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PRELIMINARY DRAINAGE REPORT

Central Plaza

Lake Elsinore, Riverside County, CA

Prepared for:
Peninsula Retail Partners
417 29th Street
Newport Beach, CA 92663

Prepared under the Supervision of:

Lucas Glauser, P.E.
December 2015

DEA Job No. PRPD00000001

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- Hydrologic Soils Group Map
- NOAA Atlas 14, Volume 6 Version 2 – Lake Elsinore
- CalTrans Right-of-Way run-on Calculations
- Flood Hazard Mitigation Letter

1. PROJECT DESCRIPTION

The Central Plaza project is located within the City of Lake Elsinore, County of Riverside at the south east corner of Collier Ave. and Central Ave. The project site is bounded on the north by Central Ave., to the south by vacant undeveloped land, to the east by the south bound corona freeway on-ramp, and to the west by Collier Ave. The surrounding land use is mainly commercial. The reader is instructed to refer to the 'Vicinity Map' included in Appendix 'A' of this report for a depiction of the project location.

The site measures approximately 7.41-acres and is intended to be developed into a commercial complex. Currently, the majority of the site is vacant and undeveloped with a residence at the north west corner of the parcel.

Part of the Project will include providing 'Off-Site' improvements that include roadway improvements to Collier Ave., and Central Ave.

The purpose of the enclosed Preliminary Hydrology Study is to determine the peak flows resulting from developing the site, and provide recommendations for the storm drain system serving the Project. Analysis will be performed for the 100-year storm event, as applicable. Calculations are based on the methodologies outlined in the County of Riverside Hydrology Manual.

2. EXISTING HYDROLOGIC CHARACTERISTICS

The project site is located within the Santa Ana River Watershed and as stated in the previous section, the proposed project site is comprised of approximately 7.41-acres of mostly vacant, undeveloped land. Visiting the site reveals the land is primarily barren with weeds, annual grasses and rock outcrops. Vegetated coverage should be considered 'Poor'. The site is considered a 'Desert' area with the majority of the site consisting of 'B' classification soils.

Topography shows the site drains from the north east to the south west end of the site. The site has medium gradient with an elevation drop of roughly 16-feet over a distance of approximately 834-feet.

The project site is located within the Lake Elsinore Quadrangle portion of the County and is considered a 'Desert' area. As a result, the 'Slope of the Intensity-Duration Curve' of 0.48 was used during Hydrology calculations. Also, the one-hour point rainfall for a 2-year design storm frequency is 0.48 inches, and the one-hour point rainfall for a 100-year design storm frequency is 1.31 inches.

The proposed project site is not within a Riverside County Flood Control Master Drainage Plan Area. The existing site receives flow from the Cal-Trans right-of-way to the east and drains west to a drainage ditch that runs along Collier Ave. The runoff from the project is conveyed to the 3rd Street Channel and out to the Temescal Wash.

As a result of flood by the 3rd street channel the majority of the project site is located within the Special Flood Hazard Area Zone AO, with a determined flood depth of 1 foot.

3. DEVELOPED HYDROLOGIC CHARACTERISTICS

Development of the site will result in a commercial center. The developed site will also include associated parking, loading areas, landscape areas, and drive aisles. The overall drainage pattern will remain unchanged as a result of the development. The site will continue to drain from east to west with the project discharging into a proposed storm drain system that will convey the water to the 3rd street channel. Upstream flows from Cal-Trans right-of-way will be intercepted via storm drain inlet and conveyed west to the proposed storm drain in Collier Ave.

The drainage area will have an increased impervious area from existing and will result in slightly higher peak runoff values. The increase in peak runoff shall be mitigated to a level at or below existing levels through the use of an underground detention basin and bio-retention. The post development detention requirements are shown in the results section of this report and calculations can be seen in Appendix D.

All of the Buildings shall be constructed so that the FF is above the established Flood Elevation published by Fema. Water quality requirements will be met using a large Bioretention facility along Collier Ave.

4. METHODOLOGY

Hydrologic calculations for the project were performed using CIVILCADD/CIVILDESIGN Engineering Software, Version 7.1. 'Peak Flow' and 'Time of Concentration' values for each storm event were obtained using the 'Riverside County Rational Hydrology Program' option within the software.

The 'Time of Concentration' and other pertinent information obtained from the rational method analysis was then used to generate a 'Unit Hydrograph' for each respective drainage area, as applicable. The SCS Curve Number entry for the unit hydrograph was calibrated in order to achieve a peak flow value consistent with the rational method analysis. The 'Unit Hydrograph Analysis' was performed using the CIVILCADD/CIVILDESIGN Engineering Software previously mentioned.

As appropriate, the resulting 'Unit Hydrograph' was then imported into '*Bentley PondPack, Version 10.1*' in order to perform basin routing and outflow analysis of each detention basin.

5. SUMMARY OF HYDROLOGIC RESULTS

The following section provides a summary of the results of the enclosed hydrologic analysis. The reader shall refer to Appendix 'C' included with this report for complete calculations.

Central Plaza Storm Water Runoff Summary

Existing Condition

Area	Acreage, ac	Storm Duration	100 Peak Runoff, cfs	10yr Peak Runoff, cfs	100yr Runoff Volume, cu.ft.
Total	34.41	1-hr	55.57	32.74	142,200
		3-hr	45.68	27.48	205,900
		6-hr	43.72	26.32	259,500
		24-hr	24.08	13.18	447,475

In order to mitigate the peak flows, an underground detention basin is proposed. This detention basin along with outlet discharge control is able to mitigate peak runoff flows to a level at or below pre-development conditions. A summary of the developed condition peak flows including flow mitigation is provided in the following table.

Central Plaza Storm Water Runoff Summary

Developed Condition

Area	Acreage, ac	Storm Duration	100yr Peak Runoff, cfs	10yr Peak Runoff, cfs	100yr Runoff Volume, cu.ft.	100yr Runoff Allowable, cfs	100yr Mitigated Peak Flow, cfs
Onsite	7.41	1-hr	19.52	12.07	33,600	14.07	6.89
		3-hr	13.21	8.39	53,150	17.46	13.21
		6-hr	12.31	7.83	73,250	18.33	12.31
		24-hr	6.24	3.77	140,150	13.77	6.24
Offsite	27	1-hr	41.5	21	74,300	-	41.5
		3-hr	28.22	13.58	76,150	-	28.22
		6-hr	25.39	12	89,130	-	25.39
		24-hr	10.31	2.09	123,450	-	10.31
Total	34.41	1-hr	61.02	33.07	107,900	55.57	48.39
		3-hr	41.43	21.97	129,300	45.68	41.43
		6-hr	37.7	19.83	162,380	43.72	37.7
		24-hr	16.55	5.86	263,600	24.08	16.55

5. SUMMARY OF HYDROLOGIC RESULTS

The following table provides detention volumes required to achieve peak runoff mitigation for the basin.

Area	Peak Storage Volume, cf
Onsite	16,000

By using the detention described above and the building elevations and layout as shown in the Developed Condition Drainage Map life and property will be protected during 100-year storm event. Furthermore the proposed development will not negatively impact existing storm drain facilities and adjacent properties.

VICINITY MAP

Vicinity Map

Central Plaza, Lake Elsinore

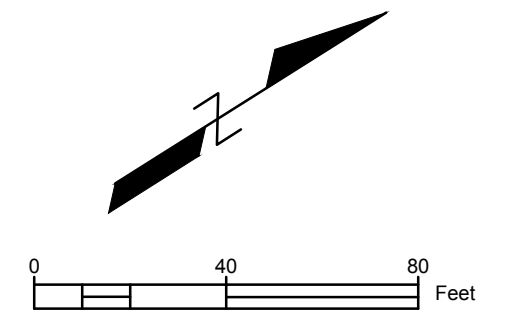


☆ Central Plaza Project Location



3000 ft

HYDROLOGY MAP

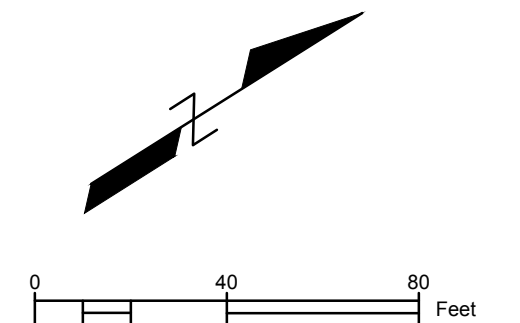


- PROJECT BOUNDARY
- DRAINAGE BOUNDARY
- PROPOSED STORM DRAIN
- FLOW PATH
- NODE NUMBER/
PROPOSED ELEVATION



CONCEPTUAL
EXISTING DRAINAGE MAP

IT NO.:



Growing Name: D:\Projects\PRP000000001\0600INF-0\0670R-reports\Hydrology\Report\Conceptual Report\Appendix B

HYDROLOGY ANALYSIS

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Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 12/22/15

File:130160DEV010.out

CENTRAL PLAZA
LAKE ELSINORE
PROPOSED DRAINAGE CALCULATIONS
10 YEAR DESIGN STORM

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

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

Program License Serial Number 4014

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

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

2 year, 1 hour precipitation = 0.480(In.)

100 year, 1 hour precipitation = 1.310(In.)

Storm event year = 10.0

Calculated rainfall intensity data:

1 hour intensity = 0.821(In/Hr)

Slope of intensity duration curve = 0.4800

+++++
Process from Point/Station 101.100 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 355.000(Ft.)

Top (of initial area) elevation = 1286.500(Ft.)

Bottom (of initial area) elevation = 1278.580(Ft.)

Difference in elevation = 7.920(Ft.)

Slope = 0.02231 s(percent)= 2.23

$TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 6.722 min.

Rainfall intensity = 2.349(In/Hr) for a 10.0 year storm

COMMERCIAL subarea type

Runoff Coefficient = 0.851

Decimal fraction soil group A = 1.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 0.000

RI index for soil(AMC 2) = 32.00

Pervious area fraction = 0.100; Impervious fraction = 0.900

Initial subarea runoff = 1.039(CFS)

Total initial stream area = 0.520(Ac.)

Pervious area fraction = 0.100

++++++
 Process from Point/Station 101.000 to Point/Station 102.000
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1278.580(Ft.)
 Downstream point/station elevation = 1277.970(Ft.)
 Pipe length = 145.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 1.039(CFS)
 Given pipe size = 12.00(In.)
 Calculated individual pipe flow = 1.039(CFS)
 Normal flow depth in pipe = 5.64(In.)
 Flow top width inside pipe = 11.98(In.)
 Critical Depth = 5.14(In.)
 Pipe flow velocity = 2.86(Ft/s)
 Travel time through pipe = 0.84 min.
 Time of concentration (TC) = 7.57 min.

++++++
 Process from Point/Station 102.100 to Point/Station 102.000
 **** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
 Runoff Coefficient = 0.871
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Time of concentration = 7.57 min.
 Rainfall intensity = 2.219(In/Hr) for a 10.0 year storm
 Subarea runoff = 1.411(CFS) for 0.730(Ac.)
 Total runoff = 2.451(CFS) Total area = 1.250(Ac.)

++++++
 Process from Point/Station 102.200 to Point/Station 102.000
 **** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
 Runoff Coefficient = 0.871
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Time of concentration = 7.57 min.
 Rainfall intensity = 2.219(In/Hr) for a 10.0 year storm
 Subarea runoff = 0.657(CFS) for 0.340(Ac.)
 Total runoff = 3.108(CFS) Total area = 1.590(Ac.)

++++++
 Process from Point/Station 102.000 to Point/Station 103.000
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1277.970(Ft.)
 Downstream point/station elevation = 1277.460(Ft.)
 Pipe length = 90.00(Ft.) Manning's N = 0.013

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No. of pipes = 1 Required pipe flow = 3.108(CFS)
Given pipe size = 18.00(In.)
Calculated individual pipe flow = 3.108(CFS)
Normal flow depth in pipe = 7.84(In.)
Flow top width inside pipe = 17.85(In.)
Critical Depth = 8.04(In.)
Pipe flow velocity = 4.21(Ft/s)
Travel time through pipe = 0.36 min.
Time of concentration (TC) = 7.92 min.

++++
Process from Point/Station 103.100 to Point/Station 103.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.871
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 7.92 min.
Rainfall intensity = 2.171(In/Hr) for a 10.0 year storm
Subarea runoff = 2.571(CFS) for 1.360(Ac.)
Total runoff = 5.679(CFS) Total area = 2.950(Ac.)

++++
Process from Point/Station 103.000 to Point/Station 104.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1277.460(Ft.)
Downstream point/station elevation = 1277.220(Ft.)
Pipe length = 32.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 5.679(CFS)
Given pipe size = 21.00(In.)
Calculated individual pipe flow = 5.679(CFS)
Normal flow depth in pipe = 9.41(In.)
Flow top width inside pipe = 20.89(In.)
Critical Depth = 10.52(In.)
Pipe flow velocity = 5.43(Ft/s)
Travel time through pipe = 0.10 min.
Time of concentration (TC) = 8.02 min.

++++
Process from Point/Station 103.000 to Point/Station 104.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 2.950(Ac.)
Runoff from this stream = 5.679(CFS)
Time of concentration = 8.02 min.
Rainfall intensity = 2.158(In/Hr)

++++
Process from Point/Station 104.100 to Point/Station 104.110
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 138.000(Ft.)
Page 3

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Top (of initial area) elevation = 1280.390(Ft.)
Bottom (of initial area) elevation = 1278.340(Ft.)
Difference in elevation = 2.050(Ft.)
Slope = 0.01486 s(percent)= 1.49
TC = $k(0.300)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration = 5.000 min.
Rainfall intensity = 2.708(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.875
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.332(CFS)
Total initial stream area = 0.140(Ac.)
Pervious area fraction = 0.100

+++++
Process from Point/Station 104.110 to Point/Station 104.120
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1278.340(Ft.)
Downstream point/station elevation = 1277.250(Ft.)
Pipe length = 192.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 0.332(CFS)
Given pipe size = 9.00(In.)
Calculated individual pipe flow = 0.332(CFS)
Normal flow depth in pipe = 3.17(In.)
Flow top width inside pipe = 8.60(In.)
Critical Depth = 3.09(In.)
Pipe flow velocity = 2.39(Ft/s)
Travel time through pipe = 1.34 min.
Time of concentration (TC) = 6.34 min.

+++++
Process from Point/Station 104.210 to Point/Station 104.120
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.873
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 6.34 min.
Rainfall intensity = 2.416(In/Hr) for a 10.0 year storm
Subarea runoff = 1.202(CFS) for 0.570(Ac.)
Total runoff = 1.533(CFS) Total area = 0.710(Ac.)

+++++
Process from Point/Station 104.120 to Point/Station 104.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1277.250(Ft.)

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 Downstream point/station elevation = 1277.220(Ft.)
 Pipe length = 124.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 1.533(CFS)
 Given pipe size = 24.00(In.)
 Calculated individual pipe flow = 1.533(CFS)
 Normal flow depth in pipe = 11.09(In.)
 Flow top width inside pipe = 23.93(In.)
 Critical Depth = 5.14(In.)
 Pipe flow velocity = 1.08(Ft/s)
 Travel time through pipe = 1.91 min.
 Time of concentration (TC) = 8.25 min.

+++++
 Process from Point/Station 104.120 to Point/Station 104.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 0.710(Ac.)
 Runoff from this stream = 1.533(CFS)
 Time of concentration = 8.25 min.
 Rainfall intensity = 2.129(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
---------------	--------------------	-------------	-------------------------------

1	5.679	8.02	2.158
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2	1.533	8.25	2.129
---	-------	------	-------

Largest stream flow has longer or shorter time of concentration

Qp = 5.679 + sum of
 Qa Tb/Ta
 1.533 * 0.972 = 1.491
 Qp = 7.169

Total of 2 streams to confluence:
 Flow rates before confluence point:

5.679	1.533
-------	-------

Area of streams before confluence:

2.950	0.710
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Results of confluence:

Total flow rate = 7.169(CFS)
 Time of concentration = 8.021 min.
 Effective stream area after confluence = 3.660(Ac.)

+++++
 Process from Point/Station 104.000 to Point/Station 105.000
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1277.220(Ft.)
 Downstream point/station elevation = 1276.620(Ft.)
 Pipe length = 50.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 7.169(CFS)
 Given pipe size = 21.00(In.)
 Calculated individual pipe flow = 7.169(CFS)
 Normal flow depth in pipe = 9.41(In.)
 Flow top width inside pipe = 20.89(In.)
 Critical Depth = 11.89(In.)
 Pipe flow velocity = 6.87(Ft/s)
 Travel time through pipe = 0.12 min.
 Time of concentration (TC) = 8.14 min.

++++++
 Process from Point/Station 105.100 to Point/Station 105.000
 **** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
 Runoff Coefficient = 0.870
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Time of concentration = 8.14 min.
 Rainfall intensity = 2.143(In/Hr) for a 10.0 year storm
 Subarea runoff = 2.742(CFS) for 1.470(Ac.)
 Total runoff = 9.911(CFS) Total area = 5.130(Ac.)

++++++
 Process from Point/Station 105.000 to Point/Station 100.000
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1276.620(Ft.)
 Downstream point/station elevation = 1272.000(Ft.)
 Pipe length = 36.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 9.911(CFS)
 Given pipe size = 15.00(In.)
 Calculated individual pipe flow = 9.911(CFS)
 Normal flow depth in pipe = 6.86(In.)
 Flow top width inside pipe = 14.94(In.)
 Critical Depth = 14.19(In.)
 Pipe flow velocity = 18.13(Ft/s)
 Travel time through pipe = 0.03 min.
 Time of concentration (TC) = 8.17 min.

++++++
 Process from Point/Station 105.000 to Point/Station 100.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 5.130(Ac.)
 Runoff from this stream = 9.911(CFS)
 Time of concentration = 8.17 min.
 Rainfall intensity = 2.139(In/Hr)

++++++
 Process from Point/Station 201.100 to Point/Station 200.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 730.000(Ft.)
 Top (of initial area) elevation = 1278.760(Ft.)
 Bottom (of initial area) elevation = 1270.750(Ft.)
 Difference in elevation = 8.010(Ft.)
 Slope = 0.01097 s(percent)= 1.10
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.337 min.
 Rainfall intensity = 1.911(In/Hr) for a 10.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.868

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Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 3.201(CFS)
Total initial stream area = 1.930(Ac.)
Pervious area fraction = 0.100

++++
Process from Point/Station 201.100 to Point/Station 200.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 1.930(Ac.)
Runoff from this stream = 3.201(CFS)
Time of concentration = 10.34 min.
Rainfall intensity = 1.911(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
------------	-----------------	----------	----------------------------

1	9.911	8.17	2.139
2	3.201	10.34	1.911

Largest stream flow has longer or shorter time of concentration

Qp = 9.911 + sum of
Qa Tb/Ta
3.201 * 0.791 = 2.532
Qp = 12.443

Total of 2 streams to confluence:
Flow rates before confluence point:
9.911 3.201

Area of streams before confluence:
5.130 1.930

Results of confluence:
Total flow rate = 12.443(CFS)
Time of concentration = 8.175 min.
Effective stream area after confluence = 7.060(Ac.)

++++
Process from Point/Station 200.000 to Point/Station 100.000
**** SUBAREA FLOW ADDITION ****

UNDEVELOPED (good cover) subarea

Runoff Coefficient = 0.643
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 61.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Time of concentration = 8.17 min.
Rainfall intensity = 2.139(In/Hr) for a 10.0 year storm
Subarea runoff = 0.468(CFS) for 0.340(Ac.)
Total runoff = 12.911(CFS) Total area = 7.400(Ac.)
End of computations, total study area = 7.40 (Ac.)
The following figures may

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be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.141

Area averaged RI index number = 54.5

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Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 12/22/15

File:130160DEV100.out

CENTRAL PLAZA
LAKE ELSINORE
PROPOSED DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

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

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

Program License Serial Number 4014

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

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

2 year, 1 hour precipitation = 0.480(In.)
100 year, 1 hour precipitation = 1.310(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.310(In/Hr)
Slope of intensity duration curve = 0.4800

+++++
Process from Point/Station 101.100 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 355.000(Ft.)
Top (of initial area) elevation = 1286.500(Ft.)
Bottom (of initial area) elevation = 1278.580(Ft.)
Difference in elevation = 7.920(Ft.)
Slope = 0.02231 s(percent)= 2.23
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
Initial area time of concentration = 6.722 min.
Rainfall intensity = 3.746(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.878
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 52.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 1.710(CFS)
Total initial stream area = 0.520(Ac.)
Pervious area fraction = 0.100

+++++
 Process from Point/Station 101.000 to Point/Station 102.000
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1278.580(Ft.)
 Downstream point/station elevation = 1277.970(Ft.)
 Pipe length = 145.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 1.710(CFS)
 Given pipe size = 12.00(In.)
 Calculated individual pipe flow = 1.710(CFS)
 Normal flow depth in pipe = 7.68(In.)
 Flow top width inside pipe = 11.52(In.)
 Critical Depth = 6.67(In.)
 Pipe flow velocity = 3.22(Ft/s)
 Travel time through pipe = 0.75 min.
 Time of concentration (TC) = 7.47 min.

+++++
 Process from Point/Station 102.100 to Point/Station 102.000
 **** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
 Runoff Coefficient = 0.890
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 74.80
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Time of concentration = 7.47 min.
 Rainfall intensity = 3.561(In/Hr) for a 100.0 year storm
 Subarea runoff = 2.313(CFS) for 0.730(Ac.)
 Total runoff = 4.023(CFS) Total area = 1.250(Ac.)

+++++
 Process from Point/Station 102.200 to Point/Station 102.000
 **** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
 Runoff Coefficient = 0.890
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 74.80
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Time of concentration = 7.47 min.
 Rainfall intensity = 3.561(In/Hr) for a 100.0 year storm
 Subarea runoff = 1.077(CFS) for 0.340(Ac.)
 Total runoff = 5.100(CFS) Total area = 1.590(Ac.)

+++++
 Process from Point/Station 102.000 to Point/Station 103.000
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1277.970(Ft.)
 Downstream point/station elevation = 1277.460(Ft.)
 Pipe length = 90.00(Ft.) Manning's N = 0.013

130160DEV100.TXT
No. of pipes = 1 Required pipe flow = 5.100(CFS)
Given pipe size = 18.00(In.)
Calculated individual pipe flow = 5.100(CFS)
Normal flow depth in pipe = 10.52(In.)
Flow top width inside pipe = 17.74(In.)
Critical Depth = 10.42(In.)
Pipe flow velocity = 4.76(Ft/s)
Travel time through pipe = 0.32 min.
Time of concentration (TC) = 7.79 min.

++++
Process from Point/Station 103.100 to Point/Station 103.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.890
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 7.79 min.
Rainfall intensity = 3.491(In/Hr) for a 100.0 year storm
Subarea runoff = 4.224(CFS) for 1.360(Ac.)
Total runoff = 9.324(CFS) Total area = 2.950(Ac.)

++++
Process from Point/Station 103.000 to Point/Station 104.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1277.460(Ft.)
Downstream point/station elevation = 1277.220(Ft.)
Pipe length = 32.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 9.324(CFS)
Given pipe size = 21.00(In.)
Calculated individual pipe flow = 9.324(CFS)
Normal flow depth in pipe = 12.69(In.)
Flow top width inside pipe = 20.54(In.)
Critical Depth = 13.63(In.)
Pipe flow velocity = 6.13(Ft/s)
Travel time through pipe = 0.09 min.
Time of concentration (TC) = 7.88 min.

++++
Process from Point/Station 103.000 to Point/Station 104.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 2.950(Ac.)
Runoff from this stream = 9.324(CFS)
Time of concentration = 7.88 min.
Rainfall intensity = 3.472(In/Hr)

++++
Process from Point/Station 104.100 to Point/Station 104.110
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 138.000(Ft.)
Page 3

130160DEV100.TXT
 Top (of initial area) elevation = 1280.390(Ft.)
 Bottom (of initial area) elevation = 1278.340(Ft.)
 Difference in elevation = 2.050(Ft.)
 Slope = 0.01486 s(percent)= 1.49
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Warning: TC computed to be less than 5 min.; program is assuming the
 time of concentration is 5 minutes.
 Initial area time of concentration = 5.000 min.
 Rainfall intensity = 4.318(In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.892
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 74.80
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 0.539(CFS)
 Total initial stream area = 0.140(Ac.)
 Pervious area fraction = 0.100

+++++
 Process from Point/Station 104.110 to Point/Station 104.120
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1278.340(Ft.)
 Downstream point/station elevation = 1277.250(Ft.)
 Pipe length = 192.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 0.539(CFS)
 Given pipe size = 9.00(In.)
 Calculated individual pipe flow = 0.539(CFS)
 Normal flow depth in pipe = 4.14(In.)
 Flow top width inside pipe = 8.97(In.)
 Critical Depth = 3.99(In.)
 Pipe flow velocity = 2.72(Ft/s)
 Travel time through pipe = 1.18 min.
 Time of concentration (TC) = 6.18 min.

+++++
 Process from Point/Station 104.210 to Point/Station 104.120
 **** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
 Runoff Coefficient = 0.891
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 74.80
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Time of concentration = 6.18 min.
 Rainfall intensity = 3.901(In/Hr) for a 100.0 year storm
 Subarea runoff = 1.981(CFS) for 0.570(Ac.)
 Total runoff = 2.520(CFS) Total area = 0.710(Ac.)

+++++
 Process from Point/Station 104.120 to Point/Station 104.000
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1277.250(Ft.)

130160DEV100.TXT

Downstream point/station elevation = 1277.220(Ft.)
Pipe length = 124.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 2.520(CFS)
Given pipe size = 24.00(In.)
Calculated individual pipe flow = 2.520(CFS)
Normal flow depth in pipe = 15.02(In.)
Flow top width inside pipe = 23.23(In.)
Critical Depth = 6.62(In.)
Pipe flow velocity = 1.22(Ft/s)
Travel time through pipe = 1.70 min.
Time of concentration (TC) = 7.87 min.

+++++
Process from Point/Station 104.120 to Point/Station 104.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 0.710(Ac.)
Runoff from this stream = 2.520(CFS)
Time of concentration = 7.87 min.
Rainfall intensity = 3.472(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	9.324	7.88	3.472
2	2.520	7.87	3.472

Largest stream flow has longer time of concentration
 $Q_p = \frac{9.324 + \text{sum of } Q_b}{I_a/I_b}$
 $Q_p = \frac{2.520 * 1.000}{1.000} = 2.520$
 $Q_p = 11.843$

Total of 2 streams to confluence:
Flow rates before confluence point:
9.324 2.520
Area of streams before confluence:
2.950 0.710
Results of confluence:
Total flow rate = 11.843(CFS)
Time of concentration = 7.875 min.
Effective stream area after confluence = 3.660(Ac.)

+++++
Process from Point/Station 104.000 to Point/Station 105.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1277.220(Ft.)
Downstream point/station elevation = 1276.620(Ft.)
Pipe length = 50.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 11.843(CFS)
Given pipe size = 21.00(In.)
Calculated individual pipe flow = 11.843(CFS)
Normal flow depth in pipe = 12.73(In.)
Flow top width inside pipe = 20.52(In.)
Critical Depth = 15.39(In.)
Pipe flow velocity = 7.76(Ft/s)
Travel time through pipe = 0.11 min.
Time of concentration (TC) = 7.98 min.

+++++
 Process from Point/Station 105.100 to Point/Station 105.000
 **** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
 Runoff Coefficient = 0.890
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 74.80
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Time of concentration = 7.98 min.
 Rainfall intensity = 3.450(In/Hr) for a 100.0 year storm
 Subarea runoff = 4.511(CFS) for 1.470(Ac.)
 Total runoff = 16.355(CFS) Total area = 5.130(Ac.)

+++++
 Process from Point/Station 105.000 to Point/Station 100.000
 **** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1276.620(Ft.)
 Downstream point/station elevation = 1272.000(Ft.)
 Pipe length = 36.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 16.355(CFS)
 Given pipe size = 15.00(In.)
 Calculated individual pipe flow = 16.355(CFS)
 Normal flow depth in pipe = 9.30(In.)
 Flow top width inside pipe = 14.56(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 20.44(Ft/s)
 Travel time through pipe = 0.03 min.
 Time of concentration (TC) = 8.01 min.

+++++
 Process from Point/Station 105.000 to Point/Station 100.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 5.130(Ac.)
 Runoff from this stream = 16.355(CFS)
 Time of concentration = 8.01 min.
 Rainfall intensity = 3.443(In/Hr)

+++++
 Process from Point/Station 201.100 to Point/Station 200.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 730.000(Ft.)
 Top (of initial area) elevation = 1278.760(Ft.)
 Bottom (of initial area) elevation = 1270.750(Ft.)
 Difference in elevation = 8.010(Ft.)
 Slope = 0.01097 s(percent)= 1.10
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.337 min.
 Rainfall intensity = 3.047(In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.888

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Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 5.225(CFS)
Total initial stream area = 1.930(Ac.)
Pervious area fraction = 0.100

++++
Process from Point/Station 201.100 to Point/Station 200.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 1.930(Ac.)
Runoff from this stream = 5.225(CFS)
Time of concentration = 10.34 min.
Rainfall intensity = 3.047(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
------------	-----------------	----------	----------------------------

1	16.355	8.01	3.443
2	5.225	10.34	3.047

Largest stream flow has longer or shorter time of concentration

Qp = 16.355 + sum of
Qa Tb/Ta
5.225 * 0.775 = 4.049
Qp = 20.404

Total of 2 streams to confluence:
Flow rates before confluence point:
16.355 5.225

Area of streams before confluence:
5.130 1.930

Results of confluence:
Total flow rate = 20.404(CFS)
Time of concentration = 8.012 min.
Effective stream area after confluence = 7.060(Ac.)

++++
Process from Point/Station 200.000 to Point/Station 100.000
**** SUBAREA FLOW ADDITION ****

UNDEVELOPED (good cover) subarea

Runoff Coefficient = 0.815
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 78.80
Pervious area fraction = 1.000; Impervious fraction = 0.000
Time of concentration = 8.01 min.
Rainfall intensity = 3.443(In/Hr) for a 100.0 year storm
Subarea runoff = 0.954(CFS) for 0.340(Ac.)
Total runoff = 21.358(CFS) Total area = 7.400(Ac.)
End of computations, total study area = 7.40 (Ac.)
The following figures may

130160DEV100.TXT
be used for a unit hydrograph study of the same area.
Area averaged pervious area fraction(A_p) = 0.141
Area averaged RI index number = 54.5

130160EX010.TXT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 12/22/15 File:130160EX010.out

CENTRAL PLAZA
LAKE ELSINORE
EXISTING DRAINAGE CALCULATIONS
10 YEAR DESIGN STORM

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

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

Program License Serial Number 4014

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

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

2 year, 1 hour precipitation = 0.480(In.)
100 year, 1 hour precipitation = 1.310(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.821(In/Hr)
Slope of intensity duration curve = 0.4800

+++++
Process from Point/Station 501.000 to Point/Station 500.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 834.000(Ft.)
Top (of initial area) elevation = 1284.610(Ft.)
Bottom (of initial area) elevation = 1268.660(Ft.)
Difference in elevation = 15.950(Ft.)
Slope = 0.01912 s(percent)= 1.91
 $TC = k(0.530)*[(length^3)/(elevation\ change)]^{0.2}$
Initial area time of concentration = 17.235 min.
Rainfall intensity = 1.495(In/Hr) for a 10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.719
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 78.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 4.193(CFS)
Total initial stream area = 3.900(Ac.)
Pervious area fraction = 1.000

130160EX010.TXT

+++++
 Process from Point/Station 501.000 to Point/Station 500.000
 ***** CONFLUENCE OF MINOR STREAMS *****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 3.900(Ac.)
 Runoff from this stream = 4.193(CFS)
 Time of concentration = 17.24 min.
 Rainfall intensity = 1.495(In/Hr)

+++++
 Process from Point/Station 502.100 to Point/Station 502.000
 ***** USER DEFINED FLOW INFORMATION AT A POINT *****

Rainfall intensity = 1.652(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.725
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 User specified values are as follows:
 TC = 14.00 min. Rain intensity = 1.65(In/Hr)
 Total area = 27.00(Ac.) Total runoff = 25.00(CFS)

+++++
 Process from Point/Station 502.000 to Point/Station 500.000
 ***** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION *****

Top of natural channel elevation = 1271.000(Ft.)
 End of natural channel elevation = 1268.660(Ft.)
 Length of natural channel = 533.000(Ft.)
 Estimated mean flow rate at midpoint of channel = 26.625(CFS)

Natural valley channel type used
 L.A. County flood control district formula for channel velocity:
 $Velocity(ft/s) = (7 + 8(q(English\ Units)^{.352})(slope^{.5}))$
 velocity using mean channel flow = 2.15(Ft/s)

Correction to map slope used on extremely rugged channels with
 drops and waterfalls (Plate D-6.2)

Normal channel slope = 0.0044
 Corrected/adjusted channel slope = 0.0044
 Travel time = 4.14 min. TC = 18.14 min.

Adding area flow to channel
 UNDEVELOPED (poor cover) subarea
 Runoff Coefficient = 0.716
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 78.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 1.459(In/Hr) for a 10.0 year storm
 Subarea runoff = 3.664(CFS) for 3.510(Ac.)
 Total runoff = 28.664(CFS) Total area = 30.510(Ac.)

+++++
 Process from Point/Station 502.000 to Point/Station 500.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 30.510(Ac.)
 Runoff from this stream = 28.664(CFS)
 Time of concentration = 18.14 min.
 Rainfall intensity = 1.459(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
------------	-----------------	----------	----------------------------

1	4.193	17.24	1.495
2	28.664	18.14	1.459

Largest stream flow has longer time of concentration

Qp = 28.664 + sum of

$$Q_b \frac{I_a}{I_b}$$

$$4.193 * 0.976 = 4.091$$
 Qp = 32.755

Total of 2 streams to confluence:
 Flow rates before confluence point:
 4.193 28.664

Area of streams before confluence:
 3.900 30.510

Results of confluence:

Total flow rate = 32.755(CFS)
 Time of concentration = 18.138 min.
 Effective stream area after confluence = 34.410(Ac.)
 End of computations, total study area = 34.41 (Ac.)

The following figures may
 be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.608
 Area averaged RI index number = 60.7

130160EX100.TXT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 12/22/15 File:130160ex100.out

CENTRAL PLAZA
LAKE ELSINORE
EXISTING DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

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

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

Program License Serial Number 4014

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

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

2 year, 1 hour precipitation = 0.480(In.)
100 year, 1 hour precipitation = 1.310(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.310(In/Hr)
Slope of intensity duration curve = 0.4800

+++++
Process from Point/Station 501.000 to Point/Station 500.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 834.000(Ft.)
Top (of initial area) elevation = 1284.610(Ft.)
Bottom (of initial area) elevation = 1268.660(Ft.)
Difference in elevation = 15.950(Ft.)
Slope = 0.01912 s(percent)= 1.91
 $TC = k(0.530)*[(length^3)/(elevation\ change)]^{0.2}$
Initial area time of concentration = 17.235 min.
Rainfall intensity = 2.384(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.846
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 89.80
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 7.868(CFS)
Total initial stream area = 3.900(Ac.)
Pervious area fraction = 1.000

130160EX100.TXT

+++++
 Process from Point/Station 501.000 to Point/Station 500.000
 ***** CONFLUENCE OF MINOR STREAMS *****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 3.900(Ac.)
 Runoff from this stream = 7.868(CFS)
 Time of concentration = 17.24 min.
 Rainfall intensity = 2.384(In/Hr)

+++++
 Process from Point/Station 502.100 to Point/Station 502.000
 ***** USER DEFINED FLOW INFORMATION AT A POINT *****

Rainfall intensity = 2.634(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.834
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 74.80
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 User specified values are as follows:
 TC = 14.00 min. Rain intensity = 2.63(In/Hr)
 Total area = 27.00(Ac.) Total runoff = 40.00(CFS)

+++++
 Process from Point/Station 502.000 to Point/Station 500.000
 ***** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION *****

Top of natural channel elevation = 1271.000(Ft.)
 End of natural channel elevation = 1268.660(Ft.)
 Length of natural channel = 533.000(Ft.)
 Estimated mean flow rate at midpoint of channel = 42.600(CFS)

Natural valley channel type used
 L.A. County flood control district formula for channel velocity:
 $\text{Velocity(ft/s)} = (7 + 8(q(\text{English Units})^{.352})(\text{slope}^{.5}))$
 velocity using mean channel flow = 2.45(Ft/s)

Correction to map slope used on extremely rugged channels with
 drops and waterfalls (Plate D-6.2)
 Normal channel slope = 0.0044
 Corrected/adjusted channel slope = 0.0044
 Travel time = 3.63 min. TC = 17.63 min.

Adding area flow to channel
 UNDEVELOPED (poor cover) subarea
 Runoff Coefficient = 0.846
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 89.80
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.358(In/Hr) for a 100.0 year storm
 Subarea runoff = 7.001(CFS) for 3.510(Ac.)
 Total runoff = 47.001(CFS) Total area = 30.510(Ac.)

+++++
 Process from Point/Station 502.000 to Point/Station 500.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 30.510(Ac.)
 Runoff from this stream = 47.001(CFS)
 Time of concentration = 17.63 min.
 Rainfall intensity = 2.358(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
------------	-----------------	----------	----------------------------

1	7.868	17.24	2.384
2	47.001	17.63	2.358

Largest stream flow has longer time of concentration

Qp = 47.001 + sum of

$$Q_b \quad I_a/I_b$$

$$7.868 * 0.989 = 7.784$$
 Qp = 54.784

Total of 2 streams to confluence:
 Flow rates before confluence point:
 7.868 47.001

Area of streams before confluence:
 3.900 30.510

Results of confluence:

Total flow rate = 54.784(CFS)
 Time of concentration = 17.627 min.
 Effective stream area after confluence = 34.410(Ac.)
 End of computations, total study area = 34.41 (Ac.)

The following figures may
 be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.608
 Area averaged RI index number = 60.7

130160caltrans010110.TXT

Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160caltrans110.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
CALTRANS DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 27.00(Ac.) = 0.042 Sq. Mi.
0.042 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 27.00(Ac.) =

USER Entry of lag time in hours
Lag time = 0.233 Hr.
Lag time = 14.00 Min.
25% of lag time = 3.50 Min.
40% of lag time = 5.60 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	0.48	12.85

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	1.31	35.37

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.476(In)
Area Averaged 100-Year Rainfall = 1.310(In)

Point rain (area averaged) = 0.819(In)
Areaal adjustment factor = 99.98 %
Adjusted average point rain = 0.819(In)

Sub-Area Data:

130160caltrans010110.TXT
Area(Ac.) Runoff Index Impervious %
27.000 32.00 0.000
Total Area Entered = 27.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	52.0	0.552	0.000	0.552	1.000	0.552
Sum (F) =						0.552

Area averaged mean soil loss (F) (In/Hr) = 0.552
Minimum soil loss rate ((In/Hr)) = 0.276
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

slope of intensity-duration curve for a 1 hour storm =0.4800

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	35.715	2.304
2	0.167	71.430	11.784
3	0.250	107.144	28.160
4	0.333	142.859	18.658
5	0.417	178.574	10.001
6	0.500	214.289	6.683
7	0.583	250.004	4.745
8	0.667	285.718	3.656
9	0.750	321.433	2.869
10	0.833	357.148	2.136
11	0.917	392.863	1.789
12	1.000	428.578	1.475
13	1.083	464.292	1.199
14	1.167	500.007	0.980
15	1.250	535.722	0.786
16	1.333	571.437	0.591
17	1.417	607.152	0.381
18	1.500	642.866	0.406
19	1.583	678.581	0.429
20	1.667	714.296	0.412
21	1.750	750.011	0.260
22	1.833	785.726	0.299
Sum = 100.000		Sum=	27.211

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	4.40	(0.552)	0.389
2	0.17	4.50	(0.552)	0.398
3	0.25	5.40	(0.552)	0.478
4	0.33	5.40	(0.552)	0.478
5	0.42	5.70	(0.552)	0.504
6	0.50	6.40	0.552 (0.566)	0.077
7	0.58	7.90	0.552 (0.699)	0.225

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8	0.67	9.10	0.894	0.552	(0.805)	0.343
9	0.75	12.80	1.258	0.552	(1.132)	0.706
10	0.83	25.60	2.516	0.552	(2.264)	1.964
11	0.92	7.90	0.776	0.552	(0.699)	0.225
12	1.00	4.90	0.482	(0.552)	0.433	0.048

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.8

Flood volume = Effective rainfall 0.32(In)

times area 27.0(Ac.)/[(In)/(Ft.)] = 0.7(Ac.Ft)

Total soil loss = 0.50(In)

Total soil loss = 1.123(Ac.Ft)

Total rainfall = 0.82(In)

Flood volume = 31343.2 Cubic Feet

Total soil loss = 48918.5 Cubic Feet

Peak flow rate of this hydrograph = 21.005(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0002	0.03	Q				
0+10	0.0013	0.17	Q				
0+15	0.0048	0.51	Q				
0+20	0.0101	0.76	VQ				
0+25	0.0166	0.95	VQ				
0+30	0.0242	1.10	Q				
0+35	0.0337	1.37	Q				
0+40	0.0485	2.15	Q				
0+45	0.0764	4.05	VQ				
0+50	0.1299	7.76	V	Q			
0+55	0.2302	14.56		V	Q		
1+ 0	0.3748	21.01			V	Q	
1+ 5	0.4774	14.90			Q	V	
1+10	0.5393	8.98		Q		V	
1+15	0.5805	5.99		Q		V	V
1+20	0.6100	4.29		Q		V	V
1+25	0.6326	3.28		Q		V	V
1+30	0.6502	2.56	Q				V
1+35							

130160caltrans010310.TXT

Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160caltrans310.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
CALTRANS DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 27.00(Ac.) = 0.042 Sq. Mi.
0.042 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 27.00(Ac.) =

USER Entry of lag time in hours
Lag time = 0.233 Hr.
Lag time = 14.00 Min.
25% of lag time = 3.50 Min.
40% of lag time = 5.60 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	0.87	23.38

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	2.16	58.32

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.866(In)
Area Averaged 100-Year Rainfall = 2.160(In)

Point rain (area averaged) = 1.398(In)
Areaal adjustment factor = 99.99 %
Adjusted average point rain = 1.398(In)

Sub-Area Data:

130160caltrans010310.TXT
Area(Ac.) Runoff Index Impervious %
27.000 32.00 0.000
Total Area Entered = 27.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	52.0	0.552	0.000	0.552	1.000	0.552
						Sum (F) = 0.552

Area averaged mean soil loss (F) (In/Hr) = 0.552
Minimum soil loss rate ((In/Hr)) = 0.276
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Unit Hydrograph
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	35.715	2.304
2	0.167	71.430	11.784
3	0.250	107.144	28.160
4	0.333	142.859	18.658
5	0.417	178.574	10.001
6	0.500	214.289	6.683
7	0.583	250.004	4.745
8	0.667	285.718	3.656
9	0.750	321.433	2.869
10	0.833	357.148	2.136
11	0.917	392.863	1.789
12	1.000	428.578	1.475
13	1.083	464.292	1.199
14	1.167	500.007	0.980
15	1.250	535.722	0.786
16	1.333	571.437	0.591
17	1.417	607.152	0.381
18	1.500	642.866	0.406
19	1.583	678.581	0.429
20	1.667	714.296	0.412
21	1.750	750.011	0.260
22	1.833	785.726	0.299
		Sum = 100.000	Sum= 27.211

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
			Max	Low	
1	0.08	1.30	0.218	(0.552)	0.196
2	0.17	1.30	0.218	(0.552)	0.196
3	0.25	1.10	0.185	(0.552)	0.166
4	0.33	1.50	0.252	(0.552)	0.227
5	0.42	1.50	0.252	(0.552)	0.227
6	0.50	1.80	0.302	(0.552)	0.272
7	0.58	1.50	0.252	(0.552)	0.227
8	0.67	1.80	0.302	(0.552)	0.272
9	0.75	1.80	0.302	(0.552)	0.272

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10	0.83	1.50	0.252	(0.552)	0.227	0.025
11	0.92	1.60	0.268	(0.552)	0.242	0.027
12	1.00	1.80	0.302	(0.552)	0.272	0.030
13	1.08	2.20	0.369	(0.552)	0.332	0.037
14	1.17	2.20	0.369	(0.552)	0.332	0.037
15	1.25	2.20	0.369	(0.552)	0.332	0.037
16	1.33	2.00	0.336	(0.552)	0.302	0.034
17	1.42	2.60	0.436	(0.552)	0.393	0.044
18	1.50	2.70	0.453	(0.552)	0.408	0.045
19	1.58	2.40	0.403	(0.552)	0.362	0.040
20	1.67	2.70	0.453	(0.552)	0.408	0.045
21	1.75	3.30	0.554	(0.552)	0.498	0.055
22	1.83	3.10	0.520	(0.552)	0.468	0.052
23	1.92	2.90	0.487	(0.552)	0.438	0.049
24	2.00	3.00	0.503	(0.552)	0.453	0.050
25	2.08	3.10	0.520	(0.552)	0.468	0.052
26	2.17	4.20	0.705	0.552 (0.634)	0.153	
27	2.25	5.00	0.839	0.552 (0.755)	0.287	
28	2.33	3.50	0.587	(0.552)	0.529	0.059
29	2.42	6.80	1.141	0.552 (1.027)	0.589	
30	2.50	7.30	1.225	0.552 (1.102)	0.673	
31	2.58	8.20	1.376	0.552 (1.238)	0.824	
32	2.67	5.90	0.990	0.552 (0.891)	0.438	
33	2.75	2.00	0.336	(0.552)	0.302	0.034
34	2.83	1.80	0.302	(0.552)	0.272	0.030
35	2.92	1.80	0.302	(0.552)	0.272	0.030
36	3.00	0.60	0.101	(0.552)	0.091	0.010

(Loss Rate Not Used)

Sum = 100.0 Sum = 4.0

Flood volume = Effective rainfall 0.33(In)
times area 27.0(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)
Total soil loss = 1.06(In)
Total soil loss = 2.393(Ac.Ft)
Total rainfall = 1.40(In)
Flood volume = 32799.3 Cubic Feet
Total soil loss = 104238.0 Cubic Feet

Peak flow rate of this hydrograph = 13.583(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0001	0.01	Q				
0+10	0.0007	0.08	Q				
0+15	0.0024	0.25	Q				
0+20	0.0048	0.35	Q				
0+25	0.0076	0.41	Q				
0+30	0.0110	0.49	Q				
0+35	0.0148	0.55	VQ				
0+40	0.0190	0.61	Q				
0+45	0.0234	0.64	Q				
0+50	0.0281	0.68	Q				
0+55	0.0329	0.70	Q				
1+ 0	0.0377	0.69	QV				
1+ 5	0.0426	0.71	QV				
1+10	0.0479	0.77	QV				
1+15	0.0537	0.84	QV				

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1+20	0.0598	0.89	Q V
1+25	0.0661	0.91	Q V
1+30	0.0725	0.94	Q V
1+35	0.0795	1.02	Q V
1+40	0.0869	1.07	Q V
1+45	0.0944	1.09	Q V
1+50	0.1024	1.16	Q V
1+55	0.1111	1.26	Q V
2+ 0	0.1199	1.29	Q V
2+ 5	0.1288	1.29	Q V
2+10	0.1383	1.38	Q V
2+15	0.1508	1.81	Q V
2+20	0.1708	2.89	Q V
2+25	0.1986	4.05	Q V
2+30	0.2332	5.02	Q V
2+35	0.2941	8.84	V Q
2+40	0.3780	12.18	V Q
2+45	0.4716	13.58	Q V Q
2+50	0.5487	11.21	Q V
2+55	0.5991	7.32	Q
3+ 0	0.6338	5.04	Q
3+ 5	0.6601	3.81	Q
3+10	0.6799	2.88	Q
3+15	0.6951	2.20	Q
3+20	0.7068	1.71	Q
3+25	0.7162	1.36	Q
3+30	0.7239	1.11	Q
3+35	0.7300	0.89	Q
3+40	0.7350	0.72	Q
3+45	0.7389	0.57	Q
3+50	0.7420	0.45	Q
3+55	0.7446	0.37	Q
4+ 0	0.7469	0.33	Q
4+ 5	0.7488	0.28	Q
4+10	0.7506	0.25	Q
4+15	0.7518	0.17	Q

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160caltrans610.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
CALTRANS DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 27.00(Ac.) = 0.042 Sq. Mi.
0.042 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 27.00(Ac.) =

USER Entry of lag time in hours
Lag time = 0.233 Hr.
Lag time = 14.00 Min.
25% of lag time = 3.50 Min.
40% of lag time = 5.60 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	1.25	33.75

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	3.09	83.43

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.250(In)
Area Averaged 100-Year Rainfall = 3.090(In)

Point rain (area averaged) = 2.007(In)
Areaal adjustment factor = 99.99 %
Adjusted average point rain = 2.007(In)

Sub-Area Data:

130160caltrans010610.TXT
Area(Ac.) Runoff Index Impervious %
27.000 32.00 0.000
Total Area Entered = 27.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	52.0	0.552	0.000	0.552	1.000	0.552
						Sum (F) = 0.552

Area averaged mean soil loss (F) (In/Hr) = 0.552
Minimum soil loss rate ((In/Hr)) = 0.276
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Unit Hydrograph
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	35.715	2.304
2	0.167	71.430	11.784
3	0.250	107.144	28.160
4	0.333	142.859	18.658
5	0.417	178.574	10.001
6	0.500	214.289	6.683
7	0.583	250.004	4.745
8	0.667	285.718	3.656
9	0.750	321.433	2.869
10	0.833	357.148	2.136
11	0.917	392.863	1.789
12	1.000	428.578	1.475
13	1.083	464.292	1.199
14	1.167	500.007	0.980
15	1.250	535.722	0.786
16	1.333	571.437	0.591
17	1.417	607.152	0.381
18	1.500	642.866	0.406
19	1.583	678.581	0.429
20	1.667	714.296	0.412
21	1.750	750.011	0.260
22	1.833	785.726	0.299
		Sum = 100.000	Sum= 27.211

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	0.120	(0.552)	0.108
2	0.17	0.144	(0.552)	0.130
3	0.25	0.144	(0.552)	0.130
4	0.33	0.144	(0.552)	0.130
5	0.42	0.144	(0.552)	0.130
6	0.50	0.169	(0.552)	0.152
7	0.58	0.169	(0.552)	0.152
8	0.67	0.169	(0.552)	0.152
9	0.75	0.169	(0.552)	0.152

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10	0.83	0.70	0.169	(0.552)	0.152	0.017
11	0.92	0.70	0.169	(0.552)	0.152	0.017
12	1.00	0.80	0.193	(0.552)	0.173	0.019
13	1.08	0.80	0.193	(0.552)	0.173	0.019
14	1.17	0.80	0.193	(0.552)	0.173	0.019
15	1.25	0.80	0.193	(0.552)	0.173	0.019
16	1.33	0.80	0.193	(0.552)	0.173	0.019
17	1.42	0.80	0.193	(0.552)	0.173	0.019
18	1.50	0.80	0.193	(0.552)	0.173	0.019
19	1.58	0.80	0.193	(0.552)	0.173	0.019
20	1.67	0.80	0.193	(0.552)	0.173	0.019
21	1.75	0.80	0.193	(0.552)	0.173	0.019
22	1.83	0.80	0.193	(0.552)	0.173	0.019
23	1.92	0.80	0.193	(0.552)	0.173	0.019
24	2.00	0.90	0.217	(0.552)	0.195	0.022
25	2.08	0.80	0.193	(0.552)	0.173	0.019
26	2.17	0.90	0.217	(0.552)	0.195	0.022
27	2.25	0.90	0.217	(0.552)	0.195	0.022
28	2.33	0.90	0.217	(0.552)	0.195	0.022
29	2.42	0.90	0.217	(0.552)	0.195	0.022
30	2.50	0.90	0.217	(0.552)	0.195	0.022
31	2.58	0.90	0.217	(0.552)	0.195	0.022
32	2.67	0.90	0.217	(0.552)	0.195	0.022
33	2.75	1.00	0.241	(0.552)	0.217	0.024
34	2.83	1.00	0.241	(0.552)	0.217	0.024
35	2.92	1.00	0.241	(0.552)	0.217	0.024
36	3.00	1.00	0.241	(0.552)	0.217	0.024
37	3.08	1.00	0.241	(0.552)	0.217	0.024
38	3.17	1.10	0.265	(0.552)	0.238	0.026
39	3.25	1.10	0.265	(0.552)	0.238	0.026
40	3.33	1.10	0.265	(0.552)	0.238	0.026
41	3.42	1.20	0.289	(0.552)	0.260	0.029
42	3.50	1.30	0.313	(0.552)	0.282	0.031
43	3.58	1.40	0.337	(0.552)	0.303	0.034
44	3.67	1.40	0.337	(0.552)	0.303	0.034
45	3.75	1.50	0.361	(0.552)	0.325	0.036
46	3.83	1.50	0.361	(0.552)	0.325	0.036
47	3.92	1.60	0.385	(0.552)	0.347	0.039
48	4.00	1.60	0.385	(0.552)	0.347	0.039
49	4.08	1.70	0.409	(0.552)	0.368	0.041
50	4.17	1.80	0.433	(0.552)	0.390	0.043
51	4.25	1.90	0.458	(0.552)	0.412	0.046
52	4.33	2.00	0.482	(0.552)	0.433	0.048
53	4.42	2.10	0.506	(0.552)	0.455	0.051
54	4.50	2.10	0.506	(0.552)	0.455	0.051
55	4.58	2.20	0.530	(0.552)	0.477	0.053
56	4.67	2.30	0.554	(0.552)	0.498	0.055
57	4.75	2.40	0.578	(0.552)	0.520	0.058
58	4.83	2.40	0.578	(0.552)	0.520	0.058
59	4.92	2.50	0.602	(0.552)	0.542	0.060
60	5.00	2.60	0.626	0.552	(0.564)	0.075
61	5.08	3.10	0.747	0.552	(0.672)	0.195
62	5.17	3.60	0.867	0.552	(0.780)	0.315
63	5.25	3.90	0.939	0.552	(0.845)	0.388
64	5.33	4.20	1.011	0.552	(0.910)	0.460
65	5.42	4.70	1.132	0.552	(1.019)	0.580
66	5.50	5.60	1.349	0.552	(1.214)	0.797
67	5.58	1.90	0.458	(0.552)	0.412	0.046
68	5.67	0.90	0.217	(0.552)	0.195	0.022
69	5.75	0.60	0.144	(0.552)	0.130	0.014
70	5.83	0.50	0.120	(0.552)	0.108	0.012
71	5.92	0.30	0.072	(0.552)	0.065	0.007
72	6.00	0.20	0.048	(0.552)	0.043	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.6

Flood volume = Effective rainfall 0.38(In)
 times area 27.0(Ac.)/[(In)/(Ft.)) = 0.9(Ac.Ft)
 Total soil loss = 1.63(In)
 Total soil loss = 3.662(Ac.Ft)
 Total rainfall = 2.01(In)
 Flood volume = 37166.4 Cubic Feet
 Total soil loss = 159520.5 Cubic Feet

 Peak flow rate of this hydrograph = 11.998(CFS)

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

 Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0001	0.01	Q				
0+10	0.0004	0.05	Q				
0+15	0.0014	0.15	Q				
0+20	0.0030	0.23	Q				
0+25	0.0048	0.27	Q				
0+30	0.0069	0.30	Q				
0+35	0.0092	0.33	Q				
0+40	0.0117	0.36	Q				
0+45	0.0144	0.39	Q				
0+50	0.0171	0.40	Q				
0+55	0.0200	0.41	Q				
1+ 0	0.0229	0.43	QV				
1+ 5	0.0260	0.44	QV				
1+10	0.0292	0.46	QV				
1+15	0.0325	0.48	QV				
1+20	0.0359	0.49	QV				
1+25	0.0393	0.50	QV				
1+30	0.0428	0.50	QV				
1+35	0.0463	0.51	QV				
1+40	0.0498	0.51	QV				
1+45	0.0534	0.52	QV				
1+50	0.0569	0.52	QV				
1+55	0.0605	0.52	QV				
2+ 0	0.0641	0.52	Q V				
2+ 5	0.0678	0.53	Q V				
2+10	0.0715	0.54	Q V				
2+15	0.0752	0.54	Q V				
2+20	0.0791	0.56	Q V				
2+25	0.0830	0.57	Q V				
2+30	0.0869	0.57	Q V				
2+35	0.0909	0.58	Q V				
2+40	0.0949	0.58	Q V				
2+45	0.0989	0.58	Q V				
2+50	0.1030	0.59	Q V				
2+55	0.1072	0.61	Q V				
3+ 0	0.1116	0.63	Q V				
3+ 5	0.1159	0.63	Q V				
3+10	0.1203	0.64	Q V				
3+15	0.1248	0.65	Q V				
3+20	0.1294	0.67	Q V				
3+25	0.1342	0.69	Q V				
3+30	0.1390	0.71	Q V				

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3+35	0.1441	0.74	Q V
3+40	0.1495	0.78	Q V
3+45	0.1552	0.82	Q V
3+50	0.1611	0.86	Q V
3+55	0.1673	0.89	Q V
4+ 0	0.1736	0.93	Q V
4+ 5	0.1803	0.96	Q V
4+10	0.1871	0.99	Q V
4+15	0.1942	1.04	Q V
4+20	0.2017	1.09	Q V
4+25	0.2096	1.14	Q V
4+30	0.2178	1.20	Q V
4+35	0.2264	1.25	Q V
4+40	0.2353	1.29	Q V
4+45	0.2446	1.34	Q V
4+50	0.2542	1.40	Q V
4+55	0.2641	1.45	Q V
5+ 0	0.2744	1.50	Q V
5+ 5	0.2858	1.66	Q V
5+10	0.3014	2.26	Q V
5+15	0.3269	3.70	Q V
5+20	0.3653	5.57	Q V
5+25	0.4163	7.41	Q V
5+30	0.4812	9.42	Q V
5+35	0.5606	11.53	Q V
5+40	0.6432	12.00	Q V
5+45	0.6985	8.04	Q V
5+50	0.7341	5.16	Q V
5+5			

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160caltrans2410.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
CALTRANS DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 27.00(Ac.) = 0.042 Sq. Mi.
0.042 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 27.00(Ac.) =

USER Entry of lag time in hours
Lag time = 0.233 Hr.
Lag time = 14.00 Min.
25% of lag time = 3.50 Min.
40% of lag time = 5.60 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	2.42	65.34

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	6.58	177.66

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 2.420(In)
Area Averaged 100-Year Rainfall = 6.580(In)

Point rain (area averaged) = 4.131(In)
Areaal adjustment factor = 99.99 %
Adjusted average point rain = 4.131(In)

Sub-Area Data:

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Area(Ac.) Runoff Index Impervious %
27.000 32.00 0.000
Total Area Entered = 27.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	52.0	0.552	0.000	0.552	1.000	0.552
						Sum (F) = 0.552

Area averaged mean soil loss (F) (In/Hr) = 0.552
Minimum soil loss rate ((In/Hr)) = 0.276
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Unit Hydrograph
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	35.715	2.304
2	0.167	71.430	11.784
3	0.250	107.144	28.160
4	0.333	142.859	18.658
5	0.417	178.574	10.001
6	0.500	214.289	6.683
7	0.583	250.004	4.745
8	0.667	285.718	3.656
9	0.750	321.433	2.869
10	0.833	357.148	2.136
11	0.917	392.863	1.789
12	1.000	428.578	1.475
13	1.083	464.292	1.199
14	1.167	500.007	0.980
15	1.250	535.722	0.786
16	1.333	571.437	0.591
17	1.417	607.152	0.381
18	1.500	642.866	0.406
19	1.583	678.581	0.429
20	1.667	714.296	0.412
21	1.750	750.011	0.260
22	1.833	785.726	0.299
		Sum = 100.000	Sum= 27.211

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
			Max	Low	
1	0.08	0.033	(0.978)	0.030	0.003
2	0.17	0.033	(0.974)	0.030	0.003
3	0.25	0.033	(0.970)	0.030	0.003
4	0.33	0.050	(0.967)	0.045	0.005
5	0.42	0.050	(0.963)	0.045	0.005
6	0.50	0.050	(0.959)	0.045	0.005
7	0.58	0.050	(0.955)	0.045	0.005
8	0.67	0.050	(0.952)	0.045	0.005
9	0.75	0.050	(0.948)	0.045	0.005

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10	0.83	0.13	0.066	(0.944)	0.059	0.007
11	0.92	0.13	0.066	(0.940)	0.059	0.007
12	1.00	0.13	0.066	(0.937)	0.059	0.007
13	1.08	0.10	0.050	(0.933)	0.045	0.005
14	1.17	0.10	0.050	(0.929)	0.045	0.005
15	1.25	0.10	0.050	(0.926)	0.045	0.005
16	1.33	0.10	0.050	(0.922)	0.045	0.005
17	1.42	0.10	0.050	(0.918)	0.045	0.005
18	1.50	0.10	0.050	(0.915)	0.045	0.005
19	1.58	0.10	0.050	(0.911)	0.045	0.005
20	1.67	0.10	0.050	(0.907)	0.045	0.005
21	1.75	0.10	0.050	(0.904)	0.045	0.005
22	1.83	0.13	0.066	(0.900)	0.059	0.007
23	1.92	0.13	0.066	(0.896)	0.059	0.007
24	2.00	0.13	0.066	(0.893)	0.059	0.007
25	2.08	0.13	0.066	(0.889)	0.059	0.007
26	2.17	0.13	0.066	(0.886)	0.059	0.007
27	2.25	0.13	0.066	(0.882)	0.059	0.007
28	2.33	0.13	0.066	(0.878)	0.059	0.007
29	2.42	0.13	0.066	(0.875)	0.059	0.007
30	2.50	0.13	0.066	(0.871)	0.059	0.007
31	2.58	0.17	0.083	(0.868)	0.074	0.008
32	2.67	0.17	0.083	(0.864)	0.074	0.008
33	2.75	0.17	0.083	(0.860)	0.074	0.008
34	2.83	0.17	0.083	(0.857)	0.074	0.008
35	2.92	0.17	0.083	(0.853)	0.074	0.008
36	3.00	0.17	0.083	(0.850)	0.074	0.008
37	3.08	0.17	0.083	(0.846)	0.074	0.008
38	3.17	0.17	0.083	(0.843)	0.074	0.008
39	3.25	0.17	0.083	(0.839)	0.074	0.008
40	3.33	0.17	0.083	(0.836)	0.074	0.008
41	3.42	0.17	0.083	(0.832)	0.074	0.008
42	3.50	0.17	0.083	(0.829)	0.074	0.008
43	3.58	0.17	0.083	(0.825)	0.074	0.008
44	3.67	0.17	0.083	(0.822)	0.074	0.008
45	3.75	0.17	0.083	(0.818)	0.074	0.008
46	3.83	0.20	0.099	(0.815)	0.089	0.010
47	3.92	0.20	0.099	(0.812)	0.089	0.010
48	4.00	0.20	0.099	(0.808)	0.089	0.010
49	4.08	0.20	0.099	(0.805)	0.089	0.010
50	4.17	0.20	0.099	(0.801)	0.089	0.010
51	4.25	0.20	0.099	(0.798)	0.089	0.010
52	4.33	0.23	0.116	(0.794)	0.104	0.012
53	4.42	0.23	0.116	(0.791)	0.104	0.012
54	4.50	0.23	0.116	(0.788)	0.104	0.012
55	4.58	0.23	0.116	(0.784)	0.104	0.012
56	4.67	0.23	0.116	(0.781)	0.104	0.012
57	4.75	0.23	0.116	(0.778)	0.104	0.012
58	4.83	0.27	0.132	(0.774)	0.119	0.013
59	4.92	0.27	0.132	(0.771)	0.119	0.013
60	5.00	0.27	0.132	(0.768)	0.119	0.013
61	5.08	0.20	0.099	(0.764)	0.089	0.010
62	5.17	0.20	0.099	(0.761)	0.089	0.010
63	5.25	0.20	0.099	(0.758)	0.089	0.010
64	5.33	0.23	0.116	(0.754)	0.104	0.012
65	5.42	0.23	0.116	(0.751)	0.104	0.012
66	5.50	0.23	0.116	(0.748)	0.104	0.012
67	5.58	0.27	0.132	(0.744)	0.119	0.013
68	5.67	0.27	0.132	(0.741)	0.119	0.013
69	5.75	0.27	0.132	(0.738)	0.119	0.013
70	5.83	0.27	0.132	(0.735)	0.119	0.013
71	5.92	0.27	0.132	(0.731)	0.119	0.013
72	6.00	0.27	0.132	(0.728)	0.119	0.013

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73	6.08	0.30	0.149	(0.725)	0.134	0.015
74	6.17	0.30	0.149	(0.722)	0.134	0.015
75	6.25	0.30	0.149	(0.718)	0.134	0.015
76	6.33	0.30	0.149	(0.715)	0.134	0.015
77	6.42	0.30	0.149	(0.712)	0.134	0.015
78	6.50	0.30	0.149	(0.709)	0.134	0.015
79	6.58	0.33	0.165	(0.706)	0.149	0.017
80	6.67	0.33	0.165	(0.702)	0.149	0.017
81	6.75	0.33	0.165	(0.699)	0.149	0.017
82	6.83	0.33	0.165	(0.696)	0.149	0.017
83	6.92	0.33	0.165	(0.693)	0.149	0.017
84	7.00	0.33	0.165	(0.690)	0.149	0.017
85	7.08	0.33	0.165	(0.687)	0.149	0.017
86	7.17	0.33	0.165	(0.684)	0.149	0.017
87	7.25	0.33	0.165	(0.680)	0.149	0.017
88	7.33	0.37	0.182	(0.677)	0.164	0.018
89	7.42	0.37	0.182	(0.674)	0.164	0.018
90	7.50	0.37	0.182	(0.671)	0.164	0.018
91	7.58	0.40	0.198	(0.668)	0.178	0.020
92	7.67	0.40	0.198	(0.665)	0.178	0.020
93	7.75	0.40	0.198	(0.662)	0.178	0.020
94	7.83	0.43	0.215	(0.659)	0.193	0.021
95	7.92	0.43	0.215	(0.656)	0.193	0.021
96	8.00	0.43	0.215	(0.653)	0.193	0.021
97	8.08	0.50	0.248	(0.650)	0.223	0.025
98	8.17	0.50	0.248	(0.647)	0.223	0.025
99	8.25	0.50	0.248	(0.644)	0.223	0.025
100	8.33	0.50	0.248	(0.641)	0.223	0.025
101	8.42	0.50	0.248	(0.638)	0.223	0.025
102	8.50	0.50	0.248	(0.635)	0.223	0.025
103	8.58	0.53	0.264	(0.632)	0.238	0.026
104	8.67	0.53	0.264	(0.629)	0.238	0.026
105	8.75	0.53	0.264	(0.626)	0.238	0.026
106	8.83	0.57	0.281	(0.623)	0.253	0.028
107	8.92	0.57	0.281	(0.620)	0.253	0.028
108	9.00	0.57	0.281	(0.617)	0.253	0.028
109	9.08	0.63	0.314	(0.614)	0.283	0.031
110	9.17	0.63	0.314	(0.611)	0.283	0.031
111	9.25	0.63	0.314	(0.608)	0.283	0.031
112	9.33	0.67	0.330	(0.605)	0.297	0.033
113	9.42	0.67	0.330	(0.602)	0.297	0.033
114	9.50	0.67	0.330	(0.600)	0.297	0.033
115	9.58	0.70	0.347	(0.597)	0.312	0.035
116	9.67	0.70	0.347	(0.594)	0.312	0.035
117	9.75	0.70	0.347	(0.591)	0.312	0.035
118	9.83	0.73	0.364	(0.588)	0.327	0.036
119	9.92	0.73	0.364	(0.585)	0.327	0.036
120	10.00	0.73	0.364	(0.582)	0.327	0.036
121	10.08	0.50	0.248	(0.580)	0.223	0.025
122	10.17	0.50	0.248	(0.577)	0.223	0.025
123	10.25	0.50	0.248	(0.574)	0.223	0.025
124	10.33	0.50	0.248	(0.571)	0.223	0.025
125	10.42	0.50	0.248	(0.568)	0.223	0.025
126	10.50	0.50	0.248	(0.566)	0.223	0.025
127	10.58	0.67	0.330	(0.563)	0.297	0.033
128	10.67	0.67	0.330	(0.560)	0.297	0.033
129	10.75	0.67	0.330	(0.557)	0.297	0.033
130	10.83	0.67	0.330	(0.555)	0.297	0.033
131	10.92	0.67	0.330	(0.552)	0.297	0.033
132	11.00	0.67	0.330	(0.549)	0.297	0.033
133	11.08	0.63	0.314	(0.547)	0.283	0.031
134	11.17	0.63	0.314	(0.544)	0.283	0.031
135	11.25	0.63	0.314	(0.541)	0.283	0.031

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136	11.33	0.63	0.314	(0.539)	0.283	0.031
137	11.42	0.63	0.314	(0.536)	0.283	0.031
138	11.50	0.63	0.314	(0.533)	0.283	0.031
139	11.58	0.57	0.281	(0.531)	0.253	0.028
140	11.67	0.57	0.281	(0.528)	0.253	0.028
141	11.75	0.57	0.281	(0.525)	0.253	0.028
142	11.83	0.60	0.297	(0.523)	0.268	0.030
143	11.92	0.60	0.297	(0.520)	0.268	0.030
144	12.00	0.60	0.297	(0.517)	0.268	0.030
145	12.08	0.83	0.413	(0.515)	0.372	0.041
146	12.17	0.83	0.413	(0.512)	0.372	0.041
147	12.25	0.83	0.413	(0.510)	0.372	0.041
148	12.33	0.87	0.430	(0.507)	0.387	0.043
149	12.42	0.87	0.430	(0.505)	0.387	0.043
150	12.50	0.87	0.430	(0.502)	0.387	0.043
151	12.58	0.93	0.463	(0.500)	0.416	0.046
152	12.67	0.93	0.463	(0.497)	0.416	0.046
153	12.75	0.93	0.463	(0.495)	0.416	0.046
154	12.83	0.97	0.479	(0.492)	0.431	0.048
155	12.92	0.97	0.479	(0.490)	0.431	0.048
156	13.00	0.97	0.479	(0.487)	0.431	0.048
157	13.08	1.13	0.562	0.485 (0.506)		0.077
158	13.17	1.13	0.562	0.482 (0.506)		0.080
159	13.25	1.13	0.562	0.480 (0.506)		0.082
160	13.33	1.13	0.562	0.477 (0.506)		0.085
161	13.42	1.13	0.562	0.475 (0.506)		0.087
162	13.50	1.13	0.562	0.472 (0.506)		0.089
163	13.58	0.77	0.380	(0.470)	0.342	0.038
164	13.67	0.77	0.380	(0.468)	0.342	0.038
165	13.75	0.77	0.380	(0.465)	0.342	0.038
166	13.83	0.77	0.380	(0.463)	0.342	0.038
167	13.92	0.77	0.380	(0.461)	0.342	0.038
168	14.00	0.77	0.380	(0.458)	0.342	0.038
169	14.08	0.90	0.446	(0.456)	0.402	0.045
170	14.17	0.90	0.446	(0.454)	0.402	0.045
171	14.25	0.90	0.446	(0.451)	0.402	0.045
172	14.33	0.87	0.430	(0.449)	0.387	0.043
173	14.42	0.87	0.430	(0.447)	0.387	0.043
174	14.50	0.87	0.430	(0.444)	0.387	0.043
175	14.58	0.87	0.430	(0.442)	0.387	0.043
176	14.67	0.87	0.430	(0.440)	0.387	0.043
177	14.75	0.87	0.430	(0.438)	0.387	0.043
178	14.83	0.83	0.413	(0.435)	0.372	0.041
179	14.92	0.83	0.413	(0.433)	0.372	0.041
180	15.00	0.83	0.413	(0.431)	0.372	0.041
181	15.08	0.80	0.397	(0.429)	0.357	0.040
182	15.17	0.80	0.397	(0.426)	0.357	0.040
183	15.25	0.80	0.397	(0.424)	0.357	0.040
184	15.33	0.77	0.380	(0.422)	0.342	0.038
185	15.42	0.77	0.380	(0.420)	0.342	0.038
186	15.50	0.77	0.380	(0.418)	0.342	0.038
187	15.58	0.63	0.314	(0.416)	0.283	0.031
188	15.67	0.63	0.314	(0.413)	0.283	0.031
189	15.75	0.63	0.314	(0.411)	0.283	0.031
190	15.83	0.63	0.314	(0.409)	0.283	0.031
191	15.92	0.63	0.314	(0.407)	0.283	0.031
192	16.00	0.63	0.314	(0.405)	0.283	0.031
193	16.08	0.13	0.066	(0.403)	0.059	0.007
194	16.17	0.13	0.066	(0.401)	0.059	0.007
195	16.25	0.13	0.066	(0.399)	0.059	0.007
196	16.33	0.13	0.066	(0.397)	0.059	0.007
197	16.42	0.13	0.066	(0.395)	0.059	0.007
198	16.50	0.13	0.066	(0.393)	0.059	0.007

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199	16.58	0.10	0.050	(0.391)	0.045	0.005
200	16.67	0.10	0.050	(0.389)	0.045	0.005
201	16.75	0.10	0.050	(0.387)	0.045	0.005
202	16.83	0.10	0.050	(0.385)	0.045	0.005
203	16.92	0.10	0.050	(0.383)	0.045	0.005
204	17.00	0.10	0.050	(0.381)	0.045	0.005
205	17.08	0.17	0.083	(0.379)	0.074	0.008
206	17.17	0.17	0.083	(0.377)	0.074	0.008
207	17.25	0.17	0.083	(0.375)	0.074	0.008
208	17.33	0.17	0.083	(0.373)	0.074	0.008
209	17.42	0.17	0.083	(0.372)	0.074	0.008
210	17.50	0.17	0.083	(0.370)	0.074	0.008
211	17.58	0.17	0.083	(0.368)	0.074	0.008
212	17.67	0.17	0.083	(0.366)	0.074	0.008
213	17.75	0.17	0.083	(0.364)	0.074	0.008
214	17.83	0.13	0.066	(0.362)	0.059	0.007
215	17.92	0.13	0.066	(0.361)	0.059	0.007
216	18.00	0.13	0.066	(0.359)	0.059	0.007
217	18.08	0.13	0.066	(0.357)	0.059	0.007
218	18.17	0.13	0.066	(0.355)	0.059	0.007
219	18.25	0.13	0.066	(0.354)	0.059	0.007
220	18.33	0.13	0.066	(0.352)	0.059	0.007
221	18.42	0.13	0.066	(0.350)	0.059	0.007
222	18.50	0.13	0.066	(0.348)	0.059	0.007
223	18.58	0.10	0.050	(0.347)	0.045	0.005
224	18.67	0.10	0.050	(0.345)	0.045	0.005
225	18.75	0.10	0.050	(0.343)	0.045	0.005
226	18.83	0.07	0.033	(0.342)	0.030	0.003
227	18.92	0.07	0.033	(0.340)	0.030	0.003
228	19.00	0.07	0.033	(0.338)	0.030	0.003
229	19.08	0.10	0.050	(0.337)	0.045	0.005
230	19.17	0.10	0.050	(0.335)	0.045	0.005
231	19.25	0.10	0.050	(0.334)	0.045	0.005
232	19.33	0.13	0.066	(0.332)	0.059	0.007
233	19.42	0.13	0.066	(0.331)	0.059	0.007
234	19.50	0.13	0.066	(0.329)	0.059	0.007
235	19.58	0.10	0.050	(0.328)	0.045	0.005
236	19.67	0.10	0.050	(0.326)	0.045	0.005
237	19.75	0.10	0.050	(0.325)	0.045	0.005
238	19.83	0.07	0.033	(0.323)	0.030	0.003
239	19.92	0.07	0.033	(0.322)	0.030	0.003
240	20.00	0.07	0.033	(0.320)	0.030	0.003
241	20.08	0.10	0.050	(0.319)	0.045	0.005
242	20.17	0.10	0.050	(0.317)	0.045	0.005
243	20.25	0.10	0.050	(0.316)	0.045	0.005
244	20.33	0.10	0.050	(0.315)	0.045	0.005
245	20.42	0.10	0.050	(0.313)	0.045	0.005
246	20.50	0.10	0.050	(0.312)	0.045	0.005
247	20.58	0.10	0.050	(0.311)	0.045	0.005
248	20.67	0.10	0.050	(0.309)	0.045	0.005
249	20.75	0.10	0.050	(0.308)	0.045	0.005
250	20.83	0.07	0.033	(0.307)	0.030	0.003
251	20.92	0.07	0.033	(0.306)	0.030	0.003
252	21.00	0.07	0.033	(0.304)	0.030	0.003
253	21.08	0.10	0.050	(0.303)	0.045	0.005
254	21.17	0.10	0.050	(0.302)	0.045	0.005
255	21.25	0.10	0.050	(0.301)	0.045	0.005
256	21.33	0.07	0.033	(0.300)	0.030	0.003
257	21.42	0.07	0.033	(0.299)	0.030	0.003
258	21.50	0.07	0.033	(0.297)	0.030	0.003
259	21.58	0.10	0.050	(0.296)	0.045	0.005
260	21.67	0.10	0.050	(0.295)	0.045	0.005
261	21.75	0.10	0.050	(0.294)	0.045	0.005

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262	21.83	0.07	0.033	(0.293)	0.030	0.003
263	21.92	0.07	0.033	(0.292)	0.030	0.003
264	22.00	0.07	0.033	(0.291)	0.030	0.003
265	22.08	0.10	0.050	(0.290)	0.045	0.005
266	22.17	0.10	0.050	(0.289)	0.045	0.005
267	22.25	0.10	0.050	(0.288)	0.045	0.005
268	22.33	0.07	0.033	(0.288)	0.030	0.003
269	22.42	0.07	0.033	(0.287)	0.030	0.003
270	22.50	0.07	0.033	(0.286)	0.030	0.003
271	22.58	0.07	0.033	(0.285)	0.030	0.003
272	22.67	0.07	0.033	(0.284)	0.030	0.003
273	22.75	0.07	0.033	(0.283)	0.030	0.003
274	22.83	0.07	0.033	(0.283)	0.030	0.003
275	22.92	0.07	0.033	(0.282)	0.030	0.003
276	23.00	0.07	0.033	(0.281)	0.030	0.003
277	23.08	0.07	0.033	(0.281)	0.030	0.003
278	23.17	0.07	0.033	(0.280)	0.030	0.003
279	23.25	0.07	0.033	(0.279)	0.030	0.003
280	23.33	0.07	0.033	(0.279)	0.030	0.003
281	23.42	0.07	0.033	(0.278)	0.030	0.003
282	23.50	0.07	0.033	(0.278)	0.030	0.003
283	23.58	0.07	0.033	(0.277)	0.030	0.003
284	23.67	0.07	0.033	(0.277)	0.030	0.003
285	23.75	0.07	0.033	(0.277)	0.030	0.003
286	23.83	0.07	0.033	(0.276)	0.030	0.003
287	23.92	0.07	0.033	(0.276)	0.030	0.003
288	24.00	0.07	0.033	(0.276)	0.030	0.003

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.1

Flood volume = Effective rainfall 0.43(In)
times area 27.0(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)
Total soil loss = 3.70(In)
Total soil loss = 8.335(Ac.Ft)
Total rainfall = 4.13(In)
Flood volume = 41820.0 Cubic Feet
Total soil loss = 363082.8 Cubic Feet

Peak flow rate of this hydrograph = 2.093(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.01	Q				
0+15	0.0004	0.04	Q				
0+20	0.0007	0.06	Q				
0+25	0.0012	0.07	Q				
0+30	0.0018	0.09	Q				
0+35	0.0025	0.10	Q				
0+40	0.0033	0.11	Q				
0+45	0.0041	0.11	Q				
0+50	0.0049	0.12	Q				
0+55	0.0058	0.13	Q				
1+ 0	0.0068	0.14	Q				
1+ 5	0.0078	0.15	Q				
1+10	0.0089	0.15	Q				
1+15	0.0099	0.15	Q				

1+20	0.0109	0.14	Q
1+25	0.0118	0.14	Q
1+30	0.0128	0.14	Q
1+35	0.0137	0.14	Q
1+40	0.0147	0.14	Q
1+45	0.0156	0.14	Q
1+50	0.0165	0.14	Q
1+55	0.0175	0.14	Q
2+ 0	0.0186	0.16	Q
2+ 5	0.0197	0.16	Q
2+10	0.0209	0.17	Q
2+15	0.0221	0.17	Q
2+20	0.0232	0.17	Q
2+25	0.0244	0.17	QV
2+30	0.0257	0.18	QV
2+35	0.0269	0.18	QV
2+40	0.0281	0.18	QV
2+45	0.0295	0.20	QV
2+50	0.0309	0.21	QV
2+55	0.0324	0.21	QV
3+ 0	0.0338	0.21	QV
3+ 5	0.0353	0.22	QV
3+10	0.0368	0.22	QV
3+15	0.0383	0.22	QV
3+20	0.0398	0.22	QV
3+25	0.0414	0.22	QV
3+30	0.0429	0.22	QV
3+35	0.0444	0.22	QV
3+40	0.0460	0.22	QV
3+45	0.0475	0.22	QV
3+50	0.0491	0.22	Q V
3+55	0.0506	0.23	Q V
4+ 0	0.0523	0.24	Q V
4+ 5	0.0541	0.25	QV
4+10	0.0558	0.26	QV
4+15	0.0576	0.26	QV
4+20	0.0594	0.26	QV
4+25	0.0613	0.27	QV
4+30	0.0632	0.28	QV
4+35	0.0653	0.29	QV
4+40	0.0673	0.30	QV
4+45	0.0694	0.30	QV
4+50	0.0715	0.31	QV
4+55	0.0737	0.31	Q V
5+ 0	0.0759	0.33	Q V
5+ 5	0.0782	0.34	Q V
5+10	0.0805	0.33	Q V
5+15	0.0826	0.31	Q V
5+20	0.0847	0.30	Q V
5+25	0.0867	0.29	Q V
5+30	0.0888	0.30	Q V
5+35	0.0909	0.31	Q V
5+40	0.0931	0.32	Q V
5+45	0.0954	0.33	Q V
5+50	0.0977	0.34	Q V
5+55	0.1001	0.35	Q V
6+ 0	0.1025	0.35	Q V
6+ 5	0.1049	0.35	Q V
6+10	0.1074	0.36	Q V
6+15	0.1099	0.37	Q V
6+20	0.1126	0.38	Q V
6+25	0.1153	0.39	Q V
6+30	0.1180	0.39	Q V

6+35	0.1207	0.40	Q	V			
6+40	0.1235	0.40	Q	V			
6+45	0.1263	0.42	Q	V			
6+50	0.1293	0.43	Q	V			
6+55	0.1323	0.43	Q	V			
7+ 0	0.1353	0.44	Q	V			
7+ 5	0.1383	0.44	Q	V			
7+10	0.1413	0.44	Q	V			
7+15	0.1444	0.44	Q	V			
7+20	0.1475	0.45	Q	V			
7+25	0.1506	0.45	Q	V			
7+30	0.1538	0.47	Q	V			
7+35	0.1571	0.48	Q	V			
7+40	0.1604	0.49	Q	V			
7+45	0.1639	0.50	Q	V			
7+50	0.1674	0.51	Q	V			
7+55	0.1710	0.53	Q	V			
8+ 0	0.1748	0.54	Q	V			
8+ 5	0.1786	0.56	Q	V			
8+10	0.1826	0.57	Q	V			
8+15	0.1867	0.61	Q	V			
8+20	0.1910	0.63	Q	V			
8+25	0.1954	0.64	Q	V			
8+30	0.1999	0.65	Q	V			
8+35	0.2044	0.65	Q	V			
8+40	0.2089	0.66	Q	V			
8+45	0.2136	0.68	Q	V			
8+50	0.2184	0.69	Q	V			
8+55	0.2232	0.70	Q	V			
9+ 0	0.2282	0.72	Q	V			
9+ 5	0.2333	0.74	Q	V			
9+10	0.2385	0.75	Q	V			
9+15	0.2439	0.78	Q	V			
9+20	0.2494	0.81	Q	V			
9+25	0.2551	0.82	Q	V			
9+30	0.2609	0.84	Q	V			
9+35	0.2668	0.86	Q	V			
9+40	0.2729	0.88	Q	V			
9+45	0.2790	0.89	Q	V			
9+50	0.2853	0.91	Q	V			
9+55	0.2916	0.92	Q	V			
10+ 0	0.2981	0.94	Q	V			
10+ 5	0.3046	0.95	Q	V			
10+10	0.3110	0.92	Q	V			
10+15	0.3167	0.84	Q	V			
10+20	0.3221	0.78	Q	V			
10+25	0.3273	0.75	Q	V			
10+30	0.3324	0.74	Q	V			
10+35	0.3374	0.73	Q	V			
10+40	0.3425	0.74	Q	V			
10+45	0.3480	0.80	Q	V			
10+50	0.3538	0.84	Q	V			
10+55	0.3597	0.85	Q	V			
11+ 0	0.3656	0.87	Q	V			
11+ 5	0.3716	0.87	Q	V			
11+10	0.3776	0.87	Q	V			
11+15	0.3836	0.86	Q	V			
11+20	0.3895	0.86	Q	V			
11+25	0.3954	0.86	Q	V			
11+30	0.4013	0.86	Q	V			
11+35	0.4072	0.85	Q	V			
11+40	0.4130	0.84	Q	V			
11+45	0.4186	0.82	Q	V			

11+50	0.4241	0.80	Q	V			
11+55	0.4296	0.80	Q	V			
12+ 0	0.4351	0.80	Q	V			
12+ 5	0.4407	0.82	Q	V			
12+10	0.4466	0.85	Q	V			
12+15	0.4531	0.94	Q	V			
12+20	0.4600	1.00	Q	V			
12+25	0.4672	1.04	Q	V			
12+30	0.4746	1.07	Q	V			
12+35	0.4822	1.10	Q	V			
12+40	0.4899	1.13	Q	V			
12+45	0.4979	1.16	Q	V			
12+50	0.5061	1.19	Q	V			
12+55	0.5144	1.21	Q	V			
13+ 0	0.5229	1.24	Q	V			
13+ 5	0.5317	1.27	Q	V			
13+10	0.5412	1.38	Q	V			
13+15	0.5524	1.62	Q	V			
13+20	0.5648	1.80	Q	V			
13+25	0.5781	1.93	Q	V			
13+30	0.5921	2.03	Q	V			
13+35	0.6065	2.09	Q	V			
13+40	0.6203	2.01	Q	V			
13+45	0.6318	1.67	Q	V			
13+50	0.6417	1.44	Q	V			
13+55	0.6509	1.33	Q	V			
14+ 0	0.6596	1.26	Q	V			
14+ 5	0.6680	1.22	Q	V			
14+10	0.6762	1.20	Q	V			
14+15	0.6847	1.22	Q	V			
14+20	0.6932	1.24	Q	V			
14+25	0.7016	1.23	Q	V			
14+30	0.7100	1.21	Q	V			
14+35	0.7183	1.20	Q	V			
14+40	0.7265	1.20	Q	V			
14+45	0.7347	1.19	Q	V			
14+50	0.7429	1.19	Q	V			
14+55	0.7511	1.18	Q	V			
15+ 0	0.7591	1.16	Q	V			
15+ 5	0.7670	1.15	Q	V			
15+10	0.7748	1.14	Q	V			
15+15	0.7825	1.12	Q	V			
15+20	0.7901	1.10	Q	V			
15+25	0.7976	1.09	Q	V			
15+30	0.8050	1.07	Q	V			
15+35	0.8123	1.06	Q	V			
15+40	0.8194	1.03	Q	V			
15+45	0.8261	0.98	Q	V			
15+50	0.8326	0.94	Q	V			
15+55	0.8389	0.92	Q	V			
16+ 0	0.8452	0.90	Q	V			
16+ 5	0.8512	0.88	Q	V			
16+10	0.8567	0.79	Q	V			
16+15	0.8608	0.59	Q	V			
16+20	0.8639	0.46	Q	V			
16+25	0.8666	0.39	Q	V			
16+30	0.8690	0.34	Q	V			
16+35	0.8711	0.31	Q	V			
16+40	0.8730	0.28	Q	V			
16+45	0.8747	0.24	Q	V			
16+50	0.8762	0.22	Q	V			
16+55	0.8776	0.20	Q	V			
17+ 0	0.8789	0.19	Q	V			

17+ 5	0.8801	0.18	Q				V
17+10	0.8813	0.18	Q				V
17+15	0.8827	0.20	Q				V
17+20	0.8841	0.21	Q				V
17+25	0.8856	0.21	Q				V
17+30	0.8871	0.22	Q				V
17+35	0.8886	0.22	Q				V
17+40	0.8901	0.22	Q				V
17+45	0.8916	0.22	Q				V
17+50	0.8931	0.22	Q				V
17+55	0.8945	0.21	Q				V
18+ 0	0.8959	0.20	Q				V
18+ 5	0.8973	0.19	Q				V
18+10	0.8986	0.19	Q				V
18+15	0.8999	0.19	Q				V
18+20	0.9011	0.19	Q				V
18+25	0.9024	0.18	Q				V
18+30	0.9037	0.18	Q				V
18+35	0.9049	0.18	Q				V
18+40	0.9061	0.18	Q				V
18+45	0.9073	0.16	Q				V
18+50	0.9083	0.15	Q				V
18+55	0.9093	0.14	Q				V
19+ 0	0.9102	0.13	Q				V
19+ 5	0.9110	0.12	Q				V
19+10	0.9118	0.12	Q				V
19+15	0.9127	0.12	Q				V
19+20	0.9136	0.13	Q				V
19+25	0.9145	0.14	Q				V
19+30	0.9156	0.15	Q				V
19+35	0.9167	0.16	Q				V
19+40	0.9178	0.16	Q				V
19+45	0.9188	0.15	Q				V
19+50	0.9198	0.14	Q				V
19+55	0.9207	0.13	Q				V
20+ 0	0.9215	0.12	Q				V
20+ 5	0.9223	0.11	Q				V
20+10	0.9231	0.11	Q				V
20+15	0.9239	0.12	Q				V
20+20	0.9248	0.13	Q				V
20+25	0.9257	0.13	Q				V
20+30	0.9266	0.13	Q				V
20+35	0.9275	0.13	Q				V
20+40	0.9284	0.13	Q				V
20+45	0.9293	0.13	Q				V
20+50	0.9302	0.13	Q				V
20+55	0.9311	0.13	Q				V
21+ 0	0.9319	0.12	Q				V
21+ 5	0.9326	0.11	Q				V
21+10	0.9334	0.11	Q				V
21+15	0.9342	0.12	Q				V
21+20	0.9350	0.12	Q				V
21+25	0.9359	0.12	Q				V
21+30	0.9366	0.11	Q				V
21+35	0.9374	0.10	Q				V
21+40	0.9381	0.11	Q				V
21+45	0.9389	0.12	Q				V
21+50	0.9397	0.12	Q				V
21+55	0.9406	0.12	Q				V
22+ 0	0.9413	0.11	Q				V
22+ 5	0.9420	0.10	Q				V
22+10	0.9428	0.11	Q				V
22+15	0.9436	0.12	Q				V

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22+20	0.9444	0.12	Q				V
22+25	0.9452	0.12	Q				V
22+30	0.9460	0.11	Q				V
22+35	0.9467	0.10	Q				V
22+40	0.9474	0.10	Q				V
22+45	0.9480	0.10	Q				V
22+50	0.9487	0.10	Q				V
22+55	0.9493	0.09	Q				V
23+ 0	0.9500	0.09	Q				V
23+ 5	0.9506	0.09	Q				V
23+10	0.9512	0.09	Q				V
23+15	0.9519	0.09	Q				V
23+20	0.9525	0.09	Q				V
23+25	0.9531	0.09	Q				V
23+30	0.9537	0.09	Q				V
23+35	0.9544	0.09	Q				V
23+40	0.9550	0.09	Q				V
23+45	0.9556	0.09	Q				V
23+50	0.9562	0.09	Q				V
23+55	0.9569	0.09	Q				V
24+ 0	0.9575	0.09	Q				V
24+ 5	0.9581	0.09	Q				V
24+10	0.9586	0.08	Q				V
24+15	0.9590	0.05	Q				V
24+20	0.9592	0.04	Q				V
24+25	0.9594	0.03	Q				V
24+30	0.9595	0.02	Q				V
24+35	0.9597	0.02	Q				V
24+40	0.9597	0.01	Q				V
24+45	0.9598	0.01	Q				V
24+50	0.9599	0.01	Q				V
24+55	0.9599	0.01	Q				V
25+ 0	0.9599	0.01	Q				V
25+ 5	0.9600	0.00	Q				V
25+10	0.9600	0.00	Q				V
25+15	0.9600	0.00	Q				V
25+20	0.9600	0.00	Q				V
25+25	0.9600	0.00	Q				V
25+30	0.9600	0.00	Q				V
25+35	0.9601	0.00	Q				V
25+40	0.9601	0.00	Q				V
25+45	0.9601	0.00	Q				V

130160CALTRANS1001100.TXT

Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160CALTRANS1100.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
CALTRANS DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 27.00(Ac.) = 0.042 Sq. Mi.
0.042 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 27.00(Ac.) =

USER Entry of lag time in hours
Lag time = 0.233 Hr.
Lag time = 14.00 Min.
25% of lag time = 3.50 Min.
40% of lag time = 5.60 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	0.48	12.85

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	1.31	35.37

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.476(In)
Area Averaged 100-Year Rainfall = 1.310(In)

Point rain (area averaged) = 1.310(In)
Areaal adjustment factor = 99.98 %
Adjusted average point rain = 1.310(In)

Sub-Area Data:

130160CALTRANS1001100.TXT
Area(Ac.) Runoff Index Impervious %
27.000 32.00 0.000
Total Area Entered = 27.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	52.0	0.552	0.000	0.552	1.000	0.552
						Sum (F) = 0.552

Area averaged mean soil loss (F) (In/Hr) = 0.552
Minimum soil loss rate ((In/Hr)) = 0.276
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

slope of intensity-duration curve for a 1 hour storm =0.4800

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	35.715	2.304
2	0.167	71.430	11.784
3	0.250	107.144	28.160
4	0.333	142.859	18.658
5	0.417	178.574	10.001
6	0.500	214.289	6.683
7	0.583	250.004	4.745
8	0.667	285.718	3.656
9	0.750	321.433	2.869
10	0.833	357.148	2.136
11	0.917	392.863	1.789
12	1.000	428.578	1.475
13	1.083	464.292	1.199
14	1.167	500.007	0.980
15	1.250	535.722	0.786
16	1.333	571.437	0.591
17	1.417	607.152	0.381
18	1.500	642.866	0.406
19	1.583	678.581	0.429
20	1.667	714.296	0.412
21	1.750	750.011	0.260
22	1.833	785.726	0.299
		Sum = 100.000	Sum= 27.211

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	4.40	0.552 (0.622)	0.140
2	0.17	4.50	0.552 (0.637)	0.156
3	0.25	5.40	0.552 (0.764)	0.297
4	0.33	5.40	0.552 (0.764)	0.297
5	0.42	5.70	0.552 (0.806)	0.344
6	0.50	6.40	0.552 (0.905)	0.454
7	0.58	7.90	0.552 (1.117)	0.690

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8	0.67	9.10	1.430	0.552	(1.287)	0.879
9	0.75	12.80	2.012	0.552	(1.811)	1.460
10	0.83	25.60	4.023	0.552	(3.621)	3.472
11	0.92	7.90	1.242	0.552	(1.117)	0.690
12	1.00	4.90	0.770	0.552	(0.693)	0.218

(Loss Rate Not Used)

Sum = 100.0 Sum = 9.1

Flood volume = Effective rainfall 0.76(In)
times area 27.0(Ac.)/[(In)/(Ft.)] = 1.7(Ac.Ft)

Total soil loss = 0.55(In)
Total soil loss = 1.241(Ac.Ft)
Total rainfall = 1.31(In)
Flood volume = 74299.4 Cubic Feet
Total soil loss = 54062.3 Cubic Feet

Peak flow rate of this hydrograph = 41.497(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0006	0.09	Q					
0+10	0.0044	0.55	Q					
0+15	0.0165	1.76	VQ					
0+20	0.0374	3.04	V Q					
0+25	0.0692	4.62	V Q					
0+30	0.1096	5.85	V Q					
0+35	0.1599	7.31	V Q					
0+40	0.2266	9.69	V Q					
0+45	0.3193	13.46	V Q					
0+50	0.4560	19.85	V Q					
0+55	0.6699	31.06	V Q					
1+ 0	0.9557	41.50	V Q					
1+ 5	1.1708	31.24	V Q					
1+10	1.3087	20.02	V Q					
1+15	1.4004	13.32	V Q					
1+20	1.4656	9.47	V Q					
1+25	1.5153	7.21	V Q					
1+30	1.5540	5.62	V Q					
1+35								

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Unit Hydrograph Analysis

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
CALTRANS DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 27.00(Ac.) = 0.042 Sq. Mi.
0.042 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 27.00(Ac.) =

USER Entry of lag time in hours
Lag time = 0.233 Hr.
Lag time = 14.00 Min.
25% of lag time = 3.50 Min.
40% of lag time = 5.60 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	0.87	23.38

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	2.16	58.32

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.866(In)
Area Averaged 100-Year Rainfall = 2.160(In)

Point rain (area averaged) = 2.160(In)
Areaal adjustment factor = 99.99 %
Adjusted average point rain = 2.160(In)

Sub-Area Data:

130160CALTRANS1003100.TXT
 Area(Ac.) Runoff Index Impervious %
 27.000 32.00 0.000
 Total Area Entered = 27.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	52.0	0.552	0.000	0.552	1.000	0.552
						Sum (F) = 0.552

Area averaged mean soil loss (F) (In/Hr) = 0.552
 Minimum soil loss rate ((In/Hr)) = 0.276
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	35.715	2.304
2	0.167	71.430	11.784
3	0.250	107.144	28.160
4	0.333	142.859	18.658
5	0.417	178.574	10.001
6	0.500	214.289	6.683
7	0.583	250.004	4.745
8	0.667	285.718	3.656
9	0.750	321.433	2.869
10	0.833	357.148	2.136
11	0.917	392.863	1.789
12	1.000	428.578	1.475
13	1.083	464.292	1.199
14	1.167	500.007	0.980
15	1.250	535.722	0.786
16	1.333	571.437	0.591
17	1.417	607.152	0.381
18	1.500	642.866	0.406
19	1.583	678.581	0.429
20	1.667	714.296	0.412
21	1.750	750.011	0.260
22	1.833	785.726	0.299
		Sum = 100.000	Sum= 27.211

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
			Max	Low	
1	0.08	1.30	0.337	(0.552)	0.303
2	0.17	1.30	0.337	(0.552)	0.303
3	0.25	1.10	0.285	(0.552)	0.257
4	0.33	1.50	0.389	(0.552)	0.350
5	0.42	1.50	0.389	(0.552)	0.350
6	0.50	1.80	0.467	(0.552)	0.420
7	0.58	1.50	0.389	(0.552)	0.350
8	0.67	1.80	0.467	(0.552)	0.420
9	0.75	1.80	0.467	(0.552)	0.420

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10	0.83	1.50	0.389	(0.552)	0.350	0.039
11	0.92	1.60	0.415	(0.552)	0.373	0.041
12	1.00	1.80	0.467	(0.552)	0.420	0.047
13	1.08	2.20	0.570	(0.552)	0.513	0.057
14	1.17	2.20	0.570	(0.552)	0.513	0.057
15	1.25	2.20	0.570	(0.552)	0.513	0.057
16	1.33	2.00	0.518	(0.552)	0.467	0.052
17	1.42	2.60	0.674	0.552	(0.606)	0.122
18	1.50	2.70	0.700	0.552	(0.630)	0.148
19	1.58	2.40	0.622	0.552	(0.560)	0.070
20	1.67	2.70	0.700	0.552	(0.630)	0.148
21	1.75	3.30	0.855	0.552	(0.770)	0.304
22	1.83	3.10	0.803	0.552	(0.723)	0.252
23	1.92	2.90	0.752	0.552	(0.676)	0.200
24	2.00	3.00	0.778	0.552	(0.700)	0.226
25	2.08	3.10	0.803	0.552	(0.723)	0.252
26	2.17	4.20	1.089	0.552	(0.980)	0.537
27	2.25	5.00	1.296	0.552	(1.166)	0.744
28	2.33	3.50	0.907	0.552	(0.816)	0.355
29	2.42	6.80	1.762	0.552	(1.586)	1.211
30	2.50	7.30	1.892	0.552	(1.703)	1.340
31	2.58	8.20	2.125	0.552	(1.913)	1.574
32	2.67	5.90	1.529	0.552	(1.376)	0.977
33	2.75	2.00	0.518	(0.552)	0.467	0.052
34	2.83	1.80	0.467	(0.552)	0.420	0.047
35	2.92	1.80	0.467	(0.552)	0.420	0.047
36	3.00	0.60	0.156	(0.552)	0.140	0.016

(Loss Rate Not Used)

Sum = 100.0 Sum = 9.3

Flood volume = Effective rainfall 0.78(In)
times area 27.0(Ac.)/[(In)/(Ft.)] = 1.7(Ac.Ft)
Total soil loss = 1.38(In)
Total soil loss = 3.111(Ac.Ft)
Total rainfall = 2.16(In)
Flood volume = 76154.0 Cubic Feet
Total soil loss = 135522.6 Cubic Feet

Peak flow rate of this hydrograph = 28.223(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0001		0.02	Q				
0+10	0.0010		0.13	Q				
0+15	0.0037		0.38	Q				
0+20	0.0074		0.55	Q				
0+25	0.0118		0.63	Q				
0+30	0.0169		0.75	Q				
0+35	0.0228		0.85	VQ				
0+40	0.0293		0.94	VQ				
0+45	0.0361		0.99	VQ				
0+50	0.0434		1.05	VQ				
0+55	0.0508		1.08	Q				
1+ 0	0.0582		1.07	Q				
1+ 5	0.0658		1.10	Q				
1+10	0.0739		1.19	Q				
1+15	0.0829		1.30	Q				

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1+20	0.0923	1.37	QV						
1+25	0.1023	1.44	QV						
1+30	0.1138	1.67	Q						
1+35	0.1293	2.25	Q						
1+40	0.1472	2.61	Q						
1+45	0.1657	2.68	Q						
1+50	0.1902	3.56	Q						
1+55	0.2237	4.87	VQ						
2+ 0	0.2602	5.29	V	Q					
2+ 5	0.2965	5.28	VQ						
2+10	0.3358	5.70	Q						
2+15	0.3848	7.11	VQ						
2+20	0.4534	9.97	V	Q					
2+25	0.5392	12.46		V	Q				
2+30	0.6374	14.25		V	Q				
2+35	0.7790	20.57			V	Q			
2+40	0.9583	26.04				V			
2+45	1.1527	28.22					V	Q	
2+50	1.3163	23.75							Q
2+55	1.4234	15.56							
3+ 0	1.4965	10.61			Q				
3+ 5	1.5514	7.97							
3+10	1.5931	6.06			Q				
3+15	1.6252	4.67							
3+20	1.6504	3.65		Q					
3+25	1.6705	2.92		Q					
3+30	1.6868	2.37		Q					
3+35	1.7000	1.91		Q					
3+40	1.7106	1.55		Q					
3+45	1.7191	1.23	Q						
3+50	1.7258	0.97	Q						
3+55	1.7313	0.79	Q						
4+ 0	1.7360	0.69	Q						
4+ 5	1.7400	0.58	Q						
4+10	1.7435	0.51	Q						
4+15	1.7459	0.35	Q						

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Unit Hydrograph Analysis

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
CALTRANS DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 27.00(Ac.) = 0.042 Sq. Mi.
0.042 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 27.00(Ac.) =

USER Entry of lag time in hours
Lag time = 0.233 Hr.
Lag time = 14.00 Min.
25% of lag time = 3.50 Min.
40% of lag time = 5.60 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	1.25	33.75

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	3.09	83.43

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.250(In)
Area Averaged 100-Year Rainfall = 3.090(In)

Point rain (area averaged) = 3.090(In)
Areaal adjustment factor = 99.99 %
Adjusted average point rain = 3.090(In)

Sub-Area Data:

130160CALTRANS1006100.TXT
Area(Ac.) Runoff Index Impervious %
27.000 32.00 0.000
Total Area Entered = 27.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	52.0	0.552	0.000	0.552	1.000	0.552
						Sum (F) = 0.552

Area averaged mean soil loss (F) (In/Hr) = 0.552
Minimum soil loss rate ((In/Hr)) = 0.276
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Unit Hydrograph
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	35.715	2.304
2	0.167	71.430	11.784
3	0.250	107.144	28.160
4	0.333	142.859	18.658
5	0.417	178.574	10.001
6	0.500	214.289	6.683
7	0.583	250.004	4.745
8	0.667	285.718	3.656
9	0.750	321.433	2.869
10	0.833	357.148	2.136
11	0.917	392.863	1.789
12	1.000	428.578	1.475
13	1.083	464.292	1.199
14	1.167	500.007	0.980
15	1.250	535.722	0.786
16	1.333	571.437	0.591
17	1.417	607.152	0.381
18	1.500	642.866	0.406
19	1.583	678.581	0.429
20	1.667	714.296	0.412
21	1.750	750.011	0.260
22	1.833	785.726	0.299
		Sum = 100.000	Sum= 27.211

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	0.185	(0.552)	0.167
2	0.17	0.222	(0.552)	0.200
3	0.25	0.222	(0.552)	0.200
4	0.33	0.222	(0.552)	0.200
5	0.42	0.222	(0.552)	0.200
6	0.50	0.260	(0.552)	0.234
7	0.58	0.260	(0.552)	0.234
8	0.67	0.260	(0.552)	0.234
9	0.75	0.260	(0.552)	0.234

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10	0.83	0.70	0.260	(0.552)	0.234	0.026
11	0.92	0.70	0.260	(0.552)	0.234	0.026
12	1.00	0.80	0.297	(0.552)	0.267	0.030
13	1.08	0.80	0.297	(0.552)	0.267	0.030
14	1.17	0.80	0.297	(0.552)	0.267	0.030
15	1.25	0.80	0.297	(0.552)	0.267	0.030
16	1.33	0.80	0.297	(0.552)	0.267	0.030
17	1.42	0.80	0.297	(0.552)	0.267	0.030
18	1.50	0.80	0.297	(0.552)	0.267	0.030
19	1.58	0.80	0.297	(0.552)	0.267	0.030
20	1.67	0.80	0.297	(0.552)	0.267	0.030
21	1.75	0.80	0.297	(0.552)	0.267	0.030
22	1.83	0.80	0.297	(0.552)	0.267	0.030
23	1.92	0.80	0.297	(0.552)	0.267	0.030
24	2.00	0.90	0.334	(0.552)	0.300	0.033
25	2.08	0.80	0.297	(0.552)	0.267	0.030
26	2.17	0.90	0.334	(0.552)	0.300	0.033
27	2.25	0.90	0.334	(0.552)	0.300	0.033
28	2.33	0.90	0.334	(0.552)	0.300	0.033
29	2.42	0.90	0.334	(0.552)	0.300	0.033
30	2.50	0.90	0.334	(0.552)	0.300	0.033
31	2.58	0.90	0.334	(0.552)	0.300	0.033
32	2.67	0.90	0.334	(0.552)	0.300	0.033
33	2.75	1.00	0.371	(0.552)	0.334	0.037
34	2.83	1.00	0.371	(0.552)	0.334	0.037
35	2.92	1.00	0.371	(0.552)	0.334	0.037
36	3.00	1.00	0.371	(0.552)	0.334	0.037
37	3.08	1.00	0.371	(0.552)	0.334	0.037
38	3.17	1.10	0.408	(0.552)	0.367	0.041
39	3.25	1.10	0.408	(0.552)	0.367	0.041
40	3.33	1.10	0.408	(0.552)	0.367	0.041
41	3.42	1.20	0.445	(0.552)	0.400	0.044
42	3.50	1.30	0.482	(0.552)	0.434	0.048
43	3.58	1.40	0.519	(0.552)	0.467	0.052
44	3.67	1.40	0.519	(0.552)	0.467	0.052
45	3.75	1.50	0.556	(0.552)	0.501	0.056
46	3.83	1.50	0.556	(0.552)	0.501	0.056
47	3.92	1.60	0.593	(0.552)	0.534	0.059
48	4.00	1.60	0.593	(0.552)	0.534	0.059
49	4.08	1.70	0.630	0.552	(0.567)	0.079
50	4.17	1.80	0.667	0.552	(0.601)	0.116
51	4.25	1.90	0.704	0.552	(0.634)	0.153
52	4.33	2.00	0.742	0.552	(0.667)	0.190
53	4.42	2.10	0.779	0.552	(0.701)	0.227
54	4.50	2.10	0.779	0.552	(0.701)	0.227
55	4.58	2.20	0.816	0.552	(0.734)	0.264
56	4.67	2.30	0.853	0.552	(0.767)	0.301
57	4.75	2.40	0.890	0.552	(0.801)	0.338
58	4.83	2.40	0.890	0.552	(0.801)	0.338
59	4.92	2.50	0.927	0.552	(0.834)	0.375
60	5.00	2.60	0.964	0.552	(0.868)	0.412
61	5.08	3.10	1.149	0.552	(1.034)	0.598
62	5.17	3.60	1.335	0.552	(1.201)	0.783
63	5.25	3.90	1.446	0.552	(1.301)	0.894
64	5.33	4.20	1.557	0.552	(1.401)	1.006
65	5.42	4.70	1.743	0.552	(1.568)	1.191
66	5.50	5.60	2.076	0.552	(1.869)	1.525
67	5.58	1.90	0.704	0.552	(0.634)	0.153
68	5.67	0.90	0.334	(0.552)	0.300	0.033
69	5.75	0.60	0.222	(0.552)	0.200	0.022
70	5.83	0.50	0.185	(0.552)	0.167	0.019
71	5.92	0.30	0.111	(0.552)	0.100	0.011
72	6.00	0.20	0.074	(0.552)	0.067	0.007

(Loss Rate Not Used)

Sum = 100.0 Sum = 10.9

Flood volume = Effective rainfall 0.91(In)
times area 27.0(Ac.)/[(In)/(Ft.)) = 2.0(Ac.Ft)

Total soil loss = 2.18(In)

Total soil loss = 4.906(Ac.Ft)

Total rainfall = 3.09(In)

Flood volume = 89130.1 Cubic Feet

Total soil loss = 213692.7 Cubic Feet

Peak flow rate of this hydrograph = 25.385(CFS)

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6 - H O U R S T O R M
R u n o f f H y d r o g r a p h-----
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0001	0.01	Q				
0+10	0.0006	0.07	Q				
0+15	0.0022	0.23	Q				
0+20	0.0046	0.35	Q				
0+25	0.0075	0.42	Q				
0+30	0.0107	0.47	Q				
0+35	0.0142	0.51	Q				
0+40	0.0180	0.56	Q				
0+45	0.0221	0.60	Q				
0+50	0.0264	0.62	Q				
0+55	0.0308	0.64	Q				
1+ 0	0.0353	0.65	Q				
1+ 5	0.0400	0.68	Q				
1+10	0.0449	0.72	Q				
1+15	0.0500	0.74	Q				
1+20	0.0552	0.76	Q				
1+25	0.0605	0.77	Q				
1+30	0.0659	0.78	Q				
1+35	0.0712	0.78	Q				
1+40	0.0767	0.79	Q				
1+45	0.0822	0.79	Q				
1+50	0.0877	0.80	Q				
1+55	0.0932	0.80	Q				
2+ 0	0.0987	0.80	Q				
2+ 5	0.1043	0.82	QV				
2+10	0.1101	0.84	QV				
2+15	0.1158	0.84	QV				
2+20	0.1218	0.86	QV				
2+25	0.1278	0.87	QV				
2+30	0.1339	0.88	QV				
2+35	0.1400	0.89	QV				
2+40	0.1461	0.89	QV				
2+45	0.1523	0.90	QV				
2+50	0.1586	0.91	Q V				
2+55	0.1651	0.94	Q V				
3+ 0	0.1717	0.96	Q V				
3+ 5	0.1785	0.98	Q V				
3+10	0.1852	0.99	Q V				
3+15	0.1922	1.00	Q V				
3+20	0.1993	1.04	Q V				
3+25	0.2066	1.06	Q V				
3+30	0.2141	1.09	Q V				

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3+35	0.2219	1.14	Q V
3+40	0.2302	1.20	Q V
3+45	0.2390	1.27	Q V
3+50	0.2480	1.32	Q V
3+55	0.2575	1.38	Q V
4+ 0	0.2673	1.42	Q V
4+ 5	0.2776	1.49	Q V
4+10	0.2887	1.61	Q V
4+15	0.3019	1.92	Q V
4+20	0.3189	2.47	Q V
4+25	0.3406	3.15	Q V
4+30	0.3673	3.88	Q V
4+35	0.3989	4.58	Q V
4+40	0.4344	5.15	Q V
4+45	0.4747	5.85	Q V
4+50	0.5205	6.64	Q V
4+55	0.5713	7.39	Q V
5+ 0	0.6265	8.00	Q V
5+ 5	0.6873	8.83	Q V
5+10	0.7578	10.24	Q V
5+15	0.8459	12.79	Q V
5+20	0.9553	15.88	Q V
5+25	1.0853	18.88	Q V
5+30	1.2376	22.11	Q V
5+35	1.4120	25.32	Q V
5+40	1.5868	25.38	Q V
5+45	1.7069	17.44	Q V
5+50	1.7850	11.34	Q V
5+			

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160CALTRANS24100.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
CALTRANS DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 27.00(Ac.) = 0.042 Sq. Mi.
0.042 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 27.00(Ac.) =

USER Entry of lag time in hours
Lag time = 0.233 Hr.
Lag time = 14.00 Min.
25% of lag time = 3.50 Min.
40% of lag time = 5.60 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	2.42	65.34

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
27.00	6.58	177.66

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.420(In)
Area Averaged 100-Year Rainfall = 6.580(In)

Point rain (area averaged) = 6.580(In)
Areaal adjustment factor = 99.99 %
Adjusted average point rain = 6.580(In)

Sub-Area Data:

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Area(Ac.) Runoff Index Impervious %
27.000 32.00 0.000
Total Area Entered = 27.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	52.0	0.552	0.000	0.552	1.000	0.552
						Sum (F) = 0.552

Area averaged mean soil loss (F) (In/Hr) = 0.552
Minimum soil loss rate ((In/Hr)) = 0.276
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Unit Hydrograph
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	35.715	2.304
2	0.167	71.430	11.784
3	0.250	107.144	28.160
4	0.333	142.859	18.658
5	0.417	178.574	10.001
6	0.500	214.289	6.683
7	0.583	250.004	4.745
8	0.667	285.718	3.656
9	0.750	321.433	2.869
10	0.833	357.148	2.136
11	0.917	392.863	1.789
12	1.000	428.578	1.475
13	1.083	464.292	1.199
14	1.167	500.007	0.980
15	1.250	535.722	0.786
16	1.333	571.437	0.591
17	1.417	607.152	0.381
18	1.500	642.866	0.406
19	1.583	678.581	0.429
20	1.667	714.296	0.412
21	1.750	750.011	0.260
22	1.833	785.726	0.299
		Sum = 100.000	Sum= 27.211

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	0.053	(0.978)	0.047
2	0.17	0.053	(0.974)	0.047
3	0.25	0.053	(0.970)	0.047
4	0.33	0.079	(0.967)	0.071
5	0.42	0.079	(0.963)	0.071
6	0.50	0.079	(0.959)	0.071
7	0.58	0.079	(0.955)	0.071
8	0.67	0.079	(0.952)	0.071
9	0.75	0.079	(0.948)	0.071

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10	0.83	0.13	0.105	(0.944)	0.095	0.011
11	0.92	0.13	0.105	(0.940)	0.095	0.011
12	1.00	0.13	0.105	(0.937)	0.095	0.011
13	1.08	0.10	0.079	(0.933)	0.071	0.008
14	1.17	0.10	0.079	(0.929)	0.071	0.008
15	1.25	0.10	0.079	(0.926)	0.071	0.008
16	1.33	0.10	0.079	(0.922)	0.071	0.008
17	1.42	0.10	0.079	(0.918)	0.071	0.008
18	1.50	0.10	0.079	(0.915)	0.071	0.008
19	1.58	0.10	0.079	(0.911)	0.071	0.008
20	1.67	0.10	0.079	(0.907)	0.071	0.008
21	1.75	0.10	0.079	(0.904)	0.071	0.008
22	1.83	0.13	0.105	(0.900)	0.095	0.011
23	1.92	0.13	0.105	(0.896)	0.095	0.011
24	2.00	0.13	0.105	(0.893)	0.095	0.011
25	2.08	0.13	0.105	(0.889)	0.095	0.011
26	2.17	0.13	0.105	(0.886)	0.095	0.011
27	2.25	0.13	0.105	(0.882)	0.095	0.011
28	2.33	0.13	0.105	(0.878)	0.095	0.011
29	2.42	0.13	0.105	(0.875)	0.095	0.011
30	2.50	0.13	0.105	(0.871)	0.095	0.011
31	2.58	0.17	0.132	(0.868)	0.118	0.013
32	2.67	0.17	0.132	(0.864)	0.118	0.013
33	2.75	0.17	0.132	(0.860)	0.118	0.013
34	2.83	0.17	0.132	(0.857)	0.118	0.013
35	2.92	0.17	0.132	(0.853)	0.118	0.013
36	3.00	0.17	0.132	(0.850)	0.118	0.013
37	3.08	0.17	0.132	(0.846)	0.118	0.013
38	3.17	0.17	0.132	(0.843)	0.118	0.013
39	3.25	0.17	0.132	(0.839)	0.118	0.013
40	3.33	0.17	0.132	(0.836)	0.118	0.013
41	3.42	0.17	0.132	(0.832)	0.118	0.013
42	3.50	0.17	0.132	(0.829)	0.118	0.013
43	3.58	0.17	0.132	(0.825)	0.118	0.013
44	3.67	0.17	0.132	(0.822)	0.118	0.013
45	3.75	0.17	0.132	(0.818)	0.118	0.013
46	3.83	0.20	0.158	(0.815)	0.142	0.016
47	3.92	0.20	0.158	(0.812)	0.142	0.016
48	4.00	0.20	0.158	(0.808)	0.142	0.016
49	4.08	0.20	0.158	(0.805)	0.142	0.016
50	4.17	0.20	0.158	(0.801)	0.142	0.016
51	4.25	0.20	0.158	(0.798)	0.142	0.016
52	4.33	0.23	0.184	(0.794)	0.166	0.018
53	4.42	0.23	0.184	(0.791)	0.166	0.018
54	4.50	0.23	0.184	(0.788)	0.166	0.018
55	4.58	0.23	0.184	(0.784)	0.166	0.018
56	4.67	0.23	0.184	(0.781)	0.166	0.018
57	4.75	0.23	0.184	(0.778)	0.166	0.018
58	4.83	0.27	0.211	(0.774)	0.189	0.021
59	4.92	0.27	0.211	(0.771)	0.189	0.021
60	5.00	0.27	0.211	(0.768)	0.189	0.021
61	5.08	0.20	0.158	(0.764)	0.142	0.016
62	5.17	0.20	0.158	(0.761)	0.142	0.016
63	5.25	0.20	0.158	(0.758)	0.142	0.016
64	5.33	0.23	0.184	(0.754)	0.166	0.018
65	5.42	0.23	0.184	(0.751)	0.166	0.018
66	5.50	0.23	0.184	(0.748)	0.166	0.018
67	5.58	0.27	0.211	(0.744)	0.189	0.021
68	5.67	0.27	0.211	(0.741)	0.189	0.021
69	5.75	0.27	0.211	(0.738)	0.189	0.021
70	5.83	0.27	0.211	(0.735)	0.189	0.021
71	5.92	0.27	0.211	(0.731)	0.189	0.021
72	6.00	0.27	0.211	(0.728)	0.189	0.021

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73	6.08	0.30	0.237	(0.725)	0.213	0.024
74	6.17	0.30	0.237	(0.722)	0.213	0.024
75	6.25	0.30	0.237	(0.718)	0.213	0.024
76	6.33	0.30	0.237	(0.715)	0.213	0.024
77	6.42	0.30	0.237	(0.712)	0.213	0.024
78	6.50	0.30	0.237	(0.709)	0.213	0.024
79	6.58	0.33	0.263	(0.706)	0.237	0.026
80	6.67	0.33	0.263	(0.702)	0.237	0.026
81	6.75	0.33	0.263	(0.699)	0.237	0.026
82	6.83	0.33	0.263	(0.696)	0.237	0.026
83	6.92	0.33	0.263	(0.693)	0.237	0.026
84	7.00	0.33	0.263	(0.690)	0.237	0.026
85	7.08	0.33	0.263	(0.687)	0.237	0.026
86	7.17	0.33	0.263	(0.684)	0.237	0.026
87	7.25	0.33	0.263	(0.680)	0.237	0.026
88	7.33	0.37	0.290	(0.677)	0.261	0.029
89	7.42	0.37	0.290	(0.674)	0.261	0.029
90	7.50	0.37	0.290	(0.671)	0.261	0.029
91	7.58	0.40	0.316	(0.668)	0.284	0.032
92	7.67	0.40	0.316	(0.665)	0.284	0.032
93	7.75	0.40	0.316	(0.662)	0.284	0.032
94	7.83	0.43	0.342	(0.659)	0.308	0.034
95	7.92	0.43	0.342	(0.656)	0.308	0.034
96	8.00	0.43	0.342	(0.653)	0.308	0.034
97	8.08	0.50	0.395	(0.650)	0.355	0.039
98	8.17	0.50	0.395	(0.647)	0.355	0.039
99	8.25	0.50	0.395	(0.644)	0.355	0.039
100	8.33	0.50	0.395	(0.641)	0.355	0.039
101	8.42	0.50	0.395	(0.638)	0.355	0.039
102	8.50	0.50	0.395	(0.635)	0.355	0.039
103	8.58	0.53	0.421	(0.632)	0.379	0.042
104	8.67	0.53	0.421	(0.629)	0.379	0.042
105	8.75	0.53	0.421	(0.626)	0.379	0.042
106	8.83	0.57	0.447	(0.623)	0.403	0.045
107	8.92	0.57	0.447	(0.620)	0.403	0.045
108	9.00	0.57	0.447	(0.617)	0.403	0.045
109	9.08	0.63	0.500	(0.614)	0.450	0.050
110	9.17	0.63	0.500	(0.611)	0.450	0.050
111	9.25	0.63	0.500	(0.608)	0.450	0.050
112	9.33	0.67	0.526	(0.605)	0.474	0.053
113	9.42	0.67	0.526	(0.602)	0.474	0.053
114	9.50	0.67	0.526	(0.600)	0.474	0.053
115	9.58	0.70	0.553	(0.597)	0.497	0.055
116	9.67	0.70	0.553	(0.594)	0.497	0.055
117	9.75	0.70	0.553	(0.591)	0.497	0.055
118	9.83	0.73	0.579	(0.588)	0.521	0.058
119	9.92	0.73	0.579	(0.585)	0.521	0.058
120	10.00	0.73	0.579	(0.582)	0.521	0.058
121	10.08	0.50	0.395	(0.580)	0.355	0.039
122	10.17	0.50	0.395	(0.577)	0.355	0.039
123	10.25	0.50	0.395	(0.574)	0.355	0.039
124	10.33	0.50	0.395	(0.571)	0.355	0.039
125	10.42	0.50	0.395	(0.568)	0.355	0.039
126	10.50	0.50	0.395	(0.566)	0.355	0.039
127	10.58	0.67	0.526	(0.563)	0.474	0.053
128	10.67	0.67	0.526	(0.560)	0.474	0.053
129	10.75	0.67	0.526	(0.557)	0.474	0.053
130	10.83	0.67	0.526	(0.555)	0.474	0.053
131	10.92	0.67	0.526	(0.552)	0.474	0.053
132	11.00	0.67	0.526	(0.549)	0.474	0.053
133	11.08	0.63	0.500	(0.547)	0.450	0.050
134	11.17	0.63	0.500	(0.544)	0.450	0.050
135	11.25	0.63	0.500	(0.541)	0.450	0.050

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136	11.33	0.63	0.500	(0.539)	0.450	0.050
137	11.42	0.63	0.500	(0.536)	0.450	0.050
138	11.50	0.63	0.500	(0.533)	0.450	0.050
139	11.58	0.57	0.447	(0.531)	0.403	0.045
140	11.67	0.57	0.447	(0.528)	0.403	0.045
141	11.75	0.57	0.447	(0.525)	0.403	0.045
142	11.83	0.60	0.474	(0.523)	0.426	0.047
143	11.92	0.60	0.474	(0.520)	0.426	0.047
144	12.00	0.60	0.474	(0.517)	0.426	0.047
145	12.08	0.83	0.658	0.515	(0.592)	0.143
146	12.17	0.83	0.658	0.512	(0.592)	0.146
147	12.25	0.83	0.658	0.510	(0.592)	0.148
148	12.33	0.87	0.684	0.507	(0.616)	0.177
149	12.42	0.87	0.684	0.505	(0.616)	0.180
150	12.50	0.87	0.684	0.502	(0.616)	0.182
151	12.58	0.93	0.737	0.500	(0.663)	0.237
152	12.67	0.93	0.737	0.497	(0.663)	0.240
153	12.75	0.93	0.737	0.495	(0.663)	0.242
154	12.83	0.97	0.763	0.492	(0.687)	0.271
155	12.92	0.97	0.763	0.490	(0.687)	0.274
156	13.00	0.97	0.763	0.487	(0.687)	0.276
157	13.08	1.13	0.895	0.485	(0.805)	0.410
158	13.17	1.13	0.895	0.482	(0.805)	0.413
159	13.25	1.13	0.895	0.480	(0.805)	0.415
160	13.33	1.13	0.895	0.477	(0.805)	0.418
161	13.42	1.13	0.895	0.475	(0.805)	0.420
162	13.50	1.13	0.895	0.472	(0.805)	0.422
163	13.58	0.77	0.605	0.470	(0.545)	0.135
164	13.67	0.77	0.605	0.468	(0.545)	0.138
165	13.75	0.77	0.605	0.465	(0.545)	0.140
166	13.83	0.77	0.605	0.463	(0.545)	0.142
167	13.92	0.77	0.605	0.461	(0.545)	0.145
168	14.00	0.77	0.605	0.458	(0.545)	0.147
169	14.08	0.90	0.711	0.456	(0.640)	0.255
170	14.17	0.90	0.711	0.454	(0.640)	0.257
171	14.25	0.90	0.711	0.451	(0.640)	0.259
172	14.33	0.87	0.684	0.449	(0.616)	0.235
173	14.42	0.87	0.684	0.447	(0.616)	0.238
174	14.50	0.87	0.684	0.444	(0.616)	0.240
175	14.58	0.87	0.684	0.442	(0.616)	0.242
176	14.67	0.87	0.684	0.440	(0.616)	0.245
177	14.75	0.87	0.684	0.438	(0.616)	0.247
178	14.83	0.83	0.658	0.435	(0.592)	0.223
179	14.92	0.83	0.658	0.433	(0.592)	0.225
180	15.00	0.83	0.658	0.431	(0.592)	0.227
181	15.08	0.80	0.632	0.429	(0.568)	0.203
182	15.17	0.80	0.632	0.426	(0.568)	0.205
183	15.25	0.80	0.632	0.424	(0.568)	0.207
184	15.33	0.77	0.605	0.422	(0.545)	0.183
185	15.42	0.77	0.605	0.420	(0.545)	0.185
186	15.50	0.77	0.605	0.418	(0.545)	0.188
187	15.58	0.63	0.500	0.416	(0.450)	0.084
188	15.67	0.63	0.500	0.413	(0.450)	0.087
189	15.75	0.63	0.500	0.411	(0.450)	0.089
190	15.83	0.63	0.500	0.409	(0.450)	0.091
191	15.92	0.63	0.500	0.407	(0.450)	0.093
192	16.00	0.63	0.500	0.405	(0.450)	0.095
193	16.08	0.13	0.105	(0.403)	0.095	0.011
194	16.17	0.13	0.105	(0.401)	0.095	0.011
195	16.25	0.13	0.105	(0.399)	0.095	0.011
196	16.33	0.13	0.105	(0.397)	0.095	0.011
197	16.42	0.13	0.105	(0.395)	0.095	0.011
198	16.50	0.13	0.105	(0.393)	0.095	0.011

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199	16.58	0.10	0.079	(0.391)	0.071	0.008
200	16.67	0.10	0.079	(0.389)	0.071	0.008
201	16.75	0.10	0.079	(0.387)	0.071	0.008
202	16.83	0.10	0.079	(0.385)	0.071	0.008
203	16.92	0.10	0.079	(0.383)	0.071	0.008
204	17.00	0.10	0.079	(0.381)	0.071	0.008
205	17.08	0.17	0.132	(0.379)	0.118	0.013
206	17.17	0.17	0.132	(0.377)	0.118	0.013
207	17.25	0.17	0.132	(0.375)	0.118	0.013
208	17.33	0.17	0.132	(0.373)	0.118	0.013
209	17.42	0.17	0.132	(0.372)	0.118	0.013
210	17.50	0.17	0.132	(0.370)	0.118	0.013
211	17.58	0.17	0.132	(0.368)	0.118	0.013
212	17.67	0.17	0.132	(0.366)	0.118	0.013
213	17.75	0.17	0.132	(0.364)	0.118	0.013
214	17.83	0.13	0.105	(0.362)	0.095	0.011
215	17.92	0.13	0.105	(0.361)	0.095	0.011
216	18.00	0.13	0.105	(0.359)	0.095	0.011
217	18.08	0.13	0.105	(0.357)	0.095	0.011
218	18.17	0.13	0.105	(0.355)	0.095	0.011
219	18.25	0.13	0.105	(0.354)	0.095	0.011
220	18.33	0.13	0.105	(0.352)	0.095	0.011
221	18.42	0.13	0.105	(0.350)	0.095	0.011
222	18.50	0.13	0.105	(0.348)	0.095	0.011
223	18.58	0.10	0.079	(0.347)	0.071	0.008
224	18.67	0.10	0.079	(0.345)	0.071	0.008
225	18.75	0.10	0.079	(0.343)	0.071	0.008
226	18.83	0.07	0.053	(0.342)	0.047	0.005
227	18.92	0.07	0.053	(0.340)	0.047	0.005
228	19.00	0.07	0.053	(0.338)	0.047	0.005
229	19.08	0.10	0.079	(0.337)	0.071	0.008
230	19.17	0.10	0.079	(0.335)	0.071	0.008
231	19.25	0.10	0.079	(0.334)	0.071	0.008
232	19.33	0.13	0.105	(0.332)	0.095	0.011
233	19.42	0.13	0.105	(0.331)	0.095	0.011
234	19.50	0.13	0.105	(0.329)	0.095	0.011
235	19.58	0.10	0.079	(0.328)	0.071	0.008
236	19.67	0.10	0.079	(0.326)	0.071	0.008
237	19.75	0.10	0.079	(0.325)	0.071	0.008
238	19.83	0.07	0.053	(0.323)	0.047	0.005
239	19.92	0.07	0.053	(0.322)	0.047	0.005
240	20.00	0.07	0.053	(0.320)	0.047	0.005
241	20.08	0.10	0.079	(0.319)	0.071	0.008
242	20.17	0.10	0.079	(0.317)	0.071	0.008
243	20.25	0.10	0.079	(0.316)	0.071	0.008
244	20.33	0.10	0.079	(0.315)	0.071	0.008
245	20.42	0.10	0.079	(0.313)	0.071	0.008
246	20.50	0.10	0.079	(0.312)	0.071	0.008
247	20.58	0.10	0.079	(0.311)	0.071	0.008
248	20.67	0.10	0.079	(0.309)	0.071	0.008
249	20.75	0.10	0.079	(0.308)	0.071	0.008
250	20.83	0.07	0.053	(0.307)	0.047	0.005
251	20.92	0.07	0.053	(0.306)	0.047	0.005
252	21.00	0.07	0.053	(0.304)	0.047	0.005
253	21.08	0.10	0.079	(0.303)	0.071	0.008
254	21.17	0.10	0.079	(0.302)	0.071	0.008
255	21.25	0.10	0.079	(0.301)	0.071	0.008
256	21.33	0.07	0.053	(0.300)	0.047	0.005
257	21.42	0.07	0.053	(0.299)	0.047	0.005
258	21.50	0.07	0.053	(0.297)	0.047	0.005
259	21.58	0.10	0.079	(0.296)	0.071	0.008
260	21.67	0.10	0.079	(0.295)	0.071	0.008
261	21.75	0.10	0.079	(0.294)	0.071	0.008

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262	21.83	0.07	0.053	(0.293)	0.047	0.005
263	21.92	0.07	0.053	(0.292)	0.047	0.005
264	22.00	0.07	0.053	(0.291)	0.047	0.005
265	22.08	0.10	0.079	(0.290)	0.071	0.008
266	22.17	0.10	0.079	(0.289)	0.071	0.008
267	22.25	0.10	0.079	(0.288)	0.071	0.008
268	22.33	0.07	0.053	(0.288)	0.047	0.005
269	22.42	0.07	0.053	(0.287)	0.047	0.005
270	22.50	0.07	0.053	(0.286)	0.047	0.005
271	22.58	0.07	0.053	(0.285)	0.047	0.005
272	22.67	0.07	0.053	(0.284)	0.047	0.005
273	22.75	0.07	0.053	(0.283)	0.047	0.005
274	22.83	0.07	0.053	(0.283)	0.047	0.005
275	22.92	0.07	0.053	(0.282)	0.047	0.005
276	23.00	0.07	0.053	(0.281)	0.047	0.005
277	23.08	0.07	0.053	(0.281)	0.047	0.005
278	23.17	0.07	0.053	(0.280)	0.047	0.005
279	23.25	0.07	0.053	(0.279)	0.047	0.005
280	23.33	0.07	0.053	(0.279)	0.047	0.005
281	23.42	0.07	0.053	(0.278)	0.047	0.005
282	23.50	0.07	0.053	(0.278)	0.047	0.005
283	23.58	0.07	0.053	(0.277)	0.047	0.005
284	23.67	0.07	0.053	(0.277)	0.047	0.005
285	23.75	0.07	0.053	(0.277)	0.047	0.005
286	23.83	0.07	0.053	(0.276)	0.047	0.005
287	23.92	0.07	0.053	(0.276)	0.047	0.005
288	24.00	0.07	0.053	(0.276)	0.047	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 15.1

Flood volume = Effective rainfall 1.26(In)
times area 27.0(Ac.)/[(In)/(Ft.)] = 2.8(Ac.Ft)
Total soil loss = 5.32(In)
Total soil loss = 11.970(Ac.Ft)
Total rainfall = 6.58(In)
Flood volume = 123451.9 Cubic Feet
Total soil loss = 521419.9 Cubic Feet

Peak flow rate of this hydrograph = 10.306(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0000	0.00	Q				
0+10	0.0002	0.02	Q				
0+15	0.0006	0.06	Q				
0+20	0.0012	0.09	Q				
0+25	0.0020	0.11	Q				
0+30	0.0029	0.14	Q				
0+35	0.0040	0.16	Q				
0+40	0.0052	0.17	Q				
0+45	0.0065	0.18	Q				
0+50	0.0078	0.19	Q				
0+55	0.0092	0.20	Q				
1+ 0	0.0108	0.23	Q				
1+ 5	0.0125	0.24	Q				
1+10	0.0142	0.25	Q				
1+15	0.0158	0.23	Q				

1+20	0.0173	0.22	Q
1+25	0.0188	0.22	Q
1+30	0.0203	0.22	Q
1+35	0.0219	0.22	Q
1+40	0.0234	0.22	Q
1+45	0.0248	0.22	Q
1+50	0.0264	0.22	Q
1+55	0.0279	0.23	Q
2+ 0	0.0296	0.25	Q
2+ 5	0.0314	0.26	Q
2+10	0.0333	0.27	Q
2+15	0.0351	0.27	Q
2+20	0.0370	0.27	Q
2+25	0.0389	0.28	Q
2+30	0.0409	0.28	Q
2+35	0.0428	0.28	Q
2+40	0.0448	0.29	Q
2+45	0.0470	0.31	Q
2+50	0.0492	0.33	Q
2+55	0.0515	0.33	Q
3+ 0	0.0539	0.34	Q
3+ 5	0.0562	0.34	Q
3+10	0.0586	0.35	Q
3+15	0.0610	0.35	Q
3+20	0.0634	0.35	Q
3+25	0.0659	0.35	Q
3+30	0.0683	0.35	Q
3+35	0.0708	0.36	Q
3+40	0.0732	0.36	QV
3+45	0.0757	0.36	QV
3+50	0.0781	0.36	QV
3+55	0.0807	0.37	QV
4+ 0	0.0833	0.39	QV
4+ 5	0.0861	0.40	QV
4+10	0.0889	0.41	QV
4+15	0.0918	0.41	QV
4+20	0.0946	0.42	QV
4+25	0.0976	0.43	QV
4+30	0.1007	0.45	QV
4+35	0.1039	0.47	QV
4+40	0.1072	0.48	QV
4+45	0.1105	0.48	QV
4+50	0.1139	0.49	QV
4+55	0.1173	0.50	QV
5+ 0	0.1209	0.52	Q
5+ 5	0.1246	0.53	Q
5+10	0.1282	0.53	Q
5+15	0.1316	0.49	QV
5+20	0.1348	0.47	QV
5+25	0.1381	0.47	QV
5+30	0.1414	0.48	QV
5+35	0.1448	0.49	Q V
5+40	0.1483	0.50	QV
5+45	0.1519	0.53	QV
5+50	0.1556	0.54	QV
5+55	0.1594	0.55	QV
6+ 0	0.1632	0.56	QV
6+ 5	0.1671	0.56	QV
6+10	0.1710	0.57	QV
6+15	0.1751	0.59	QV
6+20	0.1793	0.61	QV
6+25	0.1836	0.62	QV
6+30	0.1879	0.62	QV

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6+35	0.1922	0.63	QV				
6+40	0.1966	0.64	QV				
6+45	0.2012	0.66	QV				
6+50	0.2059	0.68	QV				
6+55	0.2106	0.69	QV				
7+ 0	0.2154	0.70	Q V				
7+ 5	0.2202	0.70	Q V				
7+10	0.2251	0.70	Q V				
7+15	0.2300	0.71	Q V				
7+20	0.2348	0.71	Q V				
7+25	0.2398	0.72	Q V				
7+30	0.2449	0.74	Q V				
7+35	0.2501	0.76	Q V				
7+40	0.2555	0.77	Q V				
7+45	0.2610	0.80	Q V				
7+50	0.2666	0.82	Q V				
7+55	0.2724	0.84	Q V				
8+ 0	0.2783	0.87	Q V				
8+ 5	0.2845	0.89	Q V				
8+10	0.2908	0.92	Q V				
8+15	0.2974	0.96	Q V				
8+20	0.3043	1.00	Q V				
8+25	0.3112	1.02	Q V				
8+30	0.3183	1.03	Q V				
8+35	0.3255	1.04	Q V				
8+40	0.3328	1.06	Q V				
8+45	0.3402	1.08	Q V				
8+50	0.3478	1.10	Q V				
8+55	0.3555	1.12	Q V				
9+ 0	0.3634	1.15	Q V				
9+ 5	0.3715	1.17	Q V				
9+10	0.3798	1.20	Q V				
9+15	0.3884	1.25	Q V				
9+20	0.3972	1.28	Q V				
9+25	0.4063	1.31	Q V				
9+30	0.4155	1.35	Q V				
9+35	0.4250	1.37	Q V				
9+40	0.4346	1.39	Q V				
9+45	0.4444	1.42	Q V				
9+50	0.4543	1.45	Q V				
9+55	0.4645	1.47	Q V				
10+ 0	0.4748	1.50	Q V				
10+ 5	0.4852	1.51	Q V				
10+10	0.4953	1.46	Q V				
10+15	0.5044	1.33	Q V				
10+20	0.5130	1.24	Q V				
10+25	0.5213	1.20	Q V				
10+30	0.5293	1.17	Q V				
10+35	0.5373	1.16	Q V				
10+40	0.5455	1.19	Q V				
10+45	0.5543	1.27	Q V				
10+50	0.5634	1.33	Q V				
10+55	0.5728	1.36	Q V				
11+ 0	0.5823	1.38	Q V				
11+ 5	0.5919	1.39	Q V				
11+10	0.6014	1.39	Q V				
11+15	0.6109	1.38	Q V				
11+20	0.6203	1.37	Q V				
11+25	0.6297	1.37	Q V				
11+30	0.6391	1.36	Q V				
11+35	0.6485	1.36	Q V				
11+40	0.6577	1.34	Q V				
11+45	0.6667	1.30	Q V				

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11+50	0.6754	1.27	Q	V				
11+55	0.6842	1.27	Q	V				
12+ 0	0.6930	1.28	Q	V				
12+ 5	0.7023	1.35	Q	V				
12+10	0.7137	1.66	Q	V				
12+15	0.7302	2.40	Q	V				
12+20	0.7505	2.94	Q	V				
12+25	0.7733	3.32	Q	V				
12+30	0.7992	3.75	Q	V				
12+35	0.8273	4.09	Q	V				
12+40	0.8582	4.48	Q	V				
12+45	0.8931	5.07	Q	V				
12+50	0.9310	5.50	Q	V				
12+55	0.9714	5.87	Q	V				
13+ 0	1.0147	6.29	Q	V				
13+ 5	1.0608	6.68	Q	V				
13+10	1.1112	7.33	Q	V				
13+15	1.1700	8.52	Q	V				
13+20	1.2343	9.35	Q	V				
13+25	1.3021	9.84	Q	V				
13+30	1.3724	10.20	Q	V				
13+35	1.4433	10.31	Q	V				
13+40	1.5096	9.61	Q	V				
13+45	1.5619	7.59	Q	V				
13+50	1.6052	6.29	Q	V				
13+55	1.6441	5.65	Q	V				
14+ 0	1.6803	5.26	Q	V				
14+ 5	1.7152	5.07	Q	V				
14+10	1.7512	5.23	Q	V				
14+15	1.7919	5.91	Q	V				
14+20	1.8356	6.35	Q	V				
14+25	1.8803	6.49	Q	V				
14+30	1.9247	6.44	Q	V				
14+35	1.9690	6.43	Q	V				
14+40	2.0135	6.47	Q	V				
14+45	2.0583	6.51	Q	V				
14+50	2.1034	6.55	Q	V				
14+55	2.1483	6.52	Q	V				
15+ 0	2.1922	6.37	Q	V				
15+ 5	2.2353	6.27	Q	V				
15+10	2.2777	6.15	Q	V				
15+15	2.3187	5.96	Q	V				
15+20	2.3588	5.82	Q	V				
15+25	2.3980	5.70	Q	V				
15+30	2.4358	5.49	Q	V				
15+35	2.4724	5.31	Q	V				
15+40	2.5064	4.93	Q	V				
15+45	2.5347	4.11	Q	V				
15+50	2.5594	3.58	Q	V				
15+55	2.5821	3.30	Q	V				
16+ 0	2.6037	3.13	Q	V				
16+ 5	2.6241	2.97	Q	V				
16+10	2.6422	2.62	Q	V				
16+15	2.6553	1.90	Q	V				
16+20	2.6651	1.42	Q	V				
16+25	2.6730	1.14	Q	V				
16+30	2.6795	0.95	Q	V				
16+35	2.6851	0.81	Q	V				
16+40	2.6898	0.69	Q	V				
16+45	2.6938	0.58	Q	V				
16+50	2.6973	0.50	Q	V				
16+55	2.7003	0.44	Q	V				
17+ 0	2.7031	0.39	Q	V				

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17+ 5	2.7055	0.36	Q				V
17+10	2.7078	0.34	Q				V
17+15	2.7103	0.35	Q				V
17+20	2.7127	0.36	Q				V
17+25	2.7152	0.36	Q				V
17+30	2.7177	0.36	Q				V
17+35	2.7201	0.36	Q				V
17+40	2.7226	0.35	Q				V
17+45	2.7250	0.35	Q				V
17+50	2.7274	0.35	Q				V
17+55	2.7297	0.34	Q				V
18+ 0	2.7319	0.32	Q				V
18+ 5	2.7341	0.31	Q				V
18+10	2.7361	0.30	Q				V
18+15	2.7382	0.30	Q				V
18+20	2.7402	0.30	Q				V
18+25	2.7423	0.29	Q				V
18+30	2.7443	0.29	Q				V
18+35	2.7463	0.29	Q				V
18+40	2.7482	0.28	Q				V
18+45	2.7500	0.26	Q				V
18+50	2.7517	0.24	Q				V
18+55	2.7533	0.23	Q				V
19+ 0	2.7546	0.20	Q				V
19+ 5	2.7559	0.19	Q				V
19+10	2.7572	0.19	Q				V
19+15	2.7586	0.20	Q				V
19+20	2.7600	0.21	Q				V
19+25	2.7615	0.22	Q				V
19+30	2.7632	0.24	Q				V
19+35	2.7649	0.25	Q				V
19+40	2.7667	0.25	Q				V
19+45	2.7683	0.24	Q				V
19+50	2.7699	0.23	Q				V
19+55	2.7714	0.21	Q				V
20+ 0	2.7727	0.19	Q				V
20+ 5	2.7739	0.18	Q				V
20+10	2.7751	0.18	Q				V
20+15	2.7765	0.19	Q				V
20+20	2.7779	0.20	Q				V
20+25	2.7793	0.21	Q				V
20+30	2.7807	0.21	Q				V
20+35	2.7822	0.21	Q				V
20+40	2.7836	0.21	Q				V
20+45	2.7851	0.21	Q				V
20+50	2.7865	0.21	Q				V
20+55	2.7879	0.20	Q				V
21+ 0	2.7892	0.18	Q				V
21+ 5	2.7904	0.17	Q				V
21+10	2.7916	0.17	Q				V
21+15	2.7929	0.19	Q				V
21+20	2.7942	0.20	Q				V
21+25	2.7956	0.19	Q				V
21+30	2.7968	0.18	Q				V
21+35	2.7979	0.17	Q				V
21+40	2.7991	0.17	Q				V
21+45	2.8004	0.19	Q				V
21+50	2.8017	0.19	Q				V
21+55	2.8030	0.19	Q				V
22+ 0	2.8042	0.17	Q				V
22+ 5	2.8054	0.17	Q				V
22+10	2.8065	0.17	Q				V
22+15	2.8078	0.18	Q				V

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22+20	2.8091	0.19	Q				V
22+25	2.8104	0.19	Q				V
22+30	2.8116	0.17	Q				V
22+35	2.8127	0.16	Q				V
22+40	2.8138	0.16	Q				V
22+45	2.8149	0.15	Q				V
22+50	2.8159	0.15	Q				V
22+55	2.8170	0.15	Q				V
23+ 0	2.8180	0.15	Q				V
23+ 5	2.8190	0.15	Q				V
23+10	2.8200	0.15	Q				V
23+15	2.8210	0.15	Q				V
23+20	2.8220	0.15	Q				V
23+25	2.8230	0.14	Q				V
23+30	2.8240	0.14	Q				V
23+35	2.8250	0.14	Q				V
23+40	2.8260	0.14	Q				V
23+45	2.8270	0.14	Q				V
23+50	2.8280	0.14	Q				V
23+55	2.8290	0.14	Q				V
24+ 0	2.8300	0.14	Q				V
24+ 5	2.8309	0.14	Q				V
24+10	2.8318	0.12	Q				V
24+15	2.8324	0.08	Q				V
24+20	2.8327	0.06	Q				V
24+25	2.8330	0.04	Q				V
24+30	2.8332	0.03	Q				V
24+35	2.8334	0.03	Q				V
24+40	2.8336	0.02	Q				V
24+45	2.8337	0.02	Q				V
24+50	2.8338	0.01	Q				V
24+55	2.8338	0.01	Q				V
25+ 0	2.8339	0.01	Q				V
25+ 5	2.8339	0.01	Q				V
25+10	2.8340	0.01	Q				V
25+15	2.8340	0.00	Q				V
25+20	2.8340	0.00	Q				V
25+25	2.8340	0.00	Q				V
25+30	2.8340	0.00	Q				V
25+35	2.8341	0.00	Q				V
25+40	2.8341	0.00	Q				V
25+45	2.8341	0.00	Q				V

130160dev010110.TXT

Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160dev010110.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
PROPOSED DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 7.41(Ac.) = 0.012 Sq. Mi.
0.012 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 7.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.107 Hr.
Lag time = 6.41 Min.
25% of lag time = 1.60 Min.
40% of lag time = 2.56 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	0.48	3.56

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	1.31	9.71

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.480(In)
Area Averaged 100-Year Rainfall = 1.310(In)

Point rain (area averaged) = 0.821(In)
Areaal adjustment factor = 99.99 %
Adjusted average point rain = 0.821(In)

Sub-Area Data:

130160dev010110.TXT

Area(Ac.) Runoff Index Impervious %
 7.410 54.20 0.900
 Total Area Entered = 7.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
54.2	73.4	0.322	0.900	0.061	1.000	0.061
						Sum (F) = 0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
 Minimum soil loss rate ((In/Hr)) = 0.031
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.720

 slope of intensity-duration curve for a 1 hour storm =0.4800

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.027	10.116
2	0.167	156.055	46.040
3	0.250	234.082	20.918
4	0.333	312.110	9.263
5	0.417	390.137	5.232
6	0.500	468.165	3.298
7	0.583	546.192	2.109
8	0.667	624.220	1.182
9	0.750	702.247	0.900
10	0.833	780.275	0.941
		Sum = 100.000	Sum= 7.468

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.434	0.061	(0.312)	0.372
2	0.17	4.50	0.444	0.061	(0.319)	0.382
3	0.25	5.40	0.532	0.061	(0.383)	0.471
4	0.33	5.40	0.532	0.061	(0.383)	0.471
5	0.42	5.70	0.562	0.061	(0.405)	0.501
6	0.50	6.40	0.631	0.061	(0.454)	0.570
7	0.58	7.90	0.779	0.061	(0.561)	0.717
8	0.67	9.10	0.897	0.061	(0.646)	0.836
9	0.75	12.80	1.262	0.061	(0.908)	1.200
10	0.83	25.60	2.523	0.061	(1.817)	2.462
11	0.92	7.90	0.779	0.061	(0.561)	0.717
12	1.00	4.90	0.483	0.061	(0.348)	0.422

(Loss Rate Not Used)
 Sum = 100.0 Sum = 9.1
 Flood volume = Effective rainfall 0.76(In)
 times area 7.4(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)
 Total soil loss = 0.06(In)
 Total soil loss = 0.038(Ac.Ft)
 Total rainfall = 0.82(In)

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Flood volume = 20447.2 Cubic Feet
Total soil loss = 1647.4 Cubic Feet

Peak flow rate of this hydrograph = 12.067(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0019	0.28	Q				
0+10	0.0128	1.57	V Q				
0+15	0.0283	2.25	V Q				
0+20	0.0478	2.83	V Q				
0+25	0.0694	3.15	V Q				
0+30	0.0932	3.46	V Q				
0+35	0.1204	3.95	V Q				
0+40	0.1530	4.73	V Q				
0+45	0.1925	5.74	V Q				
0+50	0.2498	8.31	V Q				
0+55	0.3329	12.07	V Q				
1+ 0	0.3891	8.17	V Q				
1+ 5	0.4248	5.18	V Q				
1+10	0.4433	2.68	V Q				
1+15	0.4538	1.53	V Q				
1+20	0.4603	0.94	V Q				
1+25	0.4643	0.57	V Q				
1+30	0.4669	0.38	V Q				
1+35	0.4687	0.26	V Q				
1+40	0.4692	0.08	V Q				
1+45	0.4694	0.03	V Q				

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Unit Hydrograph Analysis

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
PROPOSED DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 7.41(Ac.) = 0.012 Sq. Mi.
0.012 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 7.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.107 Hr.
Lag time = 6.41 Min.
25% of lag time = 1.60 Min.
40% of lag time = 2.56 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	0.87	6.42

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	2.16	16.01

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.866(In)
Area Averaged 100-Year Rainfall = 2.160(In)

Point rain (area averaged) = 1.398(In)
Areaal adjustment factor = 100.00 %
Adjusted average point rain = 1.398(In)

Sub-Area Data:

130160dev010310.TXT

Area(Ac.) Runoff Index Impervious %
 7.410 54.20 0.900
 Total Area Entered = 7.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
54.2	73.4	0.322	0.900	0.061	1.000	0.061
						Sum (F) = 0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
 Minimum soil loss rate ((In/Hr)) = 0.031
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.720

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.027	10.116
2	0.167	156.055	46.040
3	0.250	234.082	20.918
4	0.333	312.110	9.263
5	0.417	390.137	5.232
6	0.500	468.165	3.298
7	0.583	546.192	2.109
8	0.667	624.220	1.182
9	0.750	702.247	0.900
10	0.833	780.275	0.941
		Sum = 100.000	Sum= 7.468

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	1.30	0.218 (0.157)	0.157
2	0.17	1.30	0.218 (0.157)	0.157
3	0.25	1.10	0.185 (0.133)	0.123
4	0.33	1.50	0.252 (0.181)	0.190
5	0.42	1.50	0.252 (0.181)	0.190
6	0.50	1.80	0.302 (0.217)	0.241
7	0.58	1.50	0.252 (0.181)	0.190
8	0.67	1.80	0.302 (0.217)	0.241
9	0.75	1.80	0.302 (0.217)	0.241
10	0.83	1.50	0.252 (0.181)	0.190
11	0.92	1.60	0.268 (0.193)	0.207
12	1.00	1.80	0.302 (0.217)	0.241
13	1.08	2.20	0.369 (0.266)	0.308
14	1.17	2.20	0.369 (0.266)	0.308
15	1.25	2.20	0.369 (0.266)	0.308
16	1.33	2.00	0.336 (0.242)	0.274
17	1.42	2.60	0.436 (0.314)	0.375
18	1.50	2.70	0.453 (0.326)	0.392
19	1.58	2.40	0.403 (0.290)	0.341
20	1.67	2.70	0.453 (0.326)	0.392
21	1.75	3.30	0.554 (0.399)	0.492

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22	1.83	3.10	0.520	0.061	(0.375)	0.459
23	1.92	2.90	0.487	0.061	(0.350)	0.425
24	2.00	3.00	0.503	0.061	(0.362)	0.442
25	2.08	3.10	0.520	0.061	(0.375)	0.459
26	2.17	4.20	0.705	0.061	(0.507)	0.644
27	2.25	5.00	0.839	0.061	(0.604)	0.778
28	2.33	3.50	0.587	0.061	(0.423)	0.526
29	2.42	6.80	1.141	0.061	(0.822)	1.080
30	2.50	7.30	1.225	0.061	(0.882)	1.164
31	2.58	8.20	1.376	0.061	(0.991)	1.315
32	2.67	5.90	0.990	0.061	(0.713)	0.929
33	2.75	2.00	0.336	0.061	(0.242)	0.274
34	2.83	1.80	0.302	0.061	(0.217)	0.241
35	2.92	1.80	0.302	0.061	(0.217)	0.241
36	3.00	0.60	0.101	0.061	(0.072)	0.039

(Loss Rate Not Used)

Sum = 100.0

Sum = 14.6

Flood volume = Effective rainfall 1.21(In)
times area 7.4(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)

Total soil loss = 0.18(In)

Total soil loss = 0.113(Ac.Ft)

Total rainfall = 1.40(In)

Flood volume = 32670.0 Cubic Feet

Total soil loss = 4942.3 Cubic Feet

Peak flow rate of this hydrograph = 8.390(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0008	0.12	Q				
0+10	0.0054	0.66	V Q				
0+15	0.0114	0.88	V Q				
0+20	0.0177	0.92	V Q				
0+25	0.0257	1.16	V Q				
0+30	0.0348	1.32	V Q				
0+35	0.0453	1.51	V Q				
0+40	0.0555	1.49	V Q				
0+45	0.0668	1.64	V Q				
0+50	0.0784	1.68	V Q				
0+55	0.0891	1.55	V Q				
1+ 0	0.1000	1.58	VQ				
1+ 5	0.1120	1.75	VQ				
1+10	0.1260	2.03	V Q				
1+15	0.1408	2.16	VQ				
1+20	0.1559	2.19	Q				
1+25	0.1709	2.18	QV				
1+30	0.1882	2.51	Q				
1+35	0.2067	2.68	QV				
1+40	0.2248	2.63	QV				
1+45	0.2444	2.85	Q V				
1+50	0.2668	3.25	Q V				
1+55	0.2895	3.30	Q V				
2+ 0	0.3117	3.23	Q V				
2+ 5	0.3343	3.27	Q V				
2+10	0.3584	3.50	Q V				
2+15	0.3877	4.27	Q V				

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2+20	0.4211	4.84			Q	v		
2+25	0.4537	4.74			Q	v		
2+30	0.4985	6.49				Qv		
2+35	0.5514	7.68					vQ	
2+40	0.6091	8.39						vQ
2+45	0.6577	7.06				Q		v
2+50	0.6883	4.44			Q			v
2+55	0.7103	3.20		Q				v
3+ 0	0.7274	2.48		Q				v
3+ 5	0.7373	1.43		Q				v
3+10	0.7428	0.81	Q					v
3+15	0.7461	0.48	Q					v
3+20	0.7481	0.29	Q					v
3+25	0.7492	0.15	Q					v
3+30	0.7496	0.06	Q					v
3+35	0.7498	0.04	Q					v
3+40	0.7500	0.02	Q					v
3+45	0.7500	0.00	Q					v

130160dev010610.TXT

Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160dev010610.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
PROPOSED DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 7.41(Ac.) = 0.012 Sq. Mi.
0.012 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 7.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.107 Hr.
Lag time = 6.41 Min.
25% of lag time = 1.60 Min.
40% of lag time = 2.56 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	1.25	9.26

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	3.09	22.90

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.250(In)
Area Averaged 100-Year Rainfall = 3.090(In)

Point rain (area averaged) = 2.007(In)
Areaal adjustment factor = 100.00 %
Adjusted average point rain = 2.007(In)

Sub-Area Data:

130160dev010610.TXT

Area(Ac.) Runoff Index Impervious %
 7.410 54.20 0.900
 Total Area Entered = 7.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
54.2	73.4	0.322	0.900	0.061	1.000	0.061
						Sum (F) = 0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
 Minimum soil loss rate ((In/Hr)) = 0.031
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.720

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.027	10.116
2	0.167	156.055	46.040
3	0.250	234.082	20.918
4	0.333	312.110	9.263
5	0.417	390.137	5.232
6	0.500	468.165	3.298
7	0.583	546.192	2.109
8	0.667	624.220	1.182
9	0.750	702.247	0.900
10	0.833	780.275	0.941
		Sum = 100.000	Sum= 7.468

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	0.120	0.061 (0.087)	0.059
2	0.17	0.144	0.061 (0.104)	0.083
3	0.25	0.144	0.061 (0.104)	0.083
4	0.33	0.144	0.061 (0.104)	0.083
5	0.42	0.144	0.061 (0.104)	0.083
6	0.50	0.169	0.061 (0.121)	0.107
7	0.58	0.169	0.061 (0.121)	0.107
8	0.67	0.169	0.061 (0.121)	0.107
9	0.75	0.169	0.061 (0.121)	0.107
10	0.83	0.169	0.061 (0.121)	0.107
11	0.92	0.169	0.061 (0.121)	0.107
12	1.00	0.193	0.061 (0.139)	0.131
13	1.08	0.193	0.061 (0.139)	0.131
14	1.17	0.193	0.061 (0.139)	0.131
15	1.25	0.193	0.061 (0.139)	0.131
16	1.33	0.193	0.061 (0.139)	0.131
17	1.42	0.193	0.061 (0.139)	0.131
18	1.50	0.193	0.061 (0.139)	0.131
19	1.58	0.193	0.061 (0.139)	0.131
20	1.67	0.193	0.061 (0.139)	0.131
21	1.75	0.193	0.061 (0.139)	0.131

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22	1.83	0.80	0.193	0.061	(0.139)	0.131
23	1.92	0.80	0.193	0.061	(0.139)	0.131
24	2.00	0.90	0.217	0.061	(0.156)	0.156
25	2.08	0.80	0.193	0.061	(0.139)	0.131
26	2.17	0.90	0.217	0.061	(0.156)	0.156
27	2.25	0.90	0.217	0.061	(0.156)	0.156
28	2.33	0.90	0.217	0.061	(0.156)	0.156
29	2.42	0.90	0.217	0.061	(0.156)	0.156
30	2.50	0.90	0.217	0.061	(0.156)	0.156
31	2.58	0.90	0.217	0.061	(0.156)	0.156
32	2.67	0.90	0.217	0.061	(0.156)	0.156
33	2.75	1.00	0.241	0.061	(0.173)	0.180
34	2.83	1.00	0.241	0.061	(0.173)	0.180
35	2.92	1.00	0.241	0.061	(0.173)	0.180
36	3.00	1.00	0.241	0.061	(0.173)	0.180
37	3.08	1.00	0.241	0.061	(0.173)	0.180
38	3.17	1.10	0.265	0.061	(0.191)	0.204
39	3.25	1.10	0.265	0.061	(0.191)	0.204
40	3.33	1.10	0.265	0.061	(0.191)	0.204
41	3.42	1.20	0.289	0.061	(0.208)	0.228
42	3.50	1.30	0.313	0.061	(0.225)	0.252
43	3.58	1.40	0.337	0.061	(0.243)	0.276
44	3.67	1.40	0.337	0.061	(0.243)	0.276
45	3.75	1.50	0.361	0.061	(0.260)	0.300
46	3.83	1.50	0.361	0.061	(0.260)	0.300
47	3.92	1.60	0.385	0.061	(0.277)	0.324
48	4.00	1.60	0.385	0.061	(0.277)	0.324
49	4.08	1.70	0.409	0.061	(0.295)	0.348
50	4.17	1.80	0.433	0.061	(0.312)	0.372
51	4.25	1.90	0.458	0.061	(0.329)	0.396
52	4.33	2.00	0.482	0.061	(0.347)	0.420
53	4.42	2.10	0.506	0.061	(0.364)	0.445
54	4.50	2.10	0.506	0.061	(0.364)	0.445
55	4.58	2.20	0.530	0.061	(0.381)	0.469
56	4.67	2.30	0.554	0.061	(0.399)	0.493
57	4.75	2.40	0.578	0.061	(0.416)	0.517
58	4.83	2.40	0.578	0.061	(0.416)	0.517
59	4.92	2.50	0.602	0.061	(0.433)	0.541
60	5.00	2.60	0.626	0.061	(0.451)	0.565
61	5.08	3.10	0.747	0.061	(0.538)	0.685
62	5.17	3.60	0.867	0.061	(0.624)	0.806
63	5.25	3.90	0.939	0.061	(0.676)	0.878
64	5.33	4.20	1.011	0.061	(0.728)	0.950
65	5.42	4.70	1.132	0.061	(0.815)	1.071
66	5.50	5.60	1.349	0.061	(0.971)	1.287
67	5.58	1.90	0.458	0.061	(0.329)	0.396
68	5.67	0.90	0.217	0.061	(0.156)	0.156
69	5.75	0.60	0.144	0.061	(0.104)	0.083
70	5.83	0.50	0.120	0.061	(0.087)	0.059
71	5.92	0.30	0.072	(0.061)	0.052	0.020
72	6.00	0.20	0.048	(0.061)	0.035	0.013

(Loss Rate Not Used)

Sum = 100.0

Sum = 19.7

Flood volume = Effective rainfall 1.64(In)
times area 7.4(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)
Total soil loss = 0.36(In)
Total soil loss = 0.225(Ac.Ft)
Total rainfall = 2.01(In)
Flood volume = 44178.9 Cubic Feet
Total soil loss = 9804.4 Cubic Feet

Peak flow rate of this hydrograph = 7.832(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0003	0.04	Q					
0+10	0.0021	0.27	VQ					
0+15	0.0052	0.44	VQ					
0+20	0.0088	0.52	V Q					
0+25	0.0126	0.56	V Q					
0+30	0.0168	0.60	V Q					
0+35	0.0216	0.70	V Q					
0+40	0.0267	0.75	VQ					
0+45	0.0320	0.77	V Q					
0+50	0.0375	0.79	V Q					
0+55	0.0429	0.79	V Q					
1+ 0	0.0485	0.81	V Q					
1+ 5	0.0547	0.90	VQ					
1+10	0.0612	0.94	VQ					
1+15	0.0678	0.96	VQ					
1+20	0.0744	0.97	VQ					
1+25	0.0811	0.97	Q					
1+30	0.0879	0.98	Q					
1+35	0.0946	0.98	Q					
1+40	0.1014	0.98	Q					
1+45	0.1081	0.98	QV					
1+50	0.1149	0.98	QV					
1+55	0.1216	0.98	QV					
2+ 0	0.1285	1.00	QV					
2+ 5	0.1359	1.06	QV					
2+10	0.1430	1.04	QV					
2+15	0.1506	1.10	QV					
2+20	0.1584	1.13	Q V					
2+25	0.1662	1.14	Q V					
2+30	0.1742	1.15	Q V					
2+35	0.1821	1.15	Q V					
2+40	0.1901	1.16	Q V					
2+45	0.1982	1.18	Q V					
2+50	0.2069	1.26	Q V					
2+55	0.2159	1.30	Q V					
3+ 0	0.2249	1.32	Q V					
3+ 5	0.2341	1.33	Q V					
3+10	0.2434	1.35	Q V					
3+15	0.2533	1.44	Q V					
3+20	0.2634	1.48	Q V					
3+25	0.2739	1.51	Q V					
3+30	0.2851	1.63	Q V					
3+35	0.2973	1.77	Q V					
3+40	0.3104	1.91	Q V					
3+45	0.3242	2.00	Q V					
3+50	0.3387	2.11	Q V					
3+55	0.3538	2.19	Q V					
4+ 0	0.3696	2.30	Q V					
4+ 5	0.3860	2.37	Q V					
4+10	0.4032	2.50	Q V					
4+15	0.4215	2.66	Q V					
4+20	0.4409	2.82	Q V					
4+25	0.4615	2.99	Q V					
4+30	0.4832	3.15	Q V					

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4+35	0.5056	3.24			Q		V	
4+40	0.5288	3.38			Q		V	
4+45	0.5533	3.54			Q		V	
4+50	0.5787	3.70			Q		V	
4+55	0.6048	3.79			Q		V	
5+ 0	0.6318	3.93			Q		V	
5+ 5	0.6605	4.16			Q		V	
5+10	0.6931	4.73			Q		V	
5+15	0.7305	5.42				Q		V
5+20	0.7719	6.02					Q	V
5+25	0.8175	6.62					Q	V
5+30	0.8687	7.44						Q
5+35	0.9227	7.83						Q
5+40	0.9577	5.09				Q		
5+45	0.9787	3.06		Q				
5+50	0.9921	1.95						
5+55	1.0011	1.30		Q				
6+ 0	1.0066	0.81		Q				
6+ 5	1.0101	0.50		Q				
6+10	1.0122	0.30	Q					
6+15	1.0134	0.18	Q					
6+20	1.0138	0.07	Q					
6+25	1.0140	0.03	Q					
6+30	1.0141	0.01	Q					
6+35	1.0142	0.01	Q					
6+40	1.0142	0.00	Q					
6+45	1.0142	0.00	Q					

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160dev0102410.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
PROPOSED DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 7.41(Ac.) = 0.012 Sq. Mi.
0.012 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 7.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.107 Hr.
Lag time = 6.41 Min.
25% of lag time = 1.60 Min.
40% of lag time = 2.56 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	2.42	17.93

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	6.58	48.76

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 2.420(In)
Area Averaged 100-Year Rainfall = 6.580(In)

Point rain (area averaged) = 4.131(In)
Area adjustment factor = 100.00 %
Adjusted average point rain = 4.131(In)

Sub-Area Data:

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Area(Ac.) Runoff Index Impervious %
7.410 54.20 0.900
Total Area Entered = 7.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
54.2	73.4	0.322	0.900	0.061	1.000	0.061
						Sum (F) = 0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.031
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.720

Unit Hydrograph
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.027	10.116
2	0.167	156.055	46.040
3	0.250	234.082	20.918
4	0.333	312.110	9.263
5	0.417	390.137	5.232
6	0.500	468.165	3.298
7	0.583	546.192	2.109
8	0.667	624.220	1.182
9	0.750	702.247	0.900
10	0.833	780.275	0.941
		Sum = 100.000	Sum= 7.468

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	0.033	(0.109)	0.024
2	0.17	0.033	(0.108)	0.024
3	0.25	0.033	(0.108)	0.024
4	0.33	0.050	(0.107)	0.036
5	0.42	0.050	(0.107)	0.036
6	0.50	0.050	(0.106)	0.036
7	0.58	0.050	(0.106)	0.036
8	0.67	0.050	(0.106)	0.036
9	0.75	0.050	(0.105)	0.036
10	0.83	0.066	(0.105)	0.048
11	0.92	0.066	(0.104)	0.048
12	1.00	0.066	(0.104)	0.048
13	1.08	0.050	(0.104)	0.036
14	1.17	0.050	(0.103)	0.036
15	1.25	0.050	(0.103)	0.036
16	1.33	0.050	(0.102)	0.036
17	1.42	0.050	(0.102)	0.036
18	1.50	0.050	(0.102)	0.036
19	1.58	0.050	(0.101)	0.036
20	1.67	0.050	(0.101)	0.036
21	1.75	0.050	(0.100)	0.036

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22	1.83	0.13	0.066	(0.100)	0.048	0.019
23	1.92	0.13	0.066	(0.100)	0.048	0.019
24	2.00	0.13	0.066	(0.099)	0.048	0.019
25	2.08	0.13	0.066	(0.099)	0.048	0.019
26	2.17	0.13	0.066	(0.098)	0.048	0.019
27	2.25	0.13	0.066	(0.098)	0.048	0.019
28	2.33	0.13	0.066	(0.098)	0.048	0.019
29	2.42	0.13	0.066	(0.097)	0.048	0.019
30	2.50	0.13	0.066	(0.097)	0.048	0.019
31	2.58	0.17	0.083	(0.096)	0.059	0.023
32	2.67	0.17	0.083	(0.096)	0.059	0.023
33	2.75	0.17	0.083	(0.096)	0.059	0.023
34	2.83	0.17	0.083	(0.095)	0.059	0.023
35	2.92	0.17	0.083	(0.095)	0.059	0.023
36	3.00	0.17	0.083	(0.094)	0.059	0.023
37	3.08	0.17	0.083	(0.094)	0.059	0.023
38	3.17	0.17	0.083	(0.094)	0.059	0.023
39	3.25	0.17	0.083	(0.093)	0.059	0.023
40	3.33	0.17	0.083	(0.093)	0.059	0.023
41	3.42	0.17	0.083	(0.092)	0.059	0.023
42	3.50	0.17	0.083	(0.092)	0.059	0.023
43	3.58	0.17	0.083	(0.092)	0.059	0.023
44	3.67	0.17	0.083	(0.091)	0.059	0.023
45	3.75	0.17	0.083	(0.091)	0.059	0.023
46	3.83	0.20	0.099	(0.090)	0.071	0.028
47	3.92	0.20	0.099	(0.090)	0.071	0.028
48	4.00	0.20	0.099	(0.090)	0.071	0.028
49	4.08	0.20	0.099	(0.089)	0.071	0.028
50	4.17	0.20	0.099	(0.089)	0.071	0.028
51	4.25	0.20	0.099	(0.089)	0.071	0.028
52	4.33	0.23	0.116	(0.088)	0.083	0.032
53	4.42	0.23	0.116	(0.088)	0.083	0.032
54	4.50	0.23	0.116	(0.087)	0.083	0.032
55	4.58	0.23	0.116	(0.087)	0.083	0.032
56	4.67	0.23	0.116	(0.087)	0.083	0.032
57	4.75	0.23	0.116	(0.086)	0.083	0.032
58	4.83	0.27	0.132	0.086 (0.095)	0.046	
59	4.92	0.27	0.132	0.086 (0.095)	0.047	
60	5.00	0.27	0.132	0.085 (0.095)	0.047	
61	5.08	0.20	0.099	(0.085)	0.071	0.028
62	5.17	0.20	0.099	(0.084)	0.071	0.028
63	5.25	0.20	0.099	(0.084)	0.071	0.028
64	5.33	0.23	0.116	(0.084)	0.083	0.032
65	5.42	0.23	0.116	(0.083)	0.083	0.032
66	5.50	0.23	0.116	0.083 (0.083)	0.033	
67	5.58	0.27	0.132	0.083 (0.095)	0.050	
68	5.67	0.27	0.132	0.082 (0.095)	0.050	
69	5.75	0.27	0.132	0.082 (0.095)	0.050	
70	5.83	0.27	0.132	0.082 (0.095)	0.051	
71	5.92	0.27	0.132	0.081 (0.095)	0.051	
72	6.00	0.27	0.132	0.081 (0.095)	0.051	
73	6.08	0.30	0.149	0.080 (0.107)	0.068	
74	6.17	0.30	0.149	0.080 (0.107)	0.069	
75	6.25	0.30	0.149	0.080 (0.107)	0.069	
76	6.33	0.30	0.149	0.079 (0.107)	0.069	
77	6.42	0.30	0.149	0.079 (0.107)	0.070	
78	6.50	0.30	0.149	0.079 (0.107)	0.070	
79	6.58	0.33	0.165	0.078 (0.119)	0.087	
80	6.67	0.33	0.165	0.078 (0.119)	0.087	
81	6.75	0.33	0.165	0.078 (0.119)	0.088	
82	6.83	0.33	0.165	0.077 (0.119)	0.088	
83	6.92	0.33	0.165	0.077 (0.119)	0.088	
84	7.00	0.33	0.165	0.077 (0.119)	0.089	

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85	7.08	0.33	0.165	0.076	(0.119)	0.089
86	7.17	0.33	0.165	0.076	(0.119)	0.089
87	7.25	0.33	0.165	0.076	(0.119)	0.090
88	7.33	0.37	0.182	0.075	(0.131)	0.107
89	7.42	0.37	0.182	0.075	(0.131)	0.107
90	7.50	0.37	0.182	0.075	(0.131)	0.107
91	7.58	0.40	0.198	0.074	(0.143)	0.124
92	7.67	0.40	0.198	0.074	(0.143)	0.124
93	7.75	0.40	0.198	0.073	(0.143)	0.125
94	7.83	0.43	0.215	0.073	(0.155)	0.142
95	7.92	0.43	0.215	0.073	(0.155)	0.142
96	8.00	0.43	0.215	0.072	(0.155)	0.142
97	8.08	0.50	0.248	0.072	(0.178)	0.176
98	8.17	0.50	0.248	0.072	(0.178)	0.176
99	8.25	0.50	0.248	0.071	(0.178)	0.176
100	8.33	0.50	0.248	0.071	(0.178)	0.177
101	8.42	0.50	0.248	0.071	(0.178)	0.177
102	8.50	0.50	0.248	0.070	(0.178)	0.177
103	8.58	0.53	0.264	0.070	(0.190)	0.194
104	8.67	0.53	0.264	0.070	(0.190)	0.195
105	8.75	0.53	0.264	0.069	(0.190)	0.195
106	8.83	0.57	0.281	0.069	(0.202)	0.212
107	8.92	0.57	0.281	0.069	(0.202)	0.212
108	9.00	0.57	0.281	0.069	(0.202)	0.212
109	9.08	0.63	0.314	0.068	(0.226)	0.246
110	9.17	0.63	0.314	0.068	(0.226)	0.246
111	9.25	0.63	0.314	0.068	(0.226)	0.246
112	9.33	0.67	0.331	0.067	(0.238)	0.263
113	9.42	0.67	0.331	0.067	(0.238)	0.264
114	9.50	0.67	0.331	0.067	(0.238)	0.264
115	9.58	0.70	0.347	0.066	(0.250)	0.281
116	9.67	0.70	0.347	0.066	(0.250)	0.281
117	9.75	0.70	0.347	0.066	(0.250)	0.281
118	9.83	0.73	0.364	0.065	(0.262)	0.298
119	9.92	0.73	0.364	0.065	(0.262)	0.299
120	10.00	0.73	0.364	0.065	(0.262)	0.299
121	10.08	0.50	0.248	0.064	(0.178)	0.184
122	10.17	0.50	0.248	0.064	(0.178)	0.184
123	10.25	0.50	0.248	0.064	(0.178)	0.184
124	10.33	0.50	0.248	0.063	(0.178)	0.184
125	10.42	0.50	0.248	0.063	(0.178)	0.185
126	10.50	0.50	0.248	0.063	(0.178)	0.185
127	10.58	0.67	0.331	0.063	(0.238)	0.268
128	10.67	0.67	0.331	0.062	(0.238)	0.268
129	10.75	0.67	0.331	0.062	(0.238)	0.269
130	10.83	0.67	0.331	0.062	(0.238)	0.269
131	10.92	0.67	0.331	0.061	(0.238)	0.269
132	11.00	0.67	0.331	0.061	(0.238)	0.270
133	11.08	0.63	0.314	0.061	(0.226)	0.253
134	11.17	0.63	0.314	0.060	(0.226)	0.254
135	11.25	0.63	0.314	0.060	(0.226)	0.254
136	11.33	0.63	0.314	0.060	(0.226)	0.254
137	11.42	0.63	0.314	0.060	(0.226)	0.254
138	11.50	0.63	0.314	0.059	(0.226)	0.255
139	11.58	0.57	0.281	0.059	(0.202)	0.222
140	11.67	0.57	0.281	0.059	(0.202)	0.222
141	11.75	0.57	0.281	0.058	(0.202)	0.223
142	11.83	0.60	0.297	0.058	(0.214)	0.239
143	11.92	0.60	0.297	0.058	(0.214)	0.240
144	12.00	0.60	0.297	0.057	(0.214)	0.240
145	12.08	0.83	0.413	0.057	(0.297)	0.356
146	12.17	0.83	0.413	0.057	(0.297)	0.356
147	12.25	0.83	0.413	0.057	(0.297)	0.357

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148	12.33	0.87	0.430	0.056	(0.309)	0.373
149	12.42	0.87	0.430	0.056	(0.309)	0.374
150	12.50	0.87	0.430	0.056	(0.309)	0.374
151	12.58	0.93	0.463	0.055	(0.333)	0.407
152	12.67	0.93	0.463	0.055	(0.333)	0.408
153	12.75	0.93	0.463	0.055	(0.333)	0.408
154	12.83	0.97	0.479	0.055	(0.345)	0.425
155	12.92	0.97	0.479	0.054	(0.345)	0.425
156	13.00	0.97	0.479	0.054	(0.345)	0.425
157	13.08	1.13	0.562	0.054	(0.405)	0.508
158	13.17	1.13	0.562	0.054	(0.405)	0.508
159	13.25	1.13	0.562	0.053	(0.405)	0.509
160	13.33	1.13	0.562	0.053	(0.405)	0.509
161	13.42	1.13	0.562	0.053	(0.405)	0.509
162	13.50	1.13	0.562	0.052	(0.405)	0.509
163	13.58	0.77	0.380	0.052	(0.274)	0.328
164	13.67	0.77	0.380	0.052	(0.274)	0.328
165	13.75	0.77	0.380	0.052	(0.274)	0.328
166	13.83	0.77	0.380	0.051	(0.274)	0.329
167	13.92	0.77	0.380	0.051	(0.274)	0.329
168	14.00	0.77	0.380	0.051	(0.274)	0.329
169	14.08	0.90	0.446	0.051	(0.321)	0.396
170	14.17	0.90	0.446	0.050	(0.321)	0.396
171	14.25	0.90	0.446	0.050	(0.321)	0.396
172	14.33	0.87	0.430	0.050	(0.309)	0.380
173	14.42	0.87	0.430	0.050	(0.309)	0.380
174	14.50	0.87	0.430	0.049	(0.309)	0.380
175	14.58	0.87	0.430	0.049	(0.309)	0.381
176	14.67	0.87	0.430	0.049	(0.309)	0.381
177	14.75	0.87	0.430	0.049	(0.309)	0.381
178	14.83	0.83	0.413	0.048	(0.297)	0.365
179	14.92	0.83	0.413	0.048	(0.297)	0.365
180	15.00	0.83	0.413	0.048	(0.297)	0.365
181	15.08	0.80	0.397	0.048	(0.286)	0.349
182	15.17	0.80	0.397	0.047	(0.286)	0.349
183	15.25	0.80	0.397	0.047	(0.286)	0.350
184	15.33	0.77	0.380	0.047	(0.274)	0.333
185	15.42	0.77	0.380	0.047	(0.274)	0.333
186	15.50	0.77	0.380	0.046	(0.274)	0.334
187	15.58	0.63	0.314	0.046	(0.226)	0.268
188	15.67	0.63	0.314	0.046	(0.226)	0.268
189	15.75	0.63	0.314	0.046	(0.226)	0.268
190	15.83	0.63	0.314	0.045	(0.226)	0.269
191	15.92	0.63	0.314	0.045	(0.226)	0.269
192	16.00	0.63	0.314	0.045	(0.226)	0.269
193	16.08	0.13	0.066	0.045	(0.048)	0.021
194	16.17	0.13	0.066	0.045	(0.048)	0.022
195	16.25	0.13	0.066	0.044	(0.048)	0.022
196	16.33	0.13	0.066	0.044	(0.048)	0.022
197	16.42	0.13	0.066	0.044	(0.048)	0.022
198	16.50	0.13	0.066	0.044	(0.048)	0.022
199	16.58	0.10	0.050	(0.043)	0.036	0.014
200	16.67	0.10	0.050	(0.043)	0.036	0.014
201	16.75	0.10	0.050	(0.043)	0.036	0.014
202	16.83	0.10	0.050	(0.043)	0.036	0.014
203	16.92	0.10	0.050	(0.043)	0.036	0.014
204	17.00	0.10	0.050	(0.042)	0.036	0.014
205	17.08	0.17	0.083	0.042	(0.059)	0.041
206	17.17	0.17	0.083	0.042	(0.059)	0.041
207	17.25	0.17	0.083	0.042	(0.059)	0.041
208	17.33	0.17	0.083	0.041	(0.059)	0.041
209	17.42	0.17	0.083	0.041	(0.059)	0.041
210	17.50	0.17	0.083	0.041	(0.059)	0.042

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211	17.58	0.17	0.083	0.041	(0.059)	0.042
212	17.67	0.17	0.083	0.041	(0.059)	0.042
213	17.75	0.17	0.083	0.040	(0.059)	0.042
214	17.83	0.13	0.066	0.040	(0.048)	0.026
215	17.92	0.13	0.066	0.040	(0.048)	0.026
216	18.00	0.13	0.066	0.040	(0.048)	0.026
217	18.08	0.13	0.066	0.040	(0.048)	0.026
218	18.17	0.13	0.066	0.039	(0.048)	0.027
219	18.25	0.13	0.066	0.039	(0.048)	0.027
220	18.33	0.13	0.066	0.039	(0.048)	0.027
221	18.42	0.13	0.066	0.039	(0.048)	0.027
222	18.50	0.13	0.066	0.039	(0.048)	0.027
223	18.58	0.10	0.050	(0.038)	0.036	0.014
224	18.67	0.10	0.050	(0.038)	0.036	0.014
225	18.75	0.10	0.050	(0.038)	0.036	0.014
226	18.83	0.07	0.033	(0.038)	0.024	0.009
227	18.92	0.07	0.033	(0.038)	0.024	0.009
228	19.00	0.07	0.033	(0.038)	0.024	0.009
229	19.08	0.10	0.050	(0.037)	0.036	0.014
230	19.17	0.10	0.050	(0.037)	0.036	0.014
231	19.25	0.10	0.050	(0.037)	0.036	0.014
232	19.33	0.13	0.066	0.037	(0.048)	0.029
233	19.42	0.13	0.066	0.037	(0.048)	0.029
234	19.50	0.13	0.066	0.037	(0.048)	0.030
235	19.58	0.10	0.050	(0.036)	0.036	0.014
236	19.67	0.10	0.050	(0.036)	0.036	0.014
237	19.75	0.10	0.050	(0.036)	0.036	0.014
238	19.83	0.07	0.033	(0.036)	0.024	0.009
239	19.92	0.07	0.033	(0.036)	0.024	0.009
240	20.00	0.07	0.033	(0.036)	0.024	0.009
241	20.08	0.10	0.050	0.035	(0.036)	0.014
242	20.17	0.10	0.050	0.035	(0.036)	0.014
243	20.25	0.10	0.050	0.035	(0.036)	0.014
244	20.33	0.10	0.050	0.035	(0.036)	0.015
245	20.42	0.10	0.050	0.035	(0.036)	0.015
246	20.50	0.10	0.050	0.035	(0.036)	0.015
247	20.58	0.10	0.050	0.035	(0.036)	0.015
248	20.67	0.10	0.050	0.034	(0.036)	0.015
249	20.75	0.10	0.050	0.034	(0.036)	0.015
250	20.83	0.07	0.033	(0.034)	0.024	0.009
251	20.92	0.07	0.033	(0.034)	0.024	0.009
252	21.00	0.07	0.033	(0.034)	0.024	0.009
253	21.08	0.10	0.050	0.034	(0.036)	0.016
254	21.17	0.10	0.050	0.034	(0.036)	0.016
255	21.25	0.10	0.050	0.033	(0.036)	0.016
256	21.33	0.07	0.033	(0.033)	0.024	0.009
257	21.42	0.07	0.033	(0.033)	0.024	0.009
258	21.50	0.07	0.033	(0.033)	0.024	0.009
259	21.58	0.10	0.050	0.033	(0.036)	0.017
260	21.67	0.10	0.050	0.033	(0.036)	0.017
261	21.75	0.10	0.050	0.033	(0.036)	0.017
262	21.83	0.07	0.033	(0.033)	0.024	0.009
263	21.92	0.07	0.033	(0.032)	0.024	0.009
264	22.00	0.07	0.033	(0.032)	0.024	0.009
265	22.08	0.10	0.050	0.032	(0.036)	0.017
266	22.17	0.10	0.050	0.032	(0.036)	0.017
267	22.25	0.10	0.050	0.032	(0.036)	0.018
268	22.33	0.07	0.033	(0.032)	0.024	0.009
269	22.42	0.07	0.033	(0.032)	0.024	0.009
270	22.50	0.07	0.033	(0.032)	0.024	0.009
271	22.58	0.07	0.033	(0.032)	0.024	0.009
272	22.67	0.07	0.033	(0.032)	0.024	0.009
273	22.75	0.07	0.033	(0.031)	0.024	0.009

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274	22.83	0.07	0.033	(0.031)	0.024	0.009
275	22.92	0.07	0.033	(0.031)	0.024	0.009
276	23.00	0.07	0.033	(0.031)	0.024	0.009
277	23.08	0.07	0.033	(0.031)	0.024	0.009
278	23.17	0.07	0.033	(0.031)	0.024	0.009
279	23.25	0.07	0.033	(0.031)	0.024	0.009
280	23.33	0.07	0.033	(0.031)	0.024	0.009
281	23.42	0.07	0.033	(0.031)	0.024	0.009
282	23.50	0.07	0.033	(0.031)	0.024	0.009
283	23.58	0.07	0.033	(0.031)	0.024	0.009
284	23.67	0.07	0.033	(0.031)	0.024	0.009
285	23.75	0.07	0.033	(0.031)	0.024	0.009
286	23.83	0.07	0.033	(0.031)	0.024	0.009
287	23.92	0.07	0.033	(0.031)	0.024	0.009
288	24.00	0.07	0.033	(0.031)	0.024	0.009

(Loss Rate Not Used)

Sum = 100.0

Sum = 34.9

Flood volume = Effective rainfall 2.91(In)
times area 7.4(Ac.)/[(In)/(Ft.)] = 1.8(Ac.Ft)
Total soil loss = 1.22(In)
Total soil loss = 0.756(Ac.Ft)
Total rainfall = 4.13(In)
Flood volume = 78200.9 Cubic Feet
Total soil loss = 32926.6 Cubic Feet

Peak flow rate of this hydrograph = 3.770(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.01	Q				
0+10	0.0003	0.04	Q				
0+15	0.0007	0.05	Q				
0+20	0.0011	0.06	Q				
0+25	0.0017	0.08	Q				
0+30	0.0023	0.09	Q				
0+35	0.0030	0.10	Q				
0+40	0.0037	0.10	Q				
0+45	0.0044	0.10	Q				
0+50	0.0051	0.11	Q				
0+55	0.0059	0.12	Q				
1+ 0	0.0068	0.13	Q				
1+ 5	0.0077	0.13	Q				
1+10	0.0085	0.12	Q				
1+15	0.0093	0.11	Q				
1+20	0.0100	0.11	Q				
1+25	0.0108	0.11	Q				
1+30	0.0115	0.11	Q				
1+35	0.0122	0.10	Q				
1+40	0.0129	0.10	Q				
1+45	0.0136	0.10	Q				
1+50	0.0144	0.11	Q				
1+55	0.0152	0.12	Q				
2+ 0	0.0161	0.13	Q				
2+ 5	0.0170	0.13	Q				
2+10	0.0180	0.14	Q				
2+15	0.0189	0.14	Q				

2+20	0.0199	0.14	Q
2+25	0.0208	0.14	Q
2+30	0.0218	0.14	Q
2+35	0.0227	0.14	Q
2+40	0.0238	0.16	Q
2+45	0.0250	0.16	Q
2+50	0.0261	0.17	Q
2+55	0.0273	0.17	Q
3+ 0	0.0285	0.17	Q
3+ 5	0.0297	0.17	Q
3+10	0.0308	0.17	Q
3+15	0.0320	0.17	Q
3+20	0.0332	0.17	Q
3+25	0.0344	0.17	Q
3+30	0.0356	0.17	Q
3+35	0.0368	0.17	Q
3+40	0.0380	0.17	Q
3+45	0.0392	0.17	Q
3+50	0.0404	0.18	Q
3+55	0.0417	0.19	Q
4+ 0	0.0431	0.20	Q
4+ 5	0.0445	0.20	Q
4+10	0.0459	0.20	QV
4+15	0.0473	0.21	QV
4+20	0.0488	0.21	QV
4+25	0.0503	0.23	QV
4+30	0.0519	0.23	QV
4+35	0.0536	0.24	QV
4+40	0.0552	0.24	QV
4+45	0.0569	0.24	QV
4+50	0.0586	0.25	Q
4+55	0.0607	0.30	Q
5+ 0	0.0629	0.32	Q
5+ 5	0.0651	0.32	Q
5+10	0.0669	0.26	Q
5+15	0.0685	0.23	QV
5+20	0.0701	0.23	QV
5+25	0.0717	0.24	QV
5+30	0.0733	0.24	QV
5+35	0.0751	0.26	Q
5+40	0.0773	0.31	Q
5+45	0.0796	0.34	Q
5+50	0.0821	0.36	Q
5+55	0.0846	0.37	Q
6+ 0	0.0872	0.37	Q
6+ 5	0.0898	0.39	QV
6+10	0.0929	0.45	QV
6+15	0.0963	0.48	QV
6+20	0.0997	0.50	QV
6+25	0.1032	0.51	Q
6+30	0.1067	0.51	Q
6+35	0.1103	0.53	Q
6+40	0.1144	0.59	Q
6+45	0.1187	0.62	Q
6+50	0.1230	0.64	Q
6+55	0.1275	0.64	Q
7+ 0	0.1320	0.65	Q
7+ 5	0.1365	0.66	QV
7+10	0.1410	0.66	QV
7+15	0.1456	0.66	QV
7+20	0.1503	0.68	QV
7+25	0.1554	0.74	QV
7+30	0.1607	0.77	Q

7+35	0.1662	0.79	Q		
7+40	0.1721	0.86	Q		
7+45	0.1782	0.89	Q		
7+50	0.1846	0.92	QV		
7+55	0.1914	0.99	QV		
8+ 0	0.1984	1.02	Q		
8+ 5	0.2058	1.07	Q		
8+10	0.2140	1.19	Q		
8+15	0.2226	1.25	Q		
8+20	0.2314	1.28	Q		
8+25	0.2403	1.30	Q		
8+30	0.2493	1.31	Q		
8+35	0.2584	1.33	Q		
8+40	0.2680	1.39	Q		
8+45	0.2778	1.42	QV		
8+50	0.2878	1.45	QV		
8+55	0.2982	1.52	Q		
9+ 0	0.3089	1.55	Q		
9+ 5	0.3198	1.59	QV		
9+10	0.3316	1.71	QV		
9+15	0.3439	1.77	Q		
9+20	0.3563	1.81	Q		
9+25	0.3693	1.89	QV		
9+30	0.3826	1.93	QV		
9+35	0.3961	1.96	QV		
9+40	0.4101	2.03	QV		
9+45	0.4242	2.06	QV		
9+50	0.4387	2.09	QV		
9+55	0.4535	2.16	Q	V	
10+ 0	0.4686	2.19	Q	V	
10+ 5	0.4833	2.12	Q	V	
10+10	0.4952	1.74	Q	V	
10+15	0.5060	1.56	Q	V	
10+20	0.5162	1.49	Q	V	
10+25	0.5262	1.45	Q	V	
10+30	0.5360	1.42	Q	V	
10+35	0.5461	1.47	Q	V	
10+40	0.5581	1.75	Q	V	
10+45	0.5710	1.87	Q	V	
10+50	0.5842	1.92	Q	V	
10+55	0.5977	1.96	Q	V	
11+ 0	0.6113	1.98	Q	V	
11+ 5	0.6249	1.98	Q	V	
11+10	0.6383	1.93	Q	V	
11+15	0.6514	1.92	Q	V	
11+20	0.6646	1.91	Q	V	
11+25	0.6777	1.91	Q	V	
11+30	0.6909	1.91	Q	V	
11+35	0.7038	1.88	Q	V	
11+40	0.7160	1.77	Q	V	
11+45	0.7278	1.72	Q	V	
11+50	0.7396	1.71	Q	V	
11+55	0.7517	1.75	Q	V	
12+ 0	0.7639	1.77	Q	V	
12+ 5	0.7767	1.87	Q	V	
12+10	0.7924	2.27	Q	V	
12+15	0.8093	2.46	Q	V	
12+20	0.8269	2.55	Q	V	
12+25	0.8452	2.66	Q	V	
12+30	0.8639	2.72	Q	V	
12+35	0.8830	2.77	Q	V	
12+40	0.9030	2.91	Q	V	
12+45	0.9235	2.97	Q	V	

18+ 5	1.7429	0.21	Q			V
18+10	1.7443	0.21	Q			V
18+15	1.7457	0.20	Q			V
18+20	1.7471	0.20	Q			V
18+25	1.7485	0.20	Q			V
18+30	1.7499	0.20	Q			V
18+35	1.7512	0.19	Q			V
18+40	1.7522	0.15	Q			V
18+45	1.7531	0.13	Q			V
18+50	1.7539	0.11	Q			V
18+55	1.7545	0.09	Q			V
19+ 0	1.7551	0.08	Q			V
19+ 5	1.7556	0.08	Q			V
19+10	1.7563	0.09	Q			V
19+15	1.7570	0.10	Q			V
19+20	1.7577	0.11	Q			V
19+25	1.7589	0.17	Q			V
19+30	1.7602	0.19	Q			V
19+35	1.7615	0.19	Q			V
19+40	1.7625	0.14	Q			V
19+45	1.7634	0.12	Q			V
19+50	1.7641	0.11	Q			V
19+55	1.7648	0.09	Q			V
20+ 0	1.7653	0.08	Q			V
20+ 5	1.7659	0.08	Q			V
20+10	1.7665	0.09	Q			V
20+15	1.7672	0.10	Q			V
20+20	1.7680	0.10	Q			V
20+25	1.7687	0.11	Q			V
20+30	1.7694	0.11	Q			V
20+35	1.7702	0.11	Q			V
20+40	1.7709	0.11	Q			V
20+45	1.7717	0.11	Q			V
20+50	1.7725	0.11	Q			V
20+55	1.7731	0.09	Q			V
21+ 0	1.7736	0.08	Q			V
21+ 5	1.7742	0.08	Q			V
21+10	1.7749	0.10	Q			V
21+15	1.7756	0.11	Q			V
21+20	1.7764	0.11	Q			V
21+25	1.7770	0.09	Q			V
21+30	1.7775	0.08	Q			V
21+35	1.7781	0.08	Q			V
21+40	1.7788	0.10	Q			V
21+45	1.7796	0.11	Q			V
21+50	1.7804	0.11	Q			V
21+55	1.7810	0.09	Q			V
22+ 0	1.7815	0.08	Q			V
22+ 5	1.7821	0.08	Q			V
22+10	1.7828	0.11	Q			V
22+15	1.7837	0.12	Q			V
22+20	1.7845	0.12	Q			V
22+25	1.7851	0.09	Q			V
22+30	1.7857	0.08	Q			V
22+35	1.7862	0.08	Q			V
22+40	1.7867	0.07	Q			V
22+45	1.7872	0.07	Q			V
22+50	1.7877	0.07	Q			V
22+55	1.7881	0.07	Q			V
23+ 0	1.7886	0.07	Q			V
23+ 5	1.7891	0.07	Q			V
23+10	1.7896	0.07	Q			V
23+15	1.7901	0.07	Q			V

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23+20	1.7905	0.07	Q					V
23+25	1.7910	0.07	Q					V
23+30	1.7915	0.07	Q					V
23+35	1.7920	0.07	Q					V
23+40	1.7924	0.07	Q					V
23+45	1.7929	0.07	Q					V
23+50	1.7934	0.07	Q					V
23+55	1.7939	0.07	Q					V
24+ 0	1.7943	0.07	Q					V
24+ 5	1.7948	0.06	Q					V
24+10	1.7950	0.03	Q					V
24+15	1.7951	0.02	Q					V
24+20	1.7952	0.01	Q					V
24+25	1.7952	0.01	Q					V
24+30	1.7952	0.00	Q					V
24+35	1.7952	0.00	Q					V
24+40	1.7952	0.00	Q					V
24+45	1.7952	0.00	Q					V

130160dev1001100.TXT

Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160dev1001100.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
PROPOSED DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 7.41(Ac.) = 0.012 Sq. Mi.
0.012 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 7.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.107 Hr.
Lag time = 6.41 Min.
25% of lag time = 1.60 Min.
40% of lag time = 2.56 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	0.48	3.56

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	1.31	9.71

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.480(In)
Area Averaged 100-Year Rainfall = 1.310(In)

Point rain (area averaged) = 1.310(In)
Areaal adjustment factor = 99.99 %
Adjusted average point rain = 1.310(In)

Sub-Area Data:

130160dev1001100.TXT
 Area(Ac.) Runoff Index Impervious %
 7.410 54.20 0.900
 Total Area Entered = 7.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
54.2	73.4	0.322	0.900	0.061	1.000	0.061
						Sum (F) = 0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
 Minimum soil loss rate ((In/Hr)) = 0.031
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.720

 slope of intensity-duration curve for a 1 hour storm =0.4800

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

 Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.027	10.116
2	0.167	156.055	46.040
3	0.250	234.082	20.918
4	0.333	312.110	9.263
5	0.417	390.137	5.232
6	0.500	468.165	3.298
7	0.583	546.192	2.109
8	0.667	624.220	1.182
9	0.750	702.247	0.900
10	0.833	780.275	0.941
		Sum = 100.000	Sum= 7.468

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
			Max	Low	
1	0.08	4.40	0.692	(0.061)	0.498
2	0.17	4.50	0.707	(0.061)	0.509
3	0.25	5.40	0.849	(0.061)	0.611
4	0.33	5.40	0.849	(0.061)	0.611
5	0.42	5.70	0.896	(0.061)	0.645
6	0.50	6.40	1.006	(0.061)	0.724
7	0.58	7.90	1.242	(0.061)	0.894
8	0.67	9.10	1.430	(0.061)	1.030
9	0.75	12.80	2.012	(0.061)	1.449
10	0.83	25.60	4.024	(0.061)	2.897
11	0.92	7.90	1.242	(0.061)	0.894
12	1.00	4.90	0.770	(0.061)	0.555

(Loss Rate Not Used)
 Sum = 100.0 Sum = 15.0
 Flood volume = Effective rainfall 1.25(In)
 times area 7.4(Ac.)/[(In)/(Ft.)) = 0.8(Ac.Ft)
 Total soil loss = 0.06(In)
 Total soil loss = 0.038(Ac.Ft)
 Total rainfall = 1.31(In)

130160dev1001100.TXT
Flood volume = 33587.0 Cubic Feet
Total soil loss = 1647.4 Cubic Feet

Peak flow rate of this hydrograph = 19.515(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0033		0.48	Q				
0+10	0.0216		2.66	V	Q			
0+15	0.0478		3.80	V	Q			
0+20	0.0805		4.75	V	Q			
0+25	0.1167		5.26	V	Q			
0+30	0.1565		5.77	V	Q			
0+35	0.2017		6.56	V	Q			
0+40	0.2554		7.81	V	Q			
0+45	0.3204		9.43	V	Q			
0+50	0.4135		13.52	V	Q			
0+55	0.5479		19.51	V	Q			
1+ 0	0.6395		13.30	V	Q			
1+ 5	0.6981		8.51	V	Q			
1+10	0.7283		4.40	V	Q			
1+15	0.7456		2.50	V	Q			
1+20	0.7562		1.54	V	Q			
1+25	0.7626		0.94	V	Q			
1+30	0.7669		0.62	V	Q			
1+35	0.7698		0.42	V	Q			
1+40	0.7707		0.13	V	Q			
1+45	0.7711		0.05	V	Q			

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Unit Hydrograph Analysis

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
PROPOSED DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 7.41(Ac.) = 0.012 Sq. Mi.
0.012 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 7.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.107 Hr.
Lag time = 6.41 Min.
25% of lag time = 1.60 Min.
40% of lag time = 2.56 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	0.87	6.42

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	2.16	16.01

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.866(In)
Area Averaged 100-Year Rainfall = 2.160(In)

Point rain (area averaged) = 2.160(In)
Areaal adjustment factor = 100.00 %
Adjusted average point rain = 2.160(In)

Sub-Area Data:

130160dev1003100.TXT
Area(Ac.) Runoff Index Impervious %
7.410 54.20 0.900
Total Area Entered = 7.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
54.2	73.4	0.322	0.900	0.061	1.000	0.061
						Sum (F) = 0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.031
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.720

Unit Hydrograph
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.027	10.116
2	0.167	156.055	46.040
3	0.250	234.082	20.918
4	0.333	312.110	9.263
5	0.417	390.137	5.232
6	0.500	468.165	3.298
7	0.583	546.192	2.109
8	0.667	624.220	1.182
9	0.750	702.247	0.900
10	0.833	780.275	0.941
		Sum = 100.000	Sum= 7.468

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	1.30	0.337 (0.243)	0.276
2	0.17	1.30	0.337 (0.243)	0.276
3	0.25	1.10	0.285 (0.205)	0.224
4	0.33	1.50	0.389 (0.280)	0.328
5	0.42	1.50	0.389 (0.280)	0.328
6	0.50	1.80	0.467 (0.336)	0.405
7	0.58	1.50	0.389 (0.280)	0.328
8	0.67	1.80	0.467 (0.336)	0.405
9	0.75	1.80	0.467 (0.336)	0.405
10	0.83	1.50	0.389 (0.280)	0.328
11	0.92	1.60	0.415 (0.299)	0.353
12	1.00	1.80	0.467 (0.336)	0.405
13	1.08	2.20	0.570 (0.411)	0.509
14	1.17	2.20	0.570 (0.411)	0.509
15	1.25	2.20	0.570 (0.411)	0.509
16	1.33	2.00	0.518 (0.373)	0.457
17	1.42	2.60	0.674 (0.485)	0.613
18	1.50	2.70	0.700 (0.504)	0.639
19	1.58	2.40	0.622 (0.448)	0.561
20	1.67	2.70	0.700 (0.504)	0.639
21	1.75	3.30	0.855 (0.616)	0.794

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22	1.83	3.10	0.803	0.061	(0.579)	0.742
23	1.92	2.90	0.752	0.061	(0.541)	0.690
24	2.00	3.00	0.778	0.061	(0.560)	0.716
25	2.08	3.10	0.803	0.061	(0.579)	0.742
26	2.17	4.20	1.089	0.061	(0.784)	1.027
27	2.25	5.00	1.296	0.061	(0.933)	1.235
28	2.33	3.50	0.907	0.061	(0.653)	0.846
29	2.42	6.80	1.763	0.061	(1.269)	1.701
30	2.50	7.30	1.892	0.061	(1.362)	1.831
31	2.58	8.20	2.125	0.061	(1.530)	2.064
32	2.67	5.90	1.529	0.061	(1.101)	1.468
33	2.75	2.00	0.518	0.061	(0.373)	0.457
34	2.83	1.80	0.467	0.061	(0.336)	0.405
35	2.92	1.80	0.467	0.061	(0.336)	0.405
36	3.00	0.60	0.156	0.061	(0.112)	0.094

(Loss Rate Not Used)

Sum = 100.0

Sum = 23.7

Flood volume = Effective rainfall 1.98(In)
times area 7.4(Ac.)/[(In)/(Ft.)] = 1.2(Ac.Ft)

Total soil loss = 0.18(In)

Total soil loss = 0.113(Ac.Ft)

Total rainfall = 2.16(In)

Flood volume = 53156.1 Cubic Feet

Total soil loss = 4942.3 Cubic Feet

Peak flow rate of this hydrograph = 13.208(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0014	0.21	Q				
0+10	0.0094	1.16	V Q				
0+15	0.0201	1.55	V Q				
0+20	0.0314	1.64	V Q				
0+25	0.0453	2.02	V Q				
0+30	0.0610	2.28	V Q				
0+35	0.0787	2.58	V Q				
0+40	0.0962	2.54	V Q				
0+45	0.1154	2.78	V Q				
0+50	0.1350	2.85	VQ				
0+55	0.1533	2.65	Q				
1+ 0	0.1718	2.68	Q				
1+ 5	0.1921	2.95	QV				
1+10	0.2154	3.38	QV				
1+15	0.2400	3.58	Q				
1+20	0.2650	3.63	QV				
1+25	0.2900	3.62	Q V				
1+30	0.3184	4.13	Q V				
1+35	0.3486	4.38	Q V				
1+40	0.3783	4.32	Q V				
1+45	0.4104	4.66	Q V				
1+50	0.4466	5.27	Q V				
1+55	0.4834	5.34	Q V				
2+ 0	0.5195	5.24	Q V				
2+ 5	0.5560	5.30	Q V				
2+10	0.5949	5.65	Q V				
2+15	0.6420	6.84	Q V				

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2+20	0.6952	7.73			Q	V		
2+25	0.7474	7.58			Q		V	
2+30	0.8182	10.28				Q	V	
2+35	0.9016	12.12					Q	V
2+40	0.9926	13.21					Q	V
2+45	1.0694	11.15				Q		V
2+50	1.1183	7.10			Q			V
2+55	1.1540	5.19						V
3+ 0	1.1821	4.08		Q				V
3+ 5	1.1989	2.44						V
3+10	1.2082	1.36	Q					V
3+15	1.2137	0.79	Q					V
3+20	1.2170	0.48	Q					V
3+25	1.2188	0.26	Q					V
3+30	1.2196	0.11	Q					V
3+35	1.2200	0.06	Q					V
3+40	1.2203	0.03	Q					V
3+45	1.2203	0.01	Q					V

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160dev1006100.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
PROPOSED DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 7.41(Ac.) = 0.012 Sq. Mi.
0.012 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 7.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.107 Hr.
Lag time = 6.41 Min.
25% of lag time = 1.60 Min.
40% of lag time = 2.56 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	1.25	9.26

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	3.09	22.90

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.250(In)
Area Averaged 100-Year Rainfall = 3.090(In)

Point rain (area averaged) = 3.090(In)
Areaal adjustment factor = 100.00 %
Adjusted average point rain = 3.090(In)

Sub-Area Data:

130160dev1006100.TXT
Area(Ac.) Runoff Index Impervious %
7.410 54.20 0.900
Total Area Entered = 7.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
54.2	73.4	0.322	0.900	0.061	1.000	0.061
						Sum (F) = 0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.031
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.720

Unit Hydrograph
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.027	10.116
2	0.167	156.055	46.040
3	0.250	234.082	20.918
4	0.333	312.110	9.263
5	0.417	390.137	5.232
6	0.500	468.165	3.298
7	0.583	546.192	2.109
8	0.667	624.220	1.182
9	0.750	702.247	0.900
10	0.833	780.275	0.941
		Sum = 100.000	Sum= 7.468

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	0.50	0.185 (0.133)	0.124
2	0.17	0.60	0.222 (0.160)	0.161
3	0.25	0.60	0.222 (0.160)	0.161
4	0.33	0.60	0.222 (0.160)	0.161
5	0.42	0.60	0.222 (0.160)	0.161
6	0.50	0.70	0.260 (0.187)	0.198
7	0.58	0.70	0.260 (0.187)	0.198
8	0.67	0.70	0.260 (0.187)	0.198
9	0.75	0.70	0.260 (0.187)	0.198
10	0.83	0.70	0.260 (0.187)	0.198
11	0.92	0.70	0.260 (0.187)	0.198
12	1.00	0.80	0.297 (0.214)	0.235
13	1.08	0.80	0.297 (0.214)	0.235
14	1.17	0.80	0.297 (0.214)	0.235
15	1.25	0.80	0.297 (0.214)	0.235
16	1.33	0.80	0.297 (0.214)	0.235
17	1.42	0.80	0.297 (0.214)	0.235
18	1.50	0.80	0.297 (0.214)	0.235
19	1.58	0.80	0.297 (0.214)	0.235
20	1.67	0.80	0.297 (0.214)	0.235
21	1.75	0.80	0.297 (0.214)	0.235

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22	1.83	0.80	0.297	0.061	(0.214)	0.235
23	1.92	0.80	0.297	0.061	(0.214)	0.235
24	2.00	0.90	0.334	0.061	(0.240)	0.272
25	2.08	0.80	0.297	0.061	(0.214)	0.235
26	2.17	0.90	0.334	0.061	(0.240)	0.272
27	2.25	0.90	0.334	0.061	(0.240)	0.272
28	2.33	0.90	0.334	0.061	(0.240)	0.272
29	2.42	0.90	0.334	0.061	(0.240)	0.272
30	2.50	0.90	0.334	0.061	(0.240)	0.272
31	2.58	0.90	0.334	0.061	(0.240)	0.272
32	2.67	0.90	0.334	0.061	(0.240)	0.272
33	2.75	1.00	0.371	0.061	(0.267)	0.310
34	2.83	1.00	0.371	0.061	(0.267)	0.310
35	2.92	1.00	0.371	0.061	(0.267)	0.310
36	3.00	1.00	0.371	0.061	(0.267)	0.310
37	3.08	1.00	0.371	0.061	(0.267)	0.310
38	3.17	1.10	0.408	0.061	(0.294)	0.347
39	3.25	1.10	0.408	0.061	(0.294)	0.347
40	3.33	1.10	0.408	0.061	(0.294)	0.347
41	3.42	1.20	0.445	0.061	(0.320)	0.384
42	3.50	1.30	0.482	0.061	(0.347)	0.421
43	3.58	1.40	0.519	0.061	(0.374)	0.458
44	3.67	1.40	0.519	0.061	(0.374)	0.458
45	3.75	1.50	0.556	0.061	(0.400)	0.495
46	3.83	1.50	0.556	0.061	(0.400)	0.495
47	3.92	1.60	0.593	0.061	(0.427)	0.532
48	4.00	1.60	0.593	0.061	(0.427)	0.532
49	4.08	1.70	0.630	0.061	(0.454)	0.569
50	4.17	1.80	0.667	0.061	(0.481)	0.606
51	4.25	1.90	0.705	0.061	(0.507)	0.643
52	4.33	2.00	0.742	0.061	(0.534)	0.680
53	4.42	2.10	0.779	0.061	(0.561)	0.717
54	4.50	2.10	0.779	0.061	(0.561)	0.717
55	4.58	2.20	0.816	0.061	(0.587)	0.754
56	4.67	2.30	0.853	0.061	(0.614)	0.792
57	4.75	2.40	0.890	0.061	(0.641)	0.829
58	4.83	2.40	0.890	0.061	(0.641)	0.829
59	4.92	2.50	0.927	0.061	(0.667)	0.866
60	5.00	2.60	0.964	0.061	(0.694)	0.903
61	5.08	3.10	1.149	0.061	(0.828)	1.088
62	5.17	3.60	1.335	0.061	(0.961)	1.274
63	5.25	3.90	1.446	0.061	(1.041)	1.385
64	5.33	4.20	1.557	0.061	(1.121)	1.496
65	5.42	4.70	1.743	0.061	(1.255)	1.681
66	5.50	5.60	2.076	0.061	(1.495)	2.015
67	5.58	1.90	0.705	0.061	(0.507)	0.643
68	5.67	0.90	0.334	0.061	(0.240)	0.272
69	5.75	0.60	0.222	0.061	(0.160)	0.161
70	5.83	0.50	0.185	0.061	(0.133)	0.124
71	5.92	0.30	0.111	0.061	(0.080)	0.050
72	6.00	0.20	0.074	(0.061)	0.053	0.021

(Loss Rate Not Used)

Sum = 100.0

Sum = 32.7

Flood volume = Effective rainfall 2.72(In)
times area 7.4(Ac.)/[(In)/(Ft.)] = 1.7(Ac.Ft)
Total soil loss = 0.37(In)
Total soil loss = 0.227(Ac.Ft)
Total rainfall = 3.09(In)
Flood volume = 73246.6 Cubic Feet
Total soil loss = 9867.0 Cubic Feet

Peak flow rate of this hydrograph = 12.305(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0006	0.09	Q					
0+10	0.0044	0.55	VQ					
0+15	0.0104	0.87	VQ					
0+20	0.0174	1.01	V Q					
0+25	0.0249	1.09	V Q					
0+30	0.0329	1.16	V Q					
0+35	0.0420	1.32	V Q					
0+40	0.0516	1.39	VQ					
0+45	0.0614	1.43	VQ					
0+50	0.0714	1.46	VQ					
0+55	0.0816	1.47	VQ					
1+ 0	0.0919	1.50	VQ					
1+ 5	0.1031	1.63	VQ					
1+10	0.1148	1.69	VQ					
1+15	0.1266	1.72	Q					
1+20	0.1386	1.74	Q					
1+25	0.1506	1.74	Q					
1+30	0.1627	1.75	Q					
1+35	0.1747	1.75	QV					
1+40	0.1868	1.76	QV					
1+45	0.1990	1.76	QV					
1+50	0.2111	1.76	Q V					
1+55	0.2232	1.76	Q V					
2+ 0	0.2355	1.79	Q V					
2+ 5	0.2485	1.89	Q V					
2+10	0.2612	1.84	Q V					
2+15	0.2745	1.94	Q V					
2+20	0.2882	1.99	Q V					
2+25	0.3020	2.01	Q V					
2+30	0.3159	2.02	Q V					
2+35	0.3299	2.02	Q V					
2+40	0.3439	2.03	Q V					
2+45	0.3581	2.06	Q V					
2+50	0.3731	2.19	Q V					
2+55	0.3886	2.25	Q V					
3+ 0	0.4043	2.27	Q V					
3+ 5	0.4201	2.29	Q V					
3+10	0.4361	2.33	Q V					
3+15	0.4530	2.46	Q V					
3+20	0.4704	2.52	Q V					
3+25	0.4881	2.58	Q V					
3+30	0.5071	2.75	Q V					
3+35	0.5276	2.97	Q V					
3+40	0.5495	3.19	Q V					
3+45	0.5724	3.32	Q V					
3+50	0.5965	3.50	Q V					
3+55	0.6214	3.62	Q V					
4+ 0	0.6475	3.79	Q V					
4+ 5	0.6743	3.90	Q V					
4+10	0.7026	4.10	Q V					
4+15	0.7324	4.34	Q V					
4+20	0.7641	4.59	Q V					
4+25	0.7975	4.85	Q V					
4+30	0.8326	5.09	Q V					

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4+35	0.8687	5.24			Q	V	
4+40	0.9062	5.46			Q	V	
4+45	0.9455	5.70			Q	V	
4+50	0.9864	5.94			Q	V	
4+55	1.0283	6.08			Q	V	
5+ 0	1.0716	6.29			Q	V	
5+ 5	1.1174	6.65			Q	V	
5+10	1.1693	7.53			Q	V	
5+15	1.2285	8.60			Q	V	
5+20	1.2941	9.51			Q	V	
5+25	1.3659	10.43			Q	V	
5+30	1.4465	11.70				Q	
5+35	1.5313	12.30				Q	
5+40	1.5869	8.08			Q		
5+45	1.6210	4.95		Q			
5+50	1.6433	3.24		Q			
5+55	1.6587	2.23		Q			
6+ 0	1.6685	1.42	Q				
6+ 5	1.6744	0.86	Q				
6+10	1.6779	0.51	Q				
6+15	1.6800	0.30	Q				
6+20	1.6808	0.12	Q				
6+25	1.6812	0.05	Q				
6+30	1.6814	0.03	Q				
6+35	1.6815	0.01	Q				
6+40	1.6815	0.00	Q				
6+45	1.6815	0.00	Q				

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160dev10024100.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
PROPOSED DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 7.41(Ac.) = 0.012 Sq. Mi.
0.012 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 7.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.107 Hr.
Lag time = 6.41 Min.
25% of lag time = 1.60 Min.
40% of lag time = 2.56 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	2.42	17.93

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
7.41	6.58	48.76

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.420(In)
Area Averaged 100-Year Rainfall = 6.580(In)

Point rain (area averaged) = 6.580(In)
Areaal adjustment factor = 100.00 %
Adjusted average point rain = 6.580(In)

Sub-Area Data:

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Area(Ac.)	Runoff Index	Impervious %
7.410	54.20	0.900
Total Area Entered = 7.41(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
54.2	73.4	0.322	0.900	0.061	1.000	0.061
Sum (F) =						0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
 Minimum soil loss rate ((In/Hr)) = 0.031
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.720

Unit Hydrograph DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.027	10.116
2	0.167	156.055	46.040
3	0.250	234.082	20.918
4	0.333	312.110	9.263
5	0.417	390.137	5.232
6	0.500	468.165	3.298
7	0.583	546.192	2.109
8	0.667	624.220	1.182
9	0.750	702.247	0.900
10	0.833	780.275	0.941
Sum =		100.000	Sum= 7.468

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	0.053	(0.109) 0.038	0.015
2	0.17	0.053	(0.108) 0.038	0.015
3	0.25	0.053	(0.108) 0.038	0.015
4	0.33	0.079	(0.107) 0.057	0.022
5	0.42	0.079	(0.107) 0.057	0.022
6	0.50	0.079	(0.106) 0.057	0.022
7	0.58	0.079	(0.106) 0.057	0.022
8	0.67	0.079	(0.106) 0.057	0.022
9	0.75	0.079	(0.105) 0.057	0.022
10	0.83	0.105	(0.105) 0.076	0.029
11	0.92	0.105	(0.104) 0.076	0.029
12	1.00	0.105	(0.104) 0.076	0.029
13	1.08	0.079	(0.104) 0.057	0.022
14	1.17	0.079	(0.103) 0.057	0.022
15	1.25	0.079	(0.103) 0.057	0.022
16	1.33	0.079	(0.102) 0.057	0.022
17	1.42	0.079	(0.102) 0.057	0.022
18	1.50	0.079	(0.102) 0.057	0.022
19	1.58	0.079	(0.101) 0.057	0.022
20	1.67	0.079	(0.101) 0.057	0.022
21	1.75	0.079	(0.100) 0.057	0.022

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22	1.83	0.13	0.105	(0.100)	0.076	0.029
23	1.92	0.13	0.105	(0.100)	0.076	0.029
24	2.00	0.13	0.105	(0.099)	0.076	0.029
25	2.08	0.13	0.105	(0.099)	0.076	0.029
26	2.17	0.13	0.105	(0.098)	0.076	0.029
27	2.25	0.13	0.105	(0.098)	0.076	0.029
28	2.33	0.13	0.105	(0.098)	0.076	0.029
29	2.42	0.13	0.105	(0.097)	0.076	0.029
30	2.50	0.13	0.105	(0.097)	0.076	0.029
31	2.58	0.17	0.132	(0.096)	0.095	0.037
32	2.67	0.17	0.132	(0.096)	0.095	0.037
33	2.75	0.17	0.132	(0.096)	0.095	0.037
34	2.83	0.17	0.132	(0.095)	0.095	0.037
35	2.92	0.17	0.132	(0.095)	0.095	0.037
36	3.00	0.17	0.132	0.094 (0.095)		0.037
37	3.08	0.17	0.132	0.094 (0.095)		0.038
38	3.17	0.17	0.132	0.094 (0.095)		0.038
39	3.25	0.17	0.132	0.093 (0.095)		0.038
40	3.33	0.17	0.132	0.093 (0.095)		0.039
41	3.42	0.17	0.132	0.092 (0.095)		0.039
42	3.50	0.17	0.132	0.092 (0.095)		0.040
43	3.58	0.17	0.132	0.092 (0.095)		0.040
44	3.67	0.17	0.132	0.091 (0.095)		0.040
45	3.75	0.17	0.132	0.091 (0.095)		0.041
46	3.83	0.20	0.158	0.090 (0.114)		0.067
47	3.92	0.20	0.158	0.090 (0.114)		0.068
48	4.00	0.20	0.158	0.090 (0.114)		0.068
49	4.08	0.20	0.158	0.089 (0.114)		0.069
50	4.17	0.20	0.158	0.089 (0.114)		0.069
51	4.25	0.20	0.158	0.089 (0.114)		0.069
52	4.33	0.23	0.184	0.088 (0.133)		0.096
53	4.42	0.23	0.184	0.088 (0.133)		0.096
54	4.50	0.23	0.184	0.087 (0.133)		0.097
55	4.58	0.23	0.184	0.087 (0.133)		0.097
56	4.67	0.23	0.184	0.087 (0.133)		0.098
57	4.75	0.23	0.184	0.086 (0.133)		0.098
58	4.83	0.27	0.211	0.086 (0.152)		0.125
59	4.92	0.27	0.211	0.086 (0.152)		0.125
60	5.00	0.27	0.211	0.085 (0.152)		0.125
61	5.08	0.20	0.158	0.085 (0.114)		0.073
62	5.17	0.20	0.158	0.084 (0.114)		0.073
63	5.25	0.20	0.158	0.084 (0.114)		0.074
64	5.33	0.23	0.184	0.084 (0.133)		0.100
65	5.42	0.23	0.184	0.083 (0.133)		0.101
66	5.50	0.23	0.184	0.083 (0.133)		0.101
67	5.58	0.27	0.211	0.083 (0.152)		0.128
68	5.67	0.27	0.211	0.082 (0.152)		0.128
69	5.75	0.27	0.211	0.082 (0.152)		0.129
70	5.83	0.27	0.211	0.082 (0.152)		0.129
71	5.92	0.27	0.211	0.081 (0.152)		0.129
72	6.00	0.27	0.211	0.081 (0.152)		0.130
73	6.08	0.30	0.237	0.080 (0.171)		0.156
74	6.17	0.30	0.237	0.080 (0.171)		0.157
75	6.25	0.30	0.237	0.080 (0.171)		0.157
76	6.33	0.30	0.237	0.079 (0.171)		0.157
77	6.42	0.30	0.237	0.079 (0.171)		0.158
78	6.50	0.30	0.237	0.079 (0.171)		0.158
79	6.58	0.33	0.263	0.078 (0.190)		0.185
80	6.67	0.33	0.263	0.078 (0.190)		0.185
81	6.75	0.33	0.263	0.078 (0.190)		0.186
82	6.83	0.33	0.263	0.077 (0.190)		0.186
83	6.92	0.33	0.263	0.077 (0.190)		0.186
84	7.00	0.33	0.263	0.077 (0.190)		0.187

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85	7.08	0.33	0.263	0.076	(0.190)	0.187
86	7.17	0.33	0.263	0.076	(0.190)	0.187
87	7.25	0.33	0.263	0.076	(0.190)	0.188
88	7.33	0.37	0.290	0.075	(0.208)	0.214
89	7.42	0.37	0.290	0.075	(0.208)	0.215
90	7.50	0.37	0.290	0.075	(0.208)	0.215
91	7.58	0.40	0.316	0.074	(0.227)	0.242
92	7.67	0.40	0.316	0.074	(0.227)	0.242
93	7.75	0.40	0.316	0.073	(0.227)	0.242
94	7.83	0.43	0.342	0.073	(0.246)	0.269
95	7.92	0.43	0.342	0.073	(0.246)	0.269
96	8.00	0.43	0.342	0.072	(0.246)	0.270
97	8.08	0.50	0.395	0.072	(0.284)	0.323
98	8.17	0.50	0.395	0.072	(0.284)	0.323
99	8.25	0.50	0.395	0.071	(0.284)	0.323
100	8.33	0.50	0.395	0.071	(0.284)	0.324
101	8.42	0.50	0.395	0.071	(0.284)	0.324
102	8.50	0.50	0.395	0.070	(0.284)	0.324
103	8.58	0.53	0.421	0.070	(0.303)	0.351
104	8.67	0.53	0.421	0.070	(0.303)	0.351
105	8.75	0.53	0.421	0.069	(0.303)	0.352
106	8.83	0.57	0.447	0.069	(0.322)	0.378
107	8.92	0.57	0.447	0.069	(0.322)	0.379
108	9.00	0.57	0.447	0.069	(0.322)	0.379
109	9.08	0.63	0.500	0.068	(0.360)	0.432
110	9.17	0.63	0.500	0.068	(0.360)	0.432
111	9.25	0.63	0.500	0.068	(0.360)	0.433
112	9.33	0.67	0.526	0.067	(0.379)	0.459
113	9.42	0.67	0.526	0.067	(0.379)	0.459
114	9.50	0.67	0.526	0.067	(0.379)	0.460
115	9.58	0.70	0.553	0.066	(0.398)	0.486
116	9.67	0.70	0.553	0.066	(0.398)	0.487
117	9.75	0.70	0.553	0.066	(0.398)	0.487
118	9.83	0.73	0.579	0.065	(0.417)	0.514
119	9.92	0.73	0.579	0.065	(0.417)	0.514
120	10.00	0.73	0.579	0.065	(0.417)	0.514
121	10.08	0.50	0.395	0.064	(0.284)	0.330
122	10.17	0.50	0.395	0.064	(0.284)	0.331
123	10.25	0.50	0.395	0.064	(0.284)	0.331
124	10.33	0.50	0.395	0.063	(0.284)	0.331
125	10.42	0.50	0.395	0.063	(0.284)	0.332
126	10.50	0.50	0.395	0.063	(0.284)	0.332
127	10.58	0.67	0.526	0.063	(0.379)	0.464
128	10.67	0.67	0.526	0.062	(0.379)	0.464
129	10.75	0.67	0.526	0.062	(0.379)	0.464
130	10.83	0.67	0.526	0.062	(0.379)	0.465
131	10.92	0.67	0.526	0.061	(0.379)	0.465
132	11.00	0.67	0.526	0.061	(0.379)	0.465
133	11.08	0.63	0.500	0.061	(0.360)	0.439
134	11.17	0.63	0.500	0.060	(0.360)	0.440
135	11.25	0.63	0.500	0.060	(0.360)	0.440
136	11.33	0.63	0.500	0.060	(0.360)	0.440
137	11.42	0.63	0.500	0.060	(0.360)	0.441
138	11.50	0.63	0.500	0.059	(0.360)	0.441
139	11.58	0.57	0.447	0.059	(0.322)	0.389
140	11.67	0.57	0.447	0.059	(0.322)	0.389
141	11.75	0.57	0.447	0.058	(0.322)	0.389
142	11.83	0.60	0.474	0.058	(0.341)	0.416
143	11.92	0.60	0.474	0.058	(0.341)	0.416
144	12.00	0.60	0.474	0.057	(0.341)	0.416
145	12.08	0.83	0.658	0.057	(0.474)	0.601
146	12.17	0.83	0.658	0.057	(0.474)	0.601
147	12.25	0.83	0.658	0.057	(0.474)	0.601

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148	12.33	0.87	0.684	0.056	(0.493)	0.628
149	12.42	0.87	0.684	0.056	(0.493)	0.628
150	12.50	0.87	0.684	0.056	(0.493)	0.629
151	12.58	0.93	0.737	0.055	(0.531)	0.681
152	12.67	0.93	0.737	0.055	(0.531)	0.682
153	12.75	0.93	0.737	0.055	(0.531)	0.682
154	12.83	0.97	0.763	0.055	(0.550)	0.709
155	12.92	0.97	0.763	0.054	(0.550)	0.709
156	13.00	0.97	0.763	0.054	(0.550)	0.709
157	13.08	1.13	0.895	0.054	(0.644)	0.841
158	13.17	1.13	0.895	0.054	(0.644)	0.841
159	13.25	1.13	0.895	0.053	(0.644)	0.842
160	13.33	1.13	0.895	0.053	(0.644)	0.842
161	13.42	1.13	0.895	0.053	(0.644)	0.842
162	13.50	1.13	0.895	0.052	(0.644)	0.842
163	13.58	0.77	0.605	0.052	(0.436)	0.553
164	13.67	0.77	0.605	0.052	(0.436)	0.553
165	13.75	0.77	0.605	0.052	(0.436)	0.554
166	13.83	0.77	0.605	0.051	(0.436)	0.554
167	13.92	0.77	0.605	0.051	(0.436)	0.554
168	14.00	0.77	0.605	0.051	(0.436)	0.554
169	14.08	0.90	0.711	0.051	(0.512)	0.660
170	14.17	0.90	0.711	0.050	(0.512)	0.660
171	14.25	0.90	0.711	0.050	(0.512)	0.661
172	14.33	0.87	0.684	0.050	(0.493)	0.634
173	14.42	0.87	0.684	0.050	(0.493)	0.635
174	14.50	0.87	0.684	0.049	(0.493)	0.635
175	14.58	0.87	0.684	0.049	(0.493)	0.635
176	14.67	0.87	0.684	0.049	(0.493)	0.635
177	14.75	0.87	0.684	0.049	(0.493)	0.636
178	14.83	0.83	0.658	0.048	(0.474)	0.610
179	14.92	0.83	0.658	0.048	(0.474)	0.610
180	15.00	0.83	0.658	0.048	(0.474)	0.610
181	15.08	0.80	0.632	0.048	(0.455)	0.584
182	15.17	0.80	0.632	0.047	(0.455)	0.584
183	15.25	0.80	0.632	0.047	(0.455)	0.585
184	15.33	0.77	0.605	0.047	(0.436)	0.558
185	15.42	0.77	0.605	0.047	(0.436)	0.559
186	15.50	0.77	0.605	0.046	(0.436)	0.559
187	15.58	0.63	0.500	0.046	(0.360)	0.454
188	15.67	0.63	0.500	0.046	(0.360)	0.454
189	15.75	0.63	0.500	0.046	(0.360)	0.454
190	15.83	0.63	0.500	0.045	(0.360)	0.455
191	15.92	0.63	0.500	0.045	(0.360)	0.455
192	16.00	0.63	0.500	0.045	(0.360)	0.455
193	16.08	0.13	0.105	0.045	(0.076)	0.061
194	16.17	0.13	0.105	0.045	(0.076)	0.061
195	16.25	0.13	0.105	0.044	(0.076)	0.061
196	16.33	0.13	0.105	0.044	(0.076)	0.061
197	16.42	0.13	0.105	0.044	(0.076)	0.061
198	16.50	0.13	0.105	0.044	(0.076)	0.062
199	16.58	0.10	0.079	0.043	(0.057)	0.036
200	16.67	0.10	0.079	0.043	(0.057)	0.036
201	16.75	0.10	0.079	0.043	(0.057)	0.036
202	16.83	0.10	0.079	0.043	(0.057)	0.036
203	16.92	0.10	0.079	0.043	(0.057)	0.036
204	17.00	0.10	0.079	0.042	(0.057)	0.037
205	17.08	0.17	0.132	0.042	(0.095)	0.090
206	17.17	0.17	0.132	0.042	(0.095)	0.090
207	17.25	0.17	0.132	0.042	(0.095)	0.090
208	17.33	0.17	0.132	0.041	(0.095)	0.090
209	17.42	0.17	0.132	0.041	(0.095)	0.090
210	17.50	0.17	0.132	0.041	(0.095)	0.091

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211	17.58	0.17	0.132	0.041	(0.095)	0.091
212	17.67	0.17	0.132	0.041	(0.095)	0.091
213	17.75	0.17	0.132	0.040	(0.095)	0.091
214	17.83	0.13	0.105	0.040	(0.076)	0.065
215	17.92	0.13	0.105	0.040	(0.076)	0.065
216	18.00	0.13	0.105	0.040	(0.076)	0.065
217	18.08	0.13	0.105	0.040	(0.076)	0.066
218	18.17	0.13	0.105	0.039	(0.076)	0.066
219	18.25	0.13	0.105	0.039	(0.076)	0.066
220	18.33	0.13	0.105	0.039	(0.076)	0.066
221	18.42	0.13	0.105	0.039	(0.076)	0.066
222	18.50	0.13	0.105	0.039	(0.076)	0.067
223	18.58	0.10	0.079	0.038	(0.057)	0.040
224	18.67	0.10	0.079	0.038	(0.057)	0.041
225	18.75	0.10	0.079	0.038	(0.057)	0.041
226	18.83	0.07	0.053	(0.038)	0.038	0.015
227	18.92	0.07	0.053	0.038	(0.038)	0.015
228	19.00	0.07	0.053	0.038	(0.038)	0.015
229	19.08	0.10	0.079	0.037	(0.057)	0.042
230	19.17	0.10	0.079	0.037	(0.057)	0.042
231	19.25	0.10	0.079	0.037	(0.057)	0.042
232	19.33	0.13	0.105	0.037	(0.076)	0.068
233	19.42	0.13	0.105	0.037	(0.076)	0.069
234	19.50	0.13	0.105	0.037	(0.076)	0.069
235	19.58	0.10	0.079	0.036	(0.057)	0.043
236	19.67	0.10	0.079	0.036	(0.057)	0.043
237	19.75	0.10	0.079	0.036	(0.057)	0.043
238	19.83	0.07	0.053	0.036	(0.038)	0.017
239	19.92	0.07	0.053	0.036	(0.038)	0.017
240	20.00	0.07	0.053	0.036	(0.038)	0.017
241	20.08	0.10	0.079	0.035	(0.057)	0.044
242	20.17	0.10	0.079	0.035	(0.057)	0.044
243	20.25	0.10	0.079	0.035	(0.057)	0.044
244	20.33	0.10	0.079	0.035	(0.057)	0.044
245	20.42	0.10	0.079	0.035	(0.057)	0.044
246	20.50	0.10	0.079	0.035	(0.057)	0.044
247	20.58	0.10	0.079	0.035	(0.057)	0.044
248	20.67	0.10	0.079	0.034	(0.057)	0.045
249	20.75	0.10	0.079	0.034	(0.057)	0.045
250	20.83	0.07	0.053	0.034	(0.038)	0.019
251	20.92	0.07	0.053	0.034	(0.038)	0.019
252	21.00	0.07	0.053	0.034	(0.038)	0.019
253	21.08	0.10	0.079	0.034	(0.057)	0.045
254	21.17	0.10	0.079	0.034	(0.057)	0.045
255	21.25	0.10	0.079	0.033	(0.057)	0.046
256	21.33	0.07	0.053	0.033	(0.038)	0.019
257	21.42	0.07	0.053	0.033	(0.038)	0.019
258	21.50	0.07	0.053	0.033	(0.038)	0.020
259	21.58	0.10	0.079	0.033	(0.057)	0.046
260	21.67	0.10	0.079	0.033	(0.057)	0.046
261	21.75	0.10	0.079	0.033	(0.057)	0.046
262	21.83	0.07	0.053	0.033	(0.038)	0.020
263	21.92	0.07	0.053	0.032	(0.038)	0.020
264	22.00	0.07	0.053	0.032	(0.038)	0.020
265	22.08	0.10	0.079	0.032	(0.057)	0.047
266	22.17	0.10	0.079	0.032	(0.057)	0.047
267	22.25	0.10	0.079	0.032	(0.057)	0.047
268	22.33	0.07	0.053	0.032	(0.038)	0.021
269	22.42	0.07	0.053	0.032	(0.038)	0.021
270	22.50	0.07	0.053	0.032	(0.038)	0.021
271	22.58	0.07	0.053	0.032	(0.038)	0.021
272	22.67	0.07	0.053	0.032	(0.038)	0.021
273	22.75	0.07	0.053	0.031	(0.038)	0.021

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274	22.83	0.07	0.053	0.031	(0.038)	0.021
275	22.92	0.07	0.053	0.031	(0.038)	0.021
276	23.00	0.07	0.053	0.031	(0.038)	0.021
277	23.08	0.07	0.053	0.031	(0.038)	0.021
278	23.17	0.07	0.053	0.031	(0.038)	0.022
279	23.25	0.07	0.053	0.031	(0.038)	0.022
280	23.33	0.07	0.053	0.031	(0.038)	0.022
281	23.42	0.07	0.053	0.031	(0.038)	0.022
282	23.50	0.07	0.053	0.031	(0.038)	0.022
283	23.58	0.07	0.053	0.031	(0.038)	0.022
284	23.67	0.07	0.053	0.031	(0.038)	0.022
285	23.75	0.07	0.053	0.031	(0.038)	0.022
286	23.83	0.07	0.053	0.031	(0.038)	0.022
287	23.92	0.07	0.053	0.031	(0.038)	0.022
288	24.00	0.07	0.053	0.031	(0.038)	0.022

(Loss Rate Not Used)

Sum = 100.0

Sum = 62.5

Flood volume = Effective rainfall 5.21(In)
times area 7.4(Ac.)/[(In)/(Ft.)] = 3.2(Ac.Ft)
Total soil loss = 1.37(In)
Total soil loss = 0.846(Ac.Ft)
Total rainfall = 6.58(In)
Flood volume = 140134.8 Cubic Feet
Total soil loss = 36853.5 Cubic Feet

Peak flow rate of this hydrograph = 6.238(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.01	Q				
0+10	0.0005	0.06	Q				
0+15	0.0011	0.08	Q				
0+20	0.0018	0.10	Q				
0+25	0.0027	0.13	Q				
0+30	0.0037	0.15	Q				
0+35	0.0048	0.15	Q				
0+40	0.0059	0.16	Q				
0+45	0.0070	0.16	Q				
0+50	0.0081	0.17	Q				
0+55	0.0095	0.20	Q				
1+ 0	0.0109	0.21	Q				
1+ 5	0.0123	0.21	Q				
1+10	0.0136	0.18	Q				
1+15	0.0148	0.17	Q				
1+20	0.0160	0.17	Q				
1+25	0.0171	0.17	Q				
1+30	0.0183	0.17	Q				
1+35	0.0194	0.17	Q				
1+40	0.0206	0.17	Q				
1+45	0.0217	0.17	Q				
1+50	0.0229	0.17	Q				
1+55	0.0243	0.20	Q				
2+ 0	0.0257	0.21	Q				
2+ 5	0.0272	0.21	Q				
2+10	0.0286	0.22	Q				
2+15	0.0301	0.22	Q				

2+20	0.0316	0.22	Q
2+25	0.0332	0.22	Q
2+30	0.0347	0.22	Q
2+35	0.0362	0.23	Q
2+40	0.0380	0.25	VQ
2+45	0.0398	0.26	VQ
2+50	0.0416	0.27	VQ
2+55	0.0435	0.27	VQ
3+ 0	0.0453	0.27	VQ
3+ 5	0.0472	0.28	VQ
3+10	0.0492	0.28	VQ
3+15	0.0511	0.28	VQ
3+20	0.0531	0.28	VQ
3+25	0.0550	0.29	VQ
3+30	0.0570	0.29	VQ
3+35	0.0591	0.29	VQ
3+40	0.0611	0.30	VQ
3+45	0.0632	0.30	VQ
3+50	0.0654	0.32	VQ
3+55	0.0682	0.41	VQ
4+ 0	0.0714	0.46	VQ
4+ 5	0.0747	0.48	VQ
4+10	0.0781	0.49	VQ
4+15	0.0815	0.50	VQ
4+20	0.0852	0.53	VQ
4+25	0.0895	0.63	VQ
4+30	0.0941	0.67	VQ
4+35	0.0989	0.69	VQ
4+40	0.1038	0.71	VQ
4+45	0.1087	0.72	VQ
4+50	0.1138	0.74	VQ
4+55	0.1196	0.84	V Q
5+ 0	0.1257	0.88	V Q
5+ 5	0.1317	0.87	V Q
5+10	0.1365	0.70	VQ
5+15	0.1408	0.63	VQ
5+20	0.1450	0.62	VQ
5+25	0.1498	0.69	VQ
5+30	0.1548	0.72	VQ
5+35	0.1600	0.76	V Q
5+40	0.1659	0.86	VQ
5+45	0.1721	0.90	VQ
5+50	0.1785	0.93	VQ
5+55	0.1850	0.94	VQ
6+ 0	0.1916	0.95	VQ
6+ 5	0.1983	0.98	VQ
6+10	0.2057	1.08	V Q
6+15	0.2134	1.12	V Q
6+20	0.2213	1.14	V Q
6+25	0.2293	1.16	V Q
6+30	0.2373	1.17	V Q
6+35	0.2456	1.19	VQ
6+40	0.2544	1.29	V Q
6+45	0.2636	1.33	V Q
6+50	0.2730	1.36	V Q
6+55	0.2824	1.37	V Q
7+ 0	0.2919	1.38	V Q
7+ 5	0.3014	1.39	V Q
7+10	0.3110	1.39	V Q
7+15	0.3206	1.40	V Q
7+20	0.3304	1.42	VQ
7+25	0.3408	1.51	V Q
7+30	0.3516	1.56	V Q

7+35	0.3626	1.60	V Q
7+40	0.3743	1.70	V Q
7+45	0.3863	1.75	V Q
7+50	0.3987	1.80	V Q
7+55	0.4118	1.90	V Q
8+ 0	0.4252	1.95	V Q
8+ 5	0.4391	2.02	V Q
8+10	0.4544	2.22	V Q
8+15	0.4703	2.31	V Q
8+20	0.4865	2.35	V Q
8+25	0.5029	2.38	V Q
8+30	0.5194	2.40	V Q
8+35	0.5361	2.43	V Q
8+40	0.5535	2.53	V Q
8+45	0.5713	2.57	V Q
8+50	0.5893	2.62	V Q
8+55	0.6080	2.72	V Q
9+ 0	0.6271	2.77	V Q
9+ 5	0.6466	2.84	V Q
9+10	0.6675	3.03	V Q
9+15	0.6891	3.13	V Q
9+20	0.7110	3.19	V Q
9+25	0.7338	3.31	V Q
9+30	0.7570	3.36	V Q
9+35	0.7805	3.41	V Q
9+40	0.8047	3.52	V Q
9+45	0.8294	3.58	V Q
9+50	0.8543	3.62	V Q
9+55	0.8800	3.73	V Q
10+ 0	0.9061	3.78	V Q
10+ 5	0.9313	3.67	V Q
10+10	0.9523	3.05	V Q
10+15	0.9714	2.77	V Q
10+20	0.9897	2.65	V Q
10+25	1.0075	2.59	V Q
10+30	1.0250	2.54	V Q
10+35	1.0431	2.62	V Q
10+40	1.0641	3.06	V Q
10+45	1.0866	3.25	V Q
10+50	1.1095	3.33	V Q
10+55	1.1328	3.39	V Q
11+ 0	1.1564	3.42	V Q
11+ 5	1.1800	3.43	V Q
11+10	1.2031	3.35	V Q
11+15	1.2259	3.32	V Q
11+20	1.2487	3.31	V Q
11+25	1.2715	3.30	V Q
11+30	1.2942	3.30	V Q
11+35	1.3167	3.26	V Q
11+40	1.3379	3.08	V Q
11+45	1.3585	3.00	V Q
11+50	1.3790	2.98	V Q
11+55	1.4000	3.05	V Q
12+ 0	1.4212	3.08	V Q
12+ 5	1.4435	3.23	V Q
12+10	1.4702	3.87	V Q
12+15	1.4989	4.17	V Q
12+20	1.5286	4.32	V Q
12+25	1.5595	4.48	V Q
12+30	1.5910	4.57	V Q
12+35	1.6231	4.67	V Q
12+40	1.6567	4.88	V Q
12+45	1.6910	4.98	V Q

12+50	1.7258	5.05				QV		
12+55	1.7614	5.17				QV		
13+ 0	1.7974	5.23				Q V		
13+ 5	1.8343	5.36				QV		
13+10	1.8745	5.83				Q		
13+15	1.9161	6.05				VQ		
13+20	1.9584	6.15				Q		
13+25	2.0011	6.20				Q		
13+30	2.0441	6.24				QV		
13+35	2.0857	6.04				QV		
13+40	2.1206	5.06				Q		
13+45	2.1524	4.62				Q		
13+50	2.1829	4.43				Q		
13+55	2.2127	4.32				Q		
14+ 0	2.2419	4.25				Q		
14+ 5	2.2715	4.29				Q		
14+10	2.3033	4.62				Q		
14+15	2.3362	4.77				Q		
14+20	2.3693	4.81				Q		
14+25	2.4020	4.76				Q		
14+30	2.4347	4.75				Q		
14+35	2.4674	4.75				Q		
14+40	2.5001	4.75				Q		
14+45	2.5328	4.75				Q		
14+50	2.5654	4.73				Q		
14+55	2.5974	4.64				Q		
15+ 0	2.6291	4.60				Q		
15+ 5	2.6605	4.56				Q		
15+10	2.6913	4.47				Q		
15+15	2.7217	4.42				Q		
15+20	2.7519	4.38				Q		
15+25	2.7813	4.28				Q		
15+30	2.8105	4.23				Q		
15+35	2.8389	4.13				Q		
15+40	2.8648	3.76				Q		
15+45	2.8894	3.58				Q		
15+50	2.9136	3.51				Q		
15+55	2.9375	3.47				Q		
16+ 0	2.9611	3.44				Q		
16+ 5	2.9827	3.12				Q		
16+10	2.9948	1.76		Q				
16+15	3.0026	1.14		Q				
16+20	3.0085	0.86		Q				
16+25	3.0134	0.70		Q				
16+30	3.0175	0.61		Q				
16+35	3.0212	0.53		Q				
16+40	3.0240	0.40		Q				
16+45	3.0263	0.34		Q				
16+50	3.0283	0.29		Q				
16+55	3.0303	0.29		Q				
17+ 0	3.0322	0.28		Q				
17+ 5	3.0344	0.32		Q				
17+10	3.0379	0.50		Q				
17+15	3.0419	0.58		Q				
17+20	3.0461	0.62		Q				
17+25	3.0505	0.64		Q				
17+30	3.0550	0.65		Q				
17+35	3.0596	0.66		Q				
17+40	3.0642	0.67		Q				
17+45	3.0688	0.67		Q				
17+50	3.0734	0.66		Q				
17+55	3.0773	0.57		Q				
18+ 0	3.0810	0.53		Q				

18+ 5	3.0845	0.51	Q			V
18+10	3.0880	0.51	Q			V
18+15	3.0914	0.50	Q			V
18+20	3.0949	0.50	Q			V
18+25	3.0983	0.50	Q			V
18+30	3.1017	0.50	Q			V
18+35	3.1050	0.48	Q			V
18+40	3.1077	0.39	Q			V
18+45	3.1101	0.35	Q			V
18+50	3.1122	0.31	Q			V
18+55	3.1137	0.21	Q			V
19+ 0	3.1148	0.17	Q			V
19+ 5	3.1159	0.16	Q			V
19+10	3.1176	0.24	Q			V
19+15	3.1195	0.28	Q			V
19+20	3.1216	0.31	Q			V
19+25	3.1245	0.41	Q			V
19+30	3.1276	0.46	Q			V
19+35	3.1308	0.46	Q			V
19+40	3.1334	0.38	Q			V
19+45	3.1359	0.35	Q			V
19+50	3.1381	0.32	Q			V
19+55	3.1396	0.22	Q			V
20+ 0	3.1408	0.18	Q			V
20+ 5	3.1421	0.18	Q			V
20+10	3.1438	0.26	Q			V
20+15	3.1459	0.29	Q			V
20+20	3.1480	0.31	Q			V
20+25	3.1501	0.31	Q			V
20+30	3.1523	0.32	Q			V
20+35	3.1546	0.32	Q			V
20+40	3.1568	0.33	Q			V
20+45	3.1591	0.33	Q			V
20+50	3.1613	0.31	Q			V
20+55	3.1628	0.22	Q			V
21+ 0	3.1641	0.18	Q			V
21+ 5	3.1654	0.19	Q			V
21+10	3.1672	0.27	Q			V
21+15	3.1693	0.30	Q			V
21+20	3.1713	0.30	Q			V
21+25	3.1728	0.22	Q			V
21+30	3.1741	0.18	Q			V
21+35	3.1754	0.19	Q			V
21+40	3.1772	0.27	Q			V
21+45	3.1794	0.31	Q			V
21+50	3.1814	0.30	Q			V
21+55	3.1830	0.22	Q			V
22+ 0	3.1843	0.19	Q			V
22+ 5	3.1856	0.19	Q			V
22+10	3.1875	0.28	Q			V
22+15	3.1896	0.31	Q			V
22+20	3.1918	0.31	Q			V
22+25	3.1933	0.23	Q			V
22+30	3.1946	0.19	Q			V
22+35	3.1959	0.18	Q			V
22+40	3.1970	0.17	Q			V
22+45	3.1982	0.17	Q			V
22+50	3.1993	0.16	Q			V
22+55	3.2004	0.16	Q			V
23+ 0	3.2015	0.16	Q			V
23+ 5	3.2026	0.16	Q			V
23+10	3.2037	0.16	Q			V
23+15	3.2048	0.16	Q			V

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23+20	3.2059	0.16	Q				V
23+25	3.2070	0.16	Q				V
23+30	3.2082	0.16	Q				V
23+35	3.2093	0.16	Q				V
23+40	3.2104	0.16	Q				V
23+45	3.2115	0.16	Q				V
23+50	3.2126	0.16	Q				V
23+55	3.2138	0.16	Q				V
24+ 0	3.2149	0.16	Q				V
24+ 5	3.2159	0.15	Q				V
24+10	3.2164	0.07	Q				V
24+15	3.2167	0.04	Q				V
24+20	3.2168	0.02	Q				V
24+25	3.2169	0.01	Q				V
24+30	3.2170	0.01	Q				V
24+35	3.2170	0.00	Q				V
24+40	3.2170	0.00	Q				V
24+45	3.2171	0.00	Q				V

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160EX110.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
EXISTING DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 34.41(Ac.) = 0.054 Sq. Mi.
0.054 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 34.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.294 Hr.
Lag time = 17.64 Min.
25% of lag time = 4.41 Min.
40% of lag time = 7.06 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	0.48	16.38

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	1.31	45.08

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.476(In)
Area Averaged 100-Year Rainfall = 1.310(In)

Point rain (area averaged) = 0.819(In)
Areaal adjustment factor = 99.97 %
Adjusted average point rain = 0.819(In)

Sub-Area Data:

130160EX110.TXT
Area(Ac.) Runoff Index Impervious %
34.410 60.00 0.400
Total Area Entered = 34.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
60.0	78.0	0.268	0.400	0.171	1.000	0.171
						Sum (F) = 0.171

Area averaged mean soil loss (F) (In/Hr) = 0.171
Minimum soil loss rate ((In/Hr)) = 0.086
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

slope of intensity-duration curve for a 1 hour storm =0.4800

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	28.345	1.617
2	0.167	56.689	6.739
3	0.250	85.034	18.637
4	0.333	113.379	22.095
5	0.417	141.723	12.821
6	0.500	170.068	7.936
7	0.583	198.413	5.754
8	0.667	226.757	4.359
9	0.750	255.102	3.357
10	0.833	283.447	2.815
11	0.917	311.791	2.330
12	1.000	340.136	1.781
13	1.083	368.481	1.551
14	1.167	396.825	1.341
15	1.250	425.170	1.138
16	1.333	453.515	0.964
17	1.417	481.859	0.824
18	1.500	510.204	0.722
19	1.583	538.549	0.557
20	1.667	566.893	0.470
21	1.750	595.238	0.302
22	1.833	623.583	0.303
23	1.917	651.927	0.339
24	2.000	680.272	0.340
25	2.083	708.617	0.333
26	2.167	736.961	0.217
27	2.250	765.306	0.177
28	2.333	793.651	0.180
		Sum = 100.000	Sum= 34.679

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

Unit Time	Pattern	Storm Rain	Loss rate(In./Hr)		Effective
(Hr.)	Percent	(In/Hr)	Max	Low	(In/Hr)
1 0.08	4.40	0.432	0.171	(0.389)	0.261

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2	0.17	4.50	0.442	0.171	(0.398)	0.271
3	0.25	5.40	0.531	0.171	(0.478)	0.359
4	0.33	5.40	0.531	0.171	(0.478)	0.359
5	0.42	5.70	0.560	0.171	(0.504)	0.389
6	0.50	6.40	0.629	0.171	(0.566)	0.458
7	0.58	7.90	0.776	0.171	(0.699)	0.605
8	0.67	9.10	0.894	0.171	(0.805)	0.723
9	0.75	12.80	1.258	0.171	(1.132)	1.087
10	0.83	25.60	2.516	0.171	(2.264)	2.344
11	0.92	7.90	0.776	0.171	(0.699)	0.605
12	1.00	4.90	0.481	0.171	(0.433)	0.310

(Loss Rate Not Used)
 Sum = 100.0 Sum = 7.8

Flood volume = Effective rainfall 0.65(In)
 times area 34.4(Ac.)/[(In)/(Ft.)] = 1.9(Ac.Ft)
 Total soil loss = 0.17(In)
 Total soil loss = 0.491(Ac.Ft)
 Total rainfall = 0.82(In)
 Flood volume = 80890.0 Cubic Feet
 Total soil loss = 21392.3 Cubic Feet

 Peak flow rate of this hydrograph = 32.736(CFS)

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

 Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0010	0.15	Q				
0+10	0.0063	0.76	Q				
0+15	0.0236	2.52	V Q				
0+20	0.0567	4.80	V Q				
0+25	0.1023	6.62	V Q				
0+30	0.1585	8.17	V Q				
0+35	0.2243	9.54	V Q				
0+40	0.3020	11.28	V Q				
0+45	0.3975	13.87	V Q				
0+50	0.5222	18.11	V Q				
0+55	0.6913	24.55	V Q				
1+ 0	0.9159	32.61	V Q				
1+ 5	1.1414	32.74	V Q				
1+10							

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Unit Hydrograph Analysis

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
EXISTING DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 34.41(Ac.) = 0.054 Sq. Mi.
0.054 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 34.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.294 Hr.
Lag time = 17.64 Min.
25% of lag time = 4.41 Min.
40% of lag time = 7.06 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	0.87	29.80

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	2.16	74.33

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.866(In)
Area Averaged 100-Year Rainfall = 2.160(In)

Point rain (area averaged) = 1.398(In)
Areaal adjustment factor = 99.98 %
Adjusted average point rain = 1.398(In)

Sub-Area Data:

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Area(Ac.)	Runoff Index	Impervious %
34.410	60.00	0.400
Total Area Entered = 34.41(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
60.0	78.0	0.268	0.400	0.171	1.000	0.171
Sum (F) =						0.171

Area averaged mean soil loss (F) (In/Hr) = 0.171
 Minimum soil loss rate ((In/Hr)) = 0.086
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.900

Unit Hydrograph DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	28.345	1.617
2	0.167	56.689	6.739
3	0.250	85.034	18.637
4	0.333	113.379	22.095
5	0.417	141.723	12.821
6	0.500	170.068	7.936
7	0.583	198.413	5.754
8	0.667	226.757	4.359
9	0.750	255.102	3.357
10	0.833	283.447	2.815
11	0.917	311.791	2.330
12	1.000	340.136	1.781
13	1.083	368.481	1.551
14	1.167	396.825	1.341
15	1.250	425.170	1.138
16	1.333	453.515	0.964
17	1.417	481.859	0.824
18	1.500	510.204	0.722
19	1.583	538.549	0.557
20	1.667	566.893	0.470
21	1.750	595.238	0.302
22	1.833	623.583	0.303
23	1.917	651.927	0.339
24	2.000	680.272	0.340
25	2.083	708.617	0.333
26	2.167	736.961	0.217
27	2.250	765.306	0.177
28	2.333	793.651	0.180
Sum =		100.000	Sum= 34.679

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	1.30	0.218 (0.196)	0.047
2	0.17	1.30	0.218 (0.196)	0.047
3	0.25	1.10	(0.171) 0.166	0.018

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4	0.33	1.50	0.252	0.171	(0.227)	0.080
5	0.42	1.50	0.252	0.171	(0.227)	0.080
6	0.50	1.80	0.302	0.171	(0.272)	0.131
7	0.58	1.50	0.252	0.171	(0.227)	0.080
8	0.67	1.80	0.302	0.171	(0.272)	0.131
9	0.75	1.80	0.302	0.171	(0.272)	0.131
10	0.83	1.50	0.252	0.171	(0.227)	0.080
11	0.92	1.60	0.268	0.171	(0.242)	0.097
12	1.00	1.80	0.302	0.171	(0.272)	0.131
13	1.08	2.20	0.369	0.171	(0.332)	0.198
14	1.17	2.20	0.369	0.171	(0.332)	0.198
15	1.25	2.20	0.369	0.171	(0.332)	0.198
16	1.33	2.00	0.336	0.171	(0.302)	0.164
17	1.42	2.60	0.436	0.171	(0.393)	0.265
18	1.50	2.70	0.453	0.171	(0.408)	0.282
19	1.58	2.40	0.403	0.171	(0.362)	0.231
20	1.67	2.70	0.453	0.171	(0.408)	0.282
21	1.75	3.30	0.554	0.171	(0.498)	0.382
22	1.83	3.10	0.520	0.171	(0.468)	0.349
23	1.92	2.90	0.487	0.171	(0.438)	0.315
24	2.00	3.00	0.503	0.171	(0.453)	0.332
25	2.08	3.10	0.520	0.171	(0.468)	0.349
26	2.17	4.20	0.705	0.171	(0.634)	0.533
27	2.25	5.00	0.839	0.171	(0.755)	0.668
28	2.33	3.50	0.587	0.171	(0.529)	0.416
29	2.42	6.80	1.141	0.171	(1.027)	0.970
30	2.50	7.30	1.225	0.171	(1.102)	1.054
31	2.58	8.20	1.376	0.171	(1.238)	1.205
32	2.67	5.90	0.990	0.171	(0.891)	0.819
33	2.75	2.00	0.336	0.171	(0.302)	0.164
34	2.83	1.80	0.302	0.171	(0.272)	0.131
35	2.92	1.80	0.302	0.171	(0.272)	0.131
36	3.00	0.60	0.101	(0.171)	0.091	0.010

(Loss Rate Not Used)

Sum = 100.0

Sum = 10.7

Flood volume = Effective rainfall 0.89(In)
times area 34.4(Ac.)/[(In)/(Ft.)] = 2.6(Ac.Ft)
Total soil loss = 0.51(In)
Total soil loss = 1.453(Ac.Ft)
Total rainfall = 1.40(In)
Flood volume = 111357.2 Cubic Feet
Total soil loss = 63283.5 Cubic Feet

Peak flow rate of this hydrograph = 27.475(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0002		0.03	Q				
0+10	0.0011		0.14	Q				
0+15	0.0040		0.42	Q				
0+20	0.0092		0.75	VQ				
0+25	0.0155		0.92	VQ				
0+30	0.0242		1.26	VQ				
0+35	0.0366		1.79	V Q				
0+40	0.0524		2.30	V Q				
0+45	0.0706		2.64	V Q				

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0+50	0.0906	2.90	V	Q		
0+55	0.1126	3.20	V	Q		
1+ 0	0.1345	3.19	V	Q		
1+ 5	0.1566	3.20	V	Q		
1+10	0.1815	3.62	V	Q		
1+15	0.2115	4.35	V	Q		
1+20	0.2461	5.03	V	Q		
1+25	0.2835	5.43	V	Q		
1+30	0.3230	5.74	V	Q		
1+35	0.3667	6.35	V	Q		
1+40	0.4159	7.15	V	Q		
1+45	0.4683	7.61	V	Q		
1+50	0.5245	8.15	V	Q		
1+55	0.5875	9.15	V	Q		
2+ 0	0.6560	9.94	V	Q		
2+ 5	0.7260	10.17	V	Q		
2+10	0.7981	10.46	V	Q		
2+15	0.8759	11.30	V	Q		
2+20	0.9652	12.97	V	Q		
2+25	1.0698	15.18	V	Q		
2+30	1.1863	16.92	V	Q		
2+35	1.3246	20.09	V	Q		
2+40	1.4949	24.73	V	Q		
2+45	1.6841	27.47	V	Q		
2+50	1.8665	26.47	V	Q		
2+55	2.0127	21.23	V	Q		
3+ 0	2.1207	15.68	V	Q		
3+ 5	2.2050	12.25	V	Q		
3+10	2.2712	9.61	V	Q		
3+15	2.3220	7.37	V	Q		
3+20	2.3622	5.84	V	Q		
3+25	2.3949	4.76	V	Q		
3+30	2.4219	3.91	V	Q		
3+35	2.4443	3.26	V	Q		
3+40	2.4634	2.77	V	Q		
3+45	2.4795	2.34	V	Q		
3+50	2.4931	1.96	V	Q		

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160EX610.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
EXISTING DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 34.41(Ac.) = 0.054 Sq. Mi.
0.054 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 34.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.294 Hr.
Lag time = 17.64 Min.
25% of lag time = 4.41 Min.
40% of lag time = 7.06 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	1.25	43.01

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	3.09	106.33

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.250(In)
Area Averaged 100-Year Rainfall = 3.090(In)

Point rain (area averaged) = 2.007(In)
Areaal adjustment factor = 99.99 %
Adjusted average point rain = 2.007(In)

Sub-Area Data:

130160EX610.TXT

Area(Ac.)	Runoff Index	Impervious %
34.410	60.00	0.400
Total Area Entered = 34.41(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
60.0	78.0	0.268	0.400	0.171	1.000	0.171
Sum (F) =						0.171

Area averaged mean soil loss (F) (In/Hr) = 0.171
 Minimum soil loss rate ((In/Hr)) = 0.086
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.900

Unit Hydrograph DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	28.345	1.617
2	0.167	56.689	6.739
3	0.250	85.034	18.637
4	0.333	113.379	22.095
5	0.417	141.723	12.821
6	0.500	170.068	7.936
7	0.583	198.413	5.754
8	0.667	226.757	4.359
9	0.750	255.102	3.357
10	0.833	283.447	2.815
11	0.917	311.791	2.330
12	1.000	340.136	1.781
13	1.083	368.481	1.551
14	1.167	396.825	1.341
15	1.250	425.170	1.138
16	1.333	453.515	0.964
17	1.417	481.859	0.824
18	1.500	510.204	0.722
19	1.583	538.549	0.557
20	1.667	566.893	0.470
21	1.750	595.238	0.302
22	1.833	623.583	0.303
23	1.917	651.927	0.339
24	2.000	680.272	0.340
25	2.083	708.617	0.333
26	2.167	736.961	0.217
27	2.250	765.306	0.177
28	2.333	793.651	0.180
Sum =		100.000	Sum= 34.679

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	0.120	(0.171) 0.108	0.012
2	0.17	0.144	(0.171) 0.130	0.014
3	0.25	0.144	(0.171) 0.130	0.014

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4	0.33	0.60	0.144	(0.171)	0.130	0.014
5	0.42	0.60	0.144	(0.171)	0.130	0.014
6	0.50	0.70	0.169	(0.171)	0.152	0.017
7	0.58	0.70	0.169	(0.171)	0.152	0.017
8	0.67	0.70	0.169	(0.171)	0.152	0.017
9	0.75	0.70	0.169	(0.171)	0.152	0.017
10	0.83	0.70	0.169	(0.171)	0.152	0.017
11	0.92	0.70	0.169	(0.171)	0.152	0.017
12	1.00	0.80	0.193	0.171	(0.173)	0.021
13	1.08	0.80	0.193	0.171	(0.173)	0.021
14	1.17	0.80	0.193	0.171	(0.173)	0.021
15	1.25	0.80	0.193	0.171	(0.173)	0.021
16	1.33	0.80	0.193	0.171	(0.173)	0.021
17	1.42	0.80	0.193	0.171	(0.173)	0.021
18	1.50	0.80	0.193	0.171	(0.173)	0.021
19	1.58	0.80	0.193	0.171	(0.173)	0.021
20	1.67	0.80	0.193	0.171	(0.173)	0.021
21	1.75	0.80	0.193	0.171	(0.173)	0.021
22	1.83	0.80	0.193	0.171	(0.173)	0.021
23	1.92	0.80	0.193	0.171	(0.173)	0.021
24	2.00	0.90	0.217	0.171	(0.195)	0.045
25	2.08	0.80	0.193	0.171	(0.173)	0.021
26	2.17	0.90	0.217	0.171	(0.195)	0.045
27	2.25	0.90	0.217	0.171	(0.195)	0.045
28	2.33	0.90	0.217	0.171	(0.195)	0.045
29	2.42	0.90	0.217	0.171	(0.195)	0.045
30	2.50	0.90	0.217	0.171	(0.195)	0.045
31	2.58	0.90	0.217	0.171	(0.195)	0.045
32	2.67	0.90	0.217	0.171	(0.195)	0.045
33	2.75	1.00	0.241	0.171	(0.217)	0.070
34	2.83	1.00	0.241	0.171	(0.217)	0.070
35	2.92	1.00	0.241	0.171	(0.217)	0.070
36	3.00	1.00	0.241	0.171	(0.217)	0.070
37	3.08	1.00	0.241	0.171	(0.217)	0.070
38	3.17	1.10	0.265	0.171	(0.238)	0.094
39	3.25	1.10	0.265	0.171	(0.238)	0.094
40	3.33	1.10	0.265	0.171	(0.238)	0.094
41	3.42	1.20	0.289	0.171	(0.260)	0.118
42	3.50	1.30	0.313	0.171	(0.282)	0.142
43	3.58	1.40	0.337	0.171	(0.303)	0.166
44	3.67	1.40	0.337	0.171	(0.303)	0.166
45	3.75	1.50	0.361	0.171	(0.325)	0.190
46	3.83	1.50	0.361	0.171	(0.325)	0.190
47	3.92	1.60	0.385	0.171	(0.347)	0.214
48	4.00	1.60	0.385	0.171	(0.347)	0.214
49	4.08	1.70	0.409	0.171	(0.368)	0.238
50	4.17	1.80	0.433	0.171	(0.390)	0.262
51	4.25	1.90	0.458	0.171	(0.412)	0.286
52	4.33	2.00	0.482	0.171	(0.433)	0.310
53	4.42	2.10	0.506	0.171	(0.455)	0.334
54	4.50	2.10	0.506	0.171	(0.455)	0.334
55	4.58	2.20	0.530	0.171	(0.477)	0.359
56	4.67	2.30	0.554	0.171	(0.498)	0.383
57	4.75	2.40	0.578	0.171	(0.520)	0.407
58	4.83	2.40	0.578	0.171	(0.520)	0.407
59	4.92	2.50	0.602	0.171	(0.542)	0.431
60	5.00	2.60	0.626	0.171	(0.563)	0.455
61	5.08	3.10	0.747	0.171	(0.672)	0.575
62	5.17	3.60	0.867	0.171	(0.780)	0.696
63	5.25	3.90	0.939	0.171	(0.845)	0.768
64	5.33	4.20	1.011	0.171	(0.910)	0.840
65	5.42	4.70	1.132	0.171	(1.019)	0.961
66	5.50	5.60	1.349	0.171	(1.214)	1.177

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67	5.58	1.90	0.458	0.171	(0.412)	0.286
68	5.67	0.90	0.217	0.171	(0.195)	0.045
69	5.75	0.60	0.144	(0.171)	0.130	0.014
70	5.83	0.50	0.120	(0.171)	0.108	0.012
71	5.92	0.30	0.072	(0.171)	0.065	0.007
72	6.00	0.20	0.048	(0.171)	0.043	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 12.4

Flood volume = Effective rainfall 1.04(In)
times area 34.4(Ac.)/[(In)/(Ft.)) = 3.0(Ac.Ft)
Total soil loss = 0.97(In)
Total soil loss = 2.783(Ac.Ft)
Total rainfall = 2.01(In)
Flood volume = 129420.1 Cubic Feet
Total soil loss = 121240.1 Cubic Feet

Peak flow rate of this hydrograph = 26.317(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0000	0.01	Q				
0+10	0.0003	0.04	Q				
0+15	0.0011	0.12	Q				
0+20	0.0027	0.23	Q				
0+25	0.0048	0.30	Q				
0+30	0.0071	0.34	Q				
0+35	0.0098	0.38	Q				
0+40	0.0126	0.42	Q				
0+45	0.0158	0.46	Q				
0+50	0.0191	0.48	Q				
0+55	0.0225	0.50	Q				
1+ 0	0.0261	0.52	Q				
1+ 5	0.0298	0.54	Q				
1+10	0.0338	0.58	Q				
1+15	0.0381	0.62	Q				
1+20	0.0425	0.65	Q				
1+25	0.0471	0.67	Q				
1+30	0.0518	0.68	Q				
1+35	0.0566	0.69	Q				
1+40	0.0614	0.70	Q				
1+45	0.0662	0.71	Q				
1+50	0.0711	0.71	Q				
1+55	0.0761	0.72	QV				
2+ 0	0.0811	0.74	QV				
2+ 5	0.0865	0.78	Q				
2+10	0.0927	0.90	Q				
2+15	0.0995	0.99	Q				
2+20	0.1069	1.07	Q				
2+25	0.1152	1.21	Q				
2+30	0.1242	1.30	Q				
2+35	0.1335	1.36	Q				
2+40	0.1432	1.40	Q				
2+45	0.1531	1.44	QV				
2+50	0.1636	1.53	Q				
2+55	0.1753	1.70	Q				
3+ 0	0.1885	1.90	Q				

			130160EX610.TXT			
3+ 5	0.2024	2.02	Q			
3+10	0.2170	2.12	Q			
3+15	0.2323	2.23	QV			
3+20	0.2491	2.43	Q			
3+25	0.2674	2.66	Q			
3+30	0.2872	2.87	Q			
3+35	0.3091	3.19	Q			
3+40	0.3342	3.65	Q			
3+45	0.3629	4.16	VQ			
3+50	0.3947	4.62	VQ			
3+55	0.4295	5.05	VQ			
4+ 0	0.4671	5.47	VQ			
4+ 5	0.5076	5.88	VQ			
4+10	0.5511	6.31	VQ			
4+15	0.5978	6.78	VQ			
4+20	0.6485	7.36	VQ			
4+25	0.7037	8.02	VQ			
4+30	0.7636	8.70	VQ			
4+35	0.8281	9.36	VQ			
4+40	0.8966	9.95	VQ			
4+45	0.9691	10.52	VQ			
4+50	1.0460	11.17	Q			
4+55	1.1275	11.83	Q			
5+ 0	1.2131	12.42	Q			
5+ 5	1.3030	13.05	Q			
5+10	1.3994	14.00	Q			
5+15	1.5068	15.60	Q			
5+20	1.6297	17.84	Q			
5+25	1.7692	20.26	V		Q	
5+30			V		Q	

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160EX2410.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
EXISTING DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 34.41(Ac.) = 0.054 Sq. Mi.
0.054 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 34.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.294 Hr.
Lag time = 17.64 Min.
25% of lag time = 4.41 Min.
40% of lag time = 7.06 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	2.42	83.27

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	6.58	226.42

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 2.420(In)
Area Averaged 100-Year Rainfall = 6.580(In)

Point rain (area averaged) = 4.131(In)
Area adjustment factor = 99.99 %
Adjusted average point rain = 4.131(In)

Sub-Area Data:

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Area(Ac.) Runoff Index Impervious %
34.410 60.00 0.400
Total Area Entered = 34.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
60.0	78.0	0.268	0.400	0.171	1.000	0.171
						Sum (F) = 0.171

Area averaged mean soil loss (F) (In/Hr) = 0.171
Minimum soil loss rate ((In/Hr)) = 0.086
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Unit Hydrograph
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	28.345	1.617
2	0.167	56.689	6.739
3	0.250	85.034	18.637
4	0.333	113.379	22.095
5	0.417	141.723	12.821
6	0.500	170.068	7.936
7	0.583	198.413	5.754
8	0.667	226.757	4.359
9	0.750	255.102	3.357
10	0.833	283.447	2.815
11	0.917	311.791	2.330
12	1.000	340.136	1.781
13	1.083	368.481	1.551
14	1.167	396.825	1.341
15	1.250	425.170	1.138
16	1.333	453.515	0.964
17	1.417	481.859	0.824
18	1.500	510.204	0.722
19	1.583	538.549	0.557
20	1.667	566.893	0.470
21	1.750	595.238	0.302
22	1.833	623.583	0.303
23	1.917	651.927	0.339
24	2.000	680.272	0.340
25	2.083	708.617	0.333
26	2.167	736.961	0.217
27	2.250	765.306	0.177
28	2.333	793.651	0.180
		Sum = 100.000	Sum= 34.679

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	0.033	(0.304)	0.030
2	0.17	0.033	(0.302)	0.030
3	0.25	0.033	(0.301)	0.030

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4	0.33	0.10	0.050	(0.300)	0.045	0.005
5	0.42	0.10	0.050	(0.299)	0.045	0.005
6	0.50	0.10	0.050	(0.298)	0.045	0.005
7	0.58	0.10	0.050	(0.297)	0.045	0.005
8	0.67	0.10	0.050	(0.295)	0.045	0.005
9	0.75	0.10	0.050	(0.294)	0.045	0.005
10	0.83	0.13	0.066	(0.293)	0.059	0.007
11	0.92	0.13	0.066	(0.292)	0.059	0.007
12	1.00	0.13	0.066	(0.291)	0.059	0.007
13	1.08	0.10	0.050	(0.290)	0.045	0.005
14	1.17	0.10	0.050	(0.289)	0.045	0.005
15	1.25	0.10	0.050	(0.287)	0.045	0.005
16	1.33	0.10	0.050	(0.286)	0.045	0.005
17	1.42	0.10	0.050	(0.285)	0.045	0.005
18	1.50	0.10	0.050	(0.284)	0.045	0.005
19	1.58	0.10	0.050	(0.283)	0.045	0.005
20	1.67	0.10	0.050	(0.282)	0.045	0.005
21	1.75	0.10	0.050	(0.281)	0.045	0.005
22	1.83	0.13	0.066	(0.279)	0.059	0.007
23	1.92	0.13	0.066	(0.278)	0.059	0.007
24	2.00	0.13	0.066	(0.277)	0.059	0.007
25	2.08	0.13	0.066	(0.276)	0.059	0.007
26	2.17	0.13	0.066	(0.275)	0.059	0.007
27	2.25	0.13	0.066	(0.274)	0.059	0.007
28	2.33	0.13	0.066	(0.273)	0.059	0.007
29	2.42	0.13	0.066	(0.272)	0.059	0.007
30	2.50	0.13	0.066	(0.270)	0.059	0.007
31	2.58	0.17	0.083	(0.269)	0.074	0.008
32	2.67	0.17	0.083	(0.268)	0.074	0.008
33	2.75	0.17	0.083	(0.267)	0.074	0.008
34	2.83	0.17	0.083	(0.266)	0.074	0.008
35	2.92	0.17	0.083	(0.265)	0.074	0.008
36	3.00	0.17	0.083	(0.264)	0.074	0.008
37	3.08	0.17	0.083	(0.263)	0.074	0.008
38	3.17	0.17	0.083	(0.262)	0.074	0.008
39	3.25	0.17	0.083	(0.261)	0.074	0.008
40	3.33	0.17	0.083	(0.260)	0.074	0.008
41	3.42	0.17	0.083	(0.258)	0.074	0.008
42	3.50	0.17	0.083	(0.257)	0.074	0.008
43	3.58	0.17	0.083	(0.256)	0.074	0.008
44	3.67	0.17	0.083	(0.255)	0.074	0.008
45	3.75	0.17	0.083	(0.254)	0.074	0.008
46	3.83	0.20	0.099	(0.253)	0.089	0.010
47	3.92	0.20	0.099	(0.252)	0.089	0.010
48	4.00	0.20	0.099	(0.251)	0.089	0.010
49	4.08	0.20	0.099	(0.250)	0.089	0.010
50	4.17	0.20	0.099	(0.249)	0.089	0.010
51	4.25	0.20	0.099	(0.248)	0.089	0.010
52	4.33	0.23	0.116	(0.247)	0.104	0.012
53	4.42	0.23	0.116	(0.246)	0.104	0.012
54	4.50	0.23	0.116	(0.245)	0.104	0.012
55	4.58	0.23	0.116	(0.244)	0.104	0.012
56	4.67	0.23	0.116	(0.242)	0.104	0.012
57	4.75	0.23	0.116	(0.241)	0.104	0.012
58	4.83	0.27	0.132	(0.240)	0.119	0.013
59	4.92	0.27	0.132	(0.239)	0.119	0.013
60	5.00	0.27	0.132	(0.238)	0.119	0.013
61	5.08	0.20	0.099	(0.237)	0.089	0.010
62	5.17	0.20	0.099	(0.236)	0.089	0.010
63	5.25	0.20	0.099	(0.235)	0.089	0.010
64	5.33	0.23	0.116	(0.234)	0.104	0.012
65	5.42	0.23	0.116	(0.233)	0.104	0.012
66	5.50	0.23	0.116	(0.232)	0.104	0.012

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67	5.58	0.27	0.132	(0.231)	0.119	0.013
68	5.67	0.27	0.132	(0.230)	0.119	0.013
69	5.75	0.27	0.132	(0.229)	0.119	0.013
70	5.83	0.27	0.132	(0.228)	0.119	0.013
71	5.92	0.27	0.132	(0.227)	0.119	0.013
72	6.00	0.27	0.132	(0.226)	0.119	0.013
73	6.08	0.30	0.149	(0.225)	0.134	0.015
74	6.17	0.30	0.149	(0.224)	0.134	0.015
75	6.25	0.30	0.149	(0.223)	0.134	0.015
76	6.33	0.30	0.149	(0.222)	0.134	0.015
77	6.42	0.30	0.149	(0.221)	0.134	0.015
78	6.50	0.30	0.149	(0.220)	0.134	0.015
79	6.58	0.33	0.165	(0.219)	0.149	0.017
80	6.67	0.33	0.165	(0.218)	0.149	0.017
81	6.75	0.33	0.165	(0.217)	0.149	0.017
82	6.83	0.33	0.165	(0.216)	0.149	0.017
83	6.92	0.33	0.165	(0.215)	0.149	0.017
84	7.00	0.33	0.165	(0.214)	0.149	0.017
85	7.08	0.33	0.165	(0.213)	0.149	0.017
86	7.17	0.33	0.165	(0.212)	0.149	0.017
87	7.25	0.33	0.165	(0.211)	0.149	0.017
88	7.33	0.37	0.182	(0.210)	0.164	0.018
89	7.42	0.37	0.182	(0.209)	0.164	0.018
90	7.50	0.37	0.182	(0.208)	0.164	0.018
91	7.58	0.40	0.198	(0.207)	0.178	0.020
92	7.67	0.40	0.198	(0.206)	0.178	0.020
93	7.75	0.40	0.198	(0.206)	0.178	0.020
94	7.83	0.43	0.215	(0.205)	0.193	0.021
95	7.92	0.43	0.215	(0.204)	0.193	0.021
96	8.00	0.43	0.215	(0.203)	0.193	0.021
97	8.08	0.50	0.248	0.202 (0.223)		0.046
98	8.17	0.50	0.248	0.201 (0.223)		0.047
99	8.25	0.50	0.248	0.200 (0.223)		0.048
100	8.33	0.50	0.248	0.199 (0.223)		0.049
101	8.42	0.50	0.248	0.198 (0.223)		0.050
102	8.50	0.50	0.248	0.197 (0.223)		0.051
103	8.58	0.53	0.264	0.196 (0.238)		0.068
104	8.67	0.53	0.264	0.195 (0.238)		0.069
105	8.75	0.53	0.264	0.194 (0.238)		0.070
106	8.83	0.57	0.281	0.193 (0.253)		0.088
107	8.92	0.57	0.281	0.192 (0.253)		0.088
108	9.00	0.57	0.281	0.192 (0.253)		0.089
109	9.08	0.63	0.314	0.191 (0.283)		0.123
110	9.17	0.63	0.314	0.190 (0.283)		0.124
111	9.25	0.63	0.314	0.189 (0.283)		0.125
112	9.33	0.67	0.330	0.188 (0.297)		0.143
113	9.42	0.67	0.330	0.187 (0.297)		0.143
114	9.50	0.67	0.330	0.186 (0.297)		0.144
115	9.58	0.70	0.347	0.185 (0.312)		0.162
116	9.67	0.70	0.347	0.184 (0.312)		0.163
117	9.75	0.70	0.347	0.183 (0.312)		0.164
118	9.83	0.73	0.364	0.183 (0.327)		0.181
119	9.92	0.73	0.364	0.182 (0.327)		0.182
120	10.00	0.73	0.364	0.181 (0.327)		0.183
121	10.08	0.50	0.248	0.180 (0.223)		0.068
122	10.17	0.50	0.248	0.179 (0.223)		0.069
123	10.25	0.50	0.248	0.178 (0.223)		0.070
124	10.33	0.50	0.248	0.177 (0.223)		0.070
125	10.42	0.50	0.248	0.177 (0.223)		0.071
126	10.50	0.50	0.248	0.176 (0.223)		0.072
127	10.58	0.67	0.330	0.175 (0.297)		0.156
128	10.67	0.67	0.330	0.174 (0.297)		0.157
129	10.75	0.67	0.330	0.173 (0.297)		0.157

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130	10.83	0.67	0.330	0.172	(0.297)	0.158
131	10.92	0.67	0.330	0.171	(0.297)	0.159
132	11.00	0.67	0.330	0.171	(0.297)	0.160
133	11.08	0.63	0.314	0.170	(0.283)	0.144
134	11.17	0.63	0.314	0.169	(0.283)	0.145
135	11.25	0.63	0.314	0.168	(0.283)	0.146
136	11.33	0.63	0.314	0.167	(0.283)	0.147
137	11.42	0.63	0.314	0.166	(0.283)	0.148
138	11.50	0.63	0.314	0.166	(0.283)	0.148
139	11.58	0.57	0.281	0.165	(0.253)	0.116
140	11.67	0.57	0.281	0.164	(0.253)	0.117
141	11.75	0.57	0.281	0.163	(0.253)	0.118
142	11.83	0.60	0.297	0.162	(0.268)	0.135
143	11.92	0.60	0.297	0.161	(0.268)	0.136
144	12.00	0.60	0.297	0.161	(0.268)	0.137
145	12.08	0.83	0.413	0.160	(0.372)	0.253
146	12.17	0.83	0.413	0.159	(0.372)	0.254
147	12.25	0.83	0.413	0.158	(0.372)	0.255
148	12.33	0.87	0.430	0.157	(0.387)	0.272
149	12.42	0.87	0.430	0.157	(0.387)	0.273
150	12.50	0.87	0.430	0.156	(0.387)	0.274
151	12.58	0.93	0.463	0.155	(0.416)	0.308
152	12.67	0.93	0.463	0.154	(0.416)	0.308
153	12.75	0.93	0.463	0.154	(0.416)	0.309
154	12.83	0.97	0.479	0.153	(0.431)	0.326
155	12.92	0.97	0.479	0.152	(0.431)	0.327
156	13.00	0.97	0.479	0.151	(0.431)	0.328
157	13.08	1.13	0.562	0.150	(0.506)	0.411
158	13.17	1.13	0.562	0.150	(0.506)	0.412
159	13.25	1.13	0.562	0.149	(0.506)	0.413
160	13.33	1.13	0.562	0.148	(0.506)	0.414
161	13.42	1.13	0.562	0.147	(0.506)	0.414
162	13.50	1.13	0.562	0.147	(0.506)	0.415
163	13.58	0.77	0.380	0.146	(0.342)	0.234
164	13.67	0.77	0.380	0.145	(0.342)	0.235
165	13.75	0.77	0.380	0.144	(0.342)	0.236
166	13.83	0.77	0.380	0.144	(0.342)	0.236
167	13.92	0.77	0.380	0.143	(0.342)	0.237
168	14.00	0.77	0.380	0.142	(0.342)	0.238
169	14.08	0.90	0.446	0.142	(0.402)	0.305
170	14.17	0.90	0.446	0.141	(0.402)	0.305
171	14.25	0.90	0.446	0.140	(0.402)	0.306
172	14.33	0.87	0.430	0.139	(0.387)	0.290
173	14.42	0.87	0.430	0.139	(0.387)	0.291
174	14.50	0.87	0.430	0.138	(0.387)	0.292
175	14.58	0.87	0.430	0.137	(0.387)	0.292
176	14.67	0.87	0.430	0.137	(0.387)	0.293
177	14.75	0.87	0.430	0.136	(0.387)	0.294
178	14.83	0.83	0.413	0.135	(0.372)	0.278
179	14.92	0.83	0.413	0.134	(0.372)	0.279
180	15.00	0.83	0.413	0.134	(0.372)	0.279
181	15.08	0.80	0.397	0.133	(0.357)	0.264
182	15.17	0.80	0.397	0.132	(0.357)	0.264
183	15.25	0.80	0.397	0.132	(0.357)	0.265
184	15.33	0.77	0.380	0.131	(0.342)	0.249
185	15.42	0.77	0.380	0.130	(0.342)	0.250
186	15.50	0.77	0.380	0.130	(0.342)	0.250
187	15.58	0.63	0.314	0.129	(0.283)	0.185
188	15.67	0.63	0.314	0.128	(0.283)	0.186
189	15.75	0.63	0.314	0.128	(0.283)	0.186
190	15.83	0.63	0.314	0.127	(0.283)	0.187
191	15.92	0.63	0.314	0.126	(0.283)	0.188
192	16.00	0.63	0.314	0.126	(0.283)	0.188

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193	16.08	0.13	0.066	(0.125)	0.059	0.007
194	16.17	0.13	0.066	(0.124)	0.059	0.007
195	16.25	0.13	0.066	(0.124)	0.059	0.007
196	16.33	0.13	0.066	(0.123)	0.059	0.007
197	16.42	0.13	0.066	(0.123)	0.059	0.007
198	16.50	0.13	0.066	(0.122)	0.059	0.007
199	16.58	0.10	0.050	(0.121)	0.045	0.005
200	16.67	0.10	0.050	(0.121)	0.045	0.005
201	16.75	0.10	0.050	(0.120)	0.045	0.005
202	16.83	0.10	0.050	(0.120)	0.045	0.005
203	16.92	0.10	0.050	(0.119)	0.045	0.005
204	17.00	0.10	0.050	(0.118)	0.045	0.005
205	17.08	0.17	0.083	(0.118)	0.074	0.008
206	17.17	0.17	0.083	(0.117)	0.074	0.008
207	17.25	0.17	0.083	(0.117)	0.074	0.008
208	17.33	0.17	0.083	(0.116)	0.074	0.008
209	17.42	0.17	0.083	(0.115)	0.074	0.008
210	17.50	0.17	0.083	(0.115)	0.074	0.008
211	17.58	0.17	0.083	(0.114)	0.074	0.008
212	17.67	0.17	0.083	(0.114)	0.074	0.008
213	17.75	0.17	0.083	(0.113)	0.074	0.008
214	17.83	0.13	0.066	(0.113)	0.059	0.007
215	17.92	0.13	0.066	(0.112)	0.059	0.007
216	18.00	0.13	0.066	(0.111)	0.059	0.007
217	18.08	0.13	0.066	(0.111)	0.059	0.007
218	18.17	0.13	0.066	(0.110)	0.059	0.007
219	18.25	0.13	0.066	(0.110)	0.059	0.007
220	18.33	0.13	0.066	(0.109)	0.059	0.007
221	18.42	0.13	0.066	(0.109)	0.059	0.007
222	18.50	0.13	0.066	(0.108)	0.059	0.007
223	18.58	0.10	0.050	(0.108)	0.045	0.005
224	18.67	0.10	0.050	(0.107)	0.045	0.005
225	18.75	0.10	0.050	(0.107)	0.045	0.005
226	18.83	0.07	0.033	(0.106)	0.030	0.003
227	18.92	0.07	0.033	(0.106)	0.030	0.003
228	19.00	0.07	0.033	(0.105)	0.030	0.003
229	19.08	0.10	0.050	(0.105)	0.045	0.005
230	19.17	0.10	0.050	(0.104)	0.045	0.005
231	19.25	0.10	0.050	(0.104)	0.045	0.005
232	19.33	0.13	0.066	(0.103)	0.059	0.007
233	19.42	0.13	0.066	(0.103)	0.059	0.007
234	19.50	0.13	0.066	(0.102)	0.059	0.007
235	19.58	0.10	0.050	(0.102)	0.045	0.005
236	19.67	0.10	0.050	(0.101)	0.045	0.005
237	19.75	0.10	0.050	(0.101)	0.045	0.005
238	19.83	0.07	0.033	(0.100)	0.030	0.003
239	19.92	0.07	0.033	(0.100)	0.030	0.003
240	20.00	0.07	0.033	(0.099)	0.030	0.003
241	20.08	0.10	0.050	(0.099)	0.045	0.005
242	20.17	0.10	0.050	(0.099)	0.045	0.005
243	20.25	0.10	0.050	(0.098)	0.045	0.005
244	20.33	0.10	0.050	(0.098)	0.045	0.005
245	20.42	0.10	0.050	(0.097)	0.045	0.005
246	20.50	0.10	0.050	(0.097)	0.045	0.005
247	20.58	0.10	0.050	(0.096)	0.045	0.005
248	20.67	0.10	0.050	(0.096)	0.045	0.005
249	20.75	0.10	0.050	(0.096)	0.045	0.005
250	20.83	0.07	0.033	(0.095)	0.030	0.003
251	20.92	0.07	0.033	(0.095)	0.030	0.003
252	21.00	0.07	0.033	(0.095)	0.030	0.003
253	21.08	0.10	0.050	(0.094)	0.045	0.005
254	21.17	0.10	0.050	(0.094)	0.045	0.005
255	21.25	0.10	0.050	(0.093)	0.045	0.005

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256	21.33	0.07	0.033	(0.093)	0.030	0.003
257	21.42	0.07	0.033	(0.093)	0.030	0.003
258	21.50	0.07	0.033	(0.092)	0.030	0.003
259	21.58	0.10	0.050	(0.092)	0.045	0.005
260	21.67	0.10	0.050	(0.092)	0.045	0.005
261	21.75	0.10	0.050	(0.091)	0.045	0.005
262	21.83	0.07	0.033	(0.091)	0.030	0.003
263	21.92	0.07	0.033	(0.091)	0.030	0.003
264	22.00	0.07	0.033	(0.090)	0.030	0.003
265	22.08	0.10	0.050	(0.090)	0.045	0.005
266	22.17	0.10	0.050	(0.090)	0.045	0.005
267	22.25	0.10	0.050	(0.090)	0.045	0.005
268	22.33	0.07	0.033	(0.089)	0.030	0.003
269	22.42	0.07	0.033	(0.089)	0.030	0.003
270	22.50	0.07	0.033	(0.089)	0.030	0.003
271	22.58	0.07	0.033	(0.088)	0.030	0.003
272	22.67	0.07	0.033	(0.088)	0.030	0.003
273	22.75	0.07	0.033	(0.088)	0.030	0.003
274	22.83	0.07	0.033	(0.088)	0.030	0.003
275	22.92	0.07	0.033	(0.088)	0.030	0.003
276	23.00	0.07	0.033	(0.087)	0.030	0.003
277	23.08	0.07	0.033	(0.087)	0.030	0.003
278	23.17	0.07	0.033	(0.087)	0.030	0.003
279	23.25	0.07	0.033	(0.087)	0.030	0.003
280	23.33	0.07	0.033	(0.087)	0.030	0.003
281	23.42	0.07	0.033	(0.086)	0.030	0.003
282	23.50	0.07	0.033	(0.086)	0.030	0.003
283	23.58	0.07	0.033	(0.086)	0.030	0.003
284	23.67	0.07	0.033	(0.086)	0.030	0.003
285	23.75	0.07	0.033	(0.086)	0.030	0.003
286	23.83	0.07	0.033	(0.086)	0.030	0.003
287	23.92	0.07	0.033	(0.086)	0.030	0.003
288	24.00	0.07	0.033	(0.086)	0.030	0.003

(Loss Rate Not Used)

Sum = 100.0 Sum = 20.6

Flood volume = Effective rainfall 1.72(In)
times area 34.4(Ac.)/[(In)/(Ft.)] = 4.9(Ac.Ft)
Total soil loss = 2.41(In)
Total soil loss = 6.913(Ac.Ft)
Total rainfall = 4.13(In)
Flood volume = 214892.8 Cubic Feet
Total soil loss = 301125.9 Cubic Feet

Peak flow rate of this hydrograph = 13.181(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.01	Q				
0+15	0.0003	0.03	Q				
0+20	0.0007	0.06	Q				
0+25	0.0012	0.08	Q				
0+30	0.0019	0.10	Q				
0+35	0.0027	0.11	Q				
0+40	0.0035	0.13	Q				
0+45	0.0045	0.14	Q				

0+50	0.0055	0.14	Q
0+55	0.0065	0.15	Q
1+ 0	0.0076	0.17	Q
1+ 5	0.0089	0.18	Q
1+10	0.0102	0.19	Q
1+15	0.0115	0.18	Q
1+20	0.0127	0.18	Q
1+25	0.0139	0.17	Q
1+30	0.0151	0.17	Q
1+35	0.0163	0.17	Q
1+40	0.0174	0.17	Q
1+45	0.0186	0.17	Q
1+50	0.0198	0.17	Q
1+55	0.0210	0.18	Q
2+ 0	0.0223	0.19	Q
2+ 5	0.0237	0.20	Q
2+10	0.0251	0.21	Q
2+15	0.0266	0.21	Q
2+20	0.0281	0.22	Q
2+25	0.0296	0.22	Q
2+30	0.0311	0.22	Q
2+35	0.0327	0.22	Q
2+40	0.0342	0.23	Q
2+45	0.0359	0.24	Q
2+50	0.0376	0.25	Q
2+55	0.0394	0.26	Q
3+ 0	0.0413	0.27	Q
3+ 5	0.0431	0.27	Q
3+10	0.0450	0.27	Q
3+15	0.0469	0.28	Q
3+20	0.0488	0.28	Q
3+25	0.0507	0.28	Q
3+30	0.0527	0.28	Q
3+35	0.0546	0.28	Q
3+40	0.0565	0.28	Q
3+45	0.0585	0.28	Q
3+50	0.0604	0.28	Q
3+55	0.0624	0.29	Q
4+ 0	0.0645	0.30	Q
4+ 5	0.0667	0.31	Q
4+10	0.0689	0.32	Q
4+15	0.0711	0.33	Q
4+20	0.0734	0.33	Q
4+25	0.0757	0.34	Q
4+30	0.0781	0.35	Q
4+35	0.0806	0.36	Q
4+40	0.0832	0.37	Q
4+45	0.0858	0.38	Q
4+50	0.0884	0.38	Q
4+55	0.0911	0.39	Q
5+ 0	0.0939	0.40	Q
5+ 5	0.0968	0.42	Q
5+10	0.0997	0.42	Q
5+15	0.1024	0.40	Q
5+20	0.1051	0.38	Q
5+25	0.1077	0.38	Q
5+30	0.1103	0.38	Q
5+35	0.1130	0.39	Q
5+40	0.1157	0.40	Q
5+45	0.1185	0.41	Q
5+50	0.1215	0.42	Q
5+55	0.1244	0.43	QV
6+ 0	0.1275	0.44	QV

6+ 5	0.1305	0.44	QV
6+10	0.1336	0.45	QV
6+15	0.1368	0.46	QV
6+20	0.1401	0.48	QV
6+25	0.1434	0.49	QV
6+30	0.1468	0.49	QV
6+35	0.1503	0.50	QV
6+40	0.1537	0.50	Q
6+45	0.1573	0.52	Q
6+50	0.1610	0.53	Q
6+55	0.1647	0.54	Q
7+ 0	0.1685	0.55	Q
7+ 5	0.1723	0.55	Q
7+10	0.1761	0.56	Q
7+15	0.1800	0.56	Q
7+20	0.1839	0.56	Q
7+25	0.1878	0.57	Q
7+30	0.1918	0.58	Q
7+35	0.1959	0.60	Q
7+40	0.2001	0.61	Q
7+45	0.2044	0.62	Q
7+50	0.2088	0.64	Q
7+55	0.2133	0.66	Q
8+ 0	0.2180	0.67	Q
8+ 5	0.2228	0.71	Q
8+10	0.2282	0.78	Q
8+15	0.2347	0.95	Q
8+20	0.2426	1.15	VQ
8+25	0.2514	1.28	Q
8+30	0.2609	1.37	Q
8+35	0.2709	1.46	Q
8+40	0.2816	1.56	VQ
8+45	0.2935	1.72	VQ
8+50	0.3066	1.91	VQ
8+55	0.3209	2.07	V Q
9+ 0	0.3365	2.27	V Q
9+ 5	0.3537	2.49	V Q
9+10	0.3724	2.71	V Q Q
9+15	0.3932	3.03	V Q Q
9+20	0.4165	3.38	V Q Q
9+25	0.4415	3.64	V Q Q
9+30	0.4684	3.90	V Q Q
9+35	0.4971	4.17	V Q Q
9+40	0.5273	4.38	V Q Q
9+45	0.5591	4.62	V Q Q
9+50	0.5927	4.87	V Q Q
9+55	0.6277	5.08	V Q Q
10+ 0	0.6644	5.32	V Q Q
10+ 5	0.7022	5.49	V Q Q
10+10	0.7393	5.39	V Q Q
10+15	0.7721	4.77	V Q
10+20	0.7995	3.98	VQ
10+25	0.8241	3.56	VQ
10+30	0.8469	3.32	Q
10+35	0.8690	3.21	QV
10+40	0.8917	3.29	QV
10+45	0.9175	3.75	Q
10+50	0.9472	4.32	VQ
10+55	0.9792	4.65	V Q
11+ 0	1.0126	4.85	VQ
11+ 5	1.0470	4.99	VQ
11+10	1.0818	5.06	V Q
11+15	1.1165	5.04	VQ

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16+35	4.7658	1.98	Q			V
16+40	4.7772	1.67	Q			V
16+45	4.7870	1.41	Q			V
16+50	4.7952	1.20	Q			V
16+55	4.8022	1.02	Q			V
17+ 0	4.8083	0.88	Q			V
17+ 5	4.8136	0.77	Q			V
17+10	4.8183	0.68	Q			V
17+15	4.8226	0.62	Q			V
17+20	4.8265	0.57	Q			V
17+25	4.8301	0.53	Q			V
17+30	4.8334	0.48	Q			V
17+35	4.8365	0.44	Q			V
17+40	4.8393	0.41	Q			V
17+45	4.8420	0.39	Q			V
17+50	4.8446	0.37	Q			V
17+55	4.8470	0.35	Q			V
18+ 0	4.8492	0.32	Q			V
18+ 5	4.8511	0.29	Q			V
18+10	4.8530	0.27	Q			V
18+15	4.8547	0.25	Q			V
18+20	4.8564	0.24	Q			V
18+25	4.8580	0.24	Q			V
18+30	4.8596	0.24	Q			V
18+35	4.8612	0.23	Q			V
18+40	4.8628	0.23	Q			V
18+45	4.8643	0.22	Q			V
18+50	4.8657	0.20	Q			V
18+55	4.8670	0.19	Q			V
19+ 0	4.8682	0.18	Q			V
19+ 5	4.8693	0.16	Q			V
19+10	4.8704	0.15	Q			V
19+15	4.8715	0.16	Q			V
19+20	4.8727	0.17	Q			V
19+25	4.8739	0.17	Q			V
19+30	4.8751	0.19	Q			V
19+35	4.8765	0.20	Q			V
19+40	4.8779	0.20	Q			V
19+45	4.8793	0.20	Q			V
19+50	4.8805	0.19	Q			V
19+55	4.8818	0.18	Q			V
20+ 0	4.8829	0.16	Q			V
20+ 5	4.8839	0.15	Q			V
20+10	4.8849	0.15	Q			V
20+15	4.8860	0.15	Q			V
20+20	4.8871	0.16	Q			V
20+25	4.8882	0.16	Q			V
20+30	4.8893	0.17	Q			V
20+35	4.8905	0.17	Q			V
20+40	4.8917	0.17	Q			V
20+45	4.8928	0.17	Q			V
20+50	4.8940	0.17	Q			V
20+55	4.8951	0.17	Q			V
21+ 0	4.8962	0.15	Q			V
21+ 5	4.8972	0.14	Q			V
21+10	4.8981	0.14	Q			V
21+15	4.8991	0.15	Q			V
21+20	4.9002	0.16	Q			V
21+25	4.9013	0.16	Q			V
21+30	4.9023	0.15	Q			V
21+35	4.9033	0.14	Q			V
21+40	4.9042	0.14	Q			V
21+45	4.9052	0.14	Q			V

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21+50	4.9062	0.15	Q				V
21+55	4.9073	0.15	Q				V
22+ 0	4.9083	0.15	Q				V
22+ 5	4.9092	0.14	Q				V
22+10	4.9102	0.13	Q				V
22+15	4.9111	0.14	Q				V
22+20	4.9122	0.15	Q				V
22+25	4.9132	0.15	Q				V
22+30	4.9142	0.15	Q				V
22+35	4.9152	0.14	Q				V
22+40	4.9161	0.13	Q				V
22+45	4.9169	0.13	Q				V
22+50	4.9178	0.12	Q				V
22+55	4.9186	0.12	Q				V
23+ 0	4.9195	0.12	Q				V
23+ 5	4.9203	0.12	Q				V
23+10	4.9211	0.12	Q				V
23+15	4.9219	0.12	Q				V
23+20	4.9227	0.12	Q				V
23+25	4.9235	0.12	Q				V
23+30	4.9243	0.12	Q				V
23+35	4.9251	0.12	Q				V
23+40	4.9259	0.12	Q				V
23+45	4.9267	0.12	Q				V
23+50	4.9275	0.12	Q				V
23+55	4.9283	0.12	Q				V
24+ 0	4.9291	0.12	Q				V
24+ 5	4.9299	0.11	Q				V
24+10	4.9306	0.11	Q				V
24+15	4.9312	0.08	Q				V
24+20	4.9316	0.06	Q				V
24+25	4.9319	0.04	Q				V
24+30	4.9321	0.03	Q				V
24+35	4.9323	0.03	Q				V
24+40	4.9325	0.02	Q				V
24+45	4.9326	0.02	Q				V
24+50	4.9327	0.02	Q				V
24+55	4.9328	0.01	Q				V
25+ 0	4.9329	0.01	Q				V
25+ 5	4.9330	0.01	Q				V
25+10	4.9330	0.01	Q				V
25+15	4.9331	0.01	Q				V
25+20	4.9331	0.01	Q				V
25+25	4.9331	0.00	Q				V
25+30	4.9332	0.00	Q				V
25+35	4.9332	0.00	Q				V
25+40	4.9332	0.00	Q				V
25+45	4.9332	0.00	Q				V
25+50	4.9332	0.00	Q				V
25+55	4.9332	0.00	Q				V
26+ 0	4.9333	0.00	Q				V
26+ 5	4.9333	0.00	Q				V
26+10	4.9333	0.00	Q				V
26+15	4.9333	0.00	Q				V

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160EX1001100.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
EXISTING DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 34.41(Ac.) = 0.054 Sq. Mi.
0.054 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 34.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.294 Hr.
Lag time = 17.64 Min.
25% of lag time = 4.41 Min.
40% of lag time = 7.06 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	0.48	16.38

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	1.31	45.08

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.476(In)
Area Averaged 100-Year Rainfall = 1.310(In)

Point rain (area averaged) = 1.310(In)
Areaal adjustment factor = 99.97 %
Adjusted average point rain = 1.310(In)

Sub-Area Data:

130160EX1001100.TXT
Area(Ac.) Runoff Index Impervious %
34.410 60.00 0.400
Total Area Entered = 34.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
60.0	78.0	0.268	0.400	0.171	1.000	0.171
						Sum (F) = 0.171

Area averaged mean soil loss (F) (In/Hr) = 0.171

Minimum soil loss rate ((In/Hr)) = 0.086

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

slope of intensity-duration curve for a 1 hour storm =0.4800

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	28.345	1.617
2	0.167	56.689	6.739
3	0.250	85.034	18.637
4	0.333	113.379	22.095
5	0.417	141.723	12.821
6	0.500	170.068	7.936
7	0.583	198.413	5.754
8	0.667	226.757	4.359
9	0.750	255.102	3.357
10	0.833	283.447	2.815
11	0.917	311.791	2.330
12	1.000	340.136	1.781
13	1.083	368.481	1.551
14	1.167	396.825	1.341
15	1.250	425.170	1.138
16	1.333	453.515	0.964
17	1.417	481.859	0.824
18	1.500	510.204	0.722
19	1.583	538.549	0.557
20	1.667	566.893	0.470
21	1.750	595.238	0.302
22	1.833	623.583	0.303
23	1.917	651.927	0.339
24	2.000	680.272	0.340
25	2.083	708.617	0.333
26	2.167	736.961	0.217
27	2.250	765.306	0.177
28	2.333	793.651	0.180
		Sum = 100.000	Sum= 34.679

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

Unit Time	Pattern	Storm Rain	Loss rate(In./Hr)		Effective
(Hr.)	Percent	(In/Hr)	Max	Low	(In/Hr)
1 0.08	4.40	0.691	0.171	(0.622)	0.520

Page 2

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2	0.17	4.50	0.707	0.171	(0.636)	0.536
3	0.25	5.40	0.849	0.171	(0.764)	0.677
4	0.33	5.40	0.849	0.171	(0.764)	0.677
5	0.42	5.70	0.896	0.171	(0.806)	0.724
6	0.50	6.40	1.006	0.171	(0.905)	0.835
7	0.58	7.90	1.241	0.171	(1.117)	1.070
8	0.67	9.10	1.430	0.171	(1.287)	1.259
9	0.75	12.80	2.012	0.171	(1.810)	1.840
10	0.83	25.60	4.023	0.171	(3.621)	3.852
11	0.92	7.90	1.241	0.171	(1.117)	1.070
12	1.00	4.90	0.770	0.171	(0.693)	0.599

(Loss Rate Not Used)
Sum = 100.0 Sum = 13.7

Flood volume = Effective rainfall 1.14(In)
times area 34.4(Ac.)/[(In)/(Ft.)] = 3.3(Ac.Ft)
Total soil loss = 0.17(In)
Total soil loss = 0.491(Ac.Ft)
Total rainfall = 1.31(In)
Flood volume = 142186.6 Cubic Feet
Total soil loss = 21392.3 Cubic Feet

Peak flow rate of this hydrograph = 55.566(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	15.0	30.0	45.0	60.0
0+ 5	0.0020	0.29	Q				
0+10	0.0125	1.52	VQ				
0+15	0.0469	5.00	V Q				
0+20	0.1117	9.42	V Q				
0+25	0.1998	12.79	V Q				
0+30	0.3069	15.55	V Q				
0+35	0.4306	17.96	V Q				
0+40	0.5745	20.89	V Q				
0+45	0.7477	25.15	V Q				
0+50	0.9683	32.03	V Q				
0+55	1.2604	42.42	V Q				
1+ 0	1.6417	55.37	V Q				
1+ 5	2.0244	55.57	V Q				
1+10							

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160EX1003100.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
EXISTING DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 34.41(Ac.) = 0.054 Sq. Mi.
0.054 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 34.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.294 Hr.
Lag time = 17.64 Min.
25% of lag time = 4.41 Min.
40% of lag time = 7.06 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	0.87	29.80

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	2.16	74.33

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.866(In)
Area Averaged 100-Year Rainfall = 2.160(In)

Point rain (area averaged) = 2.160(In)
Areaal adjustment factor = 99.98 %
Adjusted average point rain = 2.160(In)

Sub-Area Data:

130160EX1003100.TXT
 Area(Ac.) Runoff Index Impervious %
 34.410 60.00 0.400
 Total Area Entered = 34.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
60.0	78.0	0.268	0.400	0.171	1.000	0.171
						Sum (F) = 0.171

Area averaged mean soil loss (F) (In/Hr) = 0.171
 Minimum soil loss rate ((In/Hr)) = 0.086
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.900

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	28.345	1.617
2	0.167	56.689	6.739
3	0.250	85.034	18.637
4	0.333	113.379	22.095
5	0.417	141.723	12.821
6	0.500	170.068	7.936
7	0.583	198.413	5.754
8	0.667	226.757	4.359
9	0.750	255.102	3.357
10	0.833	283.447	2.815
11	0.917	311.791	2.330
12	1.000	340.136	1.781
13	1.083	368.481	1.551
14	1.167	396.825	1.341
15	1.250	425.170	1.138
16	1.333	453.515	0.964
17	1.417	481.859	0.824
18	1.500	510.204	0.722
19	1.583	538.549	0.557
20	1.667	566.893	0.470
21	1.750	595.238	0.302
22	1.833	623.583	0.303
23	1.917	651.927	0.339
24	2.000	680.272	0.340
25	2.083	708.617	0.333
26	2.167	736.961	0.217
27	2.250	765.306	0.177
28	2.333	793.651	0.180
		Sum = 100.000	Sum= 34.679

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	1.30	0.337 (0.303)	0.166
2	0.17	1.30	0.337 (0.303)	0.166
3	0.25	1.10	0.285 (0.257)	0.114

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4	0.33	1.50	0.389	0.171	(0.350)	0.217
5	0.42	1.50	0.389	0.171	(0.350)	0.217
6	0.50	1.80	0.466	0.171	(0.420)	0.295
7	0.58	1.50	0.389	0.171	(0.350)	0.217
8	0.67	1.80	0.466	0.171	(0.420)	0.295
9	0.75	1.80	0.466	0.171	(0.420)	0.295
10	0.83	1.50	0.389	0.171	(0.350)	0.217
11	0.92	1.60	0.415	0.171	(0.373)	0.243
12	1.00	1.80	0.466	0.171	(0.420)	0.295
13	1.08	2.20	0.570	0.171	(0.513)	0.399
14	1.17	2.20	0.570	0.171	(0.513)	0.399
15	1.25	2.20	0.570	0.171	(0.513)	0.399
16	1.33	2.00	0.518	0.171	(0.466)	0.347
17	1.42	2.60	0.674	0.171	(0.606)	0.503
18	1.50	2.70	0.700	0.171	(0.630)	0.528
19	1.58	2.40	0.622	0.171	(0.560)	0.451
20	1.67	2.70	0.700	0.171	(0.630)	0.528
21	1.75	3.30	0.855	0.171	(0.770)	0.684
22	1.83	3.10	0.803	0.171	(0.723)	0.632
23	1.92	2.90	0.752	0.171	(0.676)	0.580
24	2.00	3.00	0.777	0.171	(0.700)	0.606
25	2.08	3.10	0.803	0.171	(0.723)	0.632
26	2.17	4.20	1.088	0.171	(0.980)	0.917
27	2.25	5.00	1.296	0.171	(1.166)	1.125
28	2.33	3.50	0.907	0.171	(0.816)	0.736
29	2.42	6.80	1.762	0.171	(1.586)	1.591
30	2.50	7.30	1.892	0.171	(1.703)	1.721
31	2.58	8.20	2.125	0.171	(1.913)	1.954
32	2.67	5.90	1.529	0.171	(1.376)	1.358
33	2.75	2.00	0.518	0.171	(0.466)	0.347
34	2.83	1.80	0.466	0.171	(0.420)	0.295
35	2.92	1.80	0.466	0.171	(0.420)	0.295
36	3.00	0.60	0.155	(0.171)	0.140	0.016

(Loss Rate Not Used)

Sum = 100.0 Sum = 19.8

Flood volume = Effective rainfall 1.65(In)
times area 34.4(Ac.)/[(In)/(Ft.)] = 4.7(Ac.Ft)
Total soil loss = 0.51(In)
Total soil loss = 1.466(Ac.Ft)
Total rainfall = 2.16(In)
Flood volume = 205910.4 Cubic Feet
Total soil loss = 63850.9 Cubic Feet

Peak flow rate of this hydrograph = 45.676(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0006		0.09	Q				
0+10	0.0039		0.48	Q				
0+15	0.0144		1.52	VQ				
0+20	0.0332		2.73	V Q				
0+25	0.0565		3.37	V Q				
0+30	0.0850		4.15	V Q				
0+35	0.1207		5.18	V Q				
0+40	0.1628		6.11	V Q				
0+45	0.2094		6.76	V Q				

			130160EX1003100.TXT			
0+50	0.2594	7.26	V	Q		
0+55	0.3130	7.79	V	Q		
1+ 0	0.3670	7.84	V	Q		
1+ 5	0.4215	7.91	V	Q		
1+10	0.4807	8.60	V	Q		
1+15	0.5480	9.77	V	Q		
1+20	0.6227	10.85	V	Q		
1+25	0.7018	11.49	V	Q		
1+30	0.7844	11.99	V	Q		
1+35	0.8736	12.95	V	Q		
1+40	0.9714	14.20	V	Q		
1+45	1.0742	14.92	V	Q		
1+50	1.1829	15.78	V	Q		
1+55	1.3023	17.34	V	Q		
2+ 0	1.4301	18.56	V	Q		
2+ 5	1.5604	18.93	V	Q		
2+10	1.6939	19.38	V	Q		
2+15	1.8364	20.69	V	Q		
2+20	1.9966	23.27	V	Q		
2+25	2.1805	26.69	V	Q		
2+30	2.3827	29.37	V	Q		
2+35	2.6187	34.26	V	Q		
2+40	2.9040	41.43	V	Q		
2+45	3.2186	45.68	V	Q		
2+50	3.5225	44.13	V	Q		
2+55	3.7707	36.03	V	Q		
3+ 0	3.9594	27.40	V	Q		
3+ 5	4.1101	21.89	V	Q		
3+10	4.2286	17.20	V	Q		
3+15	4.3184	13.04	V	Q		
3+20	4.3889	10.25	V	Q		
3+25	4.4463	8.33	V	Q		
3+30	4.4933	6.83	V	Q		
3+35	4.5325	5.69	V	Q		
3+40	4.5657	4.82	V	Q		
3+45	4.5937	4.06	V	Q		
3+50	4.6171	3.41	V	Q		

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160EX1006100.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
EXISTING DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 34.41(Ac.) = 0.054 Sq. Mi.
0.054 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 34.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.294 Hr.
Lag time = 17.64 Min.
25% of lag time = 4.41 Min.
40% of lag time = 7.06 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	1.25	43.01

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	3.09	106.33

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.250(In)
Area Averaged 100-Year Rainfall = 3.090(In)

Point rain (area averaged) = 3.090(In)
Areaal adjustment factor = 99.99 %
Adjusted average point rain = 3.090(In)

Sub-Area Data:

130160EX1006100.TXT
Area(Ac.) Runoff Index Impervious %
34.410 60.00 0.400
Total Area Entered = 34.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
60.0	78.0	0.268	0.400	0.171	1.000	0.171
					Sum (F) =	0.171

Area averaged mean soil loss (F) (In/Hr) = 0.171
Minimum soil loss rate ((In/Hr)) = 0.086
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Unit Hydrograph
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	28.345	1.617
2	0.167	56.689	6.739
3	0.250	85.034	18.637
4	0.333	113.379	22.095
5	0.417	141.723	12.821
6	0.500	170.068	7.936
7	0.583	198.413	5.754
8	0.667	226.757	4.359
9	0.750	255.102	3.357
10	0.833	283.447	2.815
11	0.917	311.791	2.330
12	1.000	340.136	1.781
13	1.083	368.481	1.551
14	1.167	396.825	1.341
15	1.250	425.170	1.138
16	1.333	453.515	0.964
17	1.417	481.859	0.824
18	1.500	510.204	0.722
19	1.583	538.549	0.557
20	1.667	566.893	0.470
21	1.750	595.238	0.302
22	1.833	623.583	0.303
23	1.917	651.927	0.339
24	2.000	680.272	0.340
25	2.083	708.617	0.333
26	2.167	736.961	0.217
27	2.250	765.306	0.177
28	2.333	793.651	0.180
		Sum = 100.000	Sum= 34.679

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	0.185	(0.171) 0.167	0.019
2	0.17	0.222	0.171 (0.200)	0.051
3	0.25	0.222	0.171 (0.200)	0.051

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4	0.33	0.60	0.222	0.171	(0.200)	0.051
5	0.42	0.60	0.222	0.171	(0.200)	0.051
6	0.50	0.70	0.260	0.171	(0.234)	0.088
7	0.58	0.70	0.260	0.171	(0.234)	0.088
8	0.67	0.70	0.260	0.171	(0.234)	0.088
9	0.75	0.70	0.260	0.171	(0.234)	0.088
10	0.83	0.70	0.260	0.171	(0.234)	0.088
11	0.92	0.70	0.260	0.171	(0.234)	0.088
12	1.00	0.80	0.297	0.171	(0.267)	0.125
13	1.08	0.80	0.297	0.171	(0.267)	0.125
14	1.17	0.80	0.297	0.171	(0.267)	0.125
15	1.25	0.80	0.297	0.171	(0.267)	0.125
16	1.33	0.80	0.297	0.171	(0.267)	0.125
17	1.42	0.80	0.297	0.171	(0.267)	0.125
18	1.50	0.80	0.297	0.171	(0.267)	0.125
19	1.58	0.80	0.297	0.171	(0.267)	0.125
20	1.67	0.80	0.297	0.171	(0.267)	0.125
21	1.75	0.80	0.297	0.171	(0.267)	0.125
22	1.83	0.80	0.297	0.171	(0.267)	0.125
23	1.92	0.80	0.297	0.171	(0.267)	0.125
24	2.00	0.90	0.334	0.171	(0.300)	0.162
25	2.08	0.80	0.297	0.171	(0.267)	0.125
26	2.17	0.90	0.334	0.171	(0.300)	0.162
27	2.25	0.90	0.334	0.171	(0.300)	0.162
28	2.33	0.90	0.334	0.171	(0.300)	0.162
29	2.42	0.90	0.334	0.171	(0.300)	0.162
30	2.50	0.90	0.334	0.171	(0.300)	0.162
31	2.58	0.90	0.334	0.171	(0.300)	0.162
32	2.67	0.90	0.334	0.171	(0.300)	0.162
33	2.75	1.00	0.371	0.171	(0.334)	0.199
34	2.83	1.00	0.371	0.171	(0.334)	0.199
35	2.92	1.00	0.371	0.171	(0.334)	0.199
36	3.00	1.00	0.371	0.171	(0.334)	0.199
37	3.08	1.00	0.371	0.171	(0.334)	0.199
38	3.17	1.10	0.408	0.171	(0.367)	0.237
39	3.25	1.10	0.408	0.171	(0.367)	0.237
40	3.33	1.10	0.408	0.171	(0.367)	0.237
41	3.42	1.20	0.445	0.171	(0.400)	0.274
42	3.50	1.30	0.482	0.171	(0.434)	0.311
43	3.58	1.40	0.519	0.171	(0.467)	0.348
44	3.67	1.40	0.519	0.171	(0.467)	0.348
45	3.75	1.50	0.556	0.171	(0.501)	0.385
46	3.83	1.50	0.556	0.171	(0.501)	0.385
47	3.92	1.60	0.593	0.171	(0.534)	0.422
48	4.00	1.60	0.593	0.171	(0.534)	0.422
49	4.08	1.70	0.630	0.171	(0.567)	0.459
50	4.17	1.80	0.667	0.171	(0.601)	0.496
51	4.25	1.90	0.704	0.171	(0.634)	0.533
52	4.33	2.00	0.742	0.171	(0.667)	0.570
53	4.42	2.10	0.779	0.171	(0.701)	0.607
54	4.50	2.10	0.779	0.171	(0.701)	0.607
55	4.58	2.20	0.816	0.171	(0.734)	0.644
56	4.67	2.30	0.853	0.171	(0.767)	0.681
57	4.75	2.40	0.890	0.171	(0.801)	0.719
58	4.83	2.40	0.890	0.171	(0.801)	0.719
59	4.92	2.50	0.927	0.171	(0.834)	0.756
60	5.00	2.60	0.964	0.171	(0.868)	0.793
61	5.08	3.10	1.149	0.171	(1.034)	0.978
62	5.17	3.60	1.335	0.171	(1.201)	1.163
63	5.25	3.90	1.446	0.171	(1.301)	1.275
64	5.33	4.20	1.557	0.171	(1.401)	1.386
65	5.42	4.70	1.743	0.171	(1.568)	1.571
66	5.50	5.60	2.076	0.171	(1.869)	1.905

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67	5.58	1.90	0.704	0.171	(0.634)	0.533
68	5.67	0.90	0.334	0.171	(0.300)	0.162
69	5.75	0.60	0.222	0.171	(0.200)	0.051
70	5.83	0.50	0.185	(0.171)	0.167	0.019
71	5.92	0.30	0.111	(0.171)	0.100	0.011
72	6.00	0.20	0.074	(0.171)	0.067	0.007

(Loss Rate Not Used)

Sum = 100.0

Sum = 24.9

Flood volume = Effective rainfall 2.08(In)
times area 34.4(Ac.)/[(In)/(Ft.)) = 6.0(Ac.Ft)
Total soil loss = 1.01(In)
Total soil loss = 2.903(Ac.Ft)
Total rainfall = 3.09(In)
Flood volume = 259488.1 Cubic Feet
Total soil loss = 126432.9 Cubic Feet

Peak flow rate of this hydrograph = 43.724(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0001		0.01	Q				
0+10	0.0006		0.07	Q				
0+15	0.0024		0.27	Q				
0+20	0.0067		0.62	Q				
0+25	0.0133		0.95	Q				
0+30	0.0213		1.17	Q				
0+35	0.0309		1.39	VQ				
0+40	0.0427		1.72	VQ				
0+45	0.0570		2.07	VQ				
0+50	0.0728		2.29	VQ				
0+55	0.0896		2.44	VQ				
1+ 0	0.1074		2.58	V Q				
1+ 5	0.1263		2.75	V Q				
1+10	0.1473		3.06	V Q				
1+15	0.1708		3.40	VQ				
1+20	0.1957		3.61	VQ				
1+25	0.2215		3.76	V Q				
1+30	0.2481		3.86	V Q				
1+35	0.2753		3.95	V Q				
1+40	0.3030		4.02	VQ				
1+45	0.3311		4.07	VQ				
1+50	0.3594		4.12	VQ				
1+55	0.3880		4.16	VQ				
2+ 0	0.4170		4.21	VQ				
2+ 5	0.4467		4.31	VQ				
2+10	0.4777		4.50	Q				
2+15	0.5097		4.65	Q				
2+20	0.5427		4.79	Q				
2+25	0.5774		5.03	VQ				
2+30	0.6130		5.18	Q				
2+35	0.6493		5.27	Q				
2+40	0.6861		5.34	Q				
2+45	0.7234		5.41	Q				
2+50	0.7616		5.54	QV				
2+55	0.8016		5.82	QV				
3+ 0	0.8438		6.13	QV				

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3+ 5	0.8874	6.32	Q			
3+10	0.9319	6.46	QV			
3+15	0.9776	6.64	QV			
3+20	1.0254	6.95	QV			
3+25	1.0758	7.31	Q V			
3+30	1.1283	7.62	QV			
3+35	1.1841	8.11	QV			
3+40	1.2449	8.82	QV			
3+45	1.3111	9.62	QV			
3+50	1.3822	10.32	QV			
3+55	1.4578	10.98	QV			
4+ 0	1.5379	11.63	QV			
4+ 5	1.6223	12.26	QV			
4+10	1.7113	12.92	QV			
4+15	1.8053	13.65	Q V			
4+20	1.9054	14.54	QV			
4+25	2.0125	15.55	QV			
4+30	2.1268	16.59	QV			
4+35	2.2482	17.62	QV			
4+40	2.3757	18.52	QV			
4+45	2.5094	19.41	QV			
4+50	2.6500	20.41	QV			
4+55	2.7975	21.43	QV			
5+ 0	2.9513	22.33	Q V			
5+ 5	3.1118	23.30	Q V			
5+10	3.2824	24.76	Q V			
5+15	3.4698	27.22	Q V			
5+20	3.6811	30.68	Q V			
5+25	3.9180	34.40	Q V			
5						

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Unit Hydrograph Analysis

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Study date 12/22/15 File: 130160EX10024100.out

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

Program License Serial Number 4014

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

English Units used in output format

CENTRAL PLAZA
LAKE ELSINORE
EXISTING DRAINAGE CALCULATIONS
100 YEAR DESIGN STORM

Drainage Area = 34.41(Ac.) = 0.054 Sq. Mi.
0.054 Sq. Mi. Drainage Area for Depth-Area Area Adjustment = 34.41(Ac.) =

USER Entry of lag time in hours
Lag time = 0.294 Hr.
Lag time = 17.64 Min.
25% of lag time = 4.41 Min.
40% of lag time = 7.06 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	2.42	83.27

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	weighting[1*2]
34.41	6.58	226.42

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.420(In)
Area Averaged 100-Year Rainfall = 6.580(In)

Point rain (area averaged) = 6.580(In)
Areaal adjustment factor = 99.99 %
Adjusted average point rain = 6.580(In)

Sub-Area Data:

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 Area(Ac.) Runoff Index Impervious %
 34.410 60.00 0.400
 Total Area Entered = 34.41(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
60.0	78.0	0.268	0.400	0.171	1.000	0.171
						Sum (F) = 0.171

Area averaged mean soil loss (F) (In/Hr) = 0.171
 Minimum soil loss rate ((In/Hr)) = 0.086
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.900

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	28.345	1.617
2	0.167	56.689	6.739
3	0.250	85.034	18.637
4	0.333	113.379	22.095
5	0.417	141.723	12.821
6	0.500	170.068	7.936
7	0.583	198.413	5.754
8	0.667	226.757	4.359
9	0.750	255.102	3.357
10	0.833	283.447	2.815
11	0.917	311.791	2.330
12	1.000	340.136	1.781
13	1.083	368.481	1.551
14	1.167	396.825	1.341
15	1.250	425.170	1.138
16	1.333	453.515	0.964
17	1.417	481.859	0.824
18	1.500	510.204	0.722
19	1.583	538.549	0.557
20	1.667	566.893	0.470
21	1.750	595.238	0.302
22	1.833	623.583	0.303
23	1.917	651.927	0.339
24	2.000	680.272	0.340
25	2.083	708.617	0.333
26	2.167	736.961	0.217
27	2.250	765.306	0.177
28	2.333	793.651	0.180
		Sum = 100.000	Sum= 34.679

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	0.053	(0.304)	0.047
2	0.17	0.053	(0.302)	0.047
3	0.25	0.053	(0.301)	0.047

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4	0.33	0.10	0.079	(0.300)	0.071	0.008
5	0.42	0.10	0.079	(0.299)	0.071	0.008
6	0.50	0.10	0.079	(0.298)	0.071	0.008
7	0.58	0.10	0.079	(0.297)	0.071	0.008
8	0.67	0.10	0.079	(0.295)	0.071	0.008
9	0.75	0.10	0.079	(0.294)	0.071	0.008
10	0.83	0.13	0.105	(0.293)	0.095	0.011
11	0.92	0.13	0.105	(0.292)	0.095	0.011
12	1.00	0.13	0.105	(0.291)	0.095	0.011
13	1.08	0.10	0.079	(0.290)	0.071	0.008
14	1.17	0.10	0.079	(0.289)	0.071	0.008
15	1.25	0.10	0.079	(0.287)	0.071	0.008
16	1.33	0.10	0.079	(0.286)	0.071	0.008
17	1.42	0.10	0.079	(0.285)	0.071	0.008
18	1.50	0.10	0.079	(0.284)	0.071	0.008
19	1.58	0.10	0.079	(0.283)	0.071	0.008
20	1.67	0.10	0.079	(0.282)	0.071	0.008
21	1.75	0.10	0.079	(0.281)	0.071	0.008
22	1.83	0.13	0.105	(0.279)	0.095	0.011
23	1.92	0.13	0.105	(0.278)	0.095	0.011
24	2.00	0.13	0.105	(0.277)	0.095	0.011
25	2.08	0.13	0.105	(0.276)	0.095	0.011
26	2.17	0.13	0.105	(0.275)	0.095	0.011
27	2.25	0.13	0.105	(0.274)	0.095	0.011
28	2.33	0.13	0.105	(0.273)	0.095	0.011
29	2.42	0.13	0.105	(0.272)	0.095	0.011
30	2.50	0.13	0.105	(0.270)	0.095	0.011
31	2.58	0.17	0.132	(0.269)	0.118	0.013
32	2.67	0.17	0.132	(0.268)	0.118	0.013
33	2.75	0.17	0.132	(0.267)	0.118	0.013
34	2.83	0.17	0.132	(0.266)	0.118	0.013
35	2.92	0.17	0.132	(0.265)	0.118	0.013
36	3.00	0.17	0.132	(0.264)	0.118	0.013
37	3.08	0.17	0.132	(0.263)	0.118	0.013
38	3.17	0.17	0.132	(0.262)	0.118	0.013
39	3.25	0.17	0.132	(0.261)	0.118	0.013
40	3.33	0.17	0.132	(0.260)	0.118	0.013
41	3.42	0.17	0.132	(0.258)	0.118	0.013
42	3.50	0.17	0.132	(0.257)	0.118	0.013
43	3.58	0.17	0.132	(0.256)	0.118	0.013
44	3.67	0.17	0.132	(0.255)	0.118	0.013
45	3.75	0.17	0.132	(0.254)	0.118	0.013
46	3.83	0.20	0.158	(0.253)	0.142	0.016
47	3.92	0.20	0.158	(0.252)	0.142	0.016
48	4.00	0.20	0.158	(0.251)	0.142	0.016
49	4.08	0.20	0.158	(0.250)	0.142	0.016
50	4.17	0.20	0.158	(0.249)	0.142	0.016
51	4.25	0.20	0.158	(0.248)	0.142	0.016
52	4.33	0.23	0.184	(0.247)	0.166	0.018
53	4.42	0.23	0.184	(0.246)	0.166	0.018
54	4.50	0.23	0.184	(0.245)	0.166	0.018
55	4.58	0.23	0.184	(0.244)	0.166	0.018
56	4.67	0.23	0.184	(0.242)	0.166	0.018
57	4.75	0.23	0.184	(0.241)	0.166	0.018
58	4.83	0.27	0.211	(0.240)	0.189	0.021
59	4.92	0.27	0.211	(0.239)	0.189	0.021
60	5.00	0.27	0.211	(0.238)	0.189	0.021
61	5.08	0.20	0.158	(0.237)	0.142	0.016
62	5.17	0.20	0.158	(0.236)	0.142	0.016
63	5.25	0.20	0.158	(0.235)	0.142	0.016
64	5.33	0.23	0.184	(0.234)	0.166	0.018
65	5.42	0.23	0.184	(0.233)	0.166	0.018
66	5.50	0.23	0.184	(0.232)	0.166	0.018

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67	5.58	0.27	0.211	(0.231)	0.189	0.021
68	5.67	0.27	0.211	(0.230)	0.189	0.021
69	5.75	0.27	0.211	(0.229)	0.189	0.021
70	5.83	0.27	0.211	(0.228)	0.189	0.021
71	5.92	0.27	0.211	(0.227)	0.189	0.021
72	6.00	0.27	0.211	(0.226)	0.189	0.021
73	6.08	0.30	0.237	(0.225)	0.213	0.024
74	6.17	0.30	0.237	(0.224)	0.213	0.024
75	6.25	0.30	0.237	(0.223)	0.213	0.024
76	6.33	0.30	0.237	(0.222)	0.213	0.024
77	6.42	0.30	0.237	(0.221)	0.213	0.024
78	6.50	0.30	0.237	(0.220)	0.213	0.024
79	6.58	0.33	0.263	0.219 (0.237)		0.044
80	6.67	0.33	0.263	0.218 (0.237)		0.045
81	6.75	0.33	0.263	0.217 (0.237)		0.046
82	6.83	0.33	0.263	0.216 (0.237)		0.047
83	6.92	0.33	0.263	0.215 (0.237)		0.048
84	7.00	0.33	0.263	0.214 (0.237)		0.049
85	7.08	0.33	0.263	0.213 (0.237)		0.050
86	7.17	0.33	0.263	0.212 (0.237)		0.051
87	7.25	0.33	0.263	0.211 (0.237)		0.052
88	7.33	0.37	0.290	0.210 (0.261)		0.079
89	7.42	0.37	0.290	0.209 (0.261)		0.080
90	7.50	0.37	0.290	0.208 (0.261)		0.081
91	7.58	0.40	0.316	0.207 (0.284)		0.108
92	7.67	0.40	0.316	0.206 (0.284)		0.109
93	7.75	0.40	0.316	0.206 (0.284)		0.110
94	7.83	0.43	0.342	0.205 (0.308)		0.138
95	7.92	0.43	0.342	0.204 (0.308)		0.139
96	8.00	0.43	0.342	0.203 (0.308)		0.139
97	8.08	0.50	0.395	0.202 (0.355)		0.193
98	8.17	0.50	0.395	0.201 (0.355)		0.194
99	8.25	0.50	0.395	0.200 (0.355)		0.195
100	8.33	0.50	0.395	0.199 (0.355)		0.196
101	8.42	0.50	0.395	0.198 (0.355)		0.197
102	8.50	0.50	0.395	0.197 (0.355)		0.198
103	8.58	0.53	0.421	0.196 (0.379)		0.225
104	8.67	0.53	0.421	0.195 (0.379)		0.226
105	8.75	0.53	0.421	0.194 (0.379)		0.227
106	8.83	0.57	0.447	0.193 (0.403)		0.254
107	8.92	0.57	0.447	0.192 (0.403)		0.255
108	9.00	0.57	0.447	0.192 (0.403)		0.256
109	9.08	0.63	0.500	0.191 (0.450)		0.309
110	9.17	0.63	0.500	0.190 (0.450)		0.310
111	9.25	0.63	0.500	0.189 (0.450)		0.311
112	9.33	0.67	0.526	0.188 (0.474)		0.338
113	9.42	0.67	0.526	0.187 (0.474)		0.339
114	9.50	0.67	0.526	0.186 (0.474)		0.340
115	9.58	0.70	0.553	0.185 (0.497)		0.367
116	9.67	0.70	0.553	0.184 (0.497)		0.368
117	9.75	0.70	0.553	0.183 (0.497)		0.369
118	9.83	0.73	0.579	0.183 (0.521)		0.396
119	9.92	0.73	0.579	0.182 (0.521)		0.397
120	10.00	0.73	0.579	0.181 (0.521)		0.398
121	10.08	0.50	0.395	0.180 (0.355)		0.215
122	10.17	0.50	0.395	0.179 (0.355)		0.216
123	10.25	0.50	0.395	0.178 (0.355)		0.217
124	10.33	0.50	0.395	0.177 (0.355)		0.217
125	10.42	0.50	0.395	0.177 (0.355)		0.218
126	10.50	0.50	0.395	0.176 (0.355)		0.219
127	10.58	0.67	0.526	0.175 (0.474)		0.352
128	10.67	0.67	0.526	0.174 (0.474)		0.352
129	10.75	0.67	0.526	0.173 (0.474)		0.353

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130	10.83	0.67	0.526	0.172	(0.474)	0.354
131	10.92	0.67	0.526	0.171	(0.474)	0.355
132	11.00	0.67	0.526	0.171	(0.474)	0.356
133	11.08	0.63	0.500	0.170	(0.450)	0.330
134	11.17	0.63	0.500	0.169	(0.450)	0.331
135	11.25	0.63	0.500	0.168	(0.450)	0.332
136	11.33	0.63	0.500	0.167	(0.450)	0.333
137	11.42	0.63	0.500	0.166	(0.450)	0.334
138	11.50	0.63	0.500	0.166	(0.450)	0.334
139	11.58	0.57	0.447	0.165	(0.403)	0.283
140	11.67	0.57	0.447	0.164	(0.403)	0.283
141	11.75	0.57	0.447	0.163	(0.403)	0.284
142	11.83	0.60	0.474	0.162	(0.426)	0.311
143	11.92	0.60	0.474	0.161	(0.426)	0.312
144	12.00	0.60	0.474	0.161	(0.426)	0.313
145	12.08	0.83	0.658	0.160	(0.592)	0.498
146	12.17	0.83	0.658	0.159	(0.592)	0.499
147	12.25	0.83	0.658	0.158	(0.592)	0.500
148	12.33	0.87	0.684	0.157	(0.616)	0.527
149	12.42	0.87	0.684	0.157	(0.616)	0.528
150	12.50	0.87	0.684	0.156	(0.616)	0.528
151	12.58	0.93	0.737	0.155	(0.663)	0.582
152	12.67	0.93	0.737	0.154	(0.663)	0.583
153	12.75	0.93	0.737	0.154	(0.663)	0.583
154	12.83	0.97	0.763	0.153	(0.687)	0.610
155	12.92	0.97	0.763	0.152	(0.687)	0.611
156	13.00	0.97	0.763	0.151	(0.687)	0.612
157	13.08	1.13	0.895	0.150	(0.805)	0.744
158	13.17	1.13	0.895	0.150	(0.805)	0.745
159	13.25	1.13	0.895	0.149	(0.805)	0.746
160	13.33	1.13	0.895	0.148	(0.805)	0.747
161	13.42	1.13	0.895	0.147	(0.805)	0.747
162	13.50	1.13	0.895	0.147	(0.805)	0.748
163	13.58	0.77	0.605	0.146	(0.545)	0.459
164	13.67	0.77	0.605	0.145	(0.545)	0.460
165	13.75	0.77	0.605	0.144	(0.545)	0.461
166	13.83	0.77	0.605	0.144	(0.545)	0.462
167	13.92	0.77	0.605	0.143	(0.545)	0.462
168	14.00	0.77	0.605	0.142	(0.545)	0.463
169	14.08	0.90	0.711	0.142	(0.640)	0.569
170	14.17	0.90	0.711	0.141	(0.640)	0.570
171	14.25	0.90	0.711	0.140	(0.640)	0.571
172	14.33	0.87	0.684	0.139	(0.616)	0.545
173	14.42	0.87	0.684	0.139	(0.616)	0.546
174	14.50	0.87	0.684	0.138	(0.616)	0.546
175	14.58	0.87	0.684	0.137	(0.616)	0.547
176	14.67	0.87	0.684	0.137	(0.616)	0.548
177	14.75	0.87	0.684	0.136	(0.616)	0.548
178	14.83	0.83	0.658	0.135	(0.592)	0.523
179	14.92	0.83	0.658	0.134	(0.592)	0.524
180	15.00	0.83	0.658	0.134	(0.592)	0.524
181	15.08	0.80	0.632	0.133	(0.568)	0.499
182	15.17	0.80	0.632	0.132	(0.568)	0.499
183	15.25	0.80	0.632	0.132	(0.568)	0.500
184	15.33	0.77	0.605	0.131	(0.545)	0.474
185	15.42	0.77	0.605	0.130	(0.545)	0.475
186	15.50	0.77	0.605	0.130	(0.545)	0.476
187	15.58	0.63	0.500	0.129	(0.450)	0.371
188	15.67	0.63	0.500	0.128	(0.450)	0.372
189	15.75	0.63	0.500	0.128	(0.450)	0.372
190	15.83	0.63	0.500	0.127	(0.450)	0.373
191	15.92	0.63	0.500	0.126	(0.450)	0.374
192	16.00	0.63	0.500	0.126	(0.450)	0.374

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193	16.08	0.13	0.105	(0.125)	0.095	0.011
194	16.17	0.13	0.105	(0.124)	0.095	0.011
195	16.25	0.13	0.105	(0.124)	0.095	0.011
196	16.33	0.13	0.105	(0.123)	0.095	0.011
197	16.42	0.13	0.105	(0.123)	0.095	0.011
198	16.50	0.13	0.105	(0.122)	0.095	0.011
199	16.58	0.10	0.079	(0.121)	0.071	0.008
200	16.67	0.10	0.079	(0.121)	0.071	0.008
201	16.75	0.10	0.079	(0.120)	0.071	0.008
202	16.83	0.10	0.079	(0.120)	0.071	0.008
203	16.92	0.10	0.079	(0.119)	0.071	0.008
204	17.00	0.10	0.079	(0.118)	0.071	0.008
205	17.08	0.17	0.132	0.118 (0.118)		0.014
206	17.17	0.17	0.132	0.117 (0.118)		0.014
207	17.25	0.17	0.132	0.117 (0.118)		0.015
208	17.33	0.17	0.132	0.116 (0.118)		0.016
209	17.42	0.17	0.132	0.115 (0.118)		0.016
210	17.50	0.17	0.132	0.115 (0.118)		0.017
211	17.58	0.17	0.132	0.114 (0.118)		0.017
212	17.67	0.17	0.132	0.114 (0.118)		0.018
213	17.75	0.17	0.132	0.113 (0.118)		0.019
214	17.83	0.13	0.105	(0.113)	0.095	0.011
215	17.92	0.13	0.105	(0.112)	0.095	0.011
216	18.00	0.13	0.105	(0.111)	0.095	0.011
217	18.08	0.13	0.105	(0.111)	0.095	0.011
218	18.17	0.13	0.105	(0.110)	0.095	0.011
219	18.25	0.13	0.105	(0.110)	0.095	0.011
220	18.33	0.13	0.105	(0.109)	0.095	0.011
221	18.42	0.13	0.105	(0.109)	0.095	0.011
222	18.50	0.13	0.105	(0.108)	0.095	0.011
223	18.58	0.10	0.079	(0.108)	0.071	0.008
224	18.67	0.10	0.079	(0.107)	0.071	0.008
225	18.75	0.10	0.079	(0.107)	0.071	0.008
226	18.83	0.07	0.053	(0.106)	0.047	0.005
227	18.92	0.07	0.053	(0.106)	0.047	0.005
228	19.00	0.07	0.053	(0.105)	0.047	0.005
229	19.08	0.10	0.079	(0.105)	0.071	0.008
230	19.17	0.10	0.079	(0.104)	0.071	0.008
231	19.25	0.10	0.079	(0.104)	0.071	0.008
232	19.33	0.13	0.105	(0.103)	0.095	0.011
233	19.42	0.13	0.105	(0.103)	0.095	0.011
234	19.50	0.13	0.105	(0.102)	0.095	0.011
235	19.58	0.10	0.079	(0.102)	0.071	0.008
236	19.67	0.10	0.079	(0.101)	0.071	0.008
237	19.75	0.10	0.079	(0.101)	0.071	0.008
238	19.83	0.07	0.053	(0.100)	0.047	0.005
239	19.92	0.07	0.053	(0.100)	0.047	0.005
240	20.00	0.07	0.053	(0.099)	0.047	0.005
241	20.08	0.10	0.079	(0.099)	0.071	0.008
242	20.17	0.10	0.079	(0.099)	0.071	0.008
243	20.25	0.10	0.079	(0.098)	0.071	0.008
244	20.33	0.10	0.079	(0.098)	0.071	0.008
245	20.42	0.10	0.079	(0.097)	0.071	0.008
246	20.50	0.10	0.079	(0.097)	0.071	0.008
247	20.58	0.10	0.079	(0.096)	0.071	0.008
248	20.67	0.10	0.079	(0.096)	0.071	0.008
249	20.75	0.10	0.079	(0.096)	0.071	0.008
250	20.83	0.07	0.053	(0.095)	0.047	0.005
251	20.92	0.07	0.053	(0.095)	0.047	0.005
252	21.00	0.07	0.053	(0.095)	0.047	0.005
253	21.08	0.10	0.079	(0.094)	0.071	0.008
254	21.17	0.10	0.079	(0.094)	0.071	0.008
255	21.25	0.10	0.079	(0.093)	0.071	0.008

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256	21.33	0.07	0.053	(0.093)	0.047	0.005
257	21.42	0.07	0.053	(0.093)	0.047	0.005
258	21.50	0.07	0.053	(0.092)	0.047	0.005
259	21.58	0.10	0.079	(0.092)	0.071	0.008
260	21.67	0.10	0.079	(0.092)	0.071	0.008
261	21.75	0.10	0.079	(0.091)	0.071	0.008
262	21.83	0.07	0.053	(0.091)	0.047	0.005
263	21.92	0.07	0.053	(0.091)	0.047	0.005
264	22.00	0.07	0.053	(0.090)	0.047	0.005
265	22.08	0.10	0.079	(0.090)	0.071	0.008
266	22.17	0.10	0.079	(0.090)	0.071	0.008
267	22.25	0.10	0.079	(0.090)	0.071	0.008
268	22.33	0.07	0.053	(0.089)	0.047	0.005
269	22.42	0.07	0.053	(0.089)	0.047	0.005
270	22.50	0.07	0.053	(0.089)	0.047	0.005
271	22.58	0.07	0.053	(0.088)	0.047	0.005
272	22.67	0.07	0.053	(0.088)	0.047	0.005
273	22.75	0.07	0.053	(0.088)	0.047	0.005
274	22.83	0.07	0.053	(0.088)	0.047	0.005
275	22.92	0.07	0.053	(0.088)	0.047	0.005
276	23.00	0.07	0.053	(0.087)	0.047	0.005
277	23.08	0.07	0.053	(0.087)	0.047	0.005
278	23.17	0.07	0.053	(0.087)	0.047	0.005
279	23.25	0.07	0.053	(0.087)	0.047	0.005
280	23.33	0.07	0.053	(0.087)	0.047	0.005
281	23.42	0.07	0.053	(0.086)	0.047	0.005
282	23.50	0.07	0.053	(0.086)	0.047	0.005
283	23.58	0.07	0.053	(0.086)	0.047	0.005
284	23.67	0.07	0.053	(0.086)	0.047	0.005
285	23.75	0.07	0.053	(0.086)	0.047	0.005
286	23.83	0.07	0.053	(0.086)	0.047	0.005
287	23.92	0.07	0.053	(0.086)	0.047	0.005
288	24.00	0.07	0.053	(0.086)	0.047	0.005

(Loss Rate Not Used)

Sum = 100.0 Sum = 43.0

Flood volume = Effective rainfall 3.58(In)
times area 34.4(Ac.)/[(In)/(Ft.)] = 10.3(Ac.Ft)
Total soil loss = 3.00(In)
Total soil loss = 8.594(Ac.Ft)
Total rainfall = 6.58(In)
Flood volume = 447471.4 Cubic Feet
Total soil loss = 374369.9 Cubic Feet

Peak flow rate of this hydrograph = 24.075(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.02	Q				
0+15	0.0005	0.05	Q				
0+20	0.0011	0.09	Q				
0+25	0.0019	0.12	Q				
0+30	0.0030	0.15	Q				
0+35	0.0042	0.18	Q				
0+40	0.0056	0.20	Q				
0+45	0.0071	0.22	Q				

0+50	0.0087	0.23	Q
0+55	0.0104	0.24	Q
1+ 0	0.0122	0.27	Q
1+ 5	0.0142	0.29	Q
1+10	0.0162	0.30	Q
1+15	0.0183	0.29	Q
1+20	0.0202	0.28	Q
1+25	0.0221	0.28	Q
1+30	0.0240	0.28	Q
1+35	0.0259	0.27	Q
1+40	0.0278	0.27	Q
1+45	0.0297	0.27	Q
1+50	0.0316	0.28	Q
1+55	0.0335	0.28	Q
2+ 0	0.0356	0.30	Q
2+ 5	0.0378	0.32	Q
2+10	0.0400	0.33	Q
2+15	0.0424	0.34	Q
2+20	0.0448	0.34	Q
2+25	0.0471	0.35	Q
2+30	0.0496	0.35	Q
2+35	0.0520	0.36	Q
2+40	0.0545	0.36	Q
2+45	0.0571	0.38	Q
2+50	0.0599	0.40	Q
2+55	0.0628	0.42	Q
3+ 0	0.0657	0.42	Q
3+ 5	0.0687	0.43	Q
3+10	0.0717	0.44	Q
3+15	0.0747	0.44	Q
3+20	0.0777	0.44	Q
3+25	0.0808	0.44	Q
3+30	0.0839	0.45	Q
3+35	0.0869	0.45	Q
3+40	0.0900	0.45	Q
3+45	0.0931	0.45	Q
3+50	0.0963	0.45	Q
3+55	0.0994	0.46	Q
4+ 0	0.1027	0.48	Q
4+ 5	0.1062	0.50	Q
4+10	0.1097	0.51	Q
4+15	0.1133	0.52	Q
4+20	0.1169	0.53	Q
4+25	0.1206	0.54	Q
4+30	0.1244	0.56	Q
4+35	0.1284	0.58	Q
4+40	0.1325	0.59	Q
4+45	0.1366	0.60	Q
4+50	0.1408	0.61	Q
4+55	0.1451	0.62	Q
5+ 0	0.1496	0.64	Q
5+ 5	0.1541	0.66	Q
5+10	0.1587	0.67	Q
5+15	0.1631	0.64	Q
5+20	0.1673	0.61	Q
5+25	0.1715	0.60	Q
5+30	0.1756	0.61	Q
5+35	0.1799	0.62	Q
5+40	0.1843	0.63	Q
5+45	0.1888	0.65	Q
5+50	0.1934	0.68	Q
5+55	0.1982	0.69	Q
6+ 0	0.2030	0.70	Q

6+ 5	0.2079	0.71	Q
6+10	0.2128	0.72	Q
6+15	0.2179	0.74	Q
6+20	0.2231	0.76	VQ
6+25	0.2285	0.78	VQ
6+30	0.2339	0.78	VQ
6+35	0.2394	0.80	VQ
6+40	0.2453	0.86	VQ
6+45	0.2521	1.00	VQ
6+50	0.2602	1.16	Q
6+55	0.2689	1.28	Q
7+ 0	0.2783	1.35	Q
7+ 5	0.2881	1.42	Q
7+10	0.2982	1.48	Q
7+15	0.3088	1.53	VQ
7+20	0.3198	1.60	VQ
7+25	0.3315	1.70	VQ
7+30	0.3447	1.92	VQ
7+35	0.3597	2.18	VQ
7+40	0.3762	2.40	V Q
7+45	0.3946	2.68	V Q
7+50	0.4152	2.99	V Q
7+55	0.4375	3.24	V Q
8+ 0	0.4620	3.55	V Q
8+ 5	0.4888	3.90	V Q
8+10	0.5180	4.24	V Q
8+15	0.5506	4.73	V Q
8+20	0.5868	5.26	V Q
8+25	0.6254	5.60	V Q
8+30	0.6656	5.84	V Q
8+35	0.7072	6.04	V Q
8+40	0.7503	6.26	V Q
8+45	0.7955	6.56	V Q
8+50	0.8429	6.89	V Q
8+55	0.8922	7.16	V Q
9+ 0	0.9438	7.49	V Q
9+ 5	0.9979	7.85	V Q
9+10	1.0544	8.20	V Q
9+15	1.1144	8.71	V Q
9+20	1.1782	9.27	V Q
9+25	1.2449	9.68	V Q
9+30	1.3144	10.09	V Q
9+35	1.3867	10.51	V Q
9+40	1.4614	10.84	V Q
9+45	1.5386	11.21	V Q
9+50	1.6185	11.60	V Q
9+55	1.7006	11.92	V Q
10+ 0	1.7852	12.28	V Q
10+ 5	1.8715	12.54	V Q
10+10	1.9566	12.36	V Q
10+15	2.0348	11.35	V Q
10+20	2.1043	10.09	V Q
10+25	2.1690	9.39	V Q
10+30	2.2309	8.99	V Q
10+35	2.2915	8.80	V Q
10+40	2.3529	8.91	V Q
10+45	2.4191	9.62	V Q
10+50	2.4915	10.52	V Q
10+55	2.5674	11.01	V Q
11+ 0	2.6453	11.32	V Q
11+ 5	2.7247	11.52	V Q
11+10	2.8048	11.62	V Q
11+15	2.8845	11.58	V Q

11+20	2.9636	11.49
11+25	3.0426	11.46
11+30	3.1215	11.46
11+35	3.2004	11.45
11+40	3.2786	11.35
11+45	3.3547	11.05
11+50	3.4283	10.69
11+55	3.5009	10.55
12+ 0	3.5739	10.60
12+ 5	3.6484	10.82
12+10	3.7263	11.31
12+15	3.8126	12.53
12+20	3.9089	13.98
12+25	4.0114	14.89
12+30	4.1189	15.61
12+35	4.2308	16.24
12+40	4.3464	16.79
12+45	4.4666	17.45
12+50	4.5914	18.13
12+55	4.7197	18.63
13+ 0	4.8514	19.11
13+ 5	4.9867	19.64
13+10	5.1263	20.28
13+15	5.2735	21.38
13+20	5.4291	22.59
13+25	5.5899	23.35
13+30	5.7542	23.85
13+35	5.9200	24.08
13+40	6.0833	23.71
13+45	6.2353	22.08
13+50	6.3735	20.07
13+55	6.5041	18.97
14+ 0	6.6304	18.33
14+ 5	6.7540	17.95
14+10	6.8771	17.88
14+15	7.0033	18.33
14+20	7.1337	18.93
14+25	7.2658	19.18
14+30	7.3979	19.19
14+35	7.5294	19.10
14+40	7.6607	19.06
14+45	7.7919	19.04
14+50	7.9229	19.03
14+55	8.0536	18.97
15+ 0	8.1831	18.80
15+ 5	8.3112	18.60
15+10	8.4382	18.44
15+15	8.5637	18.22
15+20	8.6875	17.98
15+25	8.8098	17.77
15+30	8.9304	17.50
15+35	9.0485	17.16
15+40	9.1639	16.75
15+45	9.2738	15.96
15+50	9.3776	15.07
15+55	9.4779	14.56
16+ 0	9.5760	14.25
16+ 5	9.6711	13.81
16+10	9.7592	12.79
16+15	9.8302	10.30
16+20	9.8811	7.40
16+25	9.9202	5.68
16+30	9.9518	4.60

			130160EX10024100.TXT					
16+35	9.9780	3.80		Q			V	
16+40	9.9999	3.18		Q			V	
16+45	10.0185	2.69		Q			V	
16+50	10.0341	2.27		Q			V	
16+55	10.0474	1.93		Q			V	
17+ 0	10.0589	1.67		Q			V	
17+ 5	10.0689	1.44		Q			V	
17+10	10.0776	1.26		Q			V	
17+15	10.0855	1.14		Q			V	
17+20	10.0927	1.06		Q			V	
17+25	10.0994	0.97		Q			V	
17+30	10.1056	0.90		Q			V	
17+35	10.1114	0.84		Q			V	
17+40	10.1169	0.79		Q			V	
17+45	10.1222	0.77		Q			V	
17+50	10.1273	0.74	Q				V	
17+55	10.1321	0.70	Q				V	
18+ 0	10.1364	0.62	Q				V	
18+ 5	10.1401	0.53	Q				V	
18+10	10.1434	0.48	Q				V	
18+15	10.1464	0.44	Q				V	
18+20	10.1492	0.41	Q				V	
18+25	10.1519	0.40	Q				V	
18+30	10.1546	0.39	Q				V	
18+35	10.1573	0.39	Q				V	
18+40	10.1599	0.38	Q				V	
18+45	10.1624	0.36	Q				V	
18+50	10.1646	0.33	Q				V	
18+55	10.1668	0.31	Q				V	
19+ 0	10.1688	0.29	Q				V	
19+ 5	10.1706	0.26	Q				V	
19+10	10.1723	0.25	Q				V	
19+15	10.1741	0.26	Q				V	
19+20	10.1759	0.27	Q				V	
19+25	10.1778	0.28	Q				V	
19+30	10.1799	0.30	Q				V	
19+35	10.1821	0.32	Q				V	
19+40	10.1843	0.32	Q				V	
19+45	10.1865	0.31	Q				V	
19+50	10.1886	0.30	Q				V	
19+55	10.1905	0.28	Q				V	
20+ 0	10.1923	0.26	Q				V	
20+ 5	10.1939	0.24	Q				V	
20+10	10.1955	0.23	Q				V	
20+15	10.1972	0.24	Q				V	
20+20	10.1990	0.25	Q				V	
20+25	10.2008	0.26	Q				V	
20+30	10.2026	0.26	Q				V	
20+35	10.2044	0.27	Q				V	
20+40	10.2063	0.27	Q				V	
20+45	10.2081	0.27	Q				V	
20+50	10.2100	0.27	Q				V	
20+55	10.2118	0.26	Q				V	
21+ 0	10.2135	0.25	Q				V	
21+ 5	10.2150	0.23	Q				V	
21+10	10.2166	0.22	Q				V	
21+15	10.2182	0.23	Q				V	
21+20	10.2199	0.25	Q				V	
21+25	10.2216	0.25	Q				V	
21+30	10.2232	0.24	Q				V	
21+35	10.2248	0.22	Q				V	
21+40	10.2262	0.22	Q				V	
21+45	10.2278	0.23	Q				V	

130160EX10024100.TXT

21+50	10.2295	0.24	Q				V
21+55	10.2312	0.24	Q				V
22+ 0	10.2328	0.23	Q				V
22+ 5	10.2343	0.22	Q				V
22+10	10.2357	0.21	Q				V
22+15	10.2373	0.23	Q				V
22+20	10.2390	0.24	Q				V
22+25	10.2406	0.24	Q				V
22+30	10.2422	0.23	Q				V
22+35	10.2437	0.22	Q				V
22+40	10.2451	0.21	Q				V
22+45	10.2465	0.20	Q				V
22+50	10.2479	0.20	Q				V
22+55	10.2492	0.19	Q				V
23+ 0	10.2505	0.19	Q				V
23+ 5	10.2519	0.19	Q				V
23+10	10.2532	0.19	Q				V
23+15	10.2545	0.19	Q				V
23+20	10.2557	0.19	Q				V
23+25	10.2570	0.19	Q				V
23+30	10.2583	0.19	Q				V
23+35	10.2596	0.19	Q				V
23+40	10.2609	0.19	Q				V
23+45	10.2621	0.18	Q				V
23+50	10.2634	0.18	Q				V
23+55	10.2647	0.18	Q				V
24+ 0	10.2659	0.18	Q				V
24+ 5	10.2672	0.18	Q				V
24+10	10.2683	0.17	Q				V
24+15	10.2693	0.13	Q				V
24+20	10.2699	0.09	Q				V
24+25	10.2704	0.07	Q				V
24+30	10.2708	0.06	Q				V
24+35	10.2711	0.04	Q				V
24+40	10.2713	0.04	Q				V
24+45	10.2715	0.03	Q				V
24+50	10.2717	0.03	Q				V
24+55	10.2719	0.02	Q				V
25+ 0	10.2720	0.02	Q				V
25+ 5	10.2721	0.01	Q				V
25+10	10.2722	0.01	Q				V
25+15	10.2722	0.01	Q				V
25+20	10.2723	0.01	Q				V
25+25	10.2723	0.01	Q				V
25+30	10.2724	0.01	Q				V
25+35	10.2724	0.00	Q				V
25+40	10.2724	0.00	Q				V
25+45	10.2725	0.00	Q				V
25+50	10.2725	0.00	Q				V
25+55	10.2725	0.00	Q				V
26+ 0	10.2725	0.00	Q				V
26+ 5	10.2725	0.00	Q				V
26+10	10.2725	0.00	Q				V
26+15	10.2725	0.00	Q				V

BASIN SIZING

PO-1

<General>

ID	31	Notes	
Label	PO-1	Hyperlinks	<Collection: 0 items>

GIS-IDs

GIS-ID

<Geometry>

Scaled Area	0.019 acres
-------------	-------------

Geometry

X (ft)	Y (ft)
-88.57	57.14
-87.50	31.79
-50.36	31.43
-55.36	53.57

Active Topology

Is Active?	True
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Infiltration

Pond Infiltration Method	None
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Inflow (Wet) Collection

Physical

Volume Type	Elevation- Volume
-------------	----------------------

Elevation-Volume

Elevation (ft)	Volume (ft ³)	Percent Void Space (%)
100.00	0.0	100.0
101.00	400.0	100.0
104.00	16,000.0	100.0

Simulation Initial Condition

Initial Elevation Type	Invert
------------------------	--------

Results (Engine Parsing)

Branch	1
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Results (Extended Node)

Volume	0.0 ft ³	Freeboard Height	4.0 ft
--------	---------------------	------------------	--------

PO-1

Results (Extended Node)			
Depth (Flooding)	-4.00 ft		
Results (Flow)			
Flow (Total In)	0.00 cfs	Local Inflow?	False
Flow (Total Out)	0.00 cfs	Flow (Local from Inflow Collection)	0.00 cfs
Results			
Is Overflowing?	False	Time to Maximum Outflow	69.000 min
Is Ever Overflowing?	False	Time to Maximum Inflow	54.000 min
Depth (Node)	0.00 ft	Flow (Out to Links Maximum)	6.89 cfs
Hydraulic Grade	100.00 ft	Flow (Total In Maximum)	18.31 cfs
Time to Maximum Hydraulic Grade	66.000 min	Flow (Overflow)	0.00 cfs
Hydraulic Grade (Maximum)	103.82 ft	Time to Maximum Storage	66.000 min
Time to Maximum Overflow	0.000 min	Storage (Maximum)	15,062.5 ft³
Flow (Overflow Maximum)	0.00 cfs	Flow (Out Infiltration)	0.00 cfs

Calculation Messages

Time (min)	Message
------------	---------

REFERENCE DOCUMENTS



LEGEND — SOILS GROUP BOUNDARY A SOILS GROUP DESIGNATION RCFC&WCD HYDROLOGY MANUAL   0 FEET 5000	HYDROLOGIC SOILS GROUP MAP FOR ELSINORE
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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 & aeriels](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.082 (0.069-0.099)	0.112 (0.093-0.135)	0.151 (0.126-0.183)	0.185 (0.153-0.225)	0.231 (0.185-0.292)	0.268 (0.209-0.347)	0.307 (0.233-0.407)	0.348 (0.257-0.475)	0.405 (0.286-0.578)	0.450 (0.307-0.667)
10-min	0.118 (0.099-0.142)	0.160 (0.134-0.193)	0.217 (0.181-0.262)	0.265 (0.219-0.323)	0.331 (0.265-0.419)	0.384 (0.300-0.497)	0.440 (0.335-0.584)	0.498 (0.368-0.681)	0.580 (0.410-0.828)	0.645 (0.440-0.956)
15-min	0.143 (0.119-0.172)	0.193 (0.162-0.233)	0.262 (0.219-0.317)	0.320 (0.265-0.391)	0.401 (0.320-0.507)	0.465 (0.363-0.601)	0.532 (0.405-0.706)	0.602 (0.445-0.824)	0.701 (0.496-1.00)	0.780 (0.532-1.16)
30-min	0.220 (0.185-0.265)	0.299 (0.250-0.361)	0.405 (0.338-0.490)	0.494 (0.409-0.603)	0.619 (0.494-0.783)	0.718 (0.561-0.929)	0.821 (0.625-1.09)	0.931 (0.688-1.27)	1.08 (0.766-1.55)	1.21 (0.822-1.78)
60-min	0.351 (0.294-0.423)	0.476 (0.398-0.574)	0.645 (0.538-0.781)	0.787 (0.651-0.961)	0.986 (0.787-1.25)	1.14 (0.893-1.48)	1.31 (0.995-1.74)	1.48 (1.09-2.02)	1.73 (1.22-2.46)	1.92 (1.31-2.84)
2-hr	0.539 (0.452-0.649)	0.700 (0.586-0.845)	0.920 (0.768-1.11)	1.10 (0.914-1.35)	1.37 (1.09-1.73)	1.57 (1.23-2.04)	1.79 (1.36-2.38)	2.02 (1.50-2.77)	2.35 (1.66-3.35)	2.61 (1.78-3.86)
3-hr	0.673 (0.564-0.811)	0.866 (0.725-1.04)	1.13 (0.942-1.36)	1.35 (1.12-1.65)	1.66 (1.32-2.10)	1.91 (1.49-2.46)	2.16 (1.65-2.87)	2.44 (1.80-3.33)	2.82 (1.99-4.03)	3.13 (2.13-4.63)
6-hr	0.968 (0.811-1.17)	1.25 (1.05-1.51)	1.63 (1.36-1.98)	1.95 (1.61-2.38)	2.39 (1.91-3.02)	2.73 (2.13-3.53)	3.09 (2.35-4.10)	3.46 (2.56-4.73)	3.98 (2.81-5.68)	4.38 (2.99-6.50)
12-hr	1.25 (1.05-1.51)	1.71 (1.43-2.06)	2.30 (1.92-2.78)	2.77 (2.29-3.38)	3.40 (2.72-4.30)	3.88 (3.03-5.02)	4.37 (3.33-5.80)	4.86 (3.59-6.65)	5.52 (3.90-7.89)	6.03 (4.11-8.93)
24-hr	1.65 (1.46-1.91)	2.42 (2.13-2.79)	3.38 (2.98-3.92)	4.14 (3.62-4.83)	5.13 (4.34-6.18)	5.86 (4.86-7.21)	6.58 (5.33-8.29)	7.30 (5.75-9.44)	8.24 (6.24-11.1)	8.94 (6.55-12.5)
2-day	1.97 (1.74-2.27)	3.00 (2.65-3.47)	4.30 (3.79-4.98)	5.32 (4.65-6.22)	6.66 (5.64-8.03)	7.66 (6.35-9.42)	8.64 (7.00-10.9)	9.62 (7.58-12.4)	10.9 (8.26-14.7)	11.9 (8.70-16.5)
3-day	2.15 (1.90-2.48)	3.32 (2.93-3.84)	4.82 (4.24-5.58)	6.00 (5.24-7.01)	7.56 (6.40-9.12)	8.73 (7.24-10.7)	9.89 (8.02-12.5)	11.1 (8.72-14.3)	12.6 (9.55-17.0)	13.8 (10.1-19.2)
4-day	2.32 (2.05-2.68)	3.62 (3.19-4.18)	5.28 (4.65-6.11)	6.60 (5.77-7.71)	8.37 (7.08-10.1)	9.70 (8.04-11.9)	11.0 (8.93-13.9)	12.4 (9.76-16.0)	14.2 (10.7-19.1)	15.5 (11.4-21.7)
7-day	2.64 (2.33-3.04)	4.09 (3.61-4.72)	6.00 (5.28-6.95)	7.56 (6.60-8.82)	9.68 (8.19-11.7)	11.3 (9.39-13.9)	13.0 (10.5-16.4)	14.7 (11.6-19.0)	17.1 (12.9-23.0)	18.9 (13.9-26.3)
10-day	2.79 (2.47-3.22)	4.30 (3.80-4.97)	6.32 (5.57-7.32)	8.00 (6.99-9.34)	10.3 (8.73-12.4)	12.1 (10.1-14.9)	14.0 (11.4-17.7)	16.0 (12.6-20.7)	18.7 (14.2-25.2)	20.9 (15.3-29.1)
20-day	3.33 (2.95-3.85)	5.08 (4.49-5.87)	7.50 (6.60-8.69)	9.56 (8.35-11.2)	12.5 (10.6-15.1)	14.9 (12.3-18.3)	17.4 (14.1-21.9)	20.1 (15.9-26.1)	24.0 (18.2-32.3)	27.2 (19.9-37.8)
30-day	3.94 (3.48-4.55)	5.92 (5.22-6.84)	8.69 (7.66-10.1)	11.1 (9.70-13.0)	14.6 (12.4-17.6)	17.5 (14.5-21.5)	20.6 (16.7-26.0)	24.0 (18.9-31.1)	28.9 (21.9-39.0)	33.0 (24.2-46.0)
45-day	4.63 (4.10-5.35)	6.79 (6.00-7.85)	9.88 (8.70-11.5)	12.6 (11.0-14.7)	16.7 (14.1-20.1)	20.0 (16.6-24.7)	23.7 (19.2-29.9)	27.8 (22.0-36.0)	33.9 (25.7-45.6)	39.0 (28.6-54.3)
60-day	5.37 (4.75-6.20)	7.68 (6.79-8.88)	11.0 (9.72-12.8)	14.0 (12.3-16.4)	18.5 (15.7-22.3)	22.3 (18.5-27.5)	26.5 (21.5-33.4)	31.3 (24.6-40.4)	38.3 (29.0-51.6)	44.3 (32.4-61.7)

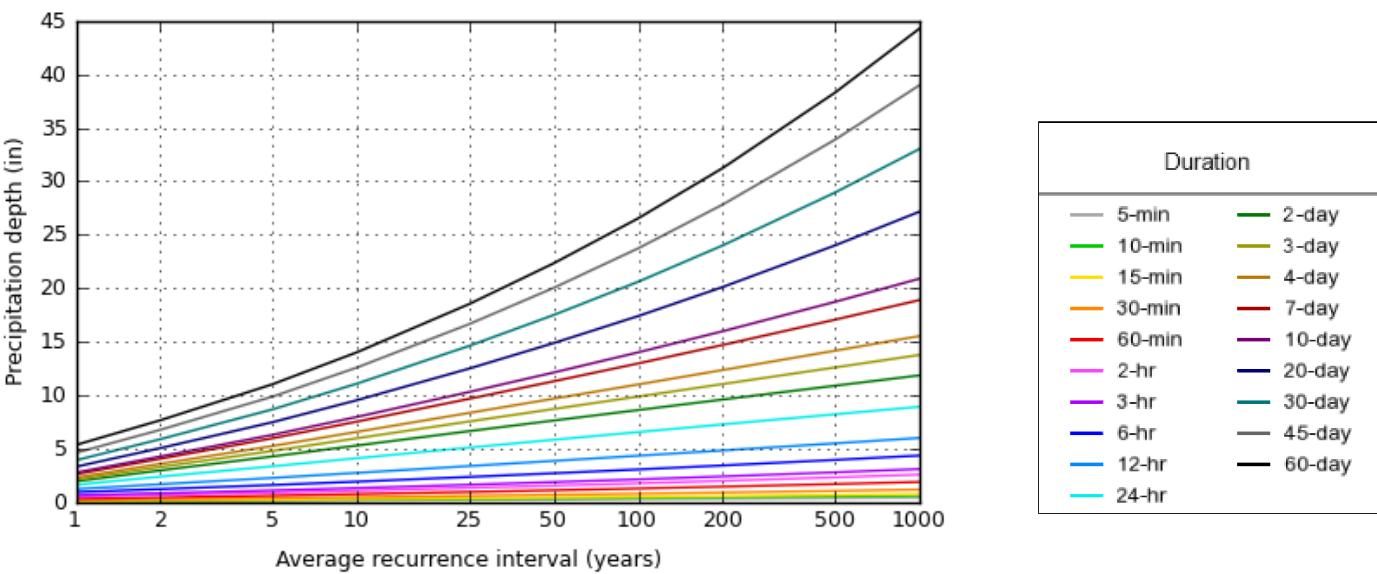
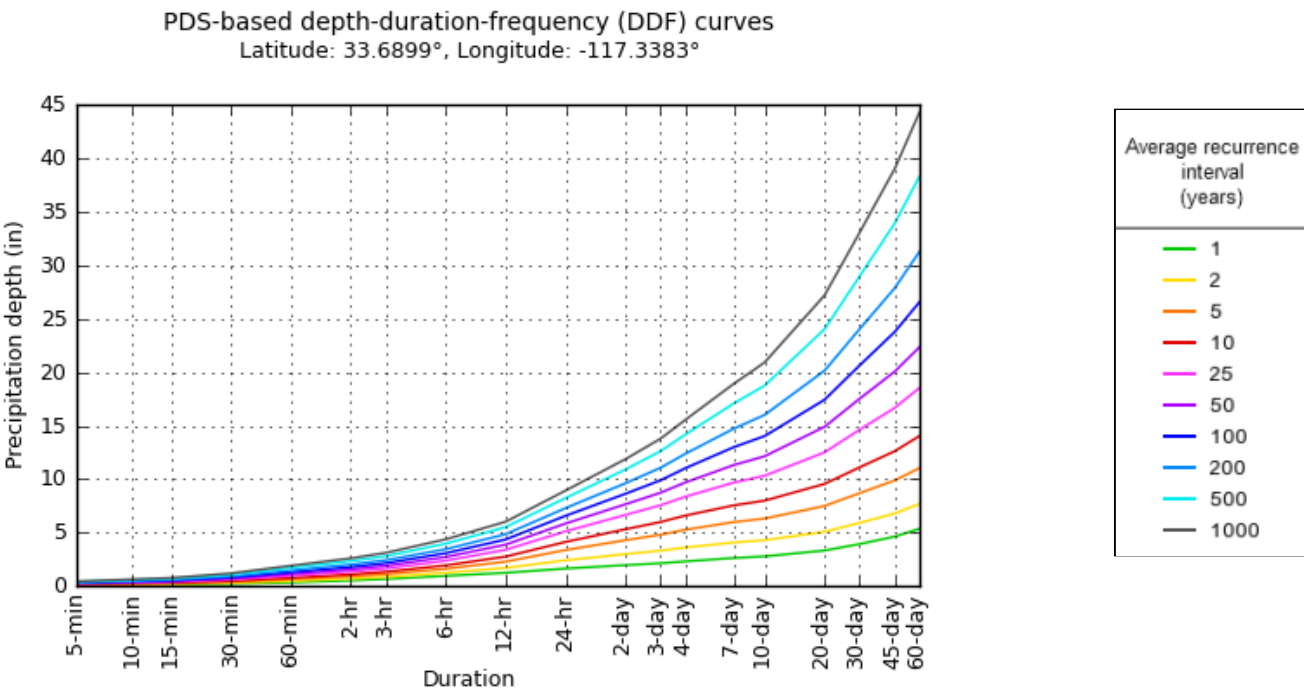
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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

Please refer to NOAA Atlas 14 document for more information.

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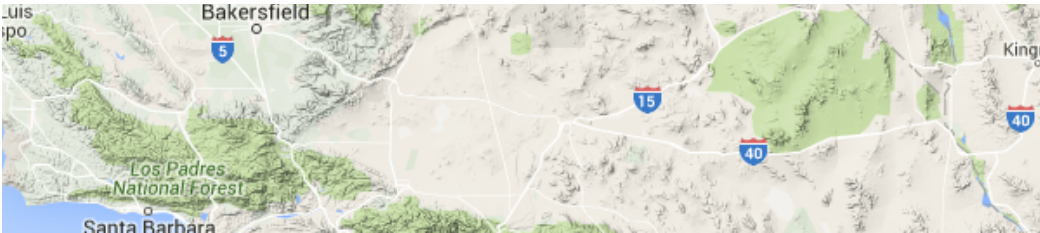
PF graphical

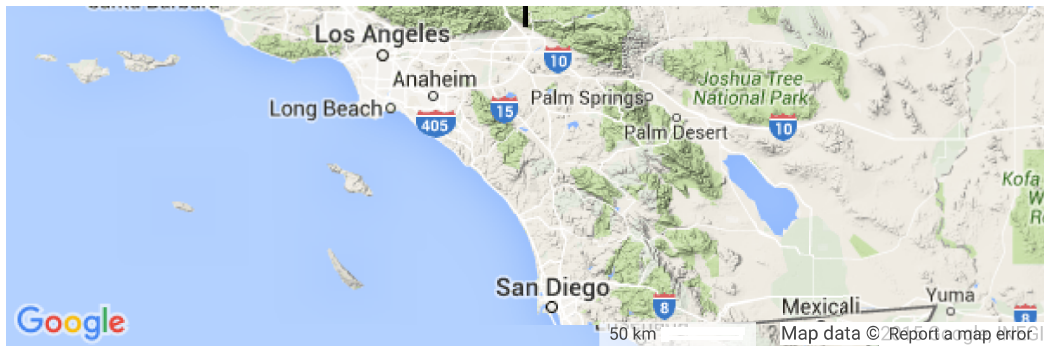


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Maps & aerials

Small scale terrain





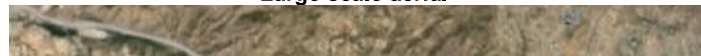
Large scale terrain



Large scale map



Large scale aerial





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

[Disclaimer](#)

DRAINAGE NOTESArea No. 130Approximate Location 27+50 - 30+50Point of Concentration (Station) 29+30Land UseExisting 1 Home site otherwise undevelopedFuture 100% Suburban developmentAnticipated Residential Density ModerateSoil Type: Sandy loamTerrain: flat alluvial slopesFlow Line Characteristics:Upstream: wide & shallowDownstream: SameExisting Structures: 30" RCP (PM 25.20)Remarks:

HYDROLOGYArea No. 130Coefficient of Runoff

Paved Surface	90%	Vegetated Slopes	- Steep	60%
Commercial Area	85%	"	- Mild	50%
Dense Residential	75%	"	- Flat	45%
Normal Residential	60%	Farm Land		35%
Suburban Property	50%	Parks, Golf Courses		30%
Barren Slopes - Steep	80%			
" " - Mild	70%			
" " - Flat	65%			

C (Consider Probable Development)

% of Area		Coeff.		
<u>100</u>	% at	<u>50</u>	% =	<u>50</u>
	% at		% =	
	% at		% =	
	% at		% =	
			C =	<u>50</u>
			Use C =	<u>50</u>

Area 27 Acres C X A = 13.5P-60: 10-Yr. 0.88 25-Yr. 1.05 50-Yr. 1.20 100-Yr. 1.40Max. Elev. 1324 Channel Length 2500 Ft. or MilesMin. Elev. 1274 Time of Conc. 14 Min. or Hrs.Elev. Diff. 50'USE

10-Yr. i =	<u>1.85</u> "/hr	<u>25.0</u> cfs	<u>25</u> cfs
25-Yr. i =	<u>2.22</u> "/hr x $\frac{13.5}{CA}$	<u>30.0</u> cfs x <u>0</u> % =	<u>30</u> cfs
50-Yr. i =	<u>2.56</u> "/hr	<u>34.6</u> cfs	<u>35</u> cfs
100-Yr. i =	<u>2.96</u> "/hr	<u>40.0</u> cfs	<u>40</u> cfs

Prepared by Bottle Date 1-72 Checked by Clawson Date 1-72

CULVERT DESIGNArea No. 130Station 69+00Design Q_{10} 25
 Q_{100} 40Culvert size & type 36" RCPMinimum Slope 0.60 % Planned Culvert Slope 0.0077Maximum headwater available 8.0 ft.Head Required 3.15 ft. Skew 0 ° Lt/RtInlet flow line elev. 1276.5 Outlet flow line elev. 1273.0Inlet Water Surface Elevation 1279.15Overfill 33.5 ft.Estimated Vel. at Outlet (Q-100) 9.2 fpsCulvert Inlet and Outlet Appurtenances Std. Headwall @ Inlet &Outlet. No RSP requiredRemarks:

June 13, 2014

Mr. John Koenig
C/O Tom O'Neil
TMI
1370 Longworth Drive
Los Angeles, California 90049

RE: Recommendations for Flood Hazard Mitigation of the Proposed Koenig Companies Commercial Center, Southeast Corner of Central and Collier Avenues, Lake Elsinore, California

The purpose of this letter is to recommend the flood hazard mitigation approach, in compliance with the National Flood Insurance Program (NFIP) as administered by the Federal Emergency Management Agency (FEMA), and propose a conceptual solution for the aforementioned site, shown below in Figure 1.

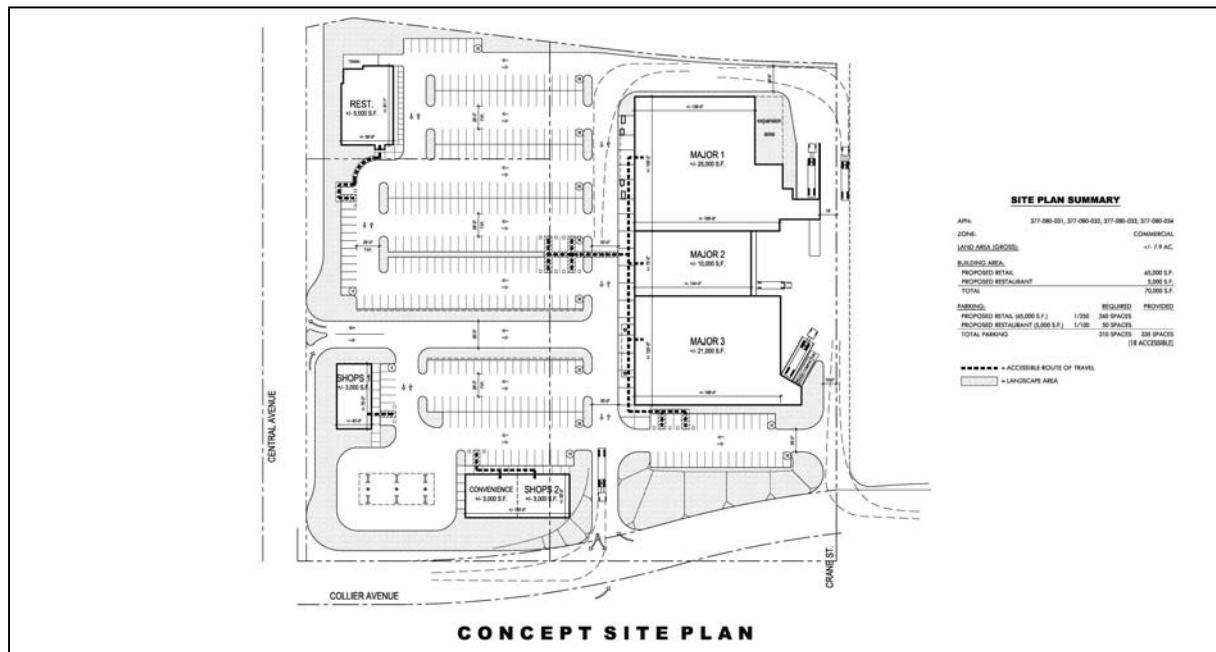


Figure 1. Site Plan, Koenig Companies Commercial Center, Lake Elsinore

A major portion of the property is located in a special flood hazard area, designated as Zone AO Depth 1, which, in this case, is the backwater effect from the overflow of Temescal Wash and 3rd Street Channel. These flood control facilities do not have the 100-year flood capacity due to the backwater from the channelized Temescal Wash emptying out into the spreading grounds. Zone AO, as designated at this site, is an ineffective flow area, i.e., a no conveyance ponding area with a designated depth of 1 foot.

There were two FEMA permit applications that we considered for conditionally removing the property from the SFHA: Conditional Letter of Map Revision (CLOMR) or Conditional Letter of Map Revision based on Fill (CLOMR-F). As stated in prior correspondences, the CLOMR-F is a less complicated process than the CLOMR. Moreover, we confirmed with the Riverside County Flood Control and Watershed Conservation District (RCFC&WCD), the local community tasked with enforcing compliance with the NFIP, that the special flood hazard area (SFHA) designated for this site Zone AO is a result of the backwater due to the overflow from the nearby Temescal Wash. Therefore, a CLOMR application

would not be feasible because the source of the backwater is the unchannelized spreading grounds. The flood hazards are depicted in Figure 2, which shows the site to be in Zone AO at the site. Temescal Wash is channelized until it reaches the spreading grounds, which causes a backwater effect propagating upstream and inundating the site.

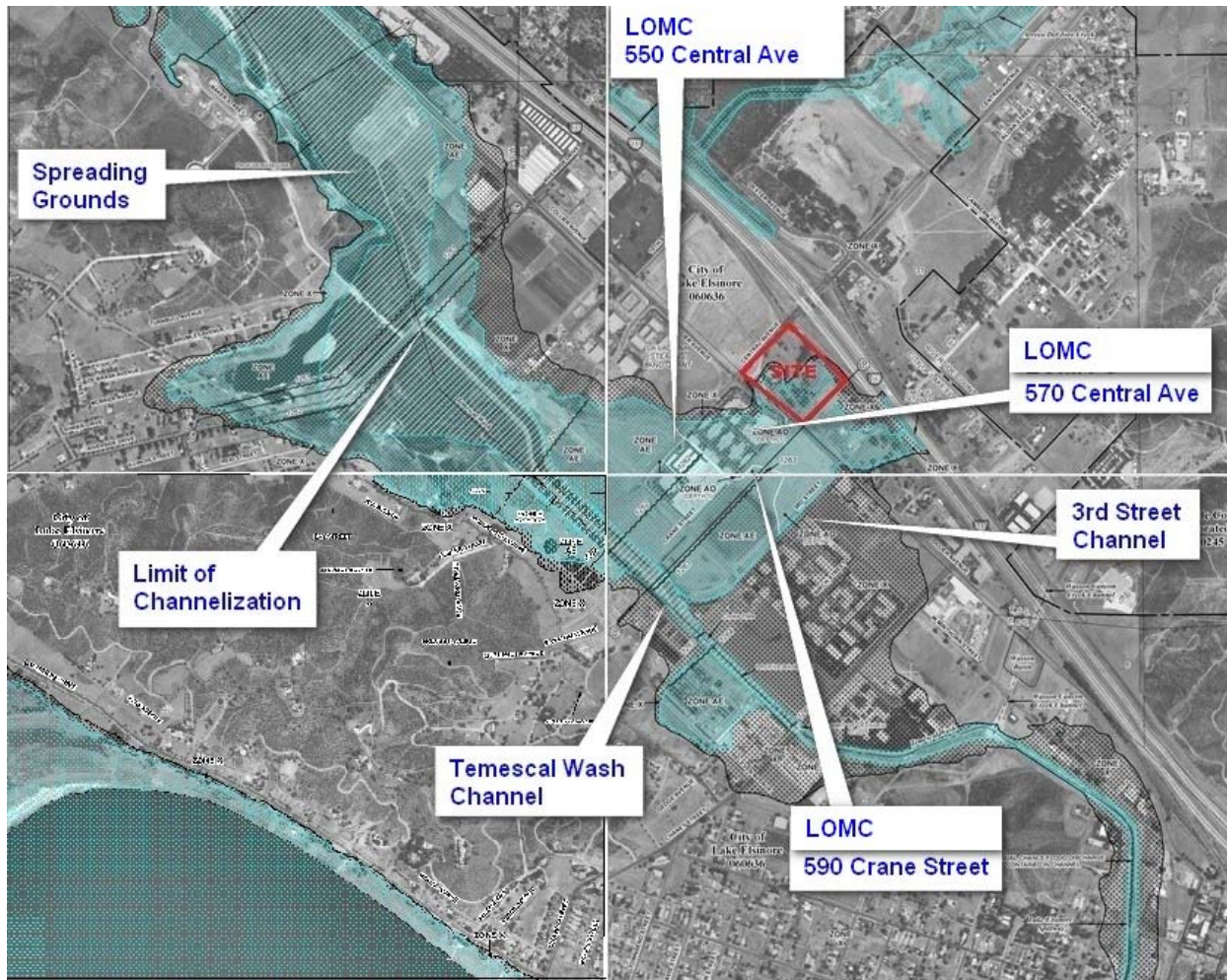


Figure 2. Flood Insurance Rate Maps (FIRMs), NFIPⁱ
(note: LOMC= Letter of Map Change which encompasses LOMR-F changes)

There are three nearby and precedent LOMR-F applications, which successfully removed structures at 550 Central Avenue, 570 Central Avenue and 590 Crane Street. These structures are also located in Zone AO and were elevated with fill above the one-foot depth, which fulfilled the NFIP requirements to remove them from the SFHA. The CLOMR-F for this site would be a similar process.

There exists a headwall in the adjacent tract, specifically located at the north side of the 3rd Street/Collier Avenue intersection, which drains into the 3rd Street channel. It appears that this inlet also serves both the Koenig Commercial Center tract and the adjacent tract to its south.

Using the geometric and hydrologic data from the design plans,ⁱⁱ which is exhibited in the appendix, a hydraulic model was developed to verify the results reflected in the FIRM panels. The hydraulic model was developed using HEC-RASⁱⁱⁱ and confirmed that the 100-year flow, which is estimated to be 1,100 ft³/s, exceeds the capacity for the dual 30-inch RCB culverts and channel. Figure 3 illustrates the 100-year water-surface profile of the 3rd Street Channel, which shows that the banks are overtopped at the downstream end and the culvert capacity is exceeded causing overtopping of Collier Avenue. The backwater from the culverts and the Temescal Wash overflow is the source of the flooding of the site.

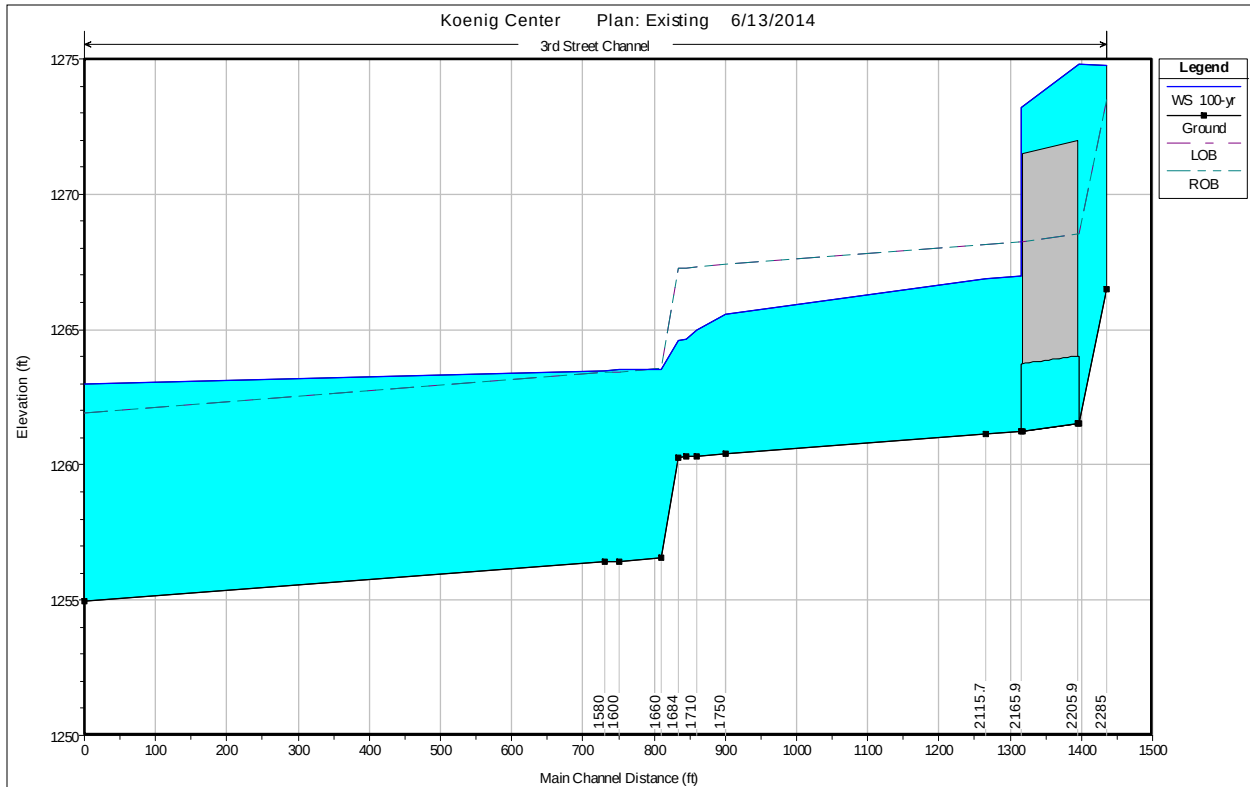


Figure 3. 100-year Water-Surface Profile

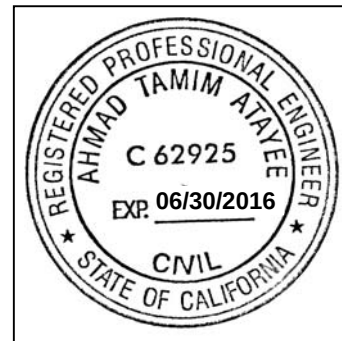
In compliance with the CLOMR-F guidelines and specifically for property located in a Zone AO, the proposed structures would have to be elevated by a minimum of the depth designation, which, in this case is one foot, above the highest adjacent existing ground. In addition to this one foot, a freeboard may apply.

The CLOMR-F application, which carries an \$800 application fee, has a statutory maximum review period of 90 days and typically is ruled upon by FEMA within 60 days. The CLOMR-F is not a revision of the FIRM and hydraulics but rather a demonstration that the flood potential due to the fill is not changed, which needs to be analytically verified in support of the application. After the implementation of the development, a LOMR-F application, supported with as-built plans confirming elevations, is required to be submitted to complete the process.

Sincerely yours,

RIVERTECH INC.

A. Tamim Atayee, PE, F.ASCE
Principal & CEO



- i Flood Insurance Rate Map, Panels No. FM06065C2028G, FM06065C2029G, FM06065C2036G, FM06065C2037G, National Flood Insurance Program, August 28, 2008.
- ii Third Street Channel, Riverside County Flood Control And Water Conservation District, April 30, 1993.
- iii HEC-RAS River Analysis System, Version 4.1, US Army Corps of Engineers, Hydrologic Engineering Center (HEC), 2010.