0.0018	0.0062
118	0.0081	0.0019	0.0063
119	0.0082	0.0019	0.0063
120	0.0083	0.0019	0.0064
121	0.0084	0.0019	0.0064
122	0.0084	0.0019	0.0065
123	0.0085	0.0019	0.0066
124	0.0086	0.0020	0.0066
125	0.0087	0.0020	0.0067
126	0.0087	0.0020	0.0067
127	0.0088	0.0020	0.0068
128	0.0089	0.0020	0.0068
129	0.0090	0.0021	0.0069
130	0.0091	0.0021	0.0070
131	0.0092	0.0021	0.0071
132	0.0092	0.0021	0.0071
133	0.0094	0.0021	0.0072
134	0.0094	0.0022	0.0073
135	0.0096	0.0022	0.0074
136	0.0096	0.0022	0.0074
137	0.0098	0.0022	0.0075
138	0.0098	0.0023	0.0076
139	0.0100	0.0023	0.0077
140	0.0101	0.0023	0.0078
141	0.0102	0.0023	0.0079
142	0.0103	0.0024	0.0080
143	0.0105	0.0024	0.0081
144	0.0106	0.0024	0.0082
145	0.0097	0.0022	0.0075
146	0.0098	0.0022	0.0076
147	0.0100	0.0023	0.0077
148	0.0101	0.0023	0.0078

149	0.0103	0.0024	0.0079
150	0.0104	0.0024	0.0080
151	0.0106	0.0024	0.0082
152	0.0107	0.0025	0.0083
153	0.0110	0.0025	0.0085
154	0.0111	0.0025	0.0086
155	0.0113	0.0026	0.0087
156	0.0115	0.0026	0.0089
157	0.0118	0.0027	0.0091
158	0.0119	0.0027	0.0092
159	0.0122	0.0028	0.0094
160	0.0124	0.0028	0.0095
161	0.0127	0.0029	0.0098
162	0.0129	0.0029	0.0099
163	0.0133	0.0030	0.0102
164	0.0135	0.0031	0.0104
165	0.0139	0.0032	0.0107
166	0.0141	0.0032	0.0109
167	0.0146	0.0033	0.0112
168	0.0148	0.0034	0.0114
169	0.0154	0.0035	0.0119
170	0.0157	0.0036	0.0121
171	0.0164	0.0037	0.0126
172	0.0167	0.0038	0.0129
173	0.0174	0.0040	0.0134
174	0.0178	0.0041	0.0137
175	0.0187	0.0043	0.0144
176	0.0192	0.0044	0.0148
177	0.0202	0.0046	0.0156
178	0.0208	0.0048	0.0160
179	0.0221	0.0051	0.0170
180	0.0228	0.0052	0.0176
181	0.0245	0.0056	0.0189
182	0.0254	0.0058	0.0196
183	0.0277	0.0063	0.0213
184	0.0290	0.0066	0.0224
185	0.0278	0.0063	0.0214
186	0.0296	0.0068	0.0228
187	0.0343	0.0078	0.0265
188	0.0375	0.0086	0.0289
189	0.0466	0.0107	0.0359
190	0.0536	0.0117	0.0420
191	0.0814	0.0117	0.0697
192	0.1182	0.0117	0.1065
193	0.5112	0.0117	0.4995
194	0.0641	0.0117	0.0524
195	0.0414	0.0095	0.0319
196	0.0317	0.0073	0.0245
197	0.0305	0.0070	0.0235
198	0.0265	0.0061	0.0204

199	0.0236	0.0054	0.0182
200	0.0214	0.0049	0.0165
201	0.0197	0.0045	0.0152
202	0.0182	0.0042	0.0141
203	0.0171	0.0039	0.0132
204	0.0160	0.0037	0.0124
205	0.0151	0.0035	0.0116
206	0.0143	0.0033	0.0111
207	0.0137	0.0031	0.0105
208	0.0131	0.0030	0.0101
209	0.0125	0.0029	0.0097
210	0.0121	0.0028	0.0093
211	0.0116	0.0027	0.0090
212	0.0112	0.0026	0.0087
213	0.0108	0.0025	0.0084
214	0.0105	0.0024	0.0081
215	0.0102	0.0023	0.0079
216	0.0099	0.0023	0.0076
217	0.0107	0.0024	0.0082
218	0.0104	0.0024	0.0080
219	0.0101	0.0023	0.0078
220	0.0099	0.0023	0.0076
221	0.0097	0.0022	0.0075
222	0.0095	0.0022	0.0073
223	0.0093	0.0021	0.0072
224	0.0091	0.0021	0.0070
225	0.0089	0.0020	0.0069
226	0.0088	0.0020	0.0068
227	0.0086	0.0020	0.0066
228	0.0085	0.0019	0.0065
229	0.0083	0.0019	0.0064
230	0.0082	0.0019	0.0063
231	0.0080	0.0018	0.0062
232	0.0079	0.0018	0.0061
233	0.0078	0.0018	0.0060
234	0.0077	0.0018	0.0059
235	0.0076	0.0017	0.0058
236	0.0075	0.0017	0.0057
237	0.0073	0.0017	0.0057
238	0.0072	0.0017	0.0056
239	0.0072	0.0016	0.0055
240	0.0071	0.0016	0.0054
241	0.0070	0.0016	0.0054
242	0.0069	0.0016	0.0053
243	0.0068	0.0016	0.0052
244	0.0067	0.0015	0.0052
245	0.0066	0.0015	0.0051
246	0.0066	0.0015	0.0051
247	0.0065	0.0015	0.0050
248	0.0064	0.0015	0.0049

249	0.0063	0.0014	0.0049
250	0.0063	0.0014	0.0048
251	0.0062	0.0014	0.0048
252	0.0061	0.0014	0.0047
253	0.0061	0.0014	0.0047
254	0.0060	0.0014	0.0046
255	0.0060	0.0014	0.0046
256	0.0059	0.0013	0.0045
257	0.0058	0.0013	0.0045
258	0.0058	0.0013	0.0045
259	0.0057	0.0013	0.0044
260	0.0057	0.0013	0.0044
261	0.0056	0.0013	0.0043
262	0.0056	0.0013	0.0043
263	0.0055	0.0013	0.0043
264	0.0055	0.0013	0.0042
265	0.0054	0.0012	0.0042
266	0.0054	0.0012	0.0042
267	0.0053	0.0012	0.0041
268	0.0053	0.0012	0.0041
269	0.0053	0.0012	0.0041
270	0.0052	0.0012	0.0040
271	0.0052	0.0012	0.0040
272	0.0051	0.0012	0.0040
273	0.0051	0.0012	0.0039
274	0.0050	0.0012	0.0039
275	0.0050	0.0011	0.0039
276	0.0050	0.0011	0.0038
277	0.0049	0.0011	0.0038
278	0.0049	0.0011	0.0038
279	0.0049	0.0011	0.0038
280	0.0048	0.0011	0.0037
281	0.0048	0.0011	0.0037
282	0.0048	0.0011	0.0037
283	0.0047	0.0011	0.0037
284	0.0047	0.0011	0.0036
285	0.0047	0.0011	0.0036
286	0.0046	0.0011	0.0036
287	0.0046	0.0011	0.0036
288	0.0046	0.0010	0.0035

Total soil rain loss = 0.65(In)
Total effective rainfall = 2.77(In)
Peak flow rate in flood hydrograph = 78.80(CFS)

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

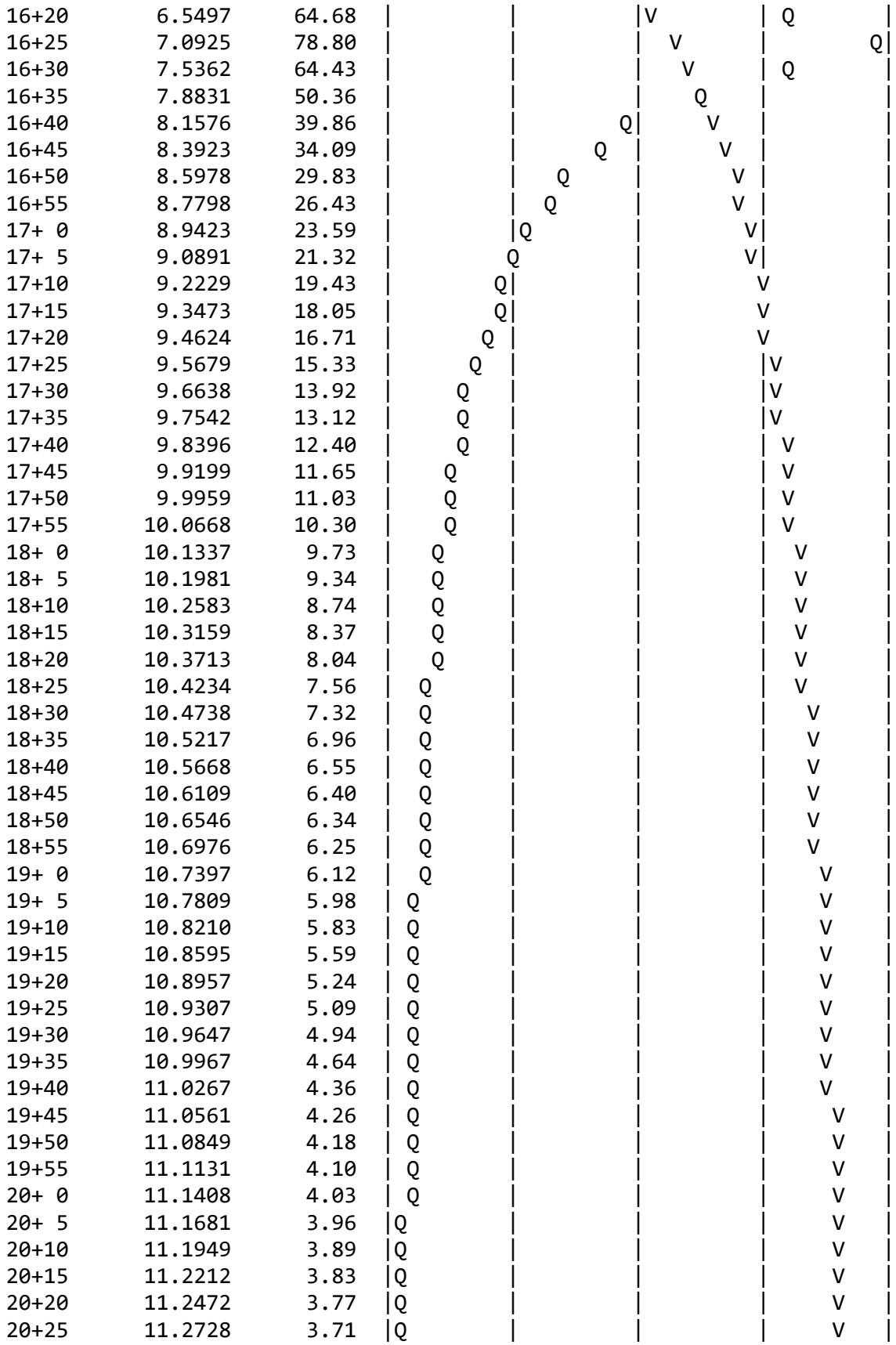
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	20.0	40.0	60.0	80.0
0+ 5	0.0001	0.02	Q				
0+10	0.0007	0.09	Q				
0+15	0.0022	0.21	Q				
0+20	0.0054	0.47	Q				
0+25	0.0113	0.85	Q				
0+30	0.0191	1.14	Q				
0+35	0.0283	1.34	Q				
0+40	0.0385	1.48	Q				
0+45	0.0495	1.60	Q				
0+50	0.0612	1.69	Q				
0+55	0.0734	1.77	Q				
1+ 0	0.0860	1.84	Q				
1+ 5	0.0991	1.90	Q				
1+10	0.1125	1.95	Q				
1+15	0.1262	1.99	Q				
1+20	0.1403	2.04	VQ				
1+25	0.1546	2.08	VQ				
1+30	0.1691	2.11	VQ				
1+35	0.1838	2.14	VQ				
1+40	0.1988	2.17	VQ				
1+45	0.2139	2.20	VQ				
1+50	0.2292	2.22	VQ				
1+55	0.2447	2.25	VQ				
2+ 0	0.2603	2.27	VQ				
2+ 5	0.2760	2.29	VQ				
2+10	0.2919	2.31	VQ				
2+15	0.3080	2.33	|Q				
2+20	0.3241	2.35	|Q				
2+25	0.3404	2.36	|Q				
2+30	0.3568	2.38	|Q				
2+35	0.3733	2.39	|Q				
2+40	0.3898	2.41	|Q				
2+45	0.4065	2.42	|Q				
2+50	0.4233	2.43	|Q				
2+55	0.4401	2.45	|Q				
3+ 0	0.4571	2.46	|Q				
3+ 5	0.4741	2.48	|Q				
3+10	0.4913	2.49	|Q				
3+15	0.5085	2.50	|Q				
3+20	0.5258	2.52	|Q				
3+25	0.5432	2.53	|Q				
3+30	0.5607	2.54	|Q				
3+35	0.5783	2.55	|Q				
3+40	0.5960	2.56	|Q				
3+45	0.6137	2.57	|QV				

3+50	0.6315	2.58	|QV	|	|	|	|
3+55	0.6493	2.59	|QV	|	|	|	|
4+ 0	0.6672	2.60	|QV	|	|	|	|
4+ 5	0.6852	2.61	|QV	|	|	|	|
4+10	0.7033	2.62	|QV	|	|	|	|
4+15	0.7215	2.64	|QV	|	|	|	|
4+20	0.7397	2.65	|QV	|	|	|	|
4+25	0.7580	2.66	|QV	|	|	|	|
4+30	0.7764	2.67	|QV	|	|	|	|
4+35	0.7948	2.68	|QV	|	|	|	|
4+40	0.8133	2.69	|QV	|	|	|	|
4+45	0.8320	2.70	|QV	|	|	|	|
4+50	0.8507	2.71	|QV	|	|	|	|
4+55	0.8694	2.73	|QV	|	|	|	|
5+ 0	0.8883	2.74	|QV	|	|	|	|
5+ 5	0.9072	2.75	|QV	|	|	|	|
5+10	0.9263	2.76	|Q V	|	|	|	|
5+15	0.9454	2.77	|Q V	|	|	|	|
5+20	0.9646	2.79	|Q V	|	|	|	|
5+25	0.9838	2.80	|Q V	|	|	|	|
5+30	1.0032	2.81	|Q V	|	|	|	|
5+35	1.0227	2.83	|Q V	|	|	|	|
5+40	1.0422	2.84	|Q V	|	|	|	|
5+45	1.0619	2.85	|Q V	|	|	|	|
5+50	1.0816	2.87	|Q V	|	|	|	|
5+55	1.1014	2.88	|Q V	|	|	|	|
6+ 0	1.1214	2.89	|Q V	|	|	|	|
6+ 5	1.1414	2.91	|Q V	|	|	|	|
6+10	1.1615	2.92	|Q V	|	|	|	|
6+15	1.1817	2.94	|Q V	|	|	|	|
6+20	1.2020	2.95	|Q V	|	|	|	|
6+25	1.2225	2.96	|Q V	|	|	|	|
6+30	1.2430	2.98	|Q V	|	|	|	|
6+35	1.2636	2.99	|Q V	|	|	|	|
6+40	1.2843	3.01	|Q V	|	|	|	|
6+45	1.3052	3.03	|Q V	|	|	|	|
6+50	1.3261	3.04	|Q V	|	|	|	|
6+55	1.3472	3.06	|Q V	|	|	|	|
7+ 0	1.3683	3.07	|Q V	|	|	|	|
7+ 5	1.3896	3.09	|Q V	|	|	|	|
7+10	1.4110	3.11	|Q V	|	|	|	|
7+15	1.4325	3.12	|Q V	|	|	|	|
7+20	1.4542	3.14	|Q V	|	|	|	|
7+25	1.4759	3.16	|Q V	|	|	|	|
7+30	1.4978	3.18	|Q V	|	|	|	|
7+35	1.5198	3.19	|Q V	|	|	|	|
7+40	1.5419	3.21	|Q V	|	|	|	|
7+45	1.5641	3.23	|Q V	|	|	|	|
7+50	1.5865	3.25	|Q V	|	|	|	|
7+55	1.6090	3.27	|Q V	|	|	|	|

8+ 0	1.6317	3.29	Q V			
8+ 5	1.6544	3.31	Q V			
8+10	1.6773	3.33	Q V			
8+15	1.7004	3.35	Q V			
8+20	1.7236	3.37	Q V			
8+25	1.7469	3.39	Q V			
8+30	1.7704	3.41	Q V			
8+35	1.7940	3.43	Q V			
8+40	1.8178	3.45	Q V			
8+45	1.8417	3.48	Q V			
8+50	1.8658	3.50	Q V			
8+55	1.8901	3.52	Q V			
9+ 0	1.9145	3.54	Q V			
9+ 5	1.9391	3.57	Q V			
9+10	1.9638	3.59	Q V			
9+15	1.9887	3.62	Q V			
9+20	2.0138	3.64	Q V			
9+25	2.0391	3.67	Q V			
9+30	2.0645	3.69	Q V			
9+35	2.0902	3.72	Q V			
9+40	2.1160	3.75	Q V			
9+45	2.1420	3.78	Q V			
9+50	2.1682	3.80	Q V			
9+55	2.1946	3.83	Q V			
10+ 0	2.2212	3.86	Q V			
10+ 5	2.2480	3.89	Q V			
10+10	2.2750	3.92	Q V			
10+15	2.3023	3.96	Q V			
10+20	2.3297	3.99	Q V			
10+25	2.3574	4.02	Q V			
10+30	2.3853	4.05	Q V			
10+35	2.4135	4.09	Q V			
10+40	2.4419	4.12	Q V			
10+45	2.4705	4.16	Q V			
10+50	2.4994	4.19	Q V			
10+55	2.5285	4.23	Q V			
11+ 0	2.5579	4.27	Q V			
11+ 5	2.5876	4.31	Q V			
11+10	2.6176	4.35	Q V			
11+15	2.6478	4.39	Q V			
11+20	2.6783	4.43	Q V			
11+25	2.7092	4.48	Q V			
11+30	2.7403	4.52	Q V			
11+35	2.7717	4.57	Q V			
11+40	2.8035	4.61	Q V			
11+45	2.8356	4.66	Q V			
11+50	2.8680	4.71	Q V			
11+55	2.9008	4.76	Q V			
12+ 0	2.9340	4.81	Q V			
12+ 5	2.9675	4.86	Q V			

12+10	3.0012	4.90	Q V			
12+15	3.0352	4.93	Q V			
12+20	3.0692	4.93	Q V			
12+25	3.1030	4.91	Q V			
12+30	3.1368	4.91	Q V			
12+35	3.1707	4.93	Q V			
12+40	3.2049	4.96	Q V			
12+45	3.2394	5.00	Q V			
12+50	3.2742	5.05	Q V			
12+55	3.3094	5.11	Q V			
13+ 0	3.3450	5.17	Q V			
13+ 5	3.3811	5.24	Q V			
13+10	3.4176	5.31	Q V			
13+15	3.4547	5.38	Q V			
13+20	3.4923	5.46	Q V			
13+25	3.5306	5.55	Q V			
13+30	3.5694	5.64	Q V			
13+35	3.6089	5.73	Q V			
13+40	3.6490	5.83	Q V			
13+45	3.6899	5.94	Q V			
13+50	3.7316	6.05	Q V			
13+55	3.7741	6.17	Q V			
14+ 0	3.8174	6.29	Q V			
14+ 5	3.8616	6.42	Q V			
14+10	3.9069	6.56	Q V			
14+15	3.9531	6.72	Q V			
14+20	4.0005	6.88	Q V			
14+25	4.0491	7.05	Q V			
14+30	4.0989	7.24	Q V			
14+35	4.1501	7.44	Q V			
14+40	4.2028	7.65	Q V			
14+45	4.2571	7.88	Q V			
14+50	4.3130	8.12	Q V			
14+55	4.3707	8.39	Q V			
15+ 0	4.4305	8.68	Q V			
15+ 5	4.4924	9.00	Q V			
15+10	4.5568	9.35	Q V			
15+15	4.6239	9.74	Q V			
15+20	4.6939	10.17	Q V			
15+25	4.7673	10.65	Q V			
15+30	4.8441	11.15	Q V			
15+35	4.9246	11.69	Q V			
15+40	5.0087	12.21	Q V			
15+45	5.0966	12.76	Q V			
15+50	5.1904	13.62	Q V			
15+55	5.2936	14.98	Q V			
16+ 0	5.4122	17.23	Q V			
16+ 5	5.5699	22.90	Q V			
16+10	5.7970	32.97	Q V			
16+15	6.1043	44.62	Q V			



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  20+30      11.2980      3.66  |Q         |          |          |     V    |
  20+35      11.3228      3.61  |Q         |          |          |     V    |
  20+40      11.3473      3.56  |Q         |          |          |     V    |
  20+45      11.3715      3.51  |Q         |          |          |      V   |
  20+50      11.3953      3.46  |Q         |          |          |      V   |
  20+55      11.4188      3.42  |Q         |          |          |      V   |
  21+ 0      11.4421      3.38  |Q         |          |          |      V   |
  21+ 5      11.4651      3.33  |Q         |          |          |      V   |
  21+10      11.4877      3.29  |Q         |          |          |      V   |
  21+15      11.5102      3.26  |Q         |          |          |      V   |
  21+20      11.5323      3.22  |Q         |          |          |      V   |
  21+25      11.5542      3.18  |Q         |          |          |      V   |
  21+30      11.5759      3.15  |Q         |          |          |      V   |
  21+35      11.5973      3.11  |Q         |          |          |      V   |
  21+40      11.6185      3.08  |Q         |          |          |      V   |
  21+45      11.6395      3.04  |Q         |          |          |      V   |
  21+50      11.6602      3.01  |Q         |          |          |       V  |
  21+55      11.6808      2.98  |Q         |          |          |       V  |
  22+ 0      11.7011      2.95  |Q         |          |          |       V  |
  22+ 5      11.7212      2.92  |Q         |          |          |       V  |
  22+10      11.7412      2.89  |Q         |          |          |       V  |
  22+15      11.7609      2.87  |Q         |          |          |       V  |
  22+20      11.7804      2.84  |Q         |          |          |       V  |
  22+25      11.7998      2.81  |Q         |          |          |       V  |
  22+30      11.8190      2.79  |Q         |          |          |       V  |
  22+35      11.8380      2.76  |Q         |          |          |       V  |
  22+40      11.8569      2.74  |Q         |          |          |       V  |
  22+45      11.8756      2.71  |Q         |          |          |       V  |
  22+50      11.8941      2.69  |Q         |          |          |       V  |
  22+55      11.9124      2.67  |Q         |          |          |       V  |
  23+ 0      11.9307      2.64  |Q         |          |          |       V  |
  23+ 5      11.9487      2.62  |Q         |          |          |       V  |
  23+10      11.9666      2.60  |Q         |          |          |        V |
  23+15      11.9844      2.58  |Q         |          |          |        V |
  23+20      12.0020      2.56  |Q         |          |          |        V |
  23+25      12.0195      2.54  |Q         |          |          |        V |
  23+30      12.0369      2.52  |Q         |          |          |        V |
  23+35      12.0541      2.50  |Q         |          |          |        V |
  23+40      12.0712      2.48  |Q         |          |          |        V |
  23+45      12.0881      2.46  |Q         |          |          |        V |
  23+50      12.1050      2.44  |Q         |          |          |        V |
  23+55      12.1217      2.43  |Q         |          |          |        V |
  24+ 0      12.1383      2.41  |Q         |          |          |        V |
-------------------------------------------------------------------------
```

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

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Study date 08/25/22

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

Program License Serial Number 6277

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
100 YR STORM UNIT HYDROGRAPH, PRE CONDITION
AREA B

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
33.56	1	0.60
Rainfall data for year 2		
33.56	6	0.76
Rainfall data for year 2		
33.56	24	1.30
Rainfall data for year 100		

```
            33.56            1           1.08
------------------------------------------------------------------------
Rainfall data for year 100
            33.56            6           2.01
------------------------------------------------------------------------
Rainfall data for year 100
            33.56           24           3.42
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 78.0      92.8         33.56      1.000     0.140    1.000    0.140

Area-averaged adjusted loss rate Fm (In/Hr) =  0.140

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
    33.56   1.000         78.0      92.8       0.78     0.771

Area-averaged catchment yield fraction, Y =  0.771
Area-averaged low loss fraction, Yb =  0.229
User entry of time of concentration  =   0.490 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =      33.56(Ac.)
Catchment Lag time =   0.392 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 21.2585
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.140(In/Hr)
Average low loss rate fraction (Yb) = 0.229 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.512(In)
Computed peak 30-minute rainfall =  0.877(In)
Specified peak 1-hour rainfall =  1.080(In)
Computed peak 3-hour rainfall =  1.581(In)
Specified peak 6-hour rainfall =  2.010(In)
Specified peak 24-hour rainfall =  3.420(In)


Rainfall depth area reduction factors:
Using a total area of      33.56(Ac.) (Ref: fig. E-4)

5-minute factor = 0.998     Adjusted rainfall =  0.512(In)
30-minute factor = 0.998    Adjusted rainfall =  0.876(In)
```

1-hour factor = 0.998 Adjusted rainfall = 1.078(In)
3-hour factor = 1.000 Adjusted rainfall = 1.580(In)
6-hour factor = 1.000 Adjusted rainfall = 2.010(In)
24-hour factor = 1.000 Adjusted rainfall = 3.420(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 = 405.87 (CFS))	
1	1.080	4.382
2	4.987	15.857
3	12.929	32.234
4	30.293	70.475
5	47.082	68.142
6	58.064	44.572
7	65.268	29.239
8	70.711	22.090
9	74.986	17.353
10	78.494	14.239
11	81.320	11.468
12	83.696	9.642
13	85.810	8.579
14	87.659	7.507
15	89.192	6.222
16	90.449	5.100
17	91.618	4.747
18	92.652	4.193
19	93.601	3.852
20	94.394	3.221
21	95.117	2.934
22	95.781	2.695
23	96.336	2.253
24	96.869	2.164
25	97.275	1.646
26	97.656	1.547
27	97.934	1.125
28	98.146	0.863
29	98.371	0.915
30	98.626	1.031
31	98.881	1.035
32	99.136	1.035
33	99.390	1.034
34	99.576	0.753
35	99.709	0.539
36	99.842	0.539
37	100.000	0.270

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5117	0.5117
2	0.6299	0.1183
3	0.7114	0.0815
4	0.7755	0.0641
5	0.8292	0.0537
6	0.8759	0.0466
7	0.9173	0.0415
8	0.9548	0.0375
9	0.9891	0.0343
10	1.0209	0.0318
11	1.0505	0.0296
12	1.0783	0.0278
13	1.1088	0.0305
14	1.1377	0.0290
15	1.1654	0.0276
16	1.1918	0.0265
17	1.2172	0.0254
18	1.2417	0.0244
19	1.2653	0.0236
20	1.2880	0.0228
21	1.3101	0.0221
22	1.3315	0.0214
23	1.3522	0.0208
24	1.3724	0.0202
25	1.3920	0.0196
26	1.4112	0.0191
27	1.4298	0.0187
28	1.4480	0.0182
29	1.4658	0.0178
30	1.4832	0.0174
31	1.5002	0.0170
32	1.5169	0.0167
33	1.5332	0.0163
34	1.5492	0.0160
35	1.5649	0.0157
36	1.5803	0.0154
37	1.5954	0.0151
38	1.6102	0.0148
39	1.6248	0.0146
40	1.6391	0.0143
41	1.6532	0.0141
42	1.6671	0.0139
43	1.6808	0.0137
44	1.6942	0.0135
45	1.7075	0.0133
46	1.7206	0.0131
47	1.7334	0.0129

48	1.7461	0.0127
49	1.7587	0.0125
50	1.7710	0.0124
51	1.7832	0.0122
52	1.7953	0.0120
53	1.8072	0.0119
54	1.8189	0.0118
55	1.8306	0.0116
56	1.8420	0.0115
57	1.8534	0.0113
58	1.8646	0.0112
59	1.8757	0.0111
60	1.8866	0.0110
61	1.8975	0.0108
62	1.9082	0.0107
63	1.9188	0.0106
64	1.9293	0.0105
65	1.9397	0.0104
66	1.9500	0.0103
67	1.9602	0.0102
68	1.9703	0.0101
69	1.9803	0.0100
70	1.9902	0.0099
71	2.0001	0.0098
72	2.0098	0.0097
73	2.0204	0.0107
74	2.0310	0.0106
75	2.0415	0.0105
76	2.0519	0.0104
77	2.0622	0.0103
78	2.0724	0.0102
79	2.0826	0.0101
80	2.0926	0.0101
81	2.1026	0.0100
82	2.1126	0.0099
83	2.1224	0.0098
84	2.1322	0.0098
85	2.1419	0.0097
86	2.1515	0.0096
87	2.1610	0.0096
88	2.1705	0.0095
89	2.1800	0.0094
90	2.1893	0.0094
91	2.1986	0.0093
92	2.2079	0.0092
93	2.2170	0.0092
94	2.2261	0.0091
95	2.2352	0.0091
96	2.2442	0.0090
97	2.2531	0.0089

98	2.2620	0.0089
99	2.2708	0.0088
100	2.2796	0.0088
101	2.2883	0.0087
102	2.2970	0.0087
103	2.3056	0.0086
104	2.3141	0.0086
105	2.3226	0.0085
106	2.3311	0.0085
107	2.3395	0.0084
108	2.3479	0.0084
109	2.3562	0.0083
110	2.3644	0.0083
111	2.3727	0.0082
112	2.3808	0.0082
113	2.3890	0.0081
114	2.3970	0.0081
115	2.4051	0.0080
116	2.4131	0.0080
117	2.4210	0.0080
118	2.4290	0.0079
119	2.4368	0.0079
120	2.4447	0.0078
121	2.4524	0.0078
122	2.4602	0.0078
123	2.4679	0.0077
124	2.4756	0.0077
125	2.4832	0.0076
126	2.4908	0.0076
127	2.4984	0.0076
128	2.5059	0.0075
129	2.5134	0.0075
130	2.5208	0.0075
131	2.5283	0.0074
132	2.5357	0.0074
133	2.5430	0.0073
134	2.5503	0.0073
135	2.5576	0.0073
136	2.5648	0.0072
137	2.5721	0.0072
138	2.5792	0.0072
139	2.5864	0.0072
140	2.5935	0.0071
141	2.6006	0.0071
142	2.6077	0.0071
143	2.6147	0.0070
144	2.6217	0.0070
145	2.6286	0.0070
146	2.6356	0.0069
147	2.6425	0.0069

148	2.6494	0.0069
149	2.6562	0.0068
150	2.6630	0.0068
151	2.6698	0.0068
152	2.6766	0.0068
153	2.6833	0.0067
154	2.6900	0.0067
155	2.6967	0.0067
156	2.7034	0.0067
157	2.7100	0.0066
158	2.7166	0.0066
159	2.7232	0.0066
160	2.7298	0.0066
161	2.7363	0.0065
162	2.7428	0.0065
163	2.7493	0.0065
164	2.7557	0.0065
165	2.7622	0.0064
166	2.7686	0.0064
167	2.7750	0.0064
168	2.7813	0.0064
169	2.7876	0.0063
170	2.7940	0.0063
171	2.8003	0.0063
172	2.8065	0.0063
173	2.8128	0.0062
174	2.8190	0.0062
175	2.8252	0.0062
176	2.8314	0.0062
177	2.8375	0.0062
178	2.8437	0.0061
179	2.8498	0.0061
180	2.8559	0.0061
181	2.8619	0.0061
182	2.8680	0.0061
183	2.8740	0.0060
184	2.8800	0.0060
185	2.8860	0.0060
186	2.8920	0.0060
187	2.8980	0.0060
188	2.9039	0.0059
189	2.9098	0.0059
190	2.9157	0.0059
191	2.9216	0.0059
192	2.9274	0.0059
193	2.9333	0.0058
194	2.9391	0.0058
195	2.9449	0.0058
196	2.9507	0.0058
197	2.9564	0.0058

198	2.9622	0.0057
199	2.9679	0.0057
200	2.9736	0.0057
201	2.9793	0.0057
202	2.9850	0.0057
203	2.9906	0.0057
204	2.9963	0.0056
205	3.0019	0.0056
206	3.0075	0.0056
207	3.0131	0.0056
208	3.0187	0.0056
209	3.0242	0.0056
210	3.0298	0.0055
211	3.0353	0.0055
212	3.0408	0.0055
213	3.0463	0.0055
214	3.0518	0.0055
215	3.0572	0.0055
216	3.0627	0.0054
217	3.0681	0.0054
218	3.0735	0.0054
219	3.0789	0.0054
220	3.0843	0.0054
221	3.0897	0.0054
222	3.0950	0.0054
223	3.1004	0.0053
224	3.1057	0.0053
225	3.1110	0.0053
226	3.1163	0.0053
227	3.1216	0.0053
228	3.1268	0.0053
229	3.1321	0.0053
230	3.1373	0.0052
231	3.1425	0.0052
232	3.1478	0.0052
233	3.1529	0.0052
234	3.1581	0.0052
235	3.1633	0.0052
236	3.1685	0.0052
237	3.1736	0.0051
238	3.1787	0.0051
239	3.1838	0.0051
240	3.1889	0.0051
241	3.1940	0.0051
242	3.1991	0.0051
243	3.2042	0.0051
244	3.2092	0.0050
245	3.2143	0.0050
246	3.2193	0.0050
247	3.2243	0.0050

248	3.2293	0.0050
249	3.2343	0.0050
250	3.2392	0.0050
251	3.2442	0.0050
252	3.2492	0.0050
253	3.2541	0.0049
254	3.2590	0.0049
255	3.2639	0.0049
256	3.2688	0.0049
257	3.2737	0.0049
258	3.2786	0.0049
259	3.2835	0.0049
260	3.2883	0.0049
261	3.2932	0.0048
262	3.2980	0.0048
263	3.3028	0.0048
264	3.3076	0.0048
265	3.3124	0.0048
266	3.3172	0.0048
267	3.3220	0.0048
268	3.3268	0.0048
269	3.3315	0.0048
270	3.3363	0.0047
271	3.3410	0.0047
272	3.3457	0.0047
273	3.3504	0.0047
274	3.3551	0.0047
275	3.3598	0.0047
276	3.3645	0.0047
277	3.3692	0.0047
278	3.3738	0.0047
279	3.3785	0.0046
280	3.3831	0.0046
281	3.3877	0.0046
282	3.3924	0.0046
283	3.3970	0.0046
284	3.4016	0.0046
285	3.4062	0.0046
286	3.4107	0.0046
287	3.4153	0.0046
288	3.4199	0.0046

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0046	0.0010	0.0035
2	0.0046	0.0010	0.0035
3	0.0046	0.0010	0.0035
4	0.0046	0.0011	0.0035

5	0.0046	0.0011	0.0036
6	0.0046	0.0011	0.0036
7	0.0046	0.0011	0.0036
8	0.0047	0.0011	0.0036
9	0.0047	0.0011	0.0036
10	0.0047	0.0011	0.0036
11	0.0047	0.0011	0.0036
12	0.0047	0.0011	0.0036
13	0.0047	0.0011	0.0037
14	0.0048	0.0011	0.0037
15	0.0048	0.0011	0.0037
16	0.0048	0.0011	0.0037
17	0.0048	0.0011	0.0037
18	0.0048	0.0011	0.0037
19	0.0048	0.0011	0.0037
20	0.0049	0.0011	0.0037
21	0.0049	0.0011	0.0038
22	0.0049	0.0011	0.0038
23	0.0049	0.0011	0.0038
24	0.0049	0.0011	0.0038
25	0.0050	0.0011	0.0038
26	0.0050	0.0011	0.0038
27	0.0050	0.0011	0.0038
28	0.0050	0.0011	0.0039
29	0.0050	0.0011	0.0039
30	0.0050	0.0012	0.0039
31	0.0051	0.0012	0.0039
32	0.0051	0.0012	0.0039
33	0.0051	0.0012	0.0039
34	0.0051	0.0012	0.0039
35	0.0051	0.0012	0.0040
36	0.0052	0.0012	0.0040
37	0.0052	0.0012	0.0040
38	0.0052	0.0012	0.0040
39	0.0052	0.0012	0.0040
40	0.0052	0.0012	0.0040
41	0.0053	0.0012	0.0041
42	0.0053	0.0012	0.0041
43	0.0053	0.0012	0.0041
44	0.0053	0.0012	0.0041
45	0.0054	0.0012	0.0041
46	0.0054	0.0012	0.0041
47	0.0054	0.0012	0.0042
48	0.0054	0.0012	0.0042
49	0.0054	0.0012	0.0042
50	0.0055	0.0012	0.0042
51	0.0055	0.0013	0.0042
52	0.0055	0.0013	0.0042
53	0.0055	0.0013	0.0043
54	0.0056	0.0013	0.0043

55	0.0056	0.0013	0.0043
56	0.0056	0.0013	0.0043
57	0.0056	0.0013	0.0044
58	0.0057	0.0013	0.0044
59	0.0057	0.0013	0.0044
60	0.0057	0.0013	0.0044
61	0.0057	0.0013	0.0044
62	0.0058	0.0013	0.0044
63	0.0058	0.0013	0.0045
64	0.0058	0.0013	0.0045
65	0.0059	0.0013	0.0045
66	0.0059	0.0013	0.0045
67	0.0059	0.0014	0.0046
68	0.0059	0.0014	0.0046
69	0.0060	0.0014	0.0046
70	0.0060	0.0014	0.0046
71	0.0060	0.0014	0.0047
72	0.0061	0.0014	0.0047
73	0.0061	0.0014	0.0047
74	0.0061	0.0014	0.0047
75	0.0062	0.0014	0.0047
76	0.0062	0.0014	0.0048
77	0.0062	0.0014	0.0048
78	0.0062	0.0014	0.0048
79	0.0063	0.0014	0.0049
80	0.0063	0.0014	0.0049
81	0.0064	0.0015	0.0049
82	0.0064	0.0015	0.0049
83	0.0064	0.0015	0.0050
84	0.0065	0.0015	0.0050
85	0.0065	0.0015	0.0050
86	0.0065	0.0015	0.0050
87	0.0066	0.0015	0.0051
88	0.0066	0.0015	0.0051
89	0.0067	0.0015	0.0051
90	0.0067	0.0015	0.0052
91	0.0067	0.0015	0.0052
92	0.0068	0.0015	0.0052
93	0.0068	0.0016	0.0053
94	0.0068	0.0016	0.0053
95	0.0069	0.0016	0.0053
96	0.0069	0.0016	0.0054
97	0.0070	0.0016	0.0054
98	0.0070	0.0016	0.0054
99	0.0071	0.0016	0.0055
100	0.0071	0.0016	0.0055
101	0.0072	0.0016	0.0055
102	0.0072	0.0016	0.0056
103	0.0073	0.0017	0.0056
104	0.0073	0.0017	0.0056

105	0.0074	0.0017	0.0057
106	0.0074	0.0017	0.0057
107	0.0075	0.0017	0.0058
108	0.0075	0.0017	0.0058
109	0.0076	0.0017	0.0059
110	0.0076	0.0017	0.0059
111	0.0077	0.0018	0.0059
112	0.0078	0.0018	0.0060
113	0.0078	0.0018	0.0060
114	0.0079	0.0018	0.0061
115	0.0080	0.0018	0.0061
116	0.0080	0.0018	0.0062
117	0.0081	0.0018	0.0062
118	0.0081	0.0019	0.0063
119	0.0082	0.0019	0.0063
120	0.0083	0.0019	0.0064
121	0.0084	0.0019	0.0064
122	0.0084	0.0019	0.0065
123	0.0085	0.0019	0.0066
124	0.0086	0.0020	0.0066
125	0.0087	0.0020	0.0067
126	0.0087	0.0020	0.0067
127	0.0088	0.0020	0.0068
128	0.0089	0.0020	0.0068
129	0.0090	0.0021	0.0069
130	0.0091	0.0021	0.0070
131	0.0092	0.0021	0.0071
132	0.0092	0.0021	0.0071
133	0.0094	0.0021	0.0072
134	0.0094	0.0022	0.0073
135	0.0096	0.0022	0.0074
136	0.0096	0.0022	0.0074
137	0.0098	0.0022	0.0075
138	0.0098	0.0023	0.0076
139	0.0100	0.0023	0.0077
140	0.0101	0.0023	0.0078
141	0.0102	0.0023	0.0079
142	0.0103	0.0024	0.0080
143	0.0105	0.0024	0.0081
144	0.0106	0.0024	0.0082
145	0.0097	0.0022	0.0075
146	0.0098	0.0022	0.0076
147	0.0100	0.0023	0.0077
148	0.0101	0.0023	0.0078
149	0.0103	0.0024	0.0079
150	0.0104	0.0024	0.0080
151	0.0106	0.0024	0.0082
152	0.0107	0.0025	0.0083
153	0.0110	0.0025	0.0085
154	0.0111	0.0025	0.0086

155	0.0113	0.0026	0.0087
156	0.0115	0.0026	0.0089
157	0.0118	0.0027	0.0091
158	0.0119	0.0027	0.0092
159	0.0122	0.0028	0.0094
160	0.0124	0.0028	0.0095
161	0.0127	0.0029	0.0098
162	0.0129	0.0029	0.0099
163	0.0133	0.0030	0.0102
164	0.0135	0.0031	0.0104
165	0.0139	0.0032	0.0107
166	0.0141	0.0032	0.0109
167	0.0146	0.0033	0.0112
168	0.0148	0.0034	0.0114
169	0.0154	0.0035	0.0119
170	0.0157	0.0036	0.0121
171	0.0163	0.0037	0.0126
172	0.0167	0.0038	0.0129
173	0.0174	0.0040	0.0134
174	0.0178	0.0041	0.0137
175	0.0187	0.0043	0.0144
176	0.0191	0.0044	0.0148
177	0.0202	0.0046	0.0156
178	0.0208	0.0047	0.0160
179	0.0221	0.0050	0.0170
180	0.0228	0.0052	0.0176
181	0.0244	0.0056	0.0189
182	0.0254	0.0058	0.0196
183	0.0276	0.0063	0.0213
184	0.0290	0.0066	0.0223
185	0.0278	0.0064	0.0214
186	0.0296	0.0068	0.0228
187	0.0343	0.0079	0.0265
188	0.0375	0.0086	0.0289
189	0.0466	0.0107	0.0360
190	0.0537	0.0117	0.0420
191	0.0815	0.0117	0.0698
192	0.1183	0.0117	0.1066
193	0.5117	0.0117	0.5000
194	0.0641	0.0117	0.0525
195	0.0415	0.0095	0.0320
196	0.0318	0.0073	0.0245
197	0.0305	0.0070	0.0235
198	0.0265	0.0061	0.0204
199	0.0236	0.0054	0.0182
200	0.0214	0.0049	0.0165
201	0.0196	0.0045	0.0151
202	0.0182	0.0042	0.0140
203	0.0170	0.0039	0.0131
204	0.0160	0.0037	0.0123

205	0.0151	0.0035	0.0116
206	0.0143	0.0033	0.0111
207	0.0137	0.0031	0.0105
208	0.0131	0.0030	0.0101
209	0.0125	0.0029	0.0097
210	0.0120	0.0028	0.0093
211	0.0116	0.0027	0.0090
212	0.0112	0.0026	0.0086
213	0.0108	0.0025	0.0084
214	0.0105	0.0024	0.0081
215	0.0102	0.0023	0.0079
216	0.0099	0.0023	0.0076
217	0.0107	0.0024	0.0082
218	0.0104	0.0024	0.0080
219	0.0101	0.0023	0.0078
220	0.0099	0.0023	0.0076
221	0.0097	0.0022	0.0075
222	0.0095	0.0022	0.0073
223	0.0093	0.0021	0.0072
224	0.0091	0.0021	0.0070
225	0.0089	0.0020	0.0069
226	0.0088	0.0020	0.0068
227	0.0086	0.0020	0.0066
228	0.0085	0.0019	0.0065
229	0.0083	0.0019	0.0064
230	0.0082	0.0019	0.0063
231	0.0080	0.0018	0.0062
232	0.0079	0.0018	0.0061
233	0.0078	0.0018	0.0060
234	0.0077	0.0018	0.0059
235	0.0076	0.0017	0.0058
236	0.0075	0.0017	0.0057
237	0.0073	0.0017	0.0057
238	0.0072	0.0017	0.0056
239	0.0072	0.0016	0.0055
240	0.0071	0.0016	0.0054
241	0.0070	0.0016	0.0054
242	0.0069	0.0016	0.0053
243	0.0068	0.0016	0.0052
244	0.0067	0.0015	0.0052
245	0.0066	0.0015	0.0051
246	0.0066	0.0015	0.0051
247	0.0065	0.0015	0.0050
248	0.0064	0.0015	0.0049
249	0.0063	0.0014	0.0049
250	0.0063	0.0014	0.0048
251	0.0062	0.0014	0.0048
252	0.0061	0.0014	0.0047
253	0.0061	0.0014	0.0047
254	0.0060	0.0014	0.0046

```
      255              0.0060          0.0014              0.0046
      256              0.0059          0.0013              0.0045
      257              0.0058          0.0013              0.0045
      258              0.0058          0.0013              0.0045
      259              0.0057          0.0013              0.0044
      260              0.0057          0.0013              0.0044
      261              0.0056          0.0013              0.0043
      262              0.0056          0.0013              0.0043
      263              0.0055          0.0013              0.0043
      264              0.0055          0.0013              0.0042
      265              0.0054          0.0012              0.0042
      266              0.0054          0.0012              0.0042
      267              0.0053          0.0012              0.0041
      268              0.0053          0.0012              0.0041
      269              0.0053          0.0012              0.0041
      270              0.0052          0.0012              0.0040
      271              0.0052          0.0012              0.0040
      272              0.0051          0.0012              0.0040
      273              0.0051          0.0012              0.0039
      274              0.0050          0.0012              0.0039
      275              0.0050          0.0011              0.0039
      276              0.0050          0.0011              0.0038
      277              0.0049          0.0011              0.0038
      278              0.0049          0.0011              0.0038
      279              0.0049          0.0011              0.0038
      280              0.0048          0.0011              0.0037
      281              0.0048          0.0011              0.0037
      282              0.0048          0.0011              0.0037
      283              0.0047          0.0011              0.0037
      284              0.0047          0.0011              0.0036
      285              0.0047          0.0011              0.0036
      286              0.0046          0.0011              0.0036
      287              0.0046          0.0011              0.0036
      288              0.0046          0.0010              0.0035
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Total soil rain loss =      0.65(In)
      Total effective rainfall =      2.77(In)
      Peak flow rate in flood hydrograph =     52.41(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))

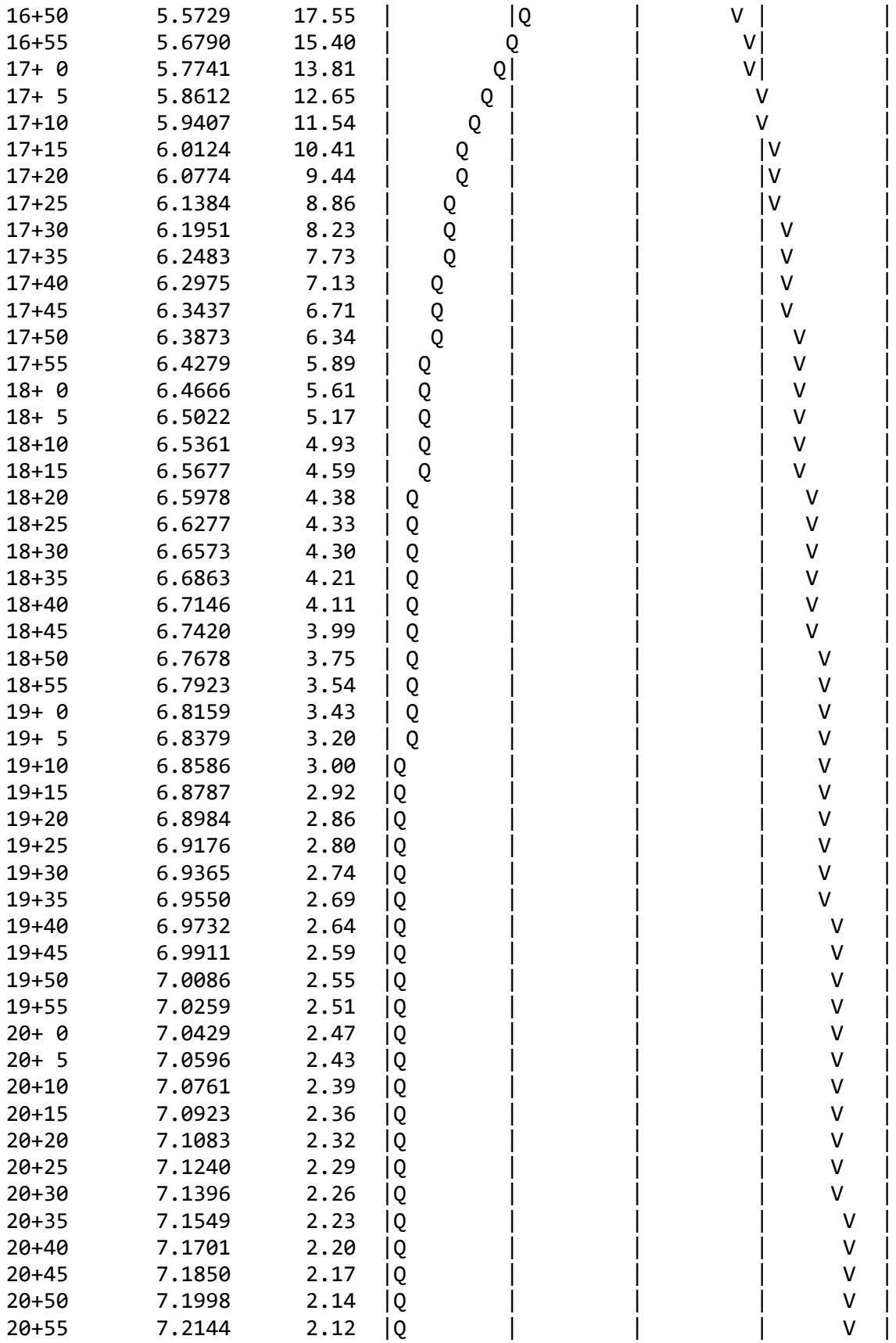
      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
-------------------------------------------------------------------------
  0+ 5       0.0001      0.02  Q         |         |         |         |
```

0+10	0.0006	0.07	Q	|	|	|	|
0+15	0.0019	0.18	Q	|	|	|	|
0+20	0.0049	0.43	Q	|	|	|	|
0+25	0.0095	0.67	Q	|	|	|	|
0+30	0.0152	0.83	Q	|	|	|	|
0+35	0.0217	0.94	Q	|	|	|	|
0+40	0.0287	1.02	Q	|	|	|	|
0+45	0.0362	1.08	Q	|	|	|	|
0+50	0.0440	1.14	Q	|	|	|	|
0+55	0.0521	1.18	Q	|	|	|	|
1+ 0	0.0605	1.22	Q	|	|	|	|
1+ 5	0.0691	1.25	Q	|	|	|	|
1+10	0.0780	1.28	Q	|	|	|	|
1+15	0.0870	1.31	Q	|	|	|	|
1+20	0.0962	1.33	Q	|	|	|	|
1+25	0.1055	1.35	Q	|	|	|	|
1+30	0.1149	1.37	Q	|	|	|	|
1+35	0.1245	1.39	Q	|	|	|	|
1+40	0.1342	1.41	Q	|	|	|	|
1+45	0.1440	1.42	Q	|	|	|	|
1+50	0.1539	1.44	Q	|	|	|	|
1+55	0.1639	1.45	Q	|	|	|	|
2+ 0	0.1739	1.46	Q	|	|	|	|
2+ 5	0.1841	1.47	Q	|	|	|	|
2+10	0.1943	1.48	QV	|	|	|	|
2+15	0.2046	1.49	QV	|	|	|	|
2+20	0.2149	1.50	|Q	|	|	|	|
2+25	0.2253	1.51	|Q	|	|	|	|
2+30	0.2358	1.52	|Q	|	|	|	|
2+35	0.2463	1.53	|Q	|	|	|	|
2+40	0.2569	1.54	|Q	|	|	|	|
2+45	0.2676	1.55	|Q	|	|	|	|
2+50	0.2783	1.56	|Q	|	|	|	|
2+55	0.2890	1.56	|Q	|	|	|	|
3+ 0	0.2999	1.57	|Q	|	|	|	|
3+ 5	0.3107	1.58	|Q	|	|	|	|
3+10	0.3216	1.58	|Q	|	|	|	|
3+15	0.3326	1.59	|Q	|	|	|	|
3+20	0.3436	1.60	|Q	|	|	|	|
3+25	0.3546	1.60	|Q	|	|	|	|
3+30	0.3657	1.61	|Q	|	|	|	|
3+35	0.3768	1.61	|Q	|	|	|	|
3+40	0.3880	1.62	|QV	|	|	|	|
3+45	0.3992	1.63	|QV	|	|	|	|
3+50	0.4104	1.63	|QV	|	|	|	|
3+55	0.4217	1.64	|QV	|	|	|	|
4+ 0	0.4331	1.65	|QV	|	|	|	|
4+ 5	0.4445	1.65	|QV	|	|	|	|
4+10	0.4559	1.66	|QV	|	|	|	|
4+15	0.4674	1.67	|QV	|	|	|	|

4+20	0.4789	1.67	|QV	|	|	|	|
4+25	0.4905	1.68	|QV	|	|	|	|
4+30	0.5021	1.69	|QV	|	|	|	|
4+35	0.5138	1.70	|QV	|	|	|	|
4+40	0.5256	1.70	|QV	|	|	|	|
4+45	0.5373	1.71	|QV	|	|	|	|
4+50	0.5492	1.72	|QV	|	|	|	|
4+55	0.5611	1.73	|QV	|	|	|	|
5+ 0	0.5730	1.73	|QV	|	|	|	|
5+ 5	0.5850	1.74	|Q V	|	|	|	|
5+10	0.5970	1.75	|Q V	|	|	|	|
5+15	0.6091	1.76	|Q V	|	|	|	|
5+20	0.6213	1.76	|Q V	|	|	|	|
5+25	0.6335	1.77	|Q V	|	|	|	|
5+30	0.6458	1.78	|Q V	|	|	|	|
5+35	0.6581	1.79	|Q V	|	|	|	|
5+40	0.6705	1.80	|Q V	|	|	|	|
5+45	0.6829	1.81	|Q V	|	|	|	|
5+50	0.6954	1.81	|Q V	|	|	|	|
5+55	0.7080	1.82	|Q V	|	|	|	|
6+ 0	0.7206	1.83	|Q V	|	|	|	|
6+ 5	0.7333	1.84	|Q V	|	|	|	|
6+10	0.7460	1.85	|Q V	|	|	|	|
6+15	0.7588	1.86	|Q V	|	|	|	|
6+20	0.7717	1.87	|Q V	|	|	|	|
6+25	0.7846	1.88	|Q V	|	|	|	|
6+30	0.7976	1.89	|Q V	|	|	|	|
6+35	0.8107	1.90	|Q V	|	|	|	|
6+40	0.8238	1.91	|Q V	|	|	|	|
6+45	0.8370	1.92	|Q V	|	|	|	|
6+50	0.8503	1.93	|Q V	|	|	|	|
6+55	0.8637	1.94	|Q V	|	|	|	|
7+ 0	0.8771	1.95	|Q V	|	|	|	|
7+ 5	0.8906	1.96	|Q V	|	|	|	|
7+10	0.9041	1.97	|Q V	|	|	|	|
7+15	0.9177	1.98	|Q V	|	|	|	|
7+20	0.9315	1.99	|Q V	|	|	|	|
7+25	0.9452	2.00	|Q V	|	|	|	|
7+30	0.9591	2.01	|Q V	|	|	|	|
7+35	0.9730	2.02	|Q V	|	|	|	|
7+40	0.9871	2.04	|Q V	|	|	|	|
7+45	1.0012	2.05	|Q V	|	|	|	|
7+50	1.0154	2.06	|Q V	|	|	|	|
7+55	1.0296	2.07	|Q V	|	|	|	|
8+ 0	1.0440	2.08	|Q V	|	|	|	|
8+ 5	1.0584	2.10	|Q V	|	|	|	|
8+10	1.0730	2.11	|Q V	|	|	|	|
8+15	1.0876	2.12	|Q V	|	|	|	|
8+20	1.1023	2.14	|Q V	|	|	|	|
8+25	1.1171	2.15	|Q V	|	|	|	|

8+30	1.1320	2.16	Q V			
8+35	1.1470	2.18	Q V			
8+40	1.1620	2.19	Q V			
8+45	1.1772	2.20	Q V			
8+50	1.1925	2.22	Q V			
8+55	1.2079	2.23	Q V			
9+ 0	1.2234	2.25	Q V			
9+ 5	1.2390	2.26	Q V			
9+10	1.2547	2.28	Q V			
9+15	1.2705	2.30	Q V			
9+20	1.2864	2.31	Q V			
9+25	1.3025	2.33	Q V			
9+30	1.3186	2.35	Q V			
9+35	1.3349	2.36	Q V			
9+40	1.3513	2.38	Q V			
9+45	1.3678	2.40	Q V			
9+50	1.3844	2.42	Q V			
9+55	1.4012	2.43	Q V			
10+ 0	1.4181	2.45	Q V			
10+ 5	1.4351	2.47	Q V			
10+10	1.4523	2.49	Q V			
10+15	1.4696	2.51	Q V			
10+20	1.4871	2.53	Q V			
10+25	1.5047	2.55	Q V			
10+30	1.5224	2.58	Q V			
10+35	1.5403	2.60	Q V			
10+40	1.5583	2.62	Q V			
10+45	1.5765	2.64	Q V			
10+50	1.5949	2.67	Q V			
10+55	1.6134	2.69	Q V			
11+ 0	1.6321	2.72	Q V			
11+ 5	1.6510	2.74	Q V			
11+10	1.6701	2.77	Q V			
11+15	1.6893	2.79	Q V			
11+20	1.7087	2.82	Q V			
11+25	1.7284	2.85	Q V			
11+30	1.7482	2.88	Q V			
11+35	1.7682	2.91	Q V			
11+40	1.7884	2.94	Q V			
11+45	1.8089	2.97	Q V			
11+50	1.8295	3.00	Q V			
11+55	1.8504	3.03	Q V			
12+ 0	1.8715	3.07	Q V			
12+ 5	1.8929	3.10	Q V			
12+10	1.9144	3.12	Q V			
12+15	1.9360	3.13	Q V			
12+20	1.9574	3.12	Q V			
12+25	1.9788	3.10	Q V			
12+30	2.0002	3.11	Q V			
12+35	2.0217	3.12	Q V			

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12+40       2.0434      3.15  | Q       V         |          |          |
12+45       2.0653      3.18  | Q       V         |          |          |
12+50       2.0874      3.21  | Q       V         |          |          |
12+55       2.1098      3.25  | Q       V         |          |          |
13+ 0       2.1325      3.29  | Q       |V        |          |          |
13+ 5       2.1555      3.34  | Q       |V        |          |          |
13+10       2.1788      3.38  | Q       |V        |          |          |
13+15       2.2024      3.43  | Q       |V        |          |          |
13+20       2.2264      3.49  | Q       |V        |          |          |
13+25       2.2508      3.54  | Q       |V        |          |          |
13+30       2.2757      3.60  | Q       |V        |          |          |
13+35       2.3009      3.67  | Q       |V        |          |          |
13+40       2.3266      3.73  | Q       | V       |          |          |
13+45       2.3528      3.80  | Q       | V       |          |          |
13+50       2.3795      3.88  | Q       | V       |          |          |
13+55       2.4067      3.95  | Q       | V       |          |          |
14+ 0       2.4345      4.04  | Q       | V       |          |          |
14+ 5       2.4629      4.12  | Q       | V       |          |          |
14+10       2.4919      4.22  | Q       | V       |          |          |
14+15       2.5216      4.32  | Q       |  V      |          |          |
14+20       2.5521      4.43  | Q       |  V      |          |          |
14+25       2.5834      4.54  |  Q      |  V      |          |          |
14+30       2.6155      4.66  |  Q      |  V      |          |          |
14+35       2.6485      4.79  |  Q      |  V      |          |          |
14+40       2.6825      4.93  |  Q      |  V      |          |          |
14+45       2.7175      5.08  |  Q      |   V     |          |          |
14+50       2.7536      5.25  |  Q      |   V     |          |          |
14+55       2.7910      5.42  |  Q      |   V     |          |          |
15+ 0       2.8297      5.62  |  Q      |   V     |          |          |
15+ 5       2.8699      5.83  |  Q      |   V     |          |          |
15+10       2.9117      6.07  |   Q     |    V    |          |          |
15+15       2.9553      6.34  |   Q     |    V    |          |          |
15+20       3.0011      6.64  |   Q     |    V    |          |          |
15+25       3.0490      6.96  |   Q     |    V    |          |          |
15+30       3.0993      7.30  |   Q     |     V   |          |          |
15+35       3.1520      7.65  |    Q    |     V   |          |          |
15+40       3.2067      7.95  |    Q    |     V   |          |          |
15+45       3.2643      8.36  |    Q    |     V   |          |          |
15+50       3.3266      9.03  |     Q   |      V  |          |          |
15+55       3.3958     10.05  |     Q   |      V  |          |          |
16+ 0       3.4770     11.79  |      Q  |      V  |          |          |
16+ 5       3.5886     16.21  |         Q       V |          |          |
16+10       3.7580     24.59  |         |     Q  V|          |          |
16+15       4.0006     35.23  |         |         V  Q       |          |
16+20       4.3616     52.41  |         |          | V       |   Q      |
16+25       4.7040     49.73  |         |          |   V     |  Q       |
16+30       4.9592     37.05  |         |          |   QV    |          |
16+35       5.1531     28.15  |         |       Q  |     V   |          |
16+40       5.3141     23.38  |         |    Q     |      V  |          |
16+45       5.4520     20.03  |         |  Q       |       V |          |
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   21+ 0       7.2288      2.09  |Q        |         |         |      V  |
   21+ 5       7.2430      2.07  |Q        |         |         |      V  |
   21+10       7.2571      2.04  |Q        |         |         |      V  |
   21+15       7.2710      2.02  |Q        |         |         |      V  |
   21+20       7.2847      2.00  |Q        |         |         |      V  |
   21+25       7.2983      1.97  |Q        |         |         |      V  |
   21+30       7.3117      1.95  |Q        |         |         |      V  |
   21+35       7.3250      1.93  |Q        |         |         |      V  |
   21+40       7.3382      1.91  |Q        |         |         |      V  |
   21+45       7.3512      1.89  |Q        |         |         |       V |
   21+50       7.3641      1.87  |Q        |         |         |       V |
   21+55       7.3769      1.85  |Q        |         |         |       V |
   22+ 0       7.3895      1.83  |Q        |         |         |       V |
   22+ 5       7.4020      1.82  |Q        |         |         |       V |
   22+10       7.4144      1.80  |Q        |         |         |       V |
   22+15       7.4267      1.78  |Q        |         |         |       V |
   22+20       7.4388      1.77  |Q        |         |         |       V |
   22+25       7.4509      1.75  |Q        |         |         |       V |
   22+30       7.4628      1.73  |Q        |         |         |       V |
   22+35       7.4747      1.72  |Q        |         |         |       V |
   22+40       7.4864      1.70  |Q        |         |         |       V |
   22+45       7.4981      1.69  |Q        |         |         |       V |
   22+50       7.5096      1.68  |Q        |         |         |       V |
   22+55       7.5210      1.66  |Q        |         |         |       V |
   23+ 0       7.5324      1.65  |Q        |         |         |       V |
   23+ 5       7.5436      1.63  |Q        |         |         |        V|
   23+10       7.5548      1.62  |Q        |         |         |        V|
   23+15       7.5659      1.61  |Q        |         |         |        V|
   23+20       7.5769      1.60  |Q        |         |         |        V|
   23+25       7.5878      1.58  |Q        |         |         |        V|
   23+30       7.5986      1.57  |Q        |         |         |        V|
   23+35       7.6094      1.56  |Q        |         |         |        V|
   23+40       7.6200      1.55  |Q        |         |         |        V|
   23+45       7.6306      1.54  |Q        |         |         |        V|
   23+50       7.6411      1.53  |Q        |         |         |        V|
   23+55       7.6516      1.52  |Q        |         |         |        V|
   24+ 0       7.6619      1.50  |Q        |         |         |        V|
-----------------------------------------------------------------------
```

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

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Study date 08/25/22

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

Program License Serial Number 6277

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
100 YR STORM UNIT HYDROGRAPH, PRE CONDITION
AREA C

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
29.07	1	0.60
Rainfall data for year 2		
29.07	6	0.76
Rainfall data for year 2		
29.07	24	1.30
Rainfall data for year 100		

```
            29.07            1            1.08
------------------------------------------------------------------------
Rainfall data for year 100
            29.07            6            2.01
------------------------------------------------------------------------
Rainfall data for year 100
            29.07           24            3.42
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 78.0      92.8         29.07      1.000     0.140    1.000    0.140

Area-averaged adjusted loss rate Fm (In/Hr) =  0.140

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
    29.07   1.000         78.0      92.8       0.78     0.771

Area-averaged catchment yield fraction, Y =  0.771
Area-averaged low loss fraction, Yb =  0.229
User entry of time of concentration  =   0.520 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =      29.07(Ac.)
Catchment Lag time =   0.416 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 20.0321
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.140(In/Hr)
Average low loss rate fraction (Yb) = 0.229 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.512(In)
Computed peak 30-minute rainfall =  0.877(In)
Specified peak 1-hour rainfall =  1.080(In)
Computed peak 3-hour rainfall =  1.581(In)
Specified peak 6-hour rainfall =  2.010(In)
Specified peak 24-hour rainfall =  3.420(In)


Rainfall depth area reduction factors:
Using a total area of      29.07(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999     Adjusted rainfall =  0.512(In)
30-minute factor = 0.999    Adjusted rainfall =  0.876(In)
```

1-hour factor = 0.999 Adjusted rainfall = 1.079(In)
3-hour factor = 1.000 Adjusted rainfall = 1.580(In)
6-hour factor = 1.000 Adjusted rainfall = 2.010(In)
24-hour factor = 1.000 Adjusted rainfall = 3.420(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 = 351.57 (CFS))	
1	0.995	3.497
2	4.516	12.378
3	11.300	23.853
4	26.240	52.522
5	43.399	60.326
6	55.091	41.103
7	62.875	27.365
8	68.500	19.779
9	73.033	15.934
10	76.661	12.755
11	79.664	10.560
12	82.167	8.798
13	84.311	7.537
14	86.250	6.817
15	87.937	5.932
16	89.330	4.896
17	90.508	4.141
18	91.609	3.872
19	92.585	3.432
20	93.487	3.171
21	94.262	2.724
22	94.943	2.394
23	95.601	2.314
24	96.140	1.892
25	96.660	1.831
26	97.095	1.527
27	97.455	1.268
28	97.792	1.184
29	98.009	0.763
30	98.210	0.704
31	98.432	0.781
32	98.672	0.845
33	98.913	0.845
34	99.153	0.845
35	99.393	0.844
36	99.570	0.621
37	99.695	0.440

38	99.820	0.440
39	100.000	0.220

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5118	0.5118
2	0.6301	0.1183
3	0.7116	0.0815
4	0.7757	0.0641
5	0.8294	0.0537
6	0.8760	0.0466
7	0.9175	0.0415
8	0.9550	0.0375
9	0.9893	0.0343
10	1.0211	0.0318
11	1.0507	0.0296
12	1.0785	0.0278
13	1.1090	0.0304
14	1.1379	0.0290
15	1.1656	0.0276
16	1.1920	0.0265
17	1.2174	0.0254
18	1.2419	0.0244
19	1.2654	0.0236
20	1.2882	0.0228
21	1.3102	0.0220
22	1.3316	0.0214
23	1.3524	0.0207
24	1.3725	0.0202
25	1.3921	0.0196
26	1.4113	0.0191
27	1.4299	0.0186
28	1.4481	0.0182
29	1.4659	0.0178
30	1.4833	0.0174
31	1.5003	0.0170
32	1.5169	0.0167
33	1.5333	0.0163
34	1.5493	0.0160
35	1.5650	0.0157
36	1.5804	0.0154
37	1.5955	0.0151
38	1.6103	0.0148
39	1.6249	0.0146
40	1.6392	0.0143
41	1.6533	0.0141
42	1.6672	0.0139
43	1.6808	0.0137
44	1.6943	0.0135
45	1.7075	0.0133

46	1.7206	0.0131
47	1.7335	0.0129
48	1.7462	0.0127
49	1.7587	0.0125
50	1.7711	0.0124
51	1.7833	0.0122
52	1.7953	0.0120
53	1.8072	0.0119
54	1.8190	0.0118
55	1.8306	0.0116
56	1.8421	0.0115
57	1.8534	0.0113
58	1.8646	0.0112
59	1.8757	0.0111
60	1.8867	0.0110
61	1.8975	0.0108
62	1.9082	0.0107
63	1.9189	0.0106
64	1.9294	0.0105
65	1.9398	0.0104
66	1.9501	0.0103
67	1.9603	0.0102
68	1.9704	0.0101
69	1.9804	0.0100
70	1.9903	0.0099
71	2.0001	0.0098
72	2.0098	0.0097
73	2.0205	0.0107
74	2.0310	0.0106
75	2.0415	0.0105
76	2.0519	0.0104
77	2.0622	0.0103
78	2.0725	0.0102
79	2.0826	0.0101
80	2.0927	0.0101
81	2.1027	0.0100
82	2.1126	0.0099
83	2.1224	0.0098
84	2.1322	0.0098
85	2.1419	0.0097
86	2.1515	0.0096
87	2.1611	0.0096
88	2.1706	0.0095
89	2.1800	0.0094
90	2.1894	0.0094
91	2.1986	0.0093
92	2.2079	0.0092
93	2.2171	0.0092
94	2.2262	0.0091
95	2.2352	0.0091

96	2.2442	0.0090
97	2.2531	0.0089
98	2.2620	0.0089
99	2.2708	0.0088
100	2.2796	0.0088
101	2.2883	0.0087
102	2.2970	0.0087
103	2.3056	0.0086
104	2.3142	0.0086
105	2.3227	0.0085
106	2.3311	0.0085
107	2.3395	0.0084
108	2.3479	0.0084
109	2.3562	0.0083
110	2.3645	0.0083
111	2.3727	0.0082
112	2.3809	0.0082
113	2.3890	0.0081
114	2.3971	0.0081
115	2.4051	0.0080
116	2.4131	0.0080
117	2.4211	0.0080
118	2.4290	0.0079
119	2.4368	0.0079
120	2.4447	0.0078
121	2.4525	0.0078
122	2.4602	0.0078
123	2.4679	0.0077
124	2.4756	0.0077
125	2.4832	0.0076
126	2.4908	0.0076
127	2.4984	0.0076
128	2.5059	0.0075
129	2.5134	0.0075
130	2.5209	0.0075
131	2.5283	0.0074
132	2.5357	0.0074
133	2.5430	0.0073
134	2.5503	0.0073
135	2.5576	0.0073
136	2.5649	0.0072
137	2.5721	0.0072
138	2.5793	0.0072
139	2.5864	0.0072
140	2.5935	0.0071
141	2.6006	0.0071
142	2.6077	0.0071
143	2.6147	0.0070
144	2.6217	0.0070
145	2.6287	0.0070

146	2.6356	0.0069
147	2.6425	0.0069
148	2.6494	0.0069
149	2.6562	0.0068
150	2.6631	0.0068
151	2.6699	0.0068
152	2.6766	0.0068
153	2.6834	0.0067
154	2.6901	0.0067
155	2.6968	0.0067
156	2.7034	0.0067
157	2.7100	0.0066
158	2.7167	0.0066
159	2.7232	0.0066
160	2.7298	0.0066
161	2.7363	0.0065
162	2.7428	0.0065
163	2.7493	0.0065
164	2.7558	0.0065
165	2.7622	0.0064
166	2.7686	0.0064
167	2.7750	0.0064
168	2.7813	0.0064
169	2.7877	0.0063
170	2.7940	0.0063
171	2.8003	0.0063
172	2.8065	0.0063
173	2.8128	0.0062
174	2.8190	0.0062
175	2.8252	0.0062
176	2.8314	0.0062
177	2.8376	0.0062
178	2.8437	0.0061
179	2.8498	0.0061
180	2.8559	0.0061
181	2.8620	0.0061
182	2.8680	0.0061
183	2.8741	0.0060
184	2.8801	0.0060
185	2.8861	0.0060
186	2.8920	0.0060
187	2.8980	0.0060
188	2.9039	0.0059
189	2.9098	0.0059
190	2.9157	0.0059
191	2.9216	0.0059
192	2.9275	0.0059
193	2.9333	0.0058
194	2.9391	0.0058
195	2.9449	0.0058

196	2.9507	0.0058
197	2.9565	0.0058
198	2.9622	0.0057
199	2.9679	0.0057
200	2.9736	0.0057
201	2.9793	0.0057
202	2.9850	0.0057
203	2.9907	0.0057
204	2.9963	0.0056
205	3.0019	0.0056
206	3.0075	0.0056
207	3.0131	0.0056
208	3.0187	0.0056
209	3.0243	0.0056
210	3.0298	0.0055
211	3.0353	0.0055
212	3.0408	0.0055
213	3.0463	0.0055
214	3.0518	0.0055
215	3.0573	0.0055
216	3.0627	0.0054
217	3.0681	0.0054
218	3.0735	0.0054
219	3.0789	0.0054
220	3.0843	0.0054
221	3.0897	0.0054
222	3.0950	0.0054
223	3.1004	0.0053
224	3.1057	0.0053
225	3.1110	0.0053
226	3.1163	0.0053
227	3.1216	0.0053
228	3.1269	0.0053
229	3.1321	0.0053
230	3.1373	0.0052
231	3.1426	0.0052
232	3.1478	0.0052
233	3.1530	0.0052
234	3.1582	0.0052
235	3.1633	0.0052
236	3.1685	0.0052
237	3.1736	0.0051
238	3.1787	0.0051
239	3.1839	0.0051
240	3.1890	0.0051
241	3.1940	0.0051
242	3.1991	0.0051
243	3.2042	0.0051
244	3.2092	0.0050
245	3.2143	0.0050

246	3.2193	0.0050
247	3.2243	0.0050
248	3.2293	0.0050
249	3.2343	0.0050
250	3.2393	0.0050
251	3.2442	0.0050
252	3.2492	0.0049
253	3.2541	0.0049
254	3.2590	0.0049
255	3.2640	0.0049
256	3.2689	0.0049
257	3.2738	0.0049
258	3.2786	0.0049
259	3.2835	0.0049
260	3.2884	0.0049
261	3.2932	0.0048
262	3.2980	0.0048
263	3.3028	0.0048
264	3.3077	0.0048
265	3.3125	0.0048
266	3.3172	0.0048
267	3.3220	0.0048
268	3.3268	0.0048
269	3.3315	0.0048
270	3.3363	0.0047
271	3.3410	0.0047
272	3.3457	0.0047
273	3.3504	0.0047
274	3.3552	0.0047
275	3.3598	0.0047
276	3.3645	0.0047
277	3.3692	0.0047
278	3.3738	0.0047
279	3.3785	0.0046
280	3.3831	0.0046
281	3.3878	0.0046
282	3.3924	0.0046
283	3.3970	0.0046
284	3.4016	0.0046
285	3.4062	0.0046
286	3.4107	0.0046
287	3.4153	0.0046
288	3.4199	0.0046

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0046	0.0010	0.0035
2	0.0046	0.0010	0.0035

3	0.0046	0.0010	0.0035
4	0.0046	0.0011	0.0035
5	0.0046	0.0011	0.0036
6	0.0046	0.0011	0.0036
7	0.0046	0.0011	0.0036
8	0.0047	0.0011	0.0036
9	0.0047	0.0011	0.0036
10	0.0047	0.0011	0.0036
11	0.0047	0.0011	0.0036
12	0.0047	0.0011	0.0036
13	0.0047	0.0011	0.0037
14	0.0048	0.0011	0.0037
15	0.0048	0.0011	0.0037
16	0.0048	0.0011	0.0037
17	0.0048	0.0011	0.0037
18	0.0048	0.0011	0.0037
19	0.0048	0.0011	0.0037
20	0.0049	0.0011	0.0037
21	0.0049	0.0011	0.0038
22	0.0049	0.0011	0.0038
23	0.0049	0.0011	0.0038
24	0.0049	0.0011	0.0038
25	0.0049	0.0011	0.0038
26	0.0050	0.0011	0.0038
27	0.0050	0.0011	0.0038
28	0.0050	0.0011	0.0039
29	0.0050	0.0011	0.0039
30	0.0050	0.0012	0.0039
31	0.0051	0.0012	0.0039
32	0.0051	0.0012	0.0039
33	0.0051	0.0012	0.0039
34	0.0051	0.0012	0.0039
35	0.0051	0.0012	0.0040
36	0.0052	0.0012	0.0040
37	0.0052	0.0012	0.0040
38	0.0052	0.0012	0.0040
39	0.0052	0.0012	0.0040
40	0.0052	0.0012	0.0040
41	0.0053	0.0012	0.0041
42	0.0053	0.0012	0.0041
43	0.0053	0.0012	0.0041
44	0.0053	0.0012	0.0041
45	0.0054	0.0012	0.0041
46	0.0054	0.0012	0.0041
47	0.0054	0.0012	0.0042
48	0.0054	0.0012	0.0042
49	0.0054	0.0012	0.0042
50	0.0055	0.0012	0.0042
51	0.0055	0.0013	0.0042
52	0.0055	0.0013	0.0042

53	0.0055	0.0013	0.0043
54	0.0056	0.0013	0.0043
55	0.0056	0.0013	0.0043
56	0.0056	0.0013	0.0043
57	0.0056	0.0013	0.0044
58	0.0057	0.0013	0.0044
59	0.0057	0.0013	0.0044
60	0.0057	0.0013	0.0044
61	0.0057	0.0013	0.0044
62	0.0058	0.0013	0.0044
63	0.0058	0.0013	0.0045
64	0.0058	0.0013	0.0045
65	0.0059	0.0013	0.0045
66	0.0059	0.0013	0.0045
67	0.0059	0.0014	0.0046
68	0.0059	0.0014	0.0046
69	0.0060	0.0014	0.0046
70	0.0060	0.0014	0.0046
71	0.0060	0.0014	0.0047
72	0.0061	0.0014	0.0047
73	0.0061	0.0014	0.0047
74	0.0061	0.0014	0.0047
75	0.0062	0.0014	0.0047
76	0.0062	0.0014	0.0048
77	0.0062	0.0014	0.0048
78	0.0062	0.0014	0.0048
79	0.0063	0.0014	0.0049
80	0.0063	0.0014	0.0049
81	0.0064	0.0015	0.0049
82	0.0064	0.0015	0.0049
83	0.0064	0.0015	0.0050
84	0.0065	0.0015	0.0050
85	0.0065	0.0015	0.0050
86	0.0065	0.0015	0.0050
87	0.0066	0.0015	0.0051
88	0.0066	0.0015	0.0051
89	0.0067	0.0015	0.0051
90	0.0067	0.0015	0.0052
91	0.0067	0.0015	0.0052
92	0.0068	0.0015	0.0052
93	0.0068	0.0016	0.0053
94	0.0068	0.0016	0.0053
95	0.0069	0.0016	0.0053
96	0.0069	0.0016	0.0054
97	0.0070	0.0016	0.0054
98	0.0070	0.0016	0.0054
99	0.0071	0.0016	0.0055
100	0.0071	0.0016	0.0055
101	0.0072	0.0016	0.0055
102	0.0072	0.0016	0.0056

103	0.0073	0.0017	0.0056
104	0.0073	0.0017	0.0056
105	0.0074	0.0017	0.0057
106	0.0074	0.0017	0.0057
107	0.0075	0.0017	0.0058
108	0.0075	0.0017	0.0058
109	0.0076	0.0017	0.0059
110	0.0076	0.0017	0.0059
111	0.0077	0.0018	0.0059
112	0.0078	0.0018	0.0060
113	0.0078	0.0018	0.0060
114	0.0079	0.0018	0.0061
115	0.0080	0.0018	0.0061
116	0.0080	0.0018	0.0062
117	0.0081	0.0018	0.0062
118	0.0081	0.0019	0.0063
119	0.0082	0.0019	0.0063
120	0.0083	0.0019	0.0064
121	0.0084	0.0019	0.0064
122	0.0084	0.0019	0.0065
123	0.0085	0.0019	0.0066
124	0.0086	0.0020	0.0066
125	0.0087	0.0020	0.0067
126	0.0087	0.0020	0.0067
127	0.0088	0.0020	0.0068
128	0.0089	0.0020	0.0068
129	0.0090	0.0021	0.0069
130	0.0091	0.0021	0.0070
131	0.0092	0.0021	0.0071
132	0.0092	0.0021	0.0071
133	0.0094	0.0021	0.0072
134	0.0094	0.0022	0.0073
135	0.0096	0.0022	0.0074
136	0.0096	0.0022	0.0074
137	0.0098	0.0022	0.0075
138	0.0098	0.0023	0.0076
139	0.0100	0.0023	0.0077
140	0.0101	0.0023	0.0078
141	0.0102	0.0023	0.0079
142	0.0103	0.0024	0.0080
143	0.0105	0.0024	0.0081
144	0.0106	0.0024	0.0082
145	0.0097	0.0022	0.0075
146	0.0098	0.0022	0.0076
147	0.0100	0.0023	0.0077
148	0.0101	0.0023	0.0078
149	0.0103	0.0024	0.0079
150	0.0104	0.0024	0.0080
151	0.0106	0.0024	0.0082
152	0.0107	0.0025	0.0083

153	0.0110	0.0025	0.0085
154	0.0111	0.0025	0.0086
155	0.0113	0.0026	0.0087
156	0.0115	0.0026	0.0089
157	0.0118	0.0027	0.0091
158	0.0119	0.0027	0.0092
159	0.0122	0.0028	0.0094
160	0.0124	0.0028	0.0095
161	0.0127	0.0029	0.0098
162	0.0129	0.0029	0.0099
163	0.0133	0.0030	0.0102
164	0.0135	0.0031	0.0104
165	0.0139	0.0032	0.0107
166	0.0141	0.0032	0.0109
167	0.0146	0.0033	0.0112
168	0.0148	0.0034	0.0114
169	0.0154	0.0035	0.0119
170	0.0157	0.0036	0.0121
171	0.0163	0.0037	0.0126
172	0.0167	0.0038	0.0128
173	0.0174	0.0040	0.0134
174	0.0178	0.0041	0.0137
175	0.0186	0.0043	0.0144
176	0.0191	0.0044	0.0147
177	0.0202	0.0046	0.0156
178	0.0207	0.0047	0.0160
179	0.0220	0.0050	0.0170
180	0.0228	0.0052	0.0176
181	0.0244	0.0056	0.0189
182	0.0254	0.0058	0.0196
183	0.0276	0.0063	0.0213
184	0.0290	0.0066	0.0223
185	0.0278	0.0064	0.0214
186	0.0296	0.0068	0.0228
187	0.0343	0.0079	0.0265
188	0.0375	0.0086	0.0289
189	0.0466	0.0107	0.0360
190	0.0537	0.0117	0.0420
191	0.0815	0.0117	0.0698
192	0.1183	0.0117	0.1066
193	0.5118	0.0117	0.5001
194	0.0641	0.0117	0.0525
195	0.0415	0.0095	0.0320
196	0.0318	0.0073	0.0245
197	0.0304	0.0070	0.0235
198	0.0265	0.0060	0.0204
199	0.0236	0.0054	0.0182
200	0.0214	0.0049	0.0165
201	0.0196	0.0045	0.0151
202	0.0182	0.0042	0.0140

203	0.0170	0.0039	0.0131
204	0.0160	0.0037	0.0123
205	0.0151	0.0035	0.0116
206	0.0143	0.0033	0.0111
207	0.0137	0.0031	0.0105
208	0.0131	0.0030	0.0101
209	0.0125	0.0029	0.0097
210	0.0120	0.0028	0.0093
211	0.0116	0.0027	0.0090
212	0.0112	0.0026	0.0086
213	0.0108	0.0025	0.0084
214	0.0105	0.0024	0.0081
215	0.0102	0.0023	0.0079
216	0.0099	0.0023	0.0076
217	0.0107	0.0024	0.0082
218	0.0104	0.0024	0.0080
219	0.0101	0.0023	0.0078
220	0.0099	0.0023	0.0076
221	0.0097	0.0022	0.0075
222	0.0095	0.0022	0.0073
223	0.0093	0.0021	0.0072
224	0.0091	0.0021	0.0070
225	0.0089	0.0020	0.0069
226	0.0088	0.0020	0.0068
227	0.0086	0.0020	0.0066
228	0.0085	0.0019	0.0065
229	0.0083	0.0019	0.0064
230	0.0082	0.0019	0.0063
231	0.0080	0.0018	0.0062
232	0.0079	0.0018	0.0061
233	0.0078	0.0018	0.0060
234	0.0077	0.0018	0.0059
235	0.0076	0.0017	0.0058
236	0.0075	0.0017	0.0057
237	0.0073	0.0017	0.0057
238	0.0072	0.0017	0.0056
239	0.0072	0.0016	0.0055
240	0.0071	0.0016	0.0054
241	0.0070	0.0016	0.0054
242	0.0069	0.0016	0.0053
243	0.0068	0.0016	0.0052
244	0.0067	0.0015	0.0052
245	0.0066	0.0015	0.0051
246	0.0066	0.0015	0.0051
247	0.0065	0.0015	0.0050
248	0.0064	0.0015	0.0049
249	0.0063	0.0014	0.0049
250	0.0063	0.0014	0.0048
251	0.0062	0.0014	0.0048
252	0.0061	0.0014	0.0047

253	0.0061	0.0014	0.0047
254	0.0060	0.0014	0.0046
255	0.0060	0.0014	0.0046
256	0.0059	0.0013	0.0045
257	0.0058	0.0013	0.0045
258	0.0058	0.0013	0.0045
259	0.0057	0.0013	0.0044
260	0.0057	0.0013	0.0044
261	0.0056	0.0013	0.0043
262	0.0056	0.0013	0.0043
263	0.0055	0.0013	0.0043
264	0.0055	0.0013	0.0042
265	0.0054	0.0012	0.0042
266	0.0054	0.0012	0.0042
267	0.0053	0.0012	0.0041
268	0.0053	0.0012	0.0041
269	0.0053	0.0012	0.0041
270	0.0052	0.0012	0.0040
271	0.0052	0.0012	0.0040
272	0.0051	0.0012	0.0040
273	0.0051	0.0012	0.0039
274	0.0050	0.0012	0.0039
275	0.0050	0.0011	0.0039
276	0.0050	0.0011	0.0038
277	0.0049	0.0011	0.0038
278	0.0049	0.0011	0.0038
279	0.0049	0.0011	0.0038
280	0.0048	0.0011	0.0037
281	0.0048	0.0011	0.0037
282	0.0048	0.0011	0.0037
283	0.0047	0.0011	0.0037
284	0.0047	0.0011	0.0036
285	0.0047	0.0011	0.0036
286	0.0046	0.0011	0.0036
287	0.0046	0.0011	0.0036
288	0.0046	0.0010	0.0035

Total soil rain loss = 0.65(In)
Total effective rainfall = 2.77(In)
Peak flow rate in flood hydrograph = 43.70(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))

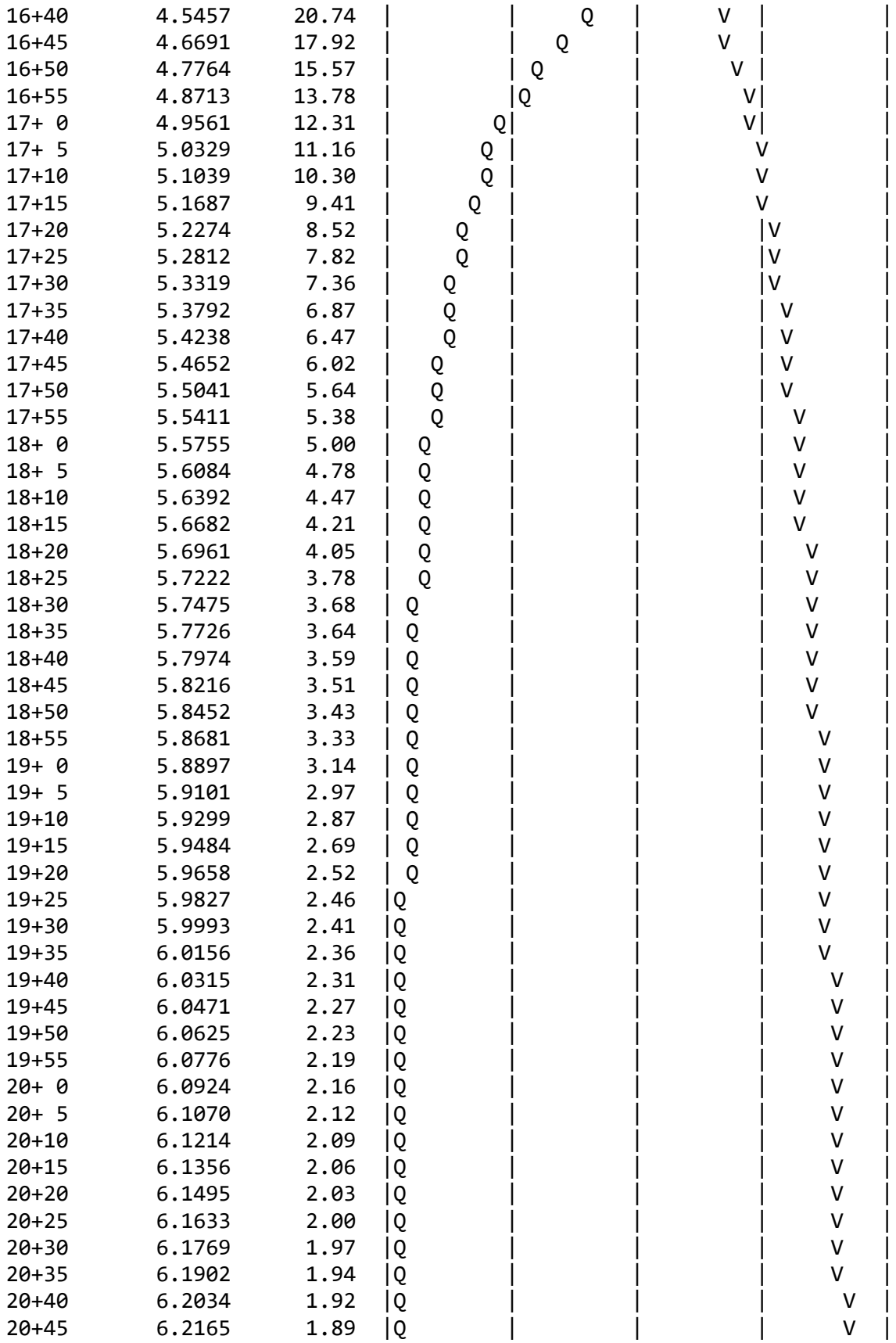
Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0

0+ 5	0.0001	0.01	Q				
0+10	0.0005	0.06	Q				
0+15	0.0014	0.14	Q				
0+20	0.0037	0.32	Q				
0+25	0.0074	0.54	Q				
0+30	0.0121	0.68	Q				
0+35	0.0175	0.78	Q				
0+40	0.0234	0.85	Q				
0+45	0.0296	0.91	Q				
0+50	0.0363	0.96	Q				
0+55	0.0432	1.00	Q				
1+ 0	0.0503	1.04	Q				
1+ 5	0.0576	1.07	Q				
1+10	0.0652	1.09	Q				
1+15	0.0729	1.12	Q				
1+20	0.0807	1.14	Q				
1+25	0.0887	1.16	Q				
1+30	0.0968	1.17	Q				
1+35	0.1050	1.19	Q				
1+40	0.1133	1.21	Q				
1+45	0.1217	1.22	Q				
1+50	0.1302	1.23	Q				
1+55	0.1387	1.24	Q				
2+ 0	0.1474	1.26	VQ				
2+ 5	0.1561	1.27	VQ				
2+10	0.1649	1.28	VQ				
2+15	0.1737	1.29	|Q				
2+20	0.1827	1.29	|Q				
2+25	0.1916	1.30	|Q				
2+30	0.2006	1.31	|Q				
2+35	0.2097	1.32	|Q				
2+40	0.2188	1.32	|Q				
2+45	0.2280	1.33	|Q				
2+50	0.2372	1.34	|Q				
2+55	0.2465	1.35	|Q				
3+ 0	0.2558	1.36	|Q				
3+ 5	0.2652	1.36	|Q				
3+10	0.2746	1.37	|Q				
3+15	0.2841	1.37	|Q				
3+20	0.2936	1.38	|Q				
3+25	0.3032	1.39	|Q				
3+30	0.3127	1.39	|Q				
3+35	0.3224	1.40	|Q				
3+40	0.3320	1.40	|Q				
3+45	0.3417	1.41	|QV				
3+50	0.3514	1.41	|QV				
3+55	0.3612	1.42	|QV				
4+ 0	0.3710	1.42	|QV				
4+ 5	0.3809	1.43	|QV				

4+10	0.3907	1.44	|QV	|	|	|	|
4+15	0.4007	1.44	|QV	|	|	|	|
4+20	0.4107	1.45	|QV	|	|	|	|
4+25	0.4207	1.45	|QV	|	|	|	|
4+30	0.4307	1.46	|QV	|	|	|	|
4+35	0.4408	1.47	|QV	|	|	|	|
4+40	0.4510	1.47	|QV	|	|	|	|
4+45	0.4612	1.48	|QV	|	|	|	|
4+50	0.4714	1.49	|QV	|	|	|	|
4+55	0.4817	1.49	|QV	|	|	|	|
5+ 0	0.4920	1.50	|QV	|	|	|	|
5+ 5	0.5023	1.51	|Q V	|	|	|	|
5+10	0.5128	1.51	|Q V	|	|	|	|
5+15	0.5232	1.52	|Q V	|	|	|	|
5+20	0.5337	1.53	|Q V	|	|	|	|
5+25	0.5443	1.53	|Q V	|	|	|	|
5+30	0.5549	1.54	|Q V	|	|	|	|
5+35	0.5655	1.55	|Q V	|	|	|	|
5+40	0.5762	1.55	|Q V	|	|	|	|
5+45	0.5870	1.56	|Q V	|	|	|	|
5+50	0.5978	1.57	|Q V	|	|	|	|
5+55	0.6087	1.58	|Q V	|	|	|	|
6+ 0	0.6196	1.58	|Q V	|	|	|	|
6+ 5	0.6305	1.59	|Q V	|	|	|	|
6+10	0.6415	1.60	|Q V	|	|	|	|
6+15	0.6526	1.61	|Q V	|	|	|	|
6+20	0.6637	1.62	|Q V	|	|	|	|
6+25	0.6749	1.62	|Q V	|	|	|	|
6+30	0.6861	1.63	|Q V	|	|	|	|
6+35	0.6974	1.64	|Q V	|	|	|	|
6+40	0.7088	1.65	|Q V	|	|	|	|
6+45	0.7202	1.66	|Q V	|	|	|	|
6+50	0.7317	1.67	|Q V	|	|	|	|
6+55	0.7432	1.67	|Q V	|	|	|	|
7+ 0	0.7548	1.68	|Q V	|	|	|	|
7+ 5	0.7664	1.69	|Q V	|	|	|	|
7+10	0.7782	1.70	|Q V	|	|	|	|
7+15	0.7899	1.71	|Q V	|	|	|	|
7+20	0.8018	1.72	|Q V	|	|	|	|
7+25	0.8137	1.73	|Q V	|	|	|	|
7+30	0.8257	1.74	|Q V	|	|	|	|
7+35	0.8377	1.75	|Q V	|	|	|	|
7+40	0.8498	1.76	|Q V	|	|	|	|
7+45	0.8620	1.77	|Q V	|	|	|	|
7+50	0.8743	1.78	|Q V	|	|	|	|
7+55	0.8866	1.79	|Q V	|	|	|	|
8+ 0	0.8990	1.80	|Q V	|	|	|	|
8+ 5	0.9115	1.81	|Q V	|	|	|	|
8+10	0.9240	1.82	|Q V	|	|	|	|
8+15	0.9367	1.83	|Q V	|	|	|	|

8+20	0.9494	1.85	|Q V |	|	|	|
8+25	0.9622	1.86	|Q V |	|	|	|
8+30	0.9750	1.87	|Q V |	|	|	|
8+35	0.9880	1.88	|Q V |	|	|	|
8+40	1.0010	1.89	|Q V |	|	|	|
8+45	1.0141	1.90	|Q V |	|	|	|
8+50	1.0273	1.92	|Q V |	|	|	|
8+55	1.0406	1.93	|Q V |	|	|	|
9+ 0	1.0540	1.94	|Q V |	|	|	|
9+ 5	1.0675	1.96	|Q V |	|	|	|
9+10	1.0810	1.97	|Q V |	|	|	|
9+15	1.0947	1.98	|Q V |	|	|	|
9+20	1.1085	2.00	|Q V |	|	|	|
9+25	1.1223	2.01	|Q V |	|	|	|
9+30	1.1363	2.03	|Q V |	|	|	|
9+35	1.1503	2.04	|Q V |	|	|	|
9+40	1.1645	2.06	|Q V |	|	|	|
9+45	1.1787	2.07	|Q V |	|	|	|
9+50	1.1931	2.09	|Q V |	|	|	|
9+55	1.2076	2.10	|Q V |	|	|	|
10+ 0	1.2222	2.12	|Q V |	|	|	|
10+ 5	1.2369	2.14	|Q V |	|	|	|
10+10	1.2517	2.15	|Q V |	|	|	|
10+15	1.2666	2.17	|Q V |	|	|	|
10+20	1.2817	2.19	|Q V |	|	|	|
10+25	1.2969	2.21	|Q V |	|	|	|
10+30	1.3122	2.22	|Q V |	|	|	|
10+35	1.3276	2.24	|Q V |	|	|	|
10+40	1.3432	2.26	|Q V |	|	|	|
10+45	1.3589	2.28	|Q V |	|	|	|
10+50	1.3748	2.30	|Q V |	|	|	|
10+55	1.3908	2.32	|Q V |	|	|	|
11+ 0	1.4069	2.34	|Q V |	|	|	|
11+ 5	1.4232	2.37	|Q V |	|	|	|
11+10	1.4397	2.39	|Q V |	|	|	|
11+15	1.4563	2.41	|Q V |	|	|	|
11+20	1.4730	2.43	|Q V |	|	|	|
11+25	1.4899	2.46	|Q V |	|	|	|
11+30	1.5070	2.48	|Q V|	|	|	|
11+35	1.5243	2.51	| Q V|	|	|	|
11+40	1.5418	2.53	| Q V|	|	|	|
11+45	1.5594	2.56	| Q V|	|	|	|
11+50	1.5772	2.59	| Q V|	|	|	|
11+55	1.5952	2.62	| Q V|	|	|	|
12+ 0	1.6134	2.65	| Q V|	|	|	|
12+ 5	1.6318	2.67	| Q V|	|	|	|
12+10	1.6504	2.69	| Q V|	|	|	|
12+15	1.6690	2.71	| Q V|	|	|	|
12+20	1.6876	2.70	| Q V |	|	|	|
12+25	1.7061	2.68	| Q V |	|	|	|

12+30	1.7246	2.69	Q V			
12+35	1.7432	2.70	Q V			
12+40	1.7619	2.72	Q V			
12+45	1.7808	2.74	Q V			
12+50	1.7999	2.77	Q V			
12+55	1.8192	2.81	Q V			
13+ 0	1.8388	2.84	Q V			
13+ 5	1.8586	2.88	Q |V			
13+10	1.8787	2.92	Q |V			
13+15	1.8991	2.96	Q |V			
13+20	1.9198	3.01	Q |V			
13+25	1.9408	3.05	Q |V			
13+30	1.9622	3.10	Q |V			
13+35	1.9839	3.16	Q |V			
13+40	2.0061	3.21	Q |V			
13+45	2.0286	3.27	Q | V			
13+50	2.0516	3.33	Q | V			
13+55	2.0750	3.40	Q | V			
14+ 0	2.0989	3.47	Q | V			
14+ 5	2.1233	3.55	Q | V			
14+10	2.1483	3.62	Q | V			
14+15	2.1738	3.71	Q | V			
14+20	2.2000	3.80	Q | V			
14+25	2.2268	3.90	Q | V			
14+30	2.2544	4.00	Q | V			
14+35	2.2827	4.11	Q | V			
14+40	2.3119	4.23	Q | V			
14+45	2.3419	4.36	Q | V			
14+50	2.3728	4.50	Q | V			
14+55	2.4048	4.65	Q | V			
15+ 0	2.4380	4.81	Q | V			
15+ 5	2.4724	4.99	Q | V			
15+10	2.5081	5.19	Q | V			
15+15	2.5455	5.42	Q | V			
15+20	2.5845	5.67	Q | V			
15+25	2.6254	5.94	Q | V			
15+30	2.6683	6.23	Q | V			
15+35	2.7132	6.53	Q | V			
15+40	2.7601	6.80	Q | V			
15+45	2.8092	7.13	Q | V			
15+50	2.8620	7.67	Q | V			
15+55	2.9205	8.50	Q | V			
16+ 0	2.9886	9.89	Q | V			
16+ 5	3.0810	13.41	Q V			
16+10	3.2182	19.93	| Q V|			
16+15	3.4105	27.92	| V Q			
16+20	3.6959	41.44	| V	| Q		
16+25	3.9969	43.70	| V	| Q		
16+30	4.2272	33.44	| VQ	|		
16+35	4.4029	25.51	| Q V	|		



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   20+50       6.2293      1.87  |Q        |         |         |      V  |
   20+55       6.2420      1.84  |Q        |         |         |      V  |
   21+ 0       6.2546      1.82  |Q        |         |         |      V  |
   21+ 5       6.2670      1.80  |Q        |         |         |      V  |
   21+10       6.2792      1.78  |Q        |         |         |      V  |
   21+15       6.2913      1.76  |Q        |         |         |      V  |
   21+20       6.3033      1.74  |Q        |         |         |      V  |
   21+25       6.3151      1.72  |Q        |         |         |      V  |
   21+30       6.3268      1.70  |Q        |         |         |      V  |
   21+35       6.3384      1.68  |Q        |         |         |      V  |
   21+40       6.3499      1.66  |Q        |         |         |      V  |
   21+45       6.3612      1.65  |Q        |         |         |      V  |
   21+50       6.3724      1.63  |Q        |         |         |       V |
   21+55       6.3835      1.61  |Q        |         |         |       V |
   22+ 0       6.3945      1.60  |Q        |         |         |       V |
   22+ 5       6.4054      1.58  |Q        |         |         |       V |
   22+10       6.4162      1.57  |Q        |         |         |       V |
   22+15       6.4269      1.55  |Q        |         |         |       V |
   22+20       6.4374      1.54  |Q        |         |         |       V |
   22+25       6.4479      1.52  |Q        |         |         |       V |
   22+30       6.4583      1.51  |Q        |         |         |       V |
   22+35       6.4686      1.50  |Q        |         |         |       V |
   22+40       6.4788      1.48  |Q        |         |         |       V |
   22+45       6.4889      1.47  |Q        |         |         |       V |
   22+50       6.4990      1.46  |Q        |         |         |       V |
   22+55       6.5089      1.44  |Q        |         |         |       V |
   23+ 0       6.5188      1.43  |Q        |         |         |       V |
   23+ 5       6.5286      1.42  |Q        |         |         |       V |
   23+10       6.5383      1.41  |Q        |         |         |        V|
   23+15       6.5479      1.40  |Q        |         |         |        V|
   23+20       6.5575      1.39  |Q        |         |         |        V|
   23+25       6.5670      1.38  |Q        |         |         |        V|
   23+30       6.5764      1.37  |Q        |         |         |        V|
   23+35       6.5857      1.36  |Q        |         |         |        V|
   23+40       6.5950      1.35  |Q        |         |         |        V|
   23+45       6.6042      1.34  |Q        |         |         |        V|
   23+50       6.6133      1.33  |Q        |         |         |        V|
   23+55       6.6224      1.32  |Q        |         |         |        V|
   24+ 0       6.6314      1.31  |Q        |         |         |        V|
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 08/25/22

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

Program License Serial Number 6277

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
100 YR STORM UNIT HYDROGRAPH, PRE CONDITION
AREA D

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
25.29	1	0.60
Rainfall data for year 2		
25.29	6	0.76
Rainfall data for year 2		
25.29	24	1.30

Rainfall data for year 100

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            25.29           1           1.08
------------------------------------------------------------------------
Rainfall data for year 100
            25.29           6           2.01
------------------------------------------------------------------------
Rainfall data for year 100
            25.29          24           3.42
------------------------------------------------------------------------
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******** Area-averaged max loss rate, Fm ********


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 78.0      92.8         25.29      1.000     0.140    1.000    0.140

Area-averaged adjusted loss rate Fm (In/Hr) =  0.140

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
    25.29   1.000         78.0      92.8       0.78     0.771

Area-averaged catchment yield fraction, Y =  0.771
Area-averaged low loss fraction, Yb =  0.229
User entry of time of concentration  =   0.450 (hours)
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Watershed area =      25.29(Ac.)
Catchment Lag time =   0.360 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 23.1481
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.140(In/Hr)
Average low loss rate fraction (Yb) = 0.229 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.512(In)
Computed peak 30-minute rainfall =  0.877(In)
Specified peak 1-hour rainfall =  1.080(In)
Computed peak 3-hour rainfall =  1.581(In)
Specified peak 6-hour rainfall =  2.010(In)
Specified peak 24-hour rainfall =  3.420(In)


Rainfall depth area reduction factors:
Using a total area of      25.29(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999     Adjusted rainfall =  0.512(In)
30-minute factor = 0.999    Adjusted rainfall =  0.876(In)
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1-hour factor = 0.999 Adjusted rainfall = 1.079(In)
3-hour factor = 1.000 Adjusted rainfall = 1.580(In)
6-hour factor = 1.000 Adjusted rainfall = 2.010(In)
24-hour factor = 1.000 Adjusted rainfall = 3.420(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 = 305.85 (CFS))	
1	1.214	3.714
2	5.764	13.915
3	16.027	31.389
4	36.219	61.757
5	51.994	48.247
6	61.887	30.259
7	68.547	20.370
8	73.668	15.663
9	77.701	12.333
10	80.906	9.804
11	83.544	8.070
12	85.853	7.060
13	87.848	6.101
14	89.450	4.900
15	90.796	4.117
16	92.021	3.746
17	93.104	3.312
18	94.064	2.937
19	94.860	2.435
20	95.618	2.318
21	96.238	1.896
22	96.825	1.795
23	97.275	1.376
24	97.686	1.258
25	97.971	0.872
26	98.203	0.708
27	98.461	0.790
28	98.739	0.850
29	99.017	0.850
30	99.294	0.850
31	99.534	0.732
32	99.682	0.454
33	99.827	0.442
34	100.000	0.221

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)

1	0.5119	0.5119
2	0.6302	0.1183
3	0.7117	0.0815
4	0.7758	0.0642
5	0.8296	0.0537
6	0.8762	0.0466
7	0.9177	0.0415
8	0.9552	0.0375
9	0.9895	0.0344
10	1.0213	0.0318
11	1.0509	0.0296
12	1.0787	0.0278
13	1.1092	0.0304
14	1.1381	0.0289
15	1.1657	0.0276
16	1.1922	0.0264
17	1.2176	0.0254
18	1.2420	0.0244
19	1.2656	0.0236
20	1.2883	0.0228
21	1.3104	0.0220
22	1.3317	0.0214
23	1.3525	0.0207
24	1.3726	0.0202
25	1.3923	0.0196
26	1.4114	0.0191
27	1.4300	0.0186
28	1.4482	0.0182
29	1.4660	0.0178
30	1.4833	0.0174
31	1.5004	0.0170
32	1.5170	0.0167
33	1.5333	0.0163
34	1.5493	0.0160
35	1.5650	0.0157
36	1.5804	0.0154
37	1.5955	0.0151
38	1.6103	0.0148
39	1.6249	0.0146
40	1.6392	0.0143
41	1.6533	0.0141
42	1.6672	0.0139
43	1.6808	0.0137
44	1.6943	0.0135
45	1.7076	0.0133
46	1.7206	0.0131
47	1.7335	0.0129
48	1.7462	0.0127
49	1.7587	0.0125
50	1.7711	0.0124

51	1.7833	0.0122
52	1.7954	0.0120
53	1.8073	0.0119
54	1.8190	0.0118
55	1.8306	0.0116
56	1.8421	0.0115
57	1.8534	0.0113
58	1.8646	0.0112
59	1.8757	0.0111
60	1.8867	0.0110
61	1.8975	0.0108
62	1.9083	0.0107
63	1.9189	0.0106
64	1.9294	0.0105
65	1.9398	0.0104
66	1.9501	0.0103
67	1.9603	0.0102
68	1.9704	0.0101
69	1.9804	0.0100
70	1.9903	0.0099
71	2.0001	0.0098
72	2.0098	0.0097
73	2.0205	0.0107
74	2.0311	0.0106
75	2.0415	0.0105
76	2.0519	0.0104
77	2.0623	0.0103
78	2.0725	0.0102
79	2.0826	0.0101
80	2.0927	0.0101
81	2.1027	0.0100
82	2.1126	0.0099
83	2.1224	0.0098
84	2.1322	0.0098
85	2.1419	0.0097
86	2.1515	0.0096
87	2.1611	0.0096
88	2.1706	0.0095
89	2.1800	0.0094
90	2.1894	0.0094
91	2.1987	0.0093
92	2.2079	0.0092
93	2.2171	0.0092
94	2.2262	0.0091
95	2.2352	0.0091
96	2.2442	0.0090
97	2.2532	0.0089
98	2.2620	0.0089
99	2.2709	0.0088
100	2.2796	0.0088

101	2.2883	0.0087
102	2.2970	0.0087
103	2.3056	0.0086
104	2.3142	0.0086
105	2.3227	0.0085
106	2.3311	0.0085
107	2.3395	0.0084
108	2.3479	0.0084
109	2.3562	0.0083
110	2.3645	0.0083
111	2.3727	0.0082
112	2.3809	0.0082
113	2.3890	0.0081
114	2.3971	0.0081
115	2.4051	0.0080
116	2.4131	0.0080
117	2.4211	0.0080
118	2.4290	0.0079
119	2.4369	0.0079
120	2.4447	0.0078
121	2.4525	0.0078
122	2.4602	0.0078
123	2.4680	0.0077
124	2.4756	0.0077
125	2.4833	0.0076
126	2.4909	0.0076
127	2.4984	0.0076
128	2.5060	0.0075
129	2.5134	0.0075
130	2.5209	0.0075
131	2.5283	0.0074
132	2.5357	0.0074
133	2.5430	0.0073
134	2.5504	0.0073
135	2.5576	0.0073
136	2.5649	0.0072
137	2.5721	0.0072
138	2.5793	0.0072
139	2.5864	0.0072
140	2.5936	0.0071
141	2.6006	0.0071
142	2.6077	0.0071
143	2.6147	0.0070
144	2.6217	0.0070
145	2.6287	0.0070
146	2.6356	0.0069
147	2.6425	0.0069
148	2.6494	0.0069
149	2.6563	0.0068
150	2.6631	0.0068

151	2.6699	0.0068
152	2.6766	0.0068
153	2.6834	0.0067
154	2.6901	0.0067
155	2.6968	0.0067
156	2.7034	0.0067
157	2.7101	0.0066
158	2.7167	0.0066
159	2.7233	0.0066
160	2.7298	0.0066
161	2.7363	0.0065
162	2.7428	0.0065
163	2.7493	0.0065
164	2.7558	0.0065
165	2.7622	0.0064
166	2.7686	0.0064
167	2.7750	0.0064
168	2.7814	0.0064
169	2.7877	0.0063
170	2.7940	0.0063
171	2.8003	0.0063
172	2.8066	0.0063
173	2.8128	0.0062
174	2.8190	0.0062
175	2.8252	0.0062
176	2.8314	0.0062
177	2.8376	0.0062
178	2.8437	0.0061
179	2.8498	0.0061
180	2.8559	0.0061
181	2.8620	0.0061
182	2.8680	0.0061
183	2.8741	0.0060
184	2.8801	0.0060
185	2.8861	0.0060
186	2.8921	0.0060
187	2.8980	0.0060
188	2.9039	0.0059
189	2.9098	0.0059
190	2.9157	0.0059
191	2.9216	0.0059
192	2.9275	0.0059
193	2.9333	0.0058
194	2.9391	0.0058
195	2.9449	0.0058
196	2.9507	0.0058
197	2.9565	0.0058
198	2.9622	0.0057
199	2.9679	0.0057
200	2.9737	0.0057

201	2.9793	0.0057
202	2.9850	0.0057
203	2.9907	0.0057
204	2.9963	0.0056
205	3.0019	0.0056
206	3.0076	0.0056
207	3.0131	0.0056
208	3.0187	0.0056
209	3.0243	0.0056
210	3.0298	0.0055
211	3.0353	0.0055
212	3.0408	0.0055
213	3.0463	0.0055
214	3.0518	0.0055
215	3.0573	0.0055
216	3.0627	0.0054
217	3.0681	0.0054
218	3.0736	0.0054
219	3.0790	0.0054
220	3.0843	0.0054
221	3.0897	0.0054
222	3.0951	0.0054
223	3.1004	0.0053
224	3.1057	0.0053
225	3.1110	0.0053
226	3.1163	0.0053
227	3.1216	0.0053
228	3.1269	0.0053
229	3.1321	0.0053
230	3.1374	0.0052
231	3.1426	0.0052
232	3.1478	0.0052
233	3.1530	0.0052
234	3.1582	0.0052
235	3.1633	0.0052
236	3.1685	0.0052
237	3.1736	0.0051
238	3.1788	0.0051
239	3.1839	0.0051
240	3.1890	0.0051
241	3.1941	0.0051
242	3.1991	0.0051
243	3.2042	0.0051
244	3.2093	0.0050
245	3.2143	0.0050
246	3.2193	0.0050
247	3.2243	0.0050
248	3.2293	0.0050
249	3.2343	0.0050
250	3.2393	0.0050

251	3.2442	0.0050
252	3.2492	0.0049
253	3.2541	0.0049
254	3.2591	0.0049
255	3.2640	0.0049
256	3.2689	0.0049
257	3.2738	0.0049
258	3.2786	0.0049
259	3.2835	0.0049
260	3.2884	0.0049
261	3.2932	0.0048
262	3.2980	0.0048
263	3.3029	0.0048
264	3.3077	0.0048
265	3.3125	0.0048
266	3.3173	0.0048
267	3.3220	0.0048
268	3.3268	0.0048
269	3.3316	0.0048
270	3.3363	0.0047
271	3.3410	0.0047
272	3.3458	0.0047
273	3.3505	0.0047
274	3.3552	0.0047
275	3.3599	0.0047
276	3.3645	0.0047
277	3.3692	0.0047
278	3.3739	0.0047
279	3.3785	0.0046
280	3.3832	0.0046
281	3.3878	0.0046
282	3.3924	0.0046
283	3.3970	0.0046
284	3.4016	0.0046
285	3.4062	0.0046
286	3.4108	0.0046
287	3.4153	0.0046
288	3.4199	0.0046

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0046	0.0010	0.0035
2	0.0046	0.0010	0.0035
3	0.0046	0.0010	0.0035
4	0.0046	0.0011	0.0035
5	0.0046	0.0011	0.0036
6	0.0046	0.0011	0.0036
7	0.0046	0.0011	0.0036

8	0.0047	0.0011	0.0036
9	0.0047	0.0011	0.0036
10	0.0047	0.0011	0.0036
11	0.0047	0.0011	0.0036
12	0.0047	0.0011	0.0036
13	0.0047	0.0011	0.0037
14	0.0048	0.0011	0.0037
15	0.0048	0.0011	0.0037
16	0.0048	0.0011	0.0037
17	0.0048	0.0011	0.0037
18	0.0048	0.0011	0.0037
19	0.0048	0.0011	0.0037
20	0.0049	0.0011	0.0037
21	0.0049	0.0011	0.0038
22	0.0049	0.0011	0.0038
23	0.0049	0.0011	0.0038
24	0.0049	0.0011	0.0038
25	0.0049	0.0011	0.0038
26	0.0050	0.0011	0.0038
27	0.0050	0.0011	0.0038
28	0.0050	0.0011	0.0039
29	0.0050	0.0011	0.0039
30	0.0050	0.0012	0.0039
31	0.0051	0.0012	0.0039
32	0.0051	0.0012	0.0039
33	0.0051	0.0012	0.0039
34	0.0051	0.0012	0.0039
35	0.0051	0.0012	0.0040
36	0.0052	0.0012	0.0040
37	0.0052	0.0012	0.0040
38	0.0052	0.0012	0.0040
39	0.0052	0.0012	0.0040
40	0.0052	0.0012	0.0040
41	0.0053	0.0012	0.0041
42	0.0053	0.0012	0.0041
43	0.0053	0.0012	0.0041
44	0.0053	0.0012	0.0041
45	0.0054	0.0012	0.0041
46	0.0054	0.0012	0.0041
47	0.0054	0.0012	0.0042
48	0.0054	0.0012	0.0042
49	0.0054	0.0012	0.0042
50	0.0055	0.0012	0.0042
51	0.0055	0.0013	0.0042
52	0.0055	0.0013	0.0042
53	0.0055	0.0013	0.0043
54	0.0056	0.0013	0.0043
55	0.0056	0.0013	0.0043
56	0.0056	0.0013	0.0043
57	0.0056	0.0013	0.0044

58	0.0057	0.0013	0.0044
59	0.0057	0.0013	0.0044
60	0.0057	0.0013	0.0044
61	0.0057	0.0013	0.0044
62	0.0058	0.0013	0.0044
63	0.0058	0.0013	0.0045
64	0.0058	0.0013	0.0045
65	0.0059	0.0013	0.0045
66	0.0059	0.0013	0.0045
67	0.0059	0.0014	0.0046
68	0.0059	0.0014	0.0046
69	0.0060	0.0014	0.0046
70	0.0060	0.0014	0.0046
71	0.0060	0.0014	0.0047
72	0.0061	0.0014	0.0047
73	0.0061	0.0014	0.0047
74	0.0061	0.0014	0.0047
75	0.0062	0.0014	0.0047
76	0.0062	0.0014	0.0048
77	0.0062	0.0014	0.0048
78	0.0062	0.0014	0.0048
79	0.0063	0.0014	0.0049
80	0.0063	0.0014	0.0049
81	0.0064	0.0015	0.0049
82	0.0064	0.0015	0.0049
83	0.0064	0.0015	0.0050
84	0.0065	0.0015	0.0050
85	0.0065	0.0015	0.0050
86	0.0065	0.0015	0.0050
87	0.0066	0.0015	0.0051
88	0.0066	0.0015	0.0051
89	0.0067	0.0015	0.0051
90	0.0067	0.0015	0.0052
91	0.0067	0.0015	0.0052
92	0.0068	0.0015	0.0052
93	0.0068	0.0016	0.0053
94	0.0068	0.0016	0.0053
95	0.0069	0.0016	0.0053
96	0.0069	0.0016	0.0054
97	0.0070	0.0016	0.0054
98	0.0070	0.0016	0.0054
99	0.0071	0.0016	0.0055
100	0.0071	0.0016	0.0055
101	0.0072	0.0016	0.0055
102	0.0072	0.0016	0.0056
103	0.0073	0.0017	0.0056
104	0.0073	0.0017	0.0056
105	0.0074	0.0017	0.0057
106	0.0074	0.0017	0.0057
107	0.0075	0.0017	0.0058

108	0.0075	0.0017	0.0058
109	0.0076	0.0017	0.0059
110	0.0076	0.0017	0.0059
111	0.0077	0.0018	0.0059
112	0.0078	0.0018	0.0060
113	0.0078	0.0018	0.0060
114	0.0079	0.0018	0.0061
115	0.0080	0.0018	0.0061
116	0.0080	0.0018	0.0062
117	0.0081	0.0018	0.0062
118	0.0081	0.0019	0.0063
119	0.0082	0.0019	0.0063
120	0.0083	0.0019	0.0064
121	0.0084	0.0019	0.0064
122	0.0084	0.0019	0.0065
123	0.0085	0.0019	0.0066
124	0.0086	0.0020	0.0066
125	0.0087	0.0020	0.0067
126	0.0087	0.0020	0.0067
127	0.0088	0.0020	0.0068
128	0.0089	0.0020	0.0068
129	0.0090	0.0021	0.0069
130	0.0091	0.0021	0.0070
131	0.0092	0.0021	0.0071
132	0.0092	0.0021	0.0071
133	0.0094	0.0021	0.0072
134	0.0094	0.0022	0.0073
135	0.0096	0.0022	0.0074
136	0.0096	0.0022	0.0074
137	0.0098	0.0022	0.0075
138	0.0098	0.0023	0.0076
139	0.0100	0.0023	0.0077
140	0.0101	0.0023	0.0078
141	0.0102	0.0023	0.0079
142	0.0103	0.0024	0.0080
143	0.0105	0.0024	0.0081
144	0.0106	0.0024	0.0082
145	0.0097	0.0022	0.0075
146	0.0098	0.0022	0.0076
147	0.0100	0.0023	0.0077
148	0.0101	0.0023	0.0078
149	0.0103	0.0024	0.0079
150	0.0104	0.0024	0.0080
151	0.0106	0.0024	0.0082
152	0.0107	0.0025	0.0083
153	0.0110	0.0025	0.0085
154	0.0111	0.0025	0.0086
155	0.0113	0.0026	0.0087
156	0.0115	0.0026	0.0089
157	0.0118	0.0027	0.0091

158	0.0119	0.0027	0.0092
159	0.0122	0.0028	0.0094
160	0.0124	0.0028	0.0095
161	0.0127	0.0029	0.0098
162	0.0129	0.0029	0.0099
163	0.0133	0.0030	0.0102
164	0.0135	0.0031	0.0104
165	0.0139	0.0032	0.0107
166	0.0141	0.0032	0.0109
167	0.0146	0.0033	0.0112
168	0.0148	0.0034	0.0114
169	0.0154	0.0035	0.0119
170	0.0157	0.0036	0.0121
171	0.0163	0.0037	0.0126
172	0.0167	0.0038	0.0128
173	0.0174	0.0040	0.0134
174	0.0178	0.0041	0.0137
175	0.0186	0.0043	0.0144
176	0.0191	0.0044	0.0147
177	0.0202	0.0046	0.0155
178	0.0207	0.0047	0.0160
179	0.0220	0.0050	0.0170
180	0.0228	0.0052	0.0176
181	0.0244	0.0056	0.0188
182	0.0254	0.0058	0.0196
183	0.0276	0.0063	0.0213
184	0.0289	0.0066	0.0223
185	0.0278	0.0064	0.0214
186	0.0296	0.0068	0.0228
187	0.0344	0.0079	0.0265
188	0.0375	0.0086	0.0289
189	0.0466	0.0107	0.0360
190	0.0537	0.0117	0.0420
191	0.0815	0.0117	0.0698
192	0.1183	0.0117	0.1066
193	0.5119	0.0117	0.5002
194	0.0642	0.0117	0.0525
195	0.0415	0.0095	0.0320
196	0.0318	0.0073	0.0245
197	0.0304	0.0070	0.0235
198	0.0264	0.0060	0.0204
199	0.0236	0.0054	0.0182
200	0.0214	0.0049	0.0165
201	0.0196	0.0045	0.0151
202	0.0182	0.0042	0.0140
203	0.0170	0.0039	0.0131
204	0.0160	0.0037	0.0123
205	0.0151	0.0035	0.0116
206	0.0143	0.0033	0.0111
207	0.0137	0.0031	0.0105

208	0.0131	0.0030	0.0101
209	0.0125	0.0029	0.0097
210	0.0120	0.0028	0.0093
211	0.0116	0.0027	0.0090
212	0.0112	0.0026	0.0086
213	0.0108	0.0025	0.0084
214	0.0105	0.0024	0.0081
215	0.0102	0.0023	0.0079
216	0.0099	0.0023	0.0076
217	0.0107	0.0024	0.0082
218	0.0104	0.0024	0.0080
219	0.0101	0.0023	0.0078
220	0.0099	0.0023	0.0076
221	0.0097	0.0022	0.0075
222	0.0095	0.0022	0.0073
223	0.0093	0.0021	0.0072
224	0.0091	0.0021	0.0070
225	0.0089	0.0020	0.0069
226	0.0088	0.0020	0.0068
227	0.0086	0.0020	0.0066
228	0.0085	0.0019	0.0065
229	0.0083	0.0019	0.0064
230	0.0082	0.0019	0.0063
231	0.0080	0.0018	0.0062
232	0.0079	0.0018	0.0061
233	0.0078	0.0018	0.0060
234	0.0077	0.0018	0.0059
235	0.0076	0.0017	0.0058
236	0.0075	0.0017	0.0057
237	0.0073	0.0017	0.0057
238	0.0072	0.0017	0.0056
239	0.0072	0.0016	0.0055
240	0.0071	0.0016	0.0054
241	0.0070	0.0016	0.0054
242	0.0069	0.0016	0.0053
243	0.0068	0.0016	0.0052
244	0.0067	0.0015	0.0052
245	0.0066	0.0015	0.0051
246	0.0066	0.0015	0.0051
247	0.0065	0.0015	0.0050
248	0.0064	0.0015	0.0049
249	0.0063	0.0014	0.0049
250	0.0063	0.0014	0.0048
251	0.0062	0.0014	0.0048
252	0.0061	0.0014	0.0047
253	0.0061	0.0014	0.0047
254	0.0060	0.0014	0.0046
255	0.0060	0.0014	0.0046
256	0.0059	0.0013	0.0045
257	0.0058	0.0013	0.0045

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      258              0.0058          0.0013              0.0045
      259              0.0057          0.0013              0.0044
      260              0.0057          0.0013              0.0044
      261              0.0056          0.0013              0.0043
      262              0.0056          0.0013              0.0043
      263              0.0055          0.0013              0.0043
      264              0.0055          0.0013              0.0042
      265              0.0054          0.0012              0.0042
      266              0.0054          0.0012              0.0042
      267              0.0053          0.0012              0.0041
      268              0.0053          0.0012              0.0041
      269              0.0053          0.0012              0.0041
      270              0.0052          0.0012              0.0040
      271              0.0052          0.0012              0.0040
      272              0.0051          0.0012              0.0040
      273              0.0051          0.0012              0.0039
      274              0.0050          0.0012              0.0039
      275              0.0050          0.0011              0.0039
      276              0.0050          0.0011              0.0038
      277              0.0049          0.0011              0.0038
      278              0.0049          0.0011              0.0038
      279              0.0049          0.0011              0.0038
      280              0.0048          0.0011              0.0037
      281              0.0048          0.0011              0.0037
      282              0.0048          0.0011              0.0037
      283              0.0047          0.0011              0.0037
      284              0.0047          0.0011              0.0036
      285              0.0047          0.0011              0.0036
      286              0.0046          0.0011              0.0036
      287              0.0046          0.0011              0.0036
      288              0.0046          0.0010              0.0035
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Total soil rain loss =      0.65(In)
      Total effective rainfall =      2.77(In)
      Peak flow rate in flood hydrograph =     43.45(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5      50.0
-------------------------------------------------------------------------
  0+ 5       0.0001      0.01  Q         |         |         |         |
  0+10       0.0005      0.06  Q         |         |         |         |
  0+15       0.0017      0.17  Q         |         |         |         |
  0+20       0.0044      0.39  Q         |         |         |         |
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0+25	0.0083	0.56	Q	|	|	|	|
0+30	0.0129	0.67	Q	|	|	|	|
0+35	0.0180	0.74	Q	|	|	|	|
0+40	0.0235	0.80	Q	|	|	|	|
0+45	0.0293	0.85	Q	|	|	|	|
0+50	0.0354	0.88	Q	|	|	|	|
0+55	0.0417	0.91	Q	|	|	|	|
1+ 0	0.0482	0.94	Q	|	|	|	|
1+ 5	0.0549	0.97	Q	|	|	|	|
1+10	0.0617	0.99	Q	|	|	|	|
1+15	0.0686	1.01	Q	|	|	|	|
1+20	0.0756	1.02	Q	|	|	|	|
1+25	0.0828	1.04	Q	|	|	|	|
1+30	0.0900	1.05	Q	|	|	|	|
1+35	0.0973	1.06	Q	|	|	|	|
1+40	0.1047	1.07	Q	|	|	|	|
1+45	0.1122	1.09	Q	|	|	|	|
1+50	0.1197	1.10	Q	|	|	|	|
1+55	0.1273	1.10	Q	|	|	|	|
2+ 0	0.1350	1.11	Q	|	|	|	|
2+ 5	0.1427	1.12	Q	|	|	|	|
2+10	0.1505	1.13	QV	|	|	|	|
2+15	0.1583	1.13	QV	|	|	|	|
2+20	0.1661	1.14	QV	|	|	|	|
2+25	0.1740	1.15	QV	|	|	|	|
2+30	0.1820	1.15	QV	|	|	|	|
2+35	0.1900	1.16	QV	|	|	|	|
2+40	0.1980	1.17	QV	|	|	|	|
2+45	0.2061	1.17	QV	|	|	|	|
2+50	0.2142	1.18	QV	|	|	|	|
2+55	0.2223	1.18	QV	|	|	|	|
3+ 0	0.2305	1.19	QV	|	|	|	|
3+ 5	0.2387	1.19	QV	|	|	|	|
3+10	0.2469	1.20	QV	|	|	|	|
3+15	0.2552	1.20	QV	|	|	|	|
3+20	0.2635	1.21	QV	|	|	|	|
3+25	0.2718	1.21	QV	|	|	|	|
3+30	0.2802	1.21	QV	|	|	|	|
3+35	0.2886	1.22	QV	|	|	|	|
3+40	0.2970	1.22	Q V	|	|	|	|
3+45	0.3055	1.23	Q V	|	|	|	|
3+50	0.3140	1.23	Q V	|	|	|	|
3+55	0.3225	1.24	Q V	|	|	|	|
4+ 0	0.3311	1.24	Q V	|	|	|	|
4+ 5	0.3397	1.25	Q V	|	|	|	|
4+10	0.3483	1.25	|QV	|	|	|	|
4+15	0.3570	1.26	|QV	|	|	|	|
4+20	0.3657	1.26	|QV	|	|	|	|
4+25	0.3745	1.27	|QV	|	|	|	|
4+30	0.3833	1.28	|QV	|	|	|	|

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4+35       0.3921      1.28  |QV        |          |          |          |
4+40       0.4010      1.29  |QV        |          |          |          |
4+45       0.4098      1.29  |QV        |          |          |          |
4+50       0.4188      1.30  |QV        |          |          |          |
4+55       0.4278      1.30  |QV        |          |          |          |
5+ 0       0.4368      1.31  |QV        |          |          |          |
5+ 5       0.4458      1.32  |Q V       |          |          |          |
5+10       0.4549      1.32  |Q V       |          |          |          |
5+15       0.4641      1.33  |Q V       |          |          |          |
5+20       0.4733      1.33  |Q V       |          |          |          |
5+25       0.4825      1.34  |Q V       |          |          |          |
5+30       0.4917      1.35  |Q V       |          |          |          |
5+35       0.5011      1.35  |Q V       |          |          |          |
5+40       0.5104      1.36  |Q V       |          |          |          |
5+45       0.5198      1.36  |Q V       |          |          |          |
5+50       0.5293      1.37  |Q V       |          |          |          |
5+55       0.5387      1.38  |Q V       |          |          |          |
6+ 0       0.5483      1.38  |Q V       |          |          |          |
6+ 5       0.5579      1.39  |Q V       |          |          |          |
6+10       0.5675      1.40  |Q V       |          |          |          |
6+15       0.5772      1.40  |Q V       |          |          |          |
6+20       0.5869      1.41  |Q  V      |          |          |          |
6+25       0.5967      1.42  |Q  V      |          |          |          |
6+30       0.6065      1.43  |Q  V      |          |          |          |
6+35       0.6164      1.43  |Q  V      |          |          |          |
6+40       0.6263      1.44  |Q  V      |          |          |          |
6+45       0.6363      1.45  |Q  V      |          |          |          |
6+50       0.6463      1.46  |Q  V      |          |          |          |
6+55       0.6564      1.46  |Q  V      |          |          |          |
7+ 0       0.6665      1.47  |Q  V      |          |          |          |
7+ 5       0.6767      1.48  |Q  V      |          |          |          |
7+10       0.6869      1.49  |Q  V      |          |          |          |
7+15       0.6972      1.50  |Q  V      |          |          |          |
7+20       0.7076      1.50  |Q  V      |          |          |          |
7+25       0.7180      1.51  |Q  V      |          |          |          |
7+30       0.7285      1.52  |Q   V     |          |          |          |
7+35       0.7390      1.53  |Q   V     |          |          |          |
7+40       0.7496      1.54  |Q   V     |          |          |          |
7+45       0.7603      1.55  |Q   V     |          |          |          |
7+50       0.7710      1.56  |Q   V     |          |          |          |
7+55       0.7818      1.57  |Q   V     |          |          |          |
8+ 0       0.7927      1.58  |Q   V     |          |          |          |
8+ 5       0.8036      1.58  |Q   V     |          |          |          |
8+10       0.8146      1.59  |Q   V     |          |          |          |
8+15       0.8256      1.60  |Q   V     |          |          |          |
8+20       0.8367      1.61  |Q   V     |          |          |          |
8+25       0.8479      1.62  |Q   V     |          |          |          |
8+30       0.8592      1.64  |Q   V     |          |          |          |
8+35       0.8705      1.65  |Q   V     |          |          |          |
8+40       0.8819      1.66  |Q    V    |          |          |          |
```

8+45	0.8934	1.67	|Q V |	|	|	|
8+50	0.9049	1.68	|Q V |	|	|	|
8+55	0.9166	1.69	|Q V |	|	|	|
9+ 0	0.9283	1.70	|Q V |	|	|	|
9+ 5	0.9401	1.71	|Q V |	|	|	|
9+10	0.9520	1.72	|Q V |	|	|	|
9+15	0.9639	1.74	|Q V |	|	|	|
9+20	0.9760	1.75	|Q V |	|	|	|
9+25	0.9881	1.76	|Q V |	|	|	|
9+30	1.0003	1.77	|Q V |	|	|	|
9+35	1.0126	1.79	|Q V |	|	|	|
9+40	1.0250	1.80	|Q V |	|	|	|
9+45	1.0375	1.81	|Q V |	|	|	|
9+50	1.0501	1.83	|Q V |	|	|	|
9+55	1.0628	1.84	|Q V |	|	|	|
10+ 0	1.0756	1.86	|Q V |	|	|	|
10+ 5	1.0885	1.87	|Q V |	|	|	|
10+10	1.1015	1.89	|Q V |	|	|	|
10+15	1.1146	1.90	|Q V |	|	|	|
10+20	1.1278	1.92	|Q V |	|	|	|
10+25	1.1411	1.93	|Q V |	|	|	|
10+30	1.1545	1.95	|Q V |	|	|	|
10+35	1.1680	1.97	|Q V |	|	|	|
10+40	1.1817	1.98	|Q V |	|	|	|
10+45	1.1955	2.00	|Q V |	|	|	|
10+50	1.2094	2.02	|Q V |	|	|	|
10+55	1.2234	2.04	|Q V |	|	|	|
11+ 0	1.2376	2.06	|Q V |	|	|	|
11+ 5	1.2519	2.08	|Q V |	|	|	|
11+10	1.2663	2.10	|Q V |	|	|	|
11+15	1.2809	2.12	|Q V |	|	|	|
11+20	1.2956	2.14	|Q V |	|	|	|
11+25	1.3104	2.16	|Q V |	|	|	|
11+30	1.3254	2.18	|Q V|	|	|	|
11+35	1.3406	2.20	|Q V|	|	|	|
11+40	1.3559	2.22	|Q V|	|	|	|
11+45	1.3714	2.25	|Q V|	|	|	|
11+50	1.3871	2.27	|Q V|	|	|	|
11+55	1.4029	2.30	|Q V|	|	|	|
12+ 0	1.4189	2.32	|Q V|	|	|	|
12+ 5	1.4351	2.35	|Q V|	|	|	|
12+10	1.4513	2.36	|Q V|	|	|	|
12+15	1.4677	2.37	|Q V	|	|	|
12+20	1.4838	2.35	|Q V	|	|	|
12+25	1.4999	2.34	|Q V	|	|	|
12+30	1.5161	2.35	|Q V	|	|	|
12+35	1.5324	2.36	|Q V	|	|	|
12+40	1.5488	2.38	|Q V	|	|	|
12+45	1.5653	2.41	|Q V	|	|	|
12+50	1.5821	2.43	|Q V	|	|	|

12+55	1.5991	2.46	Q	V			
13+ 0	1.6162	2.49	Q	V			
13+ 5	1.6337	2.53	Q	V			
13+10	1.6513	2.57	Q	V			
13+15	1.6693	2.60	Q	V			
13+20	1.6875	2.65	Q	V			
13+25	1.7060	2.69	Q	V			
13+30	1.7248	2.73	Q	V			
13+35	1.7440	2.78	Q	V			
13+40	1.7635	2.83	Q	V			
13+45	1.7834	2.89	Q	V			
13+50	1.8037	2.95	Q	V			
13+55	1.8244	3.00	Q	V			
14+ 0	1.8455	3.07	Q	V			
14+ 5	1.8671	3.14	Q	V			
14+10	1.8892	3.21	Q	V			
14+15	1.9119	3.29	Q	V			
14+20	1.9351	3.37	Q	V			
14+25	1.9589	3.46	Q	V			
14+30	1.9834	3.55	Q	V			
14+35	2.0085	3.65	Q	V			
14+40	2.0344	3.76	Q	V			
14+45	2.0611	3.88	Q	V			
14+50	2.0887	4.01	Q	V			
14+55	2.1173	4.14	Q	V			
15+ 0	2.1469	4.30	Q	V			
15+ 5	2.1777	4.46	Q	V			
15+10	2.2097	4.65	Q	V			
15+15	2.2432	4.86	Q	V			
15+20	2.2783	5.10	Q	V			
15+25	2.3151	5.35	Q	V			
15+30	2.3538	5.62	Q	V			
15+35	2.3942	5.87	Q	V			
15+40	2.4362	6.09	Q	V			
15+45	2.4806	6.44	Q	V			
15+50	2.5288	7.00	Q	V			
15+55	2.5828	7.85	Q	V			
16+ 0	2.6469	9.30	Q	V			
16+ 5	2.7370	13.08	Q	V			
16+10	2.8777	20.43	Q	V			
16+15	3.0881	30.55	Q	V			
16+20	3.3874	43.45	Q	V		Q	
16+25	3.6352	35.99	Q	V			
16+30	3.8154	26.17	Q	V			
16+35	3.9546	20.21	Q	V			
16+40	4.0714	16.95	Q	V			
16+45	4.1715	14.53	Q	V			
16+50	4.2583	12.61	Q	V			
16+55	4.3352	11.16	Q	V			
17+ 0	4.4048	10.12	Q	V			

17+ 5	4.4679	9.15	| Q |	|	|	V |
17+10	4.5241	8.16	| Q |	|	|	|V |
17+15	4.5752	7.42	| Q |	|	|	|V |
17+20	4.6227	6.90	| Q |	|	|	|V |
17+25	4.6667	6.39	| Q |	|	|	| V |
17+30	4.7076	5.94	| Q |	|	|	| V |
17+35	4.7452	5.46	| Q |	|	|	| V |
17+40	4.7808	5.17	| Q |	|	|	| V |
17+45	4.8136	4.76	| Q |	|	|	| V |
17+50	4.8446	4.51	| Q |	|	|	| V |
17+55	4.8731	4.14	| Q |	|	|	| V |
18+ 0	4.9000	3.90	| Q |	|	|	| V |
18+ 5	4.9247	3.59	| Q |	|	|	| V |
18+10	4.9482	3.41	| Q |	|	|	| V |
18+15	4.9713	3.36	| Q |	|	|	| V |
18+20	4.9943	3.34	| Q |	|	|	| V |
18+25	5.0168	3.27	| Q |	|	|	| V |
18+30	5.0388	3.19	| Q |	|	|	| V |
18+35	5.0597	3.04	| Q |	|	|	| V |
18+40	5.0791	2.83	| Q |	|	|	| V |
18+45	5.0979	2.72	| Q |	|	|	| V |
18+50	5.1154	2.54	| Q |	|	|	| V |
18+55	5.1317	2.37	|Q |	|	|	| V |
19+ 0	5.1475	2.31	|Q |	|	|	| V |
19+ 5	5.1631	2.25	|Q |	|	|	| V |
19+10	5.1782	2.20	|Q |	|	|	| V |
19+15	5.1931	2.16	|Q |	|	|	| V |
19+20	5.2076	2.11	|Q |	|	|	| V |
19+25	5.2219	2.07	|Q |	|	|	| V |
19+30	5.2359	2.03	|Q |	|	|	| V |
19+35	5.2496	2.00	|Q |	|	|	| V |
19+40	5.2631	1.96	|Q |	|	|	| V |
19+45	5.2764	1.93	|Q |	|	|	| V |
19+50	5.2895	1.90	|Q |	|	|	| V |
19+55	5.3023	1.87	|Q |	|	|	| V |
20+ 0	5.3150	1.84	|Q |	|	|	| V |
20+ 5	5.3274	1.81	|Q |	|	|	| V |
20+10	5.3397	1.78	|Q |	|	|	| V |
20+15	5.3518	1.76	|Q |	|	|	| V |
20+20	5.3637	1.73	|Q |	|	|	| V |
20+25	5.3755	1.71	|Q |	|	|	| V |
20+30	5.3871	1.69	|Q |	|	|	| V |
20+35	5.3986	1.66	|Q |	|	|	| V |
20+40	5.4099	1.64	|Q |	|	|	| V |
20+45	5.4210	1.62	|Q |	|	|	| V |
20+50	5.4321	1.60	|Q |	|	|	| V |
20+55	5.4430	1.58	|Q |	|	|	| V |
21+ 0	5.4537	1.56	|Q |	|	|	| V |
21+ 5	5.4644	1.54	|Q |	|	|	| V |
21+10	5.4749	1.53	|Q |	|	|	| V |

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   21+15       5.4853      1.51  |Q        |         |         |      V  |
   21+20       5.4955      1.49  |Q        |         |         |      V  |
   21+25       5.5057      1.48  |Q        |         |         |      V  |
   21+30       5.5158      1.46  |Q        |         |         |      V  |
   21+35       5.5257      1.44  |Q        |         |         |      V  |
   21+40       5.5355      1.43  |Q        |         |         |      V  |
   21+45       5.5453      1.41  |Q        |         |         |       V |
   21+50       5.5549      1.40  |Q        |         |         |       V |
   21+55       5.5645      1.39  |Q        |         |         |       V |
   22+ 0       5.5739      1.37  |Q        |         |         |       V |
   22+ 5       5.5833      1.36  |Q        |         |         |       V |
   22+10       5.5926      1.35  |Q        |         |         |       V |
   22+15       5.6018      1.34  |Q        |         |         |       V |
   22+20       5.6109      1.32  |Q        |         |         |       V |
   22+25       5.6199      1.31  |Q        |         |         |       V |
   22+30       5.6289      1.30  |Q        |         |         |       V |
   22+35       5.6378      1.29  |Q        |         |         |       V |
   22+40       5.6465      1.28  |Q        |         |         |       V |
   22+45       5.6553      1.27  |Q        |         |         |       V |
   22+50       5.6639      1.26  |Q        |         |         |       V |
   22+55       5.6725      1.25  Q         |         |         |       V |
   23+ 0       5.6810      1.24  Q         |         |         |       V |
   23+ 5       5.6894      1.23  Q         |         |         |        V|
   23+10       5.6978      1.22  Q         |         |         |        V|
   23+15       5.7061      1.21  Q         |         |         |        V|
   23+20       5.7144      1.20  Q         |         |         |        V|
   23+25       5.7225      1.19  Q         |         |         |        V|
   23+30       5.7306      1.18  Q         |         |         |        V|
   23+35       5.7387      1.17  Q         |         |         |        V|
   23+40       5.7467      1.16  Q         |         |         |        V|
   23+45       5.7546      1.15  Q         |         |         |        V|
   23+50       5.7625      1.14  Q         |         |         |        V|
   23+55       5.7704      1.14  Q         |         |         |        V|
   24+ 0       5.7781      1.13  Q         |         |         |        V|
-------------------------------------------------------------------------
```

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

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Study date 08/25/22

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

Program License Serial Number 6277

JOB NO 2021-181
JOHNSON AND NAVAJO INDUSTRIAL
100 YR STORM UNIT HYDROGRAPH, PRE CONDITION
AREA E

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
9.33	1	0.60
Rainfall data for year 2		
9.33	6	0.76
Rainfall data for year 2		
9.33	24	1.30
Rainfall data for year 100		

```
             9.33            1           1.08
------------------------------------------------------------------------
Rainfall data for year 100
             9.33            6           2.01
------------------------------------------------------------------------
Rainfall data for year 100
             9.33           24           3.42
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 78.0      92.8          9.33      1.000     0.140    1.000    0.140

Area-averaged adjusted loss rate Fm (In/Hr) =  0.140

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
     9.33   1.000         78.0      92.8       0.78     0.771

Area-averaged catchment yield fraction, Y =  0.771
Area-averaged low loss fraction, Yb =  0.229
User entry of time of concentration  =   0.310 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       9.33(Ac.)
Catchment Lag time =   0.248 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 33.6022
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.140(In/Hr)
Average low loss rate fraction (Yb) = 0.229 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.512(In)
Computed peak 30-minute rainfall =  0.877(In)
Specified peak 1-hour rainfall =  1.080(In)
Computed peak 3-hour rainfall =  1.581(In)
Specified peak 6-hour rainfall =  2.010(In)
Specified peak 24-hour rainfall =  3.420(In)


Rainfall depth area reduction factors:
Using a total area of       9.33(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.512(In)
30-minute factor = 1.000    Adjusted rainfall =  0.877(In)
```

1-hour factor = 1.000 Adjusted rainfall = 1.080(In)
3-hour factor = 1.000 Adjusted rainfall = 1.581(In)
6-hour factor = 1.000 Adjusted rainfall = 2.010(In)
24-hour factor = 1.000 Adjusted rainfall = 3.420(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 = 112.83 (CFS))		
1	2.097	2.366
2	12.121	11.311
3	38.286	29.524
4	58.090	22.345
5	68.679	11.948
6	75.684	7.905
7	80.693	5.652
8	84.455	4.244
9	87.539	3.480
10	89.846	2.604
11	91.712	2.106
12	93.299	1.791
13	94.581	1.446
14	95.674	1.233
15	96.566	1.007
16	97.275	0.800
17	97.826	0.622
18	98.181	0.400
19	98.560	0.427
20	98.963	0.455
21	99.363	0.452
22	99.640	0.312
23	99.850	0.237
24	100.000	0.169

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5122	0.5122
2	0.6307	0.1184
3	0.7122	0.0816
4	0.7764	0.0642
5	0.8302	0.0538
6	0.8768	0.0467
7	0.9184	0.0415
8	0.9559	0.0375
9	0.9903	0.0344
10	1.0221	0.0318

11	1.0517	0.0296
12	1.0795	0.0278
13	1.1099	0.0304
14	1.1388	0.0289
15	1.1664	0.0276
16	1.1929	0.0264
17	1.2182	0.0254
18	1.2426	0.0244
19	1.2662	0.0235
20	1.2889	0.0227
21	1.3109	0.0220
22	1.3323	0.0213
23	1.3530	0.0207
24	1.3731	0.0201
25	1.3927	0.0196
26	1.4118	0.0191
27	1.4304	0.0186
28	1.4485	0.0182
29	1.4663	0.0177
30	1.4836	0.0174
31	1.5006	0.0170
32	1.5173	0.0166
33	1.5335	0.0163
34	1.5495	0.0160
35	1.5652	0.0157
36	1.5806	0.0154
37	1.5956	0.0151
38	1.6105	0.0148
39	1.6250	0.0146
40	1.6394	0.0143
41	1.6535	0.0141
42	1.6673	0.0139
43	1.6810	0.0137
44	1.6944	0.0135
45	1.7077	0.0133
46	1.7208	0.0131
47	1.7336	0.0129
48	1.7463	0.0127
49	1.7589	0.0125
50	1.7712	0.0124
51	1.7834	0.0122
52	1.7955	0.0120
53	1.8074	0.0119
54	1.8191	0.0118
55	1.8307	0.0116
56	1.8422	0.0115
57	1.8536	0.0113
58	1.8648	0.0112
59	1.8759	0.0111
60	1.8868	0.0110

61	1.8977	0.0108
62	1.9084	0.0107
63	1.9190	0.0106
64	1.9295	0.0105
65	1.9399	0.0104
66	1.9502	0.0103
67	1.9604	0.0102
68	1.9705	0.0101
69	1.9805	0.0100
70	1.9904	0.0099
71	2.0002	0.0098
72	2.0099	0.0097
73	2.0206	0.0107
74	2.0312	0.0106
75	2.0416	0.0105
76	2.0520	0.0104
77	2.0624	0.0103
78	2.0726	0.0102
79	2.0827	0.0101
80	2.0928	0.0101
81	2.1028	0.0100
82	2.1127	0.0099
83	2.1225	0.0098
84	2.1323	0.0098
85	2.1420	0.0097
86	2.1516	0.0096
87	2.1612	0.0096
88	2.1707	0.0095
89	2.1801	0.0094
90	2.1895	0.0094
91	2.1988	0.0093
92	2.2080	0.0092
93	2.2172	0.0092
94	2.2263	0.0091
95	2.2353	0.0091
96	2.2443	0.0090
97	2.2533	0.0089
98	2.2621	0.0089
99	2.2710	0.0088
100	2.2797	0.0088
101	2.2884	0.0087
102	2.2971	0.0087
103	2.3057	0.0086
104	2.3143	0.0086
105	2.3228	0.0085
106	2.3312	0.0085
107	2.3396	0.0084
108	2.3480	0.0084
109	2.3563	0.0083
110	2.3646	0.0083

111	2.3728	0.0082
112	2.3810	0.0082
113	2.3891	0.0081
114	2.3972	0.0081
115	2.4052	0.0080
116	2.4132	0.0080
117	2.4212	0.0080
118	2.4291	0.0079
119	2.4370	0.0079
120	2.4448	0.0078
121	2.4526	0.0078
122	2.4603	0.0078
123	2.4681	0.0077
124	2.4757	0.0077
125	2.4834	0.0076
126	2.4910	0.0076
127	2.4985	0.0076
128	2.5060	0.0075
129	2.5135	0.0075
130	2.5210	0.0075
131	2.5284	0.0074
132	2.5358	0.0074
133	2.5431	0.0073
134	2.5505	0.0073
135	2.5577	0.0073
136	2.5650	0.0072
137	2.5722	0.0072
138	2.5794	0.0072
139	2.5865	0.0072
140	2.5936	0.0071
141	2.6007	0.0071
142	2.6078	0.0071
143	2.6148	0.0070
144	2.6218	0.0070
145	2.6288	0.0070
146	2.6357	0.0069
147	2.6426	0.0069
148	2.6495	0.0069
149	2.6564	0.0068
150	2.6632	0.0068
151	2.6700	0.0068
152	2.6767	0.0068
153	2.6835	0.0067
154	2.6902	0.0067
155	2.6969	0.0067
156	2.7035	0.0067
157	2.7102	0.0066
158	2.7168	0.0066
159	2.7233	0.0066
160	2.7299	0.0066

161	2.7364	0.0065
162	2.7429	0.0065
163	2.7494	0.0065
164	2.7559	0.0065
165	2.7623	0.0064
166	2.7687	0.0064
167	2.7751	0.0064
168	2.7814	0.0064
169	2.7878	0.0063
170	2.7941	0.0063
171	2.8004	0.0063
172	2.8067	0.0063
173	2.8129	0.0062
174	2.8191	0.0062
175	2.8253	0.0062
176	2.8315	0.0062
177	2.8377	0.0062
178	2.8438	0.0061
179	2.8499	0.0061
180	2.8560	0.0061
181	2.8621	0.0061
182	2.8681	0.0061
183	2.8742	0.0060
184	2.8802	0.0060
185	2.8862	0.0060
186	2.8921	0.0060
187	2.8981	0.0060
188	2.9040	0.0059
189	2.9099	0.0059
190	2.9158	0.0059
191	2.9217	0.0059
192	2.9276	0.0059
193	2.9334	0.0058
194	2.9392	0.0058
195	2.9450	0.0058
196	2.9508	0.0058
197	2.9566	0.0058
198	2.9623	0.0057
199	2.9680	0.0057
200	2.9737	0.0057
201	2.9794	0.0057
202	2.9851	0.0057
203	2.9908	0.0057
204	2.9964	0.0056
205	3.0020	0.0056
206	3.0076	0.0056
207	3.0132	0.0056
208	3.0188	0.0056
209	3.0244	0.0056
210	3.0299	0.0055

211	3.0354	0.0055
212	3.0409	0.0055
213	3.0464	0.0055
214	3.0519	0.0055
215	3.0574	0.0055
216	3.0628	0.0054
217	3.0682	0.0054
218	3.0736	0.0054
219	3.0790	0.0054
220	3.0844	0.0054
221	3.0898	0.0054
222	3.0951	0.0054
223	3.1005	0.0053
224	3.1058	0.0053
225	3.1111	0.0053
226	3.1164	0.0053
227	3.1217	0.0053
228	3.1269	0.0053
229	3.1322	0.0053
230	3.1374	0.0052
231	3.1427	0.0052
232	3.1479	0.0052
233	3.1531	0.0052
234	3.1582	0.0052
235	3.1634	0.0052
236	3.1686	0.0052
237	3.1737	0.0051
238	3.1788	0.0051
239	3.1840	0.0051
240	3.1891	0.0051
241	3.1941	0.0051
242	3.1992	0.0051
243	3.2043	0.0051
244	3.2093	0.0050
245	3.2144	0.0050
246	3.2194	0.0050
247	3.2244	0.0050
248	3.2294	0.0050
249	3.2344	0.0050
250	3.2394	0.0050
251	3.2443	0.0050
252	3.2493	0.0049
253	3.2542	0.0049
254	3.2591	0.0049
255	3.2640	0.0049
256	3.2690	0.0049
257	3.2738	0.0049
258	3.2787	0.0049
259	3.2836	0.0049
260	3.2884	0.0049

261	3.2933	0.0048
262	3.2981	0.0048
263	3.3029	0.0048
264	3.3077	0.0048
265	3.3125	0.0048
266	3.3173	0.0048
267	3.3221	0.0048
268	3.3269	0.0048
269	3.3316	0.0048
270	3.3364	0.0047
271	3.3411	0.0047
272	3.3458	0.0047
273	3.3505	0.0047
274	3.3552	0.0047
275	3.3599	0.0047
276	3.3646	0.0047
277	3.3693	0.0047
278	3.3739	0.0047
279	3.3786	0.0046
280	3.3832	0.0046
281	3.3878	0.0046
282	3.3925	0.0046
283	3.3971	0.0046
284	3.4017	0.0046
285	3.4063	0.0046
286	3.4108	0.0046
287	3.4154	0.0046
288	3.4200	0.0046

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0046	0.0010	0.0035
2	0.0046	0.0010	0.0035
3	0.0046	0.0010	0.0035
4	0.0046	0.0011	0.0035
5	0.0046	0.0011	0.0036
6	0.0046	0.0011	0.0036
7	0.0046	0.0011	0.0036
8	0.0047	0.0011	0.0036
9	0.0047	0.0011	0.0036
10	0.0047	0.0011	0.0036
11	0.0047	0.0011	0.0036
12	0.0047	0.0011	0.0036
13	0.0047	0.0011	0.0037
14	0.0048	0.0011	0.0037
15	0.0048	0.0011	0.0037
16	0.0048	0.0011	0.0037
17	0.0048	0.0011	0.0037

18	0.0048	0.0011	0.0037
19	0.0048	0.0011	0.0037
20	0.0049	0.0011	0.0037
21	0.0049	0.0011	0.0038
22	0.0049	0.0011	0.0038
23	0.0049	0.0011	0.0038
24	0.0049	0.0011	0.0038
25	0.0049	0.0011	0.0038
26	0.0050	0.0011	0.0038
27	0.0050	0.0011	0.0038
28	0.0050	0.0011	0.0039
29	0.0050	0.0011	0.0039
30	0.0050	0.0012	0.0039
31	0.0051	0.0012	0.0039
32	0.0051	0.0012	0.0039
33	0.0051	0.0012	0.0039
34	0.0051	0.0012	0.0039
35	0.0051	0.0012	0.0040
36	0.0052	0.0012	0.0040
37	0.0052	0.0012	0.0040
38	0.0052	0.0012	0.0040
39	0.0052	0.0012	0.0040
40	0.0052	0.0012	0.0040
41	0.0053	0.0012	0.0041
42	0.0053	0.0012	0.0041
43	0.0053	0.0012	0.0041
44	0.0053	0.0012	0.0041
45	0.0054	0.0012	0.0041
46	0.0054	0.0012	0.0041
47	0.0054	0.0012	0.0042
48	0.0054	0.0012	0.0042
49	0.0054	0.0012	0.0042
50	0.0055	0.0012	0.0042
51	0.0055	0.0013	0.0042
52	0.0055	0.0013	0.0042
53	0.0055	0.0013	0.0043
54	0.0056	0.0013	0.0043
55	0.0056	0.0013	0.0043
56	0.0056	0.0013	0.0043
57	0.0056	0.0013	0.0044
58	0.0057	0.0013	0.0044
59	0.0057	0.0013	0.0044
60	0.0057	0.0013	0.0044
61	0.0057	0.0013	0.0044
62	0.0058	0.0013	0.0044
63	0.0058	0.0013	0.0045
64	0.0058	0.0013	0.0045
65	0.0059	0.0013	0.0045
66	0.0059	0.0013	0.0045
67	0.0059	0.0014	0.0046

68	0.0059	0.0014	0.0046
69	0.0060	0.0014	0.0046
70	0.0060	0.0014	0.0046
71	0.0060	0.0014	0.0047
72	0.0061	0.0014	0.0047
73	0.0061	0.0014	0.0047
74	0.0061	0.0014	0.0047
75	0.0062	0.0014	0.0047
76	0.0062	0.0014	0.0048
77	0.0062	0.0014	0.0048
78	0.0062	0.0014	0.0048
79	0.0063	0.0014	0.0049
80	0.0063	0.0014	0.0049
81	0.0064	0.0015	0.0049
82	0.0064	0.0015	0.0049
83	0.0064	0.0015	0.0050
84	0.0065	0.0015	0.0050
85	0.0065	0.0015	0.0050
86	0.0065	0.0015	0.0050
87	0.0066	0.0015	0.0051
88	0.0066	0.0015	0.0051
89	0.0067	0.0015	0.0051
90	0.0067	0.0015	0.0052
91	0.0067	0.0015	0.0052
92	0.0068	0.0015	0.0052
93	0.0068	0.0016	0.0053
94	0.0068	0.0016	0.0053
95	0.0069	0.0016	0.0053
96	0.0069	0.0016	0.0054
97	0.0070	0.0016	0.0054
98	0.0070	0.0016	0.0054
99	0.0071	0.0016	0.0055
100	0.0071	0.0016	0.0055
101	0.0072	0.0016	0.0055
102	0.0072	0.0016	0.0056
103	0.0073	0.0017	0.0056
104	0.0073	0.0017	0.0056
105	0.0074	0.0017	0.0057
106	0.0074	0.0017	0.0057
107	0.0075	0.0017	0.0058
108	0.0075	0.0017	0.0058
109	0.0076	0.0017	0.0059
110	0.0076	0.0017	0.0059
111	0.0077	0.0018	0.0059
112	0.0078	0.0018	0.0060
113	0.0078	0.0018	0.0060
114	0.0079	0.0018	0.0061
115	0.0080	0.0018	0.0061
116	0.0080	0.0018	0.0062
117	0.0081	0.0018	0.0062

118	0.0081	0.0019	0.0063
119	0.0082	0.0019	0.0063
120	0.0083	0.0019	0.0064
121	0.0084	0.0019	0.0064
122	0.0084	0.0019	0.0065
123	0.0085	0.0019	0.0066
124	0.0086	0.0020	0.0066
125	0.0087	0.0020	0.0067
126	0.0087	0.0020	0.0067
127	0.0088	0.0020	0.0068
128	0.0089	0.0020	0.0068
129	0.0090	0.0021	0.0069
130	0.0091	0.0021	0.0070
131	0.0092	0.0021	0.0071
132	0.0092	0.0021	0.0071
133	0.0094	0.0021	0.0072
134	0.0094	0.0022	0.0073
135	0.0096	0.0022	0.0074
136	0.0096	0.0022	0.0074
137	0.0098	0.0022	0.0075
138	0.0098	0.0023	0.0076
139	0.0100	0.0023	0.0077
140	0.0101	0.0023	0.0078
141	0.0102	0.0023	0.0079
142	0.0103	0.0024	0.0080
143	0.0105	0.0024	0.0081
144	0.0106	0.0024	0.0082
145	0.0097	0.0022	0.0075
146	0.0098	0.0022	0.0076
147	0.0100	0.0023	0.0077
148	0.0101	0.0023	0.0078
149	0.0103	0.0024	0.0079
150	0.0104	0.0024	0.0080
151	0.0106	0.0024	0.0082
152	0.0107	0.0025	0.0083
153	0.0110	0.0025	0.0085
154	0.0111	0.0025	0.0086
155	0.0113	0.0026	0.0087
156	0.0115	0.0026	0.0088
157	0.0118	0.0027	0.0091
158	0.0119	0.0027	0.0092
159	0.0122	0.0028	0.0094
160	0.0124	0.0028	0.0095
161	0.0127	0.0029	0.0098
162	0.0129	0.0029	0.0099
163	0.0133	0.0030	0.0102
164	0.0135	0.0031	0.0104
165	0.0139	0.0032	0.0107
166	0.0141	0.0032	0.0109
167	0.0146	0.0033	0.0112

168	0.0148	0.0034	0.0114
169	0.0154	0.0035	0.0119
170	0.0157	0.0036	0.0121
171	0.0163	0.0037	0.0126
172	0.0166	0.0038	0.0128
173	0.0174	0.0040	0.0134
174	0.0177	0.0041	0.0137
175	0.0186	0.0043	0.0144
176	0.0191	0.0044	0.0147
177	0.0201	0.0046	0.0155
178	0.0207	0.0047	0.0160
179	0.0220	0.0050	0.0170
180	0.0227	0.0052	0.0175
181	0.0244	0.0056	0.0188
182	0.0254	0.0058	0.0196
183	0.0276	0.0063	0.0213
184	0.0289	0.0066	0.0223
185	0.0278	0.0064	0.0215
186	0.0296	0.0068	0.0229
187	0.0344	0.0079	0.0265
188	0.0375	0.0086	0.0290
189	0.0467	0.0107	0.0360
190	0.0538	0.0117	0.0421
191	0.0816	0.0117	0.0699
192	0.1184	0.0117	0.1067
193	0.5122	0.0117	0.5006
194	0.0642	0.0117	0.0525
195	0.0415	0.0095	0.0320
196	0.0318	0.0073	0.0245
197	0.0304	0.0070	0.0235
198	0.0264	0.0060	0.0204
199	0.0235	0.0054	0.0182
200	0.0213	0.0049	0.0165
201	0.0196	0.0045	0.0151
202	0.0182	0.0042	0.0140
203	0.0170	0.0039	0.0131
204	0.0160	0.0037	0.0123
205	0.0151	0.0034	0.0116
206	0.0143	0.0033	0.0111
207	0.0137	0.0031	0.0105
208	0.0131	0.0030	0.0101
209	0.0125	0.0029	0.0097
210	0.0120	0.0028	0.0093
211	0.0116	0.0027	0.0090
212	0.0112	0.0026	0.0086
213	0.0108	0.0025	0.0084
214	0.0105	0.0024	0.0081
215	0.0102	0.0023	0.0079
216	0.0099	0.0023	0.0076
217	0.0107	0.0024	0.0082

218	0.0104	0.0024	0.0080
219	0.0101	0.0023	0.0078
220	0.0099	0.0023	0.0076
221	0.0097	0.0022	0.0075
222	0.0095	0.0022	0.0073
223	0.0093	0.0021	0.0072
224	0.0091	0.0021	0.0070
225	0.0089	0.0020	0.0069
226	0.0088	0.0020	0.0068
227	0.0086	0.0020	0.0066
228	0.0085	0.0019	0.0065
229	0.0083	0.0019	0.0064
230	0.0082	0.0019	0.0063
231	0.0080	0.0018	0.0062
232	0.0079	0.0018	0.0061
233	0.0078	0.0018	0.0060
234	0.0077	0.0018	0.0059
235	0.0076	0.0017	0.0058
236	0.0075	0.0017	0.0057
237	0.0073	0.0017	0.0057
238	0.0072	0.0017	0.0056
239	0.0072	0.0016	0.0055
240	0.0071	0.0016	0.0054
241	0.0070	0.0016	0.0054
242	0.0069	0.0016	0.0053
243	0.0068	0.0016	0.0052
244	0.0067	0.0015	0.0052
245	0.0066	0.0015	0.0051
246	0.0066	0.0015	0.0051
247	0.0065	0.0015	0.0050
248	0.0064	0.0015	0.0049
249	0.0063	0.0014	0.0049
250	0.0063	0.0014	0.0048
251	0.0062	0.0014	0.0048
252	0.0061	0.0014	0.0047
253	0.0061	0.0014	0.0047
254	0.0060	0.0014	0.0046
255	0.0060	0.0014	0.0046
256	0.0059	0.0013	0.0045
257	0.0058	0.0013	0.0045
258	0.0058	0.0013	0.0045
259	0.0057	0.0013	0.0044
260	0.0057	0.0013	0.0044
261	0.0056	0.0013	0.0043
262	0.0056	0.0013	0.0043
263	0.0055	0.0013	0.0043
264	0.0055	0.0013	0.0042
265	0.0054	0.0012	0.0042
266	0.0054	0.0012	0.0042
267	0.0053	0.0012	0.0041

268	0.0053	0.0012	0.0041
269	0.0053	0.0012	0.0041
270	0.0052	0.0012	0.0040
271	0.0052	0.0012	0.0040
272	0.0051	0.0012	0.0040
273	0.0051	0.0012	0.0039
274	0.0050	0.0012	0.0039
275	0.0050	0.0011	0.0039
276	0.0050	0.0011	0.0038
277	0.0049	0.0011	0.0038
278	0.0049	0.0011	0.0038
279	0.0049	0.0011	0.0038
280	0.0048	0.0011	0.0037
281	0.0048	0.0011	0.0037
282	0.0048	0.0011	0.0037
283	0.0047	0.0011	0.0037
284	0.0047	0.0011	0.0036
285	0.0047	0.0011	0.0036
286	0.0046	0.0011	0.0036
287	0.0046	0.0011	0.0036
288	0.0046	0.0010	0.0035

Total soil rain loss = 0.65(In)
Total effective rainfall = 2.77(In)
Peak flow rate in flood hydrograph = 19.70(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

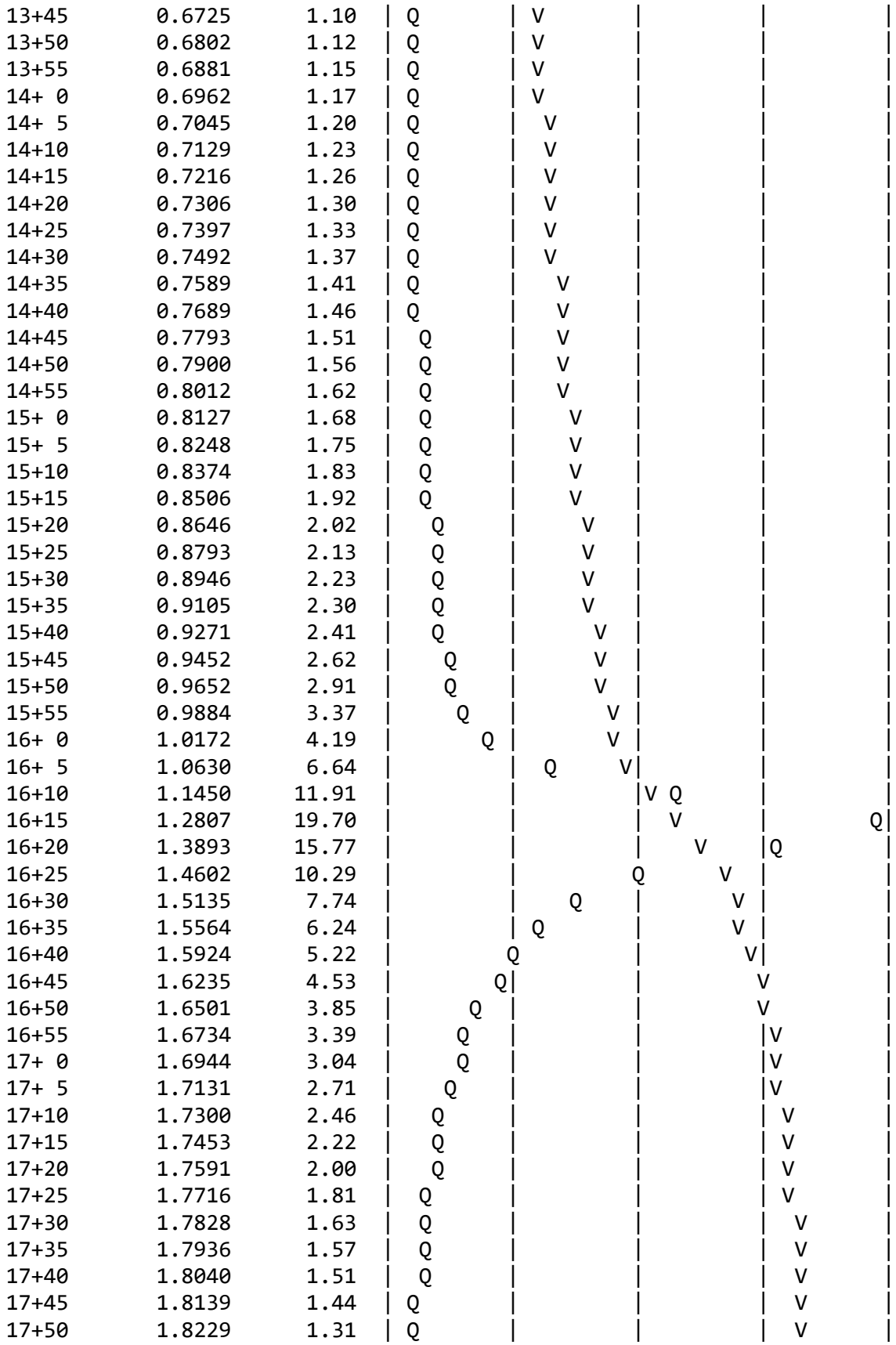
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0001	0.01	Q	|	|	|	|
0+10	0.0004	0.05	Q	|	|	|	|
0+15	0.0014	0.15	Q	|	|	|	|
0+20	0.0030	0.23	Q	|	|	|	|
0+25	0.0049	0.27	Q	|	|	|	|
0+30	0.0070	0.30	Q	|	|	|	|
0+35	0.0092	0.32	Q	|	|	|	|
0+40	0.0116	0.34	Q	|	|	|	|
0+45	0.0140	0.35	Q	|	|	|	|
0+50	0.0165	0.36	Q	|	|	|	|
0+55	0.0190	0.37	Q	|	|	|	|
1+ 0	0.0217	0.38	Q	|	|	|	|
1+ 5	0.0243	0.39	Q	|	|	|	|
1+10	0.0270	0.39	Q	|	|	|	|

1+15	0.0297	0.40	Q	|	|	|	|
1+20	0.0325	0.40	Q	|	|	|	|
1+25	0.0353	0.40	Q	|	|	|	|
1+30	0.0381	0.41	Q	|	|	|	|
1+35	0.0409	0.41	Q	|	|	|	|
1+40	0.0437	0.41	Q	|	|	|	|
1+45	0.0466	0.42	Q	|	|	|	|
1+50	0.0495	0.42	Q	|	|	|	|
1+55	0.0523	0.42	Q	|	|	|	|
2+ 0	0.0553	0.42	QV	|	|	|	|
2+ 5	0.0582	0.42	QV	|	|	|	|
2+10	0.0611	0.43	QV	|	|	|	|
2+15	0.0640	0.43	QV	|	|	|	|
2+20	0.0670	0.43	QV	|	|	|	|
2+25	0.0700	0.43	QV	|	|	|	|
2+30	0.0729	0.43	QV	|	|	|	|
2+35	0.0759	0.43	QV	|	|	|	|
2+40	0.0789	0.43	QV	|	|	|	|
2+45	0.0819	0.44	QV	|	|	|	|
2+50	0.0849	0.44	QV	|	|	|	|
2+55	0.0880	0.44	QV	|	|	|	|
3+ 0	0.0910	0.44	QV	|	|	|	|
3+ 5	0.0940	0.44	QV	|	|	|	|
3+10	0.0971	0.44	QV	|	|	|	|
3+15	0.1002	0.45	QV	|	|	|	|
3+20	0.1033	0.45	QV	|	|	|	|
3+25	0.1064	0.45	QV	|	|	|	|
3+30	0.1095	0.45	Q V	|	|	|	|
3+35	0.1126	0.45	Q V	|	|	|	|
3+40	0.1157	0.46	Q V	|	|	|	|
3+45	0.1189	0.46	Q V	|	|	|	|
3+50	0.1221	0.46	Q V	|	|	|	|
3+55	0.1252	0.46	Q V	|	|	|	|
4+ 0	0.1284	0.46	Q V	|	|	|	|
4+ 5	0.1316	0.46	Q V	|	|	|	|
4+10	0.1348	0.47	Q V	|	|	|	|
4+15	0.1381	0.47	Q V	|	|	|	|
4+20	0.1413	0.47	Q V	|	|	|	|
4+25	0.1446	0.47	Q V	|	|	|	|
4+30	0.1478	0.47	Q V	|	|	|	|
4+35	0.1511	0.48	Q V	|	|	|	|
4+40	0.1544	0.48	Q V	|	|	|	|
4+45	0.1577	0.48	Q V	|	|	|	|
4+50	0.1611	0.48	Q V	|	|	|	|
4+55	0.1644	0.49	Q V	|	|	|	|
5+ 0	0.1678	0.49	Q V	|	|	|	|
5+ 5	0.1711	0.49	Q V	|	|	|	|
5+10	0.1745	0.49	Q V	|	|	|	|
5+15	0.1779	0.49	Q V	|	|	|	|
5+20	0.1814	0.50	Q V	|	|	|	|

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5+25       0.1848      0.50  Q  V      |          |          |          |
5+30       0.1882      0.50  |Q V      |          |          |          |
5+35       0.1917      0.50  |Q V      |          |          |          |
5+40       0.1952      0.51  |Q V      |          |          |          |
5+45       0.1987      0.51  |Q V      |          |          |          |
5+50       0.2022      0.51  |Q V      |          |          |          |
5+55       0.2057      0.51  |Q V      |          |          |          |
6+ 0       0.2093      0.52  |Q V      |          |          |          |
6+ 5       0.2129      0.52  |Q V      |          |          |          |
6+10       0.2165      0.52  |Q  V     |          |          |          |
6+15       0.2201      0.52  |Q  V     |          |          |          |
6+20       0.2237      0.53  |Q  V     |          |          |          |
6+25       0.2273      0.53  |Q  V     |          |          |          |
6+30       0.2310      0.53  |Q  V     |          |          |          |
6+35       0.2347      0.53  |Q  V     |          |          |          |
6+40       0.2384      0.54  |Q  V     |          |          |          |
6+45       0.2421      0.54  |Q  V     |          |          |          |
6+50       0.2458      0.54  |Q  V     |          |          |          |
6+55       0.2496      0.55  |Q  V     |          |          |          |
7+ 0       0.2534      0.55  |Q  V     |          |          |          |
7+ 5       0.2572      0.55  |Q  V     |          |          |          |
7+10       0.2610      0.56  |Q  V     |          |          |          |
7+15       0.2649      0.56  |Q  V     |          |          |          |
7+20       0.2687      0.56  |Q  V     |          |          |          |
7+25       0.2726      0.56  |Q   V    |          |          |          |
7+30       0.2765      0.57  |Q   V    |          |          |          |
7+35       0.2805      0.57  |Q   V    |          |          |          |
7+40       0.2844      0.57  |Q   V    |          |          |          |
7+45       0.2884      0.58  |Q   V    |          |          |          |
7+50       0.2924      0.58  |Q   V    |          |          |          |
7+55       0.2964      0.58  |Q   V    |          |          |          |
8+ 0       0.3005      0.59  |Q   V    |          |          |          |
8+ 5       0.3045      0.59  |Q   V    |          |          |          |
8+10       0.3087      0.60  |Q   V    |          |          |          |
8+15       0.3128      0.60  |Q   V    |          |          |          |
8+20       0.3169      0.60  |Q   V    |          |          |          |
8+25       0.3211      0.61  |Q   V    |          |          |          |
8+30       0.3253      0.61  |Q    V   |          |          |          |
8+35       0.3296      0.62  |Q    V   |          |          |          |
8+40       0.3338      0.62  |Q    V   |          |          |          |
8+45       0.3381      0.62  |Q    V   |          |          |          |
8+50       0.3424      0.63  |Q    V   |          |          |          |
8+55       0.3468      0.63  |Q    V   |          |          |          |
9+ 0       0.3512      0.64  |Q    V   |          |          |          |
9+ 5       0.3556      0.64  |Q    V   |          |          |          |
9+10       0.3600      0.65  |Q    V   |          |          |          |
9+15       0.3645      0.65  |Q    V   |          |          |          |
9+20       0.3690      0.65  |Q    V   |          |          |          |
9+25       0.3735      0.66  |Q    V   |          |          |          |
9+30       0.3781      0.66  |Q     V  |          |          |          |
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9+35	0.3827	0.67	Q	V			
9+40	0.3874	0.67	Q	V			
9+45	0.3920	0.68	Q	V			
9+50	0.3968	0.68	Q	V			
9+55	0.4015	0.69	Q	V			
10+ 0	0.4063	0.70	Q	V			
10+ 5	0.4111	0.70	Q	V			
10+10	0.4160	0.71	Q	V			
10+15	0.4209	0.71	Q	V			
10+20	0.4259	0.72	Q	V			
10+25	0.4308	0.72	Q	V			
10+30	0.4359	0.73	Q	V			
10+35	0.4410	0.74	Q	V			
10+40	0.4461	0.74	Q	V			
10+45	0.4513	0.75	Q	V			
10+50	0.4565	0.76	Q	V			
10+55	0.4618	0.76	Q	V			
11+ 0	0.4671	0.77	Q	V			
11+ 5	0.4724	0.78	Q	V			
11+10	0.4779	0.79	Q	V			
11+15	0.4833	0.80	Q	V			
11+20	0.4889	0.80	Q	V			
11+25	0.4945	0.81	Q	V			
11+30	0.5001	0.82	Q	V			
11+35	0.5058	0.83	Q	V			
11+40	0.5116	0.84	Q	V			
11+45	0.5174	0.85	Q	V			
11+50	0.5233	0.86	Q	V			
11+55	0.5293	0.87	Q	V			
12+ 0	0.5353	0.88	Q	V			
12+ 5	0.5414	0.88	Q	V			
12+10	0.5475	0.89	Q	V			
12+15	0.5535	0.87	Q	V			
12+20	0.5595	0.87	Q	V			
12+25	0.5655	0.87	Q	V			
12+30	0.5715	0.87	Q	V			
12+35	0.5776	0.88	Q	V			
12+40	0.5837	0.89	Q	V			
12+45	0.5899	0.90	Q	V			
12+50	0.5962	0.91	Q	V			
12+55	0.6026	0.93	Q	V			
13+ 0	0.6091	0.94	Q	V			
13+ 5	0.6157	0.95	Q	V			
13+10	0.6223	0.97	Q	V			
13+15	0.6291	0.99	Q	V			
13+20	0.6360	1.00	Q	V			
13+25	0.6430	1.02	Q	V			
13+30	0.6502	1.04	Q	V			
13+35	0.6575	1.06	Q	V			
13+40	0.6649	1.08	Q	V			



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17+55       1.8313      1.21  | Q       |         |         |   V     |
18+ 0       1.8390      1.12  | Q       |         |         |   V     |
18+ 5       1.8459      1.00  | Q       |         |         |   V     |
18+10       1.8526      0.97  |Q        |         |         |   V     |
18+15       1.8592      0.96  |Q        |         |         |   V     |
18+20       1.8657      0.95  |Q        |         |         |   V     |
18+25       1.8721      0.93  |Q        |         |         |   V     |
18+30       1.8784      0.91  |Q        |         |         |   V     |
18+35       1.8845      0.89  |Q        |         |         |    V    |
18+40       1.8905      0.87  |Q        |         |         |    V    |
18+45       1.8964      0.85  |Q        |         |         |    V    |
18+50       1.9021      0.83  |Q        |         |         |    V    |
18+55       1.9078      0.82  |Q        |         |         |    V    |
19+ 0       1.9133      0.80  |Q        |         |         |    V    |
19+ 5       1.9187      0.79  |Q        |         |         |    V    |
19+10       1.9240      0.77  |Q        |         |         |    V    |
19+15       1.9292      0.76  |Q        |         |         |    V    |
19+20       1.9344      0.74  |Q        |         |         |    V    |
19+25       1.9394      0.73  |Q        |         |         |     V   |
19+30       1.9444      0.72  |Q        |         |         |     V   |
19+35       1.9492      0.71  |Q        |         |         |     V   |
19+40       1.9540      0.70  |Q        |         |         |     V   |
19+45       1.9588      0.69  |Q        |         |         |     V   |
19+50       1.9634      0.68  |Q        |         |         |     V   |
19+55       1.9680      0.67  |Q        |         |         |     V   |
20+ 0       1.9725      0.66  |Q        |         |         |     V   |
20+ 5       1.9770      0.65  |Q        |         |         |     V   |
20+10       1.9814      0.64  |Q        |         |         |     V   |
20+15       1.9857      0.63  |Q        |         |         |     V   |
20+20       1.9900      0.62  |Q        |         |         |     V   |
20+25       1.9942      0.61  |Q        |         |         |      V  |
20+30       1.9983      0.60  |Q        |         |         |      V  |
20+35       2.0024      0.60  |Q        |         |         |      V  |
20+40       2.0065      0.59  |Q        |         |         |      V  |
20+45       2.0105      0.58  |Q        |         |         |      V  |
20+50       2.0145      0.57  |Q        |         |         |      V  |
20+55       2.0184      0.57  |Q        |         |         |      V  |
21+ 0       2.0222      0.56  |Q        |         |         |      V  |
21+ 5       2.0261      0.56  |Q        |         |         |      V  |
21+10       2.0299      0.55  |Q        |         |         |      V  |
21+15       2.0336      0.54  |Q        |         |         |      V  |
21+20       2.0373      0.54  |Q        |         |         |      V  |
21+25       2.0410      0.53  |Q        |         |         |      V  |
21+30       2.0446      0.53  |Q        |         |         |       V |
21+35       2.0482      0.52  |Q        |         |         |       V |
21+40       2.0517      0.52  |Q        |         |         |       V |
21+45       2.0553      0.51  |Q        |         |         |       V |
21+50       2.0587      0.51  |Q        |         |         |       V |
21+55       2.0622      0.50  |Q        |         |         |       V |
22+ 0       2.0656      0.50  Q         |         |         |       V |
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22+ 5	2.0690	0.49	Q	|	|	|	V |
22+10	2.0724	0.49	Q	|	|	|	V |
22+15	2.0757	0.48	Q	|	|	|	V |
22+20	2.0790	0.48	Q	|	|	|	V |
22+25	2.0823	0.47	Q	|	|	|	V |
22+30	2.0855	0.47	Q	|	|	|	V |
22+35	2.0887	0.47	Q	|	|	|	V |
22+40	2.0919	0.46	Q	|	|	|	V |
22+45	2.0951	0.46	Q	|	|	|	V |
22+50	2.0982	0.46	Q	|	|	|	V |
22+55	2.1013	0.45	Q	|	|	|	V|
23+ 0	2.1044	0.45	Q	|	|	|	V|
23+ 5	2.1075	0.44	Q	|	|	|	V|
23+10	2.1105	0.44	Q	|	|	|	V|
23+15	2.1135	0.44	Q	|	|	|	V|
23+20	2.1165	0.43	Q	|	|	|	V|
23+25	2.1195	0.43	Q	|	|	|	V|
23+30	2.1224	0.43	Q	|	|	|	V|
23+35	2.1254	0.43	Q	|	|	|	V|
23+40	2.1283	0.42	Q	|	|	|	V|
23+45	2.1312	0.42	Q	|	|	|	V|
23+50	2.1340	0.42	Q	|	|	|	V|
23+55	2.1369	0.41	Q	|	|	|	V|
24+ 0	2.1397	0.41	Q	|	|	|	V|

UNIT HYDROGRAPH ANALYSIS

POST-DEVELOPMENT CONDITION 10 YEAR, 24 HOUR STORM

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

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2004, Version 7.0

Study date 08/08/24

++

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

Program License Serial Number 6277

JOB NO 2021-181
WATSON APPLEY VALLEY 145
10 YEAR UNIT HYDROGRAPH
POST, AREA A

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
26.87	1	0.60
Rainfall data for year 2		
26.87	6	0.76
Rainfall data for year 2		
26.87	24	1.30
Rainfall data for year 100		
26.87	1	1.08
Rainfall data for year 100		
26.87	6	2.01
Rainfall data for year 100		
26.87	24	3.42

++

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

```
SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      32.0         26.87      1.000     0.978    0.119    0.116

Area-averaged adjusted loss rate Fm (In/Hr) =  0.116

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     3.20   0.119         32.0      32.0      10.86     0.000
    23.67   0.881         98.0      98.0       0.20     0.895

Area-averaged catchment yield fraction, Y =  0.789
Area-averaged low loss fraction, Yb =  0.211
User entry of time of concentration  =   0.230 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =      26.87(Ac.)
Catchment Lag time =   0.184 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 45.2899
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.116(In/Hr)
Average low loss rate fraction (Yb) = 0.211 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.287(In)
Computed peak 30-minute rainfall =  0.491(In)
Specified peak 1-hour rainfall =  0.605(In)
Computed peak 3-hour rainfall =  0.955(In)
Specified peak 6-hour rainfall =  1.273(In)
Specified peak 24-hour rainfall =  2.172(In)


Rainfall depth area reduction factors:
Using a total area of      26.87(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999     Adjusted rainfall =  0.287(In)
30-minute factor = 0.999    Adjusted rainfall =  0.491(In)
1-hour factor = 0.999       Adjusted rainfall =  0.604(In)
3-hour factor = 1.000       Adjusted rainfall =  0.955(In)
6-hour factor = 1.000       Adjusted rainfall =  1.273(In)
24-hour factor = 1.000      Adjusted rainfall =  2.172(In)
----------------------------------------------------------------------

                      U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
----------------------------------------------------------------------
               (K =       324.96 (CFS))

  1                3.365                 10.935
  2               24.923                 70.053
  3               55.845                100.487
  4               70.325                 47.054
  5               78.657                 27.074
  6               84.140                 17.816
  7               88.185                 13.145
  8               91.006                  9.166
```

9	93.225	7.212
10	94.928	5.534
11	96.264	4.342
12	97.275	3.284
13	97.957	2.219
14	98.440	1.567
15	98.980	1.757
16	99.485	1.641
17	99.796	1.008
18	100.000	0.664

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2867	0.2867
2	0.3530	0.0663
3	0.3986	0.0457
4	0.4346	0.0359
5	0.4647	0.0301
6	0.4908	0.0261
7	0.5140	0.0232
8	0.5350	0.0210
9	0.5543	0.0192
10	0.5721	0.0178
11	0.5887	0.0166
12	0.6042	0.0156
13	0.6247	0.0205
14	0.6443	0.0196
15	0.6630	0.0188
16	0.6811	0.0181
17	0.6985	0.0174
18	0.7153	0.0168
19	0.7316	0.0163
20	0.7474	0.0158
21	0.7627	0.0153
22	0.7776	0.0149
23	0.7922	0.0145
24	0.8063	0.0142
25	0.8201	0.0138
26	0.8336	0.0135
27	0.8468	0.0132
28	0.8597	0.0129
29	0.8724	0.0126
30	0.8848	0.0124
31	0.8969	0.0122
32	0.9089	0.0119
33	0.9206	0.0117
34	0.9321	0.0115
35	0.9434	0.0113
36	0.9545	0.0111
37	0.9655	0.0109
38	0.9762	0.0108
39	0.9868	0.0106
40	0.9972	0.0104
41	1.0075	0.0103
42	1.0177	0.0101
43	1.0276	0.0100
44	1.0375	0.0099
45	1.0472	0.0097
46	1.0568	0.0096
47	1.0663	0.0095
48	1.0757	0.0094

49	1.0849	0.0093
50	1.0941	0.0091
51	1.1031	0.0090
52	1.1120	0.0089
53	1.1209	0.0088
54	1.1296	0.0087
55	1.1383	0.0086
56	1.1468	0.0086
57	1.1553	0.0085
58	1.1636	0.0084
59	1.1719	0.0083
60	1.1801	0.0082
61	1.1883	0.0081
62	1.1963	0.0081
63	1.2043	0.0080
64	1.2122	0.0079
65	1.2200	0.0078
66	1.2278	0.0078
67	1.2355	0.0077
68	1.2431	0.0076
69	1.2507	0.0076
70	1.2582	0.0075
71	1.2656	0.0074
72	1.2730	0.0074
73	1.2798	0.0068
74	1.2865	0.0067
75	1.2932	0.0067
76	1.2998	0.0066
77	1.3063	0.0066
78	1.3129	0.0065
79	1.3193	0.0065
80	1.3257	0.0064
81	1.3321	0.0064
82	1.3384	0.0063
83	1.3447	0.0063
84	1.3509	0.0062
85	1.3571	0.0062
86	1.3632	0.0061
87	1.3693	0.0061
88	1.3753	0.0060
89	1.3813	0.0060
90	1.3873	0.0060
91	1.3932	0.0059
92	1.3991	0.0059
93	1.4050	0.0058
94	1.4108	0.0058
95	1.4165	0.0058
96	1.4223	0.0057
97	1.4279	0.0057
98	1.4336	0.0057
99	1.4392	0.0056
100	1.4448	0.0056
101	1.4504	0.0056
102	1.4559	0.0055
103	1.4614	0.0055
104	1.4668	0.0055
105	1.4722	0.0054
106	1.4776	0.0054
107	1.4830	0.0054
108	1.4883	0.0053
109	1.4936	0.0053

110	1.4989	0.0053
111	1.5041	0.0052
112	1.5093	0.0052
113	1.5145	0.0052
114	1.5197	0.0052
115	1.5248	0.0051
116	1.5299	0.0051
117	1.5349	0.0051
118	1.5400	0.0050
119	1.5450	0.0050
120	1.5500	0.0050
121	1.5550	0.0050
122	1.5599	0.0049
123	1.5648	0.0049
124	1.5697	0.0049
125	1.5746	0.0049
126	1.5794	0.0048
127	1.5842	0.0048
128	1.5890	0.0048
129	1.5938	0.0048
130	1.5986	0.0048
131	1.6033	0.0047
132	1.6080	0.0047
133	1.6127	0.0047
134	1.6173	0.0047
135	1.6220	0.0046
136	1.6266	0.0046
137	1.6312	0.0046
138	1.6358	0.0046
139	1.6403	0.0046
140	1.6449	0.0045
141	1.6494	0.0045
142	1.6539	0.0045
143	1.6584	0.0045
144	1.6628	0.0045
145	1.6673	0.0044
146	1.6717	0.0044
147	1.6761	0.0044
148	1.6805	0.0044
149	1.6849	0.0044
150	1.6892	0.0043
151	1.6935	0.0043
152	1.6979	0.0043
153	1.7022	0.0043
154	1.7064	0.0043
155	1.7107	0.0043
156	1.7149	0.0042
157	1.7192	0.0042
158	1.7234	0.0042
159	1.7276	0.0042
160	1.7318	0.0042
161	1.7359	0.0042
162	1.7401	0.0041
163	1.7442	0.0041
164	1.7483	0.0041
165	1.7524	0.0041
166	1.7565	0.0041
167	1.7606	0.0041
168	1.7646	0.0041
169	1.7687	0.0040
170	1.7727	0.0040

171	1.7767	0.0040
172	1.7807	0.0040
173	1.7847	0.0040
174	1.7887	0.0040
175	1.7926	0.0040
176	1.7966	0.0039
177	1.8005	0.0039
178	1.8044	0.0039
179	1.8083	0.0039
180	1.8122	0.0039
181	1.8161	0.0039
182	1.8199	0.0039
183	1.8238	0.0038
184	1.8276	0.0038
185	1.8314	0.0038
186	1.8352	0.0038
187	1.8390	0.0038
188	1.8428	0.0038
189	1.8466	0.0038
190	1.8504	0.0038
191	1.8541	0.0037
192	1.8578	0.0037
193	1.8616	0.0037
194	1.8653	0.0037
195	1.8690	0.0037
196	1.8727	0.0037
197	1.8763	0.0037
198	1.8800	0.0037
199	1.8837	0.0037
200	1.8873	0.0036
201	1.8909	0.0036
202	1.8946	0.0036
203	1.8982	0.0036
204	1.9018	0.0036
205	1.9054	0.0036
206	1.9089	0.0036
207	1.9125	0.0036
208	1.9161	0.0036
209	1.9196	0.0035
210	1.9231	0.0035
211	1.9267	0.0035
212	1.9302	0.0035
213	1.9337	0.0035
214	1.9372	0.0035
215	1.9407	0.0035
216	1.9441	0.0035
217	1.9476	0.0035
218	1.9510	0.0035
219	1.9545	0.0034
220	1.9579	0.0034
221	1.9614	0.0034
222	1.9648	0.0034
223	1.9682	0.0034
224	1.9716	0.0034
225	1.9750	0.0034
226	1.9783	0.0034
227	1.9817	0.0034
228	1.9851	0.0034
229	1.9884	0.0034
230	1.9918	0.0033
231	1.9951	0.0033

232	1.9984	0.0033	
233	2.0017	0.0033	
234	2.0050	0.0033	
235	2.0083	0.0033	
236	2.0116	0.0033	
237	2.0149	0.0033	
238	2.0182	0.0033	
239	2.0215	0.0033	
240	2.0247	0.0033	
241	2.0280	0.0032	
242	2.0312	0.0032	
243	2.0344	0.0032	
244	2.0376	0.0032	
245	2.0409	0.0032	
246	2.0441	0.0032	
247	2.0473	0.0032	
248	2.0505	0.0032	
249	2.0536	0.0032	
250	2.0568	0.0032	
251	2.0600	0.0032	
252	2.0631	0.0032	
253	2.0663	0.0032	
254	2.0694	0.0031	
255	2.0726	0.0031	
256	2.0757	0.0031	
257	2.0788	0.0031	
258	2.0819	0.0031	
259	2.0850	0.0031	
260	2.0881	0.0031	
261	2.0912	0.0031	
262	2.0943	0.0031	
263	2.0974	0.0031	
264	2.1005	0.0031	
265	2.1035	0.0031	
266	2.1066	0.0031	
267	2.1096	0.0030	
268	2.1127	0.0030	
269	2.1157	0.0030	
270	2.1187	0.0030	
271	2.1218	0.0030	
272	2.1248	0.0030	
273	2.1278	0.0030	
274	2.1308	0.0030	
275	2.1338	0.0030	
276	2.1368	0.0030	
277	2.1398	0.0030	
278	2.1427	0.0030	
279	2.1457	0.0030	
280	2.1487	0.0030	
281	2.1516	0.0030	
282	2.1546	0.0029	
283	2.1575	0.0029	
284	2.1604	0.0029	
285	2.1634	0.0029	
286	2.1663	0.0029	
287	2.1692	0.0029	
288	2.1721	0.0029	

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)

1	0.0029	0.0006	0.0023
2	0.0029	0.0006	0.0023
3	0.0029	0.0006	0.0023
4	0.0029	0.0006	0.0023
5	0.0029	0.0006	0.0023
6	0.0030	0.0006	0.0023
7	0.0030	0.0006	0.0023
8	0.0030	0.0006	0.0023
9	0.0030	0.0006	0.0024
10	0.0030	0.0006	0.0024
11	0.0030	0.0006	0.0024
12	0.0030	0.0006	0.0024
13	0.0030	0.0006	0.0024
14	0.0030	0.0006	0.0024
15	0.0030	0.0006	0.0024
16	0.0031	0.0006	0.0024
17	0.0031	0.0006	0.0024
18	0.0031	0.0006	0.0024
19	0.0031	0.0007	0.0024
20	0.0031	0.0007	0.0024
21	0.0031	0.0007	0.0025
22	0.0031	0.0007	0.0025
23	0.0031	0.0007	0.0025
24	0.0031	0.0007	0.0025
25	0.0032	0.0007	0.0025
26	0.0032	0.0007	0.0025
27	0.0032	0.0007	0.0025
28	0.0032	0.0007	0.0025
29	0.0032	0.0007	0.0025
30	0.0032	0.0007	0.0025
31	0.0032	0.0007	0.0025
32	0.0032	0.0007	0.0026
33	0.0033	0.0007	0.0026
34	0.0033	0.0007	0.0026
35	0.0033	0.0007	0.0026
36	0.0033	0.0007	0.0026
37	0.0033	0.0007	0.0026
38	0.0033	0.0007	0.0026
39	0.0033	0.0007	0.0026
40	0.0033	0.0007	0.0026
41	0.0034	0.0007	0.0027
42	0.0034	0.0007	0.0027
43	0.0034	0.0007	0.0027
44	0.0034	0.0007	0.0027
45	0.0034	0.0007	0.0027
46	0.0034	0.0007	0.0027
47	0.0034	0.0007	0.0027
48	0.0035	0.0007	0.0027
49	0.0035	0.0007	0.0027
50	0.0035	0.0007	0.0027
51	0.0035	0.0007	0.0028
52	0.0035	0.0007	0.0028
53	0.0035	0.0007	0.0028
54	0.0035	0.0007	0.0028
55	0.0036	0.0008	0.0028
56	0.0036	0.0008	0.0028
57	0.0036	0.0008	0.0028
58	0.0036	0.0008	0.0028
59	0.0036	0.0008	0.0029
60	0.0036	0.0008	0.0029

61	0.0037	0.0008	0.0029
62	0.0037	0.0008	0.0029
63	0.0037	0.0008	0.0029
64	0.0037	0.0008	0.0029
65	0.0037	0.0008	0.0029
66	0.0037	0.0008	0.0030
67	0.0038	0.0008	0.0030
68	0.0038	0.0008	0.0030
69	0.0038	0.0008	0.0030
70	0.0038	0.0008	0.0030
71	0.0038	0.0008	0.0030
72	0.0039	0.0008	0.0030
73	0.0039	0.0008	0.0031
74	0.0039	0.0008	0.0031
75	0.0039	0.0008	0.0031
76	0.0039	0.0008	0.0031
77	0.0040	0.0008	0.0031
78	0.0040	0.0008	0.0031
79	0.0040	0.0008	0.0032
80	0.0040	0.0008	0.0032
81	0.0041	0.0009	0.0032
82	0.0041	0.0009	0.0032
83	0.0041	0.0009	0.0032
84	0.0041	0.0009	0.0032
85	0.0041	0.0009	0.0033
86	0.0042	0.0009	0.0033
87	0.0042	0.0009	0.0033
88	0.0042	0.0009	0.0033
89	0.0042	0.0009	0.0033
90	0.0043	0.0009	0.0034
91	0.0043	0.0009	0.0034
92	0.0043	0.0009	0.0034
93	0.0043	0.0009	0.0034
94	0.0044	0.0009	0.0034
95	0.0044	0.0009	0.0035
96	0.0044	0.0009	0.0035
97	0.0045	0.0009	0.0035
98	0.0045	0.0009	0.0035
99	0.0045	0.0010	0.0036
100	0.0045	0.0010	0.0036
101	0.0046	0.0010	0.0036
102	0.0046	0.0010	0.0036
103	0.0046	0.0010	0.0037
104	0.0047	0.0010	0.0037
105	0.0047	0.0010	0.0037
106	0.0047	0.0010	0.0037
107	0.0048	0.0010	0.0038
108	0.0048	0.0010	0.0038
109	0.0048	0.0010	0.0038
110	0.0049	0.0010	0.0038
111	0.0049	0.0010	0.0039
112	0.0049	0.0010	0.0039
113	0.0050	0.0011	0.0039
114	0.0050	0.0011	0.0040
115	0.0051	0.0011	0.0040
116	0.0051	0.0011	0.0040
117	0.0052	0.0011	0.0041
118	0.0052	0.0011	0.0041
119	0.0052	0.0011	0.0041
120	0.0053	0.0011	0.0042
121	0.0053	0.0011	0.0042

122	0.0054	0.0011	0.0042
123	0.0054	0.0011	0.0043
124	0.0055	0.0012	0.0043
125	0.0055	0.0012	0.0044
126	0.0056	0.0012	0.0044
127	0.0056	0.0012	0.0044
128	0.0057	0.0012	0.0045
129	0.0057	0.0012	0.0045
130	0.0058	0.0012	0.0045
131	0.0058	0.0012	0.0046
132	0.0059	0.0012	0.0046
133	0.0060	0.0013	0.0047
134	0.0060	0.0013	0.0047
135	0.0061	0.0013	0.0048
136	0.0061	0.0013	0.0048
137	0.0062	0.0013	0.0049
138	0.0063	0.0013	0.0049
139	0.0064	0.0013	0.0050
140	0.0064	0.0014	0.0051
141	0.0065	0.0014	0.0051
142	0.0066	0.0014	0.0052
143	0.0067	0.0014	0.0053
144	0.0067	0.0014	0.0053
145	0.0074	0.0016	0.0058
146	0.0074	0.0016	0.0059
147	0.0076	0.0016	0.0060
148	0.0076	0.0016	0.0060
149	0.0078	0.0016	0.0061
150	0.0078	0.0017	0.0062
151	0.0080	0.0017	0.0063
152	0.0081	0.0017	0.0064
153	0.0082	0.0017	0.0065
154	0.0083	0.0018	0.0065
155	0.0085	0.0018	0.0067
156	0.0086	0.0018	0.0067
157	0.0087	0.0018	0.0069
158	0.0088	0.0019	0.0070
159	0.0090	0.0019	0.0071
160	0.0091	0.0019	0.0072
161	0.0094	0.0020	0.0074
162	0.0095	0.0020	0.0075
163	0.0097	0.0021	0.0077
164	0.0099	0.0021	0.0078
165	0.0101	0.0021	0.0080
166	0.0103	0.0022	0.0081
167	0.0106	0.0022	0.0084
168	0.0108	0.0023	0.0085
169	0.0111	0.0023	0.0088
170	0.0113	0.0024	0.0089
171	0.0117	0.0025	0.0092
172	0.0119	0.0025	0.0094
173	0.0124	0.0026	0.0098
174	0.0126	0.0027	0.0100
175	0.0132	0.0028	0.0104
176	0.0135	0.0028	0.0106
177	0.0142	0.0030	0.0112
178	0.0145	0.0031	0.0115
179	0.0153	0.0032	0.0121
180	0.0158	0.0033	0.0125
181	0.0168	0.0035	0.0133
182	0.0174	0.0037	0.0137

183	0.0188	0.0040	0.0148
184	0.0196	0.0041	0.0154
185	0.0156	0.0033	0.0123
186	0.0166	0.0035	0.0131
187	0.0192	0.0041	0.0152
188	0.0210	0.0044	0.0166
189	0.0261	0.0055	0.0206
190	0.0301	0.0064	0.0237
191	0.0457	0.0096	0.0360
192	0.0663	0.0097	0.0566
193	0.2867	0.0097	0.2770
194	0.0359	0.0076	0.0283
195	0.0232	0.0049	0.0183
196	0.0178	0.0038	0.0140
197	0.0205	0.0043	0.0161
198	0.0181	0.0038	0.0142
199	0.0163	0.0034	0.0128
200	0.0149	0.0031	0.0118
201	0.0138	0.0029	0.0109
202	0.0129	0.0027	0.0102
203	0.0122	0.0026	0.0096
204	0.0115	0.0024	0.0091
205	0.0109	0.0023	0.0086
206	0.0104	0.0022	0.0082
207	0.0100	0.0021	0.0079
208	0.0096	0.0020	0.0076
209	0.0093	0.0020	0.0073
210	0.0089	0.0019	0.0070
211	0.0086	0.0018	0.0068
212	0.0084	0.0018	0.0066
213	0.0081	0.0017	0.0064
214	0.0079	0.0017	0.0062
215	0.0077	0.0016	0.0061
216	0.0075	0.0016	0.0059
217	0.0068	0.0014	0.0054
218	0.0066	0.0014	0.0052
219	0.0065	0.0014	0.0051
220	0.0063	0.0013	0.0050
221	0.0062	0.0013	0.0049
222	0.0060	0.0013	0.0048
223	0.0059	0.0012	0.0047
224	0.0058	0.0012	0.0046
225	0.0057	0.0012	0.0045
226	0.0056	0.0012	0.0044
227	0.0055	0.0012	0.0043
228	0.0054	0.0011	0.0043
229	0.0053	0.0011	0.0042
230	0.0052	0.0011	0.0041
231	0.0051	0.0011	0.0040
232	0.0050	0.0011	0.0040
233	0.0050	0.0010	0.0039
234	0.0049	0.0010	0.0039
235	0.0048	0.0010	0.0038
236	0.0048	0.0010	0.0037
237	0.0047	0.0010	0.0037
238	0.0046	0.0010	0.0036
239	0.0046	0.0010	0.0036
240	0.0045	0.0009	0.0035
241	0.0044	0.0009	0.0035
242	0.0044	0.0009	0.0035
243	0.0043	0.0009	0.0034

244	0.0043	0.0009	0.0034
245	0.0042	0.0009	0.0033
246	0.0042	0.0009	0.0033
247	0.0041	0.0009	0.0033
248	0.0041	0.0009	0.0032
249	0.0040	0.0009	0.0032
250	0.0040	0.0008	0.0032
251	0.0040	0.0008	0.0031
252	0.0039	0.0008	0.0031
253	0.0039	0.0008	0.0031
254	0.0038	0.0008	0.0030
255	0.0038	0.0008	0.0030
256	0.0038	0.0008	0.0030
257	0.0037	0.0008	0.0029
258	0.0037	0.0008	0.0029
259	0.0037	0.0008	0.0029
260	0.0036	0.0008	0.0029
261	0.0036	0.0008	0.0028
262	0.0036	0.0008	0.0028
263	0.0035	0.0007	0.0028
264	0.0035	0.0007	0.0028
265	0.0035	0.0007	0.0027
266	0.0034	0.0007	0.0027
267	0.0034	0.0007	0.0027
268	0.0034	0.0007	0.0027
269	0.0034	0.0007	0.0026
270	0.0033	0.0007	0.0026
271	0.0033	0.0007	0.0026
272	0.0033	0.0007	0.0026
273	0.0032	0.0007	0.0026
274	0.0032	0.0007	0.0025
275	0.0032	0.0007	0.0025
276	0.0032	0.0007	0.0025
277	0.0032	0.0007	0.0025
278	0.0031	0.0007	0.0025
279	0.0031	0.0007	0.0025
280	0.0031	0.0007	0.0024
281	0.0031	0.0006	0.0024
282	0.0030	0.0006	0.0024
283	0.0030	0.0006	0.0024
284	0.0030	0.0006	0.0024
285	0.0030	0.0006	0.0024
286	0.0030	0.0006	0.0023
287	0.0029	0.0006	0.0023
288	0.0029	0.0006	0.0023

Total soil rain loss = 0.40(In)
Total effective rainfall = 1.77(In)
Peak flow rate in flood hydrograph = 34.91(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

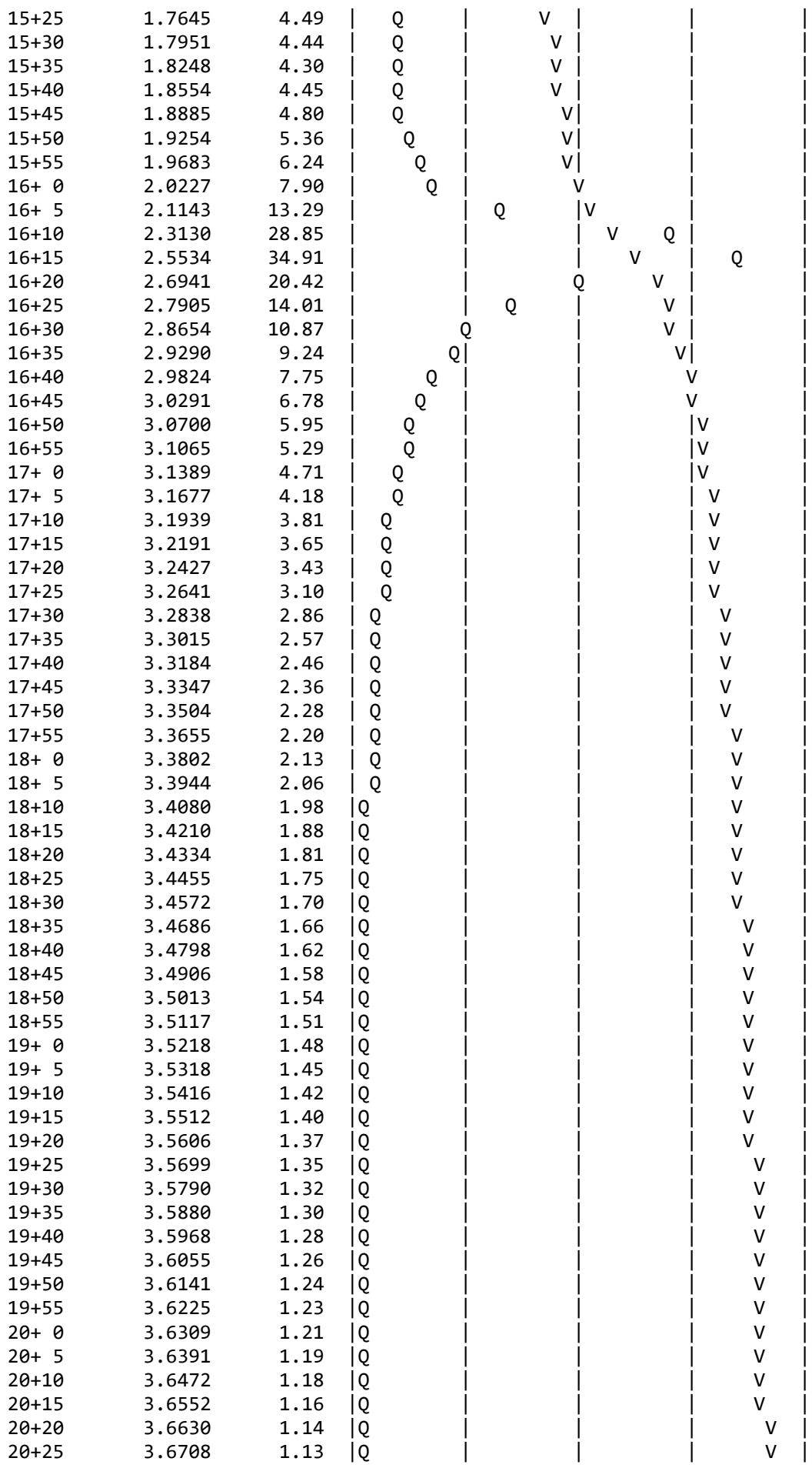
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0002	0.03	Q	|	|	|	|

0+10	0.0015	0.19	Q	|	|	|	|
0+15	0.0043	0.42	Q	|	|	|	|
0+20	0.0080	0.53	Q	|	|	|	|
0+25	0.0120	0.59	Q	|	|	|	|
0+30	0.0164	0.63	Q	|	|	|	|
0+35	0.0210	0.67	Q	|	|	|	|
0+40	0.0257	0.69	Q	|	|	|	|
0+45	0.0306	0.71	Q	|	|	|	|
0+50	0.0355	0.72	Q	|	|	|	|
0+55	0.0406	0.73	Q	|	|	|	|
1+ 0	0.0457	0.74	Q	|	|	|	|
1+ 5	0.0509	0.75	Q	|	|	|	|
1+10	0.0561	0.76	Q	|	|	|	|
1+15	0.0614	0.77	Q	|	|	|	|
1+20	0.0667	0.77	Q	|	|	|	|
1+25	0.0721	0.78	Q	|	|	|	|
1+30	0.0774	0.78	Q	|	|	|	|
1+35	0.0828	0.78	Q	|	|	|	|
1+40	0.0883	0.79	Q	|	|	|	|
1+45	0.0937	0.79	Q	|	|	|	|
1+50	0.0991	0.79	QV	|	|	|	|
1+55	0.1046	0.79	QV	|	|	|	|
2+ 0	0.1101	0.80	QV	|	|	|	|
2+ 5	0.1156	0.80	QV	|	|	|	|
2+10	0.1211	0.80	QV	|	|	|	|
2+15	0.1267	0.81	QV	|	|	|	|
2+20	0.1323	0.81	QV	|	|	|	|
2+25	0.1378	0.81	QV	|	|	|	|
2+30	0.1435	0.81	QV	|	|	|	|
2+35	0.1491	0.82	QV	|	|	|	|
2+40	0.1547	0.82	QV	|	|	|	|
2+45	0.1604	0.82	QV	|	|	|	|
2+50	0.1661	0.83	QV	|	|	|	|
2+55	0.1718	0.83	QV	|	|	|	|
3+ 0	0.1776	0.83	QV	|	|	|	|
3+ 5	0.1833	0.84	QV	|	|	|	|
3+10	0.1891	0.84	QV	|	|	|	|
3+15	0.1949	0.84	QV	|	|	|	|
3+20	0.2008	0.85	Q V	|	|	|	|
3+25	0.2066	0.85	Q V	|	|	|	|
3+30	0.2125	0.85	Q V	|	|	|	|
3+35	0.2184	0.86	Q V	|	|	|	|
3+40	0.2243	0.86	Q V	|	|	|	|
3+45	0.2303	0.86	Q V	|	|	|	|
3+50	0.2362	0.87	Q V	|	|	|	|
3+55	0.2422	0.87	Q V	|	|	|	|
4+ 0	0.2482	0.87	Q V	|	|	|	|
4+ 5	0.2543	0.88	Q V	|	|	|	|
4+10	0.2604	0.88	Q V	|	|	|	|
4+15	0.2665	0.89	Q V	|	|	|	|
4+20	0.2726	0.89	Q V	|	|	|	|
4+25	0.2787	0.89	Q V	|	|	|	|
4+30	0.2849	0.90	Q V	|	|	|	|
4+35	0.2911	0.90	Q V	|	|	|	|
4+40	0.2973	0.90	Q V	|	|	|	|
4+45	0.3036	0.91	Q V	|	|	|	|
4+50	0.3099	0.91	Q V	|	|	|	|
4+55	0.3162	0.92	Q V	|	|	|	|
5+ 0	0.3225	0.92	Q V	|	|	|	|
5+ 5	0.3289	0.93	Q V	|	|	|	|
5+10	0.3353	0.93	Q V	|	|	|	|

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 5+15       0.3417      0.93  Q  V      |          |          |          |
 5+20       0.3482      0.94  Q  V      |          |          |          |
 5+25       0.3547      0.94  Q  V      |          |          |          |
 5+30       0.3612      0.95  Q  V      |          |          |          |
 5+35       0.3678      0.95  Q  V      |          |          |          |
 5+40       0.3744      0.96  Q  V      |          |          |          |
 5+45       0.3810      0.96  Q  V      |          |          |          |
 5+50       0.3876      0.97  Q  V      |          |          |          |
 5+55       0.3943      0.97  Q  V      |          |          |          |
 6+ 0       0.4010      0.97  Q   V     |          |          |          |
 6+ 5       0.4078      0.98  Q   V     |          |          |          |
 6+10       0.4145      0.98  Q   V     |          |          |          |
 6+15       0.4214      0.99  Q   V     |          |          |          |
 6+20       0.4282      0.99  Q   V     |          |          |          |
 6+25       0.4351      1.00  Q   V     |          |          |          |
 6+30       0.4420      1.00  |Q  V     |          |          |          |
 6+35       0.4490      1.01  |Q  V     |          |          |          |
 6+40       0.4560      1.02  |Q  V     |          |          |          |
 6+45       0.4630      1.02  |Q  V     |          |          |          |
 6+50       0.4701      1.03  |Q  V     |          |          |          |
 6+55       0.4772      1.03  |Q  V     |          |          |          |
 7+ 0       0.4843      1.04  |Q  V     |          |          |          |
 7+ 5       0.4915      1.04  |Q  V     |          |          |          |
 7+10       0.4987      1.05  |Q   V    |          |          |          |
 7+15       0.5060      1.06  |Q   V    |          |          |          |
 7+20       0.5133      1.06  |Q   V    |          |          |          |
 7+25       0.5207      1.07  |Q   V    |          |          |          |
 7+30       0.5280      1.07  |Q   V    |          |          |          |
 7+35       0.5355      1.08  |Q   V    |          |          |          |
 7+40       0.5430      1.09  |Q   V    |          |          |          |
 7+45       0.5505      1.09  |Q   V    |          |          |          |
 7+50       0.5581      1.10  |Q   V    |          |          |          |
 7+55       0.5657      1.11  |Q   V    |          |          |          |
 8+ 0       0.5733      1.11  |Q   V    |          |          |          |
 8+ 5       0.5810      1.12  |Q   V    |          |          |          |
 8+10       0.5888      1.13  |Q   V    |          |          |          |
 8+15       0.5966      1.13  |Q    V   |          |          |          |
 8+20       0.6045      1.14  |Q    V   |          |          |          |
 8+25       0.6124      1.15  |Q    V   |          |          |          |
 8+30       0.6203      1.16  |Q    V   |          |          |          |
 8+35       0.6283      1.16  |Q    V   |          |          |          |
 8+40       0.6364      1.17  |Q    V   |          |          |          |
 8+45       0.6445      1.18  |Q    V   |          |          |          |
 8+50       0.6527      1.19  |Q    V   |          |          |          |
 8+55       0.6609      1.20  |Q    V   |          |          |          |
 9+ 0       0.6692      1.20  |Q    V   |          |          |          |
 9+ 5       0.6776      1.21  |Q    V   |          |          |          |
 9+10       0.6860      1.22  |Q    V   |          |          |          |
 9+15       0.6944      1.23  |Q     V  |          |          |          |
 9+20       0.7030      1.24  |Q     V  |          |          |          |
 9+25       0.7116      1.25  |Q     V  |          |          |          |
 9+30       0.7202      1.26  |Q     V  |          |          |          |
 9+35       0.7289      1.27  |Q     V  |          |          |          |
 9+40       0.7377      1.28  |Q     V  |          |          |          |
 9+45       0.7466      1.29  |Q     V  |          |          |          |
 9+50       0.7555      1.30  |Q     V  |          |          |          |
 9+55       0.7645      1.31  |Q     V  |          |          |          |
10+ 0       0.7736      1.32  |Q     V  |          |          |          |
10+ 5       0.7827      1.33  |Q     V  |          |          |          |
10+10       0.7919      1.34  |Q      V |          |          |          |
10+15       0.8012      1.35  |Q      V |          |          |          |
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10+20       0.8106      1.36  |Q      V |          |          |          |
10+25       0.8201      1.37  |Q      V |          |          |          |
10+30       0.8296      1.39  |Q      V |          |          |          |
10+35       0.8392      1.40  |Q      V |          |          |          |
10+40       0.8489      1.41  |Q      V |          |          |          |
10+45       0.8587      1.42  |Q      V |          |          |          |
10+50       0.8686      1.44  |Q      V |          |          |          |
10+55       0.8786      1.45  |Q      V |          |          |          |
11+ 0       0.8887      1.46  |Q      V |          |          |          |
11+ 5       0.8989      1.48  |Q       V|          |          |          |
11+10       0.9092      1.49  |Q       V|          |          |          |
11+15       0.9196      1.51  |Q       V|          |          |          |
11+20       0.9300      1.52  |Q       V|          |          |          |
11+25       0.9406      1.54  |Q       V|          |          |          |
11+30       0.9514      1.56  |Q       V|          |          |          |
11+35       0.9622      1.57  |Q       V|          |          |          |
11+40       0.9731      1.59  |Q       V|          |          |          |
11+45       0.9842      1.61  |Q       V|          |          |          |
11+50       0.9954      1.63  |Q        V          |          |          |
11+55       1.0067      1.64  |Q        V          |          |          |
12+ 0       1.0182      1.66  |Q        V          |          |          |
12+ 5       1.0298      1.69  |Q        V          |          |          |
12+10       1.0418      1.74  |Q        V          |          |          |
12+15       1.0542      1.80  |Q        V          |          |          |
12+20       1.0669      1.84  |Q        V          |          |          |
12+25       1.0798      1.88  |Q        V          |          |          |
12+30       1.0929      1.91  |Q        |V          |          |          |
12+35       1.1063      1.94  |Q        |V          |          |          |
12+40       1.1199      1.97  |Q        |V          |          |          |
12+45       1.1336      2.00  |Q        |V          |          |          |
12+50       1.1476      2.03  | Q       |V          |          |          |
12+55       1.1618      2.06  | Q       |V          |          |          |
13+ 0       1.1762      2.09  | Q       |V          |          |          |
13+ 5       1.1908      2.12  | Q       | V         |          |          |
13+10       1.2057      2.16  | Q       | V         |          |          |
13+15       1.2208      2.19  | Q       | V         |          |          |
13+20       1.2362      2.23  | Q       | V         |          |          |
13+25       1.2518      2.27  | Q       | V         |          |          |
13+30       1.2676      2.31  | Q       | V         |          |          |
13+35       1.2838      2.35  | Q       | V         |          |          |
13+40       1.3003      2.39  | Q       |  V        |          |          |
13+45       1.3170      2.43  | Q       |  V        |          |          |
13+50       1.3341      2.48  | Q       |  V        |          |          |
13+55       1.3516      2.53  | Q       |  V        |          |          |
14+ 0       1.3694      2.58  | Q       |  V        |          |          |
14+ 5       1.3876      2.64  | Q       |   V       |          |          |
14+10       1.4062      2.70  | Q       |   V       |          |          |
14+15       1.4252      2.77  | Q       |   V       |          |          |
14+20       1.4448      2.84  | Q       |   V       |          |          |
14+25       1.4648      2.91  | Q       |   V       |          |          |
14+30       1.4854      2.99  | Q       |    V      |          |          |
14+35       1.5065      3.07  |  Q      |    V      |          |          |
14+40       1.5283      3.16  |  Q      |    V      |          |          |
14+45       1.5508      3.26  |  Q      |    V      |          |          |
14+50       1.5739      3.37  |  Q      |    V      |          |          |
14+55       1.5980      3.49  |  Q      |     V     |          |          |
15+ 0       1.6228      3.61  |  Q      |     V     |          |          |
15+ 5       1.6487      3.76  |  Q      |     V     |          |          |
15+10       1.6757      3.92  |  Q      |     V     |          |          |
15+15       1.7039      4.10  |   Q     |      V    |          |          |
15+20       1.7336      4.31  |   Q     |      V    |          |          |
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20+30	3.6785	1.12	|Q	|	|	|	V |
20+35	3.6861	1.10	|Q	|	|	|	V |
20+40	3.6936	1.09	|Q	|	|	|	V |
20+45	3.7010	1.08	|Q	|	|	|	V |
20+50	3.7084	1.06	|Q	|	|	|	V |
20+55	3.7156	1.05	|Q	|	|	|	V |
21+ 0	3.7228	1.04	|Q	|	|	|	V |
21+ 5	3.7299	1.03	|Q	|	|	|	V |
21+10	3.7369	1.02	|Q	|	|	|	V |
21+15	3.7438	1.01	|Q	|	|	|	V |
21+20	3.7507	1.00	Q	|	|	|	V |
21+25	3.7575	0.99	Q	|	|	|	V |
21+30	3.7642	0.98	Q	|	|	|	V |
21+35	3.7709	0.97	Q	|	|	|	V |
21+40	3.7775	0.96	Q	|	|	|	V |
21+45	3.7840	0.95	Q	|	|	|	V |
21+50	3.7905	0.94	Q	|	|	|	V |
21+55	3.7969	0.93	Q	|	|	|	V |
22+ 0	3.8033	0.92	Q	|	|	|	V |
22+ 5	3.8096	0.91	Q	|	|	|	V |
22+10	3.8158	0.91	Q	|	|	|	V |
22+15	3.8220	0.90	Q	|	|	|	V |
22+20	3.8281	0.89	Q	|	|	|	V |
22+25	3.8342	0.88	Q	|	|	|	V |
22+30	3.8402	0.88	Q	|	|	|	V |
22+35	3.8462	0.87	Q	|	|	|	V |
22+40	3.8522	0.86	Q	|	|	|	V |
22+45	3.8580	0.85	Q	|	|	|	V |
22+50	3.8639	0.85	Q	|	|	|	V|
22+55	3.8697	0.84	Q	|	|	|	V|
23+ 0	3.8754	0.83	Q	|	|	|	V|
23+ 5	3.8811	0.83	Q	|	|	|	V|
23+10	3.8868	0.82	Q	|	|	|	V|
23+15	3.8924	0.82	Q	|	|	|	V|
23+20	3.8980	0.81	Q	|	|	|	V|
23+25	3.9035	0.80	Q	|	|	|	V|
23+30	3.9090	0.80	Q	|	|	|	V|
23+35	3.9145	0.79	Q	|	|	|	V|
23+40	3.9199	0.79	Q	|	|	|	V|
23+45	3.9253	0.78	Q	|	|	|	V|
23+50	3.9307	0.78	Q	|	|	|	V|
23+55	3.9360	0.77	Q	|	|	|	V|
24+ 0	3.9412	0.77	Q	|	|	|	V|

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

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Study date 08/09/24

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

Program License Serial Number 6277

JOB NO 2021-181
WATSON APPLEY VALLEY 145
10 YEAR UNIT HYDROGRAPH
POST, AREA B

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
8.88	1	0.60
Rainfall data for year 2		
8.88	6	0.76
Rainfall data for year 2		
8.88	24	1.30
Rainfall data for year 100		
8.88	1	1.08
Rainfall data for year 100		
8.88	6	2.01
Rainfall data for year 100		
8.88	24	3.42

++

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

```
SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      32.0          8.88      1.000     0.978    0.436    0.426

Area-averaged adjusted loss rate Fm (In/Hr) =  0.426

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     3.87   0.436         32.0      32.0      10.86     0.000
     5.01   0.564         98.0      98.0       0.20     0.895

Area-averaged catchment yield fraction, Y =  0.505
Area-averaged low loss fraction, Yb =  0.495
User entry of time of concentration  =   0.250 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       8.88(Ac.)
Catchment Lag time =   0.200 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 41.6667
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.426(In/Hr)
Average low loss rate fraction (Yb) = 0.495 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.287(In)
Computed peak 30-minute rainfall =  0.491(In)
Specified peak 1-hour rainfall =  0.605(In)
Computed peak 3-hour rainfall =  0.955(In)
Specified peak 6-hour rainfall =  1.273(In)
Specified peak 24-hour rainfall =  2.172(In)


Rainfall depth area reduction factors:
Using a total area of       8.88(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.287(In)
30-minute factor = 1.000    Adjusted rainfall =  0.491(In)
1-hour factor = 1.000       Adjusted rainfall =  0.605(In)
3-hour factor = 1.000       Adjusted rainfall =  0.955(In)
6-hour factor = 1.000       Adjusted rainfall =  1.273(In)
24-hour factor = 1.000      Adjusted rainfall =  2.172(In)
----------------------------------------------------------------------

                      U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
----------------------------------------------------------------------
               (K =       107.39 (CFS))

  1                2.935                   3.152
  2               20.613                  18.985
  3               51.467                  33.134
  4               67.222                  16.920
  5               76.108                   9.544
  6               81.970                   6.295
  7               86.247                   4.593
  8               89.430                   3.419
```

9	91.773	2.517
10	93.683	2.051
11	95.168	1.595
12	96.358	1.278
13	97.275	0.984
14	97.918	0.691
15	98.357	0.471
16	98.850	0.530
17	99.345	0.532
18	99.682	0.362
19	100.000	0.341

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2870	0.2870
2	0.3533	0.0663
3	0.3990	0.0457
4	0.4349	0.0360
5	0.4651	0.0301
6	0.4912	0.0261
7	0.5145	0.0232
8	0.5355	0.0210
9	0.5547	0.0193
10	0.5726	0.0178
11	0.5892	0.0166
12	0.6047	0.0156
13	0.6252	0.0205
14	0.6448	0.0196
15	0.6635	0.0188
16	0.6815	0.0180
17	0.6989	0.0174
18	0.7157	0.0168
19	0.7320	0.0163
20	0.7478	0.0158
21	0.7631	0.0153
22	0.7780	0.0149
23	0.7925	0.0145
24	0.8066	0.0141
25	0.8204	0.0138
26	0.8339	0.0135
27	0.8471	0.0132
28	0.8600	0.0129
29	0.8726	0.0126
30	0.8850	0.0124
31	0.8971	0.0121
32	0.9090	0.0119
33	0.9207	0.0117
34	0.9322	0.0115
35	0.9435	0.0113
36	0.9546	0.0111
37	0.9656	0.0109
38	0.9763	0.0108
39	0.9869	0.0106
40	0.9973	0.0104
41	1.0076	0.0103
42	1.0177	0.0101
43	1.0277	0.0100
44	1.0376	0.0099
45	1.0473	0.0097
46	1.0569	0.0096
47	1.0664	0.0095

48	1.0758	0.0094
49	1.0850	0.0093
50	1.0942	0.0091
51	1.1032	0.0090
52	1.1121	0.0089
53	1.1210	0.0088
54	1.1297	0.0087
55	1.1383	0.0086
56	1.1469	0.0085
57	1.1554	0.0085
58	1.1637	0.0084
59	1.1720	0.0083
60	1.1802	0.0082
61	1.1884	0.0081
62	1.1964	0.0081
63	1.2044	0.0080
64	1.2123	0.0079
65	1.2201	0.0078
66	1.2279	0.0078
67	1.2356	0.0077
68	1.2432	0.0076
69	1.2507	0.0076
70	1.2582	0.0075
71	1.2657	0.0074
72	1.2730	0.0074
73	1.2798	0.0068
74	1.2866	0.0067
75	1.2932	0.0067
76	1.2999	0.0066
77	1.3064	0.0066
78	1.3129	0.0065
79	1.3194	0.0065
80	1.3258	0.0064
81	1.3322	0.0064
82	1.3385	0.0063
83	1.3448	0.0063
84	1.3510	0.0062
85	1.3572	0.0062
86	1.3633	0.0061
87	1.3694	0.0061
88	1.3754	0.0060
89	1.3814	0.0060
90	1.3874	0.0060
91	1.3933	0.0059
92	1.3992	0.0059
93	1.4050	0.0058
94	1.4108	0.0058
95	1.4166	0.0058
96	1.4223	0.0057
97	1.4280	0.0057
98	1.4337	0.0057
99	1.4393	0.0056
100	1.4449	0.0056
101	1.4504	0.0056
102	1.4560	0.0055
103	1.4614	0.0055
104	1.4669	0.0055
105	1.4723	0.0054
106	1.4777	0.0054
107	1.4831	0.0054
108	1.4884	0.0053

109	1.4937	0.0053
110	1.4989	0.0053
111	1.5042	0.0052
112	1.5094	0.0052
113	1.5146	0.0052
114	1.5197	0.0052
115	1.5248	0.0051
116	1.5299	0.0051
117	1.5350	0.0051
118	1.5401	0.0050
119	1.5451	0.0050
120	1.5501	0.0050
121	1.5550	0.0050
122	1.5600	0.0049
123	1.5649	0.0049
124	1.5698	0.0049
125	1.5746	0.0049
126	1.5795	0.0048
127	1.5843	0.0048
128	1.5891	0.0048
129	1.5939	0.0048
130	1.5986	0.0048
131	1.6034	0.0047
132	1.6081	0.0047
133	1.6128	0.0047
134	1.6174	0.0047
135	1.6221	0.0046
136	1.6267	0.0046
137	1.6313	0.0046
138	1.6359	0.0046
139	1.6404	0.0046
140	1.6450	0.0045
141	1.6495	0.0045
142	1.6540	0.0045
143	1.6584	0.0045
144	1.6629	0.0045
145	1.6673	0.0044
146	1.6718	0.0044
147	1.6762	0.0044
148	1.6806	0.0044
149	1.6849	0.0044
150	1.6893	0.0043
151	1.6936	0.0043
152	1.6979	0.0043
153	1.7022	0.0043
154	1.7065	0.0043
155	1.7108	0.0043
156	1.7150	0.0042
157	1.7192	0.0042
158	1.7235	0.0042
159	1.7276	0.0042
160	1.7318	0.0042
161	1.7360	0.0042
162	1.7401	0.0041
163	1.7443	0.0041
164	1.7484	0.0041
165	1.7525	0.0041
166	1.7566	0.0041
167	1.7606	0.0041
168	1.7647	0.0041
169	1.7687	0.0040

170	1.7728	0.0040
171	1.7768	0.0040
172	1.7808	0.0040
173	1.7848	0.0040
174	1.7887	0.0040
175	1.7927	0.0040
176	1.7966	0.0039
177	1.8006	0.0039
178	1.8045	0.0039
179	1.8084	0.0039
180	1.8123	0.0039
181	1.8161	0.0039
182	1.8200	0.0039
183	1.8238	0.0038
184	1.8277	0.0038
185	1.8315	0.0038
186	1.8353	0.0038
187	1.8391	0.0038
188	1.8429	0.0038
189	1.8467	0.0038
190	1.8504	0.0038
191	1.8542	0.0037
192	1.8579	0.0037
193	1.8616	0.0037
194	1.8653	0.0037
195	1.8690	0.0037
196	1.8727	0.0037
197	1.8764	0.0037
198	1.8801	0.0037
199	1.8837	0.0037
200	1.8874	0.0036
201	1.8910	0.0036
202	1.8946	0.0036
203	1.8982	0.0036
204	1.9018	0.0036
205	1.9054	0.0036
206	1.9090	0.0036
207	1.9126	0.0036
208	1.9161	0.0036
209	1.9197	0.0035
210	1.9232	0.0035
211	1.9267	0.0035
212	1.9302	0.0035
213	1.9337	0.0035
214	1.9372	0.0035
215	1.9407	0.0035
216	1.9442	0.0035
217	1.9477	0.0035
218	1.9511	0.0035
219	1.9545	0.0034
220	1.9580	0.0034
221	1.9614	0.0034
222	1.9648	0.0034
223	1.9682	0.0034
224	1.9716	0.0034
225	1.9750	0.0034
226	1.9784	0.0034
227	1.9818	0.0034
228	1.9851	0.0034
229	1.9885	0.0034
230	1.9918	0.0033

231	1.9952	0.0033	
232	1.9985	0.0033	
233	2.0018	0.0033	
234	2.0051	0.0033	
235	2.0084	0.0033	
236	2.0117	0.0033	
237	2.0150	0.0033	
238	2.0182	0.0033	
239	2.0215	0.0033	
240	2.0248	0.0033	
241	2.0280	0.0032	
242	2.0312	0.0032	
243	2.0345	0.0032	
244	2.0377	0.0032	
245	2.0409	0.0032	
246	2.0441	0.0032	
247	2.0473	0.0032	
248	2.0505	0.0032	
249	2.0537	0.0032	
250	2.0569	0.0032	
251	2.0600	0.0032	
252	2.0632	0.0032	
253	2.0663	0.0032	
254	2.0695	0.0031	
255	2.0726	0.0031	
256	2.0758	0.0031	
257	2.0789	0.0031	
258	2.0820	0.0031	
259	2.0851	0.0031	
260	2.0882	0.0031	
261	2.0913	0.0031	
262	2.0944	0.0031	
263	2.0975	0.0031	
264	2.1005	0.0031	
265	2.1036	0.0031	
266	2.1066	0.0031	
267	2.1097	0.0030	
268	2.1127	0.0030	
269	2.1158	0.0030	
270	2.1188	0.0030	
271	2.1218	0.0030	
272	2.1248	0.0030	
273	2.1278	0.0030	
274	2.1308	0.0030	
275	2.1338	0.0030	
276	2.1368	0.0030	
277	2.1398	0.0030	
278	2.1428	0.0030	
279	2.1457	0.0030	
280	2.1487	0.0030	
281	2.1517	0.0030	
282	2.1546	0.0029	
283	2.1575	0.0029	
284	2.1605	0.0029	
285	2.1634	0.0029	
286	2.1663	0.0029	
287	2.1693	0.0029	
288	2.1722	0.0029	

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0029	0.0014	0.0015
2	0.0029	0.0014	0.0015
3	0.0029	0.0014	0.0015
4	0.0029	0.0015	0.0015
5	0.0029	0.0015	0.0015
6	0.0030	0.0015	0.0015
7	0.0030	0.0015	0.0015
8	0.0030	0.0015	0.0015
9	0.0030	0.0015	0.0015
10	0.0030	0.0015	0.0015
11	0.0030	0.0015	0.0015
12	0.0030	0.0015	0.0015
13	0.0030	0.0015	0.0015
14	0.0030	0.0015	0.0015
15	0.0030	0.0015	0.0015
16	0.0031	0.0015	0.0015
17	0.0031	0.0015	0.0016
18	0.0031	0.0015	0.0016
19	0.0031	0.0015	0.0016
20	0.0031	0.0015	0.0016
21	0.0031	0.0015	0.0016
22	0.0031	0.0015	0.0016
23	0.0031	0.0016	0.0016
24	0.0031	0.0016	0.0016
25	0.0032	0.0016	0.0016
26	0.0032	0.0016	0.0016
27	0.0032	0.0016	0.0016
28	0.0032	0.0016	0.0016
29	0.0032	0.0016	0.0016
30	0.0032	0.0016	0.0016
31	0.0032	0.0016	0.0016
32	0.0032	0.0016	0.0016
33	0.0033	0.0016	0.0016
34	0.0033	0.0016	0.0016
35	0.0033	0.0016	0.0017
36	0.0033	0.0016	0.0017
37	0.0033	0.0016	0.0017
38	0.0033	0.0016	0.0017
39	0.0033	0.0016	0.0017
40	0.0033	0.0017	0.0017
41	0.0034	0.0017	0.0017
42	0.0034	0.0017	0.0017
43	0.0034	0.0017	0.0017
44	0.0034	0.0017	0.0017
45	0.0034	0.0017	0.0017
46	0.0034	0.0017	0.0017
47	0.0034	0.0017	0.0017
48	0.0035	0.0017	0.0017
49	0.0035	0.0017	0.0018
50	0.0035	0.0017	0.0018
51	0.0035	0.0017	0.0018
52	0.0035	0.0017	0.0018
53	0.0035	0.0017	0.0018
54	0.0035	0.0018	0.0018
55	0.0036	0.0018	0.0018
56	0.0036	0.0018	0.0018
57	0.0036	0.0018	0.0018
58	0.0036	0.0018	0.0018
59	0.0036	0.0018	0.0018

60	0.0036	0.0018	0.0018
61	0.0037	0.0018	0.0019
62	0.0037	0.0018	0.0019
63	0.0037	0.0018	0.0019
64	0.0037	0.0018	0.0019
65	0.0037	0.0018	0.0019
66	0.0037	0.0019	0.0019
67	0.0038	0.0019	0.0019
68	0.0038	0.0019	0.0019
69	0.0038	0.0019	0.0019
70	0.0038	0.0019	0.0019
71	0.0038	0.0019	0.0019
72	0.0039	0.0019	0.0019
73	0.0039	0.0019	0.0020
74	0.0039	0.0019	0.0020
75	0.0039	0.0019	0.0020
76	0.0039	0.0020	0.0020
77	0.0040	0.0020	0.0020
78	0.0040	0.0020	0.0020
79	0.0040	0.0020	0.0020
80	0.0040	0.0020	0.0020
81	0.0041	0.0020	0.0020
82	0.0041	0.0020	0.0021
83	0.0041	0.0020	0.0021
84	0.0041	0.0020	0.0021
85	0.0041	0.0021	0.0021
86	0.0042	0.0021	0.0021
87	0.0042	0.0021	0.0021
88	0.0042	0.0021	0.0021
89	0.0042	0.0021	0.0021
90	0.0043	0.0021	0.0022
91	0.0043	0.0021	0.0022
92	0.0043	0.0021	0.0022
93	0.0043	0.0022	0.0022
94	0.0044	0.0022	0.0022
95	0.0044	0.0022	0.0022
96	0.0044	0.0022	0.0022
97	0.0045	0.0022	0.0023
98	0.0045	0.0022	0.0023
99	0.0045	0.0022	0.0023
100	0.0045	0.0022	0.0023
101	0.0046	0.0023	0.0023
102	0.0046	0.0023	0.0023
103	0.0046	0.0023	0.0023
104	0.0047	0.0023	0.0024
105	0.0047	0.0023	0.0024
106	0.0047	0.0023	0.0024
107	0.0048	0.0024	0.0024
108	0.0048	0.0024	0.0024
109	0.0048	0.0024	0.0024
110	0.0049	0.0024	0.0025
111	0.0049	0.0024	0.0025
112	0.0049	0.0024	0.0025
113	0.0050	0.0025	0.0025
114	0.0050	0.0025	0.0025
115	0.0051	0.0025	0.0026
116	0.0051	0.0025	0.0026
117	0.0052	0.0025	0.0026
118	0.0052	0.0026	0.0026
119	0.0052	0.0026	0.0026
120	0.0053	0.0026	0.0027

121	0.0053	0.0026	0.0027
122	0.0054	0.0027	0.0027
123	0.0054	0.0027	0.0027
124	0.0055	0.0027	0.0028
125	0.0055	0.0027	0.0028
126	0.0056	0.0027	0.0028
127	0.0056	0.0028	0.0028
128	0.0057	0.0028	0.0029
129	0.0057	0.0028	0.0029
130	0.0058	0.0029	0.0029
131	0.0058	0.0029	0.0030
132	0.0059	0.0029	0.0030
133	0.0060	0.0030	0.0030
134	0.0060	0.0030	0.0030
135	0.0061	0.0030	0.0031
136	0.0061	0.0030	0.0031
137	0.0062	0.0031	0.0031
138	0.0063	0.0031	0.0032
139	0.0064	0.0031	0.0032
140	0.0064	0.0032	0.0032
141	0.0065	0.0032	0.0033
142	0.0066	0.0032	0.0033
143	0.0067	0.0033	0.0034
144	0.0067	0.0033	0.0034
145	0.0074	0.0036	0.0037
146	0.0074	0.0037	0.0038
147	0.0076	0.0037	0.0038
148	0.0076	0.0038	0.0039
149	0.0078	0.0038	0.0039
150	0.0078	0.0039	0.0040
151	0.0080	0.0039	0.0040
152	0.0081	0.0040	0.0041
153	0.0082	0.0041	0.0041
154	0.0083	0.0041	0.0042
155	0.0085	0.0042	0.0043
156	0.0085	0.0042	0.0043
157	0.0087	0.0043	0.0044
158	0.0088	0.0044	0.0045
159	0.0090	0.0045	0.0046
160	0.0091	0.0045	0.0046
161	0.0094	0.0046	0.0047
162	0.0095	0.0047	0.0048
163	0.0097	0.0048	0.0049
164	0.0099	0.0049	0.0050
165	0.0101	0.0050	0.0051
166	0.0103	0.0051	0.0052
167	0.0106	0.0052	0.0053
168	0.0108	0.0053	0.0054
169	0.0111	0.0055	0.0056
170	0.0113	0.0056	0.0057
171	0.0117	0.0058	0.0059
172	0.0119	0.0059	0.0060
173	0.0124	0.0061	0.0063
174	0.0126	0.0063	0.0064
175	0.0132	0.0065	0.0067
176	0.0135	0.0067	0.0068
177	0.0141	0.0070	0.0071
178	0.0145	0.0072	0.0073
179	0.0153	0.0076	0.0077
180	0.0158	0.0078	0.0080
181	0.0168	0.0083	0.0085

182	0.0174	0.0086	0.0088
183	0.0188	0.0093	0.0095
184	0.0196	0.0097	0.0099
185	0.0156	0.0077	0.0079
186	0.0166	0.0082	0.0084
187	0.0193	0.0095	0.0097
188	0.0210	0.0104	0.0106
189	0.0261	0.0129	0.0132
190	0.0301	0.0149	0.0152
191	0.0457	0.0226	0.0231
192	0.0663	0.0328	0.0335
193	0.2870	0.0355	0.2514
194	0.0360	0.0178	0.0182
195	0.0232	0.0115	0.0117
196	0.0178	0.0088	0.0090
197	0.0205	0.0101	0.0103
198	0.0180	0.0089	0.0091
199	0.0163	0.0080	0.0082
200	0.0149	0.0074	0.0075
201	0.0138	0.0068	0.0070
202	0.0129	0.0064	0.0065
203	0.0121	0.0060	0.0061
204	0.0115	0.0057	0.0058
205	0.0109	0.0054	0.0055
206	0.0104	0.0052	0.0053
207	0.0100	0.0049	0.0050
208	0.0096	0.0048	0.0048
209	0.0093	0.0046	0.0047
210	0.0089	0.0044	0.0045
211	0.0086	0.0043	0.0044
212	0.0084	0.0041	0.0042
213	0.0081	0.0040	0.0041
214	0.0079	0.0039	0.0040
215	0.0077	0.0038	0.0039
216	0.0075	0.0037	0.0038
217	0.0068	0.0034	0.0034
218	0.0066	0.0033	0.0033
219	0.0065	0.0032	0.0033
220	0.0063	0.0031	0.0032
221	0.0062	0.0031	0.0031
222	0.0060	0.0030	0.0031
223	0.0059	0.0029	0.0030
224	0.0058	0.0029	0.0029
225	0.0057	0.0028	0.0029
226	0.0056	0.0028	0.0028
227	0.0055	0.0027	0.0028
228	0.0054	0.0027	0.0027
229	0.0053	0.0026	0.0027
230	0.0052	0.0026	0.0026
231	0.0051	0.0025	0.0026
232	0.0050	0.0025	0.0025
233	0.0050	0.0025	0.0025
234	0.0049	0.0024	0.0025
235	0.0048	0.0024	0.0024
236	0.0048	0.0024	0.0024
237	0.0047	0.0023	0.0024
238	0.0046	0.0023	0.0023
239	0.0046	0.0023	0.0023
240	0.0045	0.0022	0.0023
241	0.0044	0.0022	0.0022
242	0.0044	0.0022	0.0022

243	0.0043	0.0021	0.0022
244	0.0043	0.0021	0.0022
245	0.0042	0.0021	0.0021
246	0.0042	0.0021	0.0021
247	0.0041	0.0020	0.0021
248	0.0041	0.0020	0.0021
249	0.0040	0.0020	0.0020
250	0.0040	0.0020	0.0020
251	0.0040	0.0020	0.0020
252	0.0039	0.0019	0.0020
253	0.0039	0.0019	0.0020
254	0.0038	0.0019	0.0019
255	0.0038	0.0019	0.0019
256	0.0038	0.0019	0.0019
257	0.0037	0.0018	0.0019
258	0.0037	0.0018	0.0019
259	0.0037	0.0018	0.0018
260	0.0036	0.0018	0.0018
261	0.0036	0.0018	0.0018
262	0.0036	0.0018	0.0018
263	0.0035	0.0017	0.0018
264	0.0035	0.0017	0.0018
265	0.0035	0.0017	0.0017
266	0.0034	0.0017	0.0017
267	0.0034	0.0017	0.0017
268	0.0034	0.0017	0.0017
269	0.0034	0.0017	0.0017
270	0.0033	0.0016	0.0017
271	0.0033	0.0016	0.0017
272	0.0033	0.0016	0.0017
273	0.0032	0.0016	0.0016
274	0.0032	0.0016	0.0016
275	0.0032	0.0016	0.0016
276	0.0032	0.0016	0.0016
277	0.0032	0.0016	0.0016
278	0.0031	0.0015	0.0016
279	0.0031	0.0015	0.0016
280	0.0031	0.0015	0.0016
281	0.0031	0.0015	0.0015
282	0.0030	0.0015	0.0015
283	0.0030	0.0015	0.0015
284	0.0030	0.0015	0.0015
285	0.0030	0.0015	0.0015
286	0.0030	0.0015	0.0015
287	0.0029	0.0015	0.0015
288	0.0029	0.0014	0.0015

Total soil rain loss = 0.97(In)
Total effective rainfall = 1.20(In)
Peak flow rate in flood hydrograph = 9.79(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

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

0+ 5	0.0000	0.00	Q	|	|	|	|
0+10	0.0003	0.03	Q	|	|	|	|
0+15	0.0008	0.08	Q	|	|	|	|
0+20	0.0015	0.11	Q	|	|	|	|
0+25	0.0024	0.12	Q	|	|	|	|
0+30	0.0033	0.13	Q	|	|	|	|
0+35	0.0042	0.14	Q	|	|	|	|
0+40	0.0052	0.14	Q	|	|	|	|
0+45	0.0062	0.15	Q	|	|	|	|
0+50	0.0073	0.15	Q	|	|	|	|
0+55	0.0083	0.15	Q	|	|	|	|
1+ 0	0.0094	0.16	Q	|	|	|	|
1+ 5	0.0105	0.16	Q	|	|	|	|
1+10	0.0116	0.16	Q	|	|	|	|
1+15	0.0127	0.16	Q	|	|	|	|
1+20	0.0138	0.16	Q	|	|	|	|
1+25	0.0149	0.16	Q	|	|	|	|
1+30	0.0161	0.16	Q	|	|	|	|
1+35	0.0172	0.17	Q	|	|	|	|
1+40	0.0183	0.17	Q	|	|	|	|
1+45	0.0195	0.17	Q	|	|	|	|
1+50	0.0206	0.17	Q	|	|	|	|
1+55	0.0218	0.17	Q	|	|	|	|
2+ 0	0.0230	0.17	QV	|	|	|	|
2+ 5	0.0241	0.17	QV	|	|	|	|
2+10	0.0253	0.17	QV	|	|	|	|
2+15	0.0265	0.17	QV	|	|	|	|
2+20	0.0276	0.17	QV	|	|	|	|
2+25	0.0288	0.17	QV	|	|	|	|
2+30	0.0300	0.17	QV	|	|	|	|
2+35	0.0312	0.17	QV	|	|	|	|
2+40	0.0324	0.17	QV	|	|	|	|
2+45	0.0336	0.17	QV	|	|	|	|
2+50	0.0348	0.17	QV	|	|	|	|
2+55	0.0360	0.18	QV	|	|	|	|
3+ 0	0.0372	0.18	QV	|	|	|	|
3+ 5	0.0384	0.18	QV	|	|	|	|
3+10	0.0397	0.18	QV	|	|	|	|
3+15	0.0409	0.18	QV	|	|	|	|
3+20	0.0421	0.18	QV	|	|	|	|
3+25	0.0434	0.18	QV	|	|	|	|
3+30	0.0446	0.18	Q V	|	|	|	|
3+35	0.0459	0.18	Q V	|	|	|	|
3+40	0.0471	0.18	Q V	|	|	|	|
3+45	0.0484	0.18	Q V	|	|	|	|
3+50	0.0496	0.18	Q V	|	|	|	|
3+55	0.0509	0.18	Q V	|	|	|	|
4+ 0	0.0522	0.18	Q V	|	|	|	|
4+ 5	0.0534	0.19	Q V	|	|	|	|
4+10	0.0547	0.19	Q V	|	|	|	|
4+15	0.0560	0.19	Q V	|	|	|	|
4+20	0.0573	0.19	Q V	|	|	|	|
4+25	0.0586	0.19	Q V	|	|	|	|
4+30	0.0599	0.19	Q V	|	|	|	|
4+35	0.0612	0.19	Q V	|	|	|	|
4+40	0.0625	0.19	Q V	|	|	|	|
4+45	0.0639	0.19	Q V	|	|	|	|
4+50	0.0652	0.19	Q V	|	|	|	|
4+55	0.0665	0.19	Q V	|	|	|	|
5+ 0	0.0679	0.19	Q V	|	|	|	|
5+ 5	0.0692	0.20	Q V	|	|	|	|

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 5+10       0.0706      0.20  Q  V      |          |          |          |
 5+15       0.0719      0.20  Q  V      |          |          |          |
 5+20       0.0733      0.20  Q  V      |          |          |          |
 5+25       0.0747      0.20  Q  V      |          |          |          |
 5+30       0.0760      0.20  Q  V      |          |          |          |
 5+35       0.0774      0.20  Q  V      |          |          |          |
 5+40       0.0788      0.20  Q  V      |          |          |          |
 5+45       0.0802      0.20  Q  V      |          |          |          |
 5+50       0.0816      0.20  Q  V      |          |          |          |
 5+55       0.0830      0.20  Q  V      |          |          |          |
 6+ 0       0.0844      0.21  Q  V      |          |          |          |
 6+ 5       0.0859      0.21  Q  V      |          |          |          |
 6+10       0.0873      0.21  Q  V      |          |          |          |
 6+15       0.0887      0.21  Q  V      |          |          |          |
 6+20       0.0902      0.21  Q   V     |          |          |          |
 6+25       0.0916      0.21  Q   V     |          |          |          |
 6+30       0.0931      0.21  Q   V     |          |          |          |
 6+35       0.0946      0.21  Q   V     |          |          |          |
 6+40       0.0960      0.21  Q   V     |          |          |          |
 6+45       0.0975      0.22  Q   V     |          |          |          |
 6+50       0.0990      0.22  Q   V     |          |          |          |
 6+55       0.1005      0.22  Q   V     |          |          |          |
 7+ 0       0.1020      0.22  Q   V     |          |          |          |
 7+ 5       0.1036      0.22  Q   V     |          |          |          |
 7+10       0.1051      0.22  Q   V     |          |          |          |
 7+15       0.1066      0.22  Q   V     |          |          |          |
 7+20       0.1082      0.22  Q   V     |          |          |          |
 7+25       0.1097      0.23  Q   V     |          |          |          |
 7+30       0.1113      0.23  Q    V    |          |          |          |
 7+35       0.1128      0.23  Q    V    |          |          |          |
 7+40       0.1144      0.23  Q    V    |          |          |          |
 7+45       0.1160      0.23  Q    V    |          |          |          |
 7+50       0.1176      0.23  Q    V    |          |          |          |
 7+55       0.1192      0.23  Q    V    |          |          |          |
 8+ 0       0.1208      0.23  Q    V    |          |          |          |
 8+ 5       0.1225      0.24  Q    V    |          |          |          |
 8+10       0.1241      0.24  Q    V    |          |          |          |
 8+15       0.1258      0.24  Q    V    |          |          |          |
 8+20       0.1274      0.24  Q    V    |          |          |          |
 8+25       0.1291      0.24  Q    V    |          |          |          |
 8+30       0.1308      0.24  Q    V    |          |          |          |
 8+35       0.1325      0.25  Q    V    |          |          |          |
 8+40       0.1342      0.25  Q     V   |          |          |          |
 8+45       0.1359      0.25  Q     V   |          |          |          |
 8+50       0.1376      0.25  |Q    V   |          |          |          |
 8+55       0.1393      0.25  |Q    V   |          |          |          |
 9+ 0       0.1411      0.25  |Q    V   |          |          |          |
 9+ 5       0.1429      0.26  |Q    V   |          |          |          |
 9+10       0.1446      0.26  |Q    V   |          |          |          |
 9+15       0.1464      0.26  |Q    V   |          |          |          |
 9+20       0.1482      0.26  |Q    V   |          |          |          |
 9+25       0.1500      0.26  |Q    V   |          |          |          |
 9+30       0.1519      0.27  |Q    V   |          |          |          |
 9+35       0.1537      0.27  |Q    V   |          |          |          |
 9+40       0.1556      0.27  |Q    V   |          |          |          |
 9+45       0.1574      0.27  |Q     V  |          |          |          |
 9+50       0.1593      0.27  |Q     V  |          |          |          |
 9+55       0.1612      0.28  |Q     V  |          |          |          |
10+ 0       0.1631      0.28  |Q     V  |          |          |          |
10+ 5       0.1651      0.28  |Q     V  |          |          |          |
10+10       0.1670      0.28  |Q     V  |          |          |          |
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10+15       0.1690      0.28  |Q     V  |          |          |          |
10+20       0.1709      0.29  |Q     V  |          |          |          |
10+25       0.1729      0.29  |Q     V  |          |          |          |
10+30       0.1750      0.29  |Q     V  |          |          |          |
10+35       0.1770      0.30  |Q     V  |          |          |          |
10+40       0.1790      0.30  |Q      V |          |          |          |
10+45       0.1811      0.30  |Q      V |          |          |          |
10+50       0.1832      0.30  |Q      V |          |          |          |
10+55       0.1853      0.31  |Q      V |          |          |          |
11+ 0       0.1874      0.31  |Q      V |          |          |          |
11+ 5       0.1896      0.31  |Q      V |          |          |          |
11+10       0.1917      0.31  |Q      V |          |          |          |
11+15       0.1939      0.32  |Q      V |          |          |          |
11+20       0.1961      0.32  |Q      V |          |          |          |
11+25       0.1984      0.32  |Q      V |          |          |          |
11+30       0.2006      0.33  |Q       V|          |          |          |
11+35       0.2029      0.33  |Q       V|          |          |          |
11+40       0.2052      0.34  |Q       V|          |          |          |
11+45       0.2076      0.34  |Q       V|          |          |          |
11+50       0.2099      0.34  |Q       V|          |          |          |
11+55       0.2123      0.35  |Q       V|          |          |          |
12+ 0       0.2147      0.35  |Q       V|          |          |          |
12+ 5       0.2172      0.36  |Q       V|          |          |          |
12+10       0.2197      0.37  |Q       V|          |          |          |
12+15       0.2223      0.38  |Q       V|          |          |          |
12+20       0.2250      0.39  |Q        V          |          |          |
12+25       0.2277      0.40  |Q        V          |          |          |
12+30       0.2305      0.40  |Q        V          |          |          |
12+35       0.2333      0.41  |Q        V          |          |          |
12+40       0.2361      0.41  |Q        V          |          |          |
12+45       0.2390      0.42  |Q        V          |          |          |
12+50       0.2420      0.43  |Q        V          |          |          |
12+55       0.2450      0.43  |Q        |V         |          |          |
13+ 0       0.2480      0.44  |Q        |V         |          |          |
13+ 5       0.2511      0.45  |Q        |V         |          |          |
13+10       0.2542      0.45  |Q        |V         |          |          |
13+15       0.2574      0.46  |Q        |V         |          |          |
13+20       0.2606      0.47  |Q        |V         |          |          |
13+25       0.2639      0.48  |Q        |V         |          |          |
13+30       0.2673      0.49  |Q        | V        |          |          |
13+35       0.2707      0.49  |Q        | V        |          |          |
13+40       0.2741      0.50  | Q       | V        |          |          |
13+45       0.2777      0.51  | Q       | V        |          |          |
13+50       0.2813      0.52  | Q       | V        |          |          |
13+55       0.2849      0.53  | Q       | V        |          |          |
14+ 0       0.2887      0.54  | Q       | V        |          |          |
14+ 5       0.2925      0.56  | Q       |  V       |          |          |
14+10       0.2964      0.57  | Q       |  V       |          |          |
14+15       0.3004      0.58  | Q       |  V       |          |          |
14+20       0.3045      0.60  | Q       |  V       |          |          |
14+25       0.3087      0.61  | Q       |  V       |          |          |
14+30       0.3130      0.63  | Q       |   V      |          |          |
14+35       0.3175      0.64  | Q       |   V      |          |          |
14+40       0.3221      0.66  | Q       |   V      |          |          |
14+45       0.3268      0.68  | Q       |   V      |          |          |
14+50       0.3316      0.71  | Q       |   V      |          |          |
14+55       0.3367      0.73  | Q       |    V     |          |          |
15+ 0       0.3419      0.76  |  Q      |    V     |          |          |
15+ 5       0.3473      0.79  |  Q      |    V     |          |          |
15+10       0.3529      0.82  |  Q      |    V     |          |          |
15+15       0.3588      0.86  |  Q      |     V    |          |          |
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15+20	0.3650	0.90	Q	V			
15+25	0.3715	0.94	Q	V			
15+30	0.3780	0.94	Q	V			
15+35	0.3842	0.91	Q	V			
15+40	0.3907	0.93	Q	V			
15+45	0.3976	1.00	Q	V			
15+50	0.4052	1.11	Q	V			
15+55	0.4141	1.29	Q	V			
16+ 0	0.4251	1.60	Q	V			
16+ 5	0.4445	2.81	Q	V			
16+10	0.4909	6.74		V Q			
16+15	0.5583	9.79		V			Q
16+20	0.5982	5.79		Q V			
16+25	0.6243	3.78	Q	V			
16+30	0.6438	2.84	Q	V			
16+35	0.6600	2.35	Q	V			
16+40	0.6735	1.97	Q	V			
16+45	0.6850	1.66	Q	V			
16+50	0.6951	1.46	Q	V			
16+55	0.7039	1.28	Q	V			
17+ 0	0.7117	1.14	Q	V			
17+ 5	0.7187	1.01	Q	V			
17+10	0.7249	0.90	Q	V			
17+15	0.7304	0.80	Q	V			
17+20	0.7358	0.78	Q	V			
17+25	0.7409	0.75	Q	V			
17+30	0.7456	0.67	Q	V			
17+35	0.7500	0.63	Q	V			
17+40	0.7536	0.53	Q	V			
17+45	0.7571	0.51	Q	V			
17+50	0.7605	0.49	Q	V			
17+55	0.7637	0.47	Q	V			
18+ 0	0.7669	0.46	Q	V			
18+ 5	0.7699	0.44	Q	V			
18+10	0.7728	0.42	Q	V			
18+15	0.7756	0.40	Q	V			
18+20	0.7783	0.39	Q	V			
18+25	0.7809	0.38	Q	V			
18+30	0.7834	0.36	Q	V			
18+35	0.7858	0.35	Q	V			
18+40	0.7882	0.35	Q	V			
18+45	0.7905	0.34	Q	V			
18+50	0.7928	0.33	Q	V			
18+55	0.7950	0.32	Q	V			
19+ 0	0.7972	0.32	Q	V			
19+ 5	0.7993	0.31	Q	V			
19+10	0.8014	0.30	Q	V			
19+15	0.8034	0.30	Q	V			
19+20	0.8054	0.29	Q	V			
19+25	0.8074	0.29	Q	V			
19+30	0.8093	0.28	Q	V			
19+35	0.8112	0.28	Q	V			
19+40	0.8131	0.27	Q	V			
19+45	0.8150	0.27	Q	V			
19+50	0.8168	0.26	Q	V			
19+55	0.8186	0.26	Q	V			
20+ 0	0.8203	0.26	Q	V			
20+ 5	0.8221	0.25	Q	V			
20+10	0.8238	0.25	Q	V			
20+15	0.8255	0.25	Q	V			
20+20	0.8272	0.24	Q	V			

20+25	0.8288	0.24	Q	|	|	|	V |
20+30	0.8305	0.24	Q	|	|	|	V |
20+35	0.8321	0.23	Q	|	|	|	V |
20+40	0.8337	0.23	Q	|	|	|	V |
20+45	0.8353	0.23	Q	|	|	|	V |
20+50	0.8368	0.23	Q	|	|	|	V |
20+55	0.8383	0.22	Q	|	|	|	V |
21+ 0	0.8399	0.22	Q	|	|	|	V |
21+ 5	0.8414	0.22	Q	|	|	|	V |
21+10	0.8429	0.22	Q	|	|	|	V |
21+15	0.8443	0.21	Q	|	|	|	V |
21+20	0.8458	0.21	Q	|	|	|	V |
21+25	0.8472	0.21	Q	|	|	|	V |
21+30	0.8487	0.21	Q	|	|	|	V |
21+35	0.8501	0.21	Q	|	|	|	V |
21+40	0.8515	0.20	Q	|	|	|	V |
21+45	0.8529	0.20	Q	|	|	|	V |
21+50	0.8542	0.20	Q	|	|	|	V |
21+55	0.8556	0.20	Q	|	|	|	V |
22+ 0	0.8569	0.20	Q	|	|	|	V |
22+ 5	0.8583	0.19	Q	|	|	|	V |
22+10	0.8596	0.19	Q	|	|	|	V |
22+15	0.8609	0.19	Q	|	|	|	V |
22+20	0.8622	0.19	Q	|	|	|	V |
22+25	0.8635	0.19	Q	|	|	|	V |
22+30	0.8648	0.19	Q	|	|	|	V |
22+35	0.8661	0.18	Q	|	|	|	V |
22+40	0.8673	0.18	Q	|	|	|	V |
22+45	0.8686	0.18	Q	|	|	|	V|
22+50	0.8698	0.18	Q	|	|	|	V|
22+55	0.8710	0.18	Q	|	|	|	V|
23+ 0	0.8723	0.18	Q	|	|	|	V|
23+ 5	0.8735	0.18	Q	|	|	|	V|
23+10	0.8747	0.17	Q	|	|	|	V|
23+15	0.8759	0.17	Q	|	|	|	V|
23+20	0.8770	0.17	Q	|	|	|	V|
23+25	0.8782	0.17	Q	|	|	|	V|
23+30	0.8794	0.17	Q	|	|	|	V|
23+35	0.8805	0.17	Q	|	|	|	V|
23+40	0.8817	0.17	Q	|	|	|	V|
23+45	0.8828	0.17	Q	|	|	|	V|
23+50	0.8840	0.16	Q	|	|	|	V|
23+55	0.8851	0.16	Q	|	|	|	V|
24+ 0	0.8862	0.16	Q	|	|	|	V|

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

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Study date 08/09/24

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

Program License Serial Number 6277

JOB NO 2021-181
WATSON APPLEY VALLEY 145
10 YEAR UNIT HYDROGRAPH
POST, AREA C

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
27.33	1	0.60
Rainfall data for year 2		
27.33	6	0.76
Rainfall data for year 2		
27.33	24	1.30
Rainfall data for year 100		
27.33	1	1.08
Rainfall data for year 100		
27.33	6	2.01
Rainfall data for year 100		
27.33	24	3.42

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	32.0	27.33	1.000	0.978	0.149	0.146

Area-averaged adjusted loss rate Fm (In/Hr) = 0.146

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
4.07	0.149	32.0	32.0	10.86	0.000
23.26	0.851	98.0	98.0	0.20	0.895

Area-averaged catchment yield fraction, Y = 0.762
Area-averaged low loss fraction, Yb = 0.238
User entry of time of concentration = 0.250 (hours)
++
Watershed area = 27.33(Ac.)
Catchment Lag time = 0.200 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 41.6667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.146(In/Hr)
Average low loss rate fraction (Yb) = 0.238 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.287(In)
Computed peak 30-minute rainfall = 0.491(In)
Specified peak 1-hour rainfall = 0.605(In)
Computed peak 3-hour rainfall = 0.955(In)
Specified peak 6-hour rainfall = 1.273(In)
Specified peak 24-hour rainfall = 2.172(In)

Rainfall depth area reduction factors:
Using a total area of 27.33(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.287(In)
30-minute factor = 0.999 Adjusted rainfall = 0.491(In)
1-hour factor = 0.999 Adjusted rainfall = 0.604(In)
3-hour factor = 1.000 Adjusted rainfall = 0.955(In)
6-hour factor = 1.000 Adjusted rainfall = 1.273(In)
24-hour factor = 1.000 Adjusted rainfall = 2.172(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 = 330.52 (CFS))	
1	2.935	9.701
2	20.613	58.431
3	51.467	101.977
4	67.222	52.074
5	76.108	29.372
6	81.970	19.374
7	86.247	14.135
8	89.430	10.522

9	91.773	7.745
10	93.683	6.313
11	95.168	4.908
12	96.358	3.933
13	97.275	3.030
14	97.918	2.126
15	98.357	1.449
16	98.850	1.631
17	99.345	1.637
18	99.682	1.114
19	100.000	1.050

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2867	0.2867
2	0.3530	0.0663
3	0.3986	0.0457
4	0.4346	0.0359
5	0.4647	0.0301
6	0.4908	0.0261
7	0.5140	0.0232
8	0.5350	0.0210
9	0.5543	0.0192
10	0.5721	0.0178
11	0.5887	0.0166
12	0.6042	0.0156
13	0.6247	0.0205
14	0.6443	0.0196
15	0.6630	0.0188
16	0.6811	0.0181
17	0.6985	0.0174
18	0.7153	0.0168
19	0.7316	0.0163
20	0.7474	0.0158
21	0.7627	0.0153
22	0.7776	0.0149
23	0.7921	0.0145
24	0.8063	0.0142
25	0.8201	0.0138
26	0.8336	0.0135
27	0.8468	0.0132
28	0.8597	0.0129
29	0.8724	0.0126
30	0.8848	0.0124
31	0.8969	0.0122
32	0.9089	0.0119
33	0.9206	0.0117
34	0.9321	0.0115
35	0.9434	0.0113
36	0.9545	0.0111
37	0.9655	0.0109
38	0.9762	0.0108
39	0.9868	0.0106
40	0.9972	0.0104
41	1.0075	0.0103
42	1.0176	0.0101
43	1.0276	0.0100
44	1.0375	0.0099
45	1.0472	0.0097
46	1.0568	0.0096
47	1.0663	0.0095

48	1.0757	0.0094
49	1.0849	0.0093
50	1.0941	0.0091
51	1.1031	0.0090
52	1.1120	0.0089
53	1.1209	0.0088
54	1.1296	0.0087
55	1.1383	0.0086
56	1.1468	0.0086
57	1.1553	0.0085
58	1.1636	0.0084
59	1.1719	0.0083
60	1.1801	0.0082
61	1.1883	0.0081
62	1.1963	0.0081
63	1.2043	0.0080
64	1.2122	0.0079
65	1.2200	0.0078
66	1.2278	0.0078
67	1.2355	0.0077
68	1.2431	0.0076
69	1.2507	0.0076
70	1.2582	0.0075
71	1.2656	0.0074
72	1.2730	0.0074
73	1.2798	0.0068
74	1.2865	0.0067
75	1.2932	0.0067
76	1.2998	0.0066
77	1.3063	0.0066
78	1.3129	0.0065
79	1.3193	0.0065
80	1.3257	0.0064
81	1.3321	0.0064
82	1.3384	0.0063
83	1.3447	0.0063
84	1.3509	0.0062
85	1.3571	0.0062
86	1.3632	0.0061
87	1.3693	0.0061
88	1.3753	0.0060
89	1.3813	0.0060
90	1.3873	0.0060
91	1.3932	0.0059
92	1.3991	0.0059
93	1.4050	0.0058
94	1.4108	0.0058
95	1.4165	0.0058
96	1.4223	0.0057
97	1.4279	0.0057
98	1.4336	0.0057
99	1.4392	0.0056
100	1.4448	0.0056
101	1.4504	0.0056
102	1.4559	0.0055
103	1.4614	0.0055
104	1.4668	0.0055
105	1.4722	0.0054
106	1.4776	0.0054
107	1.4830	0.0054
108	1.4883	0.0053

109	1.4936	0.0053
110	1.4989	0.0053
111	1.5041	0.0052
112	1.5093	0.0052
113	1.5145	0.0052
114	1.5197	0.0052
115	1.5248	0.0051
116	1.5299	0.0051
117	1.5349	0.0051
118	1.5400	0.0050
119	1.5450	0.0050
120	1.5500	0.0050
121	1.5550	0.0050
122	1.5599	0.0049
123	1.5648	0.0049
124	1.5697	0.0049
125	1.5746	0.0049
126	1.5794	0.0048
127	1.5842	0.0048
128	1.5890	0.0048
129	1.5938	0.0048
130	1.5986	0.0048
131	1.6033	0.0047
132	1.6080	0.0047
133	1.6127	0.0047
134	1.6173	0.0047
135	1.6220	0.0046
136	1.6266	0.0046
137	1.6312	0.0046
138	1.6358	0.0046
139	1.6403	0.0046
140	1.6449	0.0045
141	1.6494	0.0045
142	1.6539	0.0045
143	1.6584	0.0045
144	1.6628	0.0045
145	1.6673	0.0044
146	1.6717	0.0044
147	1.6761	0.0044
148	1.6805	0.0044
149	1.6849	0.0044
150	1.6892	0.0043
151	1.6935	0.0043
152	1.6979	0.0043
153	1.7022	0.0043
154	1.7064	0.0043
155	1.7107	0.0043
156	1.7149	0.0042
157	1.7192	0.0042
158	1.7234	0.0042
159	1.7276	0.0042
160	1.7318	0.0042
161	1.7359	0.0042
162	1.7401	0.0041
163	1.7442	0.0041
164	1.7483	0.0041
165	1.7524	0.0041
166	1.7565	0.0041
167	1.7606	0.0041
168	1.7646	0.0041
169	1.7687	0.0040

170	1.7727	0.0040
171	1.7767	0.0040
172	1.7807	0.0040
173	1.7847	0.0040
174	1.7887	0.0040
175	1.7926	0.0040
176	1.7966	0.0039
177	1.8005	0.0039
178	1.8044	0.0039
179	1.8083	0.0039
180	1.8122	0.0039
181	1.8161	0.0039
182	1.8199	0.0039
183	1.8238	0.0038
184	1.8276	0.0038
185	1.8314	0.0038
186	1.8352	0.0038
187	1.8390	0.0038
188	1.8428	0.0038
189	1.8466	0.0038
190	1.8504	0.0038
191	1.8541	0.0037
192	1.8578	0.0037
193	1.8616	0.0037
194	1.8653	0.0037
195	1.8690	0.0037
196	1.8727	0.0037
197	1.8763	0.0037
198	1.8800	0.0037
199	1.8837	0.0037
200	1.8873	0.0036
201	1.8909	0.0036
202	1.8946	0.0036
203	1.8982	0.0036
204	1.9018	0.0036
205	1.9054	0.0036
206	1.9089	0.0036
207	1.9125	0.0036
208	1.9161	0.0036
209	1.9196	0.0035
210	1.9231	0.0035
211	1.9267	0.0035
212	1.9302	0.0035
213	1.9337	0.0035
214	1.9372	0.0035
215	1.9407	0.0035
216	1.9441	0.0035
217	1.9476	0.0035
218	1.9510	0.0035
219	1.9545	0.0034
220	1.9579	0.0034
221	1.9614	0.0034
222	1.9648	0.0034
223	1.9682	0.0034
224	1.9716	0.0034
225	1.9750	0.0034
226	1.9783	0.0034
227	1.9817	0.0034
228	1.9851	0.0034
229	1.9884	0.0034
230	1.9918	0.0033

231	1.9951	0.0033
232	1.9984	0.0033
233	2.0017	0.0033
234	2.0050	0.0033
235	2.0083	0.0033
236	2.0116	0.0033
237	2.0149	0.0033
238	2.0182	0.0033
239	2.0214	0.0033
240	2.0247	0.0033
241	2.0280	0.0032
242	2.0312	0.0032
243	2.0344	0.0032
244	2.0376	0.0032
245	2.0409	0.0032
246	2.0441	0.0032
247	2.0473	0.0032
248	2.0505	0.0032
249	2.0536	0.0032
250	2.0568	0.0032
251	2.0600	0.0032
252	2.0631	0.0032
253	2.0663	0.0032
254	2.0694	0.0031
255	2.0726	0.0031
256	2.0757	0.0031
257	2.0788	0.0031
258	2.0819	0.0031
259	2.0850	0.0031
260	2.0881	0.0031
261	2.0912	0.0031
262	2.0943	0.0031
263	2.0974	0.0031
264	2.1005	0.0031
265	2.1035	0.0031
266	2.1066	0.0031
267	2.1096	0.0030
268	2.1127	0.0030
269	2.1157	0.0030
270	2.1187	0.0030
271	2.1218	0.0030
272	2.1248	0.0030
273	2.1278	0.0030
274	2.1308	0.0030
275	2.1338	0.0030
276	2.1368	0.0030
277	2.1398	0.0030
278	2.1427	0.0030
279	2.1457	0.0030
280	2.1487	0.0030
281	2.1516	0.0030
282	2.1546	0.0029
283	2.1575	0.0029
284	2.1604	0.0029
285	2.1634	0.0029
286	2.1663	0.0029
287	2.1692	0.0029
288	2.1721	0.0029

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0029	0.0007	0.0022
2	0.0029	0.0007	0.0022
3	0.0029	0.0007	0.0022
4	0.0029	0.0007	0.0022
5	0.0029	0.0007	0.0022
6	0.0030	0.0007	0.0023
7	0.0030	0.0007	0.0023
8	0.0030	0.0007	0.0023
9	0.0030	0.0007	0.0023
10	0.0030	0.0007	0.0023
11	0.0030	0.0007	0.0023
12	0.0030	0.0007	0.0023
13	0.0030	0.0007	0.0023
14	0.0030	0.0007	0.0023
15	0.0030	0.0007	0.0023
16	0.0031	0.0007	0.0023
17	0.0031	0.0007	0.0023
18	0.0031	0.0007	0.0023
19	0.0031	0.0007	0.0024
20	0.0031	0.0007	0.0024
21	0.0031	0.0007	0.0024
22	0.0031	0.0007	0.0024
23	0.0031	0.0007	0.0024
24	0.0031	0.0007	0.0024
25	0.0032	0.0008	0.0024
26	0.0032	0.0008	0.0024
27	0.0032	0.0008	0.0024
28	0.0032	0.0008	0.0024
29	0.0032	0.0008	0.0024
30	0.0032	0.0008	0.0024
31	0.0032	0.0008	0.0025
32	0.0032	0.0008	0.0025
33	0.0033	0.0008	0.0025
34	0.0033	0.0008	0.0025
35	0.0033	0.0008	0.0025
36	0.0033	0.0008	0.0025
37	0.0033	0.0008	0.0025
38	0.0033	0.0008	0.0025
39	0.0033	0.0008	0.0025
40	0.0033	0.0008	0.0025
41	0.0034	0.0008	0.0026
42	0.0034	0.0008	0.0026
43	0.0034	0.0008	0.0026
44	0.0034	0.0008	0.0026
45	0.0034	0.0008	0.0026
46	0.0034	0.0008	0.0026
47	0.0034	0.0008	0.0026
48	0.0035	0.0008	0.0026
49	0.0035	0.0008	0.0026
50	0.0035	0.0008	0.0027
51	0.0035	0.0008	0.0027
52	0.0035	0.0008	0.0027
53	0.0035	0.0008	0.0027
54	0.0035	0.0008	0.0027
55	0.0036	0.0008	0.0027
56	0.0036	0.0009	0.0027
57	0.0036	0.0009	0.0027
58	0.0036	0.0009	0.0028
59	0.0036	0.0009	0.0028

60	0.0036	0.0009	0.0028
61	0.0037	0.0009	0.0028
62	0.0037	0.0009	0.0028
63	0.0037	0.0009	0.0028
64	0.0037	0.0009	0.0028
65	0.0037	0.0009	0.0028
66	0.0037	0.0009	0.0029
67	0.0038	0.0009	0.0029
68	0.0038	0.0009	0.0029
69	0.0038	0.0009	0.0029
70	0.0038	0.0009	0.0029
71	0.0038	0.0009	0.0029
72	0.0039	0.0009	0.0029
73	0.0039	0.0009	0.0030
74	0.0039	0.0009	0.0030
75	0.0039	0.0009	0.0030
76	0.0039	0.0009	0.0030
77	0.0040	0.0009	0.0030
78	0.0040	0.0009	0.0030
79	0.0040	0.0010	0.0031
80	0.0040	0.0010	0.0031
81	0.0041	0.0010	0.0031
82	0.0041	0.0010	0.0031
83	0.0041	0.0010	0.0031
84	0.0041	0.0010	0.0031
85	0.0041	0.0010	0.0032
86	0.0042	0.0010	0.0032
87	0.0042	0.0010	0.0032
88	0.0042	0.0010	0.0032
89	0.0042	0.0010	0.0032
90	0.0043	0.0010	0.0032
91	0.0043	0.0010	0.0033
92	0.0043	0.0010	0.0033
93	0.0043	0.0010	0.0033
94	0.0044	0.0010	0.0033
95	0.0044	0.0010	0.0034
96	0.0044	0.0011	0.0034
97	0.0045	0.0011	0.0034
98	0.0045	0.0011	0.0034
99	0.0045	0.0011	0.0034
100	0.0045	0.0011	0.0035
101	0.0046	0.0011	0.0035
102	0.0046	0.0011	0.0035
103	0.0046	0.0011	0.0035
104	0.0047	0.0011	0.0036
105	0.0047	0.0011	0.0036
106	0.0047	0.0011	0.0036
107	0.0048	0.0011	0.0036
108	0.0048	0.0011	0.0037
109	0.0048	0.0012	0.0037
110	0.0049	0.0012	0.0037
111	0.0049	0.0012	0.0037
112	0.0049	0.0012	0.0038
113	0.0050	0.0012	0.0038
114	0.0050	0.0012	0.0038
115	0.0051	0.0012	0.0039
116	0.0051	0.0012	0.0039
117	0.0052	0.0012	0.0039
118	0.0052	0.0012	0.0039
119	0.0052	0.0012	0.0040
120	0.0053	0.0013	0.0040

121	0.0053	0.0013	0.0041
122	0.0054	0.0013	0.0041
123	0.0054	0.0013	0.0041
124	0.0055	0.0013	0.0042
125	0.0055	0.0013	0.0042
126	0.0056	0.0013	0.0042
127	0.0056	0.0013	0.0043
128	0.0057	0.0013	0.0043
129	0.0057	0.0014	0.0044
130	0.0058	0.0014	0.0044
131	0.0058	0.0014	0.0045
132	0.0059	0.0014	0.0045
133	0.0060	0.0014	0.0045
134	0.0060	0.0014	0.0046
135	0.0061	0.0014	0.0046
136	0.0061	0.0015	0.0047
137	0.0062	0.0015	0.0047
138	0.0063	0.0015	0.0048
139	0.0064	0.0015	0.0048
140	0.0064	0.0015	0.0049
141	0.0065	0.0015	0.0050
142	0.0066	0.0016	0.0050
143	0.0067	0.0016	0.0051
144	0.0067	0.0016	0.0051
145	0.0074	0.0018	0.0056
146	0.0074	0.0018	0.0057
147	0.0076	0.0018	0.0058
148	0.0076	0.0018	0.0058
149	0.0078	0.0018	0.0059
150	0.0078	0.0019	0.0060
151	0.0080	0.0019	0.0061
152	0.0081	0.0019	0.0061
153	0.0082	0.0020	0.0063
154	0.0083	0.0020	0.0063
155	0.0085	0.0020	0.0064
156	0.0086	0.0020	0.0065
157	0.0087	0.0021	0.0067
158	0.0088	0.0021	0.0067
159	0.0090	0.0022	0.0069
160	0.0091	0.0022	0.0070
161	0.0094	0.0022	0.0071
162	0.0095	0.0023	0.0072
163	0.0097	0.0023	0.0074
164	0.0099	0.0023	0.0075
165	0.0101	0.0024	0.0077
166	0.0103	0.0024	0.0078
167	0.0106	0.0025	0.0081
168	0.0108	0.0026	0.0082
169	0.0111	0.0026	0.0085
170	0.0113	0.0027	0.0086
171	0.0117	0.0028	0.0089
172	0.0119	0.0028	0.0091
173	0.0124	0.0030	0.0094
174	0.0126	0.0030	0.0096
175	0.0132	0.0031	0.0101
176	0.0135	0.0032	0.0103
177	0.0142	0.0034	0.0108
178	0.0145	0.0035	0.0111
179	0.0153	0.0036	0.0117
180	0.0158	0.0038	0.0120
181	0.0168	0.0040	0.0128

182	0.0174	0.0041	0.0133
183	0.0188	0.0045	0.0143
184	0.0196	0.0047	0.0149
185	0.0156	0.0037	0.0119
186	0.0166	0.0039	0.0126
187	0.0192	0.0046	0.0147
188	0.0210	0.0050	0.0160
189	0.0261	0.0062	0.0199
190	0.0301	0.0072	0.0229
191	0.0457	0.0109	0.0348
192	0.0663	0.0121	0.0541
193	0.2867	0.0121	0.2746
194	0.0359	0.0086	0.0274
195	0.0232	0.0055	0.0177
196	0.0178	0.0042	0.0136
197	0.0205	0.0049	0.0156
198	0.0181	0.0043	0.0138
199	0.0163	0.0039	0.0124
200	0.0149	0.0035	0.0114
201	0.0138	0.0033	0.0105
202	0.0129	0.0031	0.0098
203	0.0122	0.0029	0.0093
204	0.0115	0.0027	0.0088
205	0.0109	0.0026	0.0083
206	0.0104	0.0025	0.0079
207	0.0100	0.0024	0.0076
208	0.0096	0.0023	0.0073
209	0.0093	0.0022	0.0070
210	0.0089	0.0021	0.0068
211	0.0086	0.0021	0.0066
212	0.0084	0.0020	0.0064
213	0.0081	0.0019	0.0062
214	0.0079	0.0019	0.0060
215	0.0077	0.0018	0.0059
216	0.0075	0.0018	0.0057
217	0.0068	0.0016	0.0052
218	0.0066	0.0016	0.0050
219	0.0065	0.0015	0.0049
220	0.0063	0.0015	0.0048
221	0.0062	0.0015	0.0047
222	0.0060	0.0014	0.0046
223	0.0059	0.0014	0.0045
224	0.0058	0.0014	0.0044
225	0.0057	0.0014	0.0043
226	0.0056	0.0013	0.0043
227	0.0055	0.0013	0.0042
228	0.0054	0.0013	0.0041
229	0.0053	0.0013	0.0040
230	0.0052	0.0012	0.0040
231	0.0051	0.0012	0.0039
232	0.0050	0.0012	0.0038
233	0.0050	0.0012	0.0038
234	0.0049	0.0012	0.0037
235	0.0048	0.0011	0.0037
236	0.0048	0.0011	0.0036
237	0.0047	0.0011	0.0036
238	0.0046	0.0011	0.0035
239	0.0046	0.0011	0.0035
240	0.0045	0.0011	0.0034
241	0.0044	0.0011	0.0034
242	0.0044	0.0010	0.0033

243	0.0043	0.0010	0.0033
244	0.0043	0.0010	0.0033
245	0.0042	0.0010	0.0032
246	0.0042	0.0010	0.0032
247	0.0041	0.0010	0.0031
248	0.0041	0.0010	0.0031
249	0.0040	0.0010	0.0031
250	0.0040	0.0010	0.0030
251	0.0040	0.0009	0.0030
252	0.0039	0.0009	0.0030
253	0.0039	0.0009	0.0030
254	0.0038	0.0009	0.0029
255	0.0038	0.0009	0.0029
256	0.0038	0.0009	0.0029
257	0.0037	0.0009	0.0028
258	0.0037	0.0009	0.0028
259	0.0037	0.0009	0.0028
260	0.0036	0.0009	0.0028
261	0.0036	0.0009	0.0027
262	0.0036	0.0008	0.0027
263	0.0035	0.0008	0.0027
264	0.0035	0.0008	0.0027
265	0.0035	0.0008	0.0026
266	0.0034	0.0008	0.0026
267	0.0034	0.0008	0.0026
268	0.0034	0.0008	0.0026
269	0.0034	0.0008	0.0026
270	0.0033	0.0008	0.0025
271	0.0033	0.0008	0.0025
272	0.0033	0.0008	0.0025
273	0.0032	0.0008	0.0025
274	0.0032	0.0008	0.0025
275	0.0032	0.0008	0.0024
276	0.0032	0.0008	0.0024
277	0.0032	0.0008	0.0024
278	0.0031	0.0007	0.0024
279	0.0031	0.0007	0.0024
280	0.0031	0.0007	0.0024
281	0.0031	0.0007	0.0023
282	0.0030	0.0007	0.0023
283	0.0030	0.0007	0.0023
284	0.0030	0.0007	0.0023
285	0.0030	0.0007	0.0023
286	0.0030	0.0007	0.0023
287	0.0029	0.0007	0.0022
288	0.0029	0.0007	0.0022

Total soil rain loss = 0.46(In)
Total effective rainfall = 1.71(In)
Peak flow rate in flood hydrograph = 34.97(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 10.0 20.0 30.0 40.0

0+ 5	0.0001	0.02	Q	|	|	|	|
0+10	0.0012	0.15	Q	|	|	|	|
0+15	0.0038	0.38	Q	|	|	|	|
0+20	0.0072	0.49	Q	|	|	|	|
0+25	0.0111	0.56	Q	|	|	|	|
0+30	0.0152	0.61	Q	|	|	|	|
0+35	0.0196	0.64	Q	|	|	|	|
0+40	0.0242	0.66	Q	|	|	|	|
0+45	0.0289	0.68	Q	|	|	|	|
0+50	0.0337	0.70	Q	|	|	|	|
0+55	0.0386	0.71	Q	|	|	|	|
1+ 0	0.0436	0.72	Q	|	|	|	|
1+ 5	0.0487	0.73	Q	|	|	|	|
1+10	0.0538	0.74	Q	|	|	|	|
1+15	0.0589	0.75	Q	|	|	|	|
1+20	0.0641	0.75	Q	|	|	|	|
1+25	0.0693	0.76	Q	|	|	|	|
1+30	0.0746	0.76	Q	|	|	|	|
1+35	0.0799	0.77	Q	|	|	|	|
1+40	0.0852	0.77	Q	|	|	|	|
1+45	0.0905	0.77	Q	|	|	|	|
1+50	0.0959	0.78	Q	|	|	|	|
1+55	0.1013	0.78	QV	|	|	|	|
2+ 0	0.1066	0.78	QV	|	|	|	|
2+ 5	0.1121	0.79	QV	|	|	|	|
2+10	0.1175	0.79	QV	|	|	|	|
2+15	0.1229	0.79	QV	|	|	|	|
2+20	0.1284	0.79	QV	|	|	|	|
2+25	0.1339	0.80	QV	|	|	|	|
2+30	0.1394	0.80	QV	|	|	|	|
2+35	0.1449	0.80	QV	|	|	|	|
2+40	0.1505	0.81	QV	|	|	|	|
2+45	0.1560	0.81	QV	|	|	|	|
2+50	0.1616	0.81	QV	|	|	|	|
2+55	0.1672	0.81	QV	|	|	|	|
3+ 0	0.1729	0.82	QV	|	|	|	|
3+ 5	0.1785	0.82	QV	|	|	|	|
3+10	0.1842	0.82	QV	|	|	|	|
3+15	0.1899	0.83	QV	|	|	|	|
3+20	0.1956	0.83	Q V	|	|	|	|
3+25	0.2014	0.83	Q V	|	|	|	|
3+30	0.2071	0.84	Q V	|	|	|	|
3+35	0.2129	0.84	Q V	|	|	|	|
3+40	0.2187	0.84	Q V	|	|	|	|
3+45	0.2246	0.85	Q V	|	|	|	|
3+50	0.2304	0.85	Q V	|	|	|	|
3+55	0.2363	0.85	Q V	|	|	|	|
4+ 0	0.2422	0.86	Q V	|	|	|	|
4+ 5	0.2482	0.86	Q V	|	|	|	|
4+10	0.2541	0.87	Q V	|	|	|	|
4+15	0.2601	0.87	Q V	|	|	|	|
4+20	0.2661	0.87	Q V	|	|	|	|
4+25	0.2722	0.88	Q V	|	|	|	|
4+30	0.2782	0.88	Q V	|	|	|	|
4+35	0.2843	0.88	Q V	|	|	|	|
4+40	0.2904	0.89	Q V	|	|	|	|
4+45	0.2966	0.89	Q V	|	|	|	|
4+50	0.3027	0.90	Q V	|	|	|	|
4+55	0.3089	0.90	Q V	|	|	|	|
5+ 0	0.3151	0.90	Q V	|	|	|	|
5+ 5	0.3214	0.91	Q V	|	|	|	|

5+10	0.3277	0.91	Q V	|	|	|	|
5+15	0.3340	0.92	Q V	|	|	|	|
5+20	0.3403	0.92	Q V	|	|	|	|
5+25	0.3467	0.92	Q V	|	|	|	|
5+30	0.3531	0.93	Q V	|	|	|	|
5+35	0.3595	0.93	Q V	|	|	|	|
5+40	0.3660	0.94	Q V	|	|	|	|
5+45	0.3725	0.94	Q V	|	|	|	|
5+50	0.3790	0.95	Q V	|	|	|	|
5+55	0.3855	0.95	Q V	|	|	|	|
6+ 0	0.3921	0.96	Q V	|	|	|	|
6+ 5	0.3988	0.96	Q V	|	|	|	|
6+10	0.4054	0.97	Q V	|	|	|	|
6+15	0.4121	0.97	Q V	|	|	|	|
6+20	0.4188	0.98	Q V	|	|	|	|
6+25	0.4256	0.98	Q V	|	|	|	|
6+30	0.4324	0.99	Q V	|	|	|	|
6+35	0.4392	0.99	Q V	|	|	|	|
6+40	0.4460	1.00	Q V	|	|	|	|
6+45	0.4529	1.00	|Q V	|	|	|	|
6+50	0.4599	1.01	|Q V	|	|	|	|
6+55	0.4669	1.01	|Q V	|	|	|	|
7+ 0	0.4739	1.02	|Q V	|	|	|	|
7+ 5	0.4809	1.02	|Q V	|	|	|	|
7+10	0.4880	1.03	|Q V	|	|	|	|
7+15	0.4951	1.04	|Q V	|	|	|	|
7+20	0.5023	1.04	|Q V	|	|	|	|
7+25	0.5095	1.05	|Q V	|	|	|	|
7+30	0.5168	1.05	|Q V	|	|	|	|
7+35	0.5241	1.06	|Q V	|	|	|	|
7+40	0.5314	1.07	|Q V	|	|	|	|
7+45	0.5388	1.07	|Q V	|	|	|	|
7+50	0.5462	1.08	|Q V	|	|	|	|
7+55	0.5537	1.08	|Q V	|	|	|	|
8+ 0	0.5612	1.09	|Q V	|	|	|	|
8+ 5	0.5687	1.10	|Q V	|	|	|	|
8+10	0.5763	1.10	|Q V	|	|	|	|
8+15	0.5840	1.11	|Q V	|	|	|	|
8+20	0.5917	1.12	|Q V	|	|	|	|
8+25	0.5995	1.13	|Q V	|	|	|	|
8+30	0.6073	1.13	|Q V	|	|	|	|
8+35	0.6151	1.14	|Q V	|	|	|	|
8+40	0.6230	1.15	|Q V	|	|	|	|
8+45	0.6310	1.16	|Q V	|	|	|	|
8+50	0.6390	1.16	|Q V	|	|	|	|
8+55	0.6471	1.17	|Q V	|	|	|	|
9+ 0	0.6552	1.18	|Q V	|	|	|	|
9+ 5	0.6634	1.19	|Q V	|	|	|	|
9+10	0.6716	1.20	|Q V	|	|	|	|
9+15	0.6799	1.21	|Q V	|	|	|	|
9+20	0.6883	1.21	|Q V	|	|	|	|
9+25	0.6967	1.22	|Q V	|	|	|	|
9+30	0.7052	1.23	|Q V	|	|	|	|
9+35	0.7138	1.24	|Q V	|	|	|	|
9+40	0.7224	1.25	|Q V	|	|	|	|
9+45	0.7311	1.26	|Q V	|	|	|	|
9+50	0.7398	1.27	|Q V	|	|	|	|
9+55	0.7486	1.28	|Q V	|	|	|	|
10+ 0	0.7575	1.29	|Q V	|	|	|	|
10+ 5	0.7665	1.30	|Q V	|	|	|	|
10+10	0.7755	1.31	|Q V	|	|	|	|

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10+15       0.7847      1.32  |Q      V |          |          |          |
10+20       0.7938      1.33  |Q      V |          |          |          |
10+25       0.8031      1.35  |Q      V |          |          |          |
10+30       0.8125      1.36  |Q      V |          |          |          |
10+35       0.8219      1.37  |Q      V |          |          |          |
10+40       0.8314      1.38  |Q      V |          |          |          |
10+45       0.8410      1.39  |Q      V |          |          |          |
10+50       0.8507      1.41  |Q      V |          |          |          |
10+55       0.8605      1.42  |Q      V |          |          |          |
11+ 0       0.8704      1.43  |Q      V |          |          |          |
11+ 5       0.8804      1.45  |Q       V|          |          |          |
11+10       0.8904      1.46  |Q       V|          |          |          |
11+15       0.9006      1.48  |Q       V|          |          |          |
11+20       0.9109      1.49  |Q       V|          |          |          |
11+25       0.9213      1.51  |Q       V|          |          |          |
11+30       0.9318      1.52  |Q       V|          |          |          |
11+35       0.9424      1.54  |Q       V|          |          |          |
11+40       0.9531      1.56  |Q       V|          |          |          |
11+45       0.9639      1.57  |Q       V|          |          |          |
11+50       0.9749      1.59  |Q       V|          |          |          |
11+55       0.9860      1.61  |Q        V          |          |          |
12+ 0       0.9972      1.63  |Q        V          |          |          |
12+ 5       1.0086      1.65  |Q        V          |          |          |
12+10       1.0203      1.70  |Q        V          |          |          |
12+15       1.0324      1.76  |Q        V          |          |          |
12+20       1.0448      1.80  |Q        V          |          |          |
12+25       1.0574      1.84  |Q        V          |          |          |
12+30       1.0703      1.87  |Q        V          |          |          |
12+35       1.0834      1.90  |Q        |V         |          |          |
12+40       1.0966      1.93  |Q        |V         |          |          |
12+45       1.1101      1.96  |Q        |V         |          |          |
12+50       1.1238      1.98  |Q        |V         |          |          |
12+55       1.1376      2.02  | Q       |V         |          |          |
13+ 0       1.1517      2.05  | Q       |V         |          |          |
13+ 5       1.1660      2.08  | Q       |V         |          |          |
13+10       1.1806      2.11  | Q       | V        |          |          |
13+15       1.1953      2.14  | Q       | V        |          |          |
13+20       1.2104      2.18  | Q       | V        |          |          |
13+25       1.2256      2.22  | Q       | V        |          |          |
13+30       1.2412      2.25  | Q       | V        |          |          |
13+35       1.2570      2.30  | Q       | V        |          |          |
13+40       1.2731      2.34  | Q       |  V       |          |          |
13+45       1.2894      2.38  | Q       |  V       |          |          |
13+50       1.3062      2.43  | Q       |  V       |          |          |
13+55       1.3232      2.48  | Q       |  V       |          |          |
14+ 0       1.3406      2.53  | Q       |  V       |          |          |
14+ 5       1.3584      2.58  | Q       |  V       |          |          |
14+10       1.3766      2.64  | Q       |   V      |          |          |
14+15       1.3952      2.70  | Q       |   V      |          |          |
14+20       1.4143      2.77  | Q       |   V      |          |          |
14+25       1.4338      2.84  | Q       |   V      |          |          |
14+30       1.4539      2.92  | Q       |   V      |          |          |
14+35       1.4745      3.00  | Q       |    V     |          |          |
14+40       1.4958      3.08  |  Q      |    V     |          |          |
14+45       1.5177      3.18  |  Q      |    V     |          |          |
14+50       1.5403      3.28  |  Q      |    V     |          |          |
14+55       1.5637      3.40  |  Q      |     V    |          |          |
15+ 0       1.5879      3.52  |  Q      |     V    |          |          |
15+ 5       1.6131      3.66  |  Q      |     V    |          |          |
15+10       1.6394      3.81  |  Q      |     V    |          |          |
15+15       1.6668      3.99  |  Q      |      V   |          |          |
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15+20	1.6956	4.18	Q	V			
15+25	1.7257	4.37	Q	V			
15+30	1.7558	4.37	Q	V			
15+35	1.7848	4.22	Q	V			
15+40	1.8147	4.34	Q	V			
15+45	1.8468	4.66	Q	V			
15+50	1.8823	5.16	Q	V			
15+55	1.9234	5.97	Q	V			
16+ 0	1.9747	7.45	Q	V			
16+ 5	2.0591	12.25	Q	V			
16+10	2.2349	25.53	Q	V			
16+15	2.4757	34.97	Q	V			
16+20	2.6241	21.54	Q	V			
16+25	2.7243	14.56	Q	V			
16+30	2.8015	11.20	Q	V			
16+35	2.8666	9.46	Q	V			
16+40	2.9222	8.07	Q	V			
16+45	2.9699	6.92	Q	V			
16+50	3.0123	6.16	Q	V			
16+55	3.0498	5.45	Q	V			
17+ 0	3.0836	4.90	Q	V			
17+ 5	3.1139	4.40	Q	V			
17+10	3.1411	3.94	Q	V			
17+15	3.1658	3.59	Q	V			
17+20	3.1896	3.46	Q	V			
17+25	3.2123	3.30	Q	V			
17+30	3.2331	3.02	Q	V			
17+35	3.2526	2.84	Q	V			
17+40	3.2696	2.46	Q	V			
17+45	3.2859	2.36	Q	V			
17+50	3.3015	2.27	Q	V			
17+55	3.3166	2.19	Q	V			
18+ 0	3.3312	2.12	Q	V			
18+ 5	3.3453	2.05	Q	V			
18+10	3.3589	1.97	Q	V			
18+15	3.3718	1.87	Q	V			
18+20	3.3842	1.80	Q	V			
18+25	3.3962	1.74	Q	V			
18+30	3.4078	1.69	Q	V			
18+35	3.4192	1.64	Q	V			
18+40	3.4302	1.60	Q	V			
18+45	3.4410	1.56	Q	V			
18+50	3.4515	1.53	Q	V			
18+55	3.4618	1.49	Q	V			
19+ 0	3.4719	1.46	Q	V			
19+ 5	3.4817	1.43	Q	V			
19+10	3.4914	1.41	Q	V			
19+15	3.5009	1.38	Q	V			
19+20	3.5102	1.35	Q	V			
19+25	3.5194	1.33	Q	V			
19+30	3.5284	1.31	Q	V			
19+35	3.5373	1.29	Q	V			
19+40	3.5460	1.27	Q	V			
19+45	3.5546	1.25	Q	V			
19+50	3.5630	1.23	Q	V			
19+55	3.5714	1.21	Q	V			
20+ 0	3.5796	1.19	Q	V			
20+ 5	3.5877	1.18	Q	V			
20+10	3.5957	1.16	Q	V			
20+15	3.6036	1.14	Q	V			
20+20	3.6113	1.13	Q	V			

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  20+25       3.6190      1.12  |Q        |         |         |      V  |
  20+30       3.6266      1.10  |Q        |         |         |      V  |
  20+35       3.6341      1.09  |Q        |         |         |      V  |
  20+40       3.6415      1.07  |Q        |         |         |      V  |
  20+45       3.6488      1.06  |Q        |         |         |      V  |
  20+50       3.6560      1.05  |Q        |         |         |      V  |
  20+55       3.6632      1.04  |Q        |         |         |      V  |
  21+ 0       3.6702      1.03  |Q        |         |         |      V  |
  21+ 5       3.6772      1.01  |Q        |         |         |      V  |
  21+10       3.6841      1.00  |Q        |         |         |      V  |
  21+15       3.6910      0.99  Q         |         |         |      V  |
  21+20       3.6977      0.98  Q         |         |         |      V  |
  21+25       3.7044      0.97  Q         |         |         |      V  |
  21+30       3.7111      0.96  Q         |         |         |       V |
  21+35       3.7176      0.95  Q         |         |         |       V |
  21+40       3.7242      0.94  Q         |         |         |       V |
  21+45       3.7306      0.94  Q         |         |         |       V |
  21+50       3.7370      0.93  Q         |         |         |       V |
  21+55       3.7433      0.92  Q         |         |         |       V |
  22+ 0       3.7496      0.91  Q         |         |         |       V |
  22+ 5       3.7558      0.90  Q         |         |         |       V |
  22+10       3.7619      0.89  Q         |         |         |       V |
  22+15       3.7680      0.89  Q         |         |         |       V |
  22+20       3.7741      0.88  Q         |         |         |       V |
  22+25       3.7800      0.87  Q         |         |         |       V |
  22+30       3.7860      0.86  Q         |         |         |       V |
  22+35       3.7919      0.86  Q         |         |         |       V |
  22+40       3.7977      0.85  Q         |         |         |       V |
  22+45       3.8035      0.84  Q         |         |         |       V |
  22+50       3.8093      0.84  Q         |         |         |        V|
  22+55       3.8150      0.83  Q         |         |         |        V|
  23+ 0       3.8206      0.82  Q         |         |         |        V|
  23+ 5       3.8263      0.82  Q         |         |         |        V|
  23+10       3.8318      0.81  Q         |         |         |        V|
  23+15       3.8374      0.80  Q         |         |         |        V|
  23+20       3.8429      0.80  Q         |         |         |        V|
  23+25       3.8483      0.79  Q         |         |         |        V|
  23+30       3.8537      0.79  Q         |         |         |        V|
  23+35       3.8591      0.78  Q         |         |         |        V|
  23+40       3.8644      0.78  Q         |         |         |        V|
  23+45       3.8697      0.77  Q         |         |         |        V|
  23+50       3.8750      0.76  Q         |         |         |        V|
  23+55       3.8802      0.76  Q         |         |         |        V|
  24+ 0       3.8854      0.75  Q         |         |         |        V|
-------------------------------------------------------------------------
```

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

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Study date 08/30/24

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

Program License Serial Number 6277

JOB NO 2021-181
WATSON APPLEY VALLEY 145
10 YEAR UNIT HYDROGRAPH
POST, AREA D

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
40.36	1	0.60
Rainfall data for year 2		
40.36	6	0.76
Rainfall data for year 2		
40.36	24	1.30
Rainfall data for year 100		
40.36	1	1.08
Rainfall data for year 100		
40.36	6	2.01
Rainfall data for year 100		
40.36	24	3.42

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	32.0	40.36	1.000	0.978	0.237	0.232

Area-averaged adjusted loss rate Fm (In/Hr) = 0.232

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
9.57	0.237	32.0	32.0	10.86	0.000
30.79	0.763	98.0	98.0	0.20	0.895

Area-averaged catchment yield fraction, Y = 0.683
Area-averaged low loss fraction, Yb = 0.317
User entry of time of concentration = 0.340 (hours)
++
Watershed area = 40.36(Ac.)
Catchment Lag time = 0.272 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 30.6373
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.232(In/Hr)
Average low loss rate fraction (Yb) = 0.317 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.287(In)
Computed peak 30-minute rainfall = 0.491(In)
Specified peak 1-hour rainfall = 0.605(In)
Computed peak 3-hour rainfall = 0.955(In)
Specified peak 6-hour rainfall = 1.273(In)
Specified peak 24-hour rainfall = 2.172(In)

Rainfall depth area reduction factors:
Using a total area of 40.36(Ac.) (Ref: fig. E-4)

5-minute factor = 0.998 Adjusted rainfall = 0.287(In)
30-minute factor = 0.998 Adjusted rainfall = 0.490(In)
1-hour factor = 0.998 Adjusted rainfall = 0.604(In)
3-hour factor = 1.000 Adjusted rainfall = 0.954(In)
6-hour factor = 1.000 Adjusted rainfall = 1.273(In)
24-hour factor = 1.000 Adjusted rainfall = 2.172(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 = 488.10 (CFS))	
1	1.819	8.879
2	9.839	39.148
3	32.088	108.596
4	53.408	104.061
5	65.111	57.125
6	72.614	36.622
7	78.031	26.443
8	82.073	19.726

9	85.295	15.729
10	87.971	13.061
11	89.992	9.865
12	91.690	8.286
13	93.147	7.113
14	94.362	5.931
15	95.392	5.029
16	96.247	4.171
17	96.987	3.611
18	97.550	2.752
19	97.968	2.038
20	98.280	1.521
21	98.637	1.743
22	99.004	1.794
23	99.370	1.785
24	99.625	1.244
25	99.816	0.935
26	100.000	0.897

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2865	0.2865
2	0.3528	0.0662
3	0.3984	0.0456
4	0.4343	0.0359
5	0.4644	0.0301
6	0.4905	0.0261
7	0.5137	0.0232
8	0.5347	0.0210
9	0.5539	0.0192
10	0.5717	0.0178
11	0.5883	0.0166
12	0.6039	0.0156
13	0.6243	0.0205
14	0.6439	0.0196
15	0.6627	0.0188
16	0.6808	0.0181
17	0.6982	0.0174
18	0.7150	0.0168
19	0.7313	0.0163
20	0.7471	0.0158
21	0.7625	0.0153
22	0.7774	0.0149
23	0.7919	0.0145
24	0.8061	0.0142
25	0.8199	0.0138
26	0.8334	0.0135
27	0.8466	0.0132
28	0.8596	0.0129
29	0.8722	0.0127
30	0.8846	0.0124
31	0.8968	0.0122
32	0.9087	0.0119
33	0.9205	0.0117
34	0.9320	0.0115
35	0.9433	0.0113
36	0.9545	0.0111
37	0.9654	0.0109
38	0.9761	0.0108
39	0.9867	0.0106
40	0.9972	0.0104

41	1.0074	0.0103
42	1.0176	0.0101
43	1.0276	0.0100
44	1.0374	0.0099
45	1.0472	0.0097
46	1.0568	0.0096
47	1.0663	0.0095
48	1.0756	0.0094
49	1.0849	0.0093
50	1.0940	0.0091
51	1.1030	0.0090
52	1.1120	0.0089
53	1.1208	0.0088
54	1.1295	0.0087
55	1.1382	0.0086
56	1.1467	0.0086
57	1.1552	0.0085
58	1.1636	0.0084
59	1.1719	0.0083
60	1.1801	0.0082
61	1.1882	0.0081
62	1.1963	0.0081
63	1.2042	0.0080
64	1.2121	0.0079
65	1.2200	0.0078
66	1.2277	0.0078
67	1.2354	0.0077
68	1.2431	0.0076
69	1.2506	0.0076
70	1.2581	0.0075
71	1.2655	0.0074
72	1.2729	0.0074
73	1.2797	0.0068
74	1.2864	0.0067
75	1.2931	0.0067
76	1.2997	0.0066
77	1.3063	0.0066
78	1.3128	0.0065
79	1.3193	0.0065
80	1.3257	0.0064
81	1.3320	0.0064
82	1.3384	0.0063
83	1.3446	0.0063
84	1.3509	0.0062
85	1.3570	0.0062
86	1.3632	0.0061
87	1.3692	0.0061
88	1.3753	0.0060
89	1.3813	0.0060
90	1.3873	0.0060
91	1.3932	0.0059
92	1.3991	0.0059
93	1.4049	0.0058
94	1.4107	0.0058
95	1.4165	0.0058
96	1.4222	0.0057
97	1.4279	0.0057
98	1.4336	0.0057
99	1.4392	0.0056
100	1.4448	0.0056
101	1.4503	0.0056

102	1.4558	0.0055
103	1.4613	0.0055
104	1.4668	0.0055
105	1.4722	0.0054
106	1.4776	0.0054
107	1.4829	0.0054
108	1.4883	0.0053
109	1.4936	0.0053
110	1.4988	0.0053
111	1.5041	0.0052
112	1.5093	0.0052
113	1.5145	0.0052
114	1.5196	0.0052
115	1.5247	0.0051
116	1.5298	0.0051
117	1.5349	0.0051
118	1.5399	0.0050
119	1.5450	0.0050
120	1.5499	0.0050
121	1.5549	0.0050
122	1.5599	0.0049
123	1.5648	0.0049
124	1.5697	0.0049
125	1.5745	0.0049
126	1.5794	0.0048
127	1.5842	0.0048
128	1.5890	0.0048
129	1.5938	0.0048
130	1.5985	0.0048
131	1.6032	0.0047
132	1.6079	0.0047
133	1.6126	0.0047
134	1.6173	0.0047
135	1.6219	0.0046
136	1.6266	0.0046
137	1.6312	0.0046
138	1.6357	0.0046
139	1.6403	0.0046
140	1.6448	0.0045
141	1.6494	0.0045
142	1.6539	0.0045
143	1.6583	0.0045
144	1.6628	0.0045
145	1.6672	0.0044
146	1.6717	0.0044
147	1.6761	0.0044
148	1.6804	0.0044
149	1.6848	0.0044
150	1.6892	0.0043
151	1.6935	0.0043
152	1.6978	0.0043
153	1.7021	0.0043
154	1.7064	0.0043
155	1.7107	0.0043
156	1.7149	0.0042
157	1.7191	0.0042
158	1.7233	0.0042
159	1.7275	0.0042
160	1.7317	0.0042
161	1.7359	0.0042
162	1.7400	0.0041

163	1.7442	0.0041
164	1.7483	0.0041
165	1.7524	0.0041
166	1.7565	0.0041
167	1.7605	0.0041
168	1.7646	0.0041
169	1.7686	0.0040
170	1.7727	0.0040
171	1.7767	0.0040
172	1.7807	0.0040
173	1.7847	0.0040
174	1.7886	0.0040
175	1.7926	0.0040
176	1.7965	0.0039
177	1.8004	0.0039
178	1.8044	0.0039
179	1.8083	0.0039
180	1.8121	0.0039
181	1.8160	0.0039
182	1.8199	0.0039
183	1.8237	0.0038
184	1.8276	0.0038
185	1.8314	0.0038
186	1.8352	0.0038
187	1.8390	0.0038
188	1.8428	0.0038
189	1.8466	0.0038
190	1.8503	0.0038
191	1.8541	0.0037
192	1.8578	0.0037
193	1.8615	0.0037
194	1.8652	0.0037
195	1.8689	0.0037
196	1.8726	0.0037
197	1.8763	0.0037
198	1.8800	0.0037
199	1.8836	0.0037
200	1.8873	0.0036
201	1.8909	0.0036
202	1.8945	0.0036
203	1.8981	0.0036
204	1.9017	0.0036
205	1.9053	0.0036
206	1.9089	0.0036
207	1.9125	0.0036
208	1.9160	0.0036
209	1.9196	0.0035
210	1.9231	0.0035
211	1.9266	0.0035
212	1.9301	0.0035
213	1.9336	0.0035
214	1.9371	0.0035
215	1.9406	0.0035
216	1.9441	0.0035
217	1.9476	0.0035
218	1.9510	0.0035
219	1.9544	0.0034
220	1.9579	0.0034
221	1.9613	0.0034
222	1.9647	0.0034
223	1.9681	0.0034

224	1.9715	0.0034
225	1.9749	0.0034
226	1.9783	0.0034
227	1.9817	0.0034
228	1.9850	0.0034
229	1.9884	0.0034
230	1.9917	0.0033
231	1.9951	0.0033
232	1.9984	0.0033
233	2.0017	0.0033
234	2.0050	0.0033
235	2.0083	0.0033
236	2.0116	0.0033
237	2.0149	0.0033
238	2.0181	0.0033
239	2.0214	0.0033
240	2.0247	0.0033
241	2.0279	0.0032
242	2.0312	0.0032
243	2.0344	0.0032
244	2.0376	0.0032
245	2.0408	0.0032
246	2.0440	0.0032
247	2.0472	0.0032
248	2.0504	0.0032
249	2.0536	0.0032
250	2.0568	0.0032
251	2.0599	0.0032
252	2.0631	0.0032
253	2.0663	0.0032
254	2.0694	0.0031
255	2.0725	0.0031
256	2.0757	0.0031
257	2.0788	0.0031
258	2.0819	0.0031
259	2.0850	0.0031
260	2.0881	0.0031
261	2.0912	0.0031
262	2.0943	0.0031
263	2.0974	0.0031
264	2.1004	0.0031
265	2.1035	0.0031
266	2.1066	0.0031
267	2.1096	0.0030
268	2.1126	0.0030
269	2.1157	0.0030
270	2.1187	0.0030
271	2.1217	0.0030
272	2.1247	0.0030
273	2.1278	0.0030
274	2.1308	0.0030
275	2.1337	0.0030
276	2.1367	0.0030
277	2.1397	0.0030
278	2.1427	0.0030
279	2.1457	0.0030
280	2.1486	0.0030
281	2.1516	0.0030
282	2.1545	0.0029
283	2.1575	0.0029
284	2.1604	0.0029

285	2.1633	0.0029	
286	2.1662	0.0029	
287	2.1692	0.0029	
288	2.1721	0.0029	

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0029	0.0009	0.0020
2	0.0029	0.0009	0.0020
3	0.0029	0.0009	0.0020
4	0.0029	0.0009	0.0020
5	0.0029	0.0009	0.0020
6	0.0030	0.0009	0.0020
7	0.0030	0.0009	0.0020
8	0.0030	0.0009	0.0020
9	0.0030	0.0009	0.0020
10	0.0030	0.0009	0.0020
11	0.0030	0.0010	0.0021
12	0.0030	0.0010	0.0021
13	0.0030	0.0010	0.0021
14	0.0030	0.0010	0.0021
15	0.0030	0.0010	0.0021
16	0.0031	0.0010	0.0021
17	0.0031	0.0010	0.0021
18	0.0031	0.0010	0.0021
19	0.0031	0.0010	0.0021
20	0.0031	0.0010	0.0021
21	0.0031	0.0010	0.0021
22	0.0031	0.0010	0.0021
23	0.0031	0.0010	0.0021
24	0.0031	0.0010	0.0021
25	0.0032	0.0010	0.0022
26	0.0032	0.0010	0.0022
27	0.0032	0.0010	0.0022
28	0.0032	0.0010	0.0022
29	0.0032	0.0010	0.0022
30	0.0032	0.0010	0.0022
31	0.0032	0.0010	0.0022
32	0.0032	0.0010	0.0022
33	0.0033	0.0010	0.0022
34	0.0033	0.0010	0.0022
35	0.0033	0.0010	0.0022
36	0.0033	0.0010	0.0022
37	0.0033	0.0010	0.0023
38	0.0033	0.0011	0.0023
39	0.0033	0.0011	0.0023
40	0.0033	0.0011	0.0023
41	0.0034	0.0011	0.0023
42	0.0034	0.0011	0.0023
43	0.0034	0.0011	0.0023
44	0.0034	0.0011	0.0023
45	0.0034	0.0011	0.0023
46	0.0034	0.0011	0.0023
47	0.0034	0.0011	0.0024
48	0.0035	0.0011	0.0024
49	0.0035	0.0011	0.0024
50	0.0035	0.0011	0.0024
51	0.0035	0.0011	0.0024
52	0.0035	0.0011	0.0024

53	0.0035	0.0011	0.0024
54	0.0035	0.0011	0.0024
55	0.0036	0.0011	0.0024
56	0.0036	0.0011	0.0024
57	0.0036	0.0011	0.0025
58	0.0036	0.0011	0.0025
59	0.0036	0.0012	0.0025
60	0.0036	0.0012	0.0025
61	0.0037	0.0012	0.0025
62	0.0037	0.0012	0.0025
63	0.0037	0.0012	0.0025
64	0.0037	0.0012	0.0025
65	0.0037	0.0012	0.0026
66	0.0037	0.0012	0.0026
67	0.0038	0.0012	0.0026
68	0.0038	0.0012	0.0026
69	0.0038	0.0012	0.0026
70	0.0038	0.0012	0.0026
71	0.0038	0.0012	0.0026
72	0.0039	0.0012	0.0026
73	0.0039	0.0012	0.0027
74	0.0039	0.0012	0.0027
75	0.0039	0.0012	0.0027
76	0.0039	0.0012	0.0027
77	0.0040	0.0013	0.0027
78	0.0040	0.0013	0.0027
79	0.0040	0.0013	0.0027
80	0.0040	0.0013	0.0028
81	0.0041	0.0013	0.0028
82	0.0041	0.0013	0.0028
83	0.0041	0.0013	0.0028
84	0.0041	0.0013	0.0028
85	0.0041	0.0013	0.0028
86	0.0042	0.0013	0.0028
87	0.0042	0.0013	0.0029
88	0.0042	0.0013	0.0029
89	0.0042	0.0013	0.0029
90	0.0043	0.0014	0.0029
91	0.0043	0.0014	0.0029
92	0.0043	0.0014	0.0029
93	0.0043	0.0014	0.0030
94	0.0044	0.0014	0.0030
95	0.0044	0.0014	0.0030
96	0.0044	0.0014	0.0030
97	0.0045	0.0014	0.0030
98	0.0045	0.0014	0.0031
99	0.0045	0.0014	0.0031
100	0.0045	0.0014	0.0031
101	0.0046	0.0015	0.0031
102	0.0046	0.0015	0.0031
103	0.0046	0.0015	0.0032
104	0.0047	0.0015	0.0032
105	0.0047	0.0015	0.0032
106	0.0047	0.0015	0.0032
107	0.0048	0.0015	0.0033
108	0.0048	0.0015	0.0033
109	0.0048	0.0015	0.0033
110	0.0049	0.0015	0.0033
111	0.0049	0.0016	0.0034
112	0.0049	0.0016	0.0034
113	0.0050	0.0016	0.0034

114	0.0050	0.0016	0.0034
115	0.0051	0.0016	0.0035
116	0.0051	0.0016	0.0035
117	0.0052	0.0016	0.0035
118	0.0052	0.0016	0.0035
119	0.0052	0.0017	0.0036
120	0.0053	0.0017	0.0036
121	0.0053	0.0017	0.0036
122	0.0054	0.0017	0.0037
123	0.0054	0.0017	0.0037
124	0.0055	0.0017	0.0037
125	0.0055	0.0017	0.0038
126	0.0056	0.0018	0.0038
127	0.0056	0.0018	0.0038
128	0.0057	0.0018	0.0039
129	0.0057	0.0018	0.0039
130	0.0058	0.0018	0.0039
131	0.0058	0.0019	0.0040
132	0.0059	0.0019	0.0040
133	0.0060	0.0019	0.0041
134	0.0060	0.0019	0.0041
135	0.0061	0.0019	0.0042
136	0.0061	0.0019	0.0042
137	0.0062	0.0020	0.0043
138	0.0063	0.0020	0.0043
139	0.0064	0.0020	0.0043
140	0.0064	0.0020	0.0044
141	0.0065	0.0021	0.0045
142	0.0066	0.0021	0.0045
143	0.0067	0.0021	0.0046
144	0.0067	0.0021	0.0046
145	0.0074	0.0023	0.0050
146	0.0074	0.0024	0.0051
147	0.0076	0.0024	0.0052
148	0.0076	0.0024	0.0052
149	0.0078	0.0025	0.0053
150	0.0078	0.0025	0.0054
151	0.0080	0.0025	0.0055
152	0.0081	0.0026	0.0055
153	0.0082	0.0026	0.0056
154	0.0083	0.0026	0.0057
155	0.0085	0.0027	0.0058
156	0.0086	0.0027	0.0058
157	0.0087	0.0028	0.0060
158	0.0088	0.0028	0.0060
159	0.0090	0.0029	0.0062
160	0.0091	0.0029	0.0062
161	0.0094	0.0030	0.0064
162	0.0095	0.0030	0.0065
163	0.0097	0.0031	0.0066
164	0.0099	0.0031	0.0067
165	0.0101	0.0032	0.0069
166	0.0103	0.0033	0.0070
167	0.0106	0.0034	0.0072
168	0.0108	0.0034	0.0073
169	0.0111	0.0035	0.0076
170	0.0113	0.0036	0.0077
171	0.0117	0.0037	0.0080
172	0.0119	0.0038	0.0082
173	0.0124	0.0039	0.0085
174	0.0127	0.0040	0.0087

175	0.0132	0.0042	0.0090
176	0.0135	0.0043	0.0092
177	0.0142	0.0045	0.0097
178	0.0145	0.0046	0.0099
179	0.0153	0.0049	0.0105
180	0.0158	0.0050	0.0108
181	0.0168	0.0053	0.0115
182	0.0174	0.0055	0.0119
183	0.0188	0.0059	0.0128
184	0.0196	0.0062	0.0134
185	0.0156	0.0049	0.0106
186	0.0166	0.0053	0.0113
187	0.0192	0.0061	0.0131
188	0.0210	0.0067	0.0143
189	0.0261	0.0083	0.0178
190	0.0301	0.0095	0.0205
191	0.0456	0.0145	0.0312
192	0.0662	0.0193	0.0469
193	0.2865	0.0193	0.2672
194	0.0359	0.0114	0.0245
195	0.0232	0.0074	0.0159
196	0.0178	0.0056	0.0122
197	0.0205	0.0065	0.0140
198	0.0181	0.0057	0.0123
199	0.0163	0.0052	0.0111
200	0.0149	0.0047	0.0102
201	0.0138	0.0044	0.0094
202	0.0129	0.0041	0.0088
203	0.0122	0.0039	0.0083
204	0.0115	0.0036	0.0079
205	0.0109	0.0035	0.0075
206	0.0104	0.0033	0.0071
207	0.0100	0.0032	0.0068
208	0.0096	0.0030	0.0066
209	0.0093	0.0029	0.0063
210	0.0089	0.0028	0.0061
211	0.0086	0.0027	0.0059
212	0.0084	0.0027	0.0057
213	0.0081	0.0026	0.0056
214	0.0079	0.0025	0.0054
215	0.0077	0.0024	0.0053
216	0.0075	0.0024	0.0051
217	0.0068	0.0021	0.0046
218	0.0066	0.0021	0.0045
219	0.0065	0.0020	0.0044
220	0.0063	0.0020	0.0043
221	0.0062	0.0020	0.0042
222	0.0060	0.0019	0.0041
223	0.0059	0.0019	0.0040
224	0.0058	0.0018	0.0040
225	0.0057	0.0018	0.0039
226	0.0056	0.0018	0.0038
227	0.0055	0.0017	0.0037
228	0.0054	0.0017	0.0037
229	0.0053	0.0017	0.0036
230	0.0052	0.0016	0.0036
231	0.0051	0.0016	0.0035
232	0.0050	0.0016	0.0034
233	0.0050	0.0016	0.0034
234	0.0049	0.0015	0.0033
235	0.0048	0.0015	0.0033

236	0.0048	0.0015	0.0032
237	0.0047	0.0015	0.0032
238	0.0046	0.0015	0.0032
239	0.0046	0.0014	0.0031
240	0.0045	0.0014	0.0031
241	0.0044	0.0014	0.0030
242	0.0044	0.0014	0.0030
243	0.0043	0.0014	0.0030
244	0.0043	0.0014	0.0029
245	0.0042	0.0013	0.0029
246	0.0042	0.0013	0.0029
247	0.0041	0.0013	0.0028
248	0.0041	0.0013	0.0028
249	0.0040	0.0013	0.0028
250	0.0040	0.0013	0.0027
251	0.0040	0.0013	0.0027
252	0.0039	0.0012	0.0027
253	0.0039	0.0012	0.0026
254	0.0038	0.0012	0.0026
255	0.0038	0.0012	0.0026
256	0.0038	0.0012	0.0026
257	0.0037	0.0012	0.0025
258	0.0037	0.0012	0.0025
259	0.0037	0.0012	0.0025
260	0.0036	0.0011	0.0025
261	0.0036	0.0011	0.0025
262	0.0036	0.0011	0.0024
263	0.0035	0.0011	0.0024
264	0.0035	0.0011	0.0024
265	0.0035	0.0011	0.0024
266	0.0034	0.0011	0.0023
267	0.0034	0.0011	0.0023
268	0.0034	0.0011	0.0023
269	0.0034	0.0011	0.0023
270	0.0033	0.0011	0.0023
271	0.0033	0.0010	0.0023
272	0.0033	0.0010	0.0022
273	0.0032	0.0010	0.0022
274	0.0032	0.0010	0.0022
275	0.0032	0.0010	0.0022
276	0.0032	0.0010	0.0022
277	0.0032	0.0010	0.0022
278	0.0031	0.0010	0.0021
279	0.0031	0.0010	0.0021
280	0.0031	0.0010	0.0021
281	0.0031	0.0010	0.0021
282	0.0030	0.0010	0.0021
283	0.0030	0.0010	0.0021
284	0.0030	0.0010	0.0021
285	0.0030	0.0009	0.0020
286	0.0030	0.0009	0.0020
287	0.0029	0.0009	0.0020
288	0.0029	0.0009	0.0020

Total soil rain loss = 0.61(In)
Total effective rainfall = 1.56(In)
Peak flow rate in flood hydrograph = 39.30(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	10.0	20.0	30.0	40.0
0+ 5	0.0001	0.02	Q				
0+10	0.0008	0.10	Q				
0+15	0.0029	0.31	Q				
0+20	0.0065	0.52	Q				
0+25	0.0109	0.63	Q				
0+30	0.0158	0.71	Q				
0+35	0.0210	0.76	Q				
0+40	0.0266	0.81	Q				
0+45	0.0324	0.84	Q				
0+50	0.0383	0.87	Q				
0+55	0.0445	0.89	Q				
1+ 0	0.0508	0.91	Q				
1+ 5	0.0571	0.93	Q				
1+10	0.0636	0.94	Q				
1+15	0.0702	0.96	Q				
1+20	0.0769	0.97	Q				
1+25	0.0836	0.98	Q				
1+30	0.0904	0.99	Q				
1+35	0.0973	0.99	Q				
1+40	0.1041	1.00	VQ				
1+45	0.1111	1.01	VQ				
1+50	0.1181	1.01	VQ				
1+55	0.1251	1.02	VQ				
2+ 0	0.1322	1.03	|Q				
2+ 5	0.1393	1.03	|Q				
2+10	0.1465	1.04	|Q				
2+15	0.1536	1.04	|Q				
2+20	0.1608	1.05	|Q				
2+25	0.1681	1.05	|Q				
2+30	0.1753	1.05	|Q				
2+35	0.1826	1.06	|Q				
2+40	0.1899	1.06	|Q				
2+45	0.1973	1.07	|Q				
2+50	0.2046	1.07	|Q				
2+55	0.2120	1.07	|Q				
3+ 0	0.2195	1.08	|Q				
3+ 5	0.2269	1.08	|Q				
3+10	0.2344	1.09	|Q				
3+15	0.2419	1.09	|Q				
3+20	0.2494	1.09	|Q				
3+25	0.2570	1.10	|Q				
3+30	0.2646	1.10	|QV				
3+35	0.2722	1.11	|QV				
3+40	0.2799	1.11	|QV				
3+45	0.2876	1.12	|QV				
3+50	0.2953	1.12	|QV				
3+55	0.3031	1.13	|QV				
4+ 0	0.3109	1.13	|QV				
4+ 5	0.3187	1.13	|QV				
4+10	0.3265	1.14	|QV				
4+15	0.3344	1.14	|QV				
4+20	0.3423	1.15	|QV				
4+25	0.3503	1.15	|QV				
4+30	0.3582	1.16	|QV				

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4+35      0.3663     1.16  |QV       |         |         |         |
4+40      0.3743     1.17  |QV       |         |         |         |
4+45      0.3824     1.17  |QV       |         |         |         |
4+50      0.3905     1.18  |QV       |         |         |         |
4+55      0.3987     1.18  |Q V      |         |         |         |
5+ 0      0.4069     1.19  |Q V      |         |         |         |
5+ 5      0.4151     1.20  |Q V      |         |         |         |
5+10      0.4234     1.20  |Q V      |         |         |         |
5+15      0.4317     1.21  |Q V      |         |         |         |
5+20      0.4400     1.21  |Q V      |         |         |         |
5+25      0.4484     1.22  |Q V      |         |         |         |
5+30      0.4568     1.22  |Q V      |         |         |         |
5+35      0.4653     1.23  |Q V      |         |         |         |
5+40      0.4738     1.23  |Q V      |         |         |         |
5+45      0.4823     1.24  |Q V      |         |         |         |
5+50      0.4909     1.25  |Q V      |         |         |         |
5+55      0.4996     1.25  |Q V      |         |         |         |
6+ 0      0.5082     1.26  |Q V      |         |         |         |
6+ 5      0.5169     1.26  |Q V      |         |         |         |
6+10      0.5257     1.27  |Q  V     |         |         |         |
6+15      0.5345     1.28  |Q  V     |         |         |         |
6+20      0.5433     1.28  |Q  V     |         |         |         |
6+25      0.5522     1.29  |Q  V     |         |         |         |
6+30      0.5612     1.30  |Q  V     |         |         |         |
6+35      0.5701     1.30  |Q  V     |         |         |         |
6+40      0.5792     1.31  |Q  V     |         |         |         |
6+45      0.5882     1.32  |Q  V     |         |         |         |
6+50      0.5974     1.32  |Q  V     |         |         |         |
6+55      0.6065     1.33  |Q  V     |         |         |         |
7+ 0      0.6157     1.34  |Q  V     |         |         |         |
7+ 5      0.6250     1.35  |Q  V     |         |         |         |
7+10      0.6343     1.35  |Q  V     |         |         |         |
7+15      0.6437     1.36  |Q  V     |         |         |         |
7+20      0.6531     1.37  |Q  V     |         |         |         |
7+25      0.6626     1.38  |Q   V    |         |         |         |
7+30      0.6722     1.38  |Q   V    |         |         |         |
7+35      0.6817     1.39  |Q   V    |         |         |         |
7+40      0.6914     1.40  |Q   V    |         |         |         |
7+45      0.7011     1.41  |Q   V    |         |         |         |
7+50      0.7109     1.42  |Q   V    |         |         |         |
7+55      0.7207     1.43  |Q   V    |         |         |         |
8+ 0      0.7305     1.43  |Q   V    |         |         |         |
8+ 5      0.7405     1.44  |Q   V    |         |         |         |
8+10      0.7505     1.45  |Q   V    |         |         |         |
8+15      0.7605     1.46  |Q   V    |         |         |         |
8+20      0.7707     1.47  |Q   V    |         |         |         |
8+25      0.7809     1.48  |Q   V    |         |         |         |
8+30      0.7911     1.49  |Q    V   |         |         |         |
8+35      0.8014     1.50  |Q    V   |         |         |         |
8+40      0.8118     1.51  |Q    V   |         |         |         |
8+45      0.8223     1.52  |Q    V   |         |         |         |
8+50      0.8328     1.53  |Q    V   |         |         |         |
8+55      0.8434     1.54  |Q    V   |         |         |         |
9+ 0      0.8541     1.55  |Q    V   |         |         |         |
9+ 5      0.8648     1.56  |Q    V   |         |         |         |
9+10      0.8756     1.57  |Q    V   |         |         |         |
9+15      0.8865     1.58  |Q    V   |         |         |         |
9+20      0.8975     1.59  |Q    V   |         |         |         |
9+25      0.9086     1.61  |Q    V   |         |         |         |
9+30      0.9197     1.62  |Q     V  |         |         |         |
9+35      0.9309     1.63  |Q     V  |         |         |         |
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9+40	0.9422	1.64	Q V				
9+45	0.9536	1.65	Q V				
9+50	0.9651	1.67	Q V				
9+55	0.9767	1.68	Q V				
10+ 0	0.9883	1.69	Q V				
10+ 5	1.0001	1.71	Q V				
10+10	1.0119	1.72	Q V				
10+15	1.0239	1.73	Q V				
10+20	1.0359	1.75	Q V				
10+25	1.0481	1.76	Q V				
10+30	1.0603	1.78	Q V				
10+35	1.0727	1.79	Q V				
10+40	1.0852	1.81	Q V				
10+45	1.0977	1.83	Q V				
10+50	1.1104	1.84	Q V				
10+55	1.1233	1.86	Q V				
11+ 0	1.1362	1.88	Q V				
11+ 5	1.1492	1.90	Q V				
11+10	1.1624	1.91	Q V				
11+15	1.1757	1.93	Q V				
11+20	1.1892	1.95	Q V				
11+25	1.2028	1.97	Q V				
11+30	1.2165	1.99	Q V				
11+35	1.2304	2.01	Q V				
11+40	1.2444	2.04	Q V				
11+45	1.2586	2.06	Q V				
11+50	1.2729	2.08	Q V				
11+55	1.2874	2.10	Q V				
12+ 0	1.3020	2.13	Q V				
12+ 5	1.3169	2.16	Q V				
12+10	1.3320	2.20	Q V				
12+15	1.3476	2.26	Q V				
12+20	1.3636	2.33	Q V				
12+25	1.3800	2.38	Q V				
12+30	1.3966	2.42	Q V				
12+35	1.4136	2.46	Q V				
12+40	1.4308	2.50	Q V				
12+45	1.4483	2.54	Q V				
12+50	1.4660	2.58	Q V				
12+55	1.4840	2.62	Q V				
13+ 0	1.5023	2.66	Q V				
13+ 5	1.5209	2.70	Q V				
13+10	1.5398	2.74	Q V				
13+15	1.5590	2.78	Q V				
13+20	1.5785	2.83	Q V				
13+25	1.5983	2.88	Q V				
13+30	1.6184	2.93	Q V				
13+35	1.6389	2.98	Q V				
13+40	1.6598	3.03	Q V				
13+45	1.6810	3.08	Q V				
13+50	1.7027	3.14	Q V				
13+55	1.7247	3.21	Q V				
14+ 0	1.7473	3.27	Q V				
14+ 5	1.7702	3.34	Q V				
14+10	1.7937	3.41	Q V				
14+15	1.8178	3.49	Q V				
14+20	1.8424	3.57	Q V				
14+25	1.8676	3.66	Q V				
14+30	1.8935	3.76	Q V				
14+35	1.9200	3.86	Q V				
14+40	1.9473	3.96	Q V				

14+45	1.9754	4.08	Q	V			
14+50	2.0044	4.21	Q	V			
14+55	2.0343	4.34	Q	V			
15+ 0	2.0653	4.49	Q	V			
15+ 5	2.0974	4.66	Q	V			
15+10	2.1308	4.85	Q	V			
15+15	2.1656	5.05	Q	V			
15+20	2.2020	5.29	Q	V			
15+25	2.2400	5.52	Q	V			
15+30	2.2790	5.66	Q	V			
15+35	2.3175	5.59	Q	V			
15+40	2.3559	5.58	Q	V			
15+45	2.3962	5.85	Q	V			
15+50	2.4398	6.34	Q	V			
15+55	2.4891	7.15	Q	V			
16+ 0	2.5477	8.51	Q	V			
16+ 5	2.6359	12.81	Q	V			
16+10	2.7906	22.45	VQ				
16+15	3.0612	39.30	V	Q			
16+20	3.3158	36.97	V	Q			
16+25	3.4827	24.23	Q V				
16+30	3.6062	17.93	Q	V			
16+35	3.7073	14.69	Q	V			
16+40	3.7935	12.50	Q	V			
16+45	3.8689	10.95	Q	V			
16+50	3.9360	9.75	Q	V			
16+55	3.9946	8.51	Q	V			
17+ 0	4.0477	7.71	Q	V			
17+ 5	4.0963	7.06	Q	V			
17+10	4.1407	6.44	Q	V			
17+15	4.1815	5.92	Q	V			
17+20	4.2190	5.44	Q	V			
17+25	4.2538	5.06	Q	V			
17+30	4.2857	4.63	Q	V			
17+35	4.3151	4.27	Q	V			
17+40	4.3425	3.99	Q	V			
17+45	4.3693	3.90	Q	V			
17+50	4.3953	3.77	Q	V			
17+55	4.4203	3.63	Q	V			
18+ 0	4.4436	3.37	Q	V			
18+ 5	4.4654	3.17	Q	V			
18+10	4.4862	3.02	Q	V			
18+15	4.5046	2.67	Q	V			
18+20	4.5221	2.54	Q	V			
18+25	4.5389	2.45	Q	V			
18+30	4.5552	2.37	Q	V			
18+35	4.5710	2.29	Q	V			
18+40	4.5863	2.23	Q	V			
18+45	4.6012	2.17	Q	V			
18+50	4.6158	2.11	Q	V			
18+55	4.6300	2.06	Q	V			
19+ 0	4.6438	2.01	Q	V			
19+ 5	4.6574	1.97	Q	V			
19+10	4.6706	1.93	Q	V			
19+15	4.6836	1.89	Q	V			
19+20	4.6964	1.85	Q	V			
19+25	4.7089	1.81	Q	V			
19+30	4.7211	1.78	Q	V			
19+35	4.7332	1.75	Q	V			
19+40	4.7450	1.72	Q	V			
19+45	4.7567	1.69	Q	V			

19+50	4.7682	1.67	|Q	|	|	|	V |
19+55	4.7795	1.64	|Q	|	|	|	V |
20+ 0	4.7906	1.61	|Q	|	|	|	V |
20+ 5	4.8015	1.59	|Q	|	|	|	V |
20+10	4.8123	1.57	|Q	|	|	|	V |
20+15	4.8230	1.55	|Q	|	|	|	V |
20+20	4.8335	1.52	|Q	|	|	|	V |
20+25	4.8438	1.50	|Q	|	|	|	V |
20+30	4.8541	1.49	|Q	|	|	|	V |
20+35	4.8642	1.47	|Q	|	|	|	V |
20+40	4.8741	1.45	|Q	|	|	|	V |
20+45	4.8840	1.43	|Q	|	|	|	V |
20+50	4.8937	1.41	|Q	|	|	|	V |
20+55	4.9033	1.40	|Q	|	|	|	V |
21+ 0	4.9128	1.38	|Q	|	|	|	V |
21+ 5	4.9222	1.36	|Q	|	|	|	V |
21+10	4.9315	1.35	|Q	|	|	|	V |
21+15	4.9407	1.34	|Q	|	|	|	V |
21+20	4.9498	1.32	|Q	|	|	|	V |
21+25	4.9588	1.31	|Q	|	|	|	V |
21+30	4.9677	1.29	|Q	|	|	|	V |
21+35	4.9766	1.28	|Q	|	|	|	V |
21+40	4.9853	1.27	|Q	|	|	|	V |
21+45	4.9939	1.26	|Q	|	|	|	V |
21+50	5.0025	1.24	|Q	|	|	|	V |
21+55	5.0110	1.23	|Q	|	|	|	V |
22+ 0	5.0194	1.22	|Q	|	|	|	V |
22+ 5	5.0277	1.21	|Q	|	|	|	V |
22+10	5.0359	1.20	|Q	|	|	|	V |
22+15	5.0441	1.19	|Q	|	|	|	V |
22+20	5.0522	1.18	|Q	|	|	|	V |
22+25	5.0602	1.17	|Q	|	|	|	V |
22+30	5.0682	1.16	|Q	|	|	|	V |
22+35	5.0761	1.15	|Q	|	|	|	V |
22+40	5.0839	1.14	|Q	|	|	|	V |
22+45	5.0917	1.13	|Q	|	|	|	V |
22+50	5.0994	1.12	|Q	|	|	|	V |
22+55	5.1070	1.11	|Q	|	|	|	V|
23+ 0	5.1146	1.10	|Q	|	|	|	V|
23+ 5	5.1221	1.09	|Q	|	|	|	V|
23+10	5.1296	1.08	|Q	|	|	|	V|
23+15	5.1370	1.08	|Q	|	|	|	V|
23+20	5.1443	1.07	|Q	|	|	|	V|
23+25	5.1516	1.06	|Q	|	|	|	V|
23+30	5.1589	1.05	|Q	|	|	|	V|
23+35	5.1661	1.04	|Q	|	|	|	V|
23+40	5.1732	1.04	|Q	|	|	|	V|
23+45	5.1803	1.03	|Q	|	|	|	V|
23+50	5.1873	1.02	|Q	|	|	|	V|
23+55	5.1943	1.01	|Q	|	|	|	V|
24+ 0	5.2013	1.01	|Q	|	|	|	V|

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

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Study date 08/30/24

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

Program License Serial Number 6277

JOB NO 2021-181
WATSON APPLEY VALLEY 145
10 YEAR UNIT HYDROGRAPH
POST, AREA E

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
38.98	1	0.60
Rainfall data for year 2		
38.98	6	0.76
Rainfall data for year 2		
38.98	24	1.30
Rainfall data for year 100		
38.98	1	1.08
Rainfall data for year 100		
38.98	6	2.01
Rainfall data for year 100		
38.98	24	3.42

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	32.0	38.98	1.000	0.978	0.100	0.098

Area-averaged adjusted loss rate Fm (In/Hr) = 0.098

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
3.90	0.100	32.0	32.0	10.86	0.000
35.08	0.900	98.0	98.0	0.20	0.895

Area-averaged catchment yield fraction, Y = 0.806
Area-averaged low loss fraction, Yb = 0.194
User entry of time of concentration = 0.290 (hours)
++
Watershed area = 38.98(Ac.)
Catchment Lag time = 0.232 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 35.9195
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.098(In/Hr)
Average low loss rate fraction (Yb) = 0.194 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.287(In)
Computed peak 30-minute rainfall = 0.491(In)
Specified peak 1-hour rainfall = 0.605(In)
Computed peak 3-hour rainfall = 0.955(In)
Specified peak 6-hour rainfall = 1.273(In)
Specified peak 24-hour rainfall = 2.172(In)

Rainfall depth area reduction factors:
Using a total area of 38.98(Ac.) (Ref: fig. E-4)

5-minute factor = 0.998 Adjusted rainfall = 0.287(In)
30-minute factor = 0.998 Adjusted rainfall = 0.491(In)
1-hour factor = 0.998 Adjusted rainfall = 0.604(In)
3-hour factor = 1.000 Adjusted rainfall = 0.954(In)
6-hour factor = 1.000 Adjusted rainfall = 1.273(In)
24-hour factor = 1.000 Adjusted rainfall = 2.172(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 = 471.41 (CFS))	
1	2.324	10.956
2	14.291	56.414
3	42.610	133.499
4	61.158	87.439
5	71.110	46.914
6	77.762	31.359
7	82.485	22.265
8	86.128	17.173

9	88.974	13.418
10	91.100	10.018
11	92.881	8.397
12	94.341	6.884
13	95.534	5.622
14	96.507	4.587
15	97.275	3.621
16	97.854	2.727
17	98.230	1.774
18	98.643	1.948
19	99.074	2.032
20	99.478	1.904
21	99.727	1.174
22	100.000	0.587

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2866	0.2866
2	0.3528	0.0662
3	0.3984	0.0456
4	0.4343	0.0359
5	0.4644	0.0301
6	0.4905	0.0261
7	0.5137	0.0232
8	0.5347	0.0210
9	0.5540	0.0192
10	0.5718	0.0178
11	0.5883	0.0166
12	0.6039	0.0156
13	0.6244	0.0205
14	0.6440	0.0196
15	0.6627	0.0188
16	0.6808	0.0181
17	0.6982	0.0174
18	0.7150	0.0168
19	0.7313	0.0163
20	0.7471	0.0158
21	0.7625	0.0153
22	0.7774	0.0149
23	0.7919	0.0145
24	0.8061	0.0142
25	0.8199	0.0138
26	0.8334	0.0135
27	0.8467	0.0132
28	0.8596	0.0129
29	0.8722	0.0127
30	0.8846	0.0124
31	0.8968	0.0122
32	0.9088	0.0119
33	0.9205	0.0117
34	0.9320	0.0115
35	0.9433	0.0113
36	0.9545	0.0111
37	0.9654	0.0109
38	0.9762	0.0108
39	0.9867	0.0106
40	0.9972	0.0104
41	1.0075	0.0103
42	1.0176	0.0101
43	1.0276	0.0100
44	1.0374	0.0099

45	1.0472	0.0097
46	1.0568	0.0096
47	1.0663	0.0095
48	1.0756	0.0094
49	1.0849	0.0093
50	1.0940	0.0091
51	1.1031	0.0090
52	1.1120	0.0089
53	1.1208	0.0088
54	1.1296	0.0087
55	1.1382	0.0086
56	1.1467	0.0086
57	1.1552	0.0085
58	1.1636	0.0084
59	1.1719	0.0083
60	1.1801	0.0082
61	1.1882	0.0081
62	1.1963	0.0081
63	1.2042	0.0080
64	1.2121	0.0079
65	1.2200	0.0078
66	1.2277	0.0078
67	1.2354	0.0077
68	1.2431	0.0076
69	1.2506	0.0076
70	1.2581	0.0075
71	1.2656	0.0074
72	1.2729	0.0074
73	1.2797	0.0068
74	1.2864	0.0067
75	1.2931	0.0067
76	1.2997	0.0066
77	1.3063	0.0066
78	1.3128	0.0065
79	1.3193	0.0065
80	1.3257	0.0064
81	1.3321	0.0064
82	1.3384	0.0063
83	1.3446	0.0063
84	1.3509	0.0062
85	1.3570	0.0062
86	1.3632	0.0061
87	1.3693	0.0061
88	1.3753	0.0060
89	1.3813	0.0060
90	1.3873	0.0060
91	1.3932	0.0059
92	1.3991	0.0059
93	1.4049	0.0058
94	1.4107	0.0058
95	1.4165	0.0058
96	1.4222	0.0057
97	1.4279	0.0057
98	1.4336	0.0057
99	1.4392	0.0056
100	1.4448	0.0056
101	1.4503	0.0056
102	1.4558	0.0055
103	1.4613	0.0055
104	1.4668	0.0055
105	1.4722	0.0054

106	1.4776	0.0054
107	1.4829	0.0054
108	1.4883	0.0053
109	1.4936	0.0053
110	1.4988	0.0053
111	1.5041	0.0052
112	1.5093	0.0052
113	1.5145	0.0052
114	1.5196	0.0052
115	1.5247	0.0051
116	1.5298	0.0051
117	1.5349	0.0051
118	1.5399	0.0050
119	1.5450	0.0050
120	1.5500	0.0050
121	1.5549	0.0050
122	1.5599	0.0049
123	1.5648	0.0049
124	1.5697	0.0049
125	1.5745	0.0049
126	1.5794	0.0048
127	1.5842	0.0048
128	1.5890	0.0048
129	1.5938	0.0048
130	1.5985	0.0048
131	1.6032	0.0047
132	1.6080	0.0047
133	1.6126	0.0047
134	1.6173	0.0047
135	1.6219	0.0046
136	1.6266	0.0046
137	1.6312	0.0046
138	1.6357	0.0046
139	1.6403	0.0046
140	1.6448	0.0045
141	1.6494	0.0045
142	1.6539	0.0045
143	1.6583	0.0045
144	1.6628	0.0045
145	1.6672	0.0044
146	1.6717	0.0044
147	1.6761	0.0044
148	1.6805	0.0044
149	1.6848	0.0044
150	1.6892	0.0043
151	1.6935	0.0043
152	1.6978	0.0043
153	1.7021	0.0043
154	1.7064	0.0043
155	1.7107	0.0043
156	1.7149	0.0042
157	1.7191	0.0042
158	1.7233	0.0042
159	1.7275	0.0042
160	1.7317	0.0042
161	1.7359	0.0042
162	1.7400	0.0041
163	1.7442	0.0041
164	1.7483	0.0041
165	1.7524	0.0041
166	1.7565	0.0041

167	1.7605	0.0041
168	1.7646	0.0041
169	1.7686	0.0040
170	1.7727	0.0040
171	1.7767	0.0040
172	1.7807	0.0040
173	1.7847	0.0040
174	1.7886	0.0040
175	1.7926	0.0040
176	1.7965	0.0039
177	1.8005	0.0039
178	1.8044	0.0039
179	1.8083	0.0039
180	1.8122	0.0039
181	1.8160	0.0039
182	1.8199	0.0039
183	1.8237	0.0038
184	1.8276	0.0038
185	1.8314	0.0038
186	1.8352	0.0038
187	1.8390	0.0038
188	1.8428	0.0038
189	1.8466	0.0038
190	1.8503	0.0038
191	1.8541	0.0037
192	1.8578	0.0037
193	1.8615	0.0037
194	1.8652	0.0037
195	1.8689	0.0037
196	1.8726	0.0037
197	1.8763	0.0037
198	1.8800	0.0037
199	1.8836	0.0037
200	1.8873	0.0036
201	1.8909	0.0036
202	1.8945	0.0036
203	1.8981	0.0036
204	1.9017	0.0036
205	1.9053	0.0036
206	1.9089	0.0036
207	1.9125	0.0036
208	1.9160	0.0036
209	1.9196	0.0035
210	1.9231	0.0035
211	1.9266	0.0035
212	1.9301	0.0035
213	1.9336	0.0035
214	1.9371	0.0035
215	1.9406	0.0035
216	1.9441	0.0035
217	1.9476	0.0035
218	1.9510	0.0035
219	1.9545	0.0034
220	1.9579	0.0034
221	1.9613	0.0034
222	1.9647	0.0034
223	1.9681	0.0034
224	1.9715	0.0034
225	1.9749	0.0034
226	1.9783	0.0034
227	1.9817	0.0034

228	1.9850	0.0034
229	1.9884	0.0034
230	1.9917	0.0033
231	1.9951	0.0033
232	1.9984	0.0033
233	2.0017	0.0033
234	2.0050	0.0033
235	2.0083	0.0033
236	2.0116	0.0033
237	2.0149	0.0033
238	2.0181	0.0033
239	2.0214	0.0033
240	2.0247	0.0033
241	2.0279	0.0032
242	2.0312	0.0032
243	2.0344	0.0032
244	2.0376	0.0032
245	2.0408	0.0032
246	2.0440	0.0032
247	2.0472	0.0032
248	2.0504	0.0032
249	2.0536	0.0032
250	2.0568	0.0032
251	2.0599	0.0032
252	2.0631	0.0032
253	2.0663	0.0032
254	2.0694	0.0031
255	2.0725	0.0031
256	2.0757	0.0031
257	2.0788	0.0031
258	2.0819	0.0031
259	2.0850	0.0031
260	2.0881	0.0031
261	2.0912	0.0031
262	2.0943	0.0031
263	2.0974	0.0031
264	2.1004	0.0031
265	2.1035	0.0031
266	2.1066	0.0031
267	2.1096	0.0030
268	2.1126	0.0030
269	2.1157	0.0030
270	2.1187	0.0030
271	2.1217	0.0030
272	2.1247	0.0030
273	2.1278	0.0030
274	2.1308	0.0030
275	2.1337	0.0030
276	2.1367	0.0030
277	2.1397	0.0030
278	2.1427	0.0030
279	2.1457	0.0030
280	2.1486	0.0030
281	2.1516	0.0030
282	2.1545	0.0029
283	2.1575	0.0029
284	2.1604	0.0029
285	2.1633	0.0029
286	2.1663	0.0029
287	2.1692	0.0029
288	2.1721	0.0029

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0029	0.0006	0.0023
2	0.0029	0.0006	0.0024
3	0.0029	0.0006	0.0024
4	0.0029	0.0006	0.0024
5	0.0029	0.0006	0.0024
6	0.0030	0.0006	0.0024
7	0.0030	0.0006	0.0024
8	0.0030	0.0006	0.0024
9	0.0030	0.0006	0.0024
10	0.0030	0.0006	0.0024
11	0.0030	0.0006	0.0024
12	0.0030	0.0006	0.0024
13	0.0030	0.0006	0.0024
14	0.0030	0.0006	0.0024
15	0.0030	0.0006	0.0025
16	0.0031	0.0006	0.0025
17	0.0031	0.0006	0.0025
18	0.0031	0.0006	0.0025
19	0.0031	0.0006	0.0025
20	0.0031	0.0006	0.0025
21	0.0031	0.0006	0.0025
22	0.0031	0.0006	0.0025
23	0.0031	0.0006	0.0025
24	0.0031	0.0006	0.0025
25	0.0032	0.0006	0.0025
26	0.0032	0.0006	0.0026
27	0.0032	0.0006	0.0026
28	0.0032	0.0006	0.0026
29	0.0032	0.0006	0.0026
30	0.0032	0.0006	0.0026
31	0.0032	0.0006	0.0026
32	0.0032	0.0006	0.0026
33	0.0033	0.0006	0.0026
34	0.0033	0.0006	0.0026
35	0.0033	0.0006	0.0026
36	0.0033	0.0006	0.0027
37	0.0033	0.0006	0.0027
38	0.0033	0.0006	0.0027
39	0.0033	0.0006	0.0027
40	0.0033	0.0006	0.0027
41	0.0034	0.0007	0.0027
42	0.0034	0.0007	0.0027
43	0.0034	0.0007	0.0027
44	0.0034	0.0007	0.0027
45	0.0034	0.0007	0.0028
46	0.0034	0.0007	0.0028
47	0.0034	0.0007	0.0028
48	0.0035	0.0007	0.0028
49	0.0035	0.0007	0.0028
50	0.0035	0.0007	0.0028
51	0.0035	0.0007	0.0028
52	0.0035	0.0007	0.0028
53	0.0035	0.0007	0.0028
54	0.0035	0.0007	0.0029
55	0.0036	0.0007	0.0029
56	0.0036	0.0007	0.0029

57	0.0036	0.0007	0.0029
58	0.0036	0.0007	0.0029
59	0.0036	0.0007	0.0029
60	0.0036	0.0007	0.0029
61	0.0037	0.0007	0.0030
62	0.0037	0.0007	0.0030
63	0.0037	0.0007	0.0030
64	0.0037	0.0007	0.0030
65	0.0037	0.0007	0.0030
66	0.0037	0.0007	0.0030
67	0.0038	0.0007	0.0030
68	0.0038	0.0007	0.0031
69	0.0038	0.0007	0.0031
70	0.0038	0.0007	0.0031
71	0.0038	0.0007	0.0031
72	0.0039	0.0007	0.0031
73	0.0039	0.0008	0.0031
74	0.0039	0.0008	0.0031
75	0.0039	0.0008	0.0032
76	0.0039	0.0008	0.0032
77	0.0040	0.0008	0.0032
78	0.0040	0.0008	0.0032
79	0.0040	0.0008	0.0032
80	0.0040	0.0008	0.0032
81	0.0041	0.0008	0.0033
82	0.0041	0.0008	0.0033
83	0.0041	0.0008	0.0033
84	0.0041	0.0008	0.0033
85	0.0041	0.0008	0.0033
86	0.0042	0.0008	0.0034
87	0.0042	0.0008	0.0034
88	0.0042	0.0008	0.0034
89	0.0042	0.0008	0.0034
90	0.0043	0.0008	0.0034
91	0.0043	0.0008	0.0035
92	0.0043	0.0008	0.0035
93	0.0043	0.0008	0.0035
94	0.0044	0.0008	0.0035
95	0.0044	0.0009	0.0035
96	0.0044	0.0009	0.0036
97	0.0045	0.0009	0.0036
98	0.0045	0.0009	0.0036
99	0.0045	0.0009	0.0036
100	0.0045	0.0009	0.0037
101	0.0046	0.0009	0.0037
102	0.0046	0.0009	0.0037
103	0.0046	0.0009	0.0037
104	0.0047	0.0009	0.0038
105	0.0047	0.0009	0.0038
106	0.0047	0.0009	0.0038
107	0.0048	0.0009	0.0038
108	0.0048	0.0009	0.0039
109	0.0048	0.0009	0.0039
110	0.0049	0.0009	0.0039
111	0.0049	0.0010	0.0040
112	0.0049	0.0010	0.0040
113	0.0050	0.0010	0.0040
114	0.0050	0.0010	0.0040
115	0.0051	0.0010	0.0041
116	0.0051	0.0010	0.0041
117	0.0052	0.0010	0.0042

118	0.0052	0.0010	0.0042
119	0.0052	0.0010	0.0042
120	0.0053	0.0010	0.0042
121	0.0053	0.0010	0.0043
122	0.0054	0.0010	0.0043
123	0.0054	0.0011	0.0044
124	0.0055	0.0011	0.0044
125	0.0055	0.0011	0.0044
126	0.0056	0.0011	0.0045
127	0.0056	0.0011	0.0045
128	0.0057	0.0011	0.0046
129	0.0057	0.0011	0.0046
130	0.0058	0.0011	0.0046
131	0.0058	0.0011	0.0047
132	0.0059	0.0011	0.0047
133	0.0060	0.0012	0.0048
134	0.0060	0.0012	0.0048
135	0.0061	0.0012	0.0049
136	0.0061	0.0012	0.0049
137	0.0062	0.0012	0.0050
138	0.0063	0.0012	0.0051
139	0.0064	0.0012	0.0051
140	0.0064	0.0012	0.0052
141	0.0065	0.0013	0.0052
142	0.0066	0.0013	0.0053
143	0.0067	0.0013	0.0054
144	0.0067	0.0013	0.0054
145	0.0074	0.0014	0.0059
146	0.0074	0.0014	0.0060
147	0.0076	0.0015	0.0061
148	0.0076	0.0015	0.0061
149	0.0078	0.0015	0.0063
150	0.0078	0.0015	0.0063
151	0.0080	0.0015	0.0064
152	0.0081	0.0016	0.0065
153	0.0082	0.0016	0.0066
154	0.0083	0.0016	0.0067
155	0.0085	0.0016	0.0068
156	0.0086	0.0017	0.0069
157	0.0087	0.0017	0.0070
158	0.0088	0.0017	0.0071
159	0.0090	0.0018	0.0073
160	0.0091	0.0018	0.0074
161	0.0094	0.0018	0.0075
162	0.0095	0.0018	0.0076
163	0.0097	0.0019	0.0078
164	0.0099	0.0019	0.0079
165	0.0101	0.0020	0.0082
166	0.0103	0.0020	0.0083
167	0.0106	0.0021	0.0085
168	0.0108	0.0021	0.0087
169	0.0111	0.0022	0.0090
170	0.0113	0.0022	0.0091
171	0.0117	0.0023	0.0095
172	0.0119	0.0023	0.0096
173	0.0124	0.0024	0.0100
174	0.0127	0.0025	0.0102
175	0.0132	0.0026	0.0106
176	0.0135	0.0026	0.0109
177	0.0142	0.0027	0.0114
178	0.0145	0.0028	0.0117

179	0.0153	0.0030	0.0124
180	0.0158	0.0031	0.0127
181	0.0168	0.0033	0.0136
182	0.0174	0.0034	0.0140
183	0.0188	0.0036	0.0151
184	0.0196	0.0038	0.0158
185	0.0156	0.0030	0.0125
186	0.0166	0.0032	0.0134
187	0.0192	0.0037	0.0155
188	0.0210	0.0041	0.0169
189	0.0261	0.0051	0.0210
190	0.0301	0.0058	0.0242
191	0.0456	0.0081	0.0375
192	0.0662	0.0081	0.0581
193	0.2866	0.0081	0.2784
194	0.0359	0.0070	0.0289
195	0.0232	0.0045	0.0187
196	0.0178	0.0035	0.0143
197	0.0205	0.0040	0.0165
198	0.0181	0.0035	0.0146
199	0.0163	0.0032	0.0131
200	0.0149	0.0029	0.0120
201	0.0138	0.0027	0.0111
202	0.0129	0.0025	0.0104
203	0.0122	0.0024	0.0098
204	0.0115	0.0022	0.0093
205	0.0109	0.0021	0.0088
206	0.0104	0.0020	0.0084
207	0.0100	0.0019	0.0081
208	0.0096	0.0019	0.0077
209	0.0093	0.0018	0.0075
210	0.0089	0.0017	0.0072
211	0.0086	0.0017	0.0070
212	0.0084	0.0016	0.0068
213	0.0081	0.0016	0.0066
214	0.0079	0.0015	0.0064
215	0.0077	0.0015	0.0062
216	0.0075	0.0015	0.0060
217	0.0068	0.0013	0.0055
218	0.0066	0.0013	0.0053
219	0.0065	0.0013	0.0052
220	0.0063	0.0012	0.0051
221	0.0062	0.0012	0.0050
222	0.0060	0.0012	0.0049
223	0.0059	0.0011	0.0048
224	0.0058	0.0011	0.0047
225	0.0057	0.0011	0.0046
226	0.0056	0.0011	0.0045
227	0.0055	0.0011	0.0044
228	0.0054	0.0010	0.0043
229	0.0053	0.0010	0.0043
230	0.0052	0.0010	0.0042
231	0.0051	0.0010	0.0041
232	0.0050	0.0010	0.0041
233	0.0050	0.0010	0.0040
234	0.0049	0.0009	0.0039
235	0.0048	0.0009	0.0039
236	0.0048	0.0009	0.0038
237	0.0047	0.0009	0.0038
238	0.0046	0.0009	0.0037
239	0.0046	0.0009	0.0037

240	0.0045	0.0009	0.0036
241	0.0044	0.0009	0.0036
242	0.0044	0.0009	0.0035
243	0.0043	0.0008	0.0035
244	0.0043	0.0008	0.0034
245	0.0042	0.0008	0.0034
246	0.0042	0.0008	0.0034
247	0.0041	0.0008	0.0033
248	0.0041	0.0008	0.0033
249	0.0040	0.0008	0.0033
250	0.0040	0.0008	0.0032
251	0.0040	0.0008	0.0032
252	0.0039	0.0008	0.0032
253	0.0039	0.0008	0.0031
254	0.0038	0.0007	0.0031
255	0.0038	0.0007	0.0031
256	0.0038	0.0007	0.0030
257	0.0037	0.0007	0.0030
258	0.0037	0.0007	0.0030
259	0.0037	0.0007	0.0029
260	0.0036	0.0007	0.0029
261	0.0036	0.0007	0.0029
262	0.0036	0.0007	0.0029
263	0.0035	0.0007	0.0028
264	0.0035	0.0007	0.0028
265	0.0035	0.0007	0.0028
266	0.0034	0.0007	0.0028
267	0.0034	0.0007	0.0027
268	0.0034	0.0007	0.0027
269	0.0034	0.0007	0.0027
270	0.0033	0.0006	0.0027
271	0.0033	0.0006	0.0027
272	0.0033	0.0006	0.0026
273	0.0032	0.0006	0.0026
274	0.0032	0.0006	0.0026
275	0.0032	0.0006	0.0026
276	0.0032	0.0006	0.0026
277	0.0032	0.0006	0.0025
278	0.0031	0.0006	0.0025
279	0.0031	0.0006	0.0025
280	0.0031	0.0006	0.0025
281	0.0031	0.0006	0.0025
282	0.0030	0.0006	0.0025
283	0.0030	0.0006	0.0024
284	0.0030	0.0006	0.0024
285	0.0030	0.0006	0.0024
286	0.0030	0.0006	0.0024
287	0.0029	0.0006	0.0024
288	0.0029	0.0006	0.0024

Total soil rain loss = 0.37(In)
Total effective rainfall = 1.80(In)
Peak flow rate in flood hydrograph = 48.26(CFS)

++

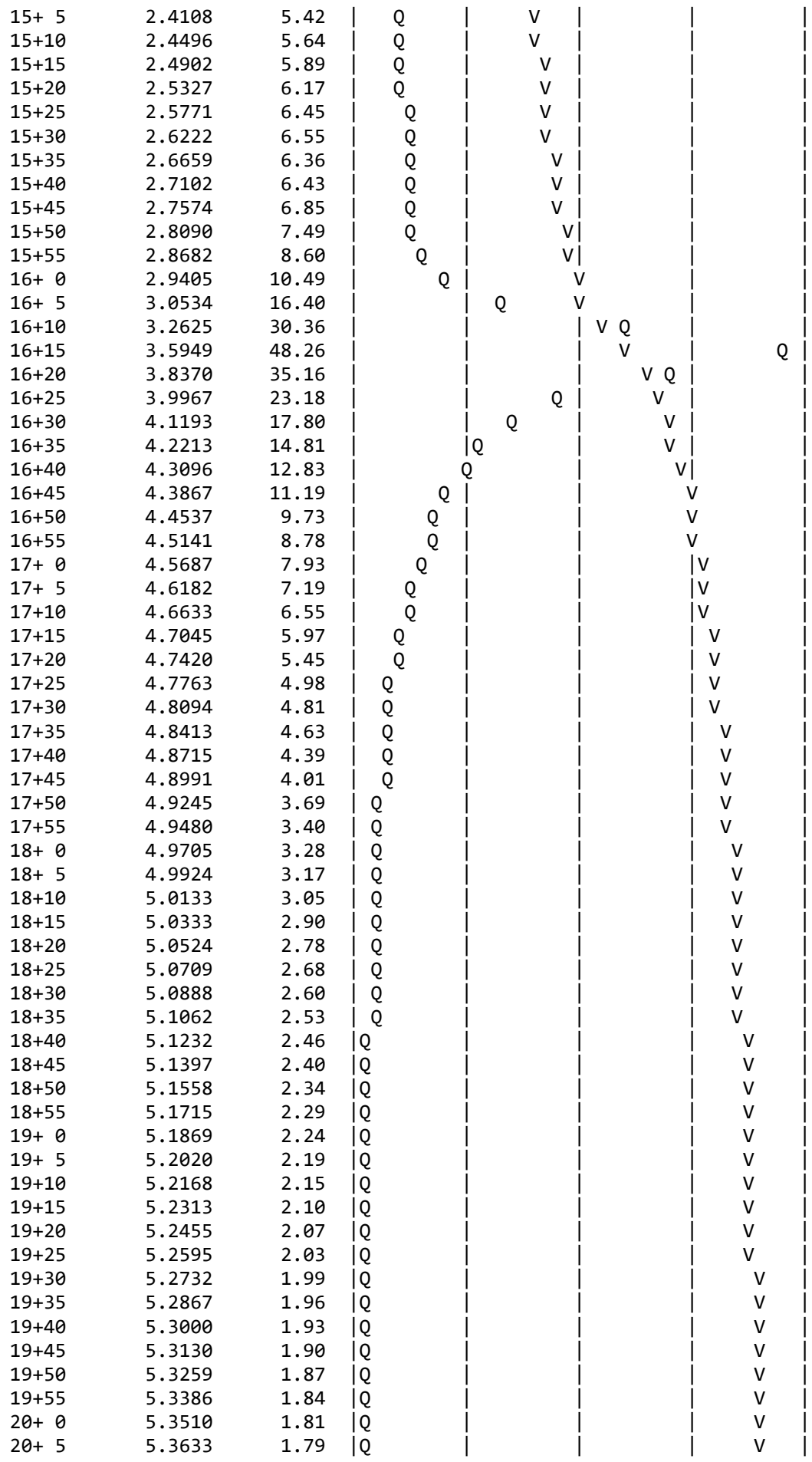
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0002	0.03	Q				
0+10	0.0013	0.16	Q				
0+15	0.0045	0.47	Q				
0+20	0.0092	0.68	Q				
0+25	0.0146	0.79	Q				
0+30	0.0206	0.87	Q				
0+35	0.0269	0.92	Q				
0+40	0.0336	0.96	Q				
0+45	0.0405	1.00	Q				
0+50	0.0475	1.03	Q				
0+55	0.0547	1.05	Q				
1+ 0	0.0621	1.07	Q				
1+ 5	0.0696	1.09	Q				
1+10	0.0772	1.10	Q				
1+15	0.0848	1.11	Q				
1+20	0.0925	1.12	Q				
1+25	0.1003	1.13	Q				
1+30	0.1082	1.14	Q				
1+35	0.1161	1.15	Q				
1+40	0.1240	1.16	Q				
1+45	0.1320	1.16	Q				
1+50	0.1401	1.17	Q				
1+55	0.1482	1.17	QV				
2+ 0	0.1563	1.18	QV				
2+ 5	0.1644	1.18	QV				
2+10	0.1725	1.18	QV				
2+15	0.1807	1.19	QV				
2+20	0.1890	1.19	QV				
2+25	0.1972	1.20	QV				
2+30	0.2055	1.20	QV				
2+35	0.2138	1.21	QV				
2+40	0.2221	1.21	QV				
2+45	0.2305	1.22	QV				
2+50	0.2389	1.22	QV				
2+55	0.2473	1.22	QV				
3+ 0	0.2558	1.23	QV				
3+ 5	0.2643	1.23	QV				
3+10	0.2728	1.24	QV				
3+15	0.2814	1.24	QV				
3+20	0.2900	1.25	QV				
3+25	0.2986	1.25	|QV				
3+30	0.3073	1.26	|QV				
3+35	0.3160	1.26	|QV				
3+40	0.3247	1.27	|QV				
3+45	0.3335	1.27	|QV				
3+50	0.3423	1.28	|QV				
3+55	0.3512	1.28	|QV				
4+ 0	0.3601	1.29	|QV				
4+ 5	0.3690	1.29	|QV				
4+10	0.3779	1.30	|QV				
4+15	0.3869	1.31	|QV				
4+20	0.3960	1.31	|QV				
4+25	0.4050	1.32	|QV				
4+30	0.4141	1.32	|QV				
4+35	0.4233	1.33	|QV				
4+40	0.4325	1.33	|QV				
4+45	0.4417	1.34	|Q V				
4+50	0.4510	1.35	|Q V				

4+55	0.4603	1.35	Q V	|	|	|	|
5+ 0	0.4696	1.36	Q V	|	|	|	|
5+ 5	0.4790	1.36	Q V	|	|	|	|
5+10	0.4885	1.37	Q V	|	|	|	|
5+15	0.4979	1.38	Q V	|	|	|	|
5+20	0.5075	1.38	Q V	|	|	|	|
5+25	0.5170	1.39	Q V	|	|	|	|
5+30	0.5266	1.40	Q V	|	|	|	|
5+35	0.5363	1.40	Q V	|	|	|	|
5+40	0.5460	1.41	Q V	|	|	|	|
5+45	0.5558	1.42	Q V	|	|	|	|
5+50	0.5656	1.42	Q V	|	|	|	|
5+55	0.5754	1.43	Q V	|	|	|	|
6+ 0	0.5853	1.44	Q V	|	|	|	|
6+ 5	0.5952	1.44	Q V	|	|	|	|
6+10	0.6052	1.45	Q V	|	|	|	|
6+15	0.6153	1.46	Q V	|	|	|	|
6+20	0.6254	1.47	Q V	|	|	|	|
6+25	0.6355	1.47	Q V	|	|	|	|
6+30	0.6457	1.48	Q V	|	|	|	|
6+35	0.6560	1.49	Q V	|	|	|	|
6+40	0.6663	1.50	Q V	|	|	|	|
6+45	0.6766	1.50	Q V	|	|	|	|
6+50	0.6871	1.51	Q V	|	|	|	|
6+55	0.6975	1.52	Q V	|	|	|	|
7+ 0	0.7081	1.53	Q V	|	|	|	|
7+ 5	0.7186	1.54	Q V	|	|	|	|
7+10	0.7293	1.55	Q V	|	|	|	|
7+15	0.7400	1.55	Q V	|	|	|	|
7+20	0.7508	1.56	Q V	|	|	|	|
7+25	0.7616	1.57	Q V	|	|	|	|
7+30	0.7725	1.58	Q V	|	|	|	|
7+35	0.7834	1.59	Q V	|	|	|	|
7+40	0.7944	1.60	Q V	|	|	|	|
7+45	0.8055	1.61	Q V	|	|	|	|
7+50	0.8167	1.62	Q V	|	|	|	|
7+55	0.8279	1.63	Q V	|	|	|	|
8+ 0	0.8392	1.64	Q V	|	|	|	|
8+ 5	0.8505	1.65	Q V	|	|	|	|
8+10	0.8619	1.66	Q V	|	|	|	|
8+15	0.8734	1.67	Q V	|	|	|	|
8+20	0.8850	1.68	Q V	|	|	|	|
8+25	0.8966	1.69	Q V	|	|	|	|
8+30	0.9084	1.70	Q V	|	|	|	|
8+35	0.9202	1.71	Q V	|	|	|	|
8+40	0.9320	1.72	Q V	|	|	|	|
8+45	0.9440	1.74	Q V	|	|	|	|
8+50	0.9560	1.75	Q V	|	|	|	|
8+55	0.9681	1.76	Q V	|	|	|	|
9+ 0	0.9803	1.77	Q V	|	|	|	|
9+ 5	0.9926	1.78	Q V	|	|	|	|
9+10	1.0050	1.80	Q V	|	|	|	|
9+15	1.0174	1.81	Q V	|	|	|	|
9+20	1.0300	1.82	Q V	|	|	|	|
9+25	1.0426	1.84	Q V	|	|	|	|
9+30	1.0554	1.85	Q V	|	|	|	|
9+35	1.0682	1.86	Q V	|	|	|	|
9+40	1.0811	1.88	Q V	|	|	|	|
9+45	1.0941	1.89	Q V	|	|	|	|
9+50	1.1073	1.91	Q V	|	|	|	|
9+55	1.1205	1.92	Q V	|	|	|	|

```
10+ 0       1.1338      1.94  |Q     V  |          |          |          |
10+ 5       1.1473      1.95  |Q     V  |          |          |          |
10+10       1.1608      1.97  |Q     V  |          |          |          |
10+15       1.1745      1.98  |Q      V |          |          |          |
10+20       1.1883      2.00  |Q      V |          |          |          |
10+25       1.2022      2.02  |Q      V |          |          |          |
10+30       1.2162      2.04  |Q      V |          |          |          |
10+35       1.2304      2.05  |Q      V |          |          |          |
10+40       1.2446      2.07  |Q      V |          |          |          |
10+45       1.2590      2.09  |Q      V |          |          |          |
10+50       1.2736      2.11  |Q      V |          |          |          |
10+55       1.2882      2.13  |Q      V |          |          |          |
11+ 0       1.3030      2.15  |Q      V |          |          |          |
11+ 5       1.3180      2.17  |Q       V|          |          |          |
11+10       1.3331      2.19  |Q       V|          |          |          |
11+15       1.3483      2.21  |Q       V|          |          |          |
11+20       1.3637      2.24  |Q       V|          |          |          |
11+25       1.3793      2.26  |Q       V|          |          |          |
11+30       1.3950      2.28  |Q       V|          |          |          |
11+35       1.4109      2.31  |Q       V|          |          |          |
11+40       1.4270      2.33  |Q       V|          |          |          |
11+45       1.4432      2.36  |Q       V|          |          |          |
11+50       1.4596      2.38  |Q       V|          |          |          |
11+55       1.4762      2.41  |Q        V          |          |          |
12+ 0       1.4930      2.44  |Q        V          |          |          |
12+ 5       1.5101      2.47  |Q        V          |          |          |
12+10       1.5275      2.53  | Q       V          |          |          |
12+15       1.5455      2.62  | Q       V          |          |          |
12+20       1.5640      2.68  | Q       V          |          |          |
12+25       1.5828      2.74  | Q       V          |          |          |
12+30       1.6020      2.79  | Q       V          |          |          |
12+35       1.6215      2.83  | Q       |V         |          |          |
12+40       1.6413      2.88  | Q       |V         |          |          |
12+45       1.6614      2.92  | Q       |V         |          |          |
12+50       1.6818      2.96  | Q       |V         |          |          |
12+55       1.7026      3.01  | Q       |V         |          |          |
13+ 0       1.7236      3.06  | Q       |V         |          |          |
13+ 5       1.7450      3.10  | Q       |V         |          |          |
13+10       1.7667      3.15  | Q       | V        |          |          |
13+15       1.7888      3.20  | Q       | V        |          |          |
13+20       1.8112      3.25  | Q       | V        |          |          |
13+25       1.8340      3.31  | Q       | V        |          |          |
13+30       1.8572      3.37  | Q       | V        |          |          |
13+35       1.8808      3.43  | Q       | V        |          |          |
13+40       1.9048      3.49  | Q       |  V       |          |          |
13+45       1.9293      3.55  | Q       |  V       |          |          |
13+50       1.9542      3.62  | Q       |  V       |          |          |
13+55       1.9796      3.69  | Q       |  V       |          |          |
14+ 0       2.0056      3.77  |  Q      |  V       |          |          |
14+ 5       2.0321      3.85  |  Q      |  V       |          |          |
14+10       2.0592      3.93  |  Q      |   V      |          |          |
14+15       2.0869      4.03  |  Q      |   V      |          |          |
14+20       2.1153      4.13  |  Q      |   V      |          |          |
14+25       2.1445      4.23  |  Q      |   V      |          |          |
14+30       2.1744      4.34  |  Q      |   V      |          |          |
14+35       2.2051      4.46  |  Q      |    V     |          |          |
14+40       2.2367      4.59  |  Q      |    V     |          |          |
14+45       2.2692      4.73  |  Q      |    V     |          |          |
14+50       2.3028      4.87  |  Q      |    V     |          |          |
14+55       2.3375      5.04  |   Q     |    V     |          |          |
15+ 0       2.3734      5.22  |   Q     |     V    |          |          |
```



```
  20+10       5.3755      1.76  |Q        |         |         |     V   |
  20+15       5.3874      1.74  |Q        |         |         |     V   |
  20+20       5.3993      1.71  |Q        |         |         |     V   |
  20+25       5.4109      1.69  |Q        |         |         |      V  |
  20+30       5.4224      1.67  |Q        |         |         |      V  |
  20+35       5.4338      1.65  |Q        |         |         |      V  |
  20+40       5.4450      1.63  |Q        |         |         |      V  |
  20+45       5.4561      1.61  |Q        |         |         |      V  |
  20+50       5.4671      1.59  |Q        |         |         |      V  |
  20+55       5.4779      1.57  |Q        |         |         |      V  |
  21+ 0       5.4886      1.56  |Q        |         |         |      V  |
  21+ 5       5.4992      1.54  |Q        |         |         |      V  |
  21+10       5.5097      1.52  |Q        |         |         |      V  |
  21+15       5.5201      1.51  |Q        |         |         |      V  |
  21+20       5.5303      1.49  |Q        |         |         |      V  |
  21+25       5.5405      1.47  |Q        |         |         |      V  |
  21+30       5.5505      1.46  |Q        |         |         |      V  |
  21+35       5.5605      1.44  |Q        |         |         |       V |
  21+40       5.5703      1.43  |Q        |         |         |       V |
  21+45       5.5801      1.42  |Q        |         |         |       V |
  21+50       5.5897      1.40  |Q        |         |         |       V |
  21+55       5.5993      1.39  |Q        |         |         |       V |
  22+ 0       5.6088      1.38  |Q        |         |         |       V |
  22+ 5       5.6182      1.36  |Q        |         |         |       V |
  22+10       5.6275      1.35  |Q        |         |         |       V |
  22+15       5.6367      1.34  |Q        |         |         |       V |
  22+20       5.6459      1.33  |Q        |         |         |       V |
  22+25       5.6549      1.32  |Q        |         |         |       V |
  22+30       5.6639      1.31  |Q        |         |         |       V |
  22+35       5.6729      1.30  |Q        |         |         |       V |
  22+40       5.6817      1.28  |Q        |         |         |       V |
  22+45       5.6905      1.27  |Q        |         |         |       V |
  22+50       5.6992      1.26  |Q        |         |         |       V |
  22+55       5.7078      1.25  |Q        |         |         |        V|
  23+ 0       5.7164      1.24  Q         |         |         |        V|
  23+ 5       5.7249      1.23  Q         |         |         |        V|
  23+10       5.7333      1.22  Q         |         |         |        V|
  23+15       5.7417      1.22  Q         |         |         |        V|
  23+20       5.7500      1.21  Q         |         |         |        V|
  23+25       5.7582      1.20  Q         |         |         |        V|
  23+30       5.7664      1.19  Q         |         |         |        V|
  23+35       5.7746      1.18  Q         |         |         |        V|
  23+40       5.7826      1.17  Q         |         |         |        V|
  23+45       5.7907      1.16  Q         |         |         |        V|
  23+50       5.7986      1.16  Q         |         |         |        V|
  23+55       5.8065      1.15  Q         |         |         |        V|
  24+ 0       5.8144      1.14  Q         |         |         |        V|
--------------------------------------------------------------------------
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UNIT HYDROGRAPH ANALYSIS

POST-DEVELOPMENT CONDITION 100 YEAR, 24 HOUR STORM

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

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2004, Version 7.0

Study date 08/07/24

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

Program License Serial Number 6277

JOB NO 2021-181
WATSON APPLEY VALLEY 145
100 YEAR UNIT HYDROGRAPH
POST, AREA A

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
26.87	1	0.60
Rainfall data for year 2		
26.87	6	0.76
Rainfall data for year 2		
26.87	24	1.30
Rainfall data for year 100		
26.87	1	1.08
Rainfall data for year 100		
26.87	6	2.01
Rainfall data for year 100		
26.87	24	3.42

++

******** 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)
32.0	52.0	26.87	1.000	0.785	0.119	0.093

Area-averaged adjusted loss rate Fm (In/Hr) = 0.093

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
3.20	0.119	32.0	52.0	9.23	0.067
23.67	0.881	98.0	98.0	0.20	0.932

Area-averaged catchment yield fraction, Y = 0.829
Area-averaged low loss fraction, Yb = 0.171
User entry of time of concentration = 0.230 (hours)
++
Watershed area = 26.87(Ac.)
Catchment Lag time = 0.184 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 45.2899
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.093(In/Hr)
Average low loss rate fraction (Yb) = 0.171 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.512(In)
Computed peak 30-minute rainfall = 0.877(In)
Specified peak 1-hour rainfall = 1.080(In)
Computed peak 3-hour rainfall = 1.581(In)
Specified peak 6-hour rainfall = 2.010(In)
Specified peak 24-hour rainfall = 3.420(In)

Rainfall depth area reduction factors:
Using a total area of 26.87(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.512(In)
30-minute factor = 0.999 Adjusted rainfall = 0.876(In)
1-hour factor = 0.999 Adjusted rainfall = 1.079(In)
3-hour factor = 1.000 Adjusted rainfall = 1.580(In)
6-hour factor = 1.000 Adjusted rainfall = 2.010(In)
24-hour factor = 1.000 Adjusted rainfall = 3.420(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 = 324.96 (CFS))	
1	3.365	10.935
2	24.923	70.053
3	55.845	100.487
4	70.325	47.054
5	78.657	27.074
6	84.140	17.816
7	88.185	13.145
8	91.006	9.166

9	93.225	7.212
10	94.928	5.534
11	96.264	4.342
12	97.275	3.284
13	97.957	2.219
14	98.440	1.567
15	98.980	1.757
16	99.485	1.641
17	99.796	1.008
18	100.000	0.664

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5118	0.5118
2	0.6301	0.1183
3	0.7116	0.0815
4	0.7758	0.0641
5	0.8295	0.0537
6	0.8761	0.0466
7	0.9176	0.0415
8	0.9551	0.0375
9	0.9895	0.0344
10	1.0212	0.0318
11	1.0508	0.0296
12	1.0786	0.0278
13	1.1091	0.0304
14	1.1380	0.0289
15	1.1657	0.0276
16	1.1921	0.0265
17	1.2175	0.0254
18	1.2419	0.0244
19	1.2655	0.0236
20	1.2883	0.0228
21	1.3103	0.0220
22	1.3317	0.0214
23	1.3524	0.0207
24	1.3726	0.0202
25	1.3922	0.0196
26	1.4113	0.0191
27	1.4300	0.0186
28	1.4482	0.0182
29	1.4659	0.0178
30	1.4833	0.0174
31	1.5003	0.0170
32	1.5170	0.0167
33	1.5333	0.0163
34	1.5493	0.0160
35	1.5650	0.0157
36	1.5804	0.0154
37	1.5955	0.0151
38	1.6103	0.0148
39	1.6249	0.0146
40	1.6392	0.0143
41	1.6533	0.0141
42	1.6672	0.0139
43	1.6808	0.0137
44	1.6943	0.0135
45	1.7075	0.0133
46	1.7206	0.0131
47	1.7335	0.0129
48	1.7462	0.0127

49	1.7587	0.0125
50	1.7711	0.0124
51	1.7833	0.0122
52	1.7953	0.0120
53	1.8072	0.0119
54	1.8190	0.0118
55	1.8306	0.0116
56	1.8421	0.0115
57	1.8534	0.0113
58	1.8646	0.0112
59	1.8757	0.0111
60	1.8867	0.0110
61	1.8975	0.0108
62	1.9083	0.0107
63	1.9189	0.0106
64	1.9294	0.0105
65	1.9398	0.0104
66	1.9501	0.0103
67	1.9603	0.0102
68	1.9704	0.0101
69	1.9804	0.0100
70	1.9903	0.0099
71	2.0001	0.0098
72	2.0098	0.0097
73	2.0205	0.0107
74	2.0311	0.0106
75	2.0415	0.0105
76	2.0519	0.0104
77	2.0622	0.0103
78	2.0725	0.0102
79	2.0826	0.0101
80	2.0927	0.0101
81	2.1027	0.0100
82	2.1126	0.0099
83	2.1224	0.0098
84	2.1322	0.0098
85	2.1419	0.0097
86	2.1515	0.0096
87	2.1611	0.0096
88	2.1706	0.0095
89	2.1800	0.0094
90	2.1894	0.0094
91	2.1987	0.0093
92	2.2079	0.0092
93	2.2171	0.0092
94	2.2262	0.0091
95	2.2352	0.0091
96	2.2442	0.0090
97	2.2532	0.0089
98	2.2620	0.0089
99	2.2709	0.0088
100	2.2796	0.0088
101	2.2883	0.0087
102	2.2970	0.0087
103	2.3056	0.0086
104	2.3142	0.0086
105	2.3227	0.0085
106	2.3311	0.0085
107	2.3395	0.0084
108	2.3479	0.0084
109	2.3562	0.0083

110	2.3645	0.0083
111	2.3727	0.0082
112	2.3809	0.0082
113	2.3890	0.0081
114	2.3971	0.0081
115	2.4051	0.0080
116	2.4131	0.0080
117	2.4211	0.0080
118	2.4290	0.0079
119	2.4369	0.0079
120	2.4447	0.0078
121	2.4525	0.0078
122	2.4602	0.0078
123	2.4680	0.0077
124	2.4756	0.0077
125	2.4833	0.0076
126	2.4909	0.0076
127	2.4984	0.0076
128	2.5059	0.0075
129	2.5134	0.0075
130	2.5209	0.0075
131	2.5283	0.0074
132	2.5357	0.0074
133	2.5430	0.0073
134	2.5504	0.0073
135	2.5576	0.0073
136	2.5649	0.0072
137	2.5721	0.0072
138	2.5793	0.0072
139	2.5864	0.0072
140	2.5935	0.0071
141	2.6006	0.0071
142	2.6077	0.0071
143	2.6147	0.0070
144	2.6217	0.0070
145	2.6287	0.0070
146	2.6356	0.0069
147	2.6425	0.0069
148	2.6494	0.0069
149	2.6563	0.0068
150	2.6631	0.0068
151	2.6699	0.0068
152	2.6766	0.0068
153	2.6834	0.0067
154	2.6901	0.0067
155	2.6968	0.0067
156	2.7034	0.0067
157	2.7101	0.0066
158	2.7167	0.0066
159	2.7232	0.0066
160	2.7298	0.0066
161	2.7363	0.0065
162	2.7428	0.0065
163	2.7493	0.0065
164	2.7558	0.0065
165	2.7622	0.0064
166	2.7686	0.0064
167	2.7750	0.0064
168	2.7813	0.0064
169	2.7877	0.0063
170	2.7940	0.0063

171	2.8003	0.0063
172	2.8066	0.0063
173	2.8128	0.0062
174	2.8190	0.0062
175	2.8252	0.0062
176	2.8314	0.0062
177	2.8376	0.0062
178	2.8437	0.0061
179	2.8498	0.0061
180	2.8559	0.0061
181	2.8620	0.0061
182	2.8680	0.0061
183	2.8741	0.0060
184	2.8801	0.0060
185	2.8861	0.0060
186	2.8920	0.0060
187	2.8980	0.0060
188	2.9039	0.0059
189	2.9098	0.0059
190	2.9157	0.0059
191	2.9216	0.0059
192	2.9275	0.0059
193	2.9333	0.0058
194	2.9391	0.0058
195	2.9449	0.0058
196	2.9507	0.0058
197	2.9565	0.0058
198	2.9622	0.0057
199	2.9679	0.0057
200	2.9736	0.0057
201	2.9793	0.0057
202	2.9850	0.0057
203	2.9907	0.0057
204	2.9963	0.0056
205	3.0019	0.0056
206	3.0075	0.0056
207	3.0131	0.0056
208	3.0187	0.0056
209	3.0243	0.0056
210	3.0298	0.0055
211	3.0353	0.0055
212	3.0408	0.0055
213	3.0463	0.0055
214	3.0518	0.0055
215	3.0573	0.0055
216	3.0627	0.0054
217	3.0681	0.0054
218	3.0735	0.0054
219	3.0789	0.0054
220	3.0843	0.0054
221	3.0897	0.0054
222	3.0951	0.0054
223	3.1004	0.0053
224	3.1057	0.0053
225	3.1110	0.0053
226	3.1163	0.0053
227	3.1216	0.0053
228	3.1269	0.0053
229	3.1321	0.0053
230	3.1374	0.0052
231	3.1426	0.0052

232	3.1478	0.0052	
233	3.1530	0.0052	
234	3.1582	0.0052	
235	3.1633	0.0052	
236	3.1685	0.0052	
237	3.1736	0.0051	
238	3.1788	0.0051	
239	3.1839	0.0051	
240	3.1890	0.0051	
241	3.1941	0.0051	
242	3.1991	0.0051	
243	3.2042	0.0051	
244	3.2092	0.0050	
245	3.2143	0.0050	
246	3.2193	0.0050	
247	3.2243	0.0050	
248	3.2293	0.0050	
249	3.2343	0.0050	
250	3.2393	0.0050	
251	3.2442	0.0050	
252	3.2492	0.0049	
253	3.2541	0.0049	
254	3.2591	0.0049	
255	3.2640	0.0049	
256	3.2689	0.0049	
257	3.2738	0.0049	
258	3.2786	0.0049	
259	3.2835	0.0049	
260	3.2884	0.0049	
261	3.2932	0.0048	
262	3.2980	0.0048	
263	3.3029	0.0048	
264	3.3077	0.0048	
265	3.3125	0.0048	
266	3.3173	0.0048	
267	3.3220	0.0048	
268	3.3268	0.0048	
269	3.3316	0.0048	
270	3.3363	0.0047	
271	3.3410	0.0047	
272	3.3457	0.0047	
273	3.3505	0.0047	
274	3.3552	0.0047	
275	3.3598	0.0047	
276	3.3645	0.0047	
277	3.3692	0.0047	
278	3.3739	0.0047	
279	3.3785	0.0046	
280	3.3831	0.0046	
281	3.3878	0.0046	
282	3.3924	0.0046	
283	3.3970	0.0046	
284	3.4016	0.0046	
285	3.4062	0.0046	
286	3.4108	0.0046	
287	3.4153	0.0046	
288	3.4199	0.0046	

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)

1	0.0046	0.0008	0.0038
2	0.0046	0.0008	0.0038
3	0.0046	0.0008	0.0038
4	0.0046	0.0008	0.0038
5	0.0046	0.0008	0.0038
6	0.0046	0.0008	0.0038
7	0.0046	0.0008	0.0039
8	0.0047	0.0008	0.0039
9	0.0047	0.0008	0.0039
10	0.0047	0.0008	0.0039
11	0.0047	0.0008	0.0039
12	0.0047	0.0008	0.0039
13	0.0047	0.0008	0.0039
14	0.0048	0.0008	0.0039
15	0.0048	0.0008	0.0040
16	0.0048	0.0008	0.0040
17	0.0048	0.0008	0.0040
18	0.0048	0.0008	0.0040
19	0.0048	0.0008	0.0040
20	0.0049	0.0008	0.0040
21	0.0049	0.0008	0.0040
22	0.0049	0.0008	0.0041
23	0.0049	0.0008	0.0041
24	0.0049	0.0008	0.0041
25	0.0049	0.0008	0.0041
26	0.0050	0.0008	0.0041
27	0.0050	0.0009	0.0041
28	0.0050	0.0009	0.0041
29	0.0050	0.0009	0.0042
30	0.0050	0.0009	0.0042
31	0.0051	0.0009	0.0042
32	0.0051	0.0009	0.0042
33	0.0051	0.0009	0.0042
34	0.0051	0.0009	0.0042
35	0.0051	0.0009	0.0043
36	0.0052	0.0009	0.0043
37	0.0052	0.0009	0.0043
38	0.0052	0.0009	0.0043
39	0.0052	0.0009	0.0043
40	0.0052	0.0009	0.0043
41	0.0053	0.0009	0.0044
42	0.0053	0.0009	0.0044
43	0.0053	0.0009	0.0044
44	0.0053	0.0009	0.0044
45	0.0054	0.0009	0.0044
46	0.0054	0.0009	0.0044
47	0.0054	0.0009	0.0045
48	0.0054	0.0009	0.0045
49	0.0054	0.0009	0.0045
50	0.0055	0.0009	0.0045
51	0.0055	0.0009	0.0046
52	0.0055	0.0009	0.0046
53	0.0055	0.0009	0.0046
54	0.0056	0.0010	0.0046
55	0.0056	0.0010	0.0046
56	0.0056	0.0010	0.0046
57	0.0056	0.0010	0.0047
58	0.0057	0.0010	0.0047
59	0.0057	0.0010	0.0047
60	0.0057	0.0010	0.0047

61	0.0057	0.0010	0.0048
62	0.0058	0.0010	0.0048
63	0.0058	0.0010	0.0048
64	0.0058	0.0010	0.0048
65	0.0059	0.0010	0.0049
66	0.0059	0.0010	0.0049
67	0.0059	0.0010	0.0049
68	0.0059	0.0010	0.0049
69	0.0060	0.0010	0.0049
70	0.0060	0.0010	0.0050
71	0.0060	0.0010	0.0050
72	0.0061	0.0010	0.0050
73	0.0061	0.0010	0.0051
74	0.0061	0.0010	0.0051
75	0.0062	0.0011	0.0051
76	0.0062	0.0011	0.0051
77	0.0062	0.0011	0.0052
78	0.0062	0.0011	0.0052
79	0.0063	0.0011	0.0052
80	0.0063	0.0011	0.0052
81	0.0064	0.0011	0.0053
82	0.0064	0.0011	0.0053
83	0.0064	0.0011	0.0053
84	0.0065	0.0011	0.0054
85	0.0065	0.0011	0.0054
86	0.0065	0.0011	0.0054
87	0.0066	0.0011	0.0055
88	0.0066	0.0011	0.0055
89	0.0067	0.0011	0.0055
90	0.0067	0.0011	0.0055
91	0.0067	0.0012	0.0056
92	0.0068	0.0012	0.0056
93	0.0068	0.0012	0.0057
94	0.0068	0.0012	0.0057
95	0.0069	0.0012	0.0057
96	0.0069	0.0012	0.0057
97	0.0070	0.0012	0.0058
98	0.0070	0.0012	0.0058
99	0.0071	0.0012	0.0059
100	0.0071	0.0012	0.0059
101	0.0072	0.0012	0.0060
102	0.0072	0.0012	0.0060
103	0.0073	0.0012	0.0060
104	0.0073	0.0013	0.0061
105	0.0074	0.0013	0.0061
106	0.0074	0.0013	0.0061
107	0.0075	0.0013	0.0062
108	0.0075	0.0013	0.0062
109	0.0076	0.0013	0.0063
110	0.0076	0.0013	0.0063
111	0.0077	0.0013	0.0064
112	0.0078	0.0013	0.0064
113	0.0078	0.0013	0.0065
114	0.0079	0.0013	0.0065
115	0.0080	0.0014	0.0066
116	0.0080	0.0014	0.0066
117	0.0081	0.0014	0.0067
118	0.0081	0.0014	0.0067
119	0.0082	0.0014	0.0068
120	0.0083	0.0014	0.0069
121	0.0084	0.0014	0.0069

122	0.0084	0.0014	0.0070
123	0.0085	0.0015	0.0071
124	0.0086	0.0015	0.0071
125	0.0087	0.0015	0.0072
126	0.0087	0.0015	0.0072
127	0.0088	0.0015	0.0073
128	0.0089	0.0015	0.0074
129	0.0090	0.0015	0.0075
130	0.0091	0.0015	0.0075
131	0.0092	0.0016	0.0076
132	0.0092	0.0016	0.0077
133	0.0094	0.0016	0.0078
134	0.0094	0.0016	0.0078
135	0.0096	0.0016	0.0079
136	0.0096	0.0016	0.0080
137	0.0098	0.0017	0.0081
138	0.0098	0.0017	0.0082
139	0.0100	0.0017	0.0083
140	0.0101	0.0017	0.0083
141	0.0102	0.0018	0.0085
142	0.0103	0.0018	0.0085
143	0.0105	0.0018	0.0087
144	0.0106	0.0018	0.0088
145	0.0097	0.0017	0.0081
146	0.0098	0.0017	0.0081
147	0.0100	0.0017	0.0083
148	0.0101	0.0017	0.0084
149	0.0103	0.0018	0.0085
150	0.0104	0.0018	0.0086
151	0.0106	0.0018	0.0088
152	0.0107	0.0018	0.0089
153	0.0110	0.0019	0.0091
154	0.0111	0.0019	0.0092
155	0.0113	0.0019	0.0094
156	0.0115	0.0020	0.0095
157	0.0118	0.0020	0.0097
158	0.0119	0.0020	0.0099
159	0.0122	0.0021	0.0101
160	0.0124	0.0021	0.0102
161	0.0127	0.0022	0.0105
162	0.0129	0.0022	0.0107
163	0.0133	0.0023	0.0110
164	0.0135	0.0023	0.0112
165	0.0139	0.0024	0.0115
166	0.0141	0.0024	0.0117
167	0.0146	0.0025	0.0121
168	0.0148	0.0025	0.0123
169	0.0154	0.0026	0.0128
170	0.0157	0.0027	0.0130
171	0.0163	0.0028	0.0135
172	0.0167	0.0028	0.0138
173	0.0174	0.0030	0.0144
174	0.0178	0.0030	0.0147
175	0.0186	0.0032	0.0155
176	0.0191	0.0033	0.0158
177	0.0202	0.0034	0.0167
178	0.0207	0.0035	0.0172
179	0.0220	0.0038	0.0183
180	0.0228	0.0039	0.0189
181	0.0244	0.0042	0.0203
182	0.0254	0.0043	0.0210

183	0.0276	0.0047	0.0229
184	0.0289	0.0050	0.0240
185	0.0278	0.0048	0.0230
186	0.0296	0.0051	0.0246
187	0.0344	0.0059	0.0285
188	0.0375	0.0064	0.0311
189	0.0466	0.0078	0.0388
190	0.0537	0.0078	0.0459
191	0.0815	0.0078	0.0737
192	0.1183	0.0078	0.1105
193	0.5118	0.0078	0.5040
194	0.0641	0.0078	0.0564
195	0.0415	0.0071	0.0344
196	0.0318	0.0054	0.0263
197	0.0304	0.0052	0.0252
198	0.0265	0.0045	0.0219
199	0.0236	0.0040	0.0195
200	0.0214	0.0037	0.0177
201	0.0196	0.0034	0.0163
202	0.0182	0.0031	0.0151
203	0.0170	0.0029	0.0141
204	0.0160	0.0027	0.0133
205	0.0151	0.0026	0.0125
206	0.0143	0.0025	0.0119
207	0.0137	0.0023	0.0113
208	0.0131	0.0022	0.0108
209	0.0125	0.0021	0.0104
210	0.0120	0.0021	0.0100
211	0.0116	0.0020	0.0096
212	0.0112	0.0019	0.0093
213	0.0108	0.0019	0.0090
214	0.0105	0.0018	0.0087
215	0.0102	0.0017	0.0085
216	0.0099	0.0017	0.0082
217	0.0107	0.0018	0.0088
218	0.0104	0.0018	0.0086
219	0.0101	0.0017	0.0084
220	0.0099	0.0017	0.0082
221	0.0097	0.0017	0.0080
222	0.0095	0.0016	0.0079
223	0.0093	0.0016	0.0077
224	0.0091	0.0016	0.0076
225	0.0089	0.0015	0.0074
226	0.0088	0.0015	0.0073
227	0.0086	0.0015	0.0071
228	0.0085	0.0014	0.0070
229	0.0083	0.0014	0.0069
230	0.0082	0.0014	0.0068
231	0.0080	0.0014	0.0067
232	0.0079	0.0014	0.0066
233	0.0078	0.0013	0.0065
234	0.0077	0.0013	0.0064
235	0.0076	0.0013	0.0063
236	0.0075	0.0013	0.0062
237	0.0073	0.0013	0.0061
238	0.0072	0.0012	0.0060
239	0.0072	0.0012	0.0059
240	0.0071	0.0012	0.0058
241	0.0070	0.0012	0.0058
242	0.0069	0.0012	0.0057
243	0.0068	0.0012	0.0056

244	0.0067	0.0011	0.0056
245	0.0066	0.0011	0.0055
246	0.0066	0.0011	0.0054
247	0.0065	0.0011	0.0054
248	0.0064	0.0011	0.0053
249	0.0063	0.0011	0.0053
250	0.0063	0.0011	0.0052
251	0.0062	0.0011	0.0051
252	0.0061	0.0011	0.0051
253	0.0061	0.0010	0.0050
254	0.0060	0.0010	0.0050
255	0.0060	0.0010	0.0049
256	0.0059	0.0010	0.0049
257	0.0058	0.0010	0.0048
258	0.0058	0.0010	0.0048
259	0.0057	0.0010	0.0047
260	0.0057	0.0010	0.0047
261	0.0056	0.0010	0.0047
262	0.0056	0.0010	0.0046
263	0.0055	0.0009	0.0046
264	0.0055	0.0009	0.0045
265	0.0054	0.0009	0.0045
266	0.0054	0.0009	0.0045
267	0.0053	0.0009	0.0044
268	0.0053	0.0009	0.0044
269	0.0053	0.0009	0.0044
270	0.0052	0.0009	0.0043
271	0.0052	0.0009	0.0043
272	0.0051	0.0009	0.0043
273	0.0051	0.0009	0.0042
274	0.0050	0.0009	0.0042
275	0.0050	0.0009	0.0042
276	0.0050	0.0009	0.0041
277	0.0049	0.0008	0.0041
278	0.0049	0.0008	0.0041
279	0.0049	0.0008	0.0040
280	0.0048	0.0008	0.0040
281	0.0048	0.0008	0.0040
282	0.0048	0.0008	0.0039
283	0.0047	0.0008	0.0039
284	0.0047	0.0008	0.0039
285	0.0047	0.0008	0.0039
286	0.0046	0.0008	0.0038
287	0.0046	0.0008	0.0038
288	0.0046	0.0008	0.0038

Total soil rain loss = 0.48(In)
Total effective rainfall = 2.94(In)
Peak flow rate in flood hydrograph = 64.48(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       17.5      35.0      52.5      70.0
-------------------------------------------------------------------------
  0+ 5       0.0003      0.04  Q         |         |         |         |
```

0+10	0.0024	0.31	Q	|	|	|	|
0+15	0.0071	0.69	Q	|	|	|	|
0+20	0.0131	0.87	Q	|	|	|	|
0+25	0.0198	0.97	Q	|	|	|	|
0+30	0.0270	1.04	Q	|	|	|	|
0+35	0.0345	1.09	Q	|	|	|	|
0+40	0.0423	1.13	Q	|	|	|	|
0+45	0.0503	1.16	Q	|	|	|	|
0+50	0.0585	1.19	Q	|	|	|	|
0+55	0.0668	1.21	Q	|	|	|	|
1+ 0	0.0753	1.23	Q	|	|	|	|
1+ 5	0.0838	1.24	Q	|	|	|	|
1+10	0.0924	1.25	Q	|	|	|	|
1+15	0.1011	1.26	Q	|	|	|	|
1+20	0.1098	1.27	Q	|	|	|	|
1+25	0.1186	1.28	Q	|	|	|	|
1+30	0.1275	1.28	Q	|	|	|	|
1+35	0.1363	1.29	Q	|	|	|	|
1+40	0.1452	1.29	Q	|	|	|	|
1+45	0.1542	1.30	Q	|	|	|	|
1+50	0.1632	1.30	Q	|	|	|	|
1+55	0.1722	1.31	QV	|	|	|	|
2+ 0	0.1812	1.31	QV	|	|	|	|
2+ 5	0.1903	1.32	QV	|	|	|	|
2+10	0.1994	1.32	QV	|	|	|	|
2+15	0.2085	1.33	QV	|	|	|	|
2+20	0.2177	1.33	QV	|	|	|	|
2+25	0.2269	1.34	QV	|	|	|	|
2+30	0.2361	1.34	QV	|	|	|	|
2+35	0.2454	1.35	QV	|	|	|	|
2+40	0.2547	1.35	QV	|	|	|	|
2+45	0.2640	1.36	QV	|	|	|	|
2+50	0.2734	1.36	QV	|	|	|	|
2+55	0.2828	1.37	QV	|	|	|	|
3+ 0	0.2923	1.37	QV	|	|	|	|
3+ 5	0.3018	1.38	QV	|	|	|	|
3+10	0.3113	1.38	QV	|	|	|	|
3+15	0.3208	1.39	QV	|	|	|	|
3+20	0.3304	1.39	Q V	|	|	|	|
3+25	0.3401	1.40	Q V	|	|	|	|
3+30	0.3497	1.40	Q V	|	|	|	|
3+35	0.3595	1.41	Q V	|	|	|	|
3+40	0.3692	1.42	Q V	|	|	|	|
3+45	0.3790	1.42	Q V	|	|	|	|
3+50	0.3888	1.43	Q V	|	|	|	|
3+55	0.3987	1.43	Q V	|	|	|	|
4+ 0	0.4086	1.44	Q V	|	|	|	|
4+ 5	0.4186	1.45	Q V	|	|	|	|
4+10	0.4286	1.45	Q V	|	|	|	|
4+15	0.4386	1.46	Q V	|	|	|	|
4+20	0.4487	1.46	Q V	|	|	|	|
4+25	0.4588	1.47	Q V	|	|	|	|
4+30	0.4690	1.48	Q V	|	|	|	|
4+35	0.4792	1.48	Q V	|	|	|	|
4+40	0.4895	1.49	Q V	|	|	|	|
4+45	0.4998	1.50	Q V	|	|	|	|
4+50	0.5101	1.50	Q V	|	|	|	|
4+55	0.5205	1.51	Q V	|	|	|	|
5+ 0	0.5310	1.52	Q V	|	|	|	|
5+ 5	0.5415	1.52	Q V	|	|	|	|
5+10	0.5520	1.53	Q V	|	|	|	|

5+15	0.5626	1.54	Q V	|	|	|	|
5+20	0.5732	1.54	Q V	|	|	|	|
5+25	0.5839	1.55	Q V	|	|	|	|
5+30	0.5947	1.56	Q V	|	|	|	|
5+35	0.6054	1.57	Q V	|	|	|	|
5+40	0.6163	1.57	Q V	|	|	|	|
5+45	0.6272	1.58	Q V	|	|	|	|
5+50	0.6381	1.59	Q V	|	|	|	|
5+55	0.6491	1.60	Q V	|	|	|	|
6+ 0	0.6602	1.61	Q V	|	|	|	|
6+ 5	0.6713	1.61	Q V	|	|	|	|
6+10	0.6825	1.62	Q V	|	|	|	|
6+15	0.6937	1.63	Q V	|	|	|	|
6+20	0.7050	1.64	Q V	|	|	|	|
6+25	0.7163	1.65	Q V	|	|	|	|
6+30	0.7277	1.66	Q V	|	|	|	|
6+35	0.7392	1.66	Q V	|	|	|	|
6+40	0.7507	1.67	Q V	|	|	|	|
6+45	0.7623	1.68	Q V	|	|	|	|
6+50	0.7739	1.69	Q V	|	|	|	|
6+55	0.7856	1.70	Q V	|	|	|	|
7+ 0	0.7974	1.71	Q V	|	|	|	|
7+ 5	0.8093	1.72	Q V	|	|	|	|
7+10	0.8212	1.73	Q V	|	|	|	|
7+15	0.8331	1.74	Q V	|	|	|	|
7+20	0.8452	1.75	Q V	|	|	|	|
7+25	0.8573	1.76	|Q V	|	|	|	|
7+30	0.8695	1.77	|Q V	|	|	|	|
7+35	0.8817	1.78	|Q V	|	|	|	|
7+40	0.8940	1.79	|Q V	|	|	|	|
7+45	0.9064	1.80	|Q V	|	|	|	|
7+50	0.9189	1.81	|Q V	|	|	|	|
7+55	0.9314	1.82	|Q V	|	|	|	|
8+ 0	0.9441	1.83	|Q V	|	|	|	|
8+ 5	0.9568	1.84	|Q V	|	|	|	|
8+10	0.9696	1.86	|Q V	|	|	|	|
8+15	0.9824	1.87	|Q V	|	|	|	|
8+20	0.9954	1.88	|Q V	|	|	|	|
8+25	1.0084	1.89	|Q V	|	|	|	|
8+30	1.0215	1.90	|Q V	|	|	|	|
8+35	1.0347	1.92	|Q V	|	|	|	|
8+40	1.0480	1.93	|Q V	|	|	|	|
8+45	1.0614	1.94	|Q V	|	|	|	|
8+50	1.0749	1.96	|Q V	|	|	|	|
8+55	1.0884	1.97	|Q V	|	|	|	|
9+ 0	1.1021	1.98	|Q V	|	|	|	|
9+ 5	1.1158	2.00	|Q V	|	|	|	|
9+10	1.1297	2.01	|Q V	|	|	|	|
9+15	1.1437	2.03	|Q V	|	|	|	|
9+20	1.1577	2.04	|Q V	|	|	|	|
9+25	1.1719	2.06	|Q V	|	|	|	|
9+30	1.1861	2.07	|Q V	|	|	|	|
9+35	1.2005	2.09	|Q V	|	|	|	|
9+40	1.2150	2.10	|Q V	|	|	|	|
9+45	1.2296	2.12	|Q V	|	|	|	|
9+50	1.2443	2.14	|Q V	|	|	|	|
9+55	1.2592	2.15	|Q V	|	|	|	|
10+ 0	1.2741	2.17	|Q V	|	|	|	|
10+ 5	1.2892	2.19	|Q V	|	|	|	|
10+10	1.3044	2.21	|Q V	|	|	|	|
10+15	1.3197	2.23	|Q V	|	|	|	|

10+20	1.3352	2.24	Q V				
10+25	1.3508	2.26	Q V				
10+30	1.3665	2.28	Q V				
10+35	1.3824	2.30	Q V				
10+40	1.3984	2.33	Q V				
10+45	1.4146	2.35	Q V				
10+50	1.4309	2.37	Q V				
10+55	1.4474	2.39	Q V				
11+ 0	1.4640	2.41	Q V				
11+ 5	1.4808	2.44	Q V				
11+10	1.4977	2.46	Q V				
11+15	1.5149	2.49	Q V				
11+20	1.5322	2.51	Q V				
11+25	1.5496	2.54	Q V				
11+30	1.5673	2.57	Q V				
11+35	1.5852	2.59	Q V				
11+40	1.6032	2.62	Q V				
11+45	1.6215	2.65	Q V				
11+50	1.6399	2.68	Q V				
11+55	1.6586	2.71	Q V				
12+ 0	1.6775	2.74	Q V				
12+ 5	1.6966	2.77	Q V				
12+10	1.7155	2.74	Q V				
12+15	1.7340	2.69	Q V				
12+20	1.7526	2.69	Q V				
12+25	1.7712	2.70	Q V				
12+30	1.7899	2.72	Q V				
12+35	1.8089	2.75	Q V				
12+40	1.8281	2.79	Q V				
12+45	1.8475	2.82	Q V				
12+50	1.8672	2.86	Q V				
12+55	1.8872	2.90	Q V				
13+ 0	1.9075	2.95	Q V				
13+ 5	1.9281	2.99	Q V				
13+10	1.9491	3.04	Q V				
13+15	1.9704	3.10	Q V				
13+20	1.9921	3.15	Q V				
13+25	2.0142	3.21	Q V				
13+30	2.0368	3.27	Q V				
13+35	2.0597	3.34	Q V				
13+40	2.0832	3.40	Q V				
13+45	2.1071	3.48	Q V				
13+50	2.1316	3.55	Q V				
13+55	2.1566	3.63	Q V				
14+ 0	2.1822	3.72	Q V				
14+ 5	2.2084	3.81	Q V				
14+10	2.2353	3.91	Q V				
14+15	2.2630	4.01	Q V				
14+20	2.2913	4.12	Q V				
14+25	2.3206	4.24	Q V				
14+30	2.3507	4.37	Q V				
14+35	2.3817	4.51	Q V				
14+40	2.4138	4.66	Q V				
14+45	2.4470	4.82	Q V				
14+50	2.4814	5.00	Q V				
14+55	2.5171	5.19	Q V				
15+ 0	2.5544	5.41	Q V				
15+ 5	2.5933	5.65	Q V				
15+10	2.6341	5.92	Q V				
15+15	2.6769	6.23	Q V				
15+20	2.7222	6.58	Q V				

15+25	2.7701	6.95	Q	V			
15+30	2.8195	7.18	Q	V			
15+35	2.8704	7.39	Q	V			
15+40	2.9249	7.90	Q	V			
15+45	2.9847	8.69	Q	V			
15+50	3.0524	9.84	Q	V			
15+55	3.1330	11.70	Q	V			
16+ 0	3.2385	15.31	Q	V			
16+ 5	3.4152	25.66	Q	V			
16+10	3.7854	53.76	V	Q			
16+15	4.2295	64.48	V	Q			
16+20	4.4919	38.10	Q	V			
16+25	4.6715	26.09	Q	V			
16+30	4.8085	19.89	Q	V			
16+35	4.9212	16.37	Q	V			
16+40	5.0136	13.40	Q	V			
16+45	5.0929	11.52	Q	V			
16+50	5.1613	9.93	Q	V			
16+55	5.2211	8.68	Q	V			
17+ 0	5.2734	7.60	Q	V			
17+ 5	5.3190	6.62	Q	V			
17+10	5.3599	5.94	Q	V			
17+15	5.3989	5.66	Q	V			
17+20	5.4351	5.26	Q	V			
17+25	5.4673	4.67	Q	V			
17+30	5.4964	4.23	Q	V			
17+35	5.5220	3.71	Q	V			
17+40	5.5463	3.53	Q	V			
17+45	5.5695	3.37	Q	V			
17+50	5.5917	3.23	Q	V			
17+55	5.6131	3.11	Q	V			
18+ 0	5.6338	3.00	Q	V			
18+ 5	5.6538	2.91	Q	V			
18+10	5.6736	2.87	Q	V			
18+15	5.6934	2.87	Q	V			
18+20	5.7129	2.83	Q	V			
18+25	5.7321	2.78	Q	V			
18+30	5.7509	2.73	Q	V			
18+35	5.7693	2.67	Q	V			
18+40	5.7873	2.62	Q	V			
18+45	5.8050	2.57	Q	V			
18+50	5.8224	2.52	Q	V			
18+55	5.8394	2.47	Q	V			
19+ 0	5.8561	2.42	Q	V			
19+ 5	5.8724	2.38	Q	V			
19+10	5.8885	2.34	Q	V			
19+15	5.9043	2.30	Q	V			
19+20	5.9199	2.26	Q	V			
19+25	5.9352	2.22	Q	V			
19+30	5.9502	2.18	Q	V			
19+35	5.9650	2.15	Q	V			
19+40	5.9795	2.11	Q	V			
19+45	5.9939	2.08	Q	V			
19+50	6.0080	2.05	Q	V			
19+55	6.0219	2.02	Q	V			
20+ 0	6.0356	1.99	Q	V			
20+ 5	6.0492	1.96	Q	V			
20+10	6.0625	1.94	Q	V			
20+15	6.0757	1.91	Q	V			
20+20	6.0887	1.89	Q	V			
20+25	6.1015	1.86	Q	V			

```
  20+30       6.1142      1.84  |Q        |         |         |      V  |
  20+35       6.1267      1.82  |Q        |         |         |      V  |
  20+40       6.1390      1.80  |Q        |         |         |      V  |
  20+45       6.1513      1.77  |Q        |         |         |      V  |
  20+50       6.1633      1.75  |Q        |         |         |      V  |
  20+55       6.1753      1.73  Q         |         |         |      V  |
  21+ 0       6.1871      1.71  Q         |         |         |      V  |
  21+ 5       6.1988      1.70  Q         |         |         |      V  |
  21+10       6.2103      1.68  Q         |         |         |      V  |
  21+15       6.2217      1.66  Q         |         |         |      V  |
  21+20       6.2331      1.64  Q         |         |         |      V  |
  21+25       6.2443      1.63  Q         |         |         |      V  |
  21+30       6.2553      1.61  Q         |         |         |       V |
  21+35       6.2663      1.59  Q         |         |         |       V |
  21+40       6.2772      1.58  Q         |         |         |       V |
  21+45       6.2879      1.56  Q         |         |         |       V |
  21+50       6.2986      1.55  Q         |         |         |       V |
  21+55       6.3092      1.53  Q         |         |         |       V |
  22+ 0       6.3196      1.52  Q         |         |         |       V |
  22+ 5       6.3300      1.51  Q         |         |         |       V |
  22+10       6.3403      1.49  Q         |         |         |       V |
  22+15       6.3505      1.48  Q         |         |         |       V |
  22+20       6.3606      1.47  Q         |         |         |       V |
  22+25       6.3706      1.45  Q         |         |         |       V |
  22+30       6.3805      1.44  Q         |         |         |       V |
  22+35       6.3904      1.43  Q         |         |         |       V |
  22+40       6.4002      1.42  Q         |         |         |       V |
  22+45       6.4099      1.41  Q         |         |         |       V |
  22+50       6.4195      1.40  Q         |         |         |        V|
  22+55       6.4290      1.39  Q         |         |         |        V|
  23+ 0       6.4385      1.37  Q         |         |         |        V|
  23+ 5       6.4479      1.36  Q         |         |         |        V|
  23+10       6.4572      1.35  Q         |         |         |        V|
  23+15       6.4664      1.34  Q         |         |         |        V|
  23+20       6.4756      1.33  Q         |         |         |        V|
  23+25       6.4847      1.32  Q         |         |         |        V|
  23+30       6.4938      1.31  Q         |         |         |        V|
  23+35       6.5028      1.30  Q         |         |         |        V|
  23+40       6.5117      1.30  Q         |         |         |        V|
  23+45       6.5206      1.29  Q         |         |         |        V|
  23+50       6.5294      1.28  Q         |         |         |        V|
  23+55       6.5381      1.27  Q         |         |         |        V|
  24+ 0       6.5468      1.26  Q         |         |         |        V|
-------------------------------------------------------------------------
```

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

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Study date 08/09/24

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

Program License Serial Number 6277

JOB NO 2021-181
WATSON APPLEY VALLEY 145
100 YEAR UNIT HYDROGRAPH
POST, AREA B

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
8.88	1	0.60
Rainfall data for year 2		
8.88	6	0.76
Rainfall data for year 2		
8.88	24	1.30
Rainfall data for year 100		
8.88	1	1.08
Rainfall data for year 100		
8.88	6	2.01
Rainfall data for year 100		
8.88	24	3.42

++

******** 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)
32.0	52.0	8.88	1.000	0.785	0.436	0.342

Area-averaged adjusted loss rate Fm (In/Hr) = 0.342

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
3.87	0.436	32.0	52.0	9.23	0.067
5.01	0.564	98.0	98.0	0.20	0.932

Area-averaged catchment yield fraction, Y = 0.555
Area-averaged low loss fraction, Yb = 0.445
User entry of time of concentration = 0.250 (hours)
++
Watershed area = 8.88(Ac.)
Catchment Lag time = 0.200 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 41.6667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.342(In/Hr)
Average low loss rate fraction (Yb) = 0.445 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.512(In)
Computed peak 30-minute rainfall = 0.877(In)
Specified peak 1-hour rainfall = 1.080(In)
Computed peak 3-hour rainfall = 1.581(In)
Specified peak 6-hour rainfall = 2.010(In)
Specified peak 24-hour rainfall = 3.420(In)

Rainfall depth area reduction factors:
Using a total area of 8.88(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.512(In)
30-minute factor = 1.000 Adjusted rainfall = 0.877(In)
1-hour factor = 1.000 Adjusted rainfall = 1.080(In)
3-hour factor = 1.000 Adjusted rainfall = 1.581(In)
6-hour factor = 1.000 Adjusted rainfall = 2.010(In)
24-hour factor = 1.000 Adjusted rainfall = 3.420(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 = 107.39 (CFS))	
1	2.935	3.152
2	20.613	18.985
3	51.467	33.134
4	67.222	16.920
5	76.108	9.544
6	81.970	6.295
7	86.247	4.593
8	89.430	3.419

9	91.773	2.517
10	93.683	2.051
11	95.168	1.595
12	96.358	1.278
13	97.275	0.984
14	97.918	0.691
15	98.357	0.471
16	98.850	0.530
17	99.345	0.532
18	99.682	0.362
19	100.000	0.341

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5123	0.5123
2	0.6307	0.1184
3	0.7122	0.0816
4	0.7764	0.0642
5	0.8302	0.0538
6	0.8769	0.0467
7	0.9184	0.0415
8	0.9559	0.0375
9	0.9903	0.0344
10	1.0221	0.0318
11	1.0517	0.0296
12	1.0796	0.0278
13	1.1100	0.0304
14	1.1389	0.0289
15	1.1665	0.0276
16	1.1929	0.0264
17	1.2182	0.0254
18	1.2427	0.0244
19	1.2662	0.0235
20	1.2889	0.0227
21	1.3109	0.0220
22	1.3323	0.0213
23	1.3530	0.0207
24	1.3731	0.0201
25	1.3927	0.0196
26	1.4118	0.0191
27	1.4304	0.0186
28	1.4486	0.0182
29	1.4663	0.0177
30	1.4837	0.0174
31	1.5006	0.0170
32	1.5173	0.0166
33	1.5335	0.0163
34	1.5495	0.0160
35	1.5652	0.0157
36	1.5806	0.0154
37	1.5956	0.0151
38	1.6105	0.0148
39	1.6250	0.0146
40	1.6394	0.0143
41	1.6535	0.0141
42	1.6673	0.0139
43	1.6810	0.0137
44	1.6944	0.0135
45	1.7077	0.0133
46	1.7208	0.0131
47	1.7336	0.0129

48	1.7463	0.0127
49	1.7589	0.0125
50	1.7712	0.0124
51	1.7834	0.0122
52	1.7955	0.0120
53	1.8074	0.0119
54	1.8191	0.0118
55	1.8307	0.0116
56	1.8422	0.0115
57	1.8536	0.0113
58	1.8648	0.0112
59	1.8759	0.0111
60	1.8868	0.0110
61	1.8977	0.0108
62	1.9084	0.0107
63	1.9190	0.0106
64	1.9295	0.0105
65	1.9399	0.0104
66	1.9502	0.0103
67	1.9604	0.0102
68	1.9705	0.0101
69	1.9805	0.0100
70	1.9904	0.0099
71	2.0002	0.0098
72	2.0099	0.0097
73	2.0206	0.0107
74	2.0312	0.0106
75	2.0417	0.0105
76	2.0520	0.0104
77	2.0624	0.0103
78	2.0726	0.0102
79	2.0827	0.0101
80	2.0928	0.0101
81	2.1028	0.0100
82	2.1127	0.0099
83	2.1226	0.0098
84	2.1323	0.0098
85	2.1420	0.0097
86	2.1516	0.0096
87	2.1612	0.0096
88	2.1707	0.0095
89	2.1801	0.0094
90	2.1895	0.0094
91	2.1988	0.0093
92	2.2080	0.0092
93	2.2172	0.0092
94	2.2263	0.0091
95	2.2353	0.0091
96	2.2443	0.0090
97	2.2533	0.0089
98	2.2621	0.0089
99	2.2710	0.0088
100	2.2797	0.0088
101	2.2884	0.0087
102	2.2971	0.0087
103	2.3057	0.0086
104	2.3143	0.0086
105	2.3228	0.0085
106	2.3312	0.0085
107	2.3396	0.0084
108	2.3480	0.0084

109	2.3563	0.0083
110	2.3646	0.0083
111	2.3728	0.0082
112	2.3810	0.0082
113	2.3891	0.0081
114	2.3972	0.0081
115	2.4052	0.0080
116	2.4132	0.0080
117	2.4212	0.0080
118	2.4291	0.0079
119	2.4370	0.0079
120	2.4448	0.0078
121	2.4526	0.0078
122	2.4603	0.0078
123	2.4681	0.0077
124	2.4757	0.0077
125	2.4834	0.0076
126	2.4910	0.0076
127	2.4985	0.0076
128	2.5061	0.0075
129	2.5135	0.0075
130	2.5210	0.0075
131	2.5284	0.0074
132	2.5358	0.0074
133	2.5431	0.0073
134	2.5505	0.0073
135	2.5577	0.0073
136	2.5650	0.0072
137	2.5722	0.0072
138	2.5794	0.0072
139	2.5865	0.0072
140	2.5937	0.0071
141	2.6007	0.0071
142	2.6078	0.0071
143	2.6148	0.0070
144	2.6218	0.0070
145	2.6288	0.0070
146	2.6357	0.0069
147	2.6426	0.0069
148	2.6495	0.0069
149	2.6564	0.0068
150	2.6632	0.0068
151	2.6700	0.0068
152	2.6767	0.0068
153	2.6835	0.0067
154	2.6902	0.0067
155	2.6969	0.0067
156	2.7035	0.0067
157	2.7102	0.0066
158	2.7168	0.0066
159	2.7233	0.0066
160	2.7299	0.0066
161	2.7364	0.0065
162	2.7429	0.0065
163	2.7494	0.0065
164	2.7559	0.0065
165	2.7623	0.0064
166	2.7687	0.0064
167	2.7751	0.0064
168	2.7814	0.0064
169	2.7878	0.0063

170	2.7941	0.0063
171	2.8004	0.0063
172	2.8067	0.0063
173	2.8129	0.0062
174	2.8191	0.0062
175	2.8253	0.0062
176	2.8315	0.0062
177	2.8377	0.0062
178	2.8438	0.0061
179	2.8499	0.0061
180	2.8560	0.0061
181	2.8621	0.0061
182	2.8681	0.0061
183	2.8742	0.0060
184	2.8802	0.0060
185	2.8862	0.0060
186	2.8921	0.0060
187	2.8981	0.0060
188	2.9040	0.0059
189	2.9099	0.0059
190	2.9158	0.0059
191	2.9217	0.0059
192	2.9276	0.0059
193	2.9334	0.0058
194	2.9392	0.0058
195	2.9450	0.0058
196	2.9508	0.0058
197	2.9566	0.0058
198	2.9623	0.0057
199	2.9680	0.0057
200	2.9737	0.0057
201	2.9794	0.0057
202	2.9851	0.0057
203	2.9908	0.0057
204	2.9964	0.0056
205	3.0020	0.0056
206	3.0076	0.0056
207	3.0132	0.0056
208	3.0188	0.0056
209	3.0244	0.0056
210	3.0299	0.0055
211	3.0354	0.0055
212	3.0409	0.0055
213	3.0464	0.0055
214	3.0519	0.0055
215	3.0574	0.0055
216	3.0628	0.0054
217	3.0682	0.0054
218	3.0736	0.0054
219	3.0790	0.0054
220	3.0844	0.0054
221	3.0898	0.0054
222	3.0951	0.0054
223	3.1005	0.0053
224	3.1058	0.0053
225	3.1111	0.0053
226	3.1164	0.0053
227	3.1217	0.0053
228	3.1270	0.0053
229	3.1322	0.0053
230	3.1374	0.0052

231	3.1427	0.0052
232	3.1479	0.0052
233	3.1531	0.0052
234	3.1582	0.0052
235	3.1634	0.0052
236	3.1686	0.0052
237	3.1737	0.0051
238	3.1788	0.0051
239	3.1840	0.0051
240	3.1891	0.0051
241	3.1941	0.0051
242	3.1992	0.0051
243	3.2043	0.0051
244	3.2093	0.0050
245	3.2144	0.0050
246	3.2194	0.0050
247	3.2244	0.0050
248	3.2294	0.0050
249	3.2344	0.0050
250	3.2394	0.0050
251	3.2443	0.0050
252	3.2493	0.0049
253	3.2542	0.0049
254	3.2591	0.0049
255	3.2641	0.0049
256	3.2690	0.0049
257	3.2738	0.0049
258	3.2787	0.0049
259	3.2836	0.0049
260	3.2884	0.0049
261	3.2933	0.0048
262	3.2981	0.0048
263	3.3029	0.0048
264	3.3078	0.0048
265	3.3125	0.0048
266	3.3173	0.0048
267	3.3221	0.0048
268	3.3269	0.0048
269	3.3316	0.0048
270	3.3364	0.0047
271	3.3411	0.0047
272	3.3458	0.0047
273	3.3505	0.0047
274	3.3552	0.0047
275	3.3599	0.0047
276	3.3646	0.0047
277	3.3693	0.0047
278	3.3739	0.0047
279	3.3786	0.0046
280	3.3832	0.0046
281	3.3878	0.0046
282	3.3925	0.0046
283	3.3971	0.0046
284	3.4017	0.0046
285	3.4063	0.0046
286	3.4108	0.0046
287	3.4154	0.0046
288	3.4200	0.0046

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0046	0.0020	0.0025
2	0.0046	0.0020	0.0025
3	0.0046	0.0020	0.0025
4	0.0046	0.0020	0.0026
5	0.0046	0.0021	0.0026
6	0.0046	0.0021	0.0026
7	0.0046	0.0021	0.0026
8	0.0047	0.0021	0.0026
9	0.0047	0.0021	0.0026
10	0.0047	0.0021	0.0026
11	0.0047	0.0021	0.0026
12	0.0047	0.0021	0.0026
13	0.0047	0.0021	0.0026
14	0.0048	0.0021	0.0026
15	0.0048	0.0021	0.0026
16	0.0048	0.0021	0.0027
17	0.0048	0.0021	0.0027
18	0.0048	0.0021	0.0027
19	0.0048	0.0022	0.0027
20	0.0049	0.0022	0.0027
21	0.0049	0.0022	0.0027
22	0.0049	0.0022	0.0027
23	0.0049	0.0022	0.0027
24	0.0049	0.0022	0.0027
25	0.0049	0.0022	0.0027
26	0.0050	0.0022	0.0028
27	0.0050	0.0022	0.0028
28	0.0050	0.0022	0.0028
29	0.0050	0.0022	0.0028
30	0.0050	0.0022	0.0028
31	0.0051	0.0023	0.0028
32	0.0051	0.0023	0.0028
33	0.0051	0.0023	0.0028
34	0.0051	0.0023	0.0028
35	0.0051	0.0023	0.0029
36	0.0052	0.0023	0.0029
37	0.0052	0.0023	0.0029
38	0.0052	0.0023	0.0029
39	0.0052	0.0023	0.0029
40	0.0052	0.0023	0.0029
41	0.0053	0.0023	0.0029
42	0.0053	0.0024	0.0029
43	0.0053	0.0024	0.0029
44	0.0053	0.0024	0.0030
45	0.0054	0.0024	0.0030
46	0.0054	0.0024	0.0030
47	0.0054	0.0024	0.0030
48	0.0054	0.0024	0.0030
49	0.0054	0.0024	0.0030
50	0.0055	0.0024	0.0030
51	0.0055	0.0024	0.0030
52	0.0055	0.0025	0.0031
53	0.0055	0.0025	0.0031
54	0.0056	0.0025	0.0031
55	0.0056	0.0025	0.0031
56	0.0056	0.0025	0.0031
57	0.0056	0.0025	0.0031
58	0.0057	0.0025	0.0031
59	0.0057	0.0025	0.0032

60	0.0057	0.0025	0.0032
61	0.0057	0.0026	0.0032
62	0.0058	0.0026	0.0032
63	0.0058	0.0026	0.0032
64	0.0058	0.0026	0.0032
65	0.0059	0.0026	0.0032
66	0.0059	0.0026	0.0033
67	0.0059	0.0026	0.0033
68	0.0059	0.0026	0.0033
69	0.0060	0.0027	0.0033
70	0.0060	0.0027	0.0033
71	0.0060	0.0027	0.0033
72	0.0061	0.0027	0.0034
73	0.0061	0.0027	0.0034
74	0.0061	0.0027	0.0034
75	0.0062	0.0027	0.0034
76	0.0062	0.0028	0.0034
77	0.0062	0.0028	0.0035
78	0.0062	0.0028	0.0035
79	0.0063	0.0028	0.0035
80	0.0063	0.0028	0.0035
81	0.0064	0.0028	0.0035
82	0.0064	0.0028	0.0035
83	0.0064	0.0029	0.0036
84	0.0065	0.0029	0.0036
85	0.0065	0.0029	0.0036
86	0.0065	0.0029	0.0036
87	0.0066	0.0029	0.0037
88	0.0066	0.0029	0.0037
89	0.0067	0.0030	0.0037
90	0.0067	0.0030	0.0037
91	0.0067	0.0030	0.0037
92	0.0068	0.0030	0.0038
93	0.0068	0.0030	0.0038
94	0.0068	0.0030	0.0038
95	0.0069	0.0031	0.0038
96	0.0069	0.0031	0.0038
97	0.0070	0.0031	0.0039
98	0.0070	0.0031	0.0039
99	0.0071	0.0032	0.0039
100	0.0071	0.0032	0.0039
101	0.0072	0.0032	0.0040
102	0.0072	0.0032	0.0040
103	0.0073	0.0032	0.0040
104	0.0073	0.0033	0.0041
105	0.0074	0.0033	0.0041
106	0.0074	0.0033	0.0041
107	0.0075	0.0033	0.0042
108	0.0075	0.0034	0.0042
109	0.0076	0.0034	0.0042
110	0.0076	0.0034	0.0042
111	0.0077	0.0034	0.0043
112	0.0078	0.0035	0.0043
113	0.0078	0.0035	0.0043
114	0.0079	0.0035	0.0044
115	0.0080	0.0035	0.0044
116	0.0080	0.0036	0.0044
117	0.0081	0.0036	0.0045
118	0.0081	0.0036	0.0045
119	0.0082	0.0037	0.0046
120	0.0083	0.0037	0.0046

121	0.0084	0.0037	0.0046
122	0.0084	0.0037	0.0047
123	0.0085	0.0038	0.0047
124	0.0086	0.0038	0.0047
125	0.0087	0.0039	0.0048
126	0.0087	0.0039	0.0048
127	0.0088	0.0039	0.0049
128	0.0089	0.0040	0.0049
129	0.0090	0.0040	0.0050
130	0.0091	0.0040	0.0050
131	0.0092	0.0041	0.0051
132	0.0092	0.0041	0.0051
133	0.0094	0.0042	0.0052
134	0.0094	0.0042	0.0052
135	0.0096	0.0043	0.0053
136	0.0096	0.0043	0.0053
137	0.0098	0.0043	0.0054
138	0.0098	0.0044	0.0055
139	0.0100	0.0044	0.0055
140	0.0101	0.0045	0.0056
141	0.0102	0.0046	0.0057
142	0.0103	0.0046	0.0057
143	0.0105	0.0047	0.0058
144	0.0106	0.0047	0.0059
145	0.0097	0.0043	0.0054
146	0.0098	0.0044	0.0054
147	0.0100	0.0045	0.0055
148	0.0101	0.0045	0.0056
149	0.0103	0.0046	0.0057
150	0.0104	0.0046	0.0058
151	0.0106	0.0047	0.0059
152	0.0107	0.0048	0.0060
153	0.0110	0.0049	0.0061
154	0.0111	0.0049	0.0061
155	0.0113	0.0050	0.0063
156	0.0115	0.0051	0.0064
157	0.0118	0.0052	0.0065
158	0.0119	0.0053	0.0066
159	0.0122	0.0054	0.0068
160	0.0124	0.0055	0.0069
161	0.0127	0.0057	0.0070
162	0.0129	0.0057	0.0071
163	0.0133	0.0059	0.0074
164	0.0135	0.0060	0.0075
165	0.0139	0.0062	0.0077
166	0.0141	0.0063	0.0078
167	0.0146	0.0065	0.0081
168	0.0148	0.0066	0.0082
169	0.0154	0.0068	0.0085
170	0.0157	0.0070	0.0087
171	0.0163	0.0073	0.0090
172	0.0166	0.0074	0.0092
173	0.0174	0.0077	0.0096
174	0.0177	0.0079	0.0098
175	0.0186	0.0083	0.0103
176	0.0191	0.0085	0.0106
177	0.0201	0.0090	0.0112
178	0.0207	0.0092	0.0115
179	0.0220	0.0098	0.0122
180	0.0227	0.0101	0.0126
181	0.0244	0.0109	0.0135

182	0.0254	0.0113	0.0141
183	0.0276	0.0123	0.0153
184	0.0289	0.0129	0.0160
185	0.0278	0.0124	0.0154
186	0.0296	0.0132	0.0164
187	0.0344	0.0153	0.0191
188	0.0375	0.0167	0.0208
189	0.0467	0.0208	0.0259
190	0.0538	0.0239	0.0298
191	0.0816	0.0285	0.0530
192	0.1184	0.0285	0.0899
193	0.5123	0.0285	0.4837
194	0.0642	0.0285	0.0357
195	0.0415	0.0185	0.0230
196	0.0318	0.0142	0.0176
197	0.0304	0.0135	0.0169
198	0.0264	0.0118	0.0147
199	0.0235	0.0105	0.0131
200	0.0213	0.0095	0.0118
201	0.0196	0.0087	0.0109
202	0.0182	0.0081	0.0101
203	0.0170	0.0076	0.0094
204	0.0160	0.0071	0.0089
205	0.0151	0.0067	0.0084
206	0.0143	0.0064	0.0079
207	0.0137	0.0061	0.0076
208	0.0131	0.0058	0.0072
209	0.0125	0.0056	0.0070
210	0.0120	0.0054	0.0067
211	0.0116	0.0052	0.0064
212	0.0112	0.0050	0.0062
213	0.0108	0.0048	0.0060
214	0.0105	0.0047	0.0058
215	0.0102	0.0045	0.0057
216	0.0099	0.0044	0.0055
217	0.0107	0.0047	0.0059
218	0.0104	0.0046	0.0058
219	0.0101	0.0045	0.0056
220	0.0099	0.0044	0.0055
221	0.0097	0.0043	0.0054
222	0.0095	0.0042	0.0053
223	0.0093	0.0041	0.0052
224	0.0091	0.0041	0.0051
225	0.0089	0.0040	0.0050
226	0.0088	0.0039	0.0049
227	0.0086	0.0038	0.0048
228	0.0085	0.0038	0.0047
229	0.0083	0.0037	0.0046
230	0.0082	0.0036	0.0045
231	0.0080	0.0036	0.0045
232	0.0079	0.0035	0.0044
233	0.0078	0.0035	0.0043
234	0.0077	0.0034	0.0043
235	0.0076	0.0034	0.0042
236	0.0075	0.0033	0.0041
237	0.0073	0.0033	0.0041
238	0.0072	0.0032	0.0040
239	0.0072	0.0032	0.0040
240	0.0071	0.0031	0.0039
241	0.0070	0.0031	0.0039
242	0.0069	0.0031	0.0038

243	0.0068	0.0030	0.0038
244	0.0067	0.0030	0.0037
245	0.0066	0.0030	0.0037
246	0.0066	0.0029	0.0036
247	0.0065	0.0029	0.0036
248	0.0064	0.0029	0.0036
249	0.0063	0.0028	0.0035
250	0.0063	0.0028	0.0035
251	0.0062	0.0028	0.0034
252	0.0061	0.0027	0.0034
253	0.0061	0.0027	0.0034
254	0.0060	0.0027	0.0033
255	0.0060	0.0027	0.0033
256	0.0059	0.0026	0.0033
257	0.0058	0.0026	0.0032
258	0.0058	0.0026	0.0032
259	0.0057	0.0026	0.0032
260	0.0057	0.0025	0.0031
261	0.0056	0.0025	0.0031
262	0.0056	0.0025	0.0031
263	0.0055	0.0025	0.0031
264	0.0055	0.0024	0.0030
265	0.0054	0.0024	0.0030
266	0.0054	0.0024	0.0030
267	0.0053	0.0024	0.0030
268	0.0053	0.0024	0.0029
269	0.0053	0.0023	0.0029
270	0.0052	0.0023	0.0029
271	0.0052	0.0023	0.0029
272	0.0051	0.0023	0.0028
273	0.0051	0.0023	0.0028
274	0.0050	0.0022	0.0028
275	0.0050	0.0022	0.0028
276	0.0050	0.0022	0.0028
277	0.0049	0.0022	0.0027
278	0.0049	0.0022	0.0027
279	0.0049	0.0022	0.0027
280	0.0048	0.0022	0.0027
281	0.0048	0.0021	0.0027
282	0.0048	0.0021	0.0026
283	0.0047	0.0021	0.0026
284	0.0047	0.0021	0.0026
285	0.0047	0.0021	0.0026
286	0.0046	0.0021	0.0026
287	0.0046	0.0021	0.0026
288	0.0046	0.0020	0.0025

Total soil rain loss = 1.29(In)
Total effective rainfall = 2.13(In)
Peak flow rate in flood hydrograph = 19.36(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

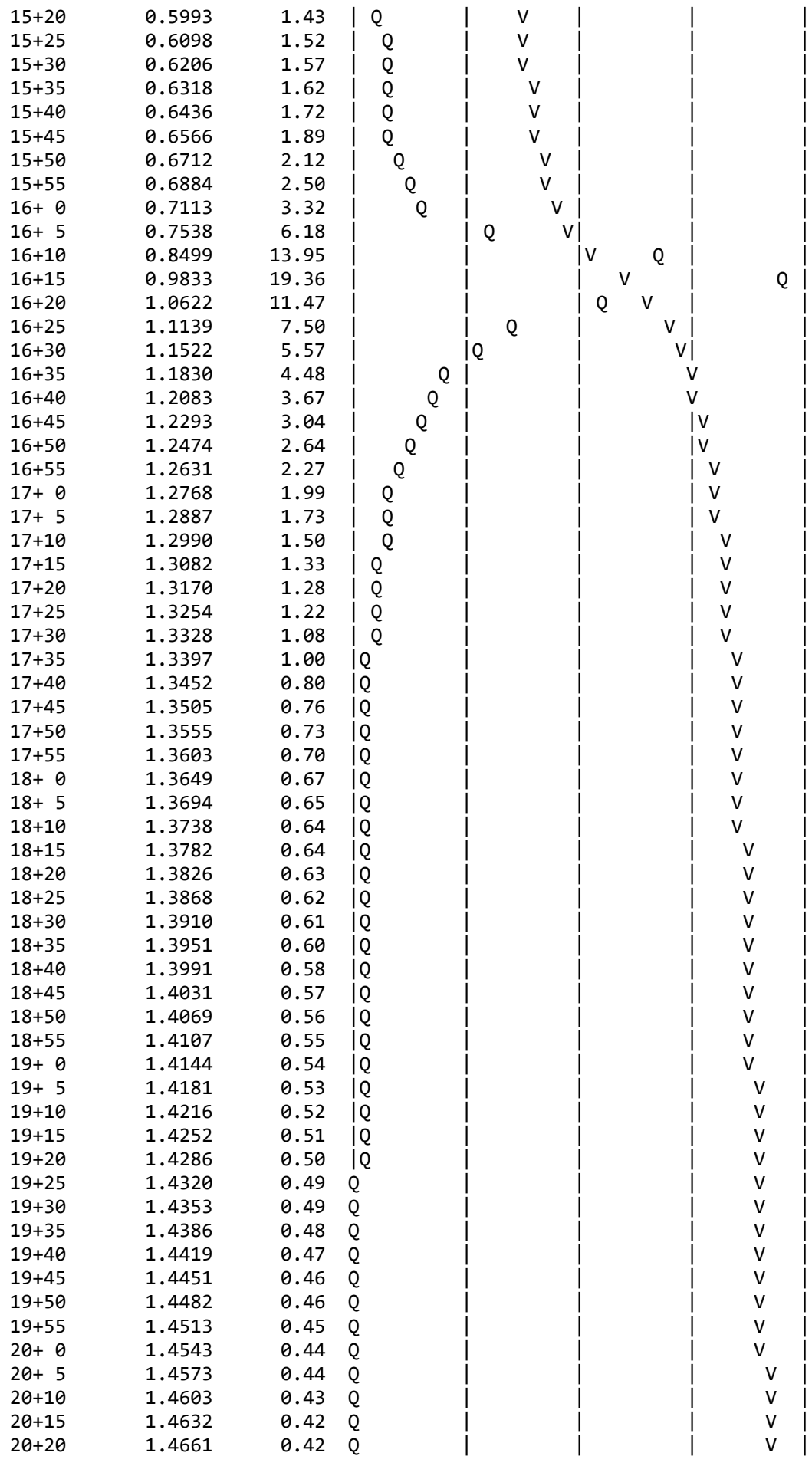
Hydrograph in 5 Minute intervals ((CFS))

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	0.0004	0.06	Q	|	|	|	|
0+15	0.0014	0.14	Q	|	|	|	|
0+20	0.0027	0.18	Q	|	|	|	|
0+25	0.0041	0.21	Q	|	|	|	|
0+30	0.0056	0.22	Q	|	|	|	|
0+35	0.0073	0.24	Q	|	|	|	|
0+40	0.0090	0.25	Q	|	|	|	|
0+45	0.0107	0.25	Q	|	|	|	|
0+50	0.0125	0.26	Q	|	|	|	|
0+55	0.0143	0.26	Q	|	|	|	|
1+ 0	0.0162	0.27	Q	|	|	|	|
1+ 5	0.0180	0.27	Q	|	|	|	|
1+10	0.0199	0.27	Q	|	|	|	|
1+15	0.0218	0.28	Q	|	|	|	|
1+20	0.0238	0.28	Q	|	|	|	|
1+25	0.0257	0.28	Q	|	|	|	|
1+30	0.0276	0.28	Q	|	|	|	|
1+35	0.0296	0.28	Q	|	|	|	|
1+40	0.0316	0.29	Q	|	|	|	|
1+45	0.0335	0.29	Q	|	|	|	|
1+50	0.0355	0.29	Q	|	|	|	|
1+55	0.0375	0.29	Q	|	|	|	|
2+ 0	0.0395	0.29	QV	|	|	|	|
2+ 5	0.0415	0.29	QV	|	|	|	|
2+10	0.0435	0.29	QV	|	|	|	|
2+15	0.0455	0.29	QV	|	|	|	|
2+20	0.0476	0.29	QV	|	|	|	|
2+25	0.0496	0.30	QV	|	|	|	|
2+30	0.0516	0.30	QV	|	|	|	|
2+35	0.0537	0.30	QV	|	|	|	|
2+40	0.0558	0.30	QV	|	|	|	|
2+45	0.0578	0.30	QV	|	|	|	|
2+50	0.0599	0.30	QV	|	|	|	|
2+55	0.0620	0.30	QV	|	|	|	|
3+ 0	0.0641	0.30	QV	|	|	|	|
3+ 5	0.0662	0.30	QV	|	|	|	|
3+10	0.0683	0.31	QV	|	|	|	|
3+15	0.0704	0.31	QV	|	|	|	|
3+20	0.0725	0.31	QV	|	|	|	|
3+25	0.0746	0.31	QV	|	|	|	|
3+30	0.0768	0.31	QV	|	|	|	|
3+35	0.0789	0.31	Q V	|	|	|	|
3+40	0.0811	0.31	Q V	|	|	|	|
3+45	0.0832	0.31	Q V	|	|	|	|
3+50	0.0854	0.32	Q V	|	|	|	|
3+55	0.0876	0.32	Q V	|	|	|	|
4+ 0	0.0898	0.32	Q V	|	|	|	|
4+ 5	0.0920	0.32	Q V	|	|	|	|
4+10	0.0942	0.32	Q V	|	|	|	|
4+15	0.0964	0.32	Q V	|	|	|	|
4+20	0.0986	0.32	Q V	|	|	|	|
4+25	0.1009	0.32	Q V	|	|	|	|
4+30	0.1031	0.33	Q V	|	|	|	|
4+35	0.1054	0.33	Q V	|	|	|	|
4+40	0.1076	0.33	Q V	|	|	|	|
4+45	0.1099	0.33	Q V	|	|	|	|
4+50	0.1122	0.33	Q V	|	|	|	|
4+55	0.1145	0.33	Q V	|	|	|	|
5+ 0	0.1168	0.33	Q V	|	|	|	|
5+ 5	0.1191	0.34	Q V	|	|	|	|

5+10	0.1214	0.34	Q	V				
5+15	0.1238	0.34	Q	V				
5+20	0.1261	0.34	Q	V				
5+25	0.1285	0.34	Q	V				
5+30	0.1309	0.34	Q	V				
5+35	0.1332	0.35	Q	V				
5+40	0.1356	0.35	Q	V				
5+45	0.1380	0.35	Q	V				
5+50	0.1405	0.35	Q	V				
5+55	0.1429	0.35	Q	V				
6+ 0	0.1453	0.35	Q	V				
6+ 5	0.1478	0.36	Q	V				
6+10	0.1503	0.36	Q	V				
6+15	0.1527	0.36	Q	V				
6+20	0.1552	0.36	Q	V				
6+25	0.1577	0.36	Q	V				
6+30	0.1602	0.37	Q	V				
6+35	0.1628	0.37	Q	V				
6+40	0.1653	0.37	Q	V				
6+45	0.1679	0.37	Q	V				
6+50	0.1705	0.37	Q	V				
6+55	0.1730	0.38	Q	V				
7+ 0	0.1756	0.38	Q	V				
7+ 5	0.1783	0.38	Q	V				
7+10	0.1809	0.38	Q	V				
7+15	0.1835	0.38	Q	V				
7+20	0.1862	0.39	Q	V				
7+25	0.1889	0.39	Q	V				
7+30	0.1915	0.39	Q	V				
7+35	0.1943	0.39	Q	V				
7+40	0.1970	0.40	Q	V				
7+45	0.1997	0.40	Q	V				
7+50	0.2025	0.40	Q	V				
7+55	0.2052	0.40	Q	V				
8+ 0	0.2080	0.40	Q	V				
8+ 5	0.2108	0.41	Q	V				
8+10	0.2137	0.41	Q	V				
8+15	0.2165	0.41	Q	V				
8+20	0.2194	0.42	Q	V				
8+25	0.2222	0.42	Q	V				
8+30	0.2251	0.42	Q	V				
8+35	0.2280	0.42	Q	V				
8+40	0.2310	0.43	Q	V				
8+45	0.2339	0.43	Q	V				
8+50	0.2369	0.43	Q	V				
8+55	0.2399	0.43	Q	V				
9+ 0	0.2429	0.44	Q	V				
9+ 5	0.2459	0.44	Q	V				
9+10	0.2490	0.44	Q	V				
9+15	0.2521	0.45	Q	V				
9+20	0.2552	0.45	Q	V				
9+25	0.2583	0.45	Q	V				
9+30	0.2615	0.46	Q	V				
9+35	0.2646	0.46	Q	V				
9+40	0.2678	0.46	Q	V				
9+45	0.2711	0.47	Q	V				
9+50	0.2743	0.47	Q	V				
9+55	0.2776	0.48	Q	V				
10+ 0	0.2809	0.48	Q	V				
10+ 5	0.2842	0.48	Q	V				
10+10	0.2876	0.49	Q	V				

```
10+15       0.2909      0.49  Q     V  |         |         |         |
10+20       0.2944      0.50  Q     V  |         |         |         |
10+25       0.2978      0.50  Q     V  |         |         |         |
10+30       0.3013      0.50  |Q    V  |         |         |         |
10+35       0.3048      0.51  |Q    V  |         |         |         |
10+40       0.3083      0.51  |Q    V  |         |         |         |
10+45       0.3119      0.52  |Q    V  |         |         |         |
10+50       0.3155      0.52  |Q     V |         |         |         |
10+55       0.3191      0.53  |Q     V |         |         |         |
11+ 0       0.3228      0.53  |Q     V |         |         |         |
11+ 5       0.3265      0.54  |Q     V |         |         |         |
11+10       0.3302      0.54  |Q     V |         |         |         |
11+15       0.3340      0.55  |Q     V |         |         |         |
11+20       0.3378      0.55  |Q     V |         |         |         |
11+25       0.3417      0.56  |Q     V |         |         |         |
11+30       0.3456      0.57  |Q     V |         |         |         |
11+35       0.3495      0.57  |Q     V |         |         |         |
11+40       0.3535      0.58  |Q     V |         |         |         |
11+45       0.3575      0.58  |Q      V|         |         |         |
11+50       0.3616      0.59  |Q      V|         |         |         |
11+55       0.3657      0.60  |Q      V|         |         |         |
12+ 0       0.3699      0.61  |Q      V|         |         |         |
12+ 5       0.3741      0.61  |Q      V|         |         |         |
12+10       0.3783      0.61  |Q      V|         |         |         |
12+15       0.3824      0.60  |Q      V|         |         |         |
12+20       0.3865      0.59  |Q      V|         |         |         |
12+25       0.3906      0.60  |Q      V|         |         |         |
12+30       0.3947      0.60  |Q       V         |         |         |
12+35       0.3989      0.61  |Q       V         |         |         |
12+40       0.4031      0.61  |Q       V         |         |         |
12+45       0.4074      0.62  |Q       V         |         |         |
12+50       0.4118      0.63  |Q       V         |         |         |
12+55       0.4162      0.64  |Q       V         |         |         |
13+ 0       0.4206      0.65  |Q       V         |         |         |
13+ 5       0.4252      0.66  |Q       V         |         |         |
13+10       0.4298      0.67  |Q       V         |         |         |
13+15       0.4345      0.68  |Q       |V        |         |         |
13+20       0.4393      0.69  |Q       |V        |         |         |
13+25       0.4442      0.71  |Q       |V        |         |         |
13+30       0.4491      0.72  |Q       |V        |         |         |
13+35       0.4542      0.73  |Q       |V        |         |         |
13+40       0.4593      0.75  |Q       |V        |         |         |
13+45       0.4646      0.76  |Q       |V        |         |         |
13+50       0.4700      0.78  |Q       |V        |         |         |
13+55       0.4755      0.80  |Q       | V       |         |         |
14+ 0       0.4811      0.82  |Q       | V       |         |         |
14+ 5       0.4869      0.84  |Q       | V       |         |         |
14+10       0.4928      0.86  |Q       | V       |         |         |
14+15       0.4988      0.88  |Q       | V       |         |         |
14+20       0.5051      0.90  |Q       | V       |         |         |
14+25       0.5115      0.93  |Q       | V       |         |         |
14+30       0.5181      0.96  |Q       |  V      |         |         |
14+35       0.5249      0.99  |Q       |  V      |         |         |
14+40       0.5319      1.02  | Q      |  V      |         |         |
14+45       0.5392      1.06  | Q      |  V      |         |         |
14+50       0.5467      1.09  | Q      |  V      |         |         |
14+55       0.5545      1.14  | Q      |   V     |         |         |
15+ 0       0.5627      1.18  | Q      |   V     |         |         |
15+ 5       0.5712      1.24  | Q      |   V     |         |         |
15+10       0.5801      1.29  | Q      |   V     |         |         |
15+15       0.5895      1.36  | Q      |   V     |         |         |
```



20+25	1.4690	0.41	Q	|	|	|	V |
20+30	1.4718	0.41	Q	|	|	|	V |
20+35	1.4746	0.40	Q	|	|	|	V |
20+40	1.4773	0.40	Q	|	|	|	V |
20+45	1.4800	0.39	Q	|	|	|	V |
20+50	1.4827	0.39	Q	|	|	|	V |
20+55	1.4853	0.38	Q	|	|	|	V |
21+ 0	1.4880	0.38	Q	|	|	|	V |
21+ 5	1.4906	0.38	Q	|	|	|	V |
21+10	1.4931	0.37	Q	|	|	|	V |
21+15	1.4957	0.37	Q	|	|	|	V |
21+20	1.4982	0.36	Q	|	|	|	V |
21+25	1.5006	0.36	Q	|	|	|	V |
21+30	1.5031	0.36	Q	|	|	|	V |
21+35	1.5055	0.35	Q	|	|	|	V |
21+40	1.5080	0.35	Q	|	|	|	V |
21+45	1.5103	0.35	Q	|	|	|	V |
21+50	1.5127	0.34	Q	|	|	|	V |
21+55	1.5150	0.34	Q	|	|	|	V |
22+ 0	1.5174	0.34	Q	|	|	|	V |
22+ 5	1.5197	0.33	Q	|	|	|	V |
22+10	1.5220	0.33	Q	|	|	|	V |
22+15	1.5242	0.33	Q	|	|	|	V |
22+20	1.5265	0.33	Q	|	|	|	V |
22+25	1.5287	0.32	Q	|	|	|	V |
22+30	1.5309	0.32	Q	|	|	|	V |
22+35	1.5331	0.32	Q	|	|	|	V |
22+40	1.5352	0.31	Q	|	|	|	V|
22+45	1.5374	0.31	Q	|	|	|	V|
22+50	1.5395	0.31	Q	|	|	|	V|
22+55	1.5416	0.31	Q	|	|	|	V|
23+ 0	1.5437	0.30	Q	|	|	|	V|
23+ 5	1.5458	0.30	Q	|	|	|	V|
23+10	1.5479	0.30	Q	|	|	|	V|
23+15	1.5499	0.30	Q	|	|	|	V|
23+20	1.5520	0.30	Q	|	|	|	V|
23+25	1.5540	0.29	Q	|	|	|	V|
23+30	1.5560	0.29	Q	|	|	|	V|
23+35	1.5580	0.29	Q	|	|	|	V|
23+40	1.5600	0.29	Q	|	|	|	V|
23+45	1.5619	0.29	Q	|	|	|	V|
23+50	1.5639	0.28	Q	|	|	|	V|
23+55	1.5658	0.28	Q	|	|	|	V|
24+ 0	1.5677	0.28	Q	|	|	|	V|

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

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Study date 08/09/24

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

Program License Serial Number 6277

JOB NO 2021-181
WATSON APPLEY VALLEY 145
100 YEAR UNIT HYDROGRAPH
POST, AREA C

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
27.33	1	0.60
Rainfall data for year 2		
27.33	6	0.76
Rainfall data for year 2		
27.33	24	1.30
Rainfall data for year 100		
27.33	1	1.08
Rainfall data for year 100		
27.33	6	2.01
Rainfall data for year 100		
27.33	24	3.42

++

******** 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)
32.0	52.0	27.33	1.000	0.785	0.149	0.117

Area-averaged adjusted loss rate Fm (In/Hr) = 0.117

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
4.07	0.149	32.0	52.0	9.23	0.067
23.26	0.851	98.0	98.0	0.20	0.932

Area-averaged catchment yield fraction, Y = 0.803
Area-averaged low loss fraction, Yb = 0.197
User entry of time of concentration = 0.250 (hours)
++
Watershed area = 27.33(Ac.)
Catchment Lag time = 0.200 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 41.6667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.117(In/Hr)
Average low loss rate fraction (Yb) = 0.197 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.512(In)
Computed peak 30-minute rainfall = 0.877(In)
Specified peak 1-hour rainfall = 1.080(In)
Computed peak 3-hour rainfall = 1.581(In)
Specified peak 6-hour rainfall = 2.010(In)
Specified peak 24-hour rainfall = 3.420(In)

Rainfall depth area reduction factors:
Using a total area of 27.33(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.512(In)
30-minute factor = 0.999 Adjusted rainfall = 0.876(In)
1-hour factor = 0.999 Adjusted rainfall = 1.079(In)
3-hour factor = 1.000 Adjusted rainfall = 1.580(In)
6-hour factor = 1.000 Adjusted rainfall = 2.010(In)
24-hour factor = 1.000 Adjusted rainfall = 3.420(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 = 330.52 (CFS))	
1	2.935	9.701
2	20.613	58.431
3	51.467	101.977
4	67.222	52.074
5	76.108	29.372
6	81.970	19.374
7	86.247	14.135
8	89.430	10.522

9	91.773	7.745
10	93.683	6.313
11	95.168	4.908
12	96.358	3.933
13	97.275	3.030
14	97.918	2.126
15	98.357	1.449
16	98.850	1.631
17	99.345	1.637
18	99.682	1.114
19	100.000	1.050

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5118	0.5118
2	0.6301	0.1183
3	0.7116	0.0815
4	0.7758	0.0641
5	0.8295	0.0537
6	0.8761	0.0466
7	0.9176	0.0415
8	0.9551	0.0375
9	0.9894	0.0344
10	1.0212	0.0318
11	1.0508	0.0296
12	1.0786	0.0278
13	1.1091	0.0304
14	1.1380	0.0289
15	1.1656	0.0276
16	1.1921	0.0265
17	1.2175	0.0254
18	1.2419	0.0244
19	1.2655	0.0236
20	1.2883	0.0228
21	1.3103	0.0220
22	1.3317	0.0214
23	1.3524	0.0207
24	1.3726	0.0202
25	1.3922	0.0196
26	1.4113	0.0191
27	1.4300	0.0186
28	1.4482	0.0182
29	1.4659	0.0178
30	1.4833	0.0174
31	1.5003	0.0170
32	1.5170	0.0167
33	1.5333	0.0163
34	1.5493	0.0160
35	1.5650	0.0157
36	1.5804	0.0154
37	1.5955	0.0151
38	1.6103	0.0148
39	1.6249	0.0146
40	1.6392	0.0143
41	1.6533	0.0141
42	1.6672	0.0139
43	1.6808	0.0137
44	1.6943	0.0135
45	1.7075	0.0133
46	1.7206	0.0131
47	1.7335	0.0129

48	1.7462	0.0127
49	1.7587	0.0125
50	1.7711	0.0124
51	1.7833	0.0122
52	1.7953	0.0120
53	1.8072	0.0119
54	1.8190	0.0118
55	1.8306	0.0116
56	1.8421	0.0115
57	1.8534	0.0113
58	1.8646	0.0112
59	1.8757	0.0111
60	1.8867	0.0110
61	1.8975	0.0108
62	1.9083	0.0107
63	1.9189	0.0106
64	1.9294	0.0105
65	1.9398	0.0104
66	1.9501	0.0103
67	1.9603	0.0102
68	1.9704	0.0101
69	1.9804	0.0100
70	1.9903	0.0099
71	2.0001	0.0098
72	2.0098	0.0097
73	2.0205	0.0107
74	2.0311	0.0106
75	2.0415	0.0105
76	2.0519	0.0104
77	2.0622	0.0103
78	2.0725	0.0102
79	2.0826	0.0101
80	2.0927	0.0101
81	2.1027	0.0100
82	2.1126	0.0099
83	2.1224	0.0098
84	2.1322	0.0098
85	2.1419	0.0097
86	2.1515	0.0096
87	2.1611	0.0096
88	2.1706	0.0095
89	2.1800	0.0094
90	2.1894	0.0094
91	2.1987	0.0093
92	2.2079	0.0092
93	2.2171	0.0092
94	2.2262	0.0091
95	2.2352	0.0091
96	2.2442	0.0090
97	2.2532	0.0089
98	2.2620	0.0089
99	2.2709	0.0088
100	2.2796	0.0088
101	2.2883	0.0087
102	2.2970	0.0087
103	2.3056	0.0086
104	2.3142	0.0086
105	2.3227	0.0085
106	2.3311	0.0085
107	2.3395	0.0084
108	2.3479	0.0084

109	2.3562	0.0083
110	2.3645	0.0083
111	2.3727	0.0082
112	2.3809	0.0082
113	2.3890	0.0081
114	2.3971	0.0081
115	2.4051	0.0080
116	2.4131	0.0080
117	2.4211	0.0080
118	2.4290	0.0079
119	2.4369	0.0079
120	2.4447	0.0078
121	2.4525	0.0078
122	2.4602	0.0078
123	2.4679	0.0077
124	2.4756	0.0077
125	2.4833	0.0076
126	2.4909	0.0076
127	2.4984	0.0076
128	2.5059	0.0075
129	2.5134	0.0075
130	2.5209	0.0075
131	2.5283	0.0074
132	2.5357	0.0074
133	2.5430	0.0073
134	2.5503	0.0073
135	2.5576	0.0073
136	2.5649	0.0072
137	2.5721	0.0072
138	2.5793	0.0072
139	2.5864	0.0072
140	2.5935	0.0071
141	2.6006	0.0071
142	2.6077	0.0071
143	2.6147	0.0070
144	2.6217	0.0070
145	2.6287	0.0070
146	2.6356	0.0069
147	2.6425	0.0069
148	2.6494	0.0069
149	2.6563	0.0068
150	2.6631	0.0068
151	2.6699	0.0068
152	2.6766	0.0068
153	2.6834	0.0067
154	2.6901	0.0067
155	2.6968	0.0067
156	2.7034	0.0067
157	2.7101	0.0066
158	2.7167	0.0066
159	2.7232	0.0066
160	2.7298	0.0066
161	2.7363	0.0065
162	2.7428	0.0065
163	2.7493	0.0065
164	2.7558	0.0065
165	2.7622	0.0064
166	2.7686	0.0064
167	2.7750	0.0064
168	2.7813	0.0064
169	2.7877	0.0063

170	2.7940	0.0063
171	2.8003	0.0063
172	2.8066	0.0063
173	2.8128	0.0062
174	2.8190	0.0062
175	2.8252	0.0062
176	2.8314	0.0062
177	2.8376	0.0062
178	2.8437	0.0061
179	2.8498	0.0061
180	2.8559	0.0061
181	2.8620	0.0061
182	2.8680	0.0061
183	2.8741	0.0060
184	2.8801	0.0060
185	2.8861	0.0060
186	2.8920	0.0060
187	2.8980	0.0060
188	2.9039	0.0059
189	2.9098	0.0059
190	2.9157	0.0059
191	2.9216	0.0059
192	2.9275	0.0059
193	2.9333	0.0058
194	2.9391	0.0058
195	2.9449	0.0058
196	2.9507	0.0058
197	2.9565	0.0058
198	2.9622	0.0057
199	2.9679	0.0057
200	2.9736	0.0057
201	2.9793	0.0057
202	2.9850	0.0057
203	2.9907	0.0057
204	2.9963	0.0056
205	3.0019	0.0056
206	3.0075	0.0056
207	3.0131	0.0056
208	3.0187	0.0056
209	3.0243	0.0056
210	3.0298	0.0055
211	3.0353	0.0055
212	3.0408	0.0055
213	3.0463	0.0055
214	3.0518	0.0055
215	3.0573	0.0055
216	3.0627	0.0054
217	3.0681	0.0054
218	3.0735	0.0054
219	3.0789	0.0054
220	3.0843	0.0054
221	3.0897	0.0054
222	3.0951	0.0054
223	3.1004	0.0053
224	3.1057	0.0053
225	3.1110	0.0053
226	3.1163	0.0053
227	3.1216	0.0053
228	3.1269	0.0053
229	3.1321	0.0053
230	3.1374	0.0052

231	3.1426	0.0052
232	3.1478	0.0052
233	3.1530	0.0052
234	3.1582	0.0052
235	3.1633	0.0052
236	3.1685	0.0052
237	3.1736	0.0051
238	3.1788	0.0051
239	3.1839	0.0051
240	3.1890	0.0051
241	3.1941	0.0051
242	3.1991	0.0051
243	3.2042	0.0051
244	3.2092	0.0050
245	3.2143	0.0050
246	3.2193	0.0050
247	3.2243	0.0050
248	3.2293	0.0050
249	3.2343	0.0050
250	3.2393	0.0050
251	3.2442	0.0050
252	3.2492	0.0049
253	3.2541	0.0049
254	3.2591	0.0049
255	3.2640	0.0049
256	3.2689	0.0049
257	3.2738	0.0049
258	3.2786	0.0049
259	3.2835	0.0049
260	3.2884	0.0049
261	3.2932	0.0048
262	3.2980	0.0048
263	3.3029	0.0048
264	3.3077	0.0048
265	3.3125	0.0048
266	3.3173	0.0048
267	3.3220	0.0048
268	3.3268	0.0048
269	3.3315	0.0048
270	3.3363	0.0047
271	3.3410	0.0047
272	3.3457	0.0047
273	3.3505	0.0047
274	3.3552	0.0047
275	3.3598	0.0047
276	3.3645	0.0047
277	3.3692	0.0047
278	3.3739	0.0047
279	3.3785	0.0046
280	3.3831	0.0046
281	3.3878	0.0046
282	3.3924	0.0046
283	3.3970	0.0046
284	3.4016	0.0046
285	3.4062	0.0046
286	3.4108	0.0046
287	3.4153	0.0046
288	3.4199	0.0046

Unit Period	Unit Rainfall	Unit Soil-Loss	Effective Rainfall

(number)	(In)	(In)	(In)
1	0.0046	0.0009	0.0037
2	0.0046	0.0009	0.0037
3	0.0046	0.0009	0.0037
4	0.0046	0.0009	0.0037
5	0.0046	0.0009	0.0037
6	0.0046	0.0009	0.0037
7	0.0046	0.0009	0.0037
8	0.0047	0.0009	0.0037
9	0.0047	0.0009	0.0038
10	0.0047	0.0009	0.0038
11	0.0047	0.0009	0.0038
12	0.0047	0.0009	0.0038
13	0.0047	0.0009	0.0038
14	0.0048	0.0009	0.0038
15	0.0048	0.0009	0.0038
16	0.0048	0.0009	0.0038
17	0.0048	0.0009	0.0039
18	0.0048	0.0010	0.0039
19	0.0048	0.0010	0.0039
20	0.0049	0.0010	0.0039
21	0.0049	0.0010	0.0039
22	0.0049	0.0010	0.0039
23	0.0049	0.0010	0.0039
24	0.0049	0.0010	0.0040
25	0.0049	0.0010	0.0040
26	0.0050	0.0010	0.0040
27	0.0050	0.0010	0.0040
28	0.0050	0.0010	0.0040
29	0.0050	0.0010	0.0040
30	0.0050	0.0010	0.0040
31	0.0051	0.0010	0.0041
32	0.0051	0.0010	0.0041
33	0.0051	0.0010	0.0041
34	0.0051	0.0010	0.0041
35	0.0051	0.0010	0.0041
36	0.0052	0.0010	0.0041
37	0.0052	0.0010	0.0042
38	0.0052	0.0010	0.0042
39	0.0052	0.0010	0.0042
40	0.0052	0.0010	0.0042
41	0.0053	0.0010	0.0042
42	0.0053	0.0010	0.0042
43	0.0053	0.0010	0.0043
44	0.0053	0.0010	0.0043
45	0.0054	0.0011	0.0043
46	0.0054	0.0011	0.0043
47	0.0054	0.0011	0.0043
48	0.0054	0.0011	0.0043
49	0.0054	0.0011	0.0044
50	0.0055	0.0011	0.0044
51	0.0055	0.0011	0.0044
52	0.0055	0.0011	0.0044
53	0.0055	0.0011	0.0044
54	0.0056	0.0011	0.0045
55	0.0056	0.0011	0.0045
56	0.0056	0.0011	0.0045
57	0.0056	0.0011	0.0045
58	0.0057	0.0011	0.0045
59	0.0057	0.0011	0.0046

60	0.0057	0.0011	0.0046
61	0.0057	0.0011	0.0046
62	0.0058	0.0011	0.0046
63	0.0058	0.0011	0.0047
64	0.0058	0.0011	0.0047
65	0.0059	0.0012	0.0047
66	0.0059	0.0012	0.0047
67	0.0059	0.0012	0.0047
68	0.0059	0.0012	0.0048
69	0.0060	0.0012	0.0048
70	0.0060	0.0012	0.0048
71	0.0060	0.0012	0.0048
72	0.0061	0.0012	0.0049
73	0.0061	0.0012	0.0049
74	0.0061	0.0012	0.0049
75	0.0062	0.0012	0.0049
76	0.0062	0.0012	0.0050
77	0.0062	0.0012	0.0050
78	0.0062	0.0012	0.0050
79	0.0063	0.0012	0.0051
80	0.0063	0.0012	0.0051
81	0.0064	0.0013	0.0051
82	0.0064	0.0013	0.0051
83	0.0064	0.0013	0.0052
84	0.0065	0.0013	0.0052
85	0.0065	0.0013	0.0052
86	0.0065	0.0013	0.0052
87	0.0066	0.0013	0.0053
88	0.0066	0.0013	0.0053
89	0.0067	0.0013	0.0053
90	0.0067	0.0013	0.0054
91	0.0067	0.0013	0.0054
92	0.0068	0.0013	0.0054
93	0.0068	0.0013	0.0055
94	0.0068	0.0013	0.0055
95	0.0069	0.0014	0.0055
96	0.0069	0.0014	0.0056
97	0.0070	0.0014	0.0056
98	0.0070	0.0014	0.0056
99	0.0071	0.0014	0.0057
100	0.0071	0.0014	0.0057
101	0.0072	0.0014	0.0058
102	0.0072	0.0014	0.0058
103	0.0073	0.0014	0.0058
104	0.0073	0.0014	0.0059
105	0.0074	0.0015	0.0059
106	0.0074	0.0015	0.0060
107	0.0075	0.0015	0.0060
108	0.0075	0.0015	0.0060
109	0.0076	0.0015	0.0061
110	0.0076	0.0015	0.0061
111	0.0077	0.0015	0.0062
112	0.0078	0.0015	0.0062
113	0.0078	0.0015	0.0063
114	0.0079	0.0016	0.0063
115	0.0080	0.0016	0.0064
116	0.0080	0.0016	0.0064
117	0.0081	0.0016	0.0065
118	0.0081	0.0016	0.0065
119	0.0082	0.0016	0.0066
120	0.0083	0.0016	0.0066

121	0.0084	0.0016	0.0067
122	0.0084	0.0017	0.0068
123	0.0085	0.0017	0.0068
124	0.0086	0.0017	0.0069
125	0.0087	0.0017	0.0070
126	0.0087	0.0017	0.0070
127	0.0088	0.0017	0.0071
128	0.0089	0.0017	0.0071
129	0.0090	0.0018	0.0072
130	0.0091	0.0018	0.0073
131	0.0092	0.0018	0.0074
132	0.0092	0.0018	0.0074
133	0.0094	0.0018	0.0075
134	0.0094	0.0019	0.0076
135	0.0096	0.0019	0.0077
136	0.0096	0.0019	0.0077
137	0.0098	0.0019	0.0078
138	0.0098	0.0019	0.0079
139	0.0100	0.0020	0.0080
140	0.0101	0.0020	0.0081
141	0.0102	0.0020	0.0082
142	0.0103	0.0020	0.0083
143	0.0105	0.0021	0.0084
144	0.0106	0.0021	0.0085
145	0.0097	0.0019	0.0078
146	0.0098	0.0019	0.0079
147	0.0100	0.0020	0.0080
148	0.0101	0.0020	0.0081
149	0.0103	0.0020	0.0083
150	0.0104	0.0020	0.0084
151	0.0106	0.0021	0.0085
152	0.0107	0.0021	0.0086
153	0.0110	0.0022	0.0088
154	0.0111	0.0022	0.0089
155	0.0113	0.0022	0.0091
156	0.0115	0.0023	0.0092
157	0.0118	0.0023	0.0094
158	0.0119	0.0023	0.0096
159	0.0122	0.0024	0.0098
160	0.0124	0.0024	0.0099
161	0.0127	0.0025	0.0102
162	0.0129	0.0025	0.0103
163	0.0133	0.0026	0.0106
164	0.0135	0.0027	0.0108
165	0.0139	0.0027	0.0111
166	0.0141	0.0028	0.0113
167	0.0146	0.0029	0.0117
168	0.0148	0.0029	0.0119
169	0.0154	0.0030	0.0124
170	0.0157	0.0031	0.0126
171	0.0163	0.0032	0.0131
172	0.0167	0.0033	0.0134
173	0.0174	0.0034	0.0140
174	0.0178	0.0035	0.0143
175	0.0186	0.0037	0.0150
176	0.0191	0.0038	0.0153
177	0.0202	0.0040	0.0162
178	0.0207	0.0041	0.0167
179	0.0220	0.0043	0.0177
180	0.0228	0.0045	0.0183
181	0.0244	0.0048	0.0196

182	0.0254	0.0050	0.0204
183	0.0276	0.0054	0.0222
184	0.0289	0.0057	0.0232
185	0.0278	0.0055	0.0223
186	0.0296	0.0058	0.0238
187	0.0344	0.0068	0.0276
188	0.0375	0.0074	0.0301
189	0.0466	0.0092	0.0374
190	0.0537	0.0097	0.0440
191	0.0815	0.0097	0.0718
192	0.1183	0.0097	0.1086
193	0.5118	0.0097	0.5021
194	0.0641	0.0097	0.0544
195	0.0415	0.0082	0.0333
196	0.0318	0.0063	0.0255
197	0.0304	0.0060	0.0244
198	0.0265	0.0052	0.0212
199	0.0236	0.0046	0.0189
200	0.0214	0.0042	0.0172
201	0.0196	0.0039	0.0158
202	0.0182	0.0036	0.0146
203	0.0170	0.0034	0.0137
204	0.0160	0.0032	0.0128
205	0.0151	0.0030	0.0121
206	0.0143	0.0028	0.0115
207	0.0137	0.0027	0.0110
208	0.0131	0.0026	0.0105
209	0.0125	0.0025	0.0101
210	0.0120	0.0024	0.0097
211	0.0116	0.0023	0.0093
212	0.0112	0.0022	0.0090
213	0.0108	0.0021	0.0087
214	0.0105	0.0021	0.0084
215	0.0102	0.0020	0.0082
216	0.0099	0.0020	0.0080
217	0.0107	0.0021	0.0086
218	0.0104	0.0020	0.0083
219	0.0101	0.0020	0.0081
220	0.0099	0.0020	0.0080
221	0.0097	0.0019	0.0078
222	0.0095	0.0019	0.0076
223	0.0093	0.0018	0.0075
224	0.0091	0.0018	0.0073
225	0.0089	0.0018	0.0072
226	0.0088	0.0017	0.0070
227	0.0086	0.0017	0.0069
228	0.0085	0.0017	0.0068
229	0.0083	0.0016	0.0067
230	0.0082	0.0016	0.0066
231	0.0080	0.0016	0.0065
232	0.0079	0.0016	0.0064
233	0.0078	0.0015	0.0063
234	0.0077	0.0015	0.0062
235	0.0076	0.0015	0.0061
236	0.0075	0.0015	0.0060
237	0.0073	0.0014	0.0059
238	0.0072	0.0014	0.0058
239	0.0072	0.0014	0.0057
240	0.0071	0.0014	0.0057
241	0.0070	0.0014	0.0056
242	0.0069	0.0014	0.0055

243	0.0068	0.0013	0.0055
244	0.0067	0.0013	0.0054
245	0.0066	0.0013	0.0053
246	0.0066	0.0013	0.0053
247	0.0065	0.0013	0.0052
248	0.0064	0.0013	0.0051
249	0.0063	0.0012	0.0051
250	0.0063	0.0012	0.0050
251	0.0062	0.0012	0.0050
252	0.0061	0.0012	0.0049
253	0.0061	0.0012	0.0049
254	0.0060	0.0012	0.0048
255	0.0060	0.0012	0.0048
256	0.0059	0.0012	0.0047
257	0.0058	0.0012	0.0047
258	0.0058	0.0011	0.0046
259	0.0057	0.0011	0.0046
260	0.0057	0.0011	0.0046
261	0.0056	0.0011	0.0045
262	0.0056	0.0011	0.0045
263	0.0055	0.0011	0.0044
264	0.0055	0.0011	0.0044
265	0.0054	0.0011	0.0044
266	0.0054	0.0011	0.0043
267	0.0053	0.0011	0.0043
268	0.0053	0.0010	0.0043
269	0.0053	0.0010	0.0042
270	0.0052	0.0010	0.0042
271	0.0052	0.0010	0.0041
272	0.0051	0.0010	0.0041
273	0.0051	0.0010	0.0041
274	0.0050	0.0010	0.0041
275	0.0050	0.0010	0.0040
276	0.0050	0.0010	0.0040
277	0.0049	0.0010	0.0040
278	0.0049	0.0010	0.0039
279	0.0049	0.0010	0.0039
280	0.0048	0.0010	0.0039
281	0.0048	0.0009	0.0039
282	0.0048	0.0009	0.0038
283	0.0047	0.0009	0.0038
284	0.0047	0.0009	0.0038
285	0.0047	0.0009	0.0037
286	0.0046	0.0009	0.0037
287	0.0046	0.0009	0.0037
288	0.0046	0.0009	0.0037

Total soil rain loss = 0.56(In)
Total effective rainfall = 2.86(In)
Peak flow rate in flood hydrograph = 64.96(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	17.5	35.0	52.5	70.0

0+ 5	0.0002	0.04	Q	|	|	|	|
0+10	0.0020	0.25	Q	|	|	|	|
0+15	0.0063	0.62	Q	|	|	|	|
0+20	0.0119	0.82	Q	|	|	|	|
0+25	0.0182	0.93	Q	|	|	|	|
0+30	0.0251	1.00	Q	|	|	|	|
0+35	0.0324	1.05	Q	|	|	|	|
0+40	0.0399	1.10	Q	|	|	|	|
0+45	0.0477	1.13	Q	|	|	|	|
0+50	0.0557	1.16	Q	|	|	|	|
0+55	0.0638	1.18	Q	|	|	|	|
1+ 0	0.0720	1.20	Q	|	|	|	|
1+ 5	0.0804	1.21	Q	|	|	|	|
1+10	0.0888	1.22	Q	|	|	|	|
1+15	0.0973	1.23	Q	|	|	|	|
1+20	0.1058	1.24	Q	|	|	|	|
1+25	0.1144	1.25	Q	|	|	|	|
1+30	0.1231	1.26	Q	|	|	|	|
1+35	0.1319	1.27	Q	|	|	|	|
1+40	0.1406	1.27	Q	|	|	|	|
1+45	0.1494	1.28	Q	|	|	|	|
1+50	0.1583	1.28	Q	|	|	|	|
1+55	0.1671	1.29	QV	|	|	|	|
2+ 0	0.1760	1.29	QV	|	|	|	|
2+ 5	0.1849	1.30	QV	|	|	|	|
2+10	0.1939	1.30	QV	|	|	|	|
2+15	0.2029	1.31	QV	|	|	|	|
2+20	0.2119	1.31	QV	|	|	|	|
2+25	0.2210	1.32	QV	|	|	|	|
2+30	0.2301	1.32	QV	|	|	|	|
2+35	0.2392	1.33	QV	|	|	|	|
2+40	0.2484	1.33	QV	|	|	|	|
2+45	0.2576	1.34	QV	|	|	|	|
2+50	0.2668	1.34	QV	|	|	|	|
2+55	0.2760	1.35	QV	|	|	|	|
3+ 0	0.2853	1.35	QV	|	|	|	|
3+ 5	0.2947	1.36	QV	|	|	|	|
3+10	0.3041	1.36	QV	|	|	|	|
3+15	0.3135	1.37	QV	|	|	|	|
3+20	0.3229	1.37	QV	|	|	|	|
3+25	0.3324	1.38	Q V	|	|	|	|
3+30	0.3419	1.38	Q V	|	|	|	|
3+35	0.3515	1.39	Q V	|	|	|	|
3+40	0.3611	1.39	Q V	|	|	|	|
3+45	0.3707	1.40	Q V	|	|	|	|
3+50	0.3804	1.41	Q V	|	|	|	|
3+55	0.3901	1.41	Q V	|	|	|	|
4+ 0	0.3999	1.42	Q V	|	|	|	|
4+ 5	0.4097	1.42	Q V	|	|	|	|
4+10	0.4195	1.43	Q V	|	|	|	|
4+15	0.4294	1.43	Q V	|	|	|	|
4+20	0.4393	1.44	Q V	|	|	|	|
4+25	0.4493	1.45	Q V	|	|	|	|
4+30	0.4593	1.45	Q V	|	|	|	|
4+35	0.4693	1.46	Q V	|	|	|	|
4+40	0.4794	1.47	Q V	|	|	|	|
4+45	0.4896	1.47	Q V	|	|	|	|
4+50	0.4998	1.48	Q V	|	|	|	|
4+55	0.5100	1.49	Q V	|	|	|	|
5+ 0	0.5203	1.49	Q V	|	|	|	|
5+ 5	0.5306	1.50	Q V	|	|	|	|

5+10	0.5410	1.51	Q	V				
5+15	0.5514	1.51	Q	V				
5+20	0.5618	1.52	Q	V				
5+25	0.5724	1.53	Q	V				
5+30	0.5829	1.53	Q	V				
5+35	0.5936	1.54	Q	V				
5+40	0.6042	1.55	Q	V				
5+45	0.6149	1.56	Q	V				
5+50	0.6257	1.56	Q	V				
5+55	0.6365	1.57	Q	V				
6+ 0	0.6474	1.58	Q	V				
6+ 5	0.6584	1.59	Q	V				
6+10	0.6693	1.60	Q	V				
6+15	0.6804	1.60	Q	V				
6+20	0.6915	1.61	Q	V				
6+25	0.7026	1.62	Q	V				
6+30	0.7139	1.63	Q	V				
6+35	0.7251	1.64	Q	V				
6+40	0.7365	1.65	Q	V				
6+45	0.7479	1.65	Q	V				
6+50	0.7593	1.66	Q	V				
6+55	0.7708	1.67	Q	V				
7+ 0	0.7824	1.68	Q	V				
7+ 5	0.7941	1.69	Q	V				
7+10	0.8058	1.70	Q	V				
7+15	0.8176	1.71	Q	V				
7+20	0.8294	1.72	Q	V				
7+25	0.8413	1.73	Q	V				
7+30	0.8533	1.74	Q	V				
7+35	0.8653	1.75	Q	V				
7+40	0.8775	1.76	|Q	V				
7+45	0.8897	1.77	|Q	V				
7+50	0.9019	1.78	|Q	V				
7+55	0.9143	1.79	|Q	V				
8+ 0	0.9267	1.80	|Q	V				
8+ 5	0.9392	1.81	|Q	V				
8+10	0.9518	1.83	|Q	V				
8+15	0.9644	1.84	|Q	V				
8+20	0.9771	1.85	|Q	V				
8+25	0.9900	1.86	|Q	V				
8+30	1.0029	1.87	|Q	V				
8+35	1.0159	1.89	|Q	V				
8+40	1.0289	1.90	|Q	V				
8+45	1.0421	1.91	|Q	V				
8+50	1.0553	1.92	|Q	V				
8+55	1.0687	1.94	|Q	V				
9+ 0	1.0821	1.95	|Q	V				
9+ 5	1.0956	1.96	|Q	V				
9+10	1.1093	1.98	|Q	V				
9+15	1.1230	1.99	|Q	V				
9+20	1.1368	2.01	|Q	V				
9+25	1.1507	2.02	|Q	V				
9+30	1.1648	2.04	|Q	V				
9+35	1.1789	2.05	|Q	V				
9+40	1.1931	2.07	|Q	V				
9+45	1.2075	2.08	|Q	V				
9+50	1.2220	2.10	|Q	V				
9+55	1.2366	2.12	|Q	V				
10+ 0	1.2513	2.13	|Q	V				
10+ 5	1.2661	2.15	|Q	V				
10+10	1.2810	2.17	|Q	V				

10+15	1.2961	2.19	Q V				
10+20	1.3113	2.21	Q V				
10+25	1.3266	2.23	Q V				
10+30	1.3421	2.25	Q V				
10+35	1.3577	2.27	Q V				
10+40	1.3734	2.29	Q V				
10+45	1.3893	2.31	Q V				
10+50	1.4054	2.33	Q V				
10+55	1.4215	2.35	Q V				
11+ 0	1.4379	2.37	Q V				
11+ 5	1.4544	2.40	Q V				
11+10	1.4710	2.42	Q V				
11+15	1.4879	2.44	Q V				
11+20	1.5049	2.47	Q V				
11+25	1.5221	2.49	Q V				
11+30	1.5394	2.52	Q V				
11+35	1.5570	2.55	Q V				
11+40	1.5747	2.58	Q V				
11+45	1.5926	2.60	Q V				
11+50	1.6108	2.63	Q V				
11+55	1.6291	2.66	Q V				
12+ 0	1.6477	2.70	Q V				
12+ 5	1.6664	2.72	Q V				
12+10	1.6851	2.71	Q V				
12+15	1.7033	2.66	Q V				
12+20	1.7216	2.65	Q V				
12+25	1.7399	2.66	Q V				
12+30	1.7584	2.68	Q V				
12+35	1.7770	2.71	Q V				
12+40	1.7959	2.74	Q V				
12+45	1.8150	2.77	Q V				
12+50	1.8343	2.81	Q V				
12+55	1.8540	2.85	Q V				
13+ 0	1.8739	2.89	Q V				
13+ 5	1.8941	2.94	Q V				
13+10	1.9147	2.99	Q V				
13+15	1.9356	3.04	Q V				
13+20	1.9569	3.09	Q V				
13+25	1.9786	3.15	Q V				
13+30	2.0007	3.21	Q V				
13+35	2.0232	3.27	Q V				
13+40	2.0462	3.34	Q V				
13+45	2.0697	3.41	Q V				
13+50	2.0936	3.48	Q V				
13+55	2.1182	3.56	Q V				
14+ 0	2.1432	3.64	Q V				
14+ 5	2.1689	3.73	Q V				
14+10	2.1953	3.82	Q V				
14+15	2.2223	3.93	Q V				
14+20	2.2501	4.03	Q V				
14+25	2.2787	4.15	Q V				
14+30	2.3081	4.27	Q V				
14+35	2.3385	4.41	Q V				
14+40	2.3698	4.55	Q V				
14+45	2.4023	4.71	Q V				
14+50	2.4359	4.88	Q V				
14+55	2.4708	5.07	Q V				
15+ 0	2.5071	5.28	Q V				
15+ 5	2.5451	5.51	Q V				
15+10	2.5848	5.77	Q V				
15+15	2.6266	6.07	Q V				

15+20	2.6706	6.40	Q	V			
15+25	2.7172	6.76	Q	V			
15+30	2.7655	7.01	Q	V			
15+35	2.8151	7.21	Q	V			
15+40	2.8679	7.67	Q	V			
15+45	2.9258	8.41	Q	V			
15+50	2.9908	9.44	Q	V			
15+55	3.0676	11.14	Q	V			
16+ 0	3.1665	14.37	Q	V			
16+ 5	3.3309	23.86	Q	V			
16+10	3.6625	48.15	V	Q			
16+15	4.1098	64.96	V	Q			
16+20	4.3876	40.34	Q	V			
16+25	4.5753	27.25	Q	V			
16+30	4.7177	20.68	Q	V			
16+35	4.8344	16.94	Q	V			
16+40	4.9316	14.12	Q	V			
16+45	5.0135	11.89	Q	V			
16+50	5.0851	10.40	Q	V			
16+55	5.1476	9.07	Q	V			
17+ 0	5.2028	8.02	Q	V			
17+ 5	5.2516	7.09	Q	V			
17+10	5.2946	6.24	Q	V			
17+15	5.3332	5.60	Q	V			
17+20	5.3701	5.36	Q	V			
17+25	5.4050	5.07	Q	V			
17+30	5.4364	4.56	Q	V			
17+35	5.4657	4.24	Q	V			
17+40	5.4903	3.57	Q	V			
17+45	5.5136	3.39	Q	V			
17+50	5.5359	3.24	Q	V			
17+55	5.5574	3.11	Q	V			
18+ 0	5.5780	3.00	Q	V			
18+ 5	5.5980	2.90	Q	V			
18+10	5.6177	2.85	Q	V			
18+15	5.6373	2.85	Q	V			
18+20	5.6567	2.81	Q	V			
18+25	5.6757	2.76	Q	V			
18+30	5.6943	2.71	Q	V			
18+35	5.7126	2.65	Q	V			
18+40	5.7305	2.60	Q	V			
18+45	5.7480	2.55	Q	V			
18+50	5.7652	2.50	Q	V			
18+55	5.7820	2.45	Q	V			
19+ 0	5.7986	2.40	Q	V			
19+ 5	5.8148	2.36	Q	V			
19+10	5.8307	2.31	Q	V			
19+15	5.8464	2.27	Q	V			
19+20	5.8618	2.23	Q	V			
19+25	5.8769	2.20	Q	V			
19+30	5.8918	2.16	Q	V			
19+35	5.9065	2.13	Q	V			
19+40	5.9209	2.09	Q	V			
19+45	5.9351	2.06	Q	V			
19+50	5.9490	2.03	Q	V			
19+55	5.9628	2.00	Q	V			
20+ 0	5.9764	1.97	Q	V			
20+ 5	5.9898	1.94	Q	V			
20+10	6.0030	1.92	Q	V			
20+15	6.0160	1.89	Q	V			
20+20	6.0289	1.87	Q	V			

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  20+25       6.0416      1.84  |Q        |         |         |      V  |
  20+30       6.0541      1.82  |Q        |         |         |      V  |
  20+35       6.0665      1.80  |Q        |         |         |      V  |
  20+40       6.0787      1.78  |Q        |         |         |      V  |
  20+45       6.0908      1.75  |Q        |         |         |      V  |
  20+50       6.1027      1.73  Q         |         |         |      V  |
  20+55       6.1145      1.71  Q         |         |         |      V  |
  21+ 0       6.1262      1.69  Q         |         |         |      V  |
  21+ 5       6.1377      1.68  Q         |         |         |      V  |
  21+10       6.1492      1.66  Q         |         |         |      V  |
  21+15       6.1605      1.64  Q         |         |         |      V  |
  21+20       6.1716      1.62  Q         |         |         |      V  |
  21+25       6.1827      1.61  Q         |         |         |      V  |
  21+30       6.1937      1.59  Q         |         |         |       V |
  21+35       6.2045      1.57  Q         |         |         |       V |
  21+40       6.2152      1.56  Q         |         |         |       V |
  21+45       6.2259      1.54  Q         |         |         |       V |
  21+50       6.2364      1.53  Q         |         |         |       V |
  21+55       6.2469      1.52  Q         |         |         |       V |
  22+ 0       6.2572      1.50  Q         |         |         |       V |
  22+ 5       6.2675      1.49  Q         |         |         |       V |
  22+10       6.2776      1.47  Q         |         |         |       V |
  22+15       6.2877      1.46  Q         |         |         |       V |
  22+20       6.2977      1.45  Q         |         |         |       V |
  22+25       6.3076      1.44  Q         |         |         |       V |
  22+30       6.3174      1.42  Q         |         |         |       V |
  22+35       6.3271      1.41  Q         |         |         |       V |
  22+40       6.3367      1.40  Q         |         |         |       V |
  22+45       6.3463      1.39  Q         |         |         |       V |
  22+50       6.3558      1.38  Q         |         |         |        V|
  22+55       6.3652      1.37  Q         |         |         |        V|
  23+ 0       6.3746      1.36  Q         |         |         |        V|
  23+ 5       6.3839      1.35  Q         |         |         |        V|
  23+10       6.3931      1.34  Q         |         |         |        V|
  23+15       6.4022      1.33  Q         |         |         |        V|
  23+20       6.4113      1.32  Q         |         |         |        V|
  23+25       6.4203      1.31  Q         |         |         |        V|
  23+30       6.4292      1.30  Q         |         |         |        V|
  23+35       6.4381      1.29  Q         |         |         |        V|
  23+40       6.4469      1.28  Q         |         |         |        V|
  23+45       6.4556      1.27  Q         |         |         |        V|
  23+50       6.4643      1.26  Q         |         |         |        V|
  23+55       6.4730      1.25  Q         |         |         |        V|
  24+ 0       6.4815      1.24  Q         |         |         |        V|
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 08/30/24

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

Program License Serial Number 6277

JOB NO 2021-181
WATSON APPLEY VALLEY 145
100 YEAR UNIT HYDROGRAPH
POST, AREA D

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
40.36	1	0.60
Rainfall data for year 2		
40.36	6	0.76
Rainfall data for year 2		
40.36	24	1.30
Rainfall data for year 100		
40.36	1	1.08
Rainfall data for year 100		
40.36	6	2.01
Rainfall data for year 100		
40.36	24	3.42

++

******** 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)
32.0	52.0	40.36	1.000	0.785	0.237	0.186

Area-averaged adjusted loss rate Fm (In/Hr) = 0.186

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
9.57	0.237	32.0	52.0	9.23	0.067
30.79	0.763	98.0	98.0	0.20	0.932

Area-averaged catchment yield fraction, Y = 0.727
Area-averaged low loss fraction, Yb = 0.273
User entry of time of concentration = 0.340 (hours)
++
Watershed area = 40.36(Ac.)
Catchment Lag time = 0.272 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 30.6373
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.186(In/Hr)
Average low loss rate fraction (Yb) = 0.273 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.512(In)
Computed peak 30-minute rainfall = 0.877(In)
Specified peak 1-hour rainfall = 1.080(In)
Computed peak 3-hour rainfall = 1.581(In)
Specified peak 6-hour rainfall = 2.010(In)
Specified peak 24-hour rainfall = 3.420(In)

Rainfall depth area reduction factors:
Using a total area of 40.36(Ac.) (Ref: fig. E-4)

5-minute factor = 0.998 Adjusted rainfall = 0.512(In)
30-minute factor = 0.998 Adjusted rainfall = 0.876(In)
1-hour factor = 0.998 Adjusted rainfall = 1.078(In)
3-hour factor = 1.000 Adjusted rainfall = 1.580(In)
6-hour factor = 1.000 Adjusted rainfall = 2.010(In)
24-hour factor = 1.000 Adjusted rainfall = 3.420(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 = 488.10 (CFS))	
1	1.819	8.879
2	9.839	39.148
3	32.088	108.596
4	53.408	104.061
5	65.111	57.125
6	72.614	36.622
7	78.031	26.443
8	82.073	19.726

9	85.295	15.729
10	87.971	13.061
11	89.992	9.865
12	91.690	8.286
13	93.147	7.113
14	94.362	5.931
15	95.392	5.029
16	96.247	4.171
17	96.987	3.611
18	97.550	2.752
19	97.968	2.038
20	98.280	1.521
21	98.637	1.743
22	99.004	1.794
23	99.370	1.785
24	99.625	1.244
25	99.816	0.935
26	100.000	0.897

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5115	0.5115
2	0.6297	0.1182
3	0.7112	0.0815
4	0.7753	0.0641
5	0.8290	0.0537
6	0.8756	0.0466
7	0.9170	0.0414
8	0.9545	0.0375
9	0.9888	0.0343
10	1.0206	0.0318
11	1.0502	0.0296
12	1.0780	0.0278
13	1.1084	0.0305
14	1.1374	0.0290
15	1.1650	0.0277
16	1.1915	0.0265
17	1.2169	0.0254
18	1.2414	0.0245
19	1.2650	0.0236
20	1.2878	0.0228
21	1.3099	0.0221
22	1.3312	0.0214
23	1.3520	0.0208
24	1.3722	0.0202
25	1.3918	0.0196
26	1.4110	0.0191
27	1.4296	0.0187
28	1.4479	0.0182
29	1.4657	0.0178
30	1.4831	0.0174
31	1.5001	0.0170
32	1.5168	0.0167
33	1.5331	0.0163
34	1.5491	0.0160
35	1.5648	0.0157
36	1.5803	0.0154
37	1.5954	0.0151
38	1.6102	0.0148
39	1.6248	0.0146
40	1.6391	0.0143

41	1.6532	0.0141
42	1.6671	0.0139
43	1.6807	0.0137
44	1.6942	0.0135
45	1.7074	0.0133
46	1.7205	0.0131
47	1.7334	0.0129
48	1.7461	0.0127
49	1.7586	0.0125
50	1.7710	0.0124
51	1.7832	0.0122
52	1.7952	0.0121
53	1.8071	0.0119
54	1.8189	0.0118
55	1.8305	0.0116
56	1.8420	0.0115
57	1.8533	0.0113
58	1.8645	0.0112
59	1.8756	0.0111
60	1.8866	0.0110
61	1.8974	0.0108
62	1.9082	0.0107
63	1.9188	0.0106
64	1.9293	0.0105
65	1.9397	0.0104
66	1.9500	0.0103
67	1.9602	0.0102
68	1.9703	0.0101
69	1.9803	0.0100
70	1.9902	0.0099
71	2.0000	0.0098
72	2.0097	0.0097
73	2.0204	0.0107
74	2.0310	0.0106
75	2.0415	0.0105
76	2.0518	0.0104
77	2.0622	0.0103
78	2.0724	0.0102
79	2.0825	0.0101
80	2.0926	0.0101
81	2.1026	0.0100
82	2.1125	0.0099
83	2.1224	0.0098
84	2.1321	0.0098
85	2.1418	0.0097
86	2.1514	0.0096
87	2.1610	0.0096
88	2.1705	0.0095
89	2.1799	0.0094
90	2.1893	0.0094
91	2.1986	0.0093
92	2.2078	0.0092
93	2.2170	0.0092
94	2.2261	0.0091
95	2.2351	0.0091
96	2.2441	0.0090
97	2.2531	0.0089
98	2.2620	0.0089
99	2.2708	0.0088
100	2.2795	0.0088
101	2.2883	0.0087

102	2.2969	0.0087
103	2.3055	0.0086
104	2.3141	0.0086
105	2.3226	0.0085
106	2.3310	0.0085
107	2.3395	0.0084
108	2.3478	0.0084
109	2.3561	0.0083
110	2.3644	0.0083
111	2.3726	0.0082
112	2.3808	0.0082
113	2.3889	0.0081
114	2.3970	0.0081
115	2.4050	0.0080
116	2.4130	0.0080
117	2.4210	0.0080
118	2.4289	0.0079
119	2.4368	0.0079
120	2.4446	0.0078
121	2.4524	0.0078
122	2.4602	0.0078
123	2.4679	0.0077
124	2.4755	0.0077
125	2.4832	0.0076
126	2.4908	0.0076
127	2.4983	0.0076
128	2.5059	0.0075
129	2.5134	0.0075
130	2.5208	0.0075
131	2.5282	0.0074
132	2.5356	0.0074
133	2.5430	0.0073
134	2.5503	0.0073
135	2.5576	0.0073
136	2.5648	0.0072
137	2.5720	0.0072
138	2.5792	0.0072
139	2.5864	0.0072
140	2.5935	0.0071
141	2.6006	0.0071
142	2.6076	0.0071
143	2.6146	0.0070
144	2.6216	0.0070
145	2.6286	0.0070
146	2.6355	0.0069
147	2.6424	0.0069
148	2.6493	0.0069
149	2.6562	0.0068
150	2.6630	0.0068
151	2.6698	0.0068
152	2.6766	0.0068
153	2.6833	0.0067
154	2.6900	0.0067
155	2.6967	0.0067
156	2.7034	0.0067
157	2.7100	0.0066
158	2.7166	0.0066
159	2.7232	0.0066
160	2.7297	0.0066
161	2.7363	0.0065
162	2.7428	0.0065

163	2.7492	0.0065
164	2.7557	0.0065
165	2.7621	0.0064
166	2.7685	0.0064
167	2.7749	0.0064
168	2.7813	0.0064
169	2.7876	0.0063
170	2.7939	0.0063
171	2.8002	0.0063
172	2.8065	0.0063
173	2.8127	0.0062
174	2.8190	0.0062
175	2.8252	0.0062
176	2.8313	0.0062
177	2.8375	0.0062
178	2.8436	0.0061
179	2.8497	0.0061
180	2.8558	0.0061
181	2.8619	0.0061
182	2.8680	0.0061
183	2.8740	0.0060
184	2.8800	0.0060
185	2.8860	0.0060
186	2.8920	0.0060
187	2.8979	0.0060
188	2.9039	0.0059
189	2.9098	0.0059
190	2.9157	0.0059
191	2.9215	0.0059
192	2.9274	0.0059
193	2.9332	0.0058
194	2.9390	0.0058
195	2.9448	0.0058
196	2.9506	0.0058
197	2.9564	0.0058
198	2.9621	0.0057
199	2.9679	0.0057
200	2.9736	0.0057
201	2.9793	0.0057
202	2.9849	0.0057
203	2.9906	0.0057
204	2.9962	0.0056
205	3.0019	0.0056
206	3.0075	0.0056
207	3.0131	0.0056
208	3.0186	0.0056
209	3.0242	0.0056
210	3.0297	0.0055
211	3.0353	0.0055
212	3.0408	0.0055
213	3.0463	0.0055
214	3.0517	0.0055
215	3.0572	0.0055
216	3.0626	0.0054
217	3.0681	0.0054
218	3.0735	0.0054
219	3.0789	0.0054
220	3.0843	0.0054
221	3.0896	0.0054
222	3.0950	0.0054
223	3.1003	0.0053

224	3.1056	0.0053
225	3.1110	0.0053
226	3.1163	0.0053
227	3.1215	0.0053
228	3.1268	0.0053
229	3.1320	0.0053
230	3.1373	0.0052
231	3.1425	0.0052
232	3.1477	0.0052
233	3.1529	0.0052
234	3.1581	0.0052
235	3.1633	0.0052
236	3.1684	0.0052
237	3.1736	0.0051
238	3.1787	0.0051
239	3.1838	0.0051
240	3.1889	0.0051
241	3.1940	0.0051
242	3.1991	0.0051
243	3.2041	0.0051
244	3.2092	0.0050
245	3.2142	0.0050
246	3.2192	0.0050
247	3.2243	0.0050
248	3.2293	0.0050
249	3.2342	0.0050
250	3.2392	0.0050
251	3.2442	0.0050
252	3.2491	0.0050
253	3.2541	0.0049
254	3.2590	0.0049
255	3.2639	0.0049
256	3.2688	0.0049
257	3.2737	0.0049
258	3.2786	0.0049
259	3.2834	0.0049
260	3.2883	0.0049
261	3.2931	0.0048
262	3.2980	0.0048
263	3.3028	0.0048
264	3.3076	0.0048
265	3.3124	0.0048
266	3.3172	0.0048
267	3.3220	0.0048
268	3.3267	0.0048
269	3.3315	0.0048
270	3.3362	0.0047
271	3.3410	0.0047
272	3.3457	0.0047
273	3.3504	0.0047
274	3.3551	0.0047
275	3.3598	0.0047
276	3.3645	0.0047
277	3.3691	0.0047
278	3.3738	0.0047
279	3.3784	0.0046
280	3.3831	0.0046
281	3.3877	0.0046
282	3.3923	0.0046
283	3.3969	0.0046
284	3.4015	0.0046

285	3.4061	0.0046	
286	3.4107	0.0046	
287	3.4153	0.0046	
288	3.4198	0.0046	

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0046	0.0012	0.0033
2	0.0046	0.0012	0.0033
3	0.0046	0.0013	0.0033
4	0.0046	0.0013	0.0033
5	0.0046	0.0013	0.0034
6	0.0046	0.0013	0.0034
7	0.0046	0.0013	0.0034
8	0.0047	0.0013	0.0034
9	0.0047	0.0013	0.0034
10	0.0047	0.0013	0.0034
11	0.0047	0.0013	0.0034
12	0.0047	0.0013	0.0034
13	0.0047	0.0013	0.0034
14	0.0048	0.0013	0.0035
15	0.0048	0.0013	0.0035
16	0.0048	0.0013	0.0035
17	0.0048	0.0013	0.0035
18	0.0048	0.0013	0.0035
19	0.0048	0.0013	0.0035
20	0.0049	0.0013	0.0035
21	0.0049	0.0013	0.0035
22	0.0049	0.0013	0.0036
23	0.0049	0.0013	0.0036
24	0.0049	0.0013	0.0036
25	0.0050	0.0014	0.0036
26	0.0050	0.0014	0.0036
27	0.0050	0.0014	0.0036
28	0.0050	0.0014	0.0036
29	0.0050	0.0014	0.0037
30	0.0050	0.0014	0.0037
31	0.0051	0.0014	0.0037
32	0.0051	0.0014	0.0037
33	0.0051	0.0014	0.0037
34	0.0051	0.0014	0.0037
35	0.0051	0.0014	0.0037
36	0.0052	0.0014	0.0037
37	0.0052	0.0014	0.0038
38	0.0052	0.0014	0.0038
39	0.0052	0.0014	0.0038
40	0.0052	0.0014	0.0038
41	0.0053	0.0014	0.0038
42	0.0053	0.0014	0.0038
43	0.0053	0.0015	0.0039
44	0.0053	0.0015	0.0039
45	0.0054	0.0015	0.0039
46	0.0054	0.0015	0.0039
47	0.0054	0.0015	0.0039
48	0.0054	0.0015	0.0039
49	0.0054	0.0015	0.0040
50	0.0055	0.0015	0.0040
51	0.0055	0.0015	0.0040
52	0.0055	0.0015	0.0040

53	0.0055	0.0015	0.0040
54	0.0056	0.0015	0.0040
55	0.0056	0.0015	0.0041
56	0.0056	0.0015	0.0041
57	0.0056	0.0015	0.0041
58	0.0057	0.0015	0.0041
59	0.0057	0.0016	0.0041
60	0.0057	0.0016	0.0042
61	0.0057	0.0016	0.0042
62	0.0058	0.0016	0.0042
63	0.0058	0.0016	0.0042
64	0.0058	0.0016	0.0042
65	0.0059	0.0016	0.0043
66	0.0059	0.0016	0.0043
67	0.0059	0.0016	0.0043
68	0.0059	0.0016	0.0043
69	0.0060	0.0016	0.0043
70	0.0060	0.0016	0.0044
71	0.0060	0.0016	0.0044
72	0.0061	0.0017	0.0044
73	0.0061	0.0017	0.0044
74	0.0061	0.0017	0.0044
75	0.0062	0.0017	0.0045
76	0.0062	0.0017	0.0045
77	0.0062	0.0017	0.0045
78	0.0062	0.0017	0.0045
79	0.0063	0.0017	0.0046
80	0.0063	0.0017	0.0046
81	0.0064	0.0017	0.0046
82	0.0064	0.0017	0.0046
83	0.0064	0.0018	0.0047
84	0.0065	0.0018	0.0047
85	0.0065	0.0018	0.0047
86	0.0065	0.0018	0.0047
87	0.0066	0.0018	0.0048
88	0.0066	0.0018	0.0048
89	0.0067	0.0018	0.0048
90	0.0067	0.0018	0.0049
91	0.0067	0.0018	0.0049
92	0.0068	0.0018	0.0049
93	0.0068	0.0019	0.0050
94	0.0068	0.0019	0.0050
95	0.0069	0.0019	0.0050
96	0.0069	0.0019	0.0050
97	0.0070	0.0019	0.0051
98	0.0070	0.0019	0.0051
99	0.0071	0.0019	0.0052
100	0.0071	0.0019	0.0052
101	0.0072	0.0020	0.0052
102	0.0072	0.0020	0.0052
103	0.0073	0.0020	0.0053
104	0.0073	0.0020	0.0053
105	0.0074	0.0020	0.0054
106	0.0074	0.0020	0.0054
107	0.0075	0.0020	0.0054
108	0.0075	0.0021	0.0055
109	0.0076	0.0021	0.0055
110	0.0076	0.0021	0.0056
111	0.0077	0.0021	0.0056
112	0.0078	0.0021	0.0056
113	0.0078	0.0021	0.0057

114	0.0079	0.0022	0.0057
115	0.0080	0.0022	0.0058
116	0.0080	0.0022	0.0058
117	0.0081	0.0022	0.0059
118	0.0081	0.0022	0.0059
119	0.0082	0.0022	0.0060
120	0.0083	0.0023	0.0060
121	0.0084	0.0023	0.0061
122	0.0084	0.0023	0.0061
123	0.0085	0.0023	0.0062
124	0.0086	0.0023	0.0062
125	0.0087	0.0024	0.0063
126	0.0087	0.0024	0.0063
127	0.0088	0.0024	0.0064
128	0.0089	0.0024	0.0065
129	0.0090	0.0025	0.0065
130	0.0091	0.0025	0.0066
131	0.0092	0.0025	0.0067
132	0.0092	0.0025	0.0067
133	0.0094	0.0026	0.0068
134	0.0094	0.0026	0.0069
135	0.0096	0.0026	0.0069
136	0.0096	0.0026	0.0070
137	0.0098	0.0027	0.0071
138	0.0098	0.0027	0.0072
139	0.0100	0.0027	0.0073
140	0.0101	0.0028	0.0073
141	0.0102	0.0028	0.0074
142	0.0103	0.0028	0.0075
143	0.0105	0.0029	0.0076
144	0.0106	0.0029	0.0077
145	0.0097	0.0027	0.0071
146	0.0098	0.0027	0.0071
147	0.0100	0.0027	0.0073
148	0.0101	0.0028	0.0073
149	0.0103	0.0028	0.0075
150	0.0104	0.0028	0.0076
151	0.0106	0.0029	0.0077
152	0.0107	0.0029	0.0078
153	0.0110	0.0030	0.0080
154	0.0111	0.0030	0.0081
155	0.0113	0.0031	0.0082
156	0.0115	0.0031	0.0083
157	0.0118	0.0032	0.0085
158	0.0119	0.0033	0.0086
159	0.0122	0.0033	0.0089
160	0.0124	0.0034	0.0090
161	0.0127	0.0035	0.0092
162	0.0129	0.0035	0.0094
163	0.0133	0.0036	0.0096
164	0.0135	0.0037	0.0098
165	0.0139	0.0038	0.0101
166	0.0141	0.0039	0.0102
167	0.0146	0.0040	0.0106
168	0.0148	0.0040	0.0108
169	0.0154	0.0042	0.0112
170	0.0157	0.0043	0.0114
171	0.0163	0.0045	0.0119
172	0.0167	0.0046	0.0121
173	0.0174	0.0048	0.0126
174	0.0178	0.0049	0.0129

175	0.0187	0.0051	0.0136
176	0.0191	0.0052	0.0139
177	0.0202	0.0055	0.0147
178	0.0208	0.0057	0.0151
179	0.0221	0.0060	0.0160
180	0.0228	0.0062	0.0166
181	0.0245	0.0067	0.0178
182	0.0254	0.0069	0.0185
183	0.0277	0.0076	0.0201
184	0.0290	0.0079	0.0211
185	0.0278	0.0076	0.0202
186	0.0296	0.0081	0.0215
187	0.0343	0.0094	0.0250
188	0.0375	0.0102	0.0272
189	0.0466	0.0127	0.0339
190	0.0537	0.0147	0.0390
191	0.0815	0.0155	0.0659
192	0.1182	0.0155	0.1027
193	0.5115	0.0155	0.4960
194	0.0641	0.0155	0.0486
195	0.0414	0.0113	0.0301
196	0.0318	0.0087	0.0231
197	0.0305	0.0083	0.0221
198	0.0265	0.0072	0.0192
199	0.0236	0.0064	0.0171
200	0.0214	0.0058	0.0155
201	0.0196	0.0054	0.0143
202	0.0182	0.0050	0.0132
203	0.0170	0.0047	0.0124
204	0.0160	0.0044	0.0116
205	0.0151	0.0041	0.0110
206	0.0143	0.0039	0.0104
207	0.0137	0.0037	0.0099
208	0.0131	0.0036	0.0095
209	0.0125	0.0034	0.0091
210	0.0121	0.0033	0.0088
211	0.0116	0.0032	0.0084
212	0.0112	0.0031	0.0082
213	0.0108	0.0030	0.0079
214	0.0105	0.0029	0.0076
215	0.0102	0.0028	0.0074
216	0.0099	0.0027	0.0072
217	0.0107	0.0029	0.0077
218	0.0104	0.0028	0.0076
219	0.0101	0.0028	0.0074
220	0.0099	0.0027	0.0072
221	0.0097	0.0026	0.0070
222	0.0095	0.0026	0.0069
223	0.0093	0.0025	0.0068
224	0.0091	0.0025	0.0066
225	0.0089	0.0024	0.0065
226	0.0088	0.0024	0.0064
227	0.0086	0.0024	0.0063
228	0.0085	0.0023	0.0061
229	0.0083	0.0023	0.0060
230	0.0082	0.0022	0.0059
231	0.0080	0.0022	0.0058
232	0.0079	0.0022	0.0058
233	0.0078	0.0021	0.0057
234	0.0077	0.0021	0.0056
235	0.0076	0.0021	0.0055

236	0.0075	0.0020	0.0054
237	0.0073	0.0020	0.0053
238	0.0072	0.0020	0.0053
239	0.0072	0.0020	0.0052
240	0.0071	0.0019	0.0051
241	0.0070	0.0019	0.0051
242	0.0069	0.0019	0.0050
243	0.0068	0.0019	0.0049
244	0.0067	0.0018	0.0049
245	0.0066	0.0018	0.0048
246	0.0066	0.0018	0.0048
247	0.0065	0.0018	0.0047
248	0.0064	0.0018	0.0047
249	0.0063	0.0017	0.0046
250	0.0063	0.0017	0.0046
251	0.0062	0.0017	0.0045
252	0.0061	0.0017	0.0045
253	0.0061	0.0017	0.0044
254	0.0060	0.0016	0.0044
255	0.0060	0.0016	0.0043
256	0.0059	0.0016	0.0043
257	0.0058	0.0016	0.0042
258	0.0058	0.0016	0.0042
259	0.0057	0.0016	0.0042
260	0.0057	0.0016	0.0041
261	0.0056	0.0015	0.0041
262	0.0056	0.0015	0.0041
263	0.0055	0.0015	0.0040
264	0.0055	0.0015	0.0040
265	0.0054	0.0015	0.0039
266	0.0054	0.0015	0.0039
267	0.0053	0.0015	0.0039
268	0.0053	0.0014	0.0038
269	0.0053	0.0014	0.0038
270	0.0052	0.0014	0.0038
271	0.0052	0.0014	0.0038
272	0.0051	0.0014	0.0037
273	0.0051	0.0014	0.0037
274	0.0050	0.0014	0.0037
275	0.0050	0.0014	0.0036
276	0.0050	0.0014	0.0036
277	0.0049	0.0013	0.0036
278	0.0049	0.0013	0.0036
279	0.0049	0.0013	0.0035
280	0.0048	0.0013	0.0035
281	0.0048	0.0013	0.0035
282	0.0048	0.0013	0.0035
283	0.0047	0.0013	0.0034
284	0.0047	0.0013	0.0034
285	0.0047	0.0013	0.0034
286	0.0046	0.0013	0.0034
287	0.0046	0.0013	0.0033
288	0.0046	0.0013	0.0033

Total soil rain loss = 0.78(In)
Total effective rainfall = 2.64(In)
Peak flow rate in flood hydrograph = 75.07(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	20.0	40.0	60.0	80.0
0+ 5	0.0002	0.03	Q				
0+10	0.0013	0.16	Q				
0+15	0.0049	0.52	Q				
0+20	0.0108	0.87	Q				
0+25	0.0181	1.06	Q				
0+30	0.0263	1.18	Q				
0+35	0.0350	1.27	Q				
0+40	0.0443	1.34	Q				
0+45	0.0539	1.40	Q				
0+50	0.0639	1.45	Q				
0+55	0.0741	1.48	Q				
1+ 0	0.0846	1.52	Q				
1+ 5	0.0952	1.55	Q				
1+10	0.1060	1.57	Q				
1+15	0.1170	1.59	Q				
1+20	0.1281	1.61	Q				
1+25	0.1393	1.63	Q				
1+30	0.1507	1.64	Q				
1+35	0.1621	1.66	Q				
1+40	0.1735	1.67	Q				
1+45	0.1851	1.68	Q				
1+50	0.1968	1.69	Q				
1+55	0.2085	1.70	Q				
2+ 0	0.2203	1.71	Q				
2+ 5	0.2321	1.72	QV				
2+10	0.2441	1.73	QV				
2+15	0.2560	1.74	QV				
2+20	0.2680	1.74	QV				
2+25	0.2801	1.75	QV				
2+30	0.2922	1.76	QV				
2+35	0.3043	1.76	QV				
2+40	0.3165	1.77	QV				
2+45	0.3288	1.78	QV				
2+50	0.3410	1.78	QV				
2+55	0.3534	1.79	QV				
3+ 0	0.3657	1.80	QV				
3+ 5	0.3782	1.80	QV				
3+10	0.3906	1.81	QV				
3+15	0.4031	1.82	QV				
3+20	0.4157	1.82	QV				
3+25	0.4283	1.83	QV				
3+30	0.4410	1.84	QV				
3+35	0.4537	1.85	Q V				
3+40	0.4665	1.85	Q V				
3+45	0.4793	1.86	Q V				
3+50	0.4922	1.87	Q V				
3+55	0.5051	1.88	Q V				
4+ 0	0.5181	1.88	Q V				
4+ 5	0.5311	1.89	Q V				
4+10	0.5442	1.90	Q V				
4+15	0.5573	1.91	Q V				
4+20	0.5705	1.92	Q V				
4+25	0.5838	1.92	Q V				
4+30	0.5971	1.93	Q V				

```
4+35      0.6104     1.94  Q V      |         |         |         |
4+40      0.6239     1.95  Q V      |         |         |         |
4+45      0.6374     1.96  Q V      |         |         |         |
4+50      0.6509     1.97  Q V      |         |         |         |
4+55      0.6645     1.98  Q  V     |         |         |         |
5+ 0      0.6782     1.98  Q  V     |         |         |         |
5+ 5      0.6919     1.99  Q  V     |         |         |         |
5+10      0.7057     2.00  |Q V     |         |         |         |
5+15      0.7195     2.01  |Q V     |         |         |         |
5+20      0.7334     2.02  |Q V     |         |         |         |
5+25      0.7474     2.03  |Q V     |         |         |         |
5+30      0.7615     2.04  |Q V     |         |         |         |
5+35      0.7756     2.05  |Q V     |         |         |         |
5+40      0.7898     2.06  |Q V     |         |         |         |
5+45      0.8040     2.07  |Q V     |         |         |         |
5+50      0.8183     2.08  |Q V     |         |         |         |
5+55      0.8327     2.09  |Q V     |         |         |         |
6+ 0      0.8472     2.10  |Q V     |         |         |         |
6+ 5      0.8617     2.11  |Q V     |         |         |         |
6+10      0.8763     2.12  |Q V     |         |         |         |
6+15      0.8910     2.13  |Q  V    |         |         |         |
6+20      0.9057     2.14  |Q  V    |         |         |         |
6+25      0.9205     2.15  |Q  V    |         |         |         |
6+30      0.9354     2.16  |Q  V    |         |         |         |
6+35      0.9504     2.17  |Q  V    |         |         |         |
6+40      0.9655     2.19  |Q  V    |         |         |         |
6+45      0.9806     2.20  |Q  V    |         |         |         |
6+50      0.9958     2.21  |Q  V    |         |         |         |
6+55      1.0111     2.22  |Q  V    |         |         |         |
7+ 0      1.0265     2.23  |Q  V    |         |         |         |
7+ 5      1.0419     2.25  |Q  V    |         |         |         |
7+10      1.0575     2.26  |Q  V    |         |         |         |
7+15      1.0731     2.27  |Q  V    |         |         |         |
7+20      1.0889     2.28  |Q  V    |         |         |         |
7+25      1.1047     2.30  |Q  V    |         |         |         |
7+30      1.1206     2.31  |Q   V   |         |         |         |
7+35      1.1366     2.32  |Q   V   |         |         |         |
7+40      1.1527     2.34  |Q   V   |         |         |         |
7+45      1.1688     2.35  |Q   V   |         |         |         |
7+50      1.1851     2.36  |Q   V   |         |         |         |
7+55      1.2015     2.38  |Q   V   |         |         |         |
8+ 0      1.2180     2.39  |Q   V   |         |         |         |
8+ 5      1.2346     2.41  |Q   V   |         |         |         |
8+10      1.2512     2.42  |Q   V   |         |         |         |
8+15      1.2680     2.44  |Q   V   |         |         |         |
8+20      1.2849     2.45  |Q   V   |         |         |         |
8+25      1.3019     2.47  |Q   V   |         |         |         |
8+30      1.3190     2.48  |Q   V   |         |         |         |
8+35      1.3363     2.50  |Q    V  |         |         |         |
8+40      1.3536     2.52  |Q    V  |         |         |         |
8+45      1.3710     2.53  |Q    V  |         |         |         |
8+50      1.3886     2.55  |Q    V  |         |         |         |
8+55      1.4063     2.57  |Q    V  |         |         |         |
9+ 0      1.4241     2.59  |Q    V  |         |         |         |
9+ 5      1.4420     2.60  |Q    V  |         |         |         |
9+10      1.4601     2.62  |Q    V  |         |         |         |
9+15      1.4783     2.64  |Q    V  |         |         |         |
9+20      1.4966     2.66  |Q    V  |         |         |         |
9+25      1.5150     2.68  |Q    V  |         |         |         |
9+30      1.5336     2.70  |Q    V  |         |         |         |
9+35      1.5524     2.72  |Q     V |         |         |         |
```

```
 9+40       1.5712      2.74  |Q     V  |          |          |          |
 9+45       1.5902      2.76  |Q     V  |          |          |          |
 9+50       1.6094      2.78  |Q     V  |          |          |          |
 9+55       1.6287      2.80  |Q     V  |          |          |          |
10+ 0       1.6482      2.83  |Q     V  |          |          |          |
10+ 5       1.6678      2.85  |Q     V  |          |          |          |
10+10       1.6876      2.87  |Q     V  |          |          |          |
10+15       1.7075      2.90  |Q     V  |          |          |          |
10+20       1.7276      2.92  |Q     V  |          |          |          |
10+25       1.7479      2.95  |Q     V  |          |          |          |
10+30       1.7684      2.97  |Q     V  |          |          |          |
10+35       1.7890      3.00  |Q      V |          |          |          |
10+40       1.8098      3.02  |Q      V |          |          |          |
10+45       1.8308      3.05  |Q      V |          |          |          |
10+50       1.8520      3.08  |Q      V |          |          |          |
10+55       1.8734      3.11  |Q      V |          |          |          |
11+ 0       1.8950      3.14  |Q      V |          |          |          |
11+ 5       1.9168      3.17  |Q      V |          |          |          |
11+10       1.9389      3.20  |Q      V |          |          |          |
11+15       1.9611      3.23  |Q      V |          |          |          |
11+20       1.9835      3.26  |Q      V |          |          |          |
11+25       2.0062      3.29  |Q       V|          |          |          |
11+30       2.0291      3.33  |Q       V|          |          |          |
11+35       2.0523      3.36  |Q       V|          |          |          |
11+40       2.0757      3.40  |Q       V|          |          |          |
11+45       2.0994      3.44  |Q       V|          |          |          |
11+50       2.1233      3.47  |Q       V|          |          |          |
11+55       2.1475      3.51  |Q       V|          |          |          |
12+ 0       2.1720      3.55  |Q       V|          |          |          |
12+ 5       2.1967      3.59  |Q       V|          |          |          |
12+10       2.2215      3.60  |Q        V          |          |          |
12+15       2.2461      3.57  |Q        V          |          |          |
12+20       2.2705      3.54  |Q        V          |          |          |
12+25       2.2948      3.54  |Q        V          |          |          |
12+30       2.3193      3.56  |Q        V          |          |          |
12+35       2.3441      3.59  |Q        V          |          |          |
12+40       2.3690      3.63  |Q        V          |          |          |
12+45       2.3943      3.67  |Q        V          |          |          |
12+50       2.4199      3.71  |Q        V          |          |          |
12+55       2.4458      3.76  |Q        |V          |          |          |
13+ 0       2.4720      3.81  |Q        |V          |          |          |
13+ 5       2.4987      3.87  |Q        |V          |          |          |
13+10       2.5258      3.93  |Q        |V          |          |          |
13+15       2.5533      3.99  |Q        |V          |          |          |
13+20       2.5813      4.06  | Q       |V          |          |          |
13+25       2.6097      4.13  | Q       |V          |          |          |
13+30       2.6387      4.21  | Q       |V          |          |          |
13+35       2.6682      4.28  | Q       | V         |          |          |
13+40       2.6983      4.37  | Q       | V         |          |          |
13+45       2.7289      4.46  | Q       | V         |          |          |
13+50       2.7602      4.55  | Q       | V         |          |          |
13+55       2.7922      4.64  | Q       | V         |          |          |
14+ 0       2.8249      4.75  | Q       | V         |          |          |
14+ 5       2.8584      4.86  | Q       | V         |          |          |
14+10       2.8926      4.98  | Q       |  V        |          |          |
14+15       2.9278      5.11  | Q       |  V        |          |          |
14+20       2.9639      5.24  | Q       |  V        |          |          |
14+25       3.0010      5.39  | Q       |  V        |          |          |
14+30       3.0392      5.54  | Q       |  V        |          |          |
14+35       3.0785      5.71  | Q       |  V        |          |          |
14+40       3.1190      5.89  | Q       |   V       |          |          |
```

14+45	3.1609	6.08	Q	V			
14+50	3.2043	6.29	Q	V			
14+55	3.2492	6.52	Q	V			
15+ 0	3.2959	6.78	Q	V			
15+ 5	3.3445	7.06	Q	V			
15+10	3.3953	7.37	Q	V			
15+15	3.4485	7.73	Q	V			
15+20	3.5044	8.13	Q	V			
15+25	3.5634	8.56	Q	V			
15+30	3.6252	8.97	Q	V			
15+35	3.6890	9.26	Q	V			
15+40	3.7556	9.68	Q	V			
15+45	3.8275	10.43	Q	V			
15+50	3.9067	11.50	Q	V			
15+55	3.9977	13.22	Q	V			
16+ 0	4.1093	16.20	Q	V			
16+ 5	4.2829	25.21	Q	V			
16+10	4.5871	44.16		V Q			
16+15	5.1040	75.07		V		Q	
16+20	5.5868	70.10		V		Q	
16+25	5.9041	46.08		Q V			
16+30	6.1377	33.92	Q	V			
16+35	6.3255	27.26	Q	V			
16+40	6.4818	22.70	Q	V			
16+45	6.6163	19.53	Q	V			
16+50	6.7343	17.13	Q	V			
16+55	6.8358	14.73	Q	V			
17+ 0	6.9266	13.18	Q	V			
17+ 5	7.0086	11.92	Q	V			
17+10	7.0827	10.75	Q	V			
17+15	7.1499	9.77	Q	V			
17+20	7.2110	8.87	Q	V			
17+25	7.2671	8.15	Q	V			
17+30	7.3177	7.34	Q	V			
17+35	7.3637	6.68	Q	V			
17+40	7.4062	6.17	Q	V			
17+45	7.4476	6.02	Q	V			
17+50	7.4876	5.80	Q	V			
17+55	7.5258	5.54	Q	V			
18+ 0	7.5608	5.07	Q	V			
18+ 5	7.5933	4.72	Q	V			
18+10	7.6242	4.50	Q	V			
18+15	7.6519	4.01	Q	V			
18+20	7.6790	3.94	Q	V			
18+25	7.7055	3.85	Q	V			
18+30	7.7315	3.76	Q	V			
18+35	7.7568	3.68	Q	V			
18+40	7.7815	3.59	Q	V			
18+45	7.8058	3.52	Q	V			
18+50	7.8295	3.44	Q	V			
18+55	7.8527	3.37	Q	V			
19+ 0	7.8754	3.30	Q	V			
19+ 5	7.8977	3.24	Q	V			
19+10	7.9196	3.18	Q	V			
19+15	7.9411	3.12	Q	V			
19+20	7.9622	3.06	Q	V			
19+25	7.9829	3.01	Q	V			
19+30	8.0033	2.96	Q	V			
19+35	8.0233	2.91	Q	V			
19+40	8.0430	2.86	Q	V			
19+45	8.0624	2.82	Q	V			

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  19+50       8.0815      2.77  |Q        |         |         |     V   |
  19+55       8.1003      2.73  |Q        |         |         |     V   |
  20+ 0       8.1189      2.69  |Q        |         |         |     V   |
  20+ 5       8.1371      2.65  |Q        |         |         |     V   |
  20+10       8.1552      2.62  |Q        |         |         |     V   |
  20+15       8.1729      2.58  |Q        |         |         |     V   |
  20+20       8.1905      2.54  |Q        |         |         |     V   |
  20+25       8.2077      2.51  |Q        |         |         |      V  |
  20+30       8.2248      2.48  |Q        |         |         |      V  |
  20+35       8.2417      2.45  |Q        |         |         |      V  |
  20+40       8.2583      2.42  |Q        |         |         |      V  |
  20+45       8.2747      2.39  |Q        |         |         |      V  |
  20+50       8.2910      2.36  |Q        |         |         |      V  |
  20+55       8.3070      2.33  |Q        |         |         |      V  |
  21+ 0       8.3229      2.30  |Q        |         |         |      V  |
  21+ 5       8.3385      2.28  |Q        |         |         |      V  |
  21+10       8.3541      2.25  |Q        |         |         |      V  |
  21+15       8.3694      2.23  |Q        |         |         |      V  |
  21+20       8.3846      2.20  |Q        |         |         |      V  |
  21+25       8.3996      2.18  |Q        |         |         |      V  |
  21+30       8.4144      2.16  |Q        |         |         |      V  |
  21+35       8.4291      2.14  |Q        |         |         |       V |
  21+40       8.4437      2.11  |Q        |         |         |       V |
  21+45       8.4581      2.09  |Q        |         |         |       V |
  21+50       8.4724      2.07  |Q        |         |         |       V |
  21+55       8.4865      2.05  |Q        |         |         |       V |
  22+ 0       8.5005      2.03  |Q        |         |         |       V |
  22+ 5       8.5144      2.01  |Q        |         |         |       V |
  22+10       8.5282      2.00  Q         |         |         |       V |
  22+15       8.5418      1.98  Q         |         |         |       V |
  22+20       8.5553      1.96  Q         |         |         |       V |
  22+25       8.5687      1.94  Q         |         |         |       V |
  22+30       8.5820      1.93  Q         |         |         |       V |
  22+35       8.5951      1.91  Q         |         |         |       V |
  22+40       8.6082      1.89  Q         |         |         |       V |
  22+45       8.6211      1.88  Q         |         |         |       V |
  22+50       8.6339      1.86  Q         |         |         |       V |
  22+55       8.6467      1.85  Q         |         |         |        V|
  23+ 0       8.6593      1.83  Q         |         |         |        V|
  23+ 5       8.6718      1.82  Q         |         |         |        V|
  23+10       8.6843      1.81  Q         |         |         |        V|
  23+15       8.6966      1.79  Q         |         |         |        V|
  23+20       8.7089      1.78  Q         |         |         |        V|
  23+25       8.7210      1.77  Q         |         |         |        V|
  23+30       8.7331      1.75  Q         |         |         |        V|
  23+35       8.7451      1.74  Q         |         |         |        V|
  23+40       8.7570      1.73  Q         |         |         |        V|
  23+45       8.7688      1.71  Q         |         |         |        V|
  23+50       8.7805      1.70  Q         |         |         |        V|
  23+55       8.7921      1.69  Q         |         |         |        V|
  24+ 0       8.8037      1.68  Q         |         |         |        V|
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U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2004, Version 7.0

Study date 08/30/24

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

Program License Serial Number 6277

JOB NO 2021-181
WATSON APPLEY VALLEY 145
100 YEAR UNIT HYDROGRAPH
POST, AREA E

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
38.98	1	0.60
Rainfall data for year 2		
38.98	6	0.76
Rainfall data for year 2		
38.98	24	1.30
Rainfall data for year 100		
38.98	1	1.08
Rainfall data for year 100		
38.98	6	2.01
Rainfall data for year 100		
38.98	24	3.42

++

******** 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)
32.0	52.0	38.98	1.000	0.785	0.100	0.079

Area-averaged adjusted loss rate Fm (In/Hr) = 0.079

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
3.90	0.100	32.0	52.0	9.23	0.067
35.08	0.900	98.0	98.0	0.20	0.932

Area-averaged catchment yield fraction, Y = 0.845
Area-averaged low loss fraction, Yb = 0.155
User entry of time of concentration = 0.290 (hours)
++
Watershed area = 38.98(Ac.)
Catchment Lag time = 0.232 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 35.9195
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.079(In/Hr)
Average low loss rate fraction (Yb) = 0.155 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.512(In)
Computed peak 30-minute rainfall = 0.877(In)
Specified peak 1-hour rainfall = 1.080(In)
Computed peak 3-hour rainfall = 1.581(In)
Specified peak 6-hour rainfall = 2.010(In)
Specified peak 24-hour rainfall = 3.420(In)

Rainfall depth area reduction factors:
Using a total area of 38.98(Ac.) (Ref: fig. E-4)

5-minute factor = 0.998 Adjusted rainfall = 0.512(In)
30-minute factor = 0.998 Adjusted rainfall = 0.876(In)
1-hour factor = 0.998 Adjusted rainfall = 1.078(In)
3-hour factor = 1.000 Adjusted rainfall = 1.580(In)
6-hour factor = 1.000 Adjusted rainfall = 2.010(In)
24-hour factor = 1.000 Adjusted rainfall = 3.420(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 = 471.41 (CFS))	
1	2.324	10.956
2	14.291	56.414
3	42.610	133.499
4	61.158	87.439
5	71.110	46.914
6	77.762	31.359
7	82.485	22.265
8	86.128	17.173

9	88.974	13.418
10	91.100	10.018
11	92.881	8.397
12	94.341	6.884
13	95.534	5.622
14	96.507	4.587
15	97.275	3.621
16	97.854	2.727
17	98.230	1.774
18	98.643	1.948
19	99.074	2.032
20	99.478	1.904
21	99.727	1.174
22	100.000	0.587

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5115	0.5115
2	0.6298	0.1182
3	0.7112	0.0815
4	0.7753	0.0641
5	0.8290	0.0537
6	0.8756	0.0466
7	0.9171	0.0414
8	0.9546	0.0375
9	0.9889	0.0343
10	1.0206	0.0318
11	1.0503	0.0296
12	1.0780	0.0278
13	1.1085	0.0305
14	1.1375	0.0290
15	1.1651	0.0277
16	1.1916	0.0265
17	1.2170	0.0254
18	1.2415	0.0245
19	1.2651	0.0236
20	1.2878	0.0228
21	1.3099	0.0221
22	1.3313	0.0214
23	1.3521	0.0208
24	1.3722	0.0202
25	1.3919	0.0196
26	1.4110	0.0191
27	1.4297	0.0187
28	1.4479	0.0182
29	1.4657	0.0178
30	1.4831	0.0174
31	1.5001	0.0170
32	1.5168	0.0167
33	1.5331	0.0163
34	1.5491	0.0160
35	1.5649	0.0157
36	1.5803	0.0154
37	1.5954	0.0151
38	1.6102	0.0148
39	1.6248	0.0146
40	1.6391	0.0143
41	1.6532	0.0141
42	1.6671	0.0139
43	1.6807	0.0137
44	1.6942	0.0135

45	1.7074	0.0133
46	1.7205	0.0131
47	1.7334	0.0129
48	1.7461	0.0127
49	1.7586	0.0125
50	1.7710	0.0124
51	1.7832	0.0122
52	1.7952	0.0121
53	1.8071	0.0119
54	1.8189	0.0118
55	1.8305	0.0116
56	1.8420	0.0115
57	1.8533	0.0113
58	1.8645	0.0112
59	1.8756	0.0111
60	1.8866	0.0110
61	1.8974	0.0108
62	1.9082	0.0107
63	1.9188	0.0106
64	1.9293	0.0105
65	1.9397	0.0104
66	1.9500	0.0103
67	1.9602	0.0102
68	1.9703	0.0101
69	1.9803	0.0100
70	1.9902	0.0099
71	2.0000	0.0098
72	2.0098	0.0097
73	2.0204	0.0107
74	2.0310	0.0106
75	2.0415	0.0105
76	2.0519	0.0104
77	2.0622	0.0103
78	2.0724	0.0102
79	2.0825	0.0101
80	2.0926	0.0101
81	2.1026	0.0100
82	2.1125	0.0099
83	2.1224	0.0098
84	2.1321	0.0098
85	2.1418	0.0097
86	2.1515	0.0096
87	2.1610	0.0096
88	2.1705	0.0095
89	2.1799	0.0094
90	2.1893	0.0094
91	2.1986	0.0093
92	2.2078	0.0092
93	2.2170	0.0092
94	2.2261	0.0091
95	2.2352	0.0091
96	2.2441	0.0090
97	2.2531	0.0089
98	2.2620	0.0089
99	2.2708	0.0088
100	2.2796	0.0088
101	2.2883	0.0087
102	2.2969	0.0087
103	2.3055	0.0086
104	2.3141	0.0086
105	2.3226	0.0085

106	2.3311	0.0085
107	2.3395	0.0084
108	2.3478	0.0084
109	2.3561	0.0083
110	2.3644	0.0083
111	2.3726	0.0082
112	2.3808	0.0082
113	2.3889	0.0081
114	2.3970	0.0081
115	2.4051	0.0080
116	2.4130	0.0080
117	2.4210	0.0080
118	2.4289	0.0079
119	2.4368	0.0079
120	2.4446	0.0078
121	2.4524	0.0078
122	2.4602	0.0078
123	2.4679	0.0077
124	2.4756	0.0077
125	2.4832	0.0076
126	2.4908	0.0076
127	2.4984	0.0076
128	2.5059	0.0075
129	2.5134	0.0075
130	2.5208	0.0075
131	2.5282	0.0074
132	2.5356	0.0074
133	2.5430	0.0073
134	2.5503	0.0073
135	2.5576	0.0073
136	2.5648	0.0072
137	2.5720	0.0072
138	2.5792	0.0072
139	2.5864	0.0072
140	2.5935	0.0071
141	2.6006	0.0071
142	2.6076	0.0071
143	2.6146	0.0070
144	2.6216	0.0070
145	2.6286	0.0070
146	2.6355	0.0069
147	2.6425	0.0069
148	2.6493	0.0069
149	2.6562	0.0068
150	2.6630	0.0068
151	2.6698	0.0068
152	2.6766	0.0068
153	2.6833	0.0067
154	2.6900	0.0067
155	2.6967	0.0067
156	2.7034	0.0067
157	2.7100	0.0066
158	2.7166	0.0066
159	2.7232	0.0066
160	2.7297	0.0066
161	2.7363	0.0065
162	2.7428	0.0065
163	2.7492	0.0065
164	2.7557	0.0065
165	2.7621	0.0064
166	2.7685	0.0064

167	2.7749	0.0064
168	2.7813	0.0064
169	2.7876	0.0063
170	2.7939	0.0063
171	2.8002	0.0063
172	2.8065	0.0063
173	2.8127	0.0062
174	2.8190	0.0062
175	2.8252	0.0062
176	2.8313	0.0062
177	2.8375	0.0062
178	2.8436	0.0061
179	2.8497	0.0061
180	2.8558	0.0061
181	2.8619	0.0061
182	2.8680	0.0061
183	2.8740	0.0060
184	2.8800	0.0060
185	2.8860	0.0060
186	2.8920	0.0060
187	2.8979	0.0060
188	2.9039	0.0059
189	2.9098	0.0059
190	2.9157	0.0059
191	2.9215	0.0059
192	2.9274	0.0059
193	2.9332	0.0058
194	2.9391	0.0058
195	2.9449	0.0058
196	2.9506	0.0058
197	2.9564	0.0058
198	2.9621	0.0057
199	2.9679	0.0057
200	2.9736	0.0057
201	2.9793	0.0057
202	2.9850	0.0057
203	2.9906	0.0057
204	2.9963	0.0056
205	3.0019	0.0056
206	3.0075	0.0056
207	3.0131	0.0056
208	3.0186	0.0056
209	3.0242	0.0056
210	3.0297	0.0055
211	3.0353	0.0055
212	3.0408	0.0055
213	3.0463	0.0055
214	3.0517	0.0055
215	3.0572	0.0055
216	3.0626	0.0054
217	3.0681	0.0054
218	3.0735	0.0054
219	3.0789	0.0054
220	3.0843	0.0054
221	3.0896	0.0054
222	3.0950	0.0054
223	3.1003	0.0053
224	3.1057	0.0053
225	3.1110	0.0053
226	3.1163	0.0053
227	3.1215	0.0053

228	3.1268	0.0053
229	3.1321	0.0053
230	3.1373	0.0052
231	3.1425	0.0052
232	3.1477	0.0052
233	3.1529	0.0052
234	3.1581	0.0052
235	3.1633	0.0052
236	3.1684	0.0052
237	3.1736	0.0051
238	3.1787	0.0051
239	3.1838	0.0051
240	3.1889	0.0051
241	3.1940	0.0051
242	3.1991	0.0051
243	3.2041	0.0051
244	3.2092	0.0050
245	3.2142	0.0050
246	3.2193	0.0050
247	3.2243	0.0050
248	3.2293	0.0050
249	3.2342	0.0050
250	3.2392	0.0050
251	3.2442	0.0050
252	3.2491	0.0050
253	3.2541	0.0049
254	3.2590	0.0049
255	3.2639	0.0049
256	3.2688	0.0049
257	3.2737	0.0049
258	3.2786	0.0049
259	3.2835	0.0049
260	3.2883	0.0049
261	3.2932	0.0048
262	3.2980	0.0048
263	3.3028	0.0048
264	3.3076	0.0048
265	3.3124	0.0048
266	3.3172	0.0048
267	3.3220	0.0048
268	3.3267	0.0048
269	3.3315	0.0048
270	3.3362	0.0047
271	3.3410	0.0047
272	3.3457	0.0047
273	3.3504	0.0047
274	3.3551	0.0047
275	3.3598	0.0047
276	3.3645	0.0047
277	3.3691	0.0047
278	3.3738	0.0047
279	3.3785	0.0046
280	3.3831	0.0046
281	3.3877	0.0046
282	3.3923	0.0046
283	3.3969	0.0046
284	3.4015	0.0046
285	3.4061	0.0046
286	3.4107	0.0046
287	3.4153	0.0046
288	3.4198	0.0046

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0046	0.0007	0.0039
2	0.0046	0.0007	0.0039
3	0.0046	0.0007	0.0039
4	0.0046	0.0007	0.0039
5	0.0046	0.0007	0.0039
6	0.0046	0.0007	0.0039
7	0.0046	0.0007	0.0039
8	0.0047	0.0007	0.0039
9	0.0047	0.0007	0.0040
10	0.0047	0.0007	0.0040
11	0.0047	0.0007	0.0040
12	0.0047	0.0007	0.0040
13	0.0047	0.0007	0.0040
14	0.0048	0.0007	0.0040
15	0.0048	0.0007	0.0040
16	0.0048	0.0007	0.0040
17	0.0048	0.0007	0.0041
18	0.0048	0.0007	0.0041
19	0.0048	0.0007	0.0041
20	0.0049	0.0008	0.0041
21	0.0049	0.0008	0.0041
22	0.0049	0.0008	0.0041
23	0.0049	0.0008	0.0042
24	0.0049	0.0008	0.0042
25	0.0050	0.0008	0.0042
26	0.0050	0.0008	0.0042
27	0.0050	0.0008	0.0042
28	0.0050	0.0008	0.0042
29	0.0050	0.0008	0.0042
30	0.0050	0.0008	0.0043
31	0.0051	0.0008	0.0043
32	0.0051	0.0008	0.0043
33	0.0051	0.0008	0.0043
34	0.0051	0.0008	0.0043
35	0.0051	0.0008	0.0043
36	0.0052	0.0008	0.0044
37	0.0052	0.0008	0.0044
38	0.0052	0.0008	0.0044
39	0.0052	0.0008	0.0044
40	0.0052	0.0008	0.0044
41	0.0053	0.0008	0.0045
42	0.0053	0.0008	0.0045
43	0.0053	0.0008	0.0045
44	0.0053	0.0008	0.0045
45	0.0054	0.0008	0.0045
46	0.0054	0.0008	0.0045
47	0.0054	0.0008	0.0046
48	0.0054	0.0008	0.0046
49	0.0054	0.0008	0.0046
50	0.0055	0.0008	0.0046
51	0.0055	0.0008	0.0046
52	0.0055	0.0009	0.0047
53	0.0055	0.0009	0.0047
54	0.0056	0.0009	0.0047
55	0.0056	0.0009	0.0047
56	0.0056	0.0009	0.0047

57	0.0056	0.0009	0.0048
58	0.0057	0.0009	0.0048
59	0.0057	0.0009	0.0048
60	0.0057	0.0009	0.0048
61	0.0057	0.0009	0.0049
62	0.0058	0.0009	0.0049
63	0.0058	0.0009	0.0049
64	0.0058	0.0009	0.0049
65	0.0059	0.0009	0.0050
66	0.0059	0.0009	0.0050
67	0.0059	0.0009	0.0050
68	0.0059	0.0009	0.0050
69	0.0060	0.0009	0.0050
70	0.0060	0.0009	0.0051
71	0.0060	0.0009	0.0051
72	0.0061	0.0009	0.0051
73	0.0061	0.0009	0.0052
74	0.0061	0.0009	0.0052
75	0.0062	0.0010	0.0052
76	0.0062	0.0010	0.0052
77	0.0062	0.0010	0.0053
78	0.0062	0.0010	0.0053
79	0.0063	0.0010	0.0053
80	0.0063	0.0010	0.0053
81	0.0064	0.0010	0.0054
82	0.0064	0.0010	0.0054
83	0.0064	0.0010	0.0054
84	0.0065	0.0010	0.0055
85	0.0065	0.0010	0.0055
86	0.0065	0.0010	0.0055
87	0.0066	0.0010	0.0056
88	0.0066	0.0010	0.0056
89	0.0067	0.0010	0.0056
90	0.0067	0.0010	0.0057
91	0.0067	0.0010	0.0057
92	0.0068	0.0010	0.0057
93	0.0068	0.0011	0.0058
94	0.0068	0.0011	0.0058
95	0.0069	0.0011	0.0058
96	0.0069	0.0011	0.0059
97	0.0070	0.0011	0.0059
98	0.0070	0.0011	0.0059
99	0.0071	0.0011	0.0060
100	0.0071	0.0011	0.0060
101	0.0072	0.0011	0.0061
102	0.0072	0.0011	0.0061
103	0.0073	0.0011	0.0062
104	0.0073	0.0011	0.0062
105	0.0074	0.0011	0.0062
106	0.0074	0.0011	0.0063
107	0.0075	0.0012	0.0063
108	0.0075	0.0012	0.0064
109	0.0076	0.0012	0.0064
110	0.0076	0.0012	0.0065
111	0.0077	0.0012	0.0065
112	0.0078	0.0012	0.0066
113	0.0078	0.0012	0.0066
114	0.0079	0.0012	0.0067
115	0.0080	0.0012	0.0067
116	0.0080	0.0012	0.0068
117	0.0081	0.0013	0.0068

118	0.0081	0.0013	0.0069
119	0.0082	0.0013	0.0069
120	0.0083	0.0013	0.0070
121	0.0084	0.0013	0.0071
122	0.0084	0.0013	0.0071
123	0.0085	0.0013	0.0072
124	0.0086	0.0013	0.0072
125	0.0087	0.0013	0.0073
126	0.0087	0.0013	0.0074
127	0.0088	0.0014	0.0075
128	0.0089	0.0014	0.0075
129	0.0090	0.0014	0.0076
130	0.0091	0.0014	0.0077
131	0.0092	0.0014	0.0078
132	0.0092	0.0014	0.0078
133	0.0094	0.0014	0.0079
134	0.0094	0.0015	0.0080
135	0.0096	0.0015	0.0081
136	0.0096	0.0015	0.0081
137	0.0098	0.0015	0.0083
138	0.0098	0.0015	0.0083
139	0.0100	0.0015	0.0084
140	0.0101	0.0016	0.0085
141	0.0102	0.0016	0.0086
142	0.0103	0.0016	0.0087
143	0.0105	0.0016	0.0089
144	0.0106	0.0016	0.0089
145	0.0097	0.0015	0.0082
146	0.0098	0.0015	0.0083
147	0.0100	0.0015	0.0085
148	0.0101	0.0016	0.0085
149	0.0103	0.0016	0.0087
150	0.0104	0.0016	0.0088
151	0.0106	0.0016	0.0090
152	0.0107	0.0017	0.0091
153	0.0110	0.0017	0.0093
154	0.0111	0.0017	0.0094
155	0.0113	0.0018	0.0096
156	0.0115	0.0018	0.0097
157	0.0118	0.0018	0.0099
158	0.0119	0.0018	0.0101
159	0.0122	0.0019	0.0103
160	0.0124	0.0019	0.0105
161	0.0127	0.0020	0.0107
162	0.0129	0.0020	0.0109
163	0.0133	0.0021	0.0112
164	0.0135	0.0021	0.0114
165	0.0139	0.0021	0.0117
166	0.0141	0.0022	0.0119
167	0.0146	0.0023	0.0123
168	0.0148	0.0023	0.0125
169	0.0154	0.0024	0.0130
170	0.0157	0.0024	0.0133
171	0.0163	0.0025	0.0138
172	0.0167	0.0026	0.0141
173	0.0174	0.0027	0.0147
174	0.0178	0.0028	0.0150
175	0.0187	0.0029	0.0158
176	0.0191	0.0030	0.0162
177	0.0202	0.0031	0.0171
178	0.0208	0.0032	0.0176

179	0.0221	0.0034	0.0186
180	0.0228	0.0035	0.0193
181	0.0245	0.0038	0.0207
182	0.0254	0.0039	0.0215
183	0.0277	0.0043	0.0234
184	0.0290	0.0045	0.0245
185	0.0278	0.0043	0.0235
186	0.0296	0.0046	0.0250
187	0.0343	0.0053	0.0290
188	0.0375	0.0058	0.0317
189	0.0466	0.0065	0.0401
190	0.0537	0.0065	0.0471
191	0.0815	0.0065	0.0749
192	0.1182	0.0065	0.1117
193	0.5115	0.0065	0.5050
194	0.0641	0.0065	0.0576
195	0.0414	0.0064	0.0350
196	0.0318	0.0049	0.0268
197	0.0305	0.0047	0.0258
198	0.0265	0.0041	0.0224
199	0.0236	0.0036	0.0199
200	0.0214	0.0033	0.0181
201	0.0196	0.0030	0.0166
202	0.0182	0.0028	0.0154
203	0.0170	0.0026	0.0144
204	0.0160	0.0025	0.0135
205	0.0151	0.0023	0.0128
206	0.0143	0.0022	0.0121
207	0.0137	0.0021	0.0115
208	0.0131	0.0020	0.0110
209	0.0125	0.0019	0.0106
210	0.0121	0.0019	0.0102
211	0.0116	0.0018	0.0098
212	0.0112	0.0017	0.0095
213	0.0108	0.0017	0.0092
214	0.0105	0.0016	0.0089
215	0.0102	0.0016	0.0086
216	0.0099	0.0015	0.0084
217	0.0107	0.0016	0.0090
218	0.0104	0.0016	0.0088
219	0.0101	0.0016	0.0086
220	0.0099	0.0015	0.0084
221	0.0097	0.0015	0.0082
222	0.0095	0.0015	0.0080
223	0.0093	0.0014	0.0079
224	0.0091	0.0014	0.0077
225	0.0089	0.0014	0.0076
226	0.0088	0.0014	0.0074
227	0.0086	0.0013	0.0073
228	0.0085	0.0013	0.0071
229	0.0083	0.0013	0.0070
230	0.0082	0.0013	0.0069
231	0.0080	0.0012	0.0068
232	0.0079	0.0012	0.0067
233	0.0078	0.0012	0.0066
234	0.0077	0.0012	0.0065
235	0.0076	0.0012	0.0064
236	0.0075	0.0012	0.0063
237	0.0073	0.0011	0.0062
238	0.0072	0.0011	0.0061
239	0.0072	0.0011	0.0060

240	0.0071	0.0011	0.0060
241	0.0070	0.0011	0.0059
242	0.0069	0.0011	0.0058
243	0.0068	0.0011	0.0057
244	0.0067	0.0010	0.0057
245	0.0066	0.0010	0.0056
246	0.0066	0.0010	0.0055
247	0.0065	0.0010	0.0055
248	0.0064	0.0010	0.0054
249	0.0063	0.0010	0.0054
250	0.0063	0.0010	0.0053
251	0.0062	0.0010	0.0052
252	0.0061	0.0009	0.0052
253	0.0061	0.0009	0.0051
254	0.0060	0.0009	0.0051
255	0.0060	0.0009	0.0050
256	0.0059	0.0009	0.0050
257	0.0058	0.0009	0.0049
258	0.0058	0.0009	0.0049
259	0.0057	0.0009	0.0048
260	0.0057	0.0009	0.0048
261	0.0056	0.0009	0.0048
262	0.0056	0.0009	0.0047
263	0.0055	0.0009	0.0047
264	0.0055	0.0008	0.0046
265	0.0054	0.0008	0.0046
266	0.0054	0.0008	0.0046
267	0.0053	0.0008	0.0045
268	0.0053	0.0008	0.0045
269	0.0053	0.0008	0.0044
270	0.0052	0.0008	0.0044
271	0.0052	0.0008	0.0044
272	0.0051	0.0008	0.0043
273	0.0051	0.0008	0.0043
274	0.0050	0.0008	0.0043
275	0.0050	0.0008	0.0042
276	0.0050	0.0008	0.0042
277	0.0049	0.0008	0.0042
278	0.0049	0.0008	0.0041
279	0.0049	0.0008	0.0041
280	0.0048	0.0007	0.0041
281	0.0048	0.0007	0.0041
282	0.0048	0.0007	0.0040
283	0.0047	0.0007	0.0040
284	0.0047	0.0007	0.0040
285	0.0047	0.0007	0.0039
286	0.0046	0.0007	0.0039
287	0.0046	0.0007	0.0039
288	0.0046	0.0007	0.0039

Total soil rain loss = 0.43(In)
Total effective rainfall = 2.99(In)
Peak flow rate in flood hydrograph = 88.77(CFS)

++

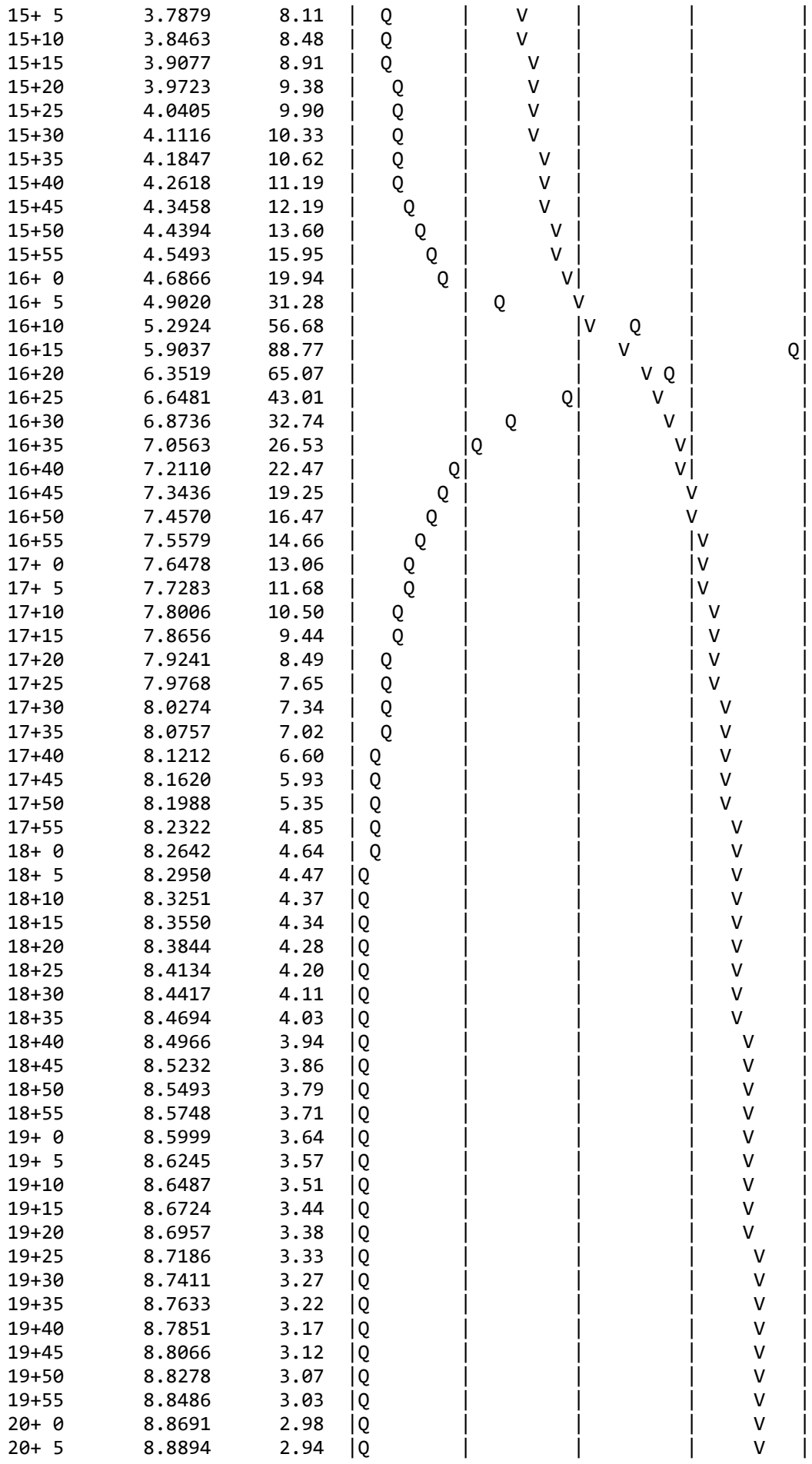
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	22.5	45.0	67.5	90.0
0+ 5	0.0003	0.04	Q				
0+10	0.0021	0.26	Q				
0+15	0.0074	0.77	Q				
0+20	0.0151	1.11	Q				
0+25	0.0240	1.30	Q				
0+30	0.0338	1.42	Q				
0+35	0.0442	1.51	Q				
0+40	0.0552	1.58	Q				
0+45	0.0665	1.64	Q				
0+50	0.0781	1.69	Q				
0+55	0.0899	1.72	Q				
1+ 0	0.1020	1.76	Q				
1+ 5	0.1143	1.78	Q				
1+10	0.1268	1.81	Q				
1+15	0.1393	1.83	Q				
1+20	0.1520	1.84	Q				
1+25	0.1648	1.86	Q				
1+30	0.1777	1.87	Q				
1+35	0.1907	1.89	Q				
1+40	0.2038	1.90	Q				
1+45	0.2169	1.91	Q				
1+50	0.2301	1.92	Q				
1+55	0.2434	1.93	QV				
2+ 0	0.2567	1.93	QV				
2+ 5	0.2701	1.94	QV				
2+10	0.2835	1.95	QV				
2+15	0.2969	1.95	QV				
2+20	0.3105	1.96	QV				
2+25	0.3240	1.97	QV				
2+30	0.3376	1.98	QV				
2+35	0.3513	1.98	QV				
2+40	0.3650	1.99	QV				
2+45	0.3787	2.00	QV				
2+50	0.3925	2.01	QV				
2+55	0.4064	2.01	QV				
3+ 0	0.4203	2.02	QV				
3+ 5	0.4343	2.03	QV				
3+10	0.4483	2.04	QV				
3+15	0.4624	2.04	QV				
3+20	0.4765	2.05	QV				
3+25	0.4907	2.06	Q V				
3+30	0.5050	2.07	Q V				
3+35	0.5193	2.08	Q V				
3+40	0.5336	2.09	Q V				
3+45	0.5480	2.09	Q V				
3+50	0.5625	2.10	Q V				
3+55	0.5771	2.11	Q V				
4+ 0	0.5917	2.12	Q V				
4+ 5	0.6063	2.13	Q V				
4+10	0.6210	2.14	Q V				
4+15	0.6358	2.15	Q V				
4+20	0.6507	2.16	Q V				
4+25	0.6656	2.16	Q V				
4+30	0.6805	2.17	Q V				
4+35	0.6956	2.18	Q V				
4+40	0.7107	2.19	Q V				
4+45	0.7258	2.20	Q V				
4+50	0.7411	2.21	Q V				

4+55	0.7564	2.22	Q V	|	|	|
5+ 0	0.7718	2.23	Q V	|	|	|
5+ 5	0.7872	2.24	Q V	|	|	|
5+10	0.8027	2.25	|Q V	|	|	|
5+15	0.8183	2.26	|Q V	|	|	|
5+20	0.8340	2.27	|Q V	|	|	|
5+25	0.8497	2.28	|Q V	|	|	|
5+30	0.8655	2.29	|Q V	|	|	|
5+35	0.8814	2.31	|Q V	|	|	|
5+40	0.8973	2.32	|Q V	|	|	|
5+45	0.9134	2.33	|Q V	|	|	|
5+50	0.9295	2.34	|Q V	|	|	|
5+55	0.9457	2.35	|Q V	|	|	|
6+ 0	0.9619	2.36	|Q V	|	|	|
6+ 5	0.9783	2.37	|Q V	|	|	|
6+10	0.9947	2.39	|Q V	|	|	|
6+15	1.0112	2.40	|Q V	|	|	|
6+20	1.0278	2.41	|Q V	|	|	|
6+25	1.0445	2.42	|Q V	|	|	|
6+30	1.0613	2.44	|Q V	|	|	|
6+35	1.0781	2.45	|Q V	|	|	|
6+40	1.0951	2.46	|Q V	|	|	|
6+45	1.1121	2.47	|Q V	|	|	|
6+50	1.1293	2.49	|Q V	|	|	|
6+55	1.1465	2.50	|Q V	|	|	|
7+ 0	1.1638	2.51	|Q V	|	|	|
7+ 5	1.1812	2.53	|Q V	|	|	|
7+10	1.1987	2.54	|Q V	|	|	|
7+15	1.2163	2.56	|Q V	|	|	|
7+20	1.2340	2.57	|Q V	|	|	|
7+25	1.2518	2.59	|Q V	|	|	|
7+30	1.2697	2.60	|Q V	|	|	|
7+35	1.2878	2.62	|Q V	|	|	|
7+40	1.3059	2.63	|Q V	|	|	|
7+45	1.3241	2.65	|Q V	|	|	|
7+50	1.3424	2.66	|Q V	|	|	|
7+55	1.3609	2.68	|Q V	|	|	|
8+ 0	1.3794	2.69	|Q V	|	|	|
8+ 5	1.3981	2.71	|Q V	|	|	|
8+10	1.4169	2.73	|Q V	|	|	|
8+15	1.4358	2.75	|Q V	|	|	|
8+20	1.4548	2.76	|Q V	|	|	|
8+25	1.4740	2.78	|Q V	|	|	|
8+30	1.4933	2.80	|Q V	|	|	|
8+35	1.5127	2.82	|Q V	|	|	|
8+40	1.5322	2.84	|Q V	|	|	|
8+45	1.5519	2.86	|Q V	|	|	|
8+50	1.5717	2.87	|Q V	|	|	|
8+55	1.5916	2.89	|Q V	|	|	|
9+ 0	1.6117	2.91	|Q V	|	|	|
9+ 5	1.6319	2.93	|Q V	|	|	|
9+10	1.6522	2.96	|Q V	|	|	|
9+15	1.6727	2.98	|Q V	|	|	|
9+20	1.6934	3.00	|Q V	|	|	|
9+25	1.7142	3.02	|Q V	|	|	|
9+30	1.7351	3.04	|Q V	|	|	|
9+35	1.7563	3.07	|Q V	|	|	|
9+40	1.7775	3.09	|Q V	|	|	|
9+45	1.7990	3.11	|Q V	|	|	|
9+50	1.8206	3.14	|Q V	|	|	|
9+55	1.8423	3.16	|Q V	|	|	|

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10+ 0       1.8643      3.19  |Q     V  |          |          |          |
10+ 5       1.8864      3.21  |Q     V  |          |          |          |
10+10       1.9087      3.24  |Q     V  |          |          |          |
10+15       1.9312      3.27  |Q     V  |          |          |          |
10+20       1.9539      3.29  |Q      V |          |          |          |
10+25       1.9768      3.32  |Q      V |          |          |          |
10+30       1.9999      3.35  |Q      V |          |          |          |
10+35       2.0232      3.38  |Q      V |          |          |          |
10+40       2.0467      3.41  |Q      V |          |          |          |
10+45       2.0704      3.44  |Q      V |          |          |          |
10+50       2.0943      3.47  |Q      V |          |          |          |
10+55       2.1184      3.51  |Q      V |          |          |          |
11+ 0       2.1428      3.54  |Q      V |          |          |          |
11+ 5       2.1674      3.57  |Q      V |          |          |          |
11+10       2.1923      3.61  |Q       V|          |          |          |
11+15       2.2174      3.65  |Q       V|          |          |          |
11+20       2.2428      3.68  |Q       V|          |          |          |
11+25       2.2684      3.72  |Q       V|          |          |          |
11+30       2.2943      3.76  |Q       V|          |          |          |
11+35       2.3204      3.80  |Q       V|          |          |          |
11+40       2.3469      3.84  |Q       V|          |          |          |
11+45       2.3736      3.88  |Q       V|          |          |          |
11+50       2.4007      3.93  |Q       V|          |          |          |
11+55       2.4280      3.97  |Q        V          |          |          |
12+ 0       2.4557      4.02  |Q        V          |          |          |
12+ 5       2.4836      4.06  |Q        V          |          |          |
12+10       2.5116      4.06  |Q        V          |          |          |
12+15       2.5391      3.99  |Q        V          |          |          |
12+20       2.5664      3.97  |Q        V          |          |          |
12+25       2.5938      3.98  |Q        V          |          |          |
12+30       2.6214      4.01  |Q        V          |          |          |
12+35       2.6493      4.05  |Q        V          |          |          |
12+40       2.6774      4.09  |Q        |V         |          |          |
12+45       2.7059      4.14  |Q        |V         |          |          |
12+50       2.7348      4.19  |Q        |V         |          |          |
12+55       2.7641      4.25  |Q        |V         |          |          |
13+ 0       2.7938      4.31  |Q        |V         |          |          |
13+ 5       2.8239      4.38  |Q        |V         |          |          |
13+10       2.8545      4.45  |Q        |V         |          |          |
13+15       2.8857      4.52  | Q       |V         |          |          |
13+20       2.9174      4.60  | Q       | V        |          |          |
13+25       2.9496      4.68  | Q       | V        |          |          |
13+30       2.9825      4.77  | Q       | V        |          |          |
13+35       3.0159      4.86  | Q       | V        |          |          |
13+40       3.0501      4.95  | Q       | V        |          |          |
13+45       3.0849      5.06  | Q       | V        |          |          |
13+50       3.1204      5.16  | Q       | V        |          |          |
13+55       3.1568      5.28  | Q       |  V       |          |          |
14+ 0       3.1940      5.40  | Q       |  V       |          |          |
14+ 5       3.2321      5.53  | Q       |  V       |          |          |
14+10       3.2711      5.67  | Q       |  V       |          |          |
14+15       3.3112      5.82  | Q       |  V       |          |          |
14+20       3.3523      5.98  | Q       |  V       |          |          |
14+25       3.3947      6.15  | Q       |   V      |          |          |
14+30       3.4382      6.32  | Q       |   V      |          |          |
14+35       3.4831      6.52  | Q       |   V      |          |          |
14+40       3.5295      6.73  | Q       |   V      |          |          |
14+45       3.5774      6.96  |  Q      |   V      |          |          |
14+50       3.6270      7.20  |  Q      |   V      |          |          |
14+55       3.6785      7.48  |  Q      |    V     |          |          |
15+ 0       3.7320      7.77  |  Q      |    V     |          |          |
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  20+10       8.9094      2.90  |Q        |         |         |     V   |
  20+15       8.9290      2.86  |Q        |         |         |     V   |
  20+20       8.9485      2.82  |Q        |         |         |     V   |
  20+25       8.9676      2.78  |Q        |         |         |      V  |
  20+30       8.9866      2.75  |Q        |         |         |      V  |
  20+35       9.0053      2.71  |Q        |         |         |      V  |
  20+40       9.0237      2.68  |Q        |         |         |      V  |
  20+45       9.0420      2.65  |Q        |         |         |      V  |
  20+50       9.0600      2.62  |Q        |         |         |      V  |
  20+55       9.0778      2.59  |Q        |         |         |      V  |
  21+ 0       9.0955      2.56  |Q        |         |         |      V  |
  21+ 5       9.1129      2.53  |Q        |         |         |      V  |
  21+10       9.1301      2.50  |Q        |         |         |      V  |
  21+15       9.1472      2.48  |Q        |         |         |      V  |
  21+20       9.1640      2.45  |Q        |         |         |      V  |
  21+25       9.1807      2.42  |Q        |         |         |      V  |
  21+30       9.1972      2.40  |Q        |         |         |      V  |
  21+35       9.2136      2.38  |Q        |         |         |       V |
  21+40       9.2298      2.35  |Q        |         |         |       V |
  21+45       9.2458      2.33  |Q        |         |         |       V |
  21+50       9.2617      2.31  |Q        |         |         |       V |
  21+55       9.2775      2.28  |Q        |         |         |       V |
  22+ 0       9.2930      2.26  |Q        |         |         |       V |
  22+ 5       9.3085      2.24  Q         |         |         |       V |
  22+10       9.3238      2.22  Q         |         |         |       V |
  22+15       9.3390      2.20  Q         |         |         |       V |
  22+20       9.3540      2.18  Q         |         |         |       V |
  22+25       9.3689      2.17  Q         |         |         |       V |
  22+30       9.3837      2.15  Q         |         |         |       V |
  22+35       9.3984      2.13  Q         |         |         |       V |
  22+40       9.4129      2.11  Q         |         |         |       V |
  22+45       9.4273      2.09  Q         |         |         |       V |
  22+50       9.4416      2.08  Q         |         |         |        V|
  22+55       9.4558      2.06  Q         |         |         |        V|
  23+ 0       9.4699      2.04  Q         |         |         |        V|
  23+ 5       9.4839      2.03  Q         |         |         |        V|
  23+10       9.4977      2.01  Q         |         |         |        V|
  23+15       9.5115      2.00  Q         |         |         |        V|
  23+20       9.5252      1.98  Q         |         |         |        V|
  23+25       9.5387      1.97  Q         |         |         |        V|
  23+30       9.5522      1.95  Q         |         |         |        V|
  23+35       9.5655      1.94  Q         |         |         |        V|
  23+40       9.5788      1.93  Q         |         |         |        V|
  23+45       9.5920      1.91  Q         |         |         |        V|
  23+50       9.6050      1.90  Q         |         |         |        V|
  23+55       9.6180      1.89  Q         |         |         |        V|
  24+ 0       9.6309      1.87  Q         |         |         |        V|
-------------------------------------------------------------------------
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