MEMORANDUM

Joshua Tree Solar Farm, LLC
Joshua Tree Solar – WG Project 1176-0001

Date: September 21, 2015

To: Joshua Tree Solar Farm LLC

From: Valerie Huff, PE

Subject: Joshua Tree Solar Site – Preliminary Hydrology Study Addendum Rev 1

PURPOSE

The purpose of this memorandum is to respond to comments provided by the County of San Bernardino to the Preliminary Hydrology Study prepared for the Joshua Tree Solar Site and dated December 2014, and to also respond to comments provided by the County on the first draft of this Addendum. Specifically, the County requested documentation of pre and post-development peak flows for the site and adjacent offsite watershed, documentation of the anticipated run-on to the project site from the Coyote Wash watershed, and mitigation of stormwater runoff in the form of shallow basins.

HYDROLOGIC ANALYSIS

This memorandum provides a pre and post-development hydrologic analysis of the proposed Joshua Tree solar site and adjacent offsite watershed, in accordance with the San Bernardino County Hydrology Manual (SBCHM). In addition, the site receives offsite run-on from the Coyote Wash watershed. Refer to the Preliminary Hydrology Study for an analysis of the Coyote Wash watershed.

Watershed Delineation

The offsite watershed was delineated based on two sources: a digital terrain model purchased from Intermap Technologies with a stated 5-meter grid resolution and 1-meter vertical accuracy, and USGS topographic maps. The project site is approximately 115 acres and the offsite watershed is approximately 548 acres, for a total study area of 663 acres. An exhibit of watershed limits is attached.

Methodology

Hydrology for the 100-year storm was analyzed using the SBCHM hydrograph procedure, as the study area exceeds the 640 acre limit for the SBCHM Rational Method procedure. The SBCHM method was applied using the computer program CivilD by Civil Design Corporation.

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Hydrologic Parameters
The following hydrologic parameters were used for the analysis. A summary table of the input parameters used for the CivilD program is attached.

- Hydrologic Soil Group (HSG) = B, per SBCHM Figure C-11
- Curve Number (CN) = 82, desert scrub 30% cover, per SBCHM Figure C-8
- Lag time = 0.44 hours, per SBCHM Equation E.2
- 100-year 24-hour rainfall depth = 4.32 inches, per NOAA Atlas 14
- 100-year Antecedent Moisture Condition (AMC) = II, per SBCHM 2010 Addendum

Impervious Cover
Impervious cover for the offsite watershed was estimated using aerial imagery. Impervious cover for the project site was estimated based on aerial survey in conjunction with the proposed site plan.

A total of 0.4 acres of new impervious surfaces are proposed on the project site. Proposed impervious surfaces include concrete foundations for the inverters, solar panel piers, fence posts, driveway entrances, and facilities at the project switch yard. While the solar panels are impervious, the panels are separated and elevated from the ground surface. Any precipitation that falls onto a solar panel will run off onto the soil and either infiltrate or run off the site as it has done historically. Therefore, the panels are not considered impervious for runoff calculations. In addition, the proposed onsite roads are not paved and will allow for infiltration.

The project site is a recently deactivated private airport. The site has gone through significant development, and the project has the advantage of repurposing otherwise unused (but developed) property rather than new development of undisturbed land. As a part of the proposed construction, existing onsite structures are expected to be removed, and all concrete structures (hangar aprons, foundations, and slabs) are expected to be demolished and removed. The paved runways will be left in place. The proposed removal of existing impervious surfaces, along with minimal construction of new impervious surfaces, results in a **net decrease of impervious surface of approximately 1.5 acres** at project completion.

Results
Table 1 provides a summary of results from the hydrologic analysis. Model output from the CivilD program is attached.

Table 1 – Summary of Peak Runoff Rates

Return Interval (Year)	Pre-Project Peak Runoff Rate (cfs)	Post-Project Peak Runoff Rate (cfs)
100	1,571.8	1,571.4

The hydrologic analysis demonstrates that the proposed project results in a decrease in peak flow rate for the study area. This decrease is a result of the proposed decrease in impervious surface on the project site.

REVISED HYDROLOGIC ANALYSIS

Although model results demonstrate a decrease in peak flows from the project site due to decreased impervious cover, the County stated that in their experience solar projects will result in an increase in peak flows due to site disturbance and soil compaction as a result of construction. The County requested that the hydrologic analysis be re-evaluated with an assumption of an increase in impervious cover in the range of 5% to 10% to account for an anticipated increase in runoff. To address this comment, a revised hydrologic analysis was prepared assuming an increase in 5% of impervious cover, in addition to the existing impervious surfaces to remain. This results in an overall assumed value of 12% impervious cover on the project site. We believe this analysis to be conservative, as the project site is previously developed, and a large portion of the site has been disturbed and/or compacted as a part of the prior airport operations. All other inputs to the hydrologic analysis remained the same.

Results

Tables 2 and 3 provide a summary of results from the revised hydrologic analysis. These results are based on modeling for the site area only, to evaluate the impact on peak flows and volumes from development of the project site. Model output from the CivilD program is attached.

Table 2 – Summary of Peak Runoff Rates for Project Site– Revised Hydrologic Analysis

Return Interval (Year)	Pre-Project Peak Runoff Rate (cfs)	Post-Project Peak Runoff Rate (cfs)	Increase (cfs)	Percent Increase
100	501.6	502.7	1.1	0.2%

Table 3 – Summary of Runoff Volumes for Project Site– Revised Hydrologic Analysis

Return Interval (Year)	Pre-Project Runoff Volume (acre-feet)	Post-Project Runoff Volume (acre-feet)	Increase (acre-feet)	Percent increase
100	28.56	28.94	0.38	1.3%

Proposed Mitigation

Based on our evaluation of impact to peak flows and volume of runoff, the assumed percent impervious cover for the project site results in a greater impact to stormwater volume. Therefore, proposed mitigation is shallow retention basins with capacity to capture the difference in pre and post-project runoff volume for the 100-year storm. The basins will be located along the east property line of the project site, to capture and retain runoff before leaving the project site. Refer to the attached exhibit which illustrates the proposed basin locations.

FLOW CONTRIBUTIONS FROM COYOTE WASH WATERSHED

In addition to run-on from the adjacent watershed, the project site is anticipated to receive run-on from the Coyote Wash watershed. The Coyote Wash was evaluated as part of the Preliminary Hydrology Study prepared for the project site. Refer to the Preliminary Hydrology Study for details of the analysis and exhibits of anticipated flood flows. Based on the FLO-2D hydraulic model prepared for the Preliminary Hydrology Study, approximately 5,400 cfs is anticipated to split from the Coyote Wash and flow onto the project site during a 100-year storm. This equates to approximately 20% of the flow in Coyote Wash. This peak flow is not considered additive to the runoff generated from the site and adjacent watershed, as the time to peak for the Coyote Wash would be much greater than the time to peak for the project site.

SUMMARY AND CONCLUSIONS

Results of the hydrologic analysis demonstrate that the proposed project will reduce peak flow rates compared to existing conditions, due to removal of existing impervious surfaces on the project site. However, at the request of the County, the hydrologic analysis was revised to include an assumed increase in impervious surface, to account for potential increase in runoff due to site disturbance and compaction. We believe this analysis to be conservative, as the project site is previously developed, and a large portion of the site has been disturbed and/or compacted as a part of the prior airport operations. The revised hydrologic analysis demonstrates that an increase in impervious surface would increase volume of stormwater runoff. To mitigate this impact, shallow retention basins are proposed to capture the difference in pre and post-project runoff volume for the 100-year storm.

LEGEND

- Tc Flow Path
- Watershed Limits
- Joshua Tree Solar Site

InterMap Contours (5-foot)

- Major Contour
- Minor Contour

4TH STREET SOUTH

COYOTE WASH
(REFER TO PRELIMINARY HYDROLOGY STUDY)

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1 inch = 1,000 Feet

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WATERSHED EXHIBIT
JOSHUA TREE SOLAR SITE PRELIMINARY HYDROLOGY STUDY ADDENDUM

PREPARED FOR: JOSHUA TREE SOLAR FARM, LLC

DATE PREPARED:
SEP 21, 2015

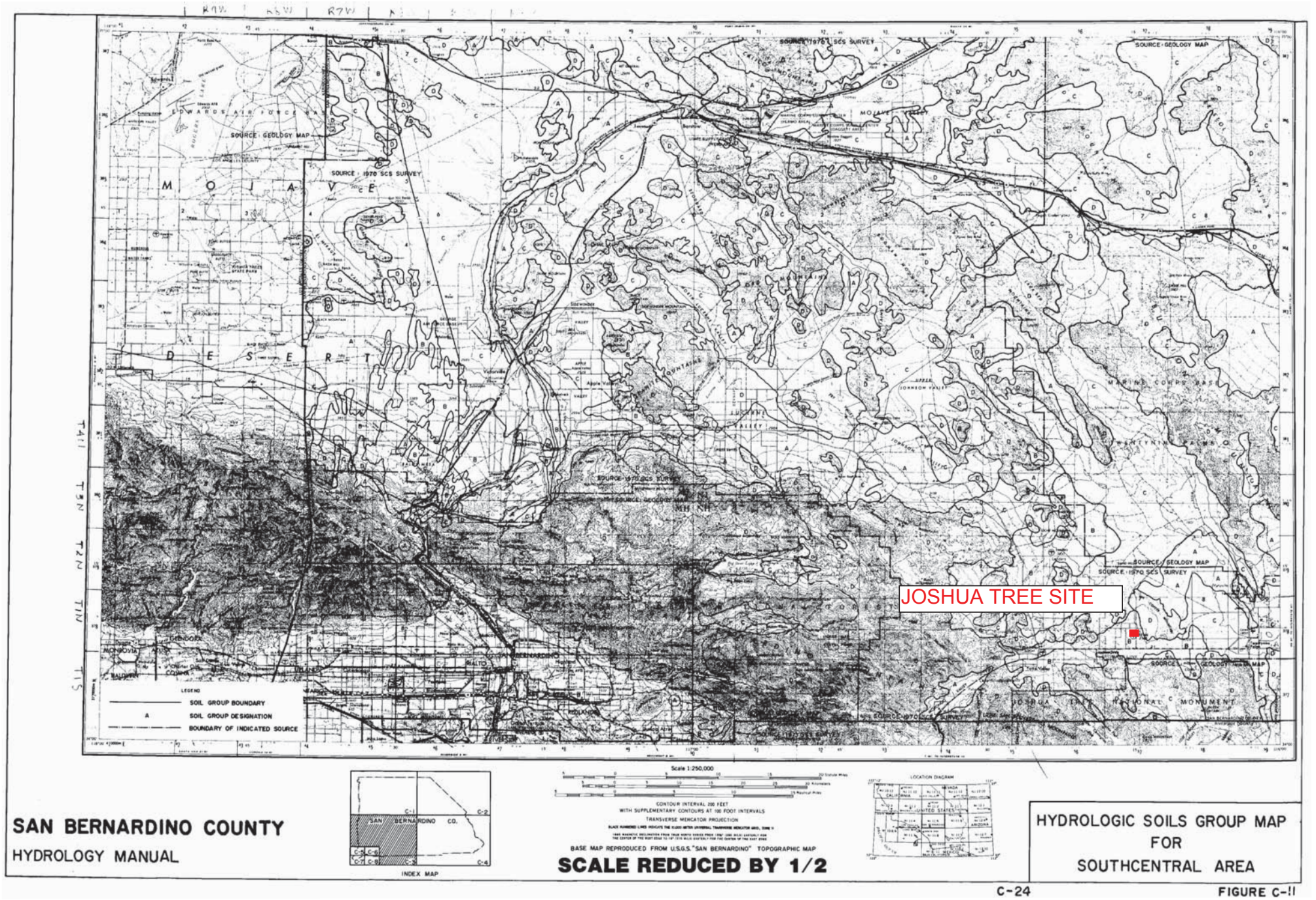
JOB NO: 1176-0001
MAP DOC: JT_AIRPORT
CREATED BY: VGH
DATE: SEP 2015

EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP. BASEMAP PER USGS.

Lag Time Calculation					
Basin Factor	Longest Watercourse (feet)	Length to Centroid (Discharge to Centroid, feet)	High Point (feet)	Low Point (feet)	Elev diff (feet)
0.03	13,006	5,383	2,630	2,430	200.0
AMC Values					
Storm Frequency	AMC				
10-year	I				
100-year	II	Use AMC II Per Hydrology Manual 2010 Addendum			
Runoff Calculations					
Watershed Sub-Area	Offsite	Onsite Existing	Onsite Proposed	Total Existing	Total Proposed
Area (acres)	548	115	115	663	663
Area for Depth-Area Adjustment (acres)	548	115	115	663	663
Baseflow (cfs)	0	0	0	0	0
Storm Duration (hours)	6	6	6	6	6
Fraction Valley Zone (Developed)	0	0	0	0	0
Fraction Valley Zone (Undeveloped)	0	0	0	0	0
Fraction Foothill Zone	0	0	0	0	0
Fraction Mountain Zone	0	0	0	0	0
Impervious Area (acres)	6.53	10.3	8.8	16.83	15.33
Fraction Impervious	1.2%	9.0%	7.7%	2.5%	2.3%
Fraction Pervious	98.8%	91.0%	92.3%	97.5%	97.7%
SCS Curve Number (AMC II)	82	82	82	82	82
10-year storm	@ Watershed Centroid				
1-hour Rainfall (inches)	0.94				
6-hour Rainfall (inches)	1.55				
24-hour Rainfall (inches)	2.38				
Area for Rainfall (acres)	663				
100-year storm	@ Watershed Centroid				
1-hour Rainfall (inches)	1.85				
6-hour Rainfall (inches)	2.79				
24-hour Rainfall (inches)	4.32				
Area for Rainfall (acres)	663.00				
Logarithm slope of intensity-duration (use default for desert area)	0.7	Used for 10-year and 100-year			

Lag Time Calculation						
Location	Basin Factor	Longest Watercourse (feet)	Length to Centroid (Discharge to Centroid, feet)	High Point (feet)	Low Point (feet)	Elev diff (feet)
Overall watershed	0.03	13,006	5,383	2,630	2,430	200.0
Site	0.03	3,013	1,176	2,473	2,432	41.3
AMC Values						
Storm Frequency	AMC					
10-year	I					
100-year	II	Use AMC II Per Hydrology Manual 2010 Addendum				
Runoff Calculations						
Watershed Sub-Area	Offsite	Onsite Existing	Onsite Proposed	Total Existing	Total Proposed	
Area (acres)	548	115	115	663	663	
Area for Depth-Area Adjustment (acres)	548	115	115	663	663	
Baseflow (cfs)	0	0	0	0	0	
Storm Duration (hours)	6	6	6	6	6	
Fraction Valley Zone (Developed)	0	0	0	0	0	
Fraction Valley Zone (Undeveloped)	0	0	0	0	0	
Fraction Foothill Zone	0	0	0	0	0	
Fraction Mountain Zone	0	0	0	0	0	
Impervious Area (acres)	6.53	10.3	13.7	16.83	20.23	
Fraction Impervious	1.2%	9.0%	11.9%	2.5%	3.1%	
Fraction Pervious	98.8%	91.0%	88.1%	97.5%	96.9%	
SCS Curve Number (AMC II)	82	82	82	82	82	
100-year storm	@ Watershed Centroid	@ Site Centroid				
1-hour Rainfall (inches)	1.85	1.85				
6-hour Rainfall (inches)	2.79	2.76				
24-hour Rainfall (inches)	4.32	4.22				
Area for Rainfall (acres)	663	115				
Logarithm slope of intensity-duration (use default for desert area)	0.7	0.7				
Runoff Volume Calculation for the Project Site						
Per SBCFCD Manual Page E-25, Runoff Volume = Y x Rainfall Depth x Area = Effective Rainfall Depth x Area						
Where Y = catchment runoff yield = 1- Yb						
Refer to CivilD output for Effective Rainfall Depth						
		Existing Runoff		Proposed Runoff		
Area (acres)	Storm Frequency	Effective Rainfall Depth (inches)	Volume (ac-ft)	Effective Rainfall Depth (inches)	Volume (ac-ft)	Volume Increase (ac-ft)
115	100-year	2.98	28.56	3.02	28.94	0.38

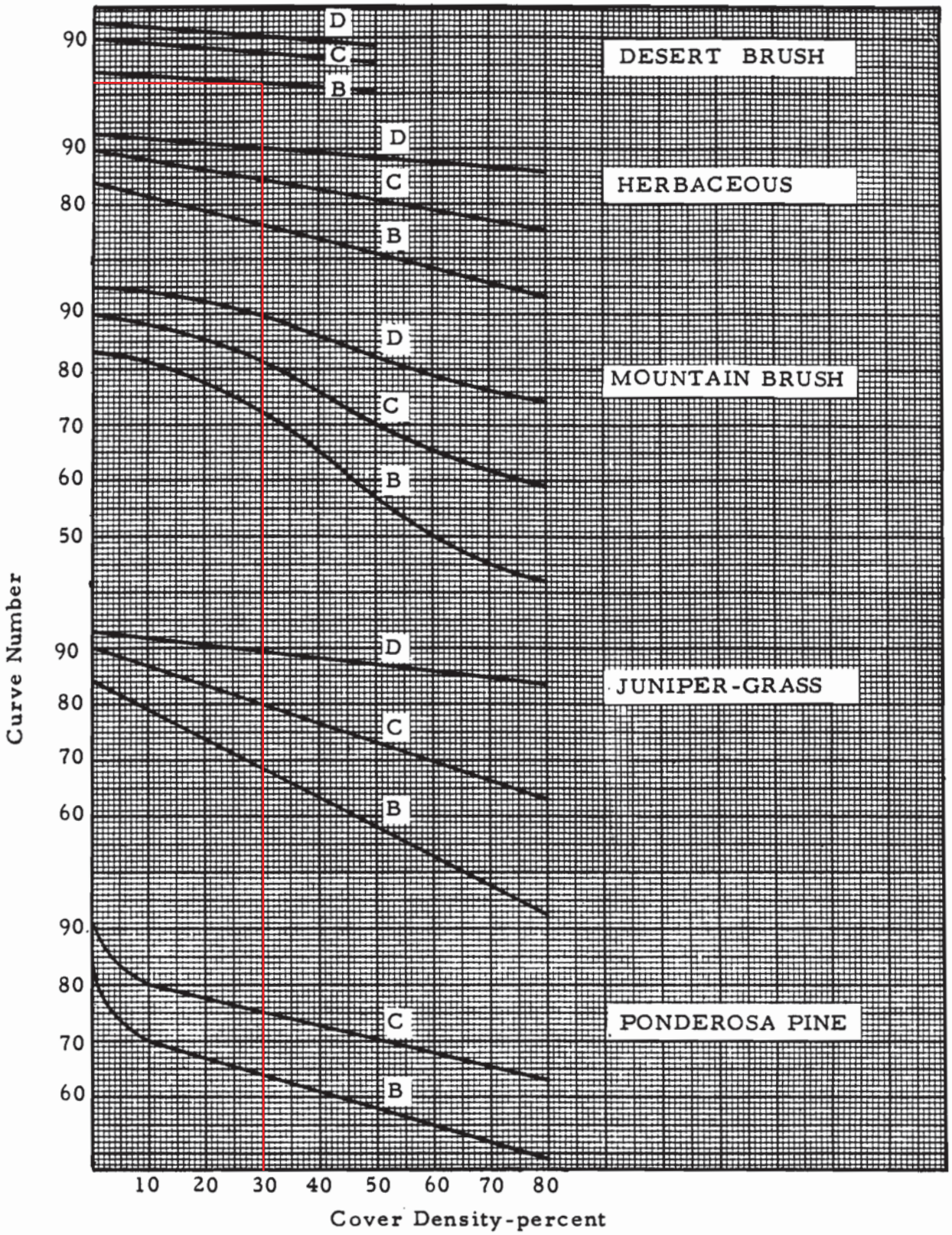
Joshua Tree Solar - Preliminary Hydrology Study Addendum Revision 1				
Evaluation of Existing and Proposed Onsite Impervious Areas				
EXISTING SITE IMPERVIOUS - FROM AERIAL SURVEY				
	Area (sf)	**Area (acres)**	**Notes**	
Buildings, Concrete Pads, asphalt at Entrance	83,619	1.9	To be removed	
Runways	365,359	8.4	To remain	
Total Existing Impervious	**448,978**	**10.3**		
PROPOSED SITE IMPERVIOUS - FROM CUP SITE PLAN				
Item	**Area (sf)**	**Count**	**Total Area (sf)**	**Notes**
Posts	0.25	11,922	2,981	Assume 6"x6" posts. Per site plan, 36 panels have 5 posts
Inverter Pads	570	10	5,701	Area and count per site plan
Fence Posts	0.79	1,022	803	Assume 12" dia concrete support, with posts at 10-ft on center
Driveways	1,500	2	3,000	Area estimated based on site plan
Switchyard	5,625	1	5,625	Assume 50% impervious
	Total New Impervious		**18,109**	
SUMMARY OF ONSITE IMPERVIOUS AREAS				
	Total Area (sf)	**Total Area (acres)**	**Notes**	
Project Site	5,009,400	115		
Total Existing Impervious	448,978	10.3		
Existing Impervious to Remain	365,359	8.4		
Assumed New Impervious (5%)	232,202	5.3	Equal to 5% of pervious area of site	
Assumed New & Existing Impervious	597,561	13.7		
Assumed Increase of Impervious Area	**148,583**	**3.4**	Compared to existing conditions	



SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHCENTRAL AREA

FIGURE C-11



SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

HYDROLOGIC SOIL COVER COMPLEXES AND ASSOCIATED CURVE NUMBERS

Figure C-8

NOAA Atlas 14, Volume 6, Version 2
Location name: Joshua Tree, California, US*
Latitude: 34.1498°, Longitude: -116.2649°
Elevation: 2514 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.097** (0.080-0.118)	**0.141** (0.117-0.173)	**0.207** (0.171-0.254)	**0.267** (0.218-0.330)	**0.358** (0.283-0.457)	**0.437** (0.338-0.569)	**0.526** (0.398-0.702)	**0.628** (0.462-0.862)	**0.785** (0.554-1.12)	**0.942** (0.643-1.39)
10-min	**0.139** (0.115-0.169)	**0.203** (0.168-0.248)	**0.297** (0.245-0.364)	**0.382** (0.312-0.472)	**0.513** (0.406-0.655)	**0.626** (0.485-0.816)	**0.753** (0.570-1.01)	**0.900** (0.662-1.24)	**1.13** (0.795-1.61)	**1.35** (0.922-2.00)
15-min	**0.168** (0.139-0.205)	**0.245** (0.203-0.300)	**0.359** (0.296-0.440)	**0.462** (0.378-0.571)	**0.620** (0.490-0.792)	**0.757** (0.586-0.987)	**0.911** (0.689-1.22)	**1.09** (0.800-1.49)	**1.36** (0.961-1.95)	**1.63** (1.11-2.42)
30-min	**0.252** (0.208-0.307)	**0.368** (0.304-0.450)	**0.540** (0.445-0.661)	**0.694** (0.568-0.858)	**0.931** (0.737-1.19)	**1.14** (0.881-1.48)	**1.37** (1.03-1.83)	**1.64** (1.20-2.24)	**2.04** (1.44-2.92)	**2.45** (1.67-3.63)
60-min	**0.340** (0.281-0.415)	**0.498** (0.411-0.608)	**0.729** (0.601-0.894)	**0.938** (0.767-1.16)	**1.26** (0.996-1.61)	**1.54** (1.19-2.00)	**1.85** (1.40-2.47)	**2.21** (1.63-3.03)	**2.76** (1.95-3.95)	**3.31** (2.26-4.91)
2-hr	**0.444** (0.368-0.542)	**0.627** (0.518-0.767)	**0.892** (0.735-1.09)	**1.13** (0.922-1.39)	**1.48** (1.17-1.89)	**1.78** (1.38-2.32)	**2.11** (1.60-2.82)	**2.48** (1.83-3.41)	**3.04** (2.15-4.35)	**3.52** (2.40-5.21)
3-hr	**0.513** (0.424-0.626)	**0.716** (0.592-0.875)	**1.01** (0.830-1.23)	**1.26** (1.03-1.56)	**1.65** (1.30-2.10)	**1.97** (1.53-2.57)	**2.33** (1.76-3.11)	**2.72** (2.00-3.73)	**3.30** (2.33-4.72)	**3.80** (2.59-5.62)
6-hr	**0.641** (0.530-0.782)	**0.890** (0.735-1.09)	**1.24** (1.02-1.52)	**1.55** (1.27-1.92)	**2.00** (1.58-2.56)	**2.38** (1.84-3.10)	**2.79** (2.11-3.72)	**3.23** (2.38-4.44)	**3.89** (2.75-5.56)	**4.43** (3.03-6.57)
12-hr	**0.762** (0.630-0.930)	**1.07** (0.887-1.31)	**1.51** (1.25-1.85)	**1.89** (1.54-2.33)	**2.44** (1.93-3.12)	**2.90** (2.24-3.77)	**3.39** (2.56-4.52)	**3.92** (2.89-5.38)	**4.70** (3.32-6.72)	**5.35** (3.65-7.92)
24-hr	**0.917** (0.812-1.06)	**1.32** (1.17-1.52)	**1.89** (1.67-2.18)	**2.38** (2.08-2.77)	**3.09** (2.62-3.72)	**3.68** (3.06-4.53)	**4.32** (3.50-5.43)	**5.01** (3.96-6.49)	**6.03** (4.57-8.12)	**6.88** (5.04-9.58)
2-day	**1.04** (0.922-1.20)	**1.53** (1.35-1.76)	**2.21** (1.96-2.56)	**2.81** (2.46-3.28)	**3.69** (3.13-4.44)	**4.42** (3.67-5.43)	**5.21** (4.22-6.55)	**6.07** (4.79-7.85)	**7.34** (5.56-9.88)	**8.40** (6.16-11.7)
3-day	**1.10** (0.978-1.27)	**1.64** (1.45-1.89)	**2.40** (2.12-2.77)	**3.06** (2.68-3.57)	**4.04** (3.43-4.87)	**4.86** (4.04-5.97)	**5.75** (4.66-7.23)	**6.73** (5.31-8.70)	**8.17** (6.19-11.0)	**9.38** (6.88-13.1)
4-day	**1.15** (1.02-1.32)	**1.72** (1.52-1.98)	**2.53** (2.23-2.93)	**3.25** (2.84-3.78)	**4.30** (3.65-5.18)	**5.18** (4.30-6.36)	**6.14** (4.98-7.72)	**7.20** (5.68-9.31)	**8.76** (6.64-11.8)	**10.1** (7.39-14.0)
7-day	**1.24** (1.10-1.43)	**1.88** (1.66-2.17)	**2.80** (2.47-3.23)	**3.61** (3.16-4.20)	**4.80** (4.07-5.78)	**5.80** (4.82-7.12)	**6.88** (5.58-8.66)	**8.09** (6.38-10.5)	**9.85** (7.47-13.3)	**11.3** (8.31-15.8)
10-day	**1.29** (1.14-1.49)	**1.98** (1.75-2.28)	**2.96** (2.61-3.42)	**3.83** (3.35-4.46)	**5.11** (4.33-6.15)	**6.18** (5.13-7.59)	**7.34** (5.95-9.23)	**8.62** (6.80-11.1)	**10.5** (7.96-14.2)	**12.1** (8.86-16.8)
20-day	**1.43** (1.26-1.64)	**2.21** (1.96-2.55)	**3.34** (2.95-3.86)	**4.33** (3.79-5.05)	**5.80** (4.92-6.99)	**7.03** (5.84-8.64)	**8.37** (6.78-10.5)	**9.83** (7.76-12.7)	**12.0** (9.07-16.1)	**13.8** (10.1-19.2)
30-day	**1.58** (1.40-1.81)	**2.45** (2.17-2.83)	**3.72** (3.28-4.30)	**4.84** (4.24-5.64)	**6.49** (5.50-7.82)	**7.87** (6.54-9.67)	**9.36** (7.59-11.8)	**11.0** (8.68-14.2)	**13.4** (10.1-18.0)	**15.3** (11.2-21.4)
45-day	**1.78** (1.58-2.06)	**2.77** (2.46-3.20)	**4.20** (3.71-4.86)	**5.46** (4.79-6.37)	**7.34** (6.22-8.83)	**8.90** (7.39-10.9)	**10.6** (8.58-13.3)	**12.4** (9.79-16.0)	**15.1** (11.4-20.3)	**17.3** (12.6-24.0)
60-day	**2.00** (1.77-2.30)	**3.09** (2.73-3.56)	**4.67** (4.13-5.40)	**6.07** (5.32-7.08)	**8.14** (6.90-9.80)	**9.87** (8.19-12.1)	**11.7** (9.51-14.8)	**13.7** (10.8-17.8)	**16.7** (12.6-22.4)	**19.1** (14.0-26.6)

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

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

Please refer to NOAA Atlas 14 document for more information.

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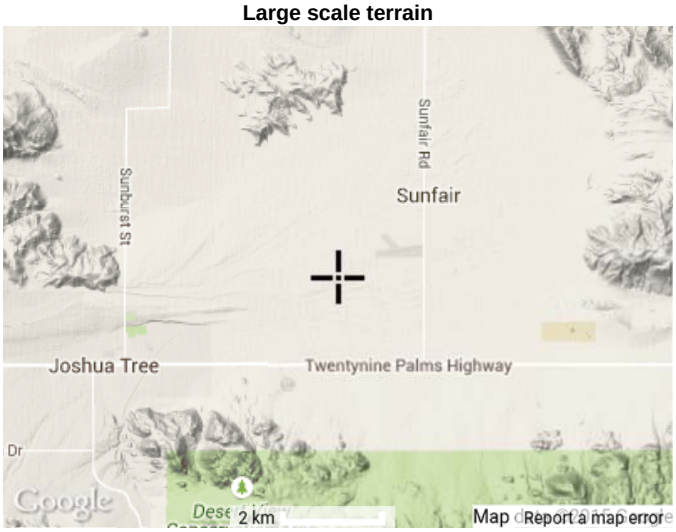
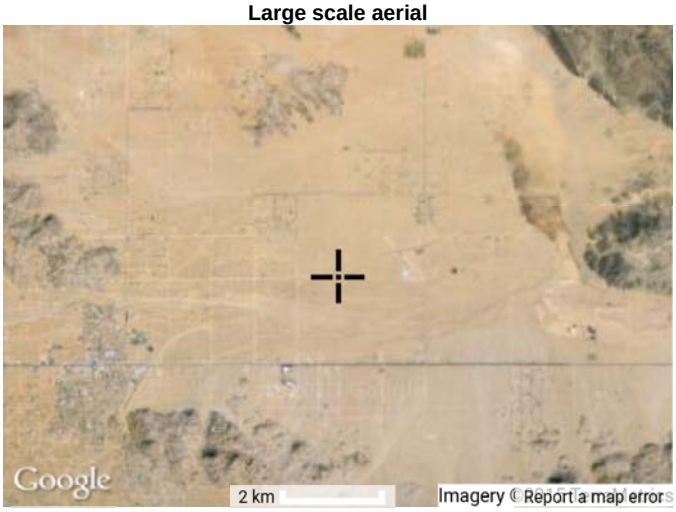
PF graphical

Large scale terrain



Large scale map

Large scale aerial



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

Study date 06/04/15

++

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

Program License Serial Number 6230

Joshua Tree Solar
Preliminary Hydrology Study Addendum
Existing Conditions, 100-year Storm

Storm Event Year = 100

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 100		
663.00	1	1.85
Rainfall data for year 100		
663.00	6	2.79
Rainfall data for year 100		
663.00	24	4.32

++

```
      ******** 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)
       82.0      82.0        663.00      1.000     0.335    0.975
0.327

      Area-averaged adjusted loss rate Fm (In/Hr) =  0.327

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

      Area       Area          SCS CN    SCS CN      S     Pervious
       (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
         646.42   0.975         82.0      82.0       2.20     0.574
          16.58   0.025         98.0      98.0       0.20     0.945

      Area-averaged catchment yield fraction, Y =  0.583
      Area-averaged low loss fraction, Yb =  0.417
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++
      Watercourse length =   13006.00(Ft.)
      Length from concentration point to centroid =    5383.00(Ft.)
      Elevation difference along watercourse =     200.00(Ft.)
      Mannings friction factor along watercourse =  0.030
      Watershed area =     663.00(Ac.)
      Catchment Lag time =   0.443 hours
      Unit interval =   5.000 minutes
      Unit interval percentage of lag time = 18.8076
      Hydrograph baseflow =     0.00(CFS)
      Average maximum watershed loss rate(Fm) =  0.327(In/Hr)
      Average low loss rate fraction (Yb) = 0.417 (decimal)
      DESERT S-Graph Selected
      Computed peak 5-minute rainfall =  0.878(In)
      Computed peak 30-minute rainfall =  1.503(In)
      Specified peak 1-hour rainfall =  1.850(In)
      Computed peak 3-hour rainfall =  2.380(In)
      Specified peak 6-hour rainfall =  2.790(In)
      Specified peak 24-hour rainfall =  4.320(In)


      Rainfall depth area reduction factors:
      Using a total area of     663.00(Ac.) (Ref: fig. E-4)

      5-minute factor = 0.969     Adjusted rainfall =  0.851(In)
      30-minute factor = 0.969    Adjusted rainfall =  1.456(In)
      1-hour factor = 0.969       Adjusted rainfall =  1.793(In)
      3-hour factor = 0.996       Adjusted rainfall =  2.371(In)
      6-hour factor = 0.998       Adjusted rainfall =  2.784(In)
      24-hour factor = 0.999      Adjusted rainfall =  4.316(In)
      ----------------------------------------------------------------
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                      U n i t  H y d r o g r a p h
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Interval          'S' Graph          Unit Hydrograph
      Number            Mean values             ((CFS))
```

(K = 8018.16 (CFS))

1	0.912	73.138
2	4.078	253.843
3	9.832	461.345
4	22.283	998.374
5	39.301	1364.544
6	51.676	992.207
7	60.159	680.192
8	66.095	475.978
9	70.819	378.738
10	74.625	305.210
11	77.831	257.061
12	80.450	209.946
13	82.690	179.657
14	84.665	158.337
15	86.459	143.818
16	88.021	125.269
17	89.320	104.120
18	90.428	88.919
19	91.473	83.766
20	92.404	74.615
21	93.264	69.011
22	94.042	62.313
23	94.688	51.814
24	95.327	51.240
25	95.880	44.387
26	96.369	39.209
27	96.845	38.170
28	97.210	29.209
29	97.548	27.144
30	97.844	23.692
31	98.036	15.438
32	98.225	15.095
33	98.435	16.869
34	98.661	18.096
35	98.886	18.096
36	99.112	18.096
37	99.338	18.096
38	99.530	15.452
39	99.651	9.633
40	99.768	9.425
41	99.886	9.425
42	100.000	9.167

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.8506	0.8506
2	1.0472	0.1966
3	1.1826	0.1354
4	1.2892	0.1066
5	1.3785	0.0893
6	1.4560	0.0775
7	1.5249	0.0689
8	1.5872	0.0623
9	1.6443	0.0571
10	1.6971	0.0528

11	1.7463	0.0492
12	1.7925	0.0462
13	1.8294	0.0369
14	1.8642	0.0348
15	1.8972	0.0330
16	1.9286	0.0314
17	1.9586	0.0300
18	1.9873	0.0287
19	2.0148	0.0275
20	2.0413	0.0265
21	2.0668	0.0255
22	2.0914	0.0246
23	2.1152	0.0238
24	2.1382	0.0230
25	2.1606	0.0223
26	2.1822	0.0217
27	2.2033	0.0211
28	2.2238	0.0205
29	2.2437	0.0199
30	2.2632	0.0194
31	2.2821	0.0190
32	2.3006	0.0185
33	2.3187	0.0181
34	2.3364	0.0177
35	2.3537	0.0173
36	2.3706	0.0169
37	2.3857	0.0151
38	2.4006	0.0148
39	2.4151	0.0145
40	2.4293	0.0142
41	2.4432	0.0140
42	2.4569	0.0137
43	2.4704	0.0134
44	2.4836	0.0132
45	2.4966	0.0130
46	2.5094	0.0128
47	2.5219	0.0126
48	2.5343	0.0123
49	2.5464	0.0122
50	2.5584	0.0120
51	2.5701	0.0118
52	2.5818	0.0116
53	2.5932	0.0114
54	2.6045	0.0113
55	2.6156	0.0111
56	2.6265	0.0110
57	2.6373	0.0108
58	2.6480	0.0107
59	2.6585	0.0105
60	2.6689	0.0104
61	2.6792	0.0103
62	2.6893	0.0101
63	2.6993	0.0100
64	2.7092	0.0099
65	2.7189	0.0098
66	2.7286	0.0096
67	2.7381	0.0095
68	2.7475	0.0094
69	2.7569	0.0093
70	2.7661	0.0092

71	2.7752	0.0091
72	2.7842	0.0090
73	2.7964	0.0122
74	2.8085	0.0121
75	2.8204	0.0119
76	2.8322	0.0118
77	2.8440	0.0117
78	2.8556	0.0116
79	2.8671	0.0115
80	2.8786	0.0114
81	2.8899	0.0113
82	2.9011	0.0112
83	2.9123	0.0111
84	2.9233	0.0111
85	2.9343	0.0110
86	2.9452	0.0109
87	2.9560	0.0108
88	2.9667	0.0107
89	2.9773	0.0106
90	2.9878	0.0105
91	2.9983	0.0105
92	3.0087	0.0104
93	3.0190	0.0103
94	3.0292	0.0102
95	3.0394	0.0102
96	3.0494	0.0101
97	3.0594	0.0100
98	3.0694	0.0099
99	3.0793	0.0099
100	3.0891	0.0098
101	3.0988	0.0097
102	3.1085	0.0097
103	3.1181	0.0096
104	3.1276	0.0095
105	3.1371	0.0095
106	3.1465	0.0094
107	3.1559	0.0094
108	3.1652	0.0093
109	3.1744	0.0092
110	3.1836	0.0092
111	3.1927	0.0091
112	3.2018	0.0091
113	3.2108	0.0090
114	3.2198	0.0090
115	3.2287	0.0089
116	3.2375	0.0089
117	3.2463	0.0088
118	3.2551	0.0088
119	3.2638	0.0087
120	3.2724	0.0086
121	3.2810	0.0086
122	3.2896	0.0086
123	3.2981	0.0085
124	3.3065	0.0085
125	3.3150	0.0084
126	3.3233	0.0084
127	3.3316	0.0083
128	3.3399	0.0083
129	3.3481	0.0082
130	3.3563	0.0082

131	3.3645	0.0081
132	3.3726	0.0081
133	3.3806	0.0081
134	3.3887	0.0080
135	3.3966	0.0080
136	3.4046	0.0079
137	3.4125	0.0079
138	3.4203	0.0079
139	3.4281	0.0078
140	3.4359	0.0078
141	3.4437	0.0077
142	3.4514	0.0077
143	3.4590	0.0077
144	3.4667	0.0076
145	3.4743	0.0076
146	3.4818	0.0076
147	3.4894	0.0075
148	3.4969	0.0075
149	3.5043	0.0075
150	3.5117	0.0074
151	3.5191	0.0074
152	3.5265	0.0074
153	3.5338	0.0073
154	3.5411	0.0073
155	3.5483	0.0073
156	3.5556	0.0072
157	3.5628	0.0072
158	3.5699	0.0072
159	3.5770	0.0071
160	3.5841	0.0071
161	3.5912	0.0071
162	3.5983	0.0070
163	3.6053	0.0070
164	3.6122	0.0070
165	3.6192	0.0070
166	3.6261	0.0069
167	3.6330	0.0069
168	3.6399	0.0069
169	3.6467	0.0068
170	3.6535	0.0068
171	3.6603	0.0068
172	3.6671	0.0068
173	3.6738	0.0067
174	3.6805	0.0067
175	3.6872	0.0067
176	3.6938	0.0067
177	3.7005	0.0066
178	3.7071	0.0066
179	3.7136	0.0066
180	3.7202	0.0065
181	3.7267	0.0065
182	3.7332	0.0065
183	3.7397	0.0065
184	3.7461	0.0065
185	3.7526	0.0064
186	3.7590	0.0064
187	3.7653	0.0064
188	3.7717	0.0064
189	3.7780	0.0063
190	3.7843	0.0063

191	3.7906	0.0063
192	3.7969	0.0063
193	3.8031	0.0062
194	3.8094	0.0062
195	3.8156	0.0062
196	3.8217	0.0062
197	3.8279	0.0062
198	3.8340	0.0061
199	3.8401	0.0061
200	3.8462	0.0061
201	3.8523	0.0061
202	3.8584	0.0061
203	3.8644	0.0060
204	3.8704	0.0060
205	3.8764	0.0060
206	3.8824	0.0060
207	3.8883	0.0060
208	3.8943	0.0059
209	3.9002	0.0059
210	3.9061	0.0059
211	3.9119	0.0059
212	3.9178	0.0059
213	3.9236	0.0058
214	3.9294	0.0058
215	3.9352	0.0058
216	3.9410	0.0058
217	3.9468	0.0058
218	3.9525	0.0057
219	3.9582	0.0057
220	3.9640	0.0057
221	3.9696	0.0057
222	3.9753	0.0057
223	3.9810	0.0057
224	3.9866	0.0056
225	3.9922	0.0056
226	3.9978	0.0056
227	4.0034	0.0056
228	4.0090	0.0056
229	4.0145	0.0056
230	4.0201	0.0055
231	4.0256	0.0055
232	4.0311	0.0055
233	4.0366	0.0055
234	4.0421	0.0055
235	4.0475	0.0055
236	4.0530	0.0054
237	4.0584	0.0054
238	4.0638	0.0054
239	4.0692	0.0054
240	4.0746	0.0054
241	4.0799	0.0054
242	4.0853	0.0053
243	4.0906	0.0053
244	4.0959	0.0053
245	4.1012	0.0053
246	4.1065	0.0053
247	4.1118	0.0053
248	4.1170	0.0053
249	4.1223	0.0052
250	4.1275	0.0052

251	4.1327	0.0052
252	4.1379	0.0052
253	4.1431	0.0052
254	4.1483	0.0052
255	4.1534	0.0052
256	4.1586	0.0051
257	4.1637	0.0051
258	4.1688	0.0051
259	4.1739	0.0051
260	4.1790	0.0051
261	4.1841	0.0051
262	4.1892	0.0051
263	4.1942	0.0051
264	4.1993	0.0050
265	4.2043	0.0050
266	4.2093	0.0050
267	4.2143	0.0050
268	4.2193	0.0050
269	4.2242	0.0050
270	4.2292	0.0050
271	4.2342	0.0049
272	4.2391	0.0049
273	4.2440	0.0049
274	4.2489	0.0049
275	4.2538	0.0049
276	4.2587	0.0049
277	4.2636	0.0049
278	4.2684	0.0049
279	4.2733	0.0049
280	4.2781	0.0048
281	4.2830	0.0048
282	4.2878	0.0048
283	4.2926	0.0048
284	4.2974	0.0048
285	4.3021	0.0048
286	4.3069	0.0048
287	4.3117	0.0048
288	4.3164	0.0047

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0047	0.0020	0.0028
2	0.0048	0.0020	0.0028
3	0.0048	0.0020	0.0028
4	0.0048	0.0020	0.0028
5	0.0048	0.0020	0.0028
6	0.0048	0.0020	0.0028
7	0.0049	0.0020	0.0028
8	0.0049	0.0020	0.0028
9	0.0049	0.0020	0.0028
10	0.0049	0.0020	0.0029
11	0.0049	0.0021	0.0029
12	0.0049	0.0021	0.0029
13	0.0050	0.0021	0.0029
14	0.0050	0.0021	0.0029
15	0.0050	0.0021	0.0029

16	0.0050	0.0021	0.0029
17	0.0050	0.0021	0.0029
18	0.0051	0.0021	0.0029
19	0.0051	0.0021	0.0030
20	0.0051	0.0021	0.0030
21	0.0051	0.0021	0.0030
22	0.0051	0.0021	0.0030
23	0.0052	0.0022	0.0030
24	0.0052	0.0022	0.0030
25	0.0052	0.0022	0.0030
26	0.0052	0.0022	0.0030
27	0.0052	0.0022	0.0031
28	0.0053	0.0022	0.0031
29	0.0053	0.0022	0.0031
30	0.0053	0.0022	0.0031
31	0.0053	0.0022	0.0031
32	0.0053	0.0022	0.0031
33	0.0054	0.0022	0.0031
34	0.0054	0.0022	0.0031
35	0.0054	0.0023	0.0032
36	0.0054	0.0023	0.0032
37	0.0055	0.0023	0.0032
38	0.0055	0.0023	0.0032
39	0.0055	0.0023	0.0032
40	0.0055	0.0023	0.0032
41	0.0056	0.0023	0.0032
42	0.0056	0.0023	0.0033
43	0.0056	0.0023	0.0033
44	0.0056	0.0024	0.0033
45	0.0057	0.0024	0.0033
46	0.0057	0.0024	0.0033
47	0.0057	0.0024	0.0033
48	0.0057	0.0024	0.0033
49	0.0058	0.0024	0.0034
50	0.0058	0.0024	0.0034
51	0.0058	0.0024	0.0034
52	0.0059	0.0024	0.0034
53	0.0059	0.0025	0.0034
54	0.0059	0.0025	0.0034
55	0.0060	0.0025	0.0035
56	0.0060	0.0025	0.0035
57	0.0060	0.0025	0.0035
58	0.0060	0.0025	0.0035
59	0.0061	0.0025	0.0035
60	0.0061	0.0025	0.0036
61	0.0061	0.0026	0.0036
62	0.0062	0.0026	0.0036
63	0.0062	0.0026	0.0036
64	0.0062	0.0026	0.0036
65	0.0063	0.0026	0.0037
66	0.0063	0.0026	0.0037
67	0.0063	0.0026	0.0037
68	0.0064	0.0027	0.0037
69	0.0064	0.0027	0.0037
70	0.0064	0.0027	0.0037
71	0.0065	0.0027	0.0038
72	0.0065	0.0027	0.0038
73	0.0065	0.0027	0.0038
74	0.0066	0.0027	0.0038
75	0.0066	0.0028	0.0039

76	0.0067	0.0028	0.0039
77	0.0067	0.0028	0.0039
78	0.0067	0.0028	0.0039
79	0.0068	0.0028	0.0040
80	0.0068	0.0028	0.0040
81	0.0069	0.0029	0.0040
82	0.0069	0.0029	0.0040
83	0.0070	0.0029	0.0041
84	0.0070	0.0029	0.0041
85	0.0070	0.0029	0.0041
86	0.0071	0.0029	0.0041
87	0.0071	0.0030	0.0042
88	0.0072	0.0030	0.0042
89	0.0072	0.0030	0.0042
90	0.0073	0.0030	0.0042
91	0.0073	0.0031	0.0043
92	0.0074	0.0031	0.0043
93	0.0074	0.0031	0.0043
94	0.0075	0.0031	0.0043
95	0.0075	0.0031	0.0044
96	0.0076	0.0032	0.0044
97	0.0076	0.0032	0.0045
98	0.0077	0.0032	0.0045
99	0.0077	0.0032	0.0045
100	0.0078	0.0032	0.0045
101	0.0079	0.0033	0.0046
102	0.0079	0.0033	0.0046
103	0.0080	0.0033	0.0047
104	0.0080	0.0033	0.0047
105	0.0081	0.0034	0.0047
106	0.0081	0.0034	0.0047
107	0.0082	0.0034	0.0048
108	0.0083	0.0034	0.0048
109	0.0084	0.0035	0.0049
110	0.0084	0.0035	0.0049
111	0.0085	0.0035	0.0050
112	0.0086	0.0036	0.0050
113	0.0086	0.0036	0.0050
114	0.0087	0.0036	0.0051
115	0.0088	0.0037	0.0051
116	0.0089	0.0037	0.0052
117	0.0090	0.0037	0.0052
118	0.0090	0.0038	0.0053
119	0.0091	0.0038	0.0053
120	0.0092	0.0038	0.0054
121	0.0093	0.0039	0.0054
122	0.0094	0.0039	0.0055
123	0.0095	0.0040	0.0055
124	0.0095	0.0040	0.0056
125	0.0097	0.0040	0.0056
126	0.0097	0.0041	0.0057
127	0.0099	0.0041	0.0058
128	0.0099	0.0041	0.0058
129	0.0101	0.0042	0.0059
130	0.0102	0.0042	0.0059
131	0.0103	0.0043	0.0060
132	0.0104	0.0043	0.0061
133	0.0105	0.0044	0.0061
134	0.0106	0.0044	0.0062
135	0.0108	0.0045	0.0063

136	0.0109	0.0045	0.0063
137	0.0111	0.0046	0.0064
138	0.0111	0.0046	0.0065
139	0.0113	0.0047	0.0066
140	0.0114	0.0048	0.0067
141	0.0116	0.0048	0.0068
142	0.0117	0.0049	0.0068
143	0.0119	0.0050	0.0070
144	0.0121	0.0050	0.0070
145	0.0090	0.0038	0.0053
146	0.0091	0.0038	0.0053
147	0.0093	0.0039	0.0054
148	0.0094	0.0039	0.0055
149	0.0096	0.0040	0.0056
150	0.0098	0.0041	0.0057
151	0.0100	0.0042	0.0058
152	0.0101	0.0042	0.0059
153	0.0104	0.0043	0.0061
154	0.0105	0.0044	0.0061
155	0.0108	0.0045	0.0063
156	0.0110	0.0046	0.0064
157	0.0113	0.0047	0.0066
158	0.0114	0.0048	0.0067
159	0.0118	0.0049	0.0069
160	0.0120	0.0050	0.0070
161	0.0123	0.0051	0.0072
162	0.0126	0.0052	0.0073
163	0.0130	0.0054	0.0076
164	0.0132	0.0055	0.0077
165	0.0137	0.0057	0.0080
166	0.0140	0.0058	0.0081
167	0.0145	0.0060	0.0085
168	0.0148	0.0062	0.0086
169	0.0169	0.0071	0.0099
170	0.0173	0.0072	0.0101
171	0.0181	0.0075	0.0105
172	0.0185	0.0077	0.0108
173	0.0194	0.0081	0.0113
174	0.0199	0.0083	0.0116
175	0.0211	0.0088	0.0123
176	0.0217	0.0090	0.0126
177	0.0230	0.0096	0.0134
178	0.0238	0.0099	0.0139
179	0.0255	0.0106	0.0149
180	0.0265	0.0110	0.0154
181	0.0287	0.0120	0.0167
182	0.0300	0.0125	0.0175
183	0.0330	0.0138	0.0193
184	0.0348	0.0145	0.0203
185	0.0462	0.0193	0.0269
186	0.0492	0.0205	0.0287
187	0.0571	0.0238	0.0333
188	0.0623	0.0260	0.0363
189	0.0775	0.0273	0.0502
190	0.0893	0.0273	0.0620
191	0.1354	0.0273	0.1082
192	0.1966	0.0273	0.1693
193	0.8506	0.0273	0.8233
194	0.1066	0.0273	0.0793
195	0.0689	0.0273	0.0417

196	0.0528	0.0220	0.0308
197	0.0369	0.0154	0.0215
198	0.0314	0.0131	0.0183
199	0.0275	0.0115	0.0161
200	0.0246	0.0103	0.0144
201	0.0223	0.0093	0.0130
202	0.0205	0.0085	0.0119
203	0.0190	0.0079	0.0111
204	0.0177	0.0074	0.0103
205	0.0151	0.0063	0.0088
206	0.0142	0.0059	0.0083
207	0.0134	0.0056	0.0078
208	0.0128	0.0053	0.0074
209	0.0122	0.0051	0.0071
210	0.0116	0.0048	0.0068
211	0.0111	0.0046	0.0065
212	0.0107	0.0044	0.0062
213	0.0103	0.0043	0.0060
214	0.0099	0.0041	0.0058
215	0.0095	0.0040	0.0056
216	0.0092	0.0038	0.0054
217	0.0122	0.0051	0.0071
218	0.0118	0.0049	0.0069
219	0.0115	0.0048	0.0067
220	0.0112	0.0047	0.0066
221	0.0110	0.0046	0.0064
222	0.0107	0.0045	0.0062
223	0.0105	0.0044	0.0061
224	0.0102	0.0043	0.0060
225	0.0100	0.0042	0.0058
226	0.0098	0.0041	0.0057
227	0.0096	0.0040	0.0056
228	0.0094	0.0039	0.0055
229	0.0092	0.0039	0.0054
230	0.0091	0.0038	0.0053
231	0.0089	0.0037	0.0052
232	0.0088	0.0036	0.0051
233	0.0086	0.0036	0.0050
234	0.0085	0.0035	0.0049
235	0.0083	0.0035	0.0049
236	0.0082	0.0034	0.0048
237	0.0081	0.0034	0.0047
238	0.0079	0.0033	0.0046
239	0.0078	0.0033	0.0046
240	0.0077	0.0032	0.0045
241	0.0076	0.0032	0.0044
242	0.0075	0.0031	0.0044
243	0.0074	0.0031	0.0043
244	0.0073	0.0030	0.0043
245	0.0072	0.0030	0.0042
246	0.0071	0.0030	0.0041
247	0.0070	0.0029	0.0041
248	0.0069	0.0029	0.0040
249	0.0068	0.0029	0.0040
250	0.0068	0.0028	0.0039
251	0.0067	0.0028	0.0039
252	0.0066	0.0028	0.0038
253	0.0065	0.0027	0.0038
254	0.0065	0.0027	0.0038
255	0.0064	0.0027	0.0037

```
      256              0.0063          0.0026              0.0037
      257              0.0062          0.0026              0.0036
      258              0.0062          0.0026              0.0036
      259              0.0061          0.0025              0.0036
      260              0.0061          0.0025              0.0035
      261              0.0060          0.0025              0.0035
      262              0.0059          0.0025              0.0035
      263              0.0059          0.0024              0.0034
      264              0.0058          0.0024              0.0034
      265              0.0058          0.0024              0.0034
      266              0.0057          0.0024              0.0033
      267              0.0057          0.0024              0.0033
      268              0.0056          0.0023              0.0033
      269              0.0056          0.0023              0.0032
      270              0.0055          0.0023              0.0032
      271              0.0055          0.0023              0.0032
      272              0.0054          0.0023              0.0032
      273              0.0054          0.0022              0.0031
      274              0.0053          0.0022              0.0031
      275              0.0053          0.0022              0.0031
      276              0.0052          0.0022              0.0030
      277              0.0052          0.0022              0.0030
      278              0.0051          0.0021              0.0030
      279              0.0051          0.0021              0.0030
      280              0.0051          0.0021              0.0030
      281              0.0050          0.0021              0.0029
      282              0.0050          0.0021              0.0029
      283              0.0049          0.0021              0.0029
      284              0.0049          0.0020              0.0029
      285              0.0049          0.0020              0.0028
      286              0.0048          0.0020              0.0028
      287              0.0048          0.0020              0.0028
      288              0.0048          0.0020              0.0028
      ------------------------------------------------------------------
--
      ------------------------------------------------------------------
--
      Total soil rain loss =      1.35(In)
      Total effective rainfall =      2.96(In)
      Peak flow rate in flood hydrograph =   1571.82(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      400.0     800.0    1200.0
1600.0

-------------------------------------------------------------------------
    0+ 5       0.0014      0.20  Q         |         |         |
|
    0+10       0.0076      0.91  Q         |         |         |
|
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0+15	0.0227	2.18	Q	|	|	|
0+20	0.0568	4.95	Q	|	|	|
0+25	0.1170	8.75	Q	|	|	|
0+30	0.1964	11.52	Q	|	|	|
0+35	0.2890	13.44	Q	|	|	|
0+40	0.3910	14.81	Q	|	|	|
0+45	0.5005	15.91	Q	|	|	|
0+50	0.6163	16.81	Q	|	|	|
0+55	0.7374	17.59	Q	|	|	|
1+ 0	0.8630	18.23	Q	|	|	|
1+ 5	0.9924	18.79	Q	|	|	|
1+10	1.1254	19.30	Q	|	|	|
1+15	1.2615	19.77	Q	|	|	|
1+20	1.4006	20.19	Q	|	|	|
1+25	1.5422	20.56	Q	|	|	|
1+30	1.6860	20.88	Q	|	|	|
1+35	1.8319	21.19	Q	|	|	|
1+40	1.9798	21.48	Q	|	|	|
1+45	2.1296	21.75	Q	|	|	|
1+50	2.2812	22.01	Q	|	|	|
1+55	2.4344	22.24	Q	|	|	|
2+ 0	2.5891	22.46	Q	|	|	|
2+ 5	2.7452	22.68	Q	|	|	|
2+10	2.9028	22.87	Q	|	|	|
2+15	3.0617	23.07	Q	|	|	|
2+20	3.2217	23.24	Q	|	|	|
2+25	3.3829	23.41	Q	|	|	|
2+30	3.5453	23.57	Q	|	|	|
2+35	3.7085	23.71	Q	|	|	|
2+40	3.8728	23.85	Q	|	|	|

2+45	4.0380	23.99	Q			
2+50	4.2042	24.14	QV			
2+55	4.3715	24.29	QV			
3+ 0	4.5398	24.44	QV			
3+ 5	4.7092	24.59	QV			
3+10	4.8796	24.74	QV			
3+15	5.0509	24.87	QV			
3+20	5.2231	25.00	QV			
3+25	5.3962	25.14	QV			
3+30	5.5702	25.27	QV			
3+35	5.7450	25.38	QV			
3+40	5.9206	25.49	QV			
3+45	6.0969	25.60	QV			
3+50	6.2740	25.72	QV			
3+55	6.4519	25.83	QV			
4+ 0	6.6306	25.95	QV			
4+ 5	6.8101	26.06	QV			
4+10	6.9904	26.18	QV			
4+15	7.1716	26.30	QV			
4+20	7.3535	26.42	QV			
4+25	7.5364	26.55	QV			
4+30	7.7200	26.67	QV			
4+35	7.9046	26.80	QV			
4+40	8.0900	26.92	QV			
4+45	8.2763	27.05	Q V			
4+50	8.4635	27.18	Q V			
4+55	8.6516	27.31	Q V			
5+ 0	8.8406	27.44	Q V			
5+ 5	9.0305	27.58	Q V			
5+10	9.2214	27.72	Q V			

5+15	9.4133	27.85	Q	V	|	|	|
5+20	9.6061	27.99	Q	V	|	|	|
5+25	9.7998	28.14	Q	V	|	|	|
5+30	9.9946	28.28	Q	V	|	|	|
5+35	10.1903	28.42	Q	V	|	|	|
5+40	10.3871	28.57	Q	V	|	|	|
5+45	10.5849	28.72	Q	V	|	|	|
5+50	10.7837	28.87	Q	V	|	|	|
5+55	10.9836	29.02	Q	V	|	|	|
6+ 0	11.1845	29.18	Q	V	|	|	|
6+ 5	11.3865	29.33	Q	V	|	|	|
6+10	11.5896	29.49	Q	V	|	|	|
6+15	11.7939	29.65	Q	V	|	|	|
6+20	11.9992	29.82	Q	V	|	|	|
6+25	12.2057	29.98	Q	V	|	|	|
6+30	12.4133	30.15	Q	V	|	|	|
6+35	12.6221	30.32	Q	V	|	|	|
6+40	12.8321	30.49	Q	V	|	|	|
6+45	13.0433	30.67	Q	V	|	|	|
6+50	13.2557	30.84	Q	V	|	|	|
6+55	13.4694	31.02	Q	V	|	|	|
7+ 0	13.6843	31.21	Q	V	|	|	|
7+ 5	13.9005	31.39	Q	V	|	|	|
7+10	14.1180	31.58	Q	V	|	|	|
7+15	14.3368	31.77	Q	V	|	|	|
7+20	14.5569	31.96	Q	V	|	|	|
7+25	14.7784	32.16	Q	V	|	|	|
7+30	15.0012	32.36	Q	V	|	|	|
7+35	15.2255	32.56	Q	V	|	|	|
7+40	15.4512	32.77	Q	V	|	|	|

7+45	15.6783	32.98	Q	V			
7+50	15.9068	33.19	Q	V			
7+55	16.1369	33.40	Q	V			
8+ 0	16.3684	33.62	Q	V			
8+ 5	16.6015	33.85	Q	V			
8+10	16.8362	34.07	Q	V			
8+15	17.0724	34.30	Q	V			
8+20	17.3103	34.54	Q	V			
8+25	17.5498	34.77	Q	V			
8+30	17.7909	35.02	Q	V			
8+35	18.0338	35.26	Q	V			
8+40	18.2783	35.51	Q	V			
8+45	18.5247	35.77	Q	V			
8+50	18.7728	36.03	Q	V			
8+55	19.0228	36.29	Q	V			
9+ 0	19.2746	36.56	Q	V			
9+ 5	19.5282	36.84	Q	V			
9+10	19.7839	37.11	Q	V			
9+15	20.0414	37.40	Q	V			
9+20	20.3010	37.69	Q	V			
9+25	20.5626	37.99	Q	V			
9+30	20.8263	38.29	Q	V			
9+35	21.0921	38.60	Q	V			
9+40	21.3601	38.91	Q	V			
9+45	21.6303	39.23	Q	V			
9+50	21.9027	39.56	Q	V			
9+55	22.1774	39.89	Q	V			
10+ 0	22.4545	40.23	|Q	V			
10+ 5	22.7339	40.58	|Q	V			
10+10	23.0158	40.93	|Q	V			

10+15	23.3003	41.30	|Q	V	|	|	|
10+20	23.5872	41.67	|Q	V	|	|	|
10+25	23.8768	42.05	|Q	V	|	|	|
10+30	24.1691	42.44	|Q	V	|	|	|
10+35	24.4641	42.83	|Q	V	|	|	|
10+40	24.7619	43.24	|Q	V	|	|	|
10+45	25.0626	43.66	|Q	V	|	|	|
10+50	25.3662	44.08	|Q	V	|	|	|
10+55	25.6728	44.52	|Q	V	|	|	|
11+ 0	25.9825	44.97	|Q	V	|	|	|
11+ 5	26.2954	45.43	|Q	V	|	|	|
11+10	26.6115	45.90	|Q	V	|	|	|
11+15	26.9309	46.38	|Q	V	|	|	|
11+20	27.2538	46.88	|Q	V	|	|	|
11+25	27.5802	47.39	|Q	V	|	|	|
11+30	27.9101	47.91	|Q	V	|	|	|
11+35	28.2438	48.45	|Q	V	|	|	|
11+40	28.5813	49.00	|Q	V	|	|	|
11+45	28.9227	49.57	|Q	V	|	|	|
11+50	29.2682	50.16	|Q	V	|	|	|
11+55	29.6178	50.76	|Q	V	|	|	|
12+ 0	29.9717	51.39	|Q	V	|	|	|
12+ 5	30.3291	51.89	|Q	V	|	|	|
12+10	30.6876	52.06	|Q	V	|	|	|
12+15	31.0448	51.86	|Q	V	|	|	|
12+20	31.3937	50.65	|Q	V	|	|	|
12+25	31.7294	48.75	|Q	V	|	|	|
12+30	32.0570	47.56	|Q	V	|	|	|
12+35	32.3804	46.97	|Q	V	|	|	|
12+40	32.7026	46.77	|Q	V	|	|	|

12+45	33.0248	46.79	|Q V |	|	|
12+50	33.3482	46.96	|Q V |	|	|
12+55	33.6737	47.25	|Q V |	|	|
13+ 0	34.0019	47.66	|Q V |	|	|
13+ 5	34.3335	48.15	|Q V |	|	|
13+10	34.6690	48.72	|Q V |	|	|
13+15	35.0088	49.35	|Q V |	|	|
13+20	35.3535	50.05	|Q V |	|	|
13+25	35.7036	50.83	|Q V |	|	|
13+30	36.0596	51.69	|Q V |	|	|
13+35	36.4219	52.61	|Q V |	|	|
13+40	36.7910	53.59	|Q V |	|	|
13+45	37.1674	54.65	|Q V|	|	|
13+50	37.5516	55.78	|Q V|	|	|
13+55	37.9441	57.00	|Q V|	|	|
14+ 0	38.3456	58.29	|Q V|	|	|
14+ 5	38.7571	59.75	|Q V|	|	|
14+10	39.1804	61.46	|Q V|	|	|
14+15	39.6175	63.47	|Q V|	|	|
14+20	40.0725	66.07	|Q V|	|	|
14+25	40.5487	69.14	|Q V|	|	|
14+30	41.0449	72.05	|Q V	|	|
14+35	41.5607	74.89	|Q V	|	|
14+40	42.0961	77.75	|Q V	|	|
14+45	42.6522	80.74	| Q V	|	|
14+50	43.2300	83.90	| Q V	|	|
14+55	43.8313	87.31	| Q V	|	|
15+ 0	44.4578	90.98	| Q V	|	|
15+ 5	45.1122	95.01	| Q |V	|	|
15+10	45.7971	99.45	| Q |V	|	|

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   15+15      46.5164     104.44 | Q       |V        |         |
|
   15+20      47.2741     110.02 | Q       |V        |         |
|
   15+25      48.0778     116.69 | Q       |V        |         |
|
   15+30      48.9390     125.04 |  Q      |V        |         |
|
   15+35      49.8729     135.60 |  Q      | V       |         |
|
   15+40      50.9067     150.11 |  Q      | V       |         |
|
   15+45      52.0712     169.09 |   Q     | V       |         |
|
   15+50      53.3914     191.70 |   Q     |  V      |         |
|
   15+55      54.9248     222.65 |    Q    |  V      |         |
|
   16+ 0      56.8077     273.40 |     Q   |  V      |         |
|
   16+ 5      59.5633     400.11 |         Q   V     |         |
|
   16+10      63.8637     624.41 |         |    Q    |         |
|
   16+15      69.9692     886.52 |         |      V  | Q       |
|
   16+20      79.1657    1335.34 |         |        V|         |  Q
|
   16+25      89.9909    1571.82 |         |         | V       |
Q|
   16+30      98.5076    1236.62 |         |         |   V     Q
|
   16+35     104.9334     933.03 |         |         |  Q V    |
|
   16+40     109.8983     720.89 |         |       Q |     V   |
|
   16+45     114.0225     598.84 |         |   Q     |      V  |
|
   16+50     117.5103     506.43 |         | Q       |       V |
|
   16+55     120.5400     439.91 |         Q         |        V|
|
   17+ 0     123.1617     380.67 |        Q|         |         V
|
   17+ 5     125.4897     338.02 |       Q |         |         V
|
   17+10     127.5906     305.05 |      Q  |         |         |V
|
   17+15     129.5084     278.47 |     Q   |         |         |V
|
   17+20     131.2299     249.96 |     Q   |         |         | V
|
   17+25     132.7536     221.24 |    Q    |         |         | V
|
   17+30     134.1257     199.22 |   Q     |         |         | V
|
   17+35     135.4058     185.87 |   Q     |         |         |  V
|
   17+40     136.5834     170.99 |   Q     |         |         |  V
|
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17+45	137.6796	159.18	| Q	|	|	| V	|
17+50	138.6933	147.18	| Q	|	|	| V	|
17+55	139.6126	133.48	| Q	|	|	| V	|
18+ 0	140.4878	127.07	| Q	|	|	| V	|
18+ 5	141.2934	116.98	| Q	|	|	| V	|
18+10	142.0426	108.79	| Q	|	|	| V	|
18+15	142.7583	103.91	| Q	|	|	| V	|
18+20	143.4127	95.03	| Q	|	|	| V	|
18+25	144.0454	91.86	| Q	|	|	| V	|
18+30	144.6464	87.28	| Q	|	|	| V	|
18+35	145.1945	79.58	|Q	|	|	| V	|
18+40	145.7311	77.90	|Q	|	|	| V	|
18+45	146.2680	77.96	|Q	|	|	| V	|
18+50	146.8021	77.55	|Q	|	|	| V	|
18+55	147.3260	76.08	|Q	|	|	| V	|
19+ 0	147.8382	74.36	|Q	|	|	| V	|
19+ 5	148.3353	72.18	|Q	|	|	| V	|
19+10	148.8029	67.90	|Q	|	|	| V	|
19+15	149.2276	61.67	|Q	|	|	| V	|
19+20	149.6385	59.65	|Q	|	|	| V	|
19+25	150.0352	57.60	|Q	|	|	| V	|
19+30	150.4136	54.94	|Q	|	|	| V	|
19+35	150.7344	46.58	|Q	|	|	| V	|
19+40	151.0450	45.10	|Q	|	|	| V	|
19+45	151.3481	44.01	|Q	|	|	| V	|
19+50	151.6445	43.05	|Q	|	|	| V	|
19+55	151.9352	42.20	|Q	|	|	| V	|
20+ 0	152.2204	41.41	|Q	|	|	| V	|
20+ 5	152.5005	40.67	|Q	|	|	| V	|
20+10	152.7757	39.97	Q	|	|	| V	|

20+15	153.0464	39.31	Q				V
20+20	153.3127	38.67	Q				V
20+25	153.5748	38.05	Q				V
20+30	153.8328	37.46	Q				V
20+35	154.0869	36.89	Q				V
20+40	154.3372	36.35	Q				V
20+45	154.5840	35.83	Q				V
20+50	154.8273	35.33	Q				V
20+55	155.0674	34.86	Q				V
21+ 0	155.3043	34.40	Q				V
21+ 5	155.5382	33.96	Q				V
21+10	155.7691	33.53	Q				V
21+15	155.9970	33.10	Q				V
21+20	156.2222	32.69	Q				V
21+25	156.4446	32.29	Q				V
21+30	156.6643	31.91	Q				V
21+35	156.8814	31.52	Q				V
21+40	157.0958	31.14	Q				V
21+45	157.3077	30.77	Q				V
21+50	157.5172	30.42	Q				V
21+55	157.7243	30.07	Q				V
22+ 0	157.9291	29.73	Q				V
22+ 5	158.1316	29.41	Q				V
22+10	158.3319	29.09	Q				V
22+15	158.5302	28.78	Q				V
22+20	158.7263	28.48	Q				V
22+25	158.9204	28.19	Q				V
22+30	159.1126	27.90	Q				V
22+35	159.3028	27.62	Q				V
22+40	159.4911	27.35	Q				V

```
   22+45     159.6777     27.08  Q         |         |         |
V|
   22+50     159.8624     26.83  Q         |         |         |
V|
   22+55     160.0454     26.57  Q         |         |         |
V|
   23+ 0     160.2268     26.33  Q         |         |         |
V|
   23+ 5     160.4064     26.09  Q         |         |         |
V|
   23+10     160.5844     25.85  Q         |         |         |
V|
   23+15     160.7609     25.62  Q         |         |         |
V|
   23+20     160.9358     25.39  Q         |         |         |
V|
   23+25     161.1091     25.17  Q         |         |         |
V|
   23+30     161.2810     24.96  Q         |         |         |
V|
   23+35     161.4515     24.75  Q         |         |         |
V|
   23+40     161.6205     24.54  Q         |         |         |
V|
   23+45     161.7881     24.34  Q         |         |         |
V|
   23+50     161.9543     24.14  Q         |         |         |
V|
   23+55     162.1192     23.94  Q         |         |         |
V|
   24+ 0     162.2828     23.75  Q         |         |         |
V|
------------------------------------------------------------------------
```

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

Study date 06/04/15

++

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

Program License Serial Number 6230

Joshua Tree Solar
Preliminary Hydrology Study Addendum
Proposed Conditions, 100-year Storm

Storm Event Year = 100

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 100		
663.00	1	1.85
Rainfall data for year 100		
663.00	6	2.79
Rainfall data for year 100		
663.00	24	4.32

++

```
      ******** 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)
       82.0      82.0        663.00      1.000     0.335    0.977
0.328

      Area-averaged adjusted loss rate Fm (In/Hr) =  0.328

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

      Area       Area          SCS CN    SCS CN      S     Pervious
       (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
         647.75   0.977         82.0      82.0       2.20     0.574
          15.25   0.023         98.0      98.0       0.20     0.945

      Area-averaged catchment yield fraction, Y =  0.582
      Area-averaged low loss fraction, Yb =  0.418
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++
      Watercourse length =   13006.00(Ft.)
      Length from concentration point to centroid =    5383.00(Ft.)
      Elevation difference along watercourse =     200.00(Ft.)
      Mannings friction factor along watercourse =  0.030
      Watershed area =     663.00(Ac.)
      Catchment Lag time =   0.443 hours
      Unit interval =   5.000 minutes
      Unit interval percentage of lag time = 18.8076
      Hydrograph baseflow =     0.00(CFS)
      Average maximum watershed loss rate(Fm) =  0.328(In/Hr)
      Average low loss rate fraction (Yb) = 0.418 (decimal)
      DESERT S-Graph Selected
      Computed peak 5-minute rainfall =  0.878(In)
      Computed peak 30-minute rainfall =  1.503(In)
      Specified peak 1-hour rainfall =  1.850(In)
      Computed peak 3-hour rainfall =  2.380(In)
      Specified peak 6-hour rainfall =  2.790(In)
      Specified peak 24-hour rainfall =  4.320(In)


      Rainfall depth area reduction factors:
      Using a total area of     663.00(Ac.) (Ref: fig. E-4)

      5-minute factor = 0.969     Adjusted rainfall =  0.851(In)
      30-minute factor = 0.969    Adjusted rainfall =  1.456(In)
      1-hour factor = 0.969       Adjusted rainfall =  1.793(In)
      3-hour factor = 0.996       Adjusted rainfall =  2.371(In)
      6-hour factor = 0.998       Adjusted rainfall =  2.784(In)
      24-hour factor = 0.999      Adjusted rainfall =  4.316(In)
      ----------------------------------------------------------------
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                      U n i t  H y d r o g r a p h
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Interval          'S' Graph          Unit Hydrograph
      Number            Mean values             ((CFS))
```

(K = 8018.16 (CFS))

1	0.912	73.138
2	4.078	253.843
3	9.832	461.345
4	22.283	998.374
5	39.301	1364.544
6	51.676	992.207
7	60.159	680.192
8	66.095	475.978
9	70.819	378.738
10	74.625	305.210
11	77.831	257.061
12	80.450	209.946
13	82.690	179.657
14	84.665	158.337
15	86.459	143.818
16	88.021	125.269
17	89.320	104.120
18	90.428	88.919
19	91.473	83.766
20	92.404	74.615
21	93.264	69.011
22	94.042	62.313
23	94.688	51.814
24	95.327	51.240
25	95.880	44.387
26	96.369	39.209
27	96.845	38.170
28	97.210	29.209
29	97.548	27.144
30	97.844	23.692
31	98.036	15.438
32	98.225	15.095
33	98.435	16.869
34	98.661	18.096
35	98.886	18.096
36	99.112	18.096
37	99.338	18.096
38	99.530	15.452
39	99.651	9.633
40	99.768	9.425
41	99.886	9.425
42	100.000	9.167

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.8506	0.8506
2	1.0472	0.1966
3	1.1826	0.1354
4	1.2892	0.1066
5	1.3785	0.0893
6	1.4560	0.0775
7	1.5249	0.0689
8	1.5872	0.0623
9	1.6443	0.0571
10	1.6971	0.0528

11	1.7463	0.0492
12	1.7925	0.0462
13	1.8294	0.0369
14	1.8642	0.0348
15	1.8972	0.0330
16	1.9286	0.0314
17	1.9586	0.0300
18	1.9873	0.0287
19	2.0148	0.0275
20	2.0413	0.0265
21	2.0668	0.0255
22	2.0914	0.0246
23	2.1152	0.0238
24	2.1382	0.0230
25	2.1606	0.0223
26	2.1822	0.0217
27	2.2033	0.0211
28	2.2238	0.0205
29	2.2437	0.0199
30	2.2632	0.0194
31	2.2821	0.0190
32	2.3006	0.0185
33	2.3187	0.0181
34	2.3364	0.0177
35	2.3537	0.0173
36	2.3706	0.0169
37	2.3857	0.0151
38	2.4006	0.0148
39	2.4151	0.0145
40	2.4293	0.0142
41	2.4432	0.0140
42	2.4569	0.0137
43	2.4704	0.0134
44	2.4836	0.0132
45	2.4966	0.0130
46	2.5094	0.0128
47	2.5219	0.0126
48	2.5343	0.0123
49	2.5464	0.0122
50	2.5584	0.0120
51	2.5701	0.0118
52	2.5818	0.0116
53	2.5932	0.0114
54	2.6045	0.0113
55	2.6156	0.0111
56	2.6265	0.0110
57	2.6373	0.0108
58	2.6480	0.0107
59	2.6585	0.0105
60	2.6689	0.0104
61	2.6792	0.0103
62	2.6893	0.0101
63	2.6993	0.0100
64	2.7092	0.0099
65	2.7189	0.0098
66	2.7286	0.0096
67	2.7381	0.0095
68	2.7475	0.0094
69	2.7569	0.0093
70	2.7661	0.0092

71	2.7752	0.0091
72	2.7842	0.0090
73	2.7964	0.0122
74	2.8085	0.0121
75	2.8204	0.0119
76	2.8322	0.0118
77	2.8440	0.0117
78	2.8556	0.0116
79	2.8671	0.0115
80	2.8786	0.0114
81	2.8899	0.0113
82	2.9011	0.0112
83	2.9123	0.0111
84	2.9233	0.0111
85	2.9343	0.0110
86	2.9452	0.0109
87	2.9560	0.0108
88	2.9667	0.0107
89	2.9773	0.0106
90	2.9878	0.0105
91	2.9983	0.0105
92	3.0087	0.0104
93	3.0190	0.0103
94	3.0292	0.0102
95	3.0394	0.0102
96	3.0494	0.0101
97	3.0594	0.0100
98	3.0694	0.0099
99	3.0793	0.0099
100	3.0891	0.0098
101	3.0988	0.0097
102	3.1085	0.0097
103	3.1181	0.0096
104	3.1276	0.0095
105	3.1371	0.0095
106	3.1465	0.0094
107	3.1559	0.0094
108	3.1652	0.0093
109	3.1744	0.0092
110	3.1836	0.0092
111	3.1927	0.0091
112	3.2018	0.0091
113	3.2108	0.0090
114	3.2198	0.0090
115	3.2287	0.0089
116	3.2375	0.0089
117	3.2463	0.0088
118	3.2551	0.0088
119	3.2638	0.0087
120	3.2724	0.0086
121	3.2810	0.0086
122	3.2896	0.0086
123	3.2981	0.0085
124	3.3065	0.0085
125	3.3150	0.0084
126	3.3233	0.0084
127	3.3316	0.0083
128	3.3399	0.0083
129	3.3481	0.0082
130	3.3563	0.0082

131	3.3645	0.0081
132	3.3726	0.0081
133	3.3806	0.0081
134	3.3887	0.0080
135	3.3966	0.0080
136	3.4046	0.0079
137	3.4125	0.0079
138	3.4203	0.0079
139	3.4281	0.0078
140	3.4359	0.0078
141	3.4437	0.0077
142	3.4514	0.0077
143	3.4590	0.0077
144	3.4667	0.0076
145	3.4743	0.0076
146	3.4818	0.0076
147	3.4894	0.0075
148	3.4969	0.0075
149	3.5043	0.0075
150	3.5117	0.0074
151	3.5191	0.0074
152	3.5265	0.0074
153	3.5338	0.0073
154	3.5411	0.0073
155	3.5483	0.0073
156	3.5556	0.0072
157	3.5628	0.0072
158	3.5699	0.0072
159	3.5770	0.0071
160	3.5841	0.0071
161	3.5912	0.0071
162	3.5983	0.0070
163	3.6053	0.0070
164	3.6122	0.0070
165	3.6192	0.0070
166	3.6261	0.0069
167	3.6330	0.0069
168	3.6399	0.0069
169	3.6467	0.0068
170	3.6535	0.0068
171	3.6603	0.0068
172	3.6671	0.0068
173	3.6738	0.0067
174	3.6805	0.0067
175	3.6872	0.0067
176	3.6938	0.0067
177	3.7005	0.0066
178	3.7071	0.0066
179	3.7136	0.0066
180	3.7202	0.0065
181	3.7267	0.0065
182	3.7332	0.0065
183	3.7397	0.0065
184	3.7461	0.0065
185	3.7526	0.0064
186	3.7590	0.0064
187	3.7653	0.0064
188	3.7717	0.0064
189	3.7780	0.0063
190	3.7843	0.0063

191	3.7906	0.0063
192	3.7969	0.0063
193	3.8031	0.0062
194	3.8094	0.0062
195	3.8156	0.0062
196	3.8217	0.0062
197	3.8279	0.0062
198	3.8340	0.0061
199	3.8401	0.0061
200	3.8462	0.0061
201	3.8523	0.0061
202	3.8584	0.0061
203	3.8644	0.0060
204	3.8704	0.0060
205	3.8764	0.0060
206	3.8824	0.0060
207	3.8883	0.0060
208	3.8943	0.0059
209	3.9002	0.0059
210	3.9061	0.0059
211	3.9119	0.0059
212	3.9178	0.0059
213	3.9236	0.0058
214	3.9294	0.0058
215	3.9352	0.0058
216	3.9410	0.0058
217	3.9468	0.0058
218	3.9525	0.0057
219	3.9582	0.0057
220	3.9640	0.0057
221	3.9696	0.0057
222	3.9753	0.0057
223	3.9810	0.0057
224	3.9866	0.0056
225	3.9922	0.0056
226	3.9978	0.0056
227	4.0034	0.0056
228	4.0090	0.0056
229	4.0145	0.0056
230	4.0201	0.0055
231	4.0256	0.0055
232	4.0311	0.0055
233	4.0366	0.0055
234	4.0421	0.0055
235	4.0475	0.0055
236	4.0530	0.0054
237	4.0584	0.0054
238	4.0638	0.0054
239	4.0692	0.0054
240	4.0746	0.0054
241	4.0799	0.0054
242	4.0853	0.0053
243	4.0906	0.0053
244	4.0959	0.0053
245	4.1012	0.0053
246	4.1065	0.0053
247	4.1118	0.0053
248	4.1170	0.0053
249	4.1223	0.0052
250	4.1275	0.0052

251	4.1327	0.0052
252	4.1379	0.0052
253	4.1431	0.0052
254	4.1483	0.0052
255	4.1534	0.0052
256	4.1586	0.0051
257	4.1637	0.0051
258	4.1688	0.0051
259	4.1739	0.0051
260	4.1790	0.0051
261	4.1841	0.0051
262	4.1892	0.0051
263	4.1942	0.0051
264	4.1993	0.0050
265	4.2043	0.0050
266	4.2093	0.0050
267	4.2143	0.0050
268	4.2193	0.0050
269	4.2242	0.0050
270	4.2292	0.0050
271	4.2342	0.0049
272	4.2391	0.0049
273	4.2440	0.0049
274	4.2489	0.0049
275	4.2538	0.0049
276	4.2587	0.0049
277	4.2636	0.0049
278	4.2684	0.0049
279	4.2733	0.0049
280	4.2781	0.0048
281	4.2830	0.0048
282	4.2878	0.0048
283	4.2926	0.0048
284	4.2974	0.0048
285	4.3021	0.0048
286	4.3069	0.0048
287	4.3117	0.0048
288	4.3164	0.0047

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0047	0.0020	0.0028
2	0.0048	0.0020	0.0028
3	0.0048	0.0020	0.0028
4	0.0048	0.0020	0.0028
5	0.0048	0.0020	0.0028
6	0.0048	0.0020	0.0028
7	0.0049	0.0020	0.0028
8	0.0049	0.0020	0.0028
9	0.0049	0.0020	0.0028
10	0.0049	0.0020	0.0029
11	0.0049	0.0021	0.0029
12	0.0049	0.0021	0.0029
13	0.0050	0.0021	0.0029
14	0.0050	0.0021	0.0029
15	0.0050	0.0021	0.0029

16	0.0050	0.0021	0.0029
17	0.0050	0.0021	0.0029
18	0.0051	0.0021	0.0029
19	0.0051	0.0021	0.0030
20	0.0051	0.0021	0.0030
21	0.0051	0.0021	0.0030
22	0.0051	0.0021	0.0030
23	0.0052	0.0022	0.0030
24	0.0052	0.0022	0.0030
25	0.0052	0.0022	0.0030
26	0.0052	0.0022	0.0030
27	0.0052	0.0022	0.0031
28	0.0053	0.0022	0.0031
29	0.0053	0.0022	0.0031
30	0.0053	0.0022	0.0031
31	0.0053	0.0022	0.0031
32	0.0053	0.0022	0.0031
33	0.0054	0.0022	0.0031
34	0.0054	0.0023	0.0031
35	0.0054	0.0023	0.0032
36	0.0054	0.0023	0.0032
37	0.0055	0.0023	0.0032
38	0.0055	0.0023	0.0032
39	0.0055	0.0023	0.0032
40	0.0055	0.0023	0.0032
41	0.0056	0.0023	0.0032
42	0.0056	0.0023	0.0033
43	0.0056	0.0023	0.0033
44	0.0056	0.0024	0.0033
45	0.0057	0.0024	0.0033
46	0.0057	0.0024	0.0033
47	0.0057	0.0024	0.0033
48	0.0057	0.0024	0.0033
49	0.0058	0.0024	0.0034
50	0.0058	0.0024	0.0034
51	0.0058	0.0024	0.0034
52	0.0059	0.0024	0.0034
53	0.0059	0.0025	0.0034
54	0.0059	0.0025	0.0034
55	0.0060	0.0025	0.0035
56	0.0060	0.0025	0.0035
57	0.0060	0.0025	0.0035
58	0.0060	0.0025	0.0035
59	0.0061	0.0025	0.0035
60	0.0061	0.0025	0.0035
61	0.0061	0.0026	0.0036
62	0.0062	0.0026	0.0036
63	0.0062	0.0026	0.0036
64	0.0062	0.0026	0.0036
65	0.0063	0.0026	0.0036
66	0.0063	0.0026	0.0037
67	0.0063	0.0026	0.0037
68	0.0064	0.0027	0.0037
69	0.0064	0.0027	0.0037
70	0.0064	0.0027	0.0037
71	0.0065	0.0027	0.0038
72	0.0065	0.0027	0.0038
73	0.0065	0.0027	0.0038
74	0.0066	0.0027	0.0038
75	0.0066	0.0028	0.0039

76	0.0067	0.0028	0.0039
77	0.0067	0.0028	0.0039
78	0.0067	0.0028	0.0039
79	0.0068	0.0028	0.0040
80	0.0068	0.0028	0.0040
81	0.0069	0.0029	0.0040
82	0.0069	0.0029	0.0040
83	0.0070	0.0029	0.0040
84	0.0070	0.0029	0.0041
85	0.0070	0.0029	0.0041
86	0.0071	0.0030	0.0041
87	0.0071	0.0030	0.0042
88	0.0072	0.0030	0.0042
89	0.0072	0.0030	0.0042
90	0.0073	0.0030	0.0042
91	0.0073	0.0031	0.0043
92	0.0074	0.0031	0.0043
93	0.0074	0.0031	0.0043
94	0.0075	0.0031	0.0043
95	0.0075	0.0031	0.0044
96	0.0076	0.0032	0.0044
97	0.0076	0.0032	0.0044
98	0.0077	0.0032	0.0045
99	0.0077	0.0032	0.0045
100	0.0078	0.0032	0.0045
101	0.0079	0.0033	0.0046
102	0.0079	0.0033	0.0046
103	0.0080	0.0033	0.0046
104	0.0080	0.0033	0.0047
105	0.0081	0.0034	0.0047
106	0.0081	0.0034	0.0047
107	0.0082	0.0034	0.0048
108	0.0083	0.0035	0.0048
109	0.0084	0.0035	0.0049
110	0.0084	0.0035	0.0049
111	0.0085	0.0036	0.0050
112	0.0086	0.0036	0.0050
113	0.0086	0.0036	0.0050
114	0.0087	0.0036	0.0051
115	0.0088	0.0037	0.0051
116	0.0089	0.0037	0.0052
117	0.0090	0.0037	0.0052
118	0.0090	0.0038	0.0052
119	0.0091	0.0038	0.0053
120	0.0092	0.0038	0.0053
121	0.0093	0.0039	0.0054
122	0.0094	0.0039	0.0055
123	0.0095	0.0040	0.0055
124	0.0095	0.0040	0.0056
125	0.0097	0.0040	0.0056
126	0.0097	0.0041	0.0057
127	0.0099	0.0041	0.0057
128	0.0099	0.0042	0.0058
129	0.0101	0.0042	0.0059
130	0.0102	0.0042	0.0059
131	0.0103	0.0043	0.0060
132	0.0104	0.0043	0.0060
133	0.0105	0.0044	0.0061
134	0.0106	0.0044	0.0062
135	0.0108	0.0045	0.0063

136	0.0109	0.0045	0.0063
137	0.0111	0.0046	0.0064
138	0.0111	0.0047	0.0065
139	0.0113	0.0047	0.0066
140	0.0114	0.0048	0.0067
141	0.0116	0.0049	0.0068
142	0.0117	0.0049	0.0068
143	0.0119	0.0050	0.0070
144	0.0121	0.0050	0.0070
145	0.0090	0.0038	0.0053
146	0.0091	0.0038	0.0053
147	0.0093	0.0039	0.0054
148	0.0094	0.0039	0.0055
149	0.0096	0.0040	0.0056
150	0.0098	0.0041	0.0057
151	0.0100	0.0042	0.0058
152	0.0101	0.0042	0.0059
153	0.0104	0.0043	0.0060
154	0.0105	0.0044	0.0061
155	0.0108	0.0045	0.0063
156	0.0110	0.0046	0.0064
157	0.0113	0.0047	0.0066
158	0.0114	0.0048	0.0067
159	0.0118	0.0049	0.0069
160	0.0120	0.0050	0.0070
161	0.0123	0.0052	0.0072
162	0.0126	0.0052	0.0073
163	0.0130	0.0054	0.0076
164	0.0132	0.0055	0.0077
165	0.0137	0.0057	0.0080
166	0.0140	0.0058	0.0081
167	0.0145	0.0061	0.0085
168	0.0148	0.0062	0.0086
169	0.0169	0.0071	0.0099
170	0.0173	0.0072	0.0101
171	0.0181	0.0076	0.0105
172	0.0185	0.0077	0.0108
173	0.0194	0.0081	0.0113
174	0.0199	0.0083	0.0116
175	0.0211	0.0088	0.0123
176	0.0217	0.0091	0.0126
177	0.0230	0.0096	0.0134
178	0.0238	0.0099	0.0139
179	0.0255	0.0106	0.0149
180	0.0265	0.0111	0.0154
181	0.0287	0.0120	0.0167
182	0.0300	0.0125	0.0175
183	0.0330	0.0138	0.0192
184	0.0348	0.0145	0.0203
185	0.0462	0.0193	0.0269
186	0.0492	0.0206	0.0287
187	0.0571	0.0238	0.0332
188	0.0623	0.0260	0.0363
189	0.0775	0.0273	0.0502
190	0.0893	0.0273	0.0619
191	0.1354	0.0273	0.1081
192	0.1966	0.0273	0.1693
193	0.8506	0.0273	0.8232
194	0.1066	0.0273	0.0793
195	0.0689	0.0273	0.0416

196	0.0528	0.0221	0.0308
197	0.0369	0.0154	0.0215
198	0.0314	0.0131	0.0183
199	0.0275	0.0115	0.0160
200	0.0246	0.0103	0.0143
201	0.0223	0.0093	0.0130
202	0.0205	0.0086	0.0119
203	0.0190	0.0079	0.0110
204	0.0177	0.0074	0.0103
205	0.0151	0.0063	0.0088
206	0.0142	0.0059	0.0083
207	0.0134	0.0056	0.0078
208	0.0128	0.0053	0.0074
209	0.0122	0.0051	0.0071
210	0.0116	0.0048	0.0068
211	0.0111	0.0046	0.0065
212	0.0107	0.0045	0.0062
213	0.0103	0.0043	0.0060
214	0.0099	0.0041	0.0058
215	0.0095	0.0040	0.0056
216	0.0092	0.0038	0.0054
217	0.0122	0.0051	0.0071
218	0.0118	0.0049	0.0069
219	0.0115	0.0048	0.0067
220	0.0112	0.0047	0.0065
221	0.0110	0.0046	0.0064
222	0.0107	0.0045	0.0062
223	0.0105	0.0044	0.0061
224	0.0102	0.0043	0.0060
225	0.0100	0.0042	0.0058
226	0.0098	0.0041	0.0057
227	0.0096	0.0040	0.0056
228	0.0094	0.0039	0.0055
229	0.0092	0.0039	0.0054
230	0.0091	0.0038	0.0053
231	0.0089	0.0037	0.0052
232	0.0088	0.0037	0.0051
233	0.0086	0.0036	0.0050
234	0.0085	0.0035	0.0049
235	0.0083	0.0035	0.0048
236	0.0082	0.0034	0.0048
237	0.0081	0.0034	0.0047
238	0.0079	0.0033	0.0046
239	0.0078	0.0033	0.0046
240	0.0077	0.0032	0.0045
241	0.0076	0.0032	0.0044
242	0.0075	0.0031	0.0044
243	0.0074	0.0031	0.0043
244	0.0073	0.0030	0.0042
245	0.0072	0.0030	0.0042
246	0.0071	0.0030	0.0041
247	0.0070	0.0029	0.0041
248	0.0069	0.0029	0.0040
249	0.0068	0.0029	0.0040
250	0.0068	0.0028	0.0039
251	0.0067	0.0028	0.0039
252	0.0066	0.0028	0.0038
253	0.0065	0.0027	0.0038
254	0.0065	0.0027	0.0038
255	0.0064	0.0027	0.0037

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      256              0.0063          0.0026              0.0037
      257              0.0062          0.0026              0.0036
      258              0.0062          0.0026              0.0036
      259              0.0061          0.0026              0.0036
      260              0.0061          0.0025              0.0035
      261              0.0060          0.0025              0.0035
      262              0.0059          0.0025              0.0035
      263              0.0059          0.0025              0.0034
      264              0.0058          0.0024              0.0034
      265              0.0058          0.0024              0.0034
      266              0.0057          0.0024              0.0033
      267              0.0057          0.0024              0.0033
      268              0.0056          0.0023              0.0033
      269              0.0056          0.0023              0.0032
      270              0.0055          0.0023              0.0032
      271              0.0055          0.0023              0.0032
      272              0.0054          0.0023              0.0031
      273              0.0054          0.0022              0.0031
      274              0.0053          0.0022              0.0031
      275              0.0053          0.0022              0.0031
      276              0.0052          0.0022              0.0030
      277              0.0052          0.0022              0.0030
      278              0.0051          0.0021              0.0030
      279              0.0051          0.0021              0.0030
      280              0.0051          0.0021              0.0029
      281              0.0050          0.0021              0.0029
      282              0.0050          0.0021              0.0029
      283              0.0049          0.0021              0.0029
      284              0.0049          0.0021              0.0029
      285              0.0049          0.0020              0.0028
      286              0.0048          0.0020              0.0028
      287              0.0048          0.0020              0.0028
      288              0.0048          0.0020              0.0028
      ------------------------------------------------------------------
--
      ------------------------------------------------------------------
--
      Total soil rain loss =      1.36(In)
      Total effective rainfall =      2.96(In)
      Peak flow rate in flood hydrograph =   1571.44(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      400.0     800.0    1200.0
1600.0

-------------------------------------------------------------------------
    0+ 5       0.0014      0.20  Q         |         |         |
|
    0+10       0.0076      0.90  Q         |         |         |
|
```

0+15	0.0226	2.18	Q			
0+20	0.0567	4.95	Q			
0+25	0.1169	8.74	Q			
0+30	0.1961	11.51	Q			
0+35	0.2886	13.43	Q			
0+40	0.3905	14.79	Q			
0+45	0.4999	15.89	Q			
0+50	0.6155	16.79	Q			
0+55	0.7365	17.56	Q			
1+ 0	0.8619	18.21	Q			
1+ 5	0.9912	18.77	Q			
1+10	1.1239	19.28	Q			
1+15	1.2599	19.75	Q			
1+20	1.3988	20.17	Q			
1+25	1.5402	20.53	Q			
1+30	1.6838	20.85	Q			
1+35	1.8296	21.16	Q			
1+40	1.9773	21.45	Q			
1+45	2.1269	21.72	Q			
1+50	2.2783	21.98	Q			
1+55	2.4313	22.21	Q			
2+ 0	2.5858	22.44	Q			
2+ 5	2.7417	22.65	Q			
2+10	2.8991	22.84	Q			
2+15	3.0577	23.04	Q			
2+20	3.2176	23.21	Q			
2+25	3.3786	23.38	Q			
2+30	3.5408	23.54	Q			
2+35	3.7038	23.68	Q			
2+40	3.8678	23.82	Q			

2+45	4.0329	23.96	Q	|	|	|
2+50	4.1989	24.11	QV	|	|	|
2+55	4.3660	24.26	QV	|	|	|
3+ 0	4.5341	24.41	QV	|	|	|
3+ 5	4.7032	24.56	QV	|	|	|
3+10	4.8734	24.71	QV	|	|	|
3+15	5.0444	24.84	QV	|	|	|
3+20	5.2164	24.97	QV	|	|	|
3+25	5.3893	25.10	QV	|	|	|
3+30	5.5631	25.24	QV	|	|	|
3+35	5.7377	25.35	QV	|	|	|
3+40	5.9130	25.46	QV	|	|	|
3+45	6.0891	25.57	QV	|	|	|
3+50	6.2660	25.68	QV	|	|	|
3+55	6.4437	25.80	QV	|	|	|
4+ 0	6.6222	25.91	QV	|	|	|
4+ 5	6.8014	26.03	QV	|	|	|
4+10	6.9815	26.15	QV	|	|	|
4+15	7.1624	26.27	QV	|	|	|
4+20	7.3442	26.39	QV	|	|	|
4+25	7.5268	26.51	QV	|	|	|
4+30	7.7102	26.64	QV	|	|	|
4+35	7.8945	26.76	QV	|	|	|
4+40	8.0797	26.89	QV	|	|	|
4+45	8.2658	27.02	Q V	|	|	|
4+50	8.4527	27.15	Q V	|	|	|
4+55	8.6406	27.28	Q V	|	|	|
5+ 0	8.8293	27.41	Q V	|	|	|
5+ 5	9.0190	27.54	Q V	|	|	|
5+10	9.2097	27.68	Q V	|	|	|

5+15	9.4013	27.82	Q V	|	|	|
5+20	9.5938	27.96	Q V	|	|	|
5+25	9.7873	28.10	Q V	|	|	|
5+30	9.9818	28.24	Q V	|	|	|
5+35	10.1773	28.39	Q V	|	|	|
5+40	10.3738	28.53	Q V	|	|	|
5+45	10.5714	28.68	Q V	|	|	|
5+50	10.7699	28.83	Q V	|	|	|
5+55	10.9696	28.99	Q V	|	|	|
6+ 0	11.1703	29.14	Q V	|	|	|
6+ 5	11.3720	29.30	Q V	|	|	|
6+10	11.5749	29.45	Q V	|	|	|
6+15	11.7788	29.62	Q V	|	|	|
6+20	11.9839	29.78	Q V	|	|	|
6+25	12.1901	29.94	Q V	|	|	|
6+30	12.3975	30.11	Q V	|	|	|
6+35	12.6060	30.28	Q V	|	|	|
6+40	12.8158	30.45	Q V	|	|	|
6+45	13.0267	30.63	Q V	|	|	|
6+50	13.2388	30.80	Q V	|	|	|
6+55	13.4522	30.98	Q V	|	|	|
7+ 0	13.6669	31.17	Q V	|	|	|
7+ 5	13.8828	31.35	Q V	|	|	|
7+10	14.1000	31.54	Q V	|	|	|
7+15	14.3185	31.73	Q V	|	|	|
7+20	14.5383	31.92	Q V	|	|	|
7+25	14.7595	32.12	Q V	|	|	|
7+30	14.9821	32.32	Q V	|	|	|
7+35	15.2061	32.52	Q V	|	|	|
7+40	15.4315	32.72	Q V	|	|	|

7+45	15.6583	32.93	Q	V	|	|	|
7+50	15.8865	33.14	Q	V	|	|	|
7+55	16.1163	33.36	Q	V	|	|	|
8+ 0	16.3476	33.58	Q	V	|	|	|
8+ 5	16.5804	33.80	Q	V	|	|	|
8+10	16.8147	34.03	Q	V	|	|	|
8+15	17.0507	34.26	Q	V	|	|	|
8+20	17.2882	34.49	Q	V	|	|	|
8+25	17.5274	34.73	Q	V	|	|	|
8+30	17.7682	34.97	Q	V	|	|	|
8+35	18.0108	35.22	Q	V	|	|	|
8+40	18.2550	35.47	Q	V	|	|	|
8+45	18.5011	35.72	Q	V	|	|	|
8+50	18.7489	35.98	Q	V	|	|	|
8+55	18.9985	36.25	Q	V	|	|	|
9+ 0	19.2500	36.51	Q	V	|	|	|
9+ 5	19.5034	36.79	Q	V	|	|	|
9+10	19.7586	37.07	Q	V	|	|	|
9+15	20.0159	37.35	Q	V	|	|	|
9+20	20.2751	37.64	Q	V	|	|	|
9+25	20.5364	37.94	Q	V	|	|	|
9+30	20.7998	38.24	Q	V	|	|	|
9+35	21.0652	38.55	Q	V	|	|	|
9+40	21.3329	38.86	Q	V	|	|	|
9+45	21.6027	39.18	Q	V	|	|	|
9+50	21.8748	39.51	Q	V	|	|	|
9+55	22.1491	39.84	Q	V	|	|	|
10+ 0	22.4258	40.18	|Q	V	|	|	|
10+ 5	22.7050	40.53	|Q	V	|	|	|
10+10	22.9865	40.88	|Q	V	|	|	|

10+15	23.2706	41.24	|Q V |	|	|
10+20	23.5572	41.61	|Q V |	|	|
10+25	23.8464	42.00	|Q V |	|	|
10+30	24.1383	42.38	|Q V |	|	|
10+35	24.4329	42.78	|Q V |	|	|
10+40	24.7303	43.19	|Q V |	|	|
10+45	25.0306	43.60	|Q V |	|	|
10+50	25.3338	44.03	|Q V |	|	|
10+55	25.6401	44.47	|Q V |	|	|
11+ 0	25.9494	44.91	|Q V |	|	|
11+ 5	26.2619	45.37	|Q V |	|	|
11+10	26.5776	45.84	|Q V |	|	|
11+15	26.8966	46.32	|Q V |	|	|
11+20	27.2190	46.82	|Q V |	|	|
11+25	27.5450	47.33	|Q V |	|	|
11+30	27.8746	47.85	|Q V |	|	|
11+35	28.2078	48.39	|Q V |	|	|
11+40	28.5449	48.94	|Q V |	|	|
11+45	28.8859	49.51	|Q V |	|	|
11+50	29.2309	50.10	|Q V |	|	|
11+55	29.5801	50.70	|Q V |	|	|
12+ 0	29.9335	51.32	|Q V |	|	|
12+ 5	30.2904	51.82	|Q V |	|	|
12+10	30.6485	52.00	|Q V |	|	|
12+15	31.0053	51.80	|Q V |	|	|
12+20	31.3537	50.59	|Q V |	|	|
12+25	31.6890	48.69	|Q V |	|	|
12+30	32.0161	47.50	|Q V |	|	|
12+35	32.3392	46.91	|Q V |	|	|
12+40	32.6609	46.71	|Q V |	|	|

12+45	32.9827	46.73	|Q V |	|	|
12+50	33.3057	46.90	|Q V |	|	|
12+55	33.6307	47.19	|Q V |	|	|
13+ 0	33.9585	47.59	|Q V |	|	|
13+ 5	34.2897	48.09	|Q V |	|	|
13+10	34.6248	48.65	|Q V |	|	|
13+15	34.9642	49.28	|Q V |	|	|
13+20	35.3085	49.98	|Q V |	|	|
13+25	35.6581	50.77	|Q V |	|	|
13+30	36.0136	51.62	|Q V |	|	|
13+35	36.3755	52.54	|Q V |	|	|
13+40	36.7441	53.52	|Q V |	|	|
13+45	37.1200	54.58	|Q V|	|	|
13+50	37.5037	55.71	|Q V|	|	|
13+55	37.8958	56.93	|Q V|	|	|
14+ 0	38.2967	58.22	|Q V|	|	|
14+ 5	38.7077	59.68	|Q V|	|	|
14+10	39.1305	61.38	|Q V|	|	|
14+15	39.5670	63.39	|Q V|	|	|
14+20	40.0215	65.98	|Q V|	|	|
14+25	40.4970	69.05	|Q V|	|	|
14+30	40.9926	71.96	|Q V	|	|
14+35	41.5077	74.80	|Q V	|	|
14+40	42.0425	77.65	|Q V	|	|
14+45	42.5978	80.64	| Q V	|	|
14+50	43.1749	83.79	| Q V	|	|
14+55	43.7754	87.19	| Q V	|	|
15+ 0	44.4012	90.86	| Q V	|	|
15+ 5	45.0547	94.89	| Q |V	|	|
15+10	45.7388	99.33	| Q |V	|	|

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   15+15      46.4571    104.31  | Q       |V        |         |
|
   15+20      47.2139    109.88  | Q       |V        |         |
|
   15+25      48.0165    116.54  | Q       |V        |         |
|
   15+30      48.8766    124.89  |  Q      |V        |         |
|
   15+35      49.8093    135.43  |  Q      | V       |         |
|
   15+40      50.8418    149.92  |  Q      | V       |         |
|
   15+45      52.0048    168.87  |   Q     | V       |         |
|
   15+50      53.3234    191.46  |   Q     |  V      |         |
|
   15+55      54.8550    222.38  |    Q    |  V      |         |
|
   16+ 0      56.7358    273.10  |     Q   |  V      |         |
|
   16+ 5      59.4892    399.79  |        Q|   V     |         |
|
   16+10      63.7872    624.06  |         |    Q    |         |
|
   16+15      69.8902    886.16  |         |      V  | Q       |
|
   16+20      79.0842   1334.96  |         |        V|         |  Q
|
   16+25      89.9068   1571.44  |         |         | V       |
Q|
   16+30      98.4209   1236.25  |         |         |   V     Q
|
   16+35     104.8442    932.67  |         |         |  Q V    |
|
   16+40     109.8068    720.57  |         |       Q |     V   |
|
   16+45     113.9291    598.55  |         |   Q     |      V  |
|
   16+50     117.4151    506.17  |         | Q       |       V |
|
   16+55     120.4431    439.67  |         Q         |        V|
|
   17+ 0     123.0633    380.45  |        Q|         |         V
|
   17+ 5     125.3899    337.82  |       Q |         |         V
|
   17+10     127.4895    304.87  |      Q  |         |         |V
|
   17+15     129.4061    278.29  |     Q   |         |         |V
|
   17+20     131.1265    249.79  |     Q   |         |         | V
|
   17+25     132.6492    221.09  |    Q    |         |         | V
|
   17+30     134.0203    199.09  |   Q     |         |         | V
|
   17+35     135.2995    185.74  |   Q     |         |         |  V
|
   17+40     136.4763    170.87  |   Q     |         |         |  V
|
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17+45	137.5717	159.06	| Q	|	|	| V
17+50	138.5846	147.07	| Q	|	|	| V
17+55	139.5032	133.38	| Q	|	|	| V
18+ 0	140.3777	126.98	| Q	|	|	| V
18+ 5	141.1827	116.89	| Q	|	|	| V
18+10	141.9313	108.70	| Q	|	|	| V
18+15	142.6464	103.82	| Q	|	|	| V
18+20	143.3002	94.94	| Q	|	|	| V
18+25	143.9323	91.78	| Q	|	|	| V
18+30	144.5328	87.19	| Q	|	|	| V
18+35	145.0804	79.50	|Q	|	|	| V
18+40	145.6163	77.82	|Q	|	|	| V
18+45	146.1528	77.89	|Q	|	|	| V
18+50	146.6863	77.47	|Q	|	|	| V
18+55	147.2098	76.01	|Q	|	|	| V
19+ 0	147.7214	74.29	|Q	|	|	| V
19+ 5	148.2180	72.11	|Q	|	|	| V
19+10	148.6852	67.83	|Q	|	|	| V
19+15	149.1095	61.61	|Q	|	|	| V
19+20	149.5199	59.59	|Q	|	|	| V
19+25	149.9162	57.54	|Q	|	|	| V
19+30	150.2941	54.88	|Q	|	|	| V
19+35	150.6145	46.52	|Q	|	|	| V
19+40	150.9247	45.04	|Q	|	|	| V
19+45	151.2274	43.95	|Q	|	|	| V
19+50	151.5235	42.99	|Q	|	|	| V
19+55	151.8138	42.14	|Q	|	|	| V
20+ 0	152.0986	41.36	|Q	|	|	| V
20+ 5	152.3784	40.62	|Q	|	|	| V
20+10	152.6533	39.92	Q	|	|	| V

20+15	152.9236	39.26	Q				V
20+20	153.1896	38.62	Q				V
20+25	153.4513	38.00	Q				V
20+30	153.7090	37.42	Q				V
20+35	153.9628	36.85	Q				V
20+40	154.2128	36.30	Q				V
20+45	154.4592	35.78	Q				V
20+50	154.7023	35.29	Q				V
20+55	154.9420	34.81	Q				V
21+ 0	155.1786	34.35	Q				V
21+ 5	155.4122	33.91	Q				V
21+10	155.6428	33.48	Q				V
21+15	155.8705	33.06	Q				V
21+20	156.0953	32.65	Q				V
21+25	156.3174	32.25	Q				V
21+30	156.5369	31.87	Q				V
21+35	156.7537	31.48	Q				V
21+40	156.9679	31.10	Q				V
21+45	157.1795	30.73	Q				V
21+50	157.3887	30.38	Q				V
21+55	157.5956	30.03	Q				V
22+ 0	157.8001	29.70	Q				V
22+ 5	158.0023	29.37	Q				V
22+10	158.2024	29.05	Q				V
22+15	158.4004	28.74	Q				V
22+20	158.5963	28.44	Q				V
22+25	158.7901	28.15	Q				V
22+30	158.9820	27.86	Q				V
22+35	159.1720	27.59	Q				V
22+40	159.3601	27.31	Q				V

```
   22+45     159.5464     27.05  Q         |         |         |
V|
   22+50     159.7309     26.79  Q         |         |         |
V|
   22+55     159.9137     26.54  Q         |         |         |
V|
   23+ 0     160.0948     26.29  Q         |         |         |
V|
   23+ 5     160.2742     26.05  Q         |         |         |
V|
   23+10     160.4520     25.82  Q         |         |         |
V|
   23+15     160.6282     25.59  Q         |         |         |
V|
   23+20     160.8029     25.36  Q         |         |         |
V|
   23+25     160.9761     25.14  Q         |         |         |
V|
   23+30     161.1477     24.93  Q         |         |         |
V|
   23+35     161.3180     24.72  Q         |         |         |
V|
   23+40     161.4867     24.51  Q         |         |         |
V|
   23+45     161.6541     24.31  Q         |         |         |
V|
   23+50     161.8202     24.11  Q         |         |         |
V|
   23+55     161.9849     23.91  Q         |         |         |
V|
   24+ 0     162.1483     23.72  Q         |         |         |
V|
-------------------------------------------------------------------------
```

JoshuaTreeSolarPreliminary_Site_Existing_100-year.out

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

Study date 07/31/15

++

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

Program License Serial Number 6230

Joshua Tree Solar
Preliminary Hydrology Study Addendum
Existing Conditions, 100-year Storm
Onsite Runoff

Storm Event Year = 100

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 100		
115.00	1	1.85
Rainfall data for year 100		
115.00	6	2.76
Rainfall data for year 100		
115.00	24	4.22

++

******** 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)
82.0	82.0	115.00	1.000	0.335	0.910	0.305

Area-averaged adjusted loss rate Fm (In/Hr) = 0.305

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

Area	Area	SCS CN	SCS CN	S	Pervious

(Ac.)	Fract	(AMC2)	(AMC2)		Yield Fr
104.65	0.910	82.0	82.0	2.20	0.567
10.35	0.090	98.0	98.0	0.20	0.944

Area-averaged catchment yield fraction, Y = 0.601
Area-averaged low loss fraction, Yb = 0.399
++
Watercourse length = 3013.00(Ft.)
Length from concentration point to centroid = 1176.00(Ft.)
Elevation difference along watercourse = 41.30(Ft.)
Mannings friction factor along watercourse = 0.030
Watershed area = 115.00(Ac.)
Catchment Lag time = 0.146 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 57.1788
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.305(In/Hr)
Average low loss rate fraction (Yb) = 0.399 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.878(In)
Computed peak 30-minute rainfall = 1.503(In)
Specified peak 1-hour rainfall = 1.850(In)
Computed peak 3-hour rainfall = 2.364(In)
Specified peak 6-hour rainfall = 2.760(In)
Specified peak 24-hour rainfall = 4.220(In)

Rainfall depth area reduction factors:
Using a total area of 115.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.995 Adjusted rainfall = 0.873(In)
30-minute factor = 0.995 Adjusted rainfall = 1.495(In)
1-hour factor = 0.995 Adjusted rainfall = 1.840(In)
3-hour factor = 0.999 Adjusted rainfall = 2.363(In)
6-hour factor = 1.000 Adjusted rainfall = 2.759(In)
24-hour factor = 1.000 Adjusted rainfall = 4.219(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 = 1390.78 (CFS))	
1	5.072	70.536
2	38.563	465.793
3	66.216	384.590
4	78.038	164.423
5	84.937	95.947
6	89.523	63.777
7	92.614	42.994
8	94.877	31.468
9	96.522	22.876
10	97.644	15.615
11	98.318	9.375
12	98.991	9.349
13	99.582	8.230
14	100.000	5.807

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.8731	0.8731

2	1.0749	0.2018
3	1.2140	0.1390
4	1.3234	0.1094
5	1.4150	0.0916
6	1.4946	0.0796
7	1.5653	0.0707
8	1.6293	0.0640
9	1.6879	0.0586
10	1.7421	0.0542
11	1.7926	0.0505
12	1.8400	0.0474
13	1.8739	0.0338
14	1.9057	0.0319
15	1.9359	0.0302
16	1.9645	0.0286
17	1.9918	0.0273
18	2.0179	0.0261
19	2.0429	0.0250
20	2.0669	0.0240
21	2.0899	0.0231
22	2.1122	0.0222
23	2.1336	0.0215
24	2.1544	0.0208
25	2.1745	0.0201
26	2.1940	0.0195
27	2.2129	0.0189
28	2.2313	0.0184
29	2.2492	0.0179
30	2.2666	0.0174
31	2.2836	0.0170
32	2.3002	0.0166
33	2.3163	0.0162
34	2.3321	0.0158
35	2.3476	0.0154
36	2.3627	0.0151
37	2.3772	0.0145
38	2.3914	0.0142
39	2.4054	0.0139
40	2.4190	0.0137
41	2.4324	0.0134
42	2.4456	0.0131
43	2.4585	0.0129
44	2.4712	0.0127
45	2.4836	0.0125
46	2.4959	0.0122
47	2.5079	0.0120
48	2.5197	0.0118
49	2.5314	0.0117
50	2.5429	0.0115
51	2.5541	0.0113
52	2.5653	0.0111
53	2.5762	0.0110
54	2.5870	0.0108
55	2.5977	0.0106
56	2.6082	0.0105
57	2.6185	0.0103
58	2.6287	0.0102
59	2.6388	0.0101
60	2.6487	0.0099
61	2.6585	0.0098
62	2.6682	0.0097
63	2.6778	0.0096
64	2.6873	0.0095

65	2.6966	0.0093
66	2.7058	0.0092
67	2.7149	0.0091
68	2.7239	0.0090
69	2.7329	0.0089
70	2.7417	0.0088
71	2.7504	0.0087
72	2.7590	0.0086
73	2.7707	0.0117
74	2.7823	0.0116
75	2.7937	0.0115
76	2.8051	0.0114
77	2.8164	0.0113
78	2.8275	0.0112
79	2.8386	0.0111
80	2.8495	0.0110
81	2.8604	0.0109
82	2.8712	0.0108
83	2.8819	0.0107
84	2.8925	0.0106
85	2.9030	0.0105
86	2.9134	0.0104
87	2.9237	0.0103
88	2.9340	0.0103
89	2.9442	0.0102
90	2.9543	0.0101
91	2.9643	0.0100
92	2.9742	0.0099
93	2.9841	0.0099
94	2.9939	0.0098
95	3.0036	0.0097
96	3.0133	0.0097
97	3.0229	0.0096
98	3.0324	0.0095
99	3.0418	0.0094
100	3.0512	0.0094
101	3.0605	0.0093
102	3.0698	0.0093
103	3.0790	0.0092
104	3.0881	0.0091
105	3.0972	0.0091
106	3.1062	0.0090
107	3.1151	0.0090
108	3.1240	0.0089
109	3.1329	0.0088
110	3.1416	0.0088
111	3.1504	0.0087
112	3.1590	0.0087
113	3.1677	0.0086
114	3.1762	0.0086
115	3.1847	0.0085
116	3.1932	0.0085
117	3.2016	0.0084
118	3.2100	0.0084
119	3.2183	0.0083
120	3.2265	0.0083
121	3.2348	0.0082
122	3.2429	0.0082
123	3.2510	0.0081
124	3.2591	0.0081
125	3.2672	0.0080
126	3.2751	0.0080
127	3.2831	0.0079

128	3.2910	0.0079
129	3.2988	0.0079
130	3.3067	0.0078
131	3.3144	0.0078
132	3.3222	0.0077
133	3.3299	0.0077
134	3.3375	0.0077
135	3.3451	0.0076
136	3.3527	0.0076
137	3.3602	0.0075
138	3.3677	0.0075
139	3.3752	0.0075
140	3.3826	0.0074
141	3.3900	0.0074
142	3.3973	0.0073
143	3.4047	0.0073
144	3.4119	0.0073
145	3.4192	0.0072
146	3.4264	0.0072
147	3.4336	0.0072
148	3.4407	0.0071
149	3.4478	0.0071
150	3.4549	0.0071
151	3.4619	0.0070
152	3.4689	0.0070
153	3.4759	0.0070
154	3.4829	0.0069
155	3.4898	0.0069
156	3.4967	0.0069
157	3.5035	0.0069
158	3.5103	0.0068
159	3.5171	0.0068
160	3.5239	0.0068
161	3.5306	0.0067
162	3.5373	0.0067
163	3.5440	0.0067
164	3.5507	0.0066
165	3.5573	0.0066
166	3.5639	0.0066
167	3.5704	0.0066
168	3.5770	0.0065
169	3.5835	0.0065
170	3.5900	0.0065
171	3.5964	0.0065
172	3.6029	0.0064
173	3.6093	0.0064
174	3.6157	0.0064
175	3.6220	0.0064
176	3.6283	0.0063
177	3.6346	0.0063
178	3.6409	0.0063
179	3.6472	0.0063
180	3.6534	0.0062
181	3.6596	0.0062
182	3.6658	0.0062
183	3.6720	0.0062
184	3.6781	0.0061
185	3.6842	0.0061
186	3.6903	0.0061
187	3.6964	0.0061
188	3.7024	0.0060
189	3.7084	0.0060
190	3.7144	0.0060

191	3.7204	0.0060
192	3.7264	0.0060
193	3.7323	0.0059
194	3.7382	0.0059
195	3.7441	0.0059
196	3.7500	0.0059
197	3.7559	0.0059
198	3.7617	0.0058
199	3.7675	0.0058
200	3.7733	0.0058
201	3.7791	0.0058
202	3.7848	0.0058
203	3.7906	0.0057
204	3.7963	0.0057
205	3.8020	0.0057
206	3.8076	0.0057
207	3.8133	0.0057
208	3.8189	0.0056
209	3.8245	0.0056
210	3.8301	0.0056
211	3.8357	0.0056
212	3.8413	0.0056
213	3.8468	0.0055
214	3.8523	0.0055
215	3.8579	0.0055
216	3.8633	0.0055
217	3.8688	0.0055
218	3.8743	0.0055
219	3.8797	0.0054
220	3.8851	0.0054
221	3.8905	0.0054
222	3.8959	0.0054
223	3.9013	0.0054
224	3.9066	0.0054
225	3.9120	0.0053
226	3.9173	0.0053
227	3.9226	0.0053
228	3.9279	0.0053
229	3.9332	0.0053
230	3.9384	0.0053
231	3.9437	0.0052
232	3.9489	0.0052
233	3.9541	0.0052
234	3.9593	0.0052
235	3.9645	0.0052
236	3.9696	0.0052
237	3.9748	0.0051
238	3.9799	0.0051
239	3.9850	0.0051
240	3.9901	0.0051
241	3.9952	0.0051
242	4.0003	0.0051
243	4.0053	0.0051
244	4.0104	0.0050
245	4.0154	0.0050
246	4.0204	0.0050
247	4.0254	0.0050
248	4.0304	0.0050
249	4.0354	0.0050
250	4.0403	0.0050
251	4.0453	0.0049
252	4.0502	0.0049
253	4.0551	0.0049

254	4.0600	0.0049
255	4.0649	0.0049
256	4.0698	0.0049
257	4.0747	0.0049
258	4.0795	0.0049
259	4.0844	0.0048
260	4.0892	0.0048
261	4.0940	0.0048
262	4.0988	0.0048
263	4.1036	0.0048
264	4.1084	0.0048
265	4.1131	0.0048
266	4.1179	0.0048
267	4.1226	0.0047
268	4.1274	0.0047
269	4.1321	0.0047
270	4.1368	0.0047
271	4.1415	0.0047
272	4.1461	0.0047
273	4.1508	0.0047
274	4.1554	0.0047
275	4.1601	0.0046
276	4.1647	0.0046
277	4.1693	0.0046
278	4.1739	0.0046
279	4.1785	0.0046
280	4.1831	0.0046
281	4.1877	0.0046
282	4.1923	0.0046
283	4.1968	0.0046
284	4.2013	0.0045
285	4.2059	0.0045
286	4.2104	0.0045
287	4.2149	0.0045
288	4.2194	0.0045

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0045	0.0018	0.0027
2	0.0045	0.0018	0.0027
3	0.0045	0.0018	0.0027
4	0.0045	0.0018	0.0027
5	0.0046	0.0018	0.0027
6	0.0046	0.0018	0.0027
7	0.0046	0.0018	0.0028
8	0.0046	0.0018	0.0028
9	0.0046	0.0018	0.0028
10	0.0046	0.0019	0.0028
11	0.0047	0.0019	0.0028
12	0.0047	0.0019	0.0028
13	0.0047	0.0019	0.0028
14	0.0047	0.0019	0.0028
15	0.0047	0.0019	0.0028
16	0.0048	0.0019	0.0029
17	0.0048	0.0019	0.0029
18	0.0048	0.0019	0.0029
19	0.0048	0.0019	0.0029
20	0.0048	0.0019	0.0029
21	0.0049	0.0019	0.0029
22	0.0049	0.0019	0.0029
23	0.0049	0.0020	0.0029

24	0.0049	0.0020	0.0029
25	0.0049	0.0020	0.0030
26	0.0049	0.0020	0.0030
27	0.0050	0.0020	0.0030
28	0.0050	0.0020	0.0030
29	0.0050	0.0020	0.0030
30	0.0050	0.0020	0.0030
31	0.0051	0.0020	0.0030
32	0.0051	0.0020	0.0030
33	0.0051	0.0020	0.0031
34	0.0051	0.0020	0.0031
35	0.0051	0.0021	0.0031
36	0.0052	0.0021	0.0031
37	0.0052	0.0021	0.0031
38	0.0052	0.0021	0.0031
39	0.0052	0.0021	0.0031
40	0.0053	0.0021	0.0032
41	0.0053	0.0021	0.0032
42	0.0053	0.0021	0.0032
43	0.0053	0.0021	0.0032
44	0.0054	0.0021	0.0032
45	0.0054	0.0022	0.0032
46	0.0054	0.0022	0.0032
47	0.0054	0.0022	0.0033
48	0.0055	0.0022	0.0033
49	0.0055	0.0022	0.0033
50	0.0055	0.0022	0.0033
51	0.0055	0.0022	0.0033
52	0.0056	0.0022	0.0033
53	0.0056	0.0022	0.0034
54	0.0056	0.0022	0.0034
55	0.0057	0.0023	0.0034
56	0.0057	0.0023	0.0034
57	0.0057	0.0023	0.0034
58	0.0057	0.0023	0.0034
59	0.0058	0.0023	0.0035
60	0.0058	0.0023	0.0035
61	0.0058	0.0023	0.0035
62	0.0059	0.0023	0.0035
63	0.0059	0.0024	0.0035
64	0.0059	0.0024	0.0036
65	0.0060	0.0024	0.0036
66	0.0060	0.0024	0.0036
67	0.0060	0.0024	0.0036
68	0.0060	0.0024	0.0036
69	0.0061	0.0024	0.0037
70	0.0061	0.0024	0.0037
71	0.0062	0.0025	0.0037
72	0.0062	0.0025	0.0037
73	0.0062	0.0025	0.0037
74	0.0063	0.0025	0.0038
75	0.0063	0.0025	0.0038
76	0.0063	0.0025	0.0038
77	0.0064	0.0025	0.0038
78	0.0064	0.0026	0.0038
79	0.0065	0.0026	0.0039
80	0.0065	0.0026	0.0039
81	0.0065	0.0026	0.0039
82	0.0066	0.0026	0.0039
83	0.0066	0.0026	0.0040
84	0.0066	0.0027	0.0040
85	0.0067	0.0027	0.0040
86	0.0067	0.0027	0.0040

87	0.0068	0.0027	0.0041
88	0.0068	0.0027	0.0041
89	0.0069	0.0027	0.0041
90	0.0069	0.0028	0.0042
91	0.0070	0.0028	0.0042
92	0.0070	0.0028	0.0042
93	0.0071	0.0028	0.0043
94	0.0071	0.0028	0.0043
95	0.0072	0.0029	0.0043
96	0.0072	0.0029	0.0043
97	0.0073	0.0029	0.0044
98	0.0073	0.0029	0.0044
99	0.0074	0.0029	0.0044
100	0.0074	0.0030	0.0045
101	0.0075	0.0030	0.0045
102	0.0075	0.0030	0.0045
103	0.0076	0.0030	0.0046
104	0.0077	0.0031	0.0046
105	0.0077	0.0031	0.0046
106	0.0078	0.0031	0.0047
107	0.0079	0.0031	0.0047
108	0.0079	0.0032	0.0047
109	0.0080	0.0032	0.0048
110	0.0080	0.0032	0.0048
111	0.0081	0.0032	0.0049
112	0.0082	0.0033	0.0049
113	0.0083	0.0033	0.0050
114	0.0083	0.0033	0.0050
115	0.0084	0.0034	0.0051
116	0.0085	0.0034	0.0051
117	0.0086	0.0034	0.0051
118	0.0086	0.0034	0.0052
119	0.0087	0.0035	0.0052
120	0.0088	0.0035	0.0053
121	0.0089	0.0035	0.0053
122	0.0090	0.0036	0.0054
123	0.0091	0.0036	0.0054
124	0.0091	0.0036	0.0055
125	0.0093	0.0037	0.0056
126	0.0093	0.0037	0.0056
127	0.0094	0.0038	0.0057
128	0.0095	0.0038	0.0057
129	0.0097	0.0039	0.0058
130	0.0097	0.0039	0.0058
131	0.0099	0.0039	0.0059
132	0.0099	0.0040	0.0060
133	0.0101	0.0040	0.0061
134	0.0102	0.0041	0.0061
135	0.0103	0.0041	0.0062
136	0.0104	0.0042	0.0063
137	0.0106	0.0042	0.0064
138	0.0107	0.0043	0.0064
139	0.0109	0.0043	0.0065
140	0.0110	0.0044	0.0066
141	0.0112	0.0045	0.0067
142	0.0113	0.0045	0.0068
143	0.0115	0.0046	0.0069
144	0.0116	0.0046	0.0070
145	0.0086	0.0034	0.0052
146	0.0087	0.0035	0.0052
147	0.0089	0.0036	0.0054
148	0.0090	0.0036	0.0054
149	0.0092	0.0037	0.0055

150	0.0093	0.0037	0.0056
151	0.0096	0.0038	0.0057
152	0.0097	0.0039	0.0058
153	0.0099	0.0040	0.0060
154	0.0101	0.0040	0.0061
155	0.0103	0.0041	0.0062
156	0.0105	0.0042	0.0063
157	0.0108	0.0043	0.0065
158	0.0110	0.0044	0.0066
159	0.0113	0.0045	0.0068
160	0.0115	0.0046	0.0069
161	0.0118	0.0047	0.0071
162	0.0120	0.0048	0.0072
163	0.0125	0.0050	0.0075
164	0.0127	0.0051	0.0076
165	0.0131	0.0052	0.0079
166	0.0134	0.0053	0.0081
167	0.0139	0.0056	0.0084
168	0.0142	0.0057	0.0085
169	0.0151	0.0060	0.0091
170	0.0154	0.0062	0.0093
171	0.0162	0.0065	0.0097
172	0.0166	0.0066	0.0099
173	0.0174	0.0070	0.0105
174	0.0179	0.0071	0.0107
175	0.0189	0.0076	0.0114
176	0.0195	0.0078	0.0117
177	0.0208	0.0083	0.0125
178	0.0215	0.0086	0.0129
179	0.0231	0.0092	0.0139
180	0.0240	0.0096	0.0144
181	0.0261	0.0104	0.0157
182	0.0273	0.0109	0.0164
183	0.0302	0.0120	0.0181
184	0.0319	0.0127	0.0191
185	0.0474	0.0189	0.0285
186	0.0505	0.0202	0.0304
187	0.0586	0.0234	0.0352
188	0.0640	0.0254	0.0385
189	0.0796	0.0254	0.0541
190	0.0916	0.0254	0.0662
191	0.1390	0.0254	0.1136
192	0.2018	0.0254	0.1764
193	0.8731	0.0254	0.8477
194	0.1094	0.0254	0.0840
195	0.0707	0.0254	0.0453
196	0.0542	0.0216	0.0326
197	0.0338	0.0135	0.0203
198	0.0286	0.0114	0.0172
199	0.0250	0.0100	0.0150
200	0.0222	0.0089	0.0134
201	0.0201	0.0080	0.0121
202	0.0184	0.0073	0.0110
203	0.0170	0.0068	0.0102
204	0.0158	0.0063	0.0095
205	0.0145	0.0058	0.0087
206	0.0137	0.0055	0.0082
207	0.0129	0.0052	0.0078
208	0.0122	0.0049	0.0074
209	0.0117	0.0047	0.0070
210	0.0111	0.0044	0.0067
211	0.0106	0.0042	0.0064
212	0.0102	0.0041	0.0061

213	0.0098	0.0039	0.0059
214	0.0095	0.0038	0.0057
215	0.0091	0.0036	0.0055
216	0.0088	0.0035	0.0053
217	0.0117	0.0047	0.0070
218	0.0114	0.0045	0.0068
219	0.0111	0.0044	0.0066
220	0.0108	0.0043	0.0065
221	0.0105	0.0042	0.0063
222	0.0103	0.0041	0.0062
223	0.0100	0.0040	0.0060
224	0.0098	0.0039	0.0059
225	0.0096	0.0038	0.0058
226	0.0094	0.0037	0.0056
227	0.0092	0.0037	0.0055
228	0.0090	0.0036	0.0054
229	0.0088	0.0035	0.0053
230	0.0087	0.0035	0.0052
231	0.0085	0.0034	0.0051
232	0.0084	0.0033	0.0050
233	0.0082	0.0033	0.0049
234	0.0081	0.0032	0.0049
235	0.0079	0.0032	0.0048
236	0.0078	0.0031	0.0047
237	0.0077	0.0031	0.0046
238	0.0076	0.0030	0.0046
239	0.0075	0.0030	0.0045
240	0.0073	0.0029	0.0044
241	0.0072	0.0029	0.0044
242	0.0071	0.0029	0.0043
243	0.0070	0.0028	0.0042
244	0.0069	0.0028	0.0042
245	0.0069	0.0027	0.0041
246	0.0068	0.0027	0.0041
247	0.0067	0.0027	0.0040
248	0.0066	0.0026	0.0040
249	0.0065	0.0026	0.0039
250	0.0064	0.0026	0.0039
251	0.0064	0.0025	0.0038
252	0.0063	0.0025	0.0038
253	0.0062	0.0025	0.0037
254	0.0061	0.0024	0.0037
255	0.0061	0.0024	0.0036
256	0.0060	0.0024	0.0036
257	0.0059	0.0024	0.0036
258	0.0059	0.0023	0.0035
259	0.0058	0.0023	0.0035
260	0.0058	0.0023	0.0035
261	0.0057	0.0023	0.0034
262	0.0056	0.0022	0.0034
263	0.0056	0.0022	0.0034
264	0.0055	0.0022	0.0033
265	0.0055	0.0022	0.0033
266	0.0054	0.0022	0.0033
267	0.0054	0.0021	0.0032
268	0.0053	0.0021	0.0032
269	0.0053	0.0021	0.0032
270	0.0052	0.0021	0.0031
271	0.0052	0.0021	0.0031
272	0.0051	0.0020	0.0031
273	0.0051	0.0020	0.0031
274	0.0050	0.0020	0.0030
275	0.0050	0.0020	0.0030

276	0.0050	0.0020	0.0030
277	0.0049	0.0020	0.0030
278	0.0049	0.0019	0.0029
279	0.0048	0.0019	0.0029
280	0.0048	0.0019	0.0029
281	0.0048	0.0019	0.0029
282	0.0047	0.0019	0.0028
283	0.0047	0.0019	0.0028
284	0.0047	0.0019	0.0028
285	0.0046	0.0018	0.0028
286	0.0046	0.0018	0.0028
287	0.0046	0.0018	0.0027
288	0.0045	0.0018	0.0027

Total soil rain loss = 1.24(In)
Total effective rainfall = 2.98(In)
Peak flow rate in flood hydrograph = 501.55(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	150.0	300.0	450.0	600.0
0+ 5	0.0013	0.19	Q				
0+10	0.0113	1.45	Q				
0+15	0.0285	2.49	Q				
0+20	0.0487	2.94	Q				
0+25	0.0709	3.21	Q				
0+30	0.0943	3.40	Q				
0+35	0.1186	3.53	Q				
0+40	0.1435	3.62	Q				
0+45	0.1690	3.70	Q				
0+50	0.1949	3.76	Q				
0+55	0.2210	3.80	Q				
1+ 0	0.2474	3.84	Q				
1+ 5	0.2741	3.87	Q				
1+10	0.3010	3.90	Q				
1+15	0.3279	3.92	Q				
1+20	0.3550	3.93	Q				
1+25	0.3822	3.95	Q				
1+30	0.4095	3.96	Q				
1+35	0.4369	3.98	Q				
1+40	0.4644	3.99	Q				
1+45	0.4920	4.01	Q				
1+50	0.5198	4.03	Q				
1+55	0.5476	4.04	Q				
2+ 0	0.5756	4.06	Q				
2+ 5	0.6036	4.08	Q				
2+10	0.6318	4.09	Q				
2+15	0.6601	4.11	Q				
2+20	0.6885	4.13	Q				
2+25	0.7171	4.14	QV				
2+30	0.7457	4.16	QV				
2+35	0.7745	4.18	QV				
2+40	0.8034	4.20	QV				
2+45	0.8324	4.21	QV				
2+50	0.8615	4.23	QV				
2+55	0.8908	4.25	QV				

3+ 0	0.9202	4.27	QV				
3+ 5	0.9497	4.29	QV				
3+10	0.9794	4.31	QV				
3+15	1.0092	4.32	QV				
3+20	1.0391	4.34	QV				
3+25	1.0692	4.36	QV				
3+30	1.0993	4.38	QV				
3+35	1.1297	4.40	QV				
3+40	1.1601	4.42	QV				
3+45	1.1907	4.44	QV				
3+50	1.2215	4.46	QV				
3+55	1.2524	4.49	QV				
4+ 0	1.2834	4.51	QV				
4+ 5	1.3146	4.53	QV				
4+10	1.3459	4.55	QV				
4+15	1.3774	4.57	QV				
4+20	1.4091	4.59	QV				
4+25	1.4408	4.62	Q V				
4+30	1.4728	4.64	Q V				
4+35	1.5049	4.66	Q V				
4+40	1.5372	4.68	Q V				
4+45	1.5696	4.71	Q V				
4+50	1.6022	4.73	Q V				
4+55	1.6349	4.76	Q V				
5+ 0	1.6678	4.78	Q V				
5+ 5	1.7009	4.80	Q V				
5+10	1.7342	4.83	Q V				
5+15	1.7676	4.85	Q V				
5+20	1.8012	4.88	Q V				
5+25	1.8350	4.91	Q V				
5+30	1.8690	4.93	Q V				
5+35	1.9032	4.96	Q V				
5+40	1.9375	4.99	Q V				
5+45	1.9720	5.01	Q V				
5+50	2.0067	5.04	Q V				
5+55	2.0417	5.07	Q V				
6+ 0	2.0768	5.10	Q V				
6+ 5	2.1121	5.13	Q V				
6+10	2.1476	5.16	Q V				
6+15	2.1833	5.19	Q V				
6+20	2.2192	5.22	Q V				
6+25	2.2554	5.25	Q V				
6+30	2.2917	5.28	Q V				
6+35	2.3283	5.31	Q V				
6+40	2.3650	5.34	Q V				
6+45	2.4020	5.37	Q V				
6+50	2.4393	5.41	Q V				
6+55	2.4767	5.44	Q V				
7+ 0	2.5144	5.47	Q V				
7+ 5	2.5524	5.51	Q V				
7+10	2.5905	5.54	Q V				
7+15	2.6289	5.58	Q V				
7+20	2.6676	5.61	Q V				
7+25	2.7065	5.65	Q V				
7+30	2.7457	5.69	Q V				
7+35	2.7851	5.72	Q V				
7+40	2.8248	5.76	Q V				
7+45	2.8648	5.80	Q V				
7+50	2.9050	5.84	Q V				
7+55	2.9455	5.88	Q V				
8+ 0	2.9863	5.92	Q V				
8+ 5	3.0274	5.96	Q V				
8+10	3.0688	6.01	Q V				

8+15	3.1104	6.05	Q	V				
8+20	3.1524	6.10	Q	V				
8+25	3.1947	6.14	Q	V				
8+30	3.2373	6.19	Q	V				
8+35	3.2802	6.23	Q	V				
8+40	3.3234	6.28	Q	V				
8+45	3.3670	6.33	Q	V				
8+50	3.4109	6.38	Q	V				
8+55	3.4552	6.42	Q	V				
9+ 0	3.4998	6.48	Q	V				
9+ 5	3.5447	6.53	Q	V				
9+10	3.5901	6.58	Q	V				
9+15	3.6358	6.63	Q	V				
9+20	3.6819	6.69	Q	V				
9+25	3.7283	6.75	Q	V				
9+30	3.7752	6.81	Q	V				
9+35	3.8225	6.86	Q	V				
9+40	3.8701	6.92	Q	V				
9+45	3.9182	6.98	Q	V				
9+50	3.9668	7.05	Q	V				
9+55	4.0157	7.11	Q	V				
10+ 0	4.0652	7.18	Q	V				
10+ 5	4.1150	7.24	Q	V				
10+10	4.1654	7.31	Q	V				
10+15	4.2162	7.38	Q	V				
10+20	4.2676	7.45	Q	V				
10+25	4.3194	7.52	Q	V				
10+30	4.3717	7.60	Q	V				
10+35	4.4246	7.68	Q	V				
10+40	4.4780	7.76	Q	V				
10+45	4.5320	7.84	Q	V				
10+50	4.5866	7.92	Q	V				
10+55	4.6417	8.01	Q	V				
11+ 0	4.6975	8.10	Q	V				
11+ 5	4.7538	8.18	Q	V				
11+10	4.8108	8.28	Q	V				
11+15	4.8685	8.37	Q	V				
11+20	4.9268	8.47	Q	V				
11+25	4.9858	8.57	Q	V				
11+30	5.0456	8.67	Q	V				
11+35	5.1060	8.78	Q	V				
11+40	5.1672	8.89	Q	V				
11+45	5.2292	9.00	Q	V				
11+50	5.2921	9.12	Q	V				
11+55	5.3557	9.24	Q	V				
12+ 0	5.4202	9.37	Q	V				
12+ 5	5.4846	9.36	Q	V				
12+10	5.5439	8.60	Q	V				
12+15	5.5989	7.99	Q	V				
12+20	5.6527	7.81	Q	V				
12+25	5.7061	7.75	Q	V				
12+30	5.7596	7.76	Q	V				
12+35	5.8133	7.81	Q	V				
12+40	5.8677	7.89	Q	V				
12+45	5.9227	7.99	Q	V				
12+50	5.9786	8.11	Q	V				
12+55	6.0353	8.24	Q	V				
13+ 0	6.0932	8.39	Q	V				
13+ 5	6.1520	8.54	Q	V				
13+10	6.2120	8.71	Q	V				
13+15	6.2733	8.89	Q	V				
13+20	6.3359	9.10	Q	V				
13+25	6.3999	9.30	Q	V				

13+30	6.4655	9.52	Q	V
13+35	6.5326	9.74	Q	V
13+40	6.6014	9.99	Q	V
13+45	6.6719	10.24	Q	V
13+50	6.7444	10.52	Q	V
13+55	6.8187	10.80	Q	V
14+ 0	6.8953	11.12	Q	V
14+ 5	6.9741	11.44	Q	V
14+10	7.0559	11.88	Q	V
14+15	7.1407	12.30	Q	V
14+20	7.2285	12.75	Q	V
14+25	7.3194	13.20	Q	V
14+30	7.4138	13.71	Q	V
14+35	7.5117	14.22	Q	V
14+40	7.6137	14.82	Q	V
14+45	7.7200	15.43	Q	V
14+50	7.8312	16.15	Q	V
14+55	7.9476	16.90	Q	V
15+ 0	8.0702	17.80	Q	V
15+ 5	8.1993	18.74	Q	V
15+10	8.3363	19.89	Q	V
15+15	8.4817	21.12	Q	V
15+20	8.6379	22.67	Q	V
15+25	8.8089	24.84	Q	V
15+30	9.0172	30.24	Q	V
15+35	9.2619	35.54	Q	V
15+40	9.5416	40.61	Q	V
15+45	9.8623	46.55	Q	V
15+50	10.2594	57.67	Q	V
15+55	10.7709	74.27	Q	V
16+ 0	11.5221	109.07	Q	V
16+ 5	12.9555	208.12	Q	V
16+10	16.4097	501.55	V	Q
16+15	19.2881	417.95	Q	V
16+20	20.8448	226.03	Q	V
16+25	21.8791	150.18	Q	V
16+30	22.6188	107.39	Q	V
16+35	23.1622	78.91	Q	V
16+40	23.5868	61.65	Q	V
16+45	23.9228	48.79	Q	V
16+50	24.1881	38.52	Q	V
16+55	24.3975	30.41	Q	V
17+ 0	24.5873	27.55	Q	V
17+ 5	24.7537	24.16	Q	V
17+10	24.8907	19.90	Q	V
17+15	24.9863	13.88	Q	V
17+20	25.0728	12.56	Q	V
17+25	25.1529	11.62	Q	V
17+30	25.2278	10.88	Q	V
17+35	25.2986	10.27	Q	V
17+40	25.3657	9.75	Q	V
17+45	25.4297	9.29	Q	V
17+50	25.4908	8.87	Q	V
17+55	25.5493	8.50	Q	V
18+ 0	25.6056	8.17	Q	V
18+ 5	25.6607	8.00	Q	V
18+10	25.7199	8.60	Q	V
18+15	25.7822	9.05	Q	V
18+20	25.8448	9.09	Q	V
18+25	25.9069	9.02	Q	V
18+30	25.9682	8.90	Q	V
18+35	26.0285	8.75	Q	V
18+40	26.0876	8.59	Q	V

18+45	26.1457	8.43	Q	|	|	|	V |
18+50	26.2026	8.26	Q	|	|	|	V |
18+55	26.2583	8.10	Q	|	|	|	V |
19+ 0	26.3130	7.94	Q	|	|	|	V |
19+ 5	26.3666	7.79	Q	|	|	|	V |
19+10	26.4192	7.64	Q	|	|	|	V |
19+15	26.4708	7.49	Q	|	|	|	V |
19+20	26.5214	7.35	Q	|	|	|	V |
19+25	26.5711	7.21	Q	|	|	|	V |
19+30	26.6198	7.08	Q	|	|	|	V |
19+35	26.6677	6.95	Q	|	|	|	V |
19+40	26.7147	6.83	Q	|	|	|	V |
19+45	26.7610	6.72	Q	|	|	|	V |
19+50	26.8065	6.61	Q	|	|	|	V |
19+55	26.8512	6.50	Q	|	|	|	V |
20+ 0	26.8953	6.40	Q	|	|	|	V |
20+ 5	26.9387	6.30	Q	|	|	|	V |
20+10	26.9814	6.21	Q	|	|	|	V |
20+15	27.0235	6.11	Q	|	|	|	V |
20+20	27.0650	6.03	Q	|	|	|	V |
20+25	27.1059	5.94	Q	|	|	|	V |
20+30	27.1463	5.86	Q	|	|	|	V |
20+35	27.1861	5.78	Q	|	|	|	V |
20+40	27.2254	5.70	Q	|	|	|	V |
20+45	27.2641	5.63	Q	|	|	|	V |
20+50	27.3024	5.56	Q	|	|	|	V |
20+55	27.3402	5.49	Q	|	|	|	V |
21+ 0	27.3775	5.42	Q	|	|	|	V |
21+ 5	27.4144	5.35	Q	|	|	|	V |
21+10	27.4508	5.29	Q	|	|	|	V |
21+15	27.4868	5.23	Q	|	|	|	V |
21+20	27.5224	5.17	Q	|	|	|	V |
21+25	27.5576	5.11	Q	|	|	|	V |
21+30	27.5924	5.05	Q	|	|	|	V |
21+35	27.6268	5.00	Q	|	|	|	V |
21+40	27.6609	4.94	Q	|	|	|	V |
21+45	27.6945	4.89	Q	|	|	|	V |
21+50	27.7279	4.84	Q	|	|	|	V |
21+55	27.7609	4.79	Q	|	|	|	V |
22+ 0	27.7935	4.74	Q	|	|	|	V |
22+ 5	27.8258	4.69	Q	|	|	|	V |
22+10	27.8578	4.65	Q	|	|	|	V|
22+15	27.8895	4.60	Q	|	|	|	V|
22+20	27.9209	4.56	Q	|	|	|	V|
22+25	27.9520	4.51	Q	|	|	|	V|
22+30	27.9828	4.47	Q	|	|	|	V|
22+35	28.0133	4.43	Q	|	|	|	V|
22+40	28.0436	4.39	Q	|	|	|	V|
22+45	28.0735	4.35	Q	|	|	|	V|
22+50	28.1032	4.31	Q	|	|	|	V|
22+55	28.1327	4.28	Q	|	|	|	V|
23+ 0	28.1619	4.24	Q	|	|	|	V|
23+ 5	28.1908	4.20	Q	|	|	|	V|
23+10	28.2195	4.17	Q	|	|	|	V|
23+15	28.2480	4.13	Q	|	|	|	V|
23+20	28.2762	4.10	Q	|	|	|	V|
23+25	28.3042	4.06	Q	|	|	|	V|
23+30	28.3320	4.03	Q	|	|	|	V|
23+35	28.3595	4.00	Q	|	|	|	V|
23+40	28.3868	3.97	Q	|	|	|	V|
23+45	28.4140	3.94	Q	|	|	|	V|
23+50	28.4409	3.91	Q	|	|	|	V|
23+55	28.4676	3.88	Q	|	|	|	V|

```
   24+ 0      28.4941      3.85  Q         |         |         |        V|
-----------------------------------------------------------------------
```

JoshuaTreeSolarSite_Proposed_100-year.out

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

Study date 07/31/15

++

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

Program License Serial Number 6230

Joshua Tree Solar
Preliminary Hydrology Study Addendum
Proposed Conditions, 100-year Storm
Onsite Runoff

Storm Event Year = 100

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 100		
115.00	1	1.85
Rainfall data for year 100		
115.00	6	2.76
Rainfall data for year 100		
115.00	24	4.22

++

******** 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)
82.0	82.0	115.00	1.000	0.335	0.881	0.296

Area-averaged adjusted loss rate Fm (In/Hr) = 0.296

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

Area	Area	SCS CN	SCS CN	S	Pervious

(Ac.)	Fract	(AMC2)	(AMC2)		Yield Fr
101.32	0.881	82.0	82.0	2.20	0.567
13.68	0.119	98.0	98.0	0.20	0.944

Area-averaged catchment yield fraction, Y = 0.612
Area-averaged low loss fraction, Yb = 0.388
++
Watercourse length = 3013.00(Ft.)
Length from concentration point to centroid = 1176.00(Ft.)
Elevation difference along watercourse = 41.30(Ft.)
Mannings friction factor along watercourse = 0.030
Watershed area = 115.00(Ac.)
Catchment Lag time = 0.146 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 57.1788
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.296(In/Hr)
Average low loss rate fraction (Yb) = 0.388 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.878(In)
Computed peak 30-minute rainfall = 1.503(In)
Specified peak 1-hour rainfall = 1.850(In)
Computed peak 3-hour rainfall = 2.364(In)
Specified peak 6-hour rainfall = 2.760(In)
Specified peak 24-hour rainfall = 4.220(In)

Rainfall depth area reduction factors:
Using a total area of 115.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.995 Adjusted rainfall = 0.873(In)
30-minute factor = 0.995 Adjusted rainfall = 1.495(In)
1-hour factor = 0.995 Adjusted rainfall = 1.840(In)
3-hour factor = 0.999 Adjusted rainfall = 2.363(In)
6-hour factor = 1.000 Adjusted rainfall = 2.759(In)
24-hour factor = 1.000 Adjusted rainfall = 4.219(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 = 1390.78 (CFS))	
1	5.072	70.536
2	38.563	465.793
3	66.216	384.590
4	78.038	164.423
5	84.937	95.947
6	89.523	63.777
7	92.614	42.994
8	94.877	31.468
9	96.522	22.876
10	97.644	15.615
11	98.318	9.375
12	98.991	9.349
13	99.582	8.230
14	100.000	5.807

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.8731	0.8731

2	1.0749	0.2018
3	1.2140	0.1390
4	1.3234	0.1094
5	1.4150	0.0916
6	1.4946	0.0796
7	1.5653	0.0707
8	1.6293	0.0640
9	1.6879	0.0586
10	1.7421	0.0542
11	1.7926	0.0505
12	1.8400	0.0474
13	1.8739	0.0338
14	1.9057	0.0319
15	1.9359	0.0302
16	1.9645	0.0286
17	1.9918	0.0273
18	2.0179	0.0261
19	2.0429	0.0250
20	2.0669	0.0240
21	2.0899	0.0231
22	2.1122	0.0222
23	2.1336	0.0215
24	2.1544	0.0208
25	2.1745	0.0201
26	2.1940	0.0195
27	2.2129	0.0189
28	2.2313	0.0184
29	2.2492	0.0179
30	2.2666	0.0174
31	2.2836	0.0170
32	2.3002	0.0166
33	2.3163	0.0162
34	2.3321	0.0158
35	2.3476	0.0154
36	2.3627	0.0151
37	2.3772	0.0145
38	2.3914	0.0142
39	2.4054	0.0139
40	2.4190	0.0137
41	2.4324	0.0134
42	2.4456	0.0131
43	2.4585	0.0129
44	2.4712	0.0127
45	2.4836	0.0125
46	2.4959	0.0122
47	2.5079	0.0120
48	2.5197	0.0118
49	2.5314	0.0117
50	2.5429	0.0115
51	2.5541	0.0113
52	2.5653	0.0111
53	2.5762	0.0110
54	2.5870	0.0108
55	2.5977	0.0106
56	2.6082	0.0105
57	2.6185	0.0103
58	2.6287	0.0102
59	2.6388	0.0101
60	2.6487	0.0099
61	2.6585	0.0098
62	2.6682	0.0097
63	2.6778	0.0096
64	2.6873	0.0095

65	2.6966	0.0093
66	2.7058	0.0092
67	2.7149	0.0091
68	2.7239	0.0090
69	2.7329	0.0089
70	2.7417	0.0088
71	2.7504	0.0087
72	2.7590	0.0086
73	2.7707	0.0117
74	2.7823	0.0116
75	2.7937	0.0115
76	2.8051	0.0114
77	2.8164	0.0113
78	2.8275	0.0112
79	2.8386	0.0111
80	2.8495	0.0110
81	2.8604	0.0109
82	2.8712	0.0108
83	2.8819	0.0107
84	2.8925	0.0106
85	2.9030	0.0105
86	2.9134	0.0104
87	2.9237	0.0103
88	2.9340	0.0103
89	2.9442	0.0102
90	2.9543	0.0101
91	2.9643	0.0100
92	2.9742	0.0099
93	2.9841	0.0099
94	2.9939	0.0098
95	3.0036	0.0097
96	3.0133	0.0097
97	3.0229	0.0096
98	3.0324	0.0095
99	3.0418	0.0094
100	3.0512	0.0094
101	3.0605	0.0093
102	3.0698	0.0093
103	3.0790	0.0092
104	3.0881	0.0091
105	3.0972	0.0091
106	3.1062	0.0090
107	3.1151	0.0090
108	3.1240	0.0089
109	3.1329	0.0088
110	3.1416	0.0088
111	3.1504	0.0087
112	3.1590	0.0087
113	3.1677	0.0086
114	3.1762	0.0086
115	3.1847	0.0085
116	3.1932	0.0085
117	3.2016	0.0084
118	3.2100	0.0084
119	3.2183	0.0083
120	3.2265	0.0083
121	3.2348	0.0082
122	3.2429	0.0082
123	3.2510	0.0081
124	3.2591	0.0081
125	3.2672	0.0080
126	3.2751	0.0080
127	3.2831	0.0079

128	3.2910	0.0079
129	3.2988	0.0079
130	3.3067	0.0078
131	3.3144	0.0078
132	3.3222	0.0077
133	3.3299	0.0077
134	3.3375	0.0077
135	3.3451	0.0076
136	3.3527	0.0076
137	3.3602	0.0075
138	3.3677	0.0075
139	3.3752	0.0075
140	3.3826	0.0074
141	3.3900	0.0074
142	3.3973	0.0073
143	3.4047	0.0073
144	3.4119	0.0073
145	3.4192	0.0072
146	3.4264	0.0072
147	3.4336	0.0072
148	3.4407	0.0071
149	3.4478	0.0071
150	3.4549	0.0071
151	3.4619	0.0070
152	3.4689	0.0070
153	3.4759	0.0070
154	3.4829	0.0069
155	3.4898	0.0069
156	3.4967	0.0069
157	3.5035	0.0069
158	3.5103	0.0068
159	3.5171	0.0068
160	3.5239	0.0068
161	3.5306	0.0067
162	3.5373	0.0067
163	3.5440	0.0067
164	3.5507	0.0066
165	3.5573	0.0066
166	3.5639	0.0066
167	3.5704	0.0066
168	3.5770	0.0065
169	3.5835	0.0065
170	3.5900	0.0065
171	3.5964	0.0065
172	3.6029	0.0064
173	3.6093	0.0064
174	3.6157	0.0064
175	3.6220	0.0064
176	3.6283	0.0063
177	3.6346	0.0063
178	3.6409	0.0063
179	3.6472	0.0063
180	3.6534	0.0062
181	3.6596	0.0062
182	3.6658	0.0062
183	3.6720	0.0062
184	3.6781	0.0061
185	3.6842	0.0061
186	3.6903	0.0061
187	3.6964	0.0061
188	3.7024	0.0060
189	3.7084	0.0060
190	3.7144	0.0060

191	3.7204	0.0060
192	3.7264	0.0060
193	3.7323	0.0059
194	3.7382	0.0059
195	3.7441	0.0059
196	3.7500	0.0059
197	3.7559	0.0059
198	3.7617	0.0058
199	3.7675	0.0058
200	3.7733	0.0058
201	3.7791	0.0058
202	3.7848	0.0058
203	3.7906	0.0057
204	3.7963	0.0057
205	3.8020	0.0057
206	3.8076	0.0057
207	3.8133	0.0057
208	3.8189	0.0056
209	3.8245	0.0056
210	3.8301	0.0056
211	3.8357	0.0056
212	3.8413	0.0056
213	3.8468	0.0055
214	3.8523	0.0055
215	3.8579	0.0055
216	3.8633	0.0055
217	3.8688	0.0055
218	3.8743	0.0055
219	3.8797	0.0054
220	3.8851	0.0054
221	3.8905	0.0054
222	3.8959	0.0054
223	3.9013	0.0054
224	3.9066	0.0054
225	3.9120	0.0053
226	3.9173	0.0053
227	3.9226	0.0053
228	3.9279	0.0053
229	3.9332	0.0053
230	3.9384	0.0053
231	3.9437	0.0052
232	3.9489	0.0052
233	3.9541	0.0052
234	3.9593	0.0052
235	3.9645	0.0052
236	3.9696	0.0052
237	3.9748	0.0051
238	3.9799	0.0051
239	3.9850	0.0051
240	3.9901	0.0051
241	3.9952	0.0051
242	4.0003	0.0051
243	4.0053	0.0051
244	4.0104	0.0050
245	4.0154	0.0050
246	4.0204	0.0050
247	4.0254	0.0050
248	4.0304	0.0050
249	4.0354	0.0050
250	4.0403	0.0050
251	4.0453	0.0049
252	4.0502	0.0049
253	4.0551	0.0049

254	4.0600	0.0049
255	4.0649	0.0049
256	4.0698	0.0049
257	4.0747	0.0049
258	4.0795	0.0049
259	4.0844	0.0048
260	4.0892	0.0048
261	4.0940	0.0048
262	4.0988	0.0048
263	4.1036	0.0048
264	4.1084	0.0048
265	4.1131	0.0048
266	4.1179	0.0048
267	4.1226	0.0047
268	4.1274	0.0047
269	4.1321	0.0047
270	4.1368	0.0047
271	4.1415	0.0047
272	4.1461	0.0047
273	4.1508	0.0047
274	4.1554	0.0047
275	4.1601	0.0046
276	4.1647	0.0046
277	4.1693	0.0046
278	4.1739	0.0046
279	4.1785	0.0046
280	4.1831	0.0046
281	4.1877	0.0046
282	4.1923	0.0046
283	4.1968	0.0046
284	4.2013	0.0045
285	4.2059	0.0045
286	4.2104	0.0045
287	4.2149	0.0045
288	4.2194	0.0045

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0045	0.0017	0.0027
2	0.0045	0.0017	0.0028
3	0.0045	0.0018	0.0028
4	0.0045	0.0018	0.0028
5	0.0046	0.0018	0.0028
6	0.0046	0.0018	0.0028
7	0.0046	0.0018	0.0028
8	0.0046	0.0018	0.0028
9	0.0046	0.0018	0.0028
10	0.0046	0.0018	0.0028
11	0.0047	0.0018	0.0029
12	0.0047	0.0018	0.0029
13	0.0047	0.0018	0.0029
14	0.0047	0.0018	0.0029
15	0.0047	0.0018	0.0029
16	0.0048	0.0018	0.0029
17	0.0048	0.0019	0.0029
18	0.0048	0.0019	0.0029
19	0.0048	0.0019	0.0029
20	0.0048	0.0019	0.0030
21	0.0049	0.0019	0.0030
22	0.0049	0.0019	0.0030
23	0.0049	0.0019	0.0030

24	0.0049	0.0019	0.0030
25	0.0049	0.0019	0.0030
26	0.0049	0.0019	0.0030
27	0.0050	0.0019	0.0030
28	0.0050	0.0019	0.0031
29	0.0050	0.0019	0.0031
30	0.0050	0.0020	0.0031
31	0.0051	0.0020	0.0031
32	0.0051	0.0020	0.0031
33	0.0051	0.0020	0.0031
34	0.0051	0.0020	0.0031
35	0.0051	0.0020	0.0031
36	0.0052	0.0020	0.0032
37	0.0052	0.0020	0.0032
38	0.0052	0.0020	0.0032
39	0.0052	0.0020	0.0032
40	0.0053	0.0020	0.0032
41	0.0053	0.0021	0.0032
42	0.0053	0.0021	0.0032
43	0.0053	0.0021	0.0033
44	0.0054	0.0021	0.0033
45	0.0054	0.0021	0.0033
46	0.0054	0.0021	0.0033
47	0.0054	0.0021	0.0033
48	0.0055	0.0021	0.0033
49	0.0055	0.0021	0.0034
50	0.0055	0.0021	0.0034
51	0.0055	0.0022	0.0034
52	0.0056	0.0022	0.0034
53	0.0056	0.0022	0.0034
54	0.0056	0.0022	0.0034
55	0.0057	0.0022	0.0035
56	0.0057	0.0022	0.0035
57	0.0057	0.0022	0.0035
58	0.0057	0.0022	0.0035
59	0.0058	0.0022	0.0035
60	0.0058	0.0022	0.0035
61	0.0058	0.0023	0.0036
62	0.0059	0.0023	0.0036
63	0.0059	0.0023	0.0036
64	0.0059	0.0023	0.0036
65	0.0060	0.0023	0.0036
66	0.0060	0.0023	0.0037
67	0.0060	0.0023	0.0037
68	0.0060	0.0023	0.0037
69	0.0061	0.0024	0.0037
70	0.0061	0.0024	0.0037
71	0.0062	0.0024	0.0038
72	0.0062	0.0024	0.0038
73	0.0062	0.0024	0.0038
74	0.0063	0.0024	0.0038
75	0.0063	0.0024	0.0039
76	0.0063	0.0025	0.0039
77	0.0064	0.0025	0.0039
78	0.0064	0.0025	0.0039
79	0.0065	0.0025	0.0040
80	0.0065	0.0025	0.0040
81	0.0065	0.0025	0.0040
82	0.0066	0.0025	0.0040
83	0.0066	0.0026	0.0041
84	0.0066	0.0026	0.0041
85	0.0067	0.0026	0.0041
86	0.0067	0.0026	0.0041

87	0.0068	0.0026	0.0042
88	0.0068	0.0026	0.0042
89	0.0069	0.0027	0.0042
90	0.0069	0.0027	0.0042
91	0.0070	0.0027	0.0043
92	0.0070	0.0027	0.0043
93	0.0071	0.0027	0.0043
94	0.0071	0.0028	0.0043
95	0.0072	0.0028	0.0044
96	0.0072	0.0028	0.0044
97	0.0073	0.0028	0.0045
98	0.0073	0.0028	0.0045
99	0.0074	0.0029	0.0045
100	0.0074	0.0029	0.0045
101	0.0075	0.0029	0.0046
102	0.0075	0.0029	0.0046
103	0.0076	0.0030	0.0047
104	0.0077	0.0030	0.0047
105	0.0077	0.0030	0.0047
106	0.0078	0.0030	0.0048
107	0.0079	0.0031	0.0048
108	0.0079	0.0031	0.0048
109	0.0080	0.0031	0.0049
110	0.0080	0.0031	0.0049
111	0.0081	0.0032	0.0050
112	0.0082	0.0032	0.0050
113	0.0083	0.0032	0.0051
114	0.0083	0.0032	0.0051
115	0.0084	0.0033	0.0051
116	0.0085	0.0033	0.0052
117	0.0086	0.0033	0.0052
118	0.0086	0.0033	0.0053
119	0.0087	0.0034	0.0053
120	0.0088	0.0034	0.0054
121	0.0089	0.0035	0.0054
122	0.0090	0.0035	0.0055
123	0.0091	0.0035	0.0055
124	0.0091	0.0035	0.0056
125	0.0093	0.0036	0.0057
126	0.0093	0.0036	0.0057
127	0.0094	0.0037	0.0058
128	0.0095	0.0037	0.0058
129	0.0097	0.0037	0.0059
130	0.0097	0.0038	0.0059
131	0.0099	0.0038	0.0060
132	0.0099	0.0039	0.0061
133	0.0101	0.0039	0.0062
134	0.0102	0.0040	0.0062
135	0.0103	0.0040	0.0063
136	0.0104	0.0040	0.0064
137	0.0106	0.0041	0.0065
138	0.0107	0.0041	0.0065
139	0.0109	0.0042	0.0066
140	0.0110	0.0043	0.0067
141	0.0112	0.0043	0.0068
142	0.0113	0.0044	0.0069
143	0.0115	0.0045	0.0070
144	0.0116	0.0045	0.0071
145	0.0086	0.0033	0.0053
146	0.0087	0.0034	0.0053
147	0.0089	0.0035	0.0055
148	0.0090	0.0035	0.0055
149	0.0092	0.0036	0.0056

150	0.0093	0.0036	0.0057
151	0.0096	0.0037	0.0059
152	0.0097	0.0038	0.0059
153	0.0099	0.0039	0.0061
154	0.0101	0.0039	0.0062
155	0.0103	0.0040	0.0063
156	0.0105	0.0041	0.0064
157	0.0108	0.0042	0.0066
158	0.0110	0.0043	0.0067
159	0.0113	0.0044	0.0069
160	0.0115	0.0045	0.0070
161	0.0118	0.0046	0.0072
162	0.0120	0.0047	0.0074
163	0.0125	0.0048	0.0076
164	0.0127	0.0049	0.0078
165	0.0131	0.0051	0.0080
166	0.0134	0.0052	0.0082
167	0.0139	0.0054	0.0085
168	0.0142	0.0055	0.0087
169	0.0151	0.0059	0.0092
170	0.0154	0.0060	0.0094
171	0.0162	0.0063	0.0099
172	0.0166	0.0064	0.0101
173	0.0174	0.0068	0.0107
174	0.0179	0.0069	0.0109
175	0.0189	0.0073	0.0116
176	0.0195	0.0076	0.0119
177	0.0208	0.0081	0.0127
178	0.0215	0.0083	0.0131
179	0.0231	0.0090	0.0141
180	0.0240	0.0093	0.0147
181	0.0261	0.0101	0.0160
182	0.0273	0.0106	0.0167
183	0.0302	0.0117	0.0184
184	0.0319	0.0124	0.0195
185	0.0474	0.0184	0.0290
186	0.0505	0.0196	0.0309
187	0.0586	0.0228	0.0358
188	0.0640	0.0246	0.0393
189	0.0796	0.0246	0.0549
190	0.0916	0.0246	0.0670
191	0.1390	0.0246	0.1144
192	0.2018	0.0246	0.1772
193	0.8731	0.0246	0.8485
194	0.1094	0.0246	0.0848
195	0.0707	0.0246	0.0461
196	0.0542	0.0210	0.0332
197	0.0338	0.0131	0.0207
198	0.0286	0.0111	0.0175
199	0.0250	0.0097	0.0153
200	0.0222	0.0086	0.0136
201	0.0201	0.0078	0.0123
202	0.0184	0.0071	0.0113
203	0.0170	0.0066	0.0104
204	0.0158	0.0061	0.0097
205	0.0145	0.0056	0.0089
206	0.0137	0.0053	0.0084
207	0.0129	0.0050	0.0079
208	0.0122	0.0048	0.0075
209	0.0117	0.0045	0.0071
210	0.0111	0.0043	0.0068
211	0.0106	0.0041	0.0065
212	0.0102	0.0040	0.0062

213	0.0098	0.0038	0.0060
214	0.0095	0.0037	0.0058
215	0.0091	0.0035	0.0056
216	0.0088	0.0034	0.0054
217	0.0117	0.0045	0.0071
218	0.0114	0.0044	0.0070
219	0.0111	0.0043	0.0068
220	0.0108	0.0042	0.0066
221	0.0105	0.0041	0.0064
222	0.0103	0.0040	0.0063
223	0.0100	0.0039	0.0061
224	0.0098	0.0038	0.0060
225	0.0096	0.0037	0.0059
226	0.0094	0.0036	0.0057
227	0.0092	0.0036	0.0056
228	0.0090	0.0035	0.0055
229	0.0088	0.0034	0.0054
230	0.0087	0.0034	0.0053
231	0.0085	0.0033	0.0052
232	0.0084	0.0032	0.0051
233	0.0082	0.0032	0.0050
234	0.0081	0.0031	0.0049
235	0.0079	0.0031	0.0049
236	0.0078	0.0030	0.0048
237	0.0077	0.0030	0.0047
238	0.0076	0.0029	0.0046
239	0.0075	0.0029	0.0046
240	0.0073	0.0029	0.0045
241	0.0072	0.0028	0.0044
242	0.0071	0.0028	0.0044
243	0.0070	0.0027	0.0043
244	0.0069	0.0027	0.0042
245	0.0069	0.0027	0.0042
246	0.0068	0.0026	0.0041
247	0.0067	0.0026	0.0041
248	0.0066	0.0026	0.0040
249	0.0065	0.0025	0.0040
250	0.0064	0.0025	0.0039
251	0.0064	0.0025	0.0039
252	0.0063	0.0024	0.0038
253	0.0062	0.0024	0.0038
254	0.0061	0.0024	0.0038
255	0.0061	0.0024	0.0037
256	0.0060	0.0023	0.0037
257	0.0059	0.0023	0.0036
258	0.0059	0.0023	0.0036
259	0.0058	0.0023	0.0036
260	0.0058	0.0022	0.0035
261	0.0057	0.0022	0.0035
262	0.0056	0.0022	0.0034
263	0.0056	0.0022	0.0034
264	0.0055	0.0021	0.0034
265	0.0055	0.0021	0.0033
266	0.0054	0.0021	0.0033
267	0.0054	0.0021	0.0033
268	0.0053	0.0021	0.0033
269	0.0053	0.0020	0.0032
270	0.0052	0.0020	0.0032
271	0.0052	0.0020	0.0032
272	0.0051	0.0020	0.0031
273	0.0051	0.0020	0.0031
274	0.0050	0.0020	0.0031
275	0.0050	0.0019	0.0031

276	0.0050	0.0019	0.0030
277	0.0049	0.0019	0.0030
278	0.0049	0.0019	0.0030
279	0.0048	0.0019	0.0030
280	0.0048	0.0019	0.0029
281	0.0048	0.0018	0.0029
282	0.0047	0.0018	0.0029
283	0.0047	0.0018	0.0029
284	0.0047	0.0018	0.0028
285	0.0046	0.0018	0.0028
286	0.0046	0.0018	0.0028
287	0.0046	0.0018	0.0028
288	0.0045	0.0018	0.0028

Total soil rain loss = 1.20(In)
Total effective rainfall = 3.02(In)
Peak flow rate in flood hydrograph = 502.65(CFS)

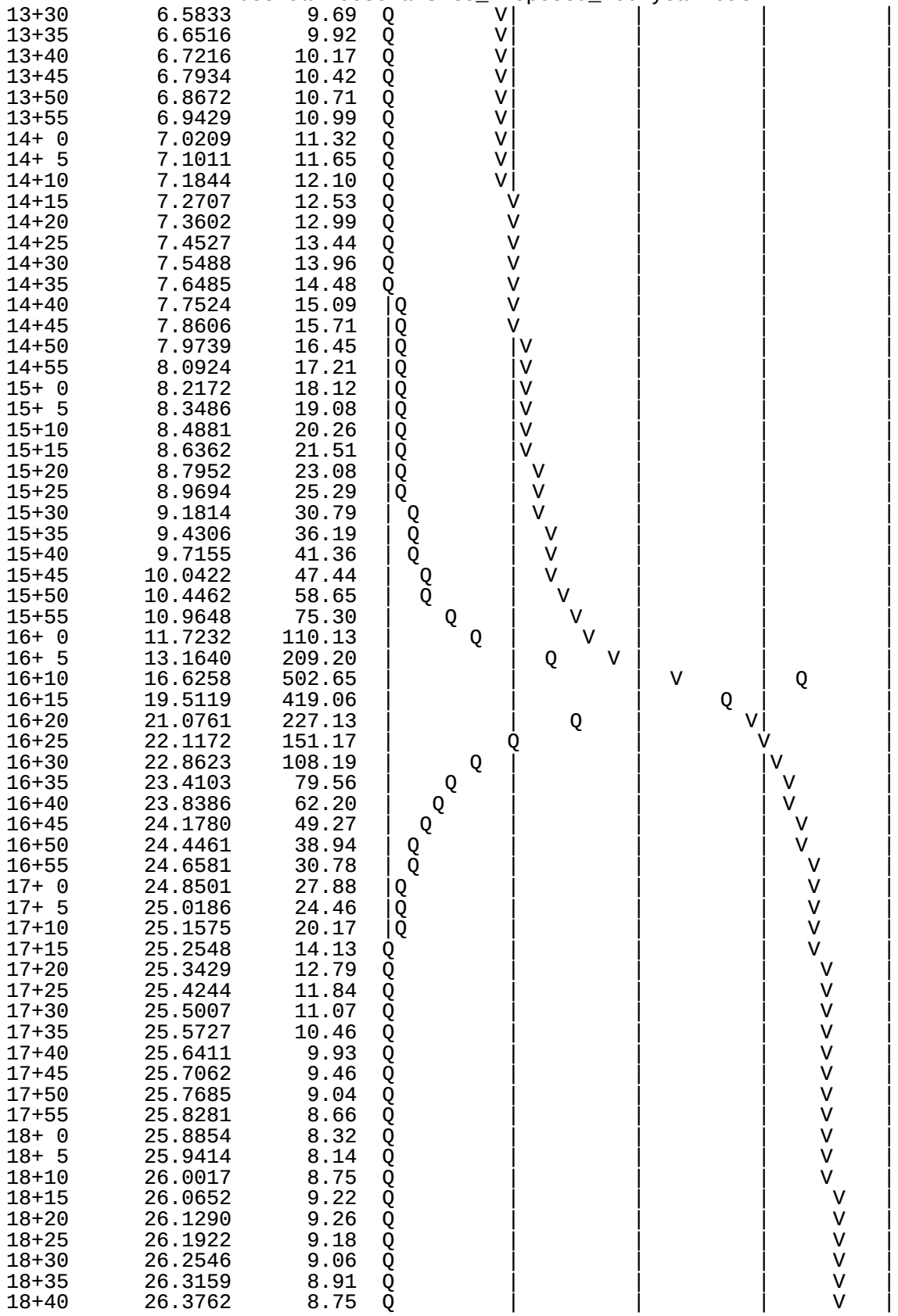
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	150.0	300.0	450.0	600.0
0+ 5	0.0013	0.19	Q				
0+10	0.0115	1.48	Q				
0+15	0.0290	2.54	Q				
0+20	0.0496	3.00	Q				
0+25	0.0722	3.27	Q				
0+30	0.0960	3.46	Q				
0+35	0.1207	3.59	Q				
0+40	0.1461	3.69	Q				
0+45	0.1721	3.77	Q				
0+50	0.1984	3.82	Q				
0+55	0.2250	3.86	Q				
1+ 0	0.2519	3.91	Q				
1+ 5	0.2791	3.94	Q				
1+10	0.3064	3.97	Q				
1+15	0.3339	3.99	Q				
1+20	0.3615	4.00	Q				
1+25	0.3892	4.02	Q				
1+30	0.4170	4.04	Q				
1+35	0.4449	4.05	Q				
1+40	0.4729	4.07	Q				
1+45	0.5010	4.08	Q				
1+50	0.5292	4.10	Q				
1+55	0.5576	4.12	Q				
2+ 0	0.5860	4.13	Q				
2+ 5	0.6146	4.15	Q				
2+10	0.6433	4.17	Q				
2+15	0.6721	4.18	Q				
2+20	0.7011	4.20	Q				
2+25	0.7301	4.22	QV				
2+30	0.7593	4.24	QV				
2+35	0.7886	4.25	QV				
2+40	0.8180	4.27	QV				
2+45	0.8476	4.29	QV				
2+50	0.8772	4.31	QV				
2+55	0.9070	4.33	QV				

3+ 0	0.9370	4.35	QV				
3+ 5	0.9670	4.36	QV				
3+10	0.9972	4.38	QV				
3+15	1.0276	4.40	QV				
3+20	1.0580	4.42	QV				
3+25	1.0886	4.44	QV				
3+30	1.1194	4.46	QV				
3+35	1.1502	4.48	QV				
3+40	1.1813	4.50	QV				
3+45	1.2124	4.52	QV				
3+50	1.2437	4.55	QV				
3+55	1.2752	4.57	QV				
4+ 0	1.3068	4.59	QV				
4+ 5	1.3385	4.61	QV				
4+10	1.3705	4.63	QV				
4+15	1.4025	4.65	QV				
4+20	1.4347	4.68	QV				
4+25	1.4671	4.70	Q V				
4+30	1.4996	4.72	Q V				
4+35	1.5323	4.75	Q V				
4+40	1.5652	4.77	Q V				
4+45	1.5982	4.79	Q V				
4+50	1.6313	4.82	Q V				
4+55	1.6647	4.84	Q V				
5+ 0	1.6982	4.87	Q V				
5+ 5	1.7319	4.89	Q V				
5+10	1.7658	4.92	Q V				
5+15	1.7998	4.94	Q V				
5+20	1.8340	4.97	Q V				
5+25	1.8685	5.00	Q V				
5+30	1.9030	5.02	Q V				
5+35	1.9378	5.05	Q V				
5+40	1.9728	5.08	Q V				
5+45	2.0079	5.10	Q V				
5+50	2.0433	5.13	Q V				
5+55	2.0788	5.16	Q V				
6+ 0	2.1146	5.19	Q V				
6+ 5	2.1505	5.22	Q V				
6+10	2.1867	5.25	Q V				
6+15	2.2231	5.28	Q V				
6+20	2.2596	5.31	Q V				
6+25	2.2964	5.34	Q V				
6+30	2.3334	5.37	Q V				
6+35	2.3707	5.40	Q V				
6+40	2.4081	5.44	Q V				
6+45	2.4458	5.47	Q V				
6+50	2.4837	5.50	Q V				
6+55	2.5218	5.54	Q V				
7+ 0	2.5602	5.57	Q V				
7+ 5	2.5988	5.61	Q V				
7+10	2.6377	5.64	Q V				
7+15	2.6768	5.68	Q V				
7+20	2.7162	5.72	Q V				
7+25	2.7558	5.75	Q V				
7+30	2.7957	5.79	Q V				
7+35	2.8358	5.83	Q V				
7+40	2.8763	5.87	Q V				
7+45	2.9169	5.91	Q V				
7+50	2.9579	5.95	Q V				
7+55	2.9992	5.99	Q V				
8+ 0	3.0407	6.03	Q V				
8+ 5	3.0825	6.07	Q V				
8+10	3.1247	6.12	Q V				

8+15	3.1671	6.16	Q	V				
8+20	3.2098	6.21	Q	V				
8+25	3.2529	6.25	Q	V				
8+30	3.2963	6.30	Q	V				
8+35	3.3399	6.34	Q	V				
8+40	3.3840	6.39	Q	V				
8+45	3.4283	6.44	Q	V				
8+50	3.4731	6.49	Q	V				
8+55	3.5181	6.54	Q	V				
9+ 0	3.5635	6.60	Q	V				
9+ 5	3.6093	6.65	Q	V				
9+10	3.6555	6.70	Q	V				
9+15	3.7020	6.76	Q	V				
9+20	3.7489	6.81	Q	V				
9+25	3.7962	6.87	Q	V				
9+30	3.8440	6.93	Q	V				
9+35	3.8921	6.99	Q	V				
9+40	3.9406	7.05	Q	V				
9+45	3.9896	7.11	Q	V				
9+50	4.0390	7.18	Q	V				
9+55	4.0889	7.24	Q	V				
10+ 0	4.1392	7.31	Q	V				
10+ 5	4.1900	7.37	Q	V				
10+10	4.2413	7.45	Q	V				
10+15	4.2930	7.51	Q	V				
10+20	4.3453	7.59	Q	V				
10+25	4.3981	7.66	Q	V				
10+30	4.4514	7.74	Q	V				
10+35	4.5052	7.82	Q	V				
10+40	4.5596	7.90	Q	V				
10+45	4.6146	7.98	Q	V				
10+50	4.6701	8.07	Q	V				
10+55	4.7263	8.15	Q	V				
11+ 0	4.7830	8.24	Q	V				
11+ 5	4.8404	8.33	Q	V				
11+10	4.8985	8.43	Q	V				
11+15	4.9571	8.52	Q	V				
11+20	5.0165	8.62	Q	V				
11+25	5.0766	8.72	Q	V				
11+30	5.1375	8.83	Q	V				
11+35	5.1990	8.94	Q	V				
11+40	5.2614	9.05	Q	V				
11+45	5.3245	9.16	Q	V				
11+50	5.3884	9.29	Q	V				
11+55	5.4532	9.41	Q	V				
12+ 0	5.5189	9.54	Q	V				
12+ 5	5.5845	9.53	Q	V				
12+10	5.6449	8.76	Q	V				
12+15	5.7009	8.14	Q	V				
12+20	5.7557	7.95	Q	V				
12+25	5.8100	7.89	Q	V				
12+30	5.8645	7.90	Q	V				
12+35	5.9192	7.95	Q	V				
12+40	5.9746	8.04	Q	V				
12+45	6.0306	8.13	Q	V				
12+50	6.0875	8.26	Q	V				
12+55	6.1453	8.39	Q	V				
13+ 0	6.2041	8.55	Q	V				
13+ 5	6.2640	8.70	Q	V				
13+10	6.3252	8.87	Q	V				
13+15	6.3875	9.06	Q	V				
13+20	6.4513	9.26	Q	V				
13+25	6.5165	9.47	Q	V				



13+30	6.5833	9.69	
13+35	6.6516	9.92	
13+40	6.7216	10.17	
13+45	6.7934	10.42	
13+50	6.8672	10.71	
13+55	6.9429	10.99	
14+ 0	7.0209	11.32	
14+ 5	7.1011	11.65	
14+10	7.1844	12.10	
14+15	7.2707	12.53	
14+20	7.3602	12.99	
14+25	7.4527	13.44	
14+30	7.5488	13.96	
14+35	7.6485	14.48	
14+40	7.7524	15.09	
14+45	7.8606	15.71	
14+50	7.9739	16.45	
14+55	8.0924	17.21	
15+ 0	8.2172	18.12	
15+ 5	8.3486	19.08	
15+10	8.4881	20.26	
15+15	8.6362	21.51	
15+20	8.7952	23.08	
15+25	8.9694	25.29	
15+30	9.1814	30.79	
15+35	9.4306	36.19	
15+40	9.7155	41.36	
15+45	10.0422	47.44	
15+50	10.4462	58.65	
15+55	10.9648	75.30	
16+ 0	11.7232	110.13	
16+ 5	13.1640	209.20	
16+10	16.6258	502.65	
16+15	19.5119	419.06	
16+20	21.0761	227.13	
16+25	22.1172	151.17	
16+30	22.8623	108.19	
16+35	23.4103	79.56	
16+40	23.8386	62.20	
16+45	24.1780	49.27	
16+50	24.4461	38.94	
16+55	24.6581	30.78	
17+ 0	24.8501	27.88	
17+ 5	25.0186	24.46	
17+10	25.1575	20.17	
17+15	25.2548	14.13	
17+20	25.3429	12.79	
17+25	25.4244	11.84	
17+30	25.5007	11.07	
17+35	25.5727	10.46	
17+40	25.6411	9.93	
17+45	25.7062	9.46	
17+50	25.7685	9.04	
17+55	25.8281	8.66	
18+ 0	25.8854	8.32	
18+ 5	25.9414	8.14	
18+10	26.0017	8.75	
18+15	26.0652	9.22	
18+20	26.1290	9.26	
18+25	26.1922	9.18	
18+30	26.2546	9.06	
18+35	26.3159	8.91	
18+40	26.3762	8.75	

18+45	26.4353	8.58	Q	|	|	|	V |
18+50	26.4932	8.41	Q	|	|	|	V |
18+55	26.5500	8.24	Q	|	|	|	V |
19+ 0	26.6056	8.08	Q	|	|	|	V |
19+ 5	26.6602	7.93	Q	|	|	|	V |
19+10	26.7138	7.78	Q	|	|	|	V |
19+15	26.7663	7.63	Q	|	|	|	V |
19+20	26.8179	7.48	Q	|	|	|	V |
19+25	26.8684	7.34	Q	|	|	|	V |
19+30	26.9180	7.21	Q	|	|	|	V |
19+35	26.9668	7.08	Q	|	|	|	V |
19+40	27.0147	6.96	Q	|	|	|	V |
19+45	27.0618	6.84	Q	|	|	|	V |
19+50	27.1081	6.73	Q	|	|	|	V |
19+55	27.1537	6.62	Q	|	|	|	V |
20+ 0	27.1986	6.51	Q	|	|	|	V |
20+ 5	27.2427	6.41	Q	|	|	|	V |
20+10	27.2862	6.32	Q	|	|	|	V |
20+15	27.3291	6.23	Q	|	|	|	V |
20+20	27.3714	6.14	Q	|	|	|	V |
20+25	27.4130	6.05	Q	|	|	|	V |
20+30	27.4541	5.97	Q	|	|	|	V |
20+35	27.4947	5.88	Q	|	|	|	V |
20+40	27.5346	5.81	Q	|	|	|	V |
20+45	27.5741	5.73	Q	|	|	|	V |
20+50	27.6131	5.66	Q	|	|	|	V |
20+55	27.6516	5.59	Q	|	|	|	V |
21+ 0	27.6896	5.52	Q	|	|	|	V |
21+ 5	27.7271	5.45	Q	|	|	|	V |
21+10	27.7642	5.39	Q	|	|	|	V |
21+15	27.8009	5.32	Q	|	|	|	V |
21+20	27.8371	5.26	Q	|	|	|	V |
21+25	27.8729	5.20	Q	|	|	|	V |
21+30	27.9084	5.14	Q	|	|	|	V |
21+35	27.9434	5.09	Q	|	|	|	V |
21+40	27.9781	5.03	Q	|	|	|	V |
21+45	28.0124	4.98	Q	|	|	|	V |
21+50	28.0463	4.93	Q	|	|	|	V |
21+55	28.0799	4.88	Q	|	|	|	V |
22+ 0	28.1131	4.83	Q	|	|	|	V |
22+ 5	28.1460	4.78	Q	|	|	|	V |
22+10	28.1786	4.73	Q	|	|	|	V|
22+15	28.2109	4.69	Q	|	|	|	V|
22+20	28.2429	4.64	Q	|	|	|	V|
22+25	28.2745	4.60	Q	|	|	|	V|
22+30	28.3059	4.55	Q	|	|	|	V|
22+35	28.3369	4.51	Q	|	|	|	V|
22+40	28.3677	4.47	Q	|	|	|	V|
22+45	28.3983	4.43	Q	|	|	|	V|
22+50	28.4285	4.39	Q	|	|	|	V|
22+55	28.4585	4.35	Q	|	|	|	V|
23+ 0	28.4882	4.32	Q	|	|	|	V|
23+ 5	28.5177	4.28	Q	|	|	|	V|
23+10	28.5469	4.24	Q	|	|	|	V|
23+15	28.5759	4.21	Q	|	|	|	V|
23+20	28.6046	4.17	Q	|	|	|	V|
23+25	28.6331	4.14	Q	|	|	|	V|
23+30	28.6614	4.11	Q	|	|	|	V|
23+35	28.6894	4.07	Q	|	|	|	V|
23+40	28.7173	4.04	Q	|	|	|	V|
23+45	28.7449	4.01	Q	|	|	|	V|
23+50	28.7723	3.98	Q	|	|	|	V|
23+55	28.7995	3.95	Q	|	|	|	V|

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   24+ 0      28.8265      3.92  Q         |         |         |        V|
-----------------------------------------------------------------------
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Valerie Huff

From: Pham, Anthony <Anthony.Pham@lus.sbcounty.gov>
Sent: Tuesday, May 19, 2015 11:55 AM
To: Valerie Huff
Cc: Dulin, Greg; Watson, Dee
Subject: RE: Joshua Tree Hydrology Study addendum

Valerie

The summary is correct. Thanks.

Anthony Pham, P.E., QSD
Land Use Services
Public Works Engineer III

Phone: 909.387.4096 | Fax: 909.387.3223
www.SBCounty.gov

Our job is to create a county in which those who reside and invest can prosper and achieve well-being.

From: Valerie Huff [mailto:ValerieH@wallacegroup.us]
Sent: Tuesday, May 19, 2015 11:53 AM
To: Pham, Anthony
Cc: Dulin, Greg; Watson, Dee
Subject: Joshua Tree Hydrology Study addendum

Hi Anthony, thank you again for your time last week to discuss the County's comments to the Preliminary Hydrology Study for the Joshua Tree solar project.

The following is a summary of our discussion. Please let me know if I have misinterpreted anything.

- NextEra will submit an addendum to the Hydrology Study, to address the County comments.
- The addendum will provide pre and post-development runoff calculations for the project site, and the offsite watershed(s) located between the Coyote Wash and the project site. The Hydrology Study and addendum will not include hydrology calculations for the Coyote Wash, as peak flows for the wash are available through FEMA.
- Runoff calculations will be based on the 100-year storm, in accordance with the methodology described in the County Hydrology Manual.
- If the calculations show an increase in runoff volume for the post-development condition, then onsite retention will be required to reduce post-development volume to pre-development volume.

Thank-you, Valerie

Valerie Huff, PE C72426 | CIVIL ENGINEER
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Valerie Huff

From: Melin, Jess <Jess.Melin@nexteraenergy.com>
Sent: Monday, April 13, 2015 4:05 PM
To: Dulin, Greg; Watson, Dee; Bernhardt, Tricia; Flajole, Andy
Subject: FW: Joshua Tree - Initial Study and Project Description- P201400482.

See comment in red below on JT hydrology study.

Jess

Jess Melin | Project Director, Business Development
NextEra Energy Resources
Mobile: 561.267.1079

From: Pham, Anthony [mailto:Anthony.Pham@lus.sbcounty.gov]
Sent: Monday, April 13, 2015 4:04 PM
To: Melin, Jess
Cc: Creason, Tracy - LUS
Subject: Joshua Tree - Initial Study and Project Description- P201400482.

Please see comments in red.

Anthony Pham, P.E., QSD
Land Use Services
Public Works Engineer III

Phone: 909.387.4096 | Fax: 909.387.3223
www.SBCounty.gov

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From

From: Creason, Tracy - LUS
Sent: Monday, April 13, 2015 2:53 PM
To: Pham, Anthony
Subject: FW: Joshua Tree - Initial Study and Project Description

Would you please weigh in on question/comment #2 below? Thanks!

Please take a moment to complete our 1 Minute Satisfaction Survey www.surveymonkey.com/s/3RK9JH7

Tracy Creason
Land Use Services
Senior Planner

Phone: 760-995-8143 | Fax: 760-995-8176
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From: Melin, Jess [mailto:Jess.Melin@nexteraenergy.com]
Sent: Monday, April 13, 2015 1:55 PM
To: Creason, Tracy - LUS
Cc: Bernhardt, Tricia; Flajole, Andy
Subject: RE: Joshua Tree - Initial Study and Project Description

Thanks Tracy. We will take a look at this. As we have gone through the project documents, maps, and submittals we have come up with a list of questions. Some of these are for you and others are for other agencies in the county. If you would like to do a quick call to discuss the background on these just let us know.

Here are the questions / comments for you (at least I think – feel free to pass us along to someone else):

1. *Can we get a list of referral agencies that the CUP Application went out to? We are keeping a tracker to make sure we are responsive to everyone.*
2. *We saw comments from the Land Development division about drainage requirements. The requirements do not apply to the project. We are not planning on preparing a drainage study. Please let us know if we are missing something on this.* Solar project will need a Drainage study showing the impact between Pre-Development and Post Development. Drainage study shall be prepared in accordance to County hydrology method. I believe you already prepared one but it's not in accordance with the County's method.
3. *A few of the comments from the various agencies seemed to point to us planting vegetation and watering it to obscure the project. Given the desert landscape and water issues we are not planning on planting any vegetation at the project. We plan on installing a fence with some type of material to obscure the project from the highway, but nothing that will require water. Please let us know if we are heading down the wrong path on this.*
4. *We saw a statement that a dust control plan is needed now to complete review of the application. Typically the dust control plan is completed by the EPC contractor much closer to construction. The EPC contractor usually looks at the mitigation requirements in the permit and uses them to create a dust control plan that is submitted for approval prior to the issuance of building permits. Do we need a dust control plan now, or can it wait until the EPC comes on board?*

Here are the questions that I think we need to discuss with someone else in the County. Please let us know who the right person to contact is to discuss these items.

1. *The title report for the project property has quite a few public easements pertaining to roads. We would like to discuss the easements and whether or not they are in use and what the possibilities are of getting some of them abandoned by the county. Who should we engage on this?*
2. *How and when should we start the lot merger? Who should we work with on this?*
3. *The Fire Department asked for a copy of the site plan. Should we provide this directly to them or give this to you to provide?*